MARKET CONDUCT IN STRUCTURE-PERFORMANCE MODELS: SOME EXPERIMENTATION IN CANADIAN SECONDARY MANUFACTURING INDUSTRIES

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ABSTRACT

Conventional industrial organization analysis has viewed market conduct and therefore market performance as being determined primarily by industry structure. The purpose of this thesis is to address the question of whether or not inter-industry or intra-industry conduct variations influence market performance. The outline of this thesis is as follows.

Chapter One is devoted to reviewing the conventional structure-performance model. The second chapter provides an overview of recent empirical and theoretical literature concerning inter-industry and intra-industry conduct variation. Chapters Three and Four present a set of statistical experiments that test whether or not inter-industry conduct variation affects profitability. In order to test for this, it was assumed that different types of industry products signal fundamental differences in the characteristics of demand for each product. This assumption allowed a sample of manufacturing goods industries to be divided into subgroups of industries (consumer, producer, nonconvenience and convenience goods industries). The conventional structure-performance model was then tested on each of these subgroups.

Test results of Chapters Three and Four indicated that the structural determinants of performance vary among groups of manufacturing goods industries, meaning that in some groups of industries inter-industry conduct variation is important in determining profitability. Results suggest that future work in industry analysis should begin to recognize the importance of inter-industry conduct variation.

Chapter Five presents several experiments testing for intra-industry conduct variation. Using a sample of consumer goods industries, tests were carried out to determine if the addition of firm specific conduct variables into the conventional structure-performance model improved the model's explanatory powers. The statistical results obtained in chapter five were mixed. Despite the strong theoretical support for the existence of intra-industry conduct variation in a sample of consumer goods industries the results of this thesis suggested otherwise.

Finally, Chapter Six discusses some of the public policy implications when recognizing the importance of inter-industry and intra-industry conduct variation in industry analysis. Generally, it was concluded that while further work should continue in improving the structure-performance paradigm, the overall perspective of stable structural features of market environments should be maintained.

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PREFACE

Industrial organization analysis, based on the conventional structure-performance model, has come to view market conduct as largely determined by industry structure. In assuming this, the conventional framework has recognized market power in an industry as being characterized primarily by a firm's size and the advantages associated with size. Conduct characteristics such as pricing, marketing and product strategies are assumed similiar for all firms. The importance of conduct variation on industry performance is therefore viewed as being minimal. There are those that argue however, that the industry's and firm's decisions about pricing, advertising, research and development and other conduct elements affects industry structure and therefore market performance.

The purpose of this thesis is to address the question of whether or not conduct variation affects industry performance. The first part of this thesis provides an overview of the conventional structure-performance model and reviews recent empirical and theoretical literature concerning market conduct and it's importance in industry analysis. The remainder of this thesis is primarily devoted to the presentation of empirical tests that attempt to determine if the absence of market conduct in the conventional structure-performance model seriously affects the explanation of cross-sectional variation in industry profitability. These tests will take two forms.

First, in a sample of manufacturing goods industries, inter-industry or between industry conduct variation will be tested. More specifically assumptions on the marketing (conduct) characteristics of product types sold in the industries will be made (eg., consumer goods, producer goods, convenience goods and nonconvenience goods). Using these conduct assumptions, a sample of manufacturing and consumer goods industries will be divided into groups of differing product type industries. The conventional structure-performance model will then be tested on each of these groups. As different types of products signal

a fundamental difference in the characteristics of demand for each product we would expect that the conventional structure-performance model should perform differently for each industry group. Inter-industry test results of this thesis suggest that the structural determinants of performance vary among broad groups of industries and that future work in industry analysis should begin including conduct considerations into the conventional framework.

Secondly, in a sample of consumer goods industries intra-industry or within industry conduct variation will be tested. Using a sample of consumer goods industries, several tests will be carried out to determine if the addition of firm specific conduct variables into the conventional structure-performance model improves the models explanatory powers. Intra-industry test results of this thesis failed to indicate the existence of intra-industry variation in a sample of consumer goods industries. However, considering the unavailability of firm specific data, the inability to measure conduct variation accurately and the strong theoretical support regarding the importance of intra-industry effects in explaining cross-sectional variations in profitability, the intra-industry results of this thesis should not be viewed as being conclusive. It is evident that considerably more work is necessary with regards to the measuring and testing of intra-industry variation.

The final chapter of this thesis summarizes the empirical results and discusses some of the public policy implications associated when recognizing the importance of inter-industry and intra-industry conduct variation in industry analysis.

CHAPTER 1

OVERVIEW OF THE STRUCTURE-PERFORMANCE MODEL

1.1 The Structure-Performance Model

The conventional structure-performance industrial organization analysis developed out of how firms and industries behave. In 1938 Edward S. Mason proposed that a general correspondence be derived for performance and market structures. Mason advocated that through the examination of the structure of an organization of firms, differences could be explained in the firm's competitive practices. Mason advanced the hypothesis that demand, size, production costs, operation characteristics and the channels of distribution (structural characteristics) were crucial to the formulation of a firm's pricing policy and therefore to performance.[1]

Mason's approach to the study of price analysis was important for several reasons. First Mason sought to analyze a firm's performance patterns by empirically measuring market structure. Secondly, and most important, he laid down a framework for analysis. He identified potentially relevant market structure variables to be used in determining performance. This saw the beginning of the structure-conduct-performance form of industry analysis.[2]

Mason's analysis, however, because of its concern with the firm, tended to obscure some of the vital forces common to the situations of many industries and posed difficulties for empirical testing.

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[1] See Mason (1939, pp.61-74).

[2] For a summary see Phillips and Stevenson (1974, pp.324-342).

Under Joe S. Bain the study of the "market" was extended to mean not the firm, "but as including all the sellers in any individual industry, and all the buyers to whom they sell."[3] Furthermore, Bain pioneered the approach of identifying a very few critical structural traits of industries and relating these to their market performance.

Of more importance Bain streamlined the structure-conduct performance industry analysis into a structure-performance paradigm. The basic framework of Bain's structure-performance model is outlined below.

1.1(a) Market Structure

Bain defined industry market structure as the characteristics of the organization of a market that exert influence on competition within an industry. According to Bain the most important influences of market structure are:[4]

a) The degree of buyer and seller concentration as measured by the number and size distribution of buyers and sellers in the industry.

b) The degree of product differentiation among the products of sellers in the market as measured by the amount of advertising in the market.

c) The conditions of entry to the industry as measured by the absolute capital requirements of the minimum efficient sized plant.

In general, while these are the primary charactertistics of market structure, market structure could include every objective circumstance (technological, geographical, or institutional) that might be considered as dimensions of market structure.

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[3]Bain (1968, pp.6-7).

[4]See Bain (1968, pp.223-464) and Scherer (1970, pp.1-7).

1.1(b) Market Conduct

Bain defined market conduct as the behaviour of member firms within the industry engaged in profit-seeking activities. Bain theorized that market conduct, which is determined by market structure, determines market performance. Market conduct refers primarily to two interrelated phases of business behaviour.

a) The types of pricing and marketing policies that the sellers in the industry adopt and the aims they pursue in determining their selling price.

b) The mechanism by which the different competing sellers in the industry coordinate their actions.

In short, market conduct is a complex notion, encompassing numerous major and subsidiary dimensions of enterprise behavior. These include, product strategy, research and development, advertising and legal tactics.

1.1(c) Market Performance

Market performance, determined by the types of conduct of member firms, refers to the margin of price above the cost of production and whether output was restricted in order to reap an excess profit.

1.1(d) The Conventional Model

In theory Bain envisioned a "three-stage sequence of causation running from market structure to market conduct to market performance".[5] However, in empirical testing Bain found that patterns of market conduct were not easily measured so as to permit a meaningful empirical association either between market conduct and market performance or between market structure and market conduct. He therefore assumed a direct relationship between market structure and market performance leaving the link of market conduct substantially unascertained. Essentially meaning that if the hypothesized relationship

[5]See Bain (1968, p.329)

between structure and performance is statistically confirmed then the conduct necessary to produce the result is presumed to have taken place.

The structure-performance model allowed the measurement of a few structural traits (e.g. seller concentration, industry growth, economies of scale, product differentiation) across broad samples of industries and the testing of their hypothesized influence on the industries' performance, measured primarily by profitability. Bain's analysis, systematized the influence of many industry charactertistics, provided a potent stimulus for further theoretical development and performed powerfully in empirical tests.

1.2 Dissatisfaction With Conventional Structure-Performance Model

Recently, there has been growing dissatisfaction over the conceptual foundations of Bain's paradigm.[6] In establishing theoretical linkages between structure and performance, assumptions have been made about the competitive behavior (conduct) of firms in the market. These behavioral assumptions have been determined in part by the structure of the market, i.e., the number and size distribution of sellers, the degree of product differentiation and entry conditions. All firms have been assumed to pursue the goal of profit maximization and follow similar pricing, marketing, and product strategies. These in turn were determined primarily by firm size. In most empirical testing, a single value has been assigned all firms in an industry with respect to individual structural traits. In general, the result of eliminating conduct in the structure-performance framework has been to treat all firms in an industry as similar except for size and market share.

The fact that previous research has avoided testing for market conduct (e.g., demand characteristics, vertical relations, and structural and behaviorial differences among firms within industries) is not surprising. Measuring inter-industry and intra-industry conduct traits is often very difficult, if not impossible. However, a growing number

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[6]Chapter 2 of this paper will explain in detail the "growing dissatisfaction".

of industrial organization theorists have attempted to overcome some of these problems and have found that the introduction of market conduct into industry analysis leads to major improvements in the understanding of industry performance.[7] Chapter 2 will review some of this literature.

[7]Porter (1976); Porter (1979) and Newman (1978) incorporated conduct variables in the conventional structure-performance model with successful results.

CHAPTER 2

INTER-INDUSTRY AND INTRA-INDUSTRY CONDUCT CHARACTERISTICS

2.1 Introduction

This chapter reviews theoretical and empirical literature concerning inter-industry and intra-industry conduct variation. More specifically, the first section of this chapter lays the groundwork for including inter-industry conduct variation in the conventional structure-performance model. The remaining portion of Chapter 2 is devoted to a discussion of strategic group theory (intra-industry conduct variation) detailing the effect intra-industry variation has on industry structure and performance.

2.2 Inter-Industry Conduct Characteristics

The basic rationale that underlies cross-sectional studies is that a change in one or more of the market structure variables causes change in the profitability of the entire industry. Moreover, there is an implicit assumption that the conduct relationships are the same for each of the industries represented in the cross section. That is, the industries are virtually identical with respect to market power and efficiency so that there are no major differences in their pricing, output, and product strategies.

Porter (1976) tested the structure-performance relation across a sample of consumer good industries utilizing a convenience-nonconvenience product-type group distinction. Porter hypothesized that the influence of conduct, as reflected by the industry advertising-

to-sales ratio, would vary according to whether the products of the industry were sold predominantly in convenience or nonconvenience consumer outlets.[8] Porter's results suggested that market structure-profitability relationships varied differently between the convenience and nonconvenience samples. Structural variables significant when estimated over one sample were not significant, or had opposite signs, when estimated with the other sample. Porter concluded that previous structure-performance testing involving consumer good industries had mixed industries with very different conduct characteristics and that care in identifying and specifying these differences would help to explain variations in industry performances.

2.3 Intra-Industry Conduct Characteristics

Structuralist models of markets imply that the structure of an industry defines the strategy of the firm; the latitude for choice of a strategy by the firm is very limited if not absent. The industry structure facing all firms in it is therefore constant, and hence all firm strategies should be similar. Thus by studying the structure of the industry we can learn most of what is important about the firm's behaviour and hence market performance.

There have been several empirical studies testing the relationship between various elements of intra-industry structure and profitability. In one of the first, Demsetz (1973) examined the importance of absolute firm size in determining profits.[9] He found that although the profits of large firms were related to concentration, the relationship did not appear to apply to small firms. He concluded that concentration among large or leading firms had little positive effect on smaller firms' profits. Marcus (1969) found that size and profits were positively related in 35 of 118 industries.[10] In the remaining 83 industries, 74

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[8] Porter (1976, pp.135-197).

[9] Demsetz (1973, pp.1-9).

[10] Marcus (1969, pp.104-107).

were not related statistically and 9 were negatively related. Finally Shephard (1972) examined the importance of a firm's market share in determining profitability and empirically found that market power is unique to the individual firm.[11]

This literature provided some support for the notion that market power was unique to each firm in an industry, but the results were not sufficiently conclusive to support the argument that intra-industry structure was a major determinant of profitability. The main weakness of the early research was related to the general absence of a cohesive theoretical model concerning the importance of intra-industry structure in determining profits.

2.4 Strategic Group Theory

In recent years several authors have integrated firm strategy with the study of competition. Michael Hunt (1972) felt that size was the distinguishing factor among firms however, he also felt that every firm was unique. This compromise produced the concept of "strategic groups" which allows recognition of groups encompassing a number which can exceed one and is less than the total number of firms in the industry.[12] Refining Hunt's theory of intra-industry structure Newman (1978) and Porter (1979) individually developed models linking important differences in conduct with differences in performance among firms within an industry.[13]

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[11] Shepherd (1972, pp.25-36).

[12] According to Porter (1979, pp.214-227) Michael S. Hunt, in his unpublished 1972 Ph.D. dissertation entitled "Competition in the Major Home Appliance Industry (1960-1970)", first coined the term "strategic groups".

[13] Besides the major work done on strategic groups by Porter (1979) and Newman (1978) additional analysis of strategic groups has been done by the following authors: Porter (1976, pp.67-94); Caves (1980, pp.64-92); Caves and Porter (1977, pp.421-441); Dalton and Esposito (1981, pp.15-25); Amato and Wilder (1981) and Thorelli (1977).

The theory of strategic groups is based upon the premise that industries are not the reasonably homogeneous units as envisioned by most industrial organization economists. Common observation suggests that firms in an industry often differ from one another in their degree of vertical integration or diversification, the extent to which they advertise and brand their product, whether they operate in national markets etc. Strategic groups therefore, are clusters of firms within the same industry which have similar operating charactertistics. Firms in an industry can be grouped according to the similarity of sets of strategies (e.g., marketing type, pricing behavior, product strategy, research and development and advertising). Each strategic group contains one or more similar firms and it is possible for the strategic group to contain all the firms in the industry.[14]

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[14]To illustrate the idea of strategic groups, a brief examination of the Canadian farm machinery industry will be helpful. Under a 1970 Royal Commission on Farm Machinery, the Canadian farm machinery industry was examined in an attempt to explain the competitive behavior of the oligopalistic industry. The study observed 17 Canadian companies which accounted for approximately 75 per cent of the sales of new farm machines and repair parts in 1966. Without really realizing it, the Commission divided their sample into four strategic groups. The Commission divided the sample basically according to size, ownership, type of distributional systems and extent of manufacturing in Canada. Their division was as follows:

Group 1. Four large firms that manufacture in Canada and control their own wholesaling operations. All sell a full-line of agricultural implements and are involved in national sales and advertising. Average return on assets (return on assets are profits before taxes plus interest payments as a percentage of total assets) = 8.9%.

Group 2. Six companies that do not manufacture in Canada but operate their own wholesaling systems. In this group we have both full-line and short-line implement sales. All firms are involved in national sales and advertising. Average return on assets = 8.7%.

Group 3. One Canadian owned manufacturing company manufactures larger machinery than Group 4 but does not have the broad range of equipment and options associated with Groups 1 and 2. The company is involved in semi-national sales and the firm's machines are priced significantly below those of Groups 1 and 2. Average return on assets = 40.1%.

Group 4. Six small, Canadian owned firms. All firms produce small implements and usually specialize. Most of these companies sell their products to Group 1 and 2 companies to be marketed under those company's brand names. These companies tend to specialize in a particular product that is specific to a particular region. Average return on assets = 22.9%.

By definition, firms in a strategic group follow similar strategies.[15] Therefore, firms in a strategic group are likely to respond in the same manner to disturbances from inside or outside the group. However, will each strategic group respond in the same way to market disturbances? The answer is no. As each strategic group operates with a different set of corporate strategies (promotional aims, preferences regarding prices, marketing methods, technology, scale of operation) it will be hard to anticipate each group's reactions to each disturbance. Newman (1978) and Porter (1979) have argued that the presence of strategic groups within an industry affects a firm's profit rates in two ways, through competitive rivalry and mobility barriers.

2.4(a) Competitive Rivalry and Strategic Groups

In the conventional model, since all firms are assumed to be similar, or belong to the one and only strategic group, responses to disturbances in the environment are assumed to be alike. However, when identifying more than one strategic group in an industry we no longer can assume homogeneous reactions to disturbances. For example because each strategic group operates with a different set of strategies, mutual interdependence among the groups is limited. Therefore, if there is a disturbance which affects the industry as a whole each group would adjust, retaliate etc., in its own unique way. Each group does not know the exact adjustment method that any other group will use (promotional aims, preferences regarding prices, marketing methods, technology, scale of operation, etc.). This will have the ultimate effect of reducing tacit collusion between groups of firms. With tacit collusion reduced this will lower the average rates of returns or increase its variance. Porter (1979) identifies three factors that will affect the rivalry between strategic groups.[16] They are: (i) the number and size distribution of groups, (ii) the strategic distance between groups and finally (iii) the market interdependence across groups. We will now consider each factor in more detail.

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[15] See previous footnote.

[16] See Porter (1979, pp.217-218).

(i) The Number and Size Distribution of Strategic Groups on Competitive Rivalry

The more equal in size and the more numerous the groups the greater will be the competitive rivalry. If however, there is one dominant group controlling a large portion of the industry and the remaining portion of the industry is held by a large number of small groups, then strategic asymmetry implies very little rivalry since the power of the small group to influence the large group is probably low.

(ii) Strategic Distance Between Groups

The greater the degree of difference in key strategy variables such as advertising, cost structure and research and development across strategic groups the more difficult collusion becomes and therefore the greater the rivalry. Groups differing only in their use of advertising are likely to face fewer difficulties in coordination than those following different strategies with respect to breadth of product line, new product innovation and advertising.

(iii) Market Interdependence Among Groups

If different strategic groups are competing for essentially the same customer, the greater will be competitive rivalry. When strategic groups are focussing on different market segments then their impact on each other is reduced.

It is possible to conclude therefore that a particular strategic group's rivalrous conduct will be greatest when there is a large number of strategic groups, each following different strategic approaches and all competing for the same market segment. Also, the profitability of the strategic group will be influenced by the degree to which firms within the industry compete with each other.

2.4(b) Mobility Barriers and Strategic Groups

The conventional view concerning "barriers to entry" implies that the same barriers protect all firms in an industry equally; that is, the barrier characteristics are assumed common to the industry and therefore the firm. However, as soon as we bring strategic groups into the picture the above notion of common barriers to entry becomes inappropriate. Entry barriers become group or firm specific and impede not only the entry of new firms into the industry but the mobility of established firms from group to group within an industry. Depending on the structure of the industry, group barriers may vary greatly from group to group. It is possible to have a situation where there are high entry barriers into the industry yet weak entry barriers between groups and vice versa. There is no reason to believe that these two sets of barriers need be the same. Entry barriers, when considering strategic groups, can therefore be thought of more generally as "mobility barriers".[17]

2.4(c) Interaction of Competitive Rivalry and Mobility Barriers on Profits

The existence of strategic groups within an industry greatly complicates the conventional theory of industry structure. In accepting the notion of strategic groups we are no longer accepting the idea of a homogenous group of firms. Careful examination of the strategic group configuration is now necessary. This involves looking at each group's mobility barriers, size and composition, strategic distance and market interdependence relative to each other group. Depending on how each of the mobility barriers and the competitive rivalry factors act between

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[17] Caves and Porter (1977, pp.241-261) suggest that the presence of differing degrees of barriers to entry from one strategic group to another implies the possibility of entry paths. It may be favourable for the new entrant to proceed by a sequence of moves from group to group, rather than move directly to his targetted group. Caves and Porter reason that such a sequence of moves would be advantageous for a number of reasons. They argue that new firms look at entry in terms of probability of success or failure. Firms will attempt to minimize the risk of failure at each strategic group. The new firm may first move into an industry's lightly defended group allowing itself time to evaluate its position, resources, and future before it decides to move into a higher barrier group or to exit and minimize it's losses.

groups, a number of situations are possible. For example, a firm may have higher profits if it is located in a group which has:[18]

1) high mobility barriers;
2) bargaining power with other industries;
3) high strategic distance (conduct variation);
4) small number of groups (easier to collude);
5) and few firms in the group (easier to collude).

Given the limited theoretical foundations for distinguishing industry variation it is no wonder why this form of industry study has been largely unexplored. In addition, the task of securing data for individual firms and becoming familiar about all firms in all industries to determine their configurations of strategic groups is onerous.

Using their newly developed theory of intra-industry structure Newman (1978) and Porter (1979) obtained the following empirical results. Newman found that as the number of strategic groups in an industry is increased, the problems associated with coordinating pricing and output strategies becomes more difficult.[19] Consequently there is an inverse relationship between the number of strategic groups and industry profits. Using a sample of 34 producer good industries, Newman assigned approximately 500 firms into strategic groups by examining a variety of strategic variables. The 34 industries were then divided into a homogeneous industry group and a heterogeneous group.[20] Newman found that for the homogeneous industry sample a conventional set of structure-performance independent variables were significant while in the heterogeneous sample the same set of variables were insignificant.

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[18]See Porter (1979, p.219).

[19]See Newman (1978, pp.423-425).

[20]Newman defines a homogeneous industry group as a group of industries containing few strategic groups with many firms all of which employ similiar marketing strategies. He defines a heterogeneous industry group as a group of industries containing many strategic groups with few firms all employing very different marketing strategies. See Newman (1978, pp.422-423).

Using a consumer goods industry sample, Porter (1979) assigned firms to strategic groups according to a leader-follower dichotomy.[21] Porter defined leader firms as the largest firms in an industry accounting for 30 per cent of total receipts. All remaining firms were classified as followers. He reasoned that the leader group should contain strategic groups that make use of strategy characteristics such as vertical integration, in-house repair and service facilities, national advertising, full-line sales and large sales forces. The follower group, he reasoned would encompass strategic groups following narrow-line strategies, regional strategies, nonintegrated strategies etc. Therefore, the leader/follower classification should capture some of the variance among strategic groups. Porter found that industry concentration exerted a positive influence on the profits of leader firms, but the influence of concentration was negative for the follower group.

In both cases, Porter and Newman concluded that the theory of strategic groups was important in explaining differences in firm profits within an industry. More generally they found that an industry's behavior is affected by the complexity of strategic groups.

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[21] See Porter (1979, pp.214-227).

CHAPTER 3

INTER-INDUSTRY CONDUCT VARIATION IN A SAMPLE OF MANUFACTURING GOODS INDUSTRIES

3.1 Introduction

The first part of Chapter 2 reviewed literature concerning inter-industry variation and it's effect on industry performance. In review, Porter (1976) empirically found that market structure-profitability relationships varied in a cross-section of consumer goods industries. Porter concluded that inter-industry conduct variation should be incorporated in the conventional structure performance framework to help explain variations in industry performances.

Chapter 3 is the first of two chapters concerned with empirically testing the effect inter-industry conduct variation has on industry performance. More specifically, a cross-section of manufacturing goods industries will be divided with respect to inter-industry conduct differences, into a cross-section of consumer and producer goods industries. Industry performance in each of the samples will be tested using the conventional structure-performance model.

3.2 Theoretical Assumptions

Product differentiation in an industry asserts an influence on pricing, on the determination of market shares, and on the scope of market conduct upon the sellers.[22] In product differentiated markets, sellers are encouraged to try to increase their market shares or generally improve their profit positions by advertising and otherwise engaging in sales promotion activities. Sales promotion policies and

[22]See Bain (1968, pp. 223-250).

product policies therefore become essential parts of the market conduct of sellers in industries. Where product differentiation is based mainly on brands and advertising, competition via sales promotion will be great. Where product design and customer service are the key to product differentiation, a different type of non-price competition exists. Therefore, the sources of product differentiation within an industry encompasses all industry conduct considerations which may induce buyers to prefer one competing output to another.

While the most obvious sources of product differentiation within an industry are differences in quality or design, among outputs an additional important source involves the knowledge of buyers regarding the essential characteristics and qualities of the goods they are purchasing. For example, buyer awareness is likely to be a very important consideration and different in the case of goods bought by consumers, those bought by producers, and even durable consumer goods that are infrequently purchased and are complex in design and composition.[23]

3.3 The Mandate For Partitioning A Manufacturing Goods Sample Into Consumer and Producer Goods Industries

Recognizing that product differentiation and the knowledge of buyers varies among manufacturing products we should expect that the conventional structure-performance model would perform differently for a sample of consumer goods industries and a sample of producer goods industries.

3.3(a) Consumer Goods Industries

The set of attributes on which the buyer of a product places a utility value and on which the buyer would base a fully informed choice varies among products. The nature of the product defines the attributes set. For example, a consumer who purchases meat, canned vegetables, bread etc. does so frequently and therefore is likely to

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[23]Bain (1968, pp. 235-245).

obtain a reasonably good knowledge of the quality and other characteristics of competing outputs and is able to arrive at a reasoned and informed choice among alternatives. In addition, buyer preferences for the above products are developed and shaped by extensive advertising. Such advertising contains little or no product information but is aimed at creating product preferences through "catchy phrases" and repetition. In general consumer goods are usually purchased because of the consumers own experience with the product; advice from friends and acquaintances; reputation of the retail outlet offering the product and media advertising (television, radio, magazines, newspapers).[24]

3.3(b) Producer Goods Industries

In contrast, choices of buyers of producer goods are usually based on technical product characteristics. Compared to the purchaser of consumer goods the perceived benefits of making an informed choice are likely to be greater for the producer good purchaser as these benefits are measured by reductions in cost and improvements in the quality of the firm's output. The producer good purchaser may be responsive to technical reports, personal selling, promptness of delivery, availability of the product, etc.[25] In general, the use of advertising in the sale of producer goods will be very limited as most producer goods are standardized. Producer goods industries find little opportunity for introducing physical product differentiation among their products.

In terms of the conventional structure-performance model, it appears likely that the model will explain relatively less of the cross-industry variation in profits of producer good industries in view of the greater importance of ancillary services which the seller performs for

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[24]Bain (1968, pp. 226-227).

[25]See Porter (1979, pp. 108-109).

buyers and the relative unimportance of advertising.[26] In consumer industries the conventional structure-performance model should perform strongly as advertising is essentially the sole means of product differentiation. Therefore, we should expect that the advertising coefficient will be significantly different between producer and consumer manufacturing goods industries.

3.4 Structure of the Test

A sample of 60 SIC classified Canadian manufacturing goods industries were used to test the structure-performance link in consumer good and producer good industries.[27] Any industries producing 50 per cent or more of output for use as intermediate inputs were classified as a producer good industries.[28] Any industries not falling in this category were considered as belonging to the consumer industry group. The partitioned sample consisted of 30 consumer good industries and 30 producer good industries. See Appendix A for a complete listing of the industries in each sample.

3.5 Discriminant Analysis: Statistically Testing Between Group Differences

An important point arising at this junction is the question of successfully dividing the sample into statistically significant groups. As indicated earlier, theory suggests that the advertising variable will be different between the two samples (consumer and producer). To help in the more-or-less arbitrary means of dividing the manufacturing good sample into consumer and producer samples, discriminant analysis was employed to help determine whether or not the between group conduct differences were statistically significant.

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[26]Because producer goods industries make use of a large number of product differentiation strategies the conventional structure-performance model should perform weakly.

[27]The manufacturing goods industry sample used in this paper is very similar to the one used by Jones and Leader (1979, pp. 499-517).

[28]Classifications of consumer and producer outputs were determined by Dominion Bureau of Statistics, The Input-Output Structure of The Canadian Economy (1961).

Briefly, the mathematical objective of discriminant analysis is to weigh and linearly combine a set of discriminating variables in some fashion so that two groups are forced to be as statistically distinct as possible. That is, we want to be able to discriminate between the groups in the sense of being able to statistically tell them apart.[29]

Using the divided consumer, producer industry samples, a conventional set of structural variables were used to comprise the set of discriminating variables.[30] The discriminating variable set comprised the following conventional structural variables: absolute capital requirements; 4-firm concentration ratio; growth rate of demand; regional dummy; advertising; ratio of imports to domestic output; and economies of scale. Using a step-wise regression process the above variables were selected for entry into the analysis on the basis of their discriminating power. The selection rule in this case was to minimize Wilkes' Lambda where Lambda is an inverse measure of the discriminating power in the original variables which has not yet been removed by the discriminant function. The larger lambda is the less information remains. By sequentially selecting the next best discriminator at each step, a reduced set of variables was found.

The results of the step-wise variable selection, as expected, indicated that the advertising variable was the most discriminating variable of the two groups. Using the equivalent F test, the between group differences with regards to advertising were found to be highly significant.[31]

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[29]See Bolch and Huang (1974), Murphy (1973), Cacoullas (1973) Cooley and Lohnes (1962) and Nie et al (1978) for detailed descriptions on the theory and usages of discriminant analysis.

[30]As most of the structural variables are standard in industrial organization literature very little time will be spent in explaining their inclusion in the conventional industrial organization model. For a review see Scherer (1980, pp.267-296).

[31]Using the equivalent F test is equivalent to performing a T^2 test.

3.6 The Model

Testing structure-performance relations in the consumer and producer groups involved estimating a linear regression equation separately for each sample.[32] The dependent variable for each test was the ratio of profits plus interest to total assets. Once again a basic set of structural variables were used as independent variables: absolute capital requirements; 4-firm concentration ratio; growth rate of demand; regional dummy; advertising; ratio of imports to output and economies of scale.[33] The sources of data, definitions of the variables and their methods of construction are detailed in Appendix A.

3.7 Regression Results

To test whether market structure-profitability relationships vary according to consumer and producer groups, the dependent variable, profitability, was regressed on the two groups and the total sample using the same combinations of independent variables.

For the most part results reported in Table 1 are consistent with those expected and reported in the literature. The literature usually considers that for both consumer and producer goods the 4-firm concentration ratio, regional dummy, growth rate of demand, economies of scale, absolute capital requirements will be positive.[34] As outlined above the ratio of advertising to sales variable should be positive and significant for consumer goods and insignificant for the

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[32]Estimating a separate equation for each data set incorporates the assumption that the variance of the error term is constant within each group but not across groups and allows the model and specification of variables to vary across groups.

[33]As the purpose of the experimentation is to test the validity of the conventional structure-performance model on the consumer and producer groups then the most standard structure-performance model must be used (see Scherer (1980, pp.267-296)). These variables comprise the simpliest structural model.

[34]See Jones, Laudadio and Percy (1977, pp.195-201).

producer goods sample. For the ratio of imports to industry output variable theory suggests the sign should be negative, but as shown in Table 1 there is Canadian evidence that the sign is positive.[35]

For the entire sample the overall proportion of the variance in profitability explained (equation 1a) was .37. As expected the advertising, and absolute capital requirement variables were positive and significant. The demand, 4-firm concentration ratio and regional dummy variables had correct signs but were not significant. In addition the imports to industry output variable was positive as previous Canadian evidence has shown. Finally the economies of scale variable had a negative sign and was not significant.[36]

Equations 1b and 1c present corresponding sets of regression equations for consumer good and producer good samples. For the consumer good sample, the model yielded a corrected R^2 of .50 as compared with .37 for the entire sample. The t value of the advertising variable increased as did most t values for all the variables. However, the economies of scale variable continued to be negative. It appears for the consumer sample that the standard structure-performance model yields a better fit than for the entire manufacturing good sample.

For the producer sample (1c), the model performed weakly. The corrected R^2 for the producer sample dropped to .15 from .37 for the entire sample, indicating an even larger proportion of the variance in

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[35]See Jones, Laudadio and Percy (1977, pp.195-201). A similiar positive sign has been obtained with Australian data, see Round (1978).

[36]The negative sign for the economies of scale variable is most likely due to multicollinearity. Jones, Laudadio and Percy (1977, p.203) found that the economies of scale variable and the absolute capital requirements variable were strongly collinear. When virtually the same data is subjected to the ridge regression technique the signs for scale economies becomes positive as would be expected on a priori grounds. See Jones and Laudadio (1983, p.367) and Prescott and Tapon (1982).

TABLE 1

MULTIPLE REGRESSION EQUATIONS EXPLAINING PROFITABILITY:
(CONSUMER, PRODUCER DIVISION)

	Intercept	Ratio of Advertising to Sales	Absolute Capital Requirements	Economies of Scale	Ratio of Imports to Industry Output	Growth Rate of Demand	4-Firm Concentration Ratio	Regional Dummy	R^2	Corrected R^2
				60 Industries - All Manufacturing Goods						
1a	3.487	0.334	0.083	-0.123	2.455	0.234	0.026	0.813	.448	.373
		(3.799)[a]	(1.960)[b]	(-0.369)	(2.706)[d]	(0.423)	(0.136)	(.968)		
				30 Consumer Good Industries						
1b	3.279	0.370	0.268	-0.353	2.757	0.308	0.024	1.580	.615	.501
		(4.923)[a]	(2.227)[b]	(-1.394)[f]	(2.080)[e]	(0.224)	(0.936)	(1.343)[c]		
				30 Producer Good Industries						
1c	3.261	0.532	0.071	-0.102	2.014	0.174	0.037	-2.409	.352	.146
		(0.714)	(1.375)[c]	(-0.534)	(1.466)	(0.274)	(1.244)	(-1.187)		

Note: Figures in parentheses are t values. The significance of the regression coefficients is tested using a t test and the significance of the coefficients of multiple determination is tested using an F test (all those reported are significant).

[a] Coefficient is significant at the 99 per cent level, one-tail tests.
[b] Coefficient is significant at the 95 per cent level, one-tail tests.
[c] Coefficient is significant at the 90 per cent level, one-tail tests.
[d] Coefficient is significant at the 99 per cent level, two-tail tests.
[e] Coefficient is significant at the 95 per cent level, two-tail tests.
[f] Coefficient is significant at the 90 per cent level, two-tail tests.

profits was unexplained. As expected, the advertising variable was not significant. The economies of scale variable was still negative and not significant and the regional dummy variable's sign changed from positive to negative.

3.8 Testing for Equivalence of Variables

As the values of the regression coefficients appeared different, it was necessary to test the null hypothesis to determine if the regression coefficients were the same for two data sets. If there is no significant difference between the coefficients in the two models, then the two data sets could be pooled with no loss in explanatory power in the model. Several simple F tests were carried out.[37]

The test for equivalence of coefficients produced mixed results. For the entire model it was not possible to reject the hypothesis that the coefficients were the same across the two data sets. However, for one coefficient, that being advertising, the calculated F-value was greater than the critical value, meaning that it is possible to conclude that the advertising coefficients of the subsets are not equal in the two regressions.

TABLE 2

EQUIVALENCE OF COEFFICIENTS

	Using Entire Model 7 Variables Significant Level of .05	Using Only Advertising Significant Levels of .05
F Critical	1.95	2.23
F Calculated	0.40	4.73

[37]This procedure for testing equivalence of coefficients is commonly called a Chow test.

3.9 Summary

The regression results have reinforced the striking differences between the consumer and producer samples. Differences in conduct lead to sharp differences in the structure-performance link. As predicted by theory, the standard industrial organizational model was most successful in explaining profits for consumer goods and the advertising variable was highly significant. The same model was weak in explaining profits for the producer good industries and the advertising variable as predicted, was not significant. These results indicate that conduct charactertistics such as ancilliary services play an important role in the purchase of producer goods and therefore in the performance of producer good industries.

CHAPTER 4

INTER-INDUSTRY CONDUCT IN A SAMPLE OF CONSUMER GOODS INDUSTRIES

4.1 Introduction

Chapter 3 focused on recognizing inter-industry conduct variation in a group of manufacturing good industries and attempted to determine its effect on the conventional structure-performance model. This chapter will carry out similiar inter-industry conduct experimentation concentrating on a sample of consumer good industries. The sample of consumer good industries used in the previous chapter will be partitioned into a convenience goods industries group and a nonconvenience goods industries group and tests similiar to the ones undertaken in Chapter 3 will be carried out. In this chapter statistical research by Porter (1976) on structure-performance relationships in consumer good industries will provide a standard of comparison for the convenience and nonconvenience inter-industry results of this thesis.[38]

4.2 The Mandate for Partitioning a Consumer Goods Sample into Convenience and Nonconvenience Goods Industries

As was outlined in Chapter 3, the type of the product sold and buyer awareness determines the types of product differentiation used by the industry. For example, if information were costless for the consumer and no uncertainty existed, he would consider all product attributes in his purchase decision and would employ the full range of sources of information available about all the attributes. Gaining information about some attributes is more costly than gaining information about others. This trade-off will vary across products with the result that the attributes on which choice is based will vary.

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[38] Porter (1976, pp.133-197)

In a sample of consumer good industries the type of consumer goods range from low priced, frequently purchased consumer goods to costly infrequently purchased consumer goods. For costly infrequently purchased consumer goods the consumer will base his choice on attributes such as technical charactertistics, reliability, ease of obtaining service, sales personnel and warranties. The consumer will also likely spend time shopping at retail outlets, consulting independent technical sources, reading seller technical literature about the product and actively seeking out information from friends and acquaintances. While advertising may be used to induce the consumer to consider a particular product, influence on the final purchase decision for costly infrequently purchased consumer goods will be small.[39]

For low priced, frequently purchased consumer goods the buyer relies on: his experience with the product and other products; advice from friends and acquaintances; reputation of the retailing outlet offering the product and most importantly media advertising. Advertising is the most important selling tool for frequently purchased low-priced consumer items as these items are usually strongly differentiated through the use of persuasive advertising.[40]

Furthermore, advertising is more likely to be used by retailers who sell low-priced frequently purchased goods than retailers who sell higher-priced infrequently purchased goods for the following reasons. If a large proportion of consuming households are buyers of a product, national television advertising, for example, may involve few wasted messages as many of the buyers are in the market for the goods at any one time. If only a fraction of households buy a product however, television advertising will be inefficient as a large proportion of the messages will be delivered to other than potential buyers. In general as purchase frequencies decline, the retailer will spend more on personal selling rather than advertising.[41]

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[39]Porter (1976, pp.30-38).

[40]Porter (1976, pp.25-30).

[41]Porter (1976, pp.116-117).

We would expect therefore that the link between structure and performance for low-priced frequently purchased consumer goods would be different from higher-cost infrequently purchased consumer goods. The omission of conduct variables such as size of sales staff, size of service department etc., from the standard industrial organization model should affect the ability to explain profits only slightly in a group of consumer industries selling low-priced frequently purchased goods but significantly in a group of consumer industries selling higher-priced infrequently purchased goods.

4.3 Convenience and Nonconvenience Consumer Goods Industries--Porter's American and Canadian Results

Using the above reasoning to suggest conduct differences in a sample of consumer good industries Porter (1976) defined a low-priced frequently purchased good as a convenience good and a higher-priced infrequently purchased good as a nonconvenience good.[42] Using an American consumer goods sample Porter found that for a convenience good industry sample the structure-performance model performed relatively well yielding a corrected R^2 of .81. For an American nonconvenience goods sample the identical structure-performance model performed weakly, resulting in a corrected R^2 of .16. Most importantly, the advertising variable in the nonconvenience sample was nonsignificant, however, in the convenience sample it was highly significant and positive.[43]

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[42]Initially Porter (1976, p.24) classified the two product types as convenience goods and shopping goods. However, making use of the charactertistics of the retail stage as a proxy for buying behaviour he classified the products as convenience goods and nonconvenience goods. Porter (1976, p.25) also noted that the convenience, nonconvenience distinction differs from the durable-nondurable distinction. Porter suggests that the latter distinction refers to the types of goods not to the way they are purchased and sold as does the convenience, nonconvenience distinction.

[43]Porter (1976, pp.142-148).

In 1977, very similar tests were done by Porter on a sample of Canadian consumer good industries. In two papers written for the 1977 Canadian Royal Commission on Corporate Concentration, Porter compared the structure of retailing and advertising behavior in Canada and the United States.[44]

Geographical distribution of populations, smaller size of national markets, cultural differences, lower income levels and restricted consumer mobility were factors found by Porter to result in significant differences in Canadian and United States retailing and advertising behaviour. More specifically, Porter found that the greater geographic dispersion of the Canadian population and its lower urbanization would increase the cost of supplying advertising messages in Canada relative to the U.S. In general Porter found there was a tendency toward lower Canadian advertising.[45]

With respect to convenience and nonconvenience good industries Porter found that Canadian advertising rates, as compared to U.S. advertising rates, tended to be lower in the consumer and convenience samples yet tended to be higher in the nonconvenience sample. Porter suggested that this was primarily due to the fact that there is a greater proportion of durable good purchases per capita in Canada and therefore there is relatively more advertising spent on these goods.

In addition Porter noted, when using multiple regression analysis on a matched Canadian and U.S. convenience good industry sample, results indicated that there were important unexplained differences in buyer behaviour for convenience goods in Canada and the United States.[46]

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[44]Royal Commission on Corporate Concentration (1977, pp.19-91).

[45]Using 1965 data, Porter found that aggregate advertising in Canada amounted to 1.75% of GNP while it represented 2.25% of US GNP (see Royal Commission on Corporate Concentration [1977, p.59]).

[46]Royal Commission on Corporate Concentration (1977, p.75).

Finally, Porter found that imports and exports were associated with lower television and greater magazine advertising in convenience goods, however the opposite was found to be true for nonconvenience goods.[47] This suggests that as Canada is essentially an open economy and the United States is a relatively closed economy this would mean significant differences in the pattern of media usage for convenience and nonconvenience good industries in Canada and the United States.

4.4 Structure of the Test

A sample of 30 Canadian consumer good industries were used to test the structure-performance link in convenience and nonconvenience industries.[48] Using Porter's convenience and nonconvenience industry classification as a guideline and making assumptions on the shelf-life frequency of the consumer goods the sample of 30 consumer industries were divided into 15 convenience and 15 nonconvenience industries.[49] See Appendix A for a listing of industries in each sample.

4.5 Discriminant Analysis: Statistically Testing Between Group Differences

As in Chapter 3 discriminant analysis was used to statistically determine whether the convenience-nonconvenience group differences were significant and as a check for classifying the consumer industries into their correct groups.[50]

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[47] Royal Commission on Corporate Concentration (1977, p.84).

[48] The same consumer goods industry sample was used here as was used in Chapter 3. See footnote 24.

[49] See Porter (1976, p.139). Porter's classifications were based on a somewhat more statistical approach. Assuming that little or no sales assistance was provided in the sales of convenience goods, Porter measured the salesperson's expense as a percentage of gross margin for each industry to determine the convenience and nonconvenience classifications.

[50] See footnote 26.

Using the divided convenience, nonconvenience samples the same set of structural variables were used as possible discriminating variables as were used in Chapter 3. These were: absolute capital requirements; 4-firm concentration ratio; growth rate of demand; regional dummy advertising; ratio of imports to domestic output and economies of scale. Once again using the step-wise regression process, the advertising value was found to be the most discriminatory variable of the two groups. Using the equivalent F-test, the between group differences with regards to advertising were found to be highly significant.

4.6 The Model

Testing the structure-performance link in the convenience and nonconvenience samples involved estimating a linear regression equation separately for each sample. As in the previous chapter, the dependent variable was the ratio of profits plus interest to total assets. Seven basic structural variables were used as independent variables: advertising; absolute capital requirements; 4-firm concentration ratio; growth rate of demand; imports to domestic output and economies of scale.[51] The sources of data, definitions of the variables and their method of construction are detailed in Appendix A.

4.7 Regression Results

Table 3 gives the results of multiple regression analysis of the convenience, nonconvenience and total consumer good samples. The standard industrial organizational model performed well for the nonconvenience good sample and very weakly for the convenience good sample. For the convenience good group, the model yielded a corrected R^2 of .13 as compared with .77 for the nonconvenience sample and .50 for the entire consumer group.

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[51] As the purpose of experimentation is to test the validity of the conventional structure-performance model on the convenience and nonconvenience samples the standard model variables were used.

TABLE 3

MULTIPLE REGRESSION EQUATIONS EXPLAINING PROFITABILITY:
(CONVENIENCE, NONCONVENIENCE DIVISION)

	Intercept	Ratio of Advertising to Sales	Absolute Capital Requirements	Economies of Scale	Ratio of Imports to Industry Output	Growth Rate of Demand	4-Firm Concentration Ratio	Regional Dummy	R^2	Corrected R^2
					30 Consumer Good Industries					
3a	3.279	0.370	0.268	-0.353	2.757	0.308	0.024	1.580	.615	.501
		(4.923)[a]	(2.227)[b]	(-1.394)[f]	(2.089)[e]	(0.224)	(0.936)	(1.343)[c]		
					15 Nonconvenience Good Industries					
3b	2.786	0.753	0.414	-0.613	2.401	0.426	0.029	no	.866	.766
		(4.337)[a]	(1.642)[c]	(-2.197)[b]	(2.228)[e]	(.442)	(1.296)	variation		
					15 Convenience Good Industries					
3c	4.768	0.249	0.063	-0.040	3.746	-0.111	0.018	3.001	.310	.127
		(1.123)	(0.735)	(0.405)	(1.437)	(0.451)	(.430)	(.628)		

Note: Figures in parentheses are t values. The significance of the regression coefficients is tested under a t test and the significance of the coefficients of multiple determination is tested using an F test (all those reported are significant).

[a] Coefficient is significant at the 99 per cent level, one-tail tests.

[b] Coefficient is significant at the 95 per cent level, one-tail tests.

[c] Coefficient is significant at the 90 per cent level, one-tail tests.

[d] Coefficient is significant at the 99 per cent level, two-tail tests.

[e] Coefficient is significant at the 95 per cent level, two-tail tests.

[f] Coefficient is significant at the 90 per cent level, two-tail tests.

More specifically, for the entire consumer good sample all variables except for the economies of scale variable had correct signs. The advertising, capital requirement and imports to industry output variables were all significant while the growth rate of demand variable, the 4-firm concentration ratio variable and the regional dummy variable were all nonsignificant.

For nonconvenience good industries the advertising and imports to industry output variables continued to be highly significant. Except for a slight decline in the t value of the absolute capital requirement variable, all remaining variable t values increased. The economies of scale variable continued to be negative but unlike the entire consumer sample it was highly significant.[52]

The standard industrial organizational model performed weakly for the convenience good sample. All t values were nonsignificant and there was a sign change in the growth rate of demand variable from positive to negative.

4.8 Test for Equivalence of Coefficients

As in Chapter 3 (consumer and producer division) it was not possible to reject the null hypothesis for the entire model. However, for the advertising coefficient, it was possible to reject the hypothesis that the coefficient was the same across the two data sets.

4.9 Conclusions

The results obtained concerning the structure-performance link of Canadian convenience and nonconvenience samples were consistent with the conclusions reached by Porter using Canadian convenience and nonconvenience samples. In contrast, Porter's U.S. convenience, non-

[52]See footnote 34 in this thesis regarding the sign of the economies of scale variable.

convenience consumer good industry results were opposite from those obtained in this thesis. Despite these differences however, it can be concluded that, the nature of the structure-performance link is clearly different in convenience and nonconvenience samples regardless from which country the individual consumer groups are taken. This suggests that perhaps previous empirical work involving consumer good industries, both Canadian and United States consumer samples, have mixed two statistically different samples. Both sets of results indicate that results in previous structure-performance tests represent an averaging of two dissimilar groups. Furthermore, our results strongly suggest that for the Canadian convenience goods sample, the conventional set of structural variables normally used in structure-performance analysis performs poorly and that the addition of conduct or strategic variation variables may improve the model's explanatory powers.

CHAPTER 5

INTRA-INDUSTRY CONDUCT AND INDUSTRY PERFORMANCE

5.1 Introduction

While the type of industrial organization analysis used in Chapters 3 and 4 involved a slight departure from conventional analysis, the analysis more or less remained within the confines of the traditional measures of market structure. This chapter continues the departure from conventional industrial organization analysis by testing whether or not the presence of variations in marketing strategies within industries affects industry performance. In these tests, intra-industry conduct variables will be introduced into the conventional structure-performance model and cross-sectional variations in profitability will be tested.

As was outlined in Chapter 2 of this thesis, with the detailed discussion of strategic group theory, there has been a growing emphasis in industrial organization literature toward recognizing the existence and importance of group structures within industries. The theoretical and empirical evidence strongly suggests that in addition to the customary linkage between a firm's profits and the charactertistics of the industry, the linkage between profits and the firm's relative importance within the industry is very important. Unfortunately, due to the unavailability of firm specific data, it was beyond the scope of this thesis to test the hypotheses regarding the relationship between strategic groups and market performance. However, simple exploratory tests to determine the importance of intra-industry differences in explaining cross-sectional variations in profitability were attempted.

5.2 Introduction of Intra-Industry Variables into the Conventional Model

Porter (1976) found that by including intra-industry conduct variables in a conventional model framework, the explanatory power of both the nonconvenience and convenience samples improved considerably. Using the variation in advertising rates as a proxy for the variation in marketing strategy for an American convenience goods sample, and compiling retail strategy for an American nonconvenience goods sample, Porter found the best equation for the convenience sample yielded a corrected R^2 of .904 while the best equation for the nonconvenience group yielded a corrected R^2 of .917.[53] The results strongly suggest that the addition of strategic variables into the conventional industrial organizational model improves the model's explanatory power. Unfortunately, due to severe data restrictions, intra-industry tests similiar to those undertaken by Porter on convenience and nonconvenience samples could not be attempted.[54] However, a simple intra-industry test was undertaken on a consumer goods industry sample.

5.3 Intra-Industry Variation Within Consumer Goods Industries

Theoretically we would expect the existence of intra-industry variation within consumer goods industries. Large consumer good firms make use of marketing and production strategies such as national advertising and advanced technologies. In addition, large firms make use of broad product lines and large sales forces. In contrast, smaller consumer good firms are likely to make use of narrow-line strategies and regional strategies.

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[53]The variation in advertising rate was a measure of the advertising behaviour of the largest firms accounting for at least 30 per cent of industry sales compared to the advertising behaviour of the entire industry. See Porter (1976, pp.200-212).

[54]When data consists of measurements from firms in different industries then strategic variation can be determined directly. The availability of firm data allows the intra-industry and inter-industry variation to be statistically determined. However, the task in securing data for individual firms and becoming sufficiently well informed about all firms in all industries to determine their configurations of strategic groups, is onerous and in Canada virtually impossible.

If data were available on a firm-by-firm basis for profits, advertising, demand, etc. it would have been very simple to divide each consumer industry into a leader and follower group, regress on profitability and test the structure-performance link.[55] However, as Canadian firm data were unavailable intra-industry variation in leader and follower industry groups had to be proxied. To proxy the variation in marketing and production between large and small consumer good firms a leading firm group (leading group variable) was calculated for each consumer industry. The leading firm group in each industry was defined as the largest firms in the industry, accounting for greater than 3 per cent of the total of industry shipments.[56] The leading group variable is therefore the number of leading firms in the industry. Given the theoretical evidence for the existence of intra-industry variation within consumer industries we would expect that the leading group variable would be significant when regressed on industry profits, implying the existence of strategic groups.[57]

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[55]Tests of this kind were carried out by Porter (1979, pp.214-227). Porter found that the regression results explaining firm profitability differed greatly in the leader and follower groups.

[56]The total value of factory shipments and the average value and standard deviation of shipments for groups of large enterprises (see Canada Department of Consumer and Corporate Affairs [1971, pp.177-204]) were used to determine the leading firm group. A 3 per cent cut-off point was used primarily because Newman (1978, p.426) found that firms with less than 3 per cent of market share did not represent leading group firms.

[57]The expected sign of the leading firm group variable is difficult to predict. However as the leading firm group variable is the number of large firms in the industry we would expect that the sign of the variable to be negative. The greater the number of firms in the leading group the more difficult it is to coordinate actions within the group and therefore the lower the profits in the strategic group. (Porter, 1979, p.219). Depending on the total number of firms in the industry this effect should be felt on total industry profits however, the magnitude of the effect is uncertain.

5.4 Structure of the Test and the Model

The same sample of consumer goods industries as was used in Chapters 3 and 4 was used in the strategic groups test. Testing for the existence of intra-industry variation or strategic groups involved estimating a linear regression equation for the consumer good industry sample. The dependent variable was the ratio of profits plus interest to total assets. The eight independent variables were: absolute capital requirements; regional dummy; advertising to sales; 4-firm concentration ratio; growth of demand; imports to domestic output; economies of scale and the leading group variable.

5.5 Regression Results

The results of the test did not indicate the existence of intra-industry variation within a sample of Canadian consumer goods industries. Table 4 shows the results of including the leading firm group variable in the model (equation 4a). As was the case in Chapters 3 and 4 all variables with the exception of economies of scale had correct signs. All variables except for the leading group variable, the absolute capital requirements variable, and the growth rate of demand variable were significant. As anticipated the leading group variable was negatively related to industry profits however, it was not significant. Comparing the results of 4a with those of 4b (the conventional model) it appears the addition of the leading firm group variable does not add any explanatory power to the conventional model.

From the above results it appears that the conventional model describes quite satisfactorily variance in profits of consumer good industries. While the theoretical framework of strategic groups strongly suggests the existence of structures within consumer good industries simple experimentation does not confirm their existence.

TABLE 4

MULTIPLE REGRESSION EQUATIONS EXPLAINING PROFITABILITY

	Intercept	Leading Group Variable	Ratio of Advertising to Sales	Absolute Capital Requirements	Ratio of Imports to Industry Output	Growth Rate of Demand	4-firm Concentration Ratio	Economies of Scale	Regional Dummy	R^2	Corrected R^2
					25 Consumer Good Industries						
4a	3.144	-0.026	0.390	0.255	2.464	0.270	0.027	-0.374	1.813	.880	.750
		(-0.748)	(5.186)[a]	(0.972)	(2.234)[e]	(0.298)	(1.393)[c]	(-1.437)[c]	(2.527)[b]		
4b	3.163		0.397	0.240	2.315	0.345	0.027	-0.343	1.731	.828	.757
			(5.388)[a]	(0.929)	(2.162)[e]	(0.039)	(1.437)[c]	(-1.354)[c]	(2.473)[b]		

Note: Figures in parentheses are t values. The significance of the regression coefficients is tested under a t test an the significance of the coefficients of multiple determination is tested using an F test (all those reported a significant).

[a] Coefficient is significant at the 99 per cent level, one-tail tests.

[b] Coefficient is significant at the 95 per cent level, one-tail tests.

[c] Coefficient is significant at the 90 per cent level, one-tail tests.

[d] Coefficient is significant at the 99 per cent level, two-tail tests.

[e] Coefficient is significant at the 95 per cent level, two-tail tests.

[f] Coefficient is significant at the 90 per cent level, two-tail tests.

CHAPTER 6

CONCLUSIONS AND POLICY IMPLICATIONS

6.1 Conclusions

This thesis has considered the questions of including inter-industry and intra-industry conduct variables into conventional structure-performance industrial organization analysis.

With regards to inter-industry variation, results from Chapter 3 indicate there are definite inter-industry conduct differences between consumer and producer industry group samples. Differences in conduct between consumer and producer good industries, as measured by the buyer's process of choice, appear to lead to sharp differences in the structure-performance link.

Further testing on convenience and nonconvenience consumer industry samples also indicated substantial inter-industry differences. More specifically, for a sample of Canadian nonconvenience consumer goods industries, advertising was found to be the key element of product differentiation. For the convenience sample the conventional structure-performance model performed very weakly and the advertising variable was not significant. As a comparison, the Canadian convenience, nonconvenience inter-industry results were consistent with the findings of the Royal Commission on Corporate Concentration (1977).[58] However, our results were opposite of those reached by Porter (1976).[59] These statistical differences were explained by retailing, import and export, buyer and advertising differences between Canada and the United States.

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[58] See Chapter 4 of this paper.

[59] See Chapter 4 of this paper.

Given the results of this thesis the implications for testing future structure-performance relations are clear. The convenience/ nonconvenience, producer/consumer divisions suggest that inter-industry conduct determinants of performance vary among broad groups of industries and therefore should be included in future structure-performance industry analysis.

Empirical results of this thesis did not entirely support the existence of intra-industry variation in a sample of consumer goods industries. However, with better data (firm specific data) the intra-industry results would have most likely improved. It is clear that considerably more work is necessary with regards to the measuring and testing of intra-industry variation.

6.2 Producer/Consumer Group Public Policy Implications

When considering the producer/consumer dichotomy the public policy considerations are different for each industry sample.

In producer goods the buyer desires to make an informed choice and is willing to expend effort to inform his purchase decision. Results of this paper indicate that the producer good buyer is less influenced by advertising. Rather, he engages in research about product attributes. Because the buyer desires to make an informed choice, increasing technical information and encouraging the development of product standards will affect competition in producer good industries. That is, government policy to increase the availability of technical information and to subsidize product testing agencies may be effective in promoting competition among producer good industries.

Unlike the producer good buyer the purchaser of consumer goods makes a decision using a different set of information sources. Because advertising is very influential in the consumer's choice, government measures to provide the purchaser with more information

about consumer goods will probably be ineffective as he places little value on an informed choice. Therefore traditional government public policy emphasizing conditions of supply will most likely be effective in promoting competition among consumer goods industries. As well, measures may be needed to discourage superficial product changes, perhaps through strict control of advertising claims.

6.3 Convenience/Nonconvenience Group Public Policy Implications

While clear differences exist between Canadian convenience and nonconvenience samples substantially more empirical and theoretical work is needed on Canadian convenience and nonconvenience consumer samples before recommendations can be made on public policy implications.[60]

6.4 Policy Implications When Considering the Existence of Strategic Groups

Even though our results do not indicate the existence of strategic groups, literature in strategic groups has indicated that the conventional public policy remedies may not induce the desired results if indeed strategic groups exist. More specifically Dalton and Esposito (1981) have indicated several important policy problems when considering strategic groups.[61]

Dalton and Esposito suggest that theoretically the dissolution of the dominant firm will have no effect on competition because size within the strategic group framework is only one factor determining the advantages of the individual firm. Factors of equal or greater importance are the product, marketing and price strategies pursued by the

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[60] See Michael Porter (1976, pp.232-241). For Porter's American convenience and nonconvenience results the public policy implications were as follows. In nonconvenience good industries, because the buyer desires to make an informed choice, government policy to increase the availability of technical information would be effective in promoting competition. In convenience goods, policies directed towards conditions of supply (increasing the number of producers, lower barriers to entry) would be most effective.

[61] See Dalton and Esposito (1981, pp.15-25).

firm. The strategic group industry structure consists of the configuration of strategic groups including their mobility barriers, size and composition, strategic distance and market interdependence relative to each other.

Therefore, dissolution of the dominant firm under the strategic group model will not effectively alter competition in the market. Now instead of having one dominant firm possessing very successful strategies there will be a number of smaller firms still using the same successful strategies. Since firms with similiar strategies are more likely to recognize mutual interdependence, the likelihood of implicit or explicit collusion among the smaller firms would be quite high. The end result is to replace a single dominant firm with a dominant oligopolistic core of firms.

If we assume the existence of strategic groups, the net result of government policy is that the industry structure has not been changed. The same strategic group exists, the only difference being that instead of it consisting of one firm it now contains several. Rather than eliminating the monopoly, the structuralist's remedy has created an oligopolistic situation.

Essentially what Dalton and Esposito are saying is that the existence of strategic groups means aiming public policy at affecting competitive behavior rather than altering the size distribution of sellers. Affecting competitive behavior would mean altering a firm's goals, research and development strategies, pricing policies etc. The end result of these policies would be to very seriously affect the competitive nature of firms. Firms knowing that new processes and strategies may be prohibited would refrain from implementing the strategies thereby decreasing competition within the industry.

Considering the policy implications and the results obtained in this paper regarding strategic groups it can be concluded that the conventional structure-performance model should continue to be used. While further work should continue on improving the structure-performance paradigm the overall perspective of stable structural features of market environments should be maintained.

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APPENDIX A

THE SAMPLE, DEFINITIONS AND DATA SOURCES

A.1. The Sample

The basic data was obtained through the courtesy of Dr. J.C.H. Jones. The sample consists of 60 Canadian manufacturing good industries which in turn were divided into 30 consumer and 30 producer goods industries. The consumer goods sample was divided into 15 convenience and 15 nonconvenience goods industries. Industries comprising each sample are indicated below.

A.1(a) Consumer Good Industries

i) Convenience Goods

Dairy products; Pharmaceuticals and medicines; Meat products; Fish products; Fruit and vegetable preserves; Bakeries; Confectionary and misc. food; Soft drinks; Breweries; Wineries; Distilleries; Tobacco products; Soap and cleaning products; Toilet preparations; Brooms, brushes and mops.

ii) Nonconvenience Goods

Leather products; Men's clothing; Women's clothing; Children's clothing; Fur goods; Household furniture; Miscellaneous furniture; Foundation garments; Small electrical appliances; Major appliances; Household radio and TV receivers; Batteries; Hardware tools and cutlery; Agricultural Implements; Paints and varnishes.

A.1(b) Producer Good Industries

Shingle mills; Sash, door and other millwork plants; Publishing and printing; Ornamental and architectural metal; Heating equipment; Machine shops, Miscellaneous machinery and equipment; Hoisery mills; Knitting mills; Feed and flour; Wool, yarn and cloth mills; Synthetic textiles; Veneer and Plywood; Office furniture; Paper and pulp mills; Cartons, boxes and bags; Iron and Steel mills; Iron founderies; Metal rolling; Fabricated metal; Metal stamping; Wire and wire products; Commercial refrigeration; Electrical wire and cable; Cement; Clay products; Stone products; Petroleum and coal products; Industrial chemicals; Electrical industrial equipment.

A.2 Variable Definitions and Data Sources

i) Profitability - Ratio of profits plus interest to total assets. Source: Dominion Bureau of Statistics, Corporation Financial Statistics, 1965, 1966, 1967.

ii) Advertising - Ratio of advertising to sales. Source: Dominion Bureau of Statistics, Advertising Expenditures in Canada, 1965.

iii) Absolute Capital Requirements - Absolute capital requirements of the minimum efficient sized plant. The average output level of minimum efficient size is multiplied by the ratio of total assets to gross sales for the industry. Source: Dominion Bureau of Statistics, Corporation Financial Statistics, 1965, 1966, 1967.

iv) Ratio of Imports to Industry Output - Ratio of imports to industry output. Source: Dominion Bureau of Statistics, Input-Output Structure of the Canadian Economy, 1961.

v) Regional Dummy - Regional concentration dummy with a value of 1.0 for industries with identifiable regional markets - dairy products, bakeries, soft drinks, breweries and cement.

vi) Concentration Ratio - 4-firm concentration ratio. Source: Concentration in Manufacturing Industries of Canada, 1971.

vii) Growth Rate of Demand - Growth in demand expressed as the ratio of industry sales in 1965 to industry sales in 1956.

viii) Economies of Scale - Average plant size of the largest plants that account for 80 per cent of industry output, as a percentage of shipments. Source: Concentration in the Manufacturing Industries of Canada, 1971.

APPENDIX B

SAMPLE, VARIABLE DEFINITION AND SOURCES: LEAD VARIABLE

The same consumer goods sample as defined in Appendix A was used. Because of the limited nature of the data, five industries were not included. These were Breweries, Wineries, Distilleries, Household furniture and Miscellaneous furniture. LEAD is the number of firms in each industry's leading group. It was calculated by including only those firms contributing a 3% or greater portion to the total industry's value of shipments. The source of the shipment data were obtained from Canada, Department of Consumer and Corporate Affairs, Concentration in Manufacturing Industries of Canada (1971). Below is a list of the industries and the number of firms in the leading group.

INDUSTRY	NUMBER OF FIRMS IN LEADING GROUP (All firms with a 3% or greater portion of the industry's shipments)
Meat Processors	7
Dairy Manufacturers	8
Fish Products	8
Fruit and Vegetables	9
Bakeries	6
Confectionary Manufacturers	12
Miscellaneous Food Manufacturers	12
Soft Drink Manufacturers	8
Pharmaceuticals and Medicines	20
Toilet Preparations Manufacturers	16
Broom, Brush and Mop Industry	12
Tobacco Manufacturers	4
Leather Tanneries	9
Men's Clothing Factories	4
Women's Clothing Factories	1
Children's Clothing Factories	9
Fur Goods Industry	4
Foundation Garment Industry	14
Small Electrical Appliances	12
Major Appliances	12
Household Radio and TV Receivers	12
Batteries	9
Hardward Tools and Cutlery	10
Agricultural Implements	8
Paints and Varnishes	10

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