MARKET SHARE, PROFITABILITY AND IMPLICATIONS FOR STRATEGY FORMULATION

Graham Neil EDWARDS

A thesis submitted to the Graduate School of Business Administration, University of the Witwatersrand, in fulfilment of the requirements for the degree of Doctor of Philosophy.

Johannesburg, September 1994

ABSTRACT

The research explores the causal relationship between market share and profitability and is specifically aimed at understanding the factors that affect the strength of this relationship, and the mechanisms that cause the relationship.

The research initially utilised a data base of over 100 South African SBUs with information in the "PIMS Limited Information Model" format. The relationship between market share and profitability was explored using ordinary least squares regression analysis and the slope of the line was found to be significantly lower than that of the quoted PIMS studies. Cluster analysis was used on the environmental variables to produce clusters of similar environments and regression analysis again done on market share and profitability to test whether the correlation between profitability and market share was stronger or weaker in the different environmental settings. Significant differences were found in the correlations and one particular environment was found to exhibit a relationship between market share and profitability that was significantly stronger than all other environmental settings. A fine grained methodology was developed to determine the cause of the correlation for this environment. This initial study led to the causal relationship between market share and profitability being explained for the SBUs concerned.

The results of the initial study were then extended using intuition, logic and some accepted concepts from the literature into a new generalised theory, and some working hypotheses were formulated. A methodology for testing the hypotheses using the remaining SBUs in the data base was developed. The results supported the hypotheses and hence the theory.

In summary the theory proposes the following:

1. Market share is a measure of the relative size of a business with respect to other participants in the served market, but is not a measure of relative size elsewhere in the value chain.

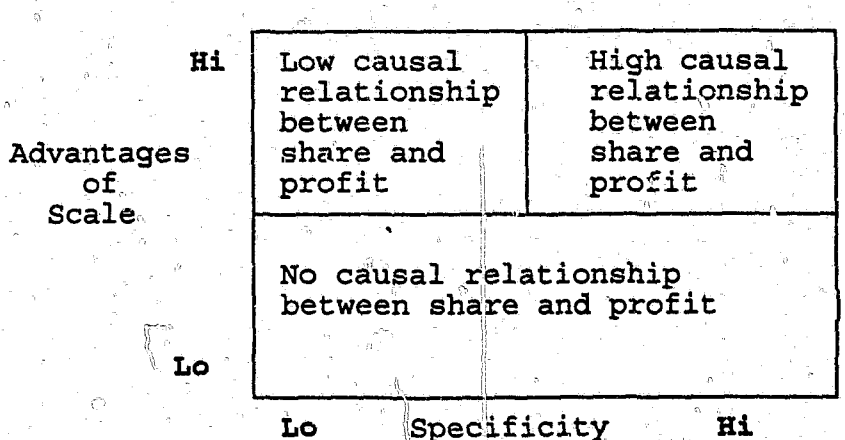
2. The profitability of a business is dictated by a limited number of critical variables or processes (key success factors) which may occur anywhere in the firm's value chain.

3. Some of the KSFs are subject to advantages of scale (in the broadest sense) and others are not subject to advantages of scale.

4. In some SBUs KSFs apply only to the industry that is being considered and are therefore specific to that business.

5. In other SBUs KSFs apply to a number of different businesses in different industries and are therefore not specific to the industry under consideration.

6. The theory predicts the following:



The research findings support the theoretical propositions made above. Thereafter some of the implications for strategy formulation were explored. It is argued that a contingency approach is required (dependent on advantages of scale and specificity) and that this has far reaching consequences for some existing strategic planning concepts. It is also argued that the research has practical applicability. By employing the research methodology the quadrant in which a business operates could be diagnosed, and therefore the nature of the causal relationship between market share and profitability predicted. This could lead to significantly different strategies compared to those dictated by conventional strategic planning concepts.

Dedication

This thesis is dedicated to my family; to my wife, Janine, for her unending patience and support, to my parents for giving me the basic values and foundation needed and to my daughters who often had to manage without me.

Acknowledgements

This research has taken 7 years to complete and I find I am indebted to many people who helped and encouraged me along the way.

I would like to express my sincere thanks and appreciation to all those who helped, especially:

1. My first supervisor Dr G.S. (Andy) Andrews who inspired the concept and always found time while Dean of the Wits Business School to help and encourage me. Also, thanks to Andy (and especially Dave Avnit) for making the initial data available for this research.

2. To the late Prof. Grant Robinson for his advice in the strategy area and for the rigour that he added to the methodology while acting as supervisor.

3. To my current supervisor, Dr Peter Pirow for being there all along and for seeing the research through to completion. Also for his invaluable advice and help with the statistical analysis of the data.

4. To AECI for the financial support given to me and for the encouragement and support from the directors of AECI Explosives Limited especially Boet Coetzee, Mike Lancaster and Dr Vernon Liddiard. Also to the ladies of the AECI Library, especially Zia Markowitz, who patiently over a period of 7 years supplied me with reference material.

5. To my secretary, Ruth Johnston (and before her Lynn Rockcliffe) who uncomplainingly found time to type this thesis in amongst the other one hundred things that I ask her to do daily.

6. To my mother and my wife for their help in the final preparation of this thesis.

7. To all the managers of the SBUs that were interviewed who found time in their busy schedules to talk to me, and were trusting enough to be open with confidential information, and without whose participation this research would not have been possible.

8. Lastly, to my wife and daughters for putting up with me and supporting me throughout the entire process.

Declaration

I hereby declare that this thesis is my own unaided work, except to the extent indicated in the text and references.

I further declare that neither this thesis nor any part hereof has been submitted to any other university for any degree. This thesis is being submitted to the University of the Witwatersrand, Johannesburg, for the Degree of Doctor of Philosophy.

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GRAHAM NEIL EDWARDS

Signed at Johannesburg.....on this 17th day

of September 1994

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CHAPTER 1 INTRODUCTION

1.1 INTRODUCTION TO THE SUBJECT

Economic theory has been obsessed with the question of relative size since the Industrial Revolution. As mankind has advanced in technology, production units have become bigger and more complex and, with the advances, more efficient. In parallel with this, and possibly as a result of this process, the notion has grown that the scale of operation (especially scale relative to competitors) is critical for obtaining efficiencies and hence competitive advantage. In short the assumption that "bigger is better" has over many years ingrained itself in economic and management thinking. This view continued unchallenged until the late 1970s when the concept was first seriously challenged. The view was put forward that technology had advanced to the extent that it was again possible to make things small and still be efficient. Today there are many schools of thought concerning this topic and many empirical studies have been undertaken, yet no universally acceptable conclusion has been reached.

At the heart of the debate lies the relationship between market share and profitability. This has been researched and reported on by many authors and in almost all cases a positive correlation between market share and profitability has been found. This, coupled with some theoretical logic, led researchers to believe that there was a causal relationship between market share and profitability. However, more recent research projects using sophisticated statistical techniques on an extensive data base have thrown doubt on this and have proposed that the relationship between market share and profitability is largely spurious and is at best weaker than was previously supposed.

The debate can be traced back to the 1930s when the structure - conduct - performance theory was first put

forward. An element of structure that was investigated was industry concentration (which relates to market share) and which was found to be correlated with profitability (Bain, 1951). This view remained in the field of Industrial Organisation for many years, while, in parallel from the field of Business Policy the view developed that it was market share, not concentration, which accounted for the correlation of size with profitability. Various theories were put forward for the correlation, including advantages of scale (popular in microeconomics), learning curve and experience curve effects (popularized by the Boston Consultancy Group) and monopolistic pricing (popular in the fields of Industrial Organisation and microeconomics). The first of the PIMS (Profit Impact of Marketing Strategy) studies in the early 70s confirmed the correlation between market share and profitability (Buzzell, Gale and Sultan, 1975) and later showed that it was market share and not industry concentration which accounted for the correlation that had been observed (Gale, 1982).

Up to this point all serious studies had concluded that "big" was "better" and that higher market share was a highly desirable strategic goal. However in the late 70s and early 80s the profitability of small market share companies was studied and found to be significantly better than the theory predicted. Specifically the work of Woo and Cooper (1982) showed that low market share companies can be successful provided correct strategic choices are made. Also, other authors examined the relationship between market share and profitability in a wider context and concluded that the correlation was largely spurious and that the direct effect of market share on profitability was much less than had previously been estimated. (e.g. Rumelt & Wensley, 1981).

As stated above, the debate still continues with many schools of thought having been formed in the interim.

A more complete and detailed review of the literature is given in chapter 2 but suffice it to say that no single school of thought is universally accepted. One of the reasons for the amount of research that has been devoted to the question is that the result has profound practical (and philosophical) implications. If a strong, universally applicable, causal relationship between market share and profitability existed, then the strategies of businessmen and women would have to reflect an aggressive market share gaining approach. This would result in a zero-sum game where one player's gain is another player's loss and a "dog eat dog" type competitive climate. It would also result in things becoming bigger and bigger and more and more complex as people strived for the ultimate scale advantage. If, on the other hand, there were no causal relationship between market share and profitability, it would mean that there would be no fundamental reason why low market share companies could not be as successful and profitable as large market share companies. This would clearly result in a completely different competitive environment, where small simple units could be stable and profitable and where growth strategies would be an option rather than a requirement.

The debate has grown beyond the realms of Business Strategy into the arena of economic philosophy. In the view of Schumacher (1979, p21)

> "We have all been brainwashed by the experience of the nineteenth century, when, probably, the technological immaturity was such that it was true to say, 'The bigger the better' : only on a large scale can you get the economics of scale. But that was a very immature technology. Now this is no longer true. Today we have enough technology and scientific knowledge to make things small again".

This research is aimed at making a contribution to the

debate in the narrower and the broader sense. Initially the focus is narrow with the debate centring around the statistical correlation between market share and profitability. Later the theory is generalized and the broader implication for strategy and strategic thinking are discussed.

1.2 RELEVANCE OF THE RESEARCH

Today there are many schools of thought regarding the desirability of high market share, which manifest themselves as opposing trends in the market place. For example, on the one hand there is the trend towards globalizing market share and the preoccupation of the Japanese with market share, while on the other hand there is the trend that major corporations are exhibiting (in the USA and South Africa) to "unbundle" and break themselves up into smaller autonomous units. While some corporations strive to achieve a dominant position in the world market, there is a growing understanding of the importance of the "informal sector" where businesses of minute size make a significant contribution to growth and employment.

All of the above have at their root some base assumption concerning market share and profitability. After more than fifty years of thinking that "big is better" the tide is turning and the "small is beautiful" school of thought is in the ascendency. However the relative merits of the cases still largely speaking remain unanswered. Is there a causal relationship between market share and profitability? Does high market share provide the holder with inherent competitive advantage? If so, how? Also, under what conditions is the effect of market share on profitability strong and under what conditions is it weak? Clearly these are questions with practical as well as theoretical significance and are highly relevant in today's economic climate.

Also, a number of widely accepted concepts from the strategic planning literature (e.g. Boston Consulting Group Portfolio Grid) have assumptions concerning the relationship between market share and profitability inherent in their functioning. These concepts and their inherent assumptions are reviewed in more detail in section 2.1.2 and 2.1.4.

1.3 RESEARCH QUESTION AND OBJECTIVES OF THE RESEARCH

The main theme of the research is centred around market share, its effect on profitability and the implications for strategy formulation. Specific questions relating to this central theme are:

a) Is the correlation between market share and profitability universal or are there certain environmental or structural criteria which must be met for the correlation to exist?

b) Is the correlation equally strong in all industries?

c) Is there a single mechanism whereby market share affects profitability or are there many different mechanisms?

d) Is there a causal relationship between market share and profitability or does the relationship depend on a spurious third factor? If so, what factor(s)?

e) Once the above questions have been answered, what implications does this have for strategy formulation?

These are the central issues which the research process has been designed to address. The objective of the research is to address these questions within the context of South African business.

1.4 KEY ASSUMPTIONS AND LIMITATIONS

Conceptually this research is made up of 6 major phases.

Phase I Literature Survey
Phase II Statistical analysis of an existing data base
Phase III Fine grained study into causality
Phase IV Generalization of theory
Phase V Fine grained test of theory
Phase VI Conclusions and implications for strategy.

(These phases are described in more detail in Chapter 3).

A limitation of the research is that the data analyzed in phase II is limited to 103 SBUs from a small number of industries within the South African business environment. Also the available data was in the PIMS Limited format which means there were a reduced number of variables available for analysis. A further limitation is that the data was not drawn on a random basis (or any systematic sample scheme) and therefore cannot be taken as being representative of South African business at large. Therefore the results of this phase of the research also cannot be taken to be representative of South African business at large but must be interpreted with the above limitation in mind. (The data is described in more detail in chapter 4). Fortunately this limitation is not critical for the other phases of the research because the fine grained studies are by their very nature much more limited in scope.

In analysing the data base in phase II of the research only a single year's data is available and it is assumed that this was representative of the SBUs concerned. (During the collection of the data normally two to three years of profit information was obtained and a check made to ensure that the year in question was not out of

line, so this assumption seems reasonable). Also, the time taken to collect the original data extended over 3 years and the data could derive from information from 1982 to 1984. This is assumed not to have added a major source of variance. Another key assumption is that when the fine grained studies were done (1988 to 1991) it was assumed that no major structural changes had taken place and that for individual SBUs the causal mechanism or reason for market shares' influence on profitability had not changed in the interim. Wherever possible this assumption was checked explicitly and this resulted in some of the SBUs being eliminated from the fine grained studies in phases III and V.

Other assumptions relating to specific phases of the project are specified in the chapters concerned. For example, the theory generalization in chapter 7 gives a detailed statement of the assumptions needed for the generalization of the theory.

1.5 DEFINITIONS AND TERMINOLOGY

In general, the concepts and terminology used in this thesis are used in accordance with accepted definitions and usages as used in most strategic planning text books. Where particular definitions are important or a particular narrow interpretation is required the concept is defined in the text. Definitions occur to a major extent in chapter 2 (with reference to usage in the literature), chapter 4 (where definitions relating to the data base are specified) and chapter 7 (where definitions relating to the theoretical concepts are specified).

For ease of reference, an Index including definitions is provided at the end of the report.

1.6 OUTLINE OF CHAPTERS

Chapter 2 gives a review of the literature pertaining to market share and profitability. The chapter starts with a brief historical overview and introduction to the concepts then moves on to review studies supporting a positive, causal relationship between market share and profitability. These studies mostly utilize the PIMS data base but other evidence is also presented. Thereafter studies not supporting a causal relationship between market share and profitability are presented. Again most of the studies utilize the PIMS data base but again other evidence is also presented. Largely speaking, all of the studies presented in the above two sections were static, cross-sectional studies. Section 2.4 presents some longitudinal studies which relate to market share and profitability. Thereafter the contributions from microeconomics and Industrial Organisation are reviewed with special reference to game theory. Finally, some industry studies and case studies are very superficially reviewed.

Chapter 3 gives an overview of the research methodology and puts the phases of the research in context. The chapter starts by introducing the classical research process and comparing this to the process followed in this thesis. The concept of a hybrid methodology is put forward and an explanation given as to how this is used in the phases of the research. The generality of the various phases of the research is then discussed and the chapter closes with a comment on research paradigms.

Chapter 4 is the start of phase II of the research and gives a complete description of the data base employed and of the South African business environment at the time of data capture.

Chapter 5 completes phase II of the research with a

description of the methodology and results of the statistical analysis of the data.

Chapter 6 (phase III) gives a complete description of the initial investigation done into SBUs that were found to have a high correlation between market share and profitability. The chapter covers the methodology, the field work and the results of the investigation. The results are discussed and at the end of the chapter some conclusions are drawn.

Chapter 7 (phase IV) covers the generalization of the theory. Firstly the theoretical concepts are discussed and defined, then the necessary assumptions are stated and thereafter the theoretical postulates are stated. These are discussed, developed into hypotheses, and justified on a theoretical basis. Then the results from chapter 6 are discussed with reference to the theoretical framework developed and some conclusions drawn.

Chapter 8 represents the start of phase V of the research and gives a description of the methodology employed in testing the hypotheses developed in chapter 7.

Chapter 9 represents the end of phase V of the research and gives a description of the field work and the results obtained. A detailed analysis of the results are given.

Chapter 10 represents the last phase of the research and covers the implications for strategy formulation. The chapter starts by extending the theoretical concepts and then discusses a new paradigm suggested by the methodology of the research process. Thereafter the implications for strategy formulation are discussed and the consistency of the theory with other theoretical concepts from the literature is examined. The chapter

also covers the limitations of the study, possible future studies, the contribution to knowledge made by the research and ends with some concluding remarks.

CHAPTER 2 LITERATURE REVIEW

2.1 INTRODUCTION

This chapter presents an overview of the literature pertaining to market share and the relationship between market share and profitability. The literature available on the subject is extensive and stems from a number of different disciplines with differing basic paradigms. The differences and breadth of focus in the literature is both enlightening and, at the same time confusing; enlightening because many of the key issues are discussed from a number of totally different perspectives, but confusing in that the lack of a common basic paradigm makes comparisons difficult and therefore contradictions are not easily resolved.

The rest of this section gives a brief historical overview and then moves on to a discussion of the basic paradigms encountered in the literature and the definition of key concepts. The importance of the relationship between market share and profitability in the literature is discussed at the end of the section.

The review of the literature is then split into two opposing camps. Section 2.2 reviews the literature supporting a causal, positive relationship between market share and profit and section 2.3 reviews literature not supporting this relationship. Broadly speaking, but with some exceptions, sections 2.2 and 2.3 review literature based on the PIMS data base. At the end of section 2.3 the difficulties regarding comparisons are highlighted when the use of explanatory variables in models designed for similar purposes are compared. Most of the models reviewed in section 2.2 and 2.3 are static cross-sectional models.

Section 2.4 differs from the preceding sections in that a dynamic element is introduced and literature focusing on change in market share, order of entry and longitudinal models is reviewed.

Section 2.5 reviews the relevant literature from the fields of Microeconomics and Industrial Organisation. Here, once again, the volume of literature available is enormous, and an attempt has been made to review only the concepts central to the main theme of this research. Section 2.6 covers some of the specific contributions from the Game Theory literature.

Section 2.7 gives a brief and by no means exhaustive review of the more striking examples of industry studies, case studies and anecdotal evidence from the literature.

Although the chapter is split into sections as indicated above, these are by no means watertight and there is some overlap and duplication which could not be avoided.

In presenting the literature, no attempt has been made to discredit one body of literature or defend another. Where appropriate, criticism has been levelled at a particular author, pointing out weaknesses in methodology or in analysis but this has been minimised in order to present an unbiased base for the research.

2.1.1 Historical Overview

The debate on the relationship between market share and profitability has a long and distinguished history stretching as far back as the 1930s and enjoying the attention of many of the foremost authors of our time. The debate developed from the structure-conduct-performance theory which was first put forward in the early 1930s. The earliest empirical tests done by Bain (1951) proposed a relationship between industry concentration and profitability. This thinking has been carried through to the present day in the field of Industrial Organisation. A study by Buzzell Gale and Sultan (1975) using the PIMS data base showed that there was a strong correlation between market share and profitability. A later study by Gale and Branch (1982) addressed the question of whether it was concentration

or market share that accounted for the relationship with profitability. Gales' study showed that once the effect of market share was taken into account the relationship between concentration and profitability was statistically insignificant. This confirmed work done by Shepherd (1972) and Gale (1972). The proposition that higher market share resulted in higher profitability was put forward and supported by the growing body of knowledge on the experience curve which was developed by the Boston Consulting Group during the 1960s and 1970s (Henderson, 1979). However, causality in the relationship of market share and profitability was never proved to the satisfaction of all concerned. Also abundant examples exist of low market share firms which are highly profitable. Some of these were investigated by Woo and Cooper (1981) and this plus other evidence led scholars to question whether universal laws could be true in the strategy arena where every situation is at least slightly different to every other situation. This led to the formulation of so-called mid-range theories with "laws" which are contingent on external environmental typologies (eg. Hambrick 1983c; Galbraith and Schendel 1983).

It is not the author's intention to give a detailed account of the history of the debate but rather to pick-up the fundamental themes and results from the various approaches. Numerous authors have reviewed the history of the debate and made comparisons for their own particular purposes. For example, Cook (1985) reviews 20 major works over the period 1962 to 1983 and rates them on a common framework so that differences in approach and results can be highlighted. Other authors (for example Bothwell, Cooley and Hall, 1984; Bass, Cattin and Wittink, 1978; Ramanujam and Venkatraman, 1984; Varadarajan and Dillon, 1981; Shepherd, 1972) give wide ranging reviews of the literature before drawing on narrower ranges to make specific points. As will be shown in more detail later in this chapter, the

literature is by no means unified in approach, methodology or in results. In fact there exist a number of different basic paradigms which dictate the approach of various authors and in some cases lead to diametrically opposing results. For example Prescott, Kohli and Venkatraman (1986) reviewed the literature and found 2 major assertions and 3 major contradictions all with key supporting literature.

2.1.2 Paradigms

One reason for the contradictions that exist in the literature as well as for the sheer volume of literature that exists on the subject is that various authors have approached the problem from differing basic perspectives. It is an accepted fact that no single, central research paradigm exists in the strategy area (Montgomery, 1988). Certainly, in the discussion of market share and profitability authors have approached the subject from (at least) the following perspectives:

a) Microeconomics & Industrial Organisation

b) Game Theory

c) Business Policy, Marketing and Strategy

d) Emperical studies, case studies and industry studies

Table 2.1 Gives some examples of work done by various authors in the above categories.

In a number of cases the difference in approach leads to considerable differences in conclusions and in some cases outright contradictions.

Although table 2.1 conveniently categorises the papers into four sections, the differences between the categories are by no means clear cut or explicitly stated by the authors. Many authors employ two or more basic paradigms and, if anything, it would appear that

the basic approaches are moving closer together over time and that the distinction between them is becoming more blurred.

Basic Theoretical Roots	Examples
Micro economics and Industrial Organisation	Bain, 1951 Caves, Gail and Porter, 1977 Cook, 1985 Dolan & Jeuland, 1981 Geroski, Masson & Shaanan, 1987 Lippman & Rumelt, 1982 McGee, 1988 Pickering, 1974 Porter, 1984, 1990 Rao and Bass, 1985 Schmalensee, 1981 Scherer, 1980 Shepherd, 1972 Weiss, 1989
Game theory	Wernerfelt, 1984; 1985; 1986 Carpenter & Lehmann, 1985 Karnani, 1983; 1984 McGuire & Weiss, 1976 Mills, 1961 Eaton and Ware, 1987 Ucheda, 1978 Basar & Olsder, 1982 Weigelt & MacMillan, 1988 Fundenburg, 1984
Business Policy, Marketing & Strategy	Buzzell, Gale & Sultan, 1975 Buzzell & Wiersema, 1981 Bloom & Kotler, 1975 Cowley, 1988 Hambrick, 1983a; 1983b; 1983c Hambrick, MacMillan & Day, 1982 Hamermesh, Anderson & Harris, 1978 Harrigan, 1980 Kotler, 1980 Woo, 1983; 1984; 1987 Woo & Cooper, 1981; 1982
Empirical studies, case studies, industry studies and anecdotal	Page, 1979 Lieberman & Montgomery, 1988 Lytle, 1982 Newton, 1983 Shaw & Shaw, 1984 Smirlock, 1985 Schuster, 1984 Thackray, 1984

Table 2.1 Basic Paradigms

The four categories can be viewed as two major categories each with two subsets. The first is the Industrial Organisation approach which is typified by Scherer (1980) and McGee (1988) and has, as a basis, the classical approach which was developed from microeconomics theory by Edward S Mason during the 1930s (Scherer, 1980, p.4). According to this approach performance in a particular industry is said to depend on the conduct of sellers and buyers (for example pricing behaviour, advertising, plant investment, etc). Conduct depends in turn upon market structure which according to Shepherd (1972) includes elements like market share, leading firm concentration ratio, advertising intensity, entry barriers, growth rate, etc. Market structure and conduct are also influenced by various basic conditions which include supply conditions (such as product durability, value/weight, unionisation, technology) and demand conditions (such as price elasticity, substitutes, rate of growth, seasonality, purchase method). This basic conditions-market structure-conduct-performance paradigm provides the theme for all Industrial Organisation approaches. It also is the underlying paradigm behind most applications of Game Theory to market share/profitability questions. Industrial organisation economists have traditionally focused on explaining differences in the average profitability of industries rather than individual businesses. The objective of Industrial Organisation is often to define economic policy rather than to act as a guide to managers of individual businesses. It is instructive to note that "good industrial performance" is defined (Scherer, 1980, pp.3-4) as satisfying four goals, viz. efficient decision as to what and how much to

produce; progressive use of technology; stable and full employment of resources; and, lastly, the distribution of income should be equitable.

In contrast, the other basic approach is that of business policy or business strategy. While it is true to say that there is no single research paradigm that is accepted by everyone in this field, one typical paradigm is the 'PIMS' approach as put forward by Buzzell and Gale which they refer to as the PIMS Competitive Strategy Paradigm (Buzzell and Gale, 1987 p.28). According to this approach performance is determined by strategy (which includes pricing, R & D spending, new product introductions, quality and variety of products/services, marketing expenses, etc.). Strategy in turn is jointly dependent on market structure and competitive position.

The two basic paradigms are graphically represented in figure 2.1 and 2.2.

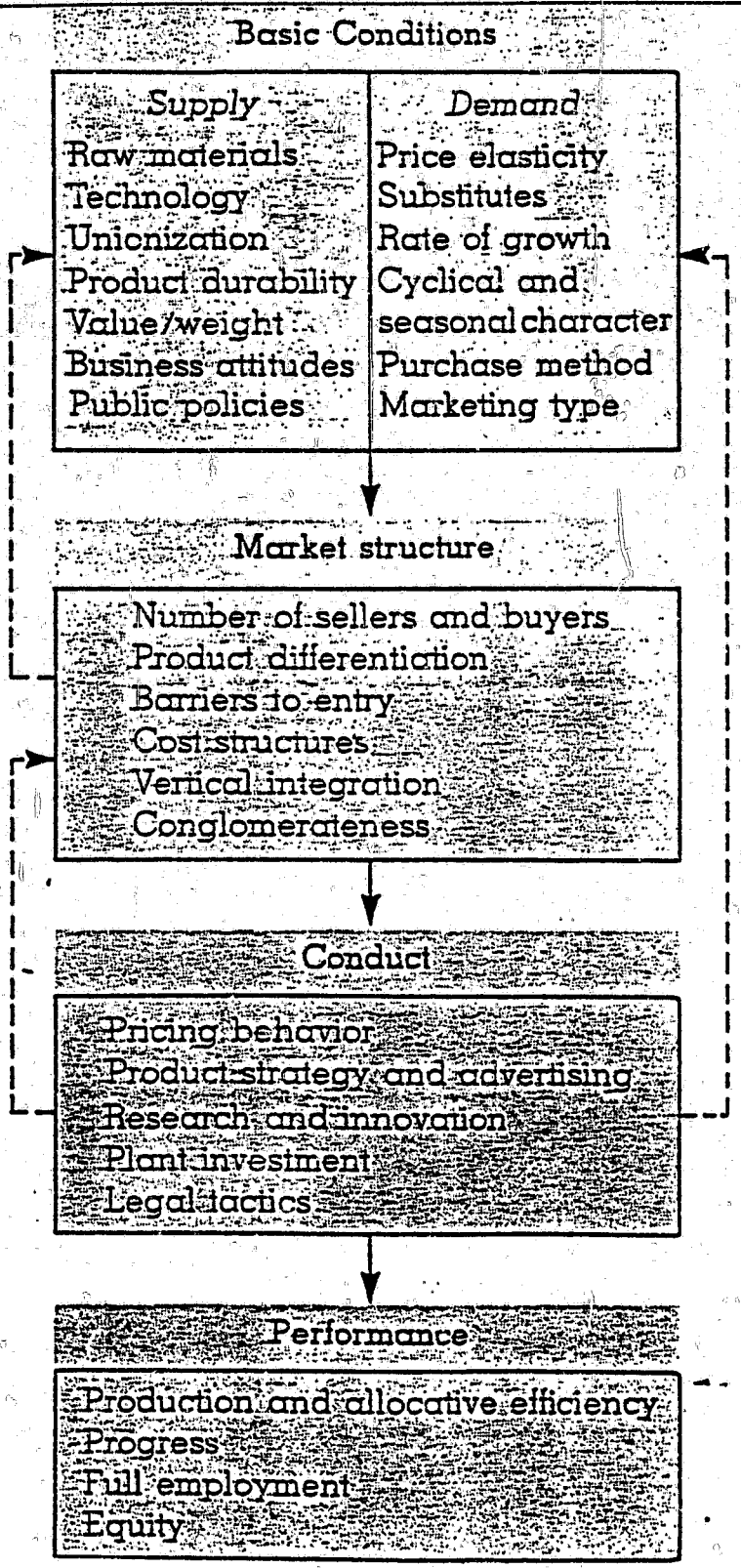

Fig 2.1 - Basic Industrial Organisation Paradigm
(Source : Scherer, 1980, p.4)

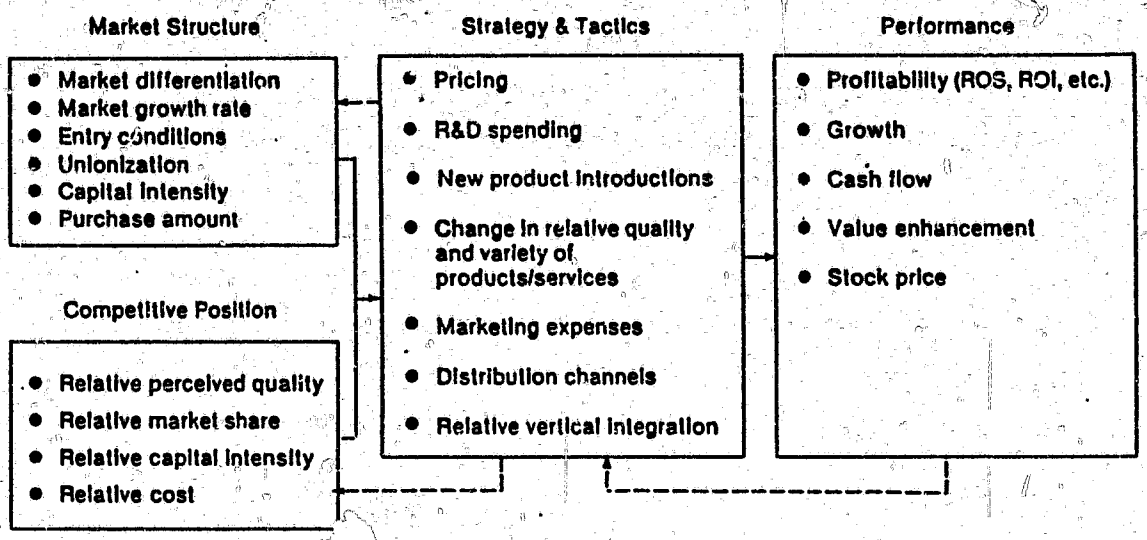

EXHIBIT 2-3
The PIMS Competitive Strategy Paradigm
NOTE: Unit of analysis = business unit and its served market.

Fig 2.2 - The basic PIMS Competitive Strategy Paradigm
(Source : Buzzell and Gale, 1987, p.28)

The contrast and similarities between the Industrial Organisation (IO) paradigm and the Pims Competitive Strategy Paradigm (PIMS) can be clearly seen by comparing Figures 2.1 and 2.2. The major point of difference which is significant to this research is that the PIMS approach aims at producing practical advice for individual business managers based on the analysis of past strategies of other businesses. A basic assumption of the PIMS approach is that there are "general relationships that can provide valuable guidance to managers" (Buzzell & Gale, 1987, p.6).

This view has drawn criticism from some authors of business policy who claim that there can be no universal laws in the field of business strategy because every situation is unique. Lubatkin and Pitts (1985) compare the "policy perspective" to the "PIMS perspective" and point out that no two businesses are exactly alike and therefore there can be few, if any, formulas for achieving competitive advantage. Lubatkin and Pitts go on to report on a longitudinal study done on the brewing industry from 1952 to 1974. They claim that "while the PIMS model may provide good competitive information, industry-specific models may be able to provide better information" (Lubatkin & Pitts, 1985, p.91).

IO and PIMS not only differ in their basic paradigms but also differ in the methodology used to advance their theories. IO tends to rely heavily on rigorous mathematical logic, and thus moves easily on to game theory, derivations from perfect competition and decision theory. The approach usually adopted is to derive logically consistent (highly complicated) mathematical models of the phenomenon being investigated and then to assume special cases for the parameters of the equation to demonstrate the workings of the model. PIMS, on the other, hand has been criticised for statistical combing of the data base, the use of cross-sectional analysis of non-homogeneous data, and the use of multiple linear regression where causality is not logically implied. While some of these criticisms are no doubt applicable to some PIMS studies, efforts have been made in the more recent studies to avoid these problems.

2.1.3 Definition of Central Concepts

Before the literature is reviewed in more detail, some discussion of the central concepts is required to facilitate a more precise understanding and usage later on in the chapter.

Market Share

In most IO studies market share is defined as:

$$MS_i = Y_i \Big/ \sum_{i=1}^{n} Y_i$$

where MS_i = the market share of the i^{th} firm
Y_i = the output of the i^{th} firm.

If not defined in terms of output then the equivalent definition is made in terms of value (see for example Bass *et al*, 1978, p.9).

This is the accurate, mathematical definition of market share defined as the firms output divided by the industry output. It, of course, presupposes an accurate and accepted definition of the industry (firms 1 to n) and that each firm views its business in the same way.

The PIMS approach differs significantly in that it starts with the definition of the business as "an operating unit that:

- sells a distinct set of products and services
- to an identifiable group of customers
- in competition with a well-defined set of competitors."

(Abell and Hammond, 1979, p.273)

The PIMS definition of market share is then given as: (Schoeffler, Buzzell & Heany, 1974, p.140)

> "The ratio of dollar sales by a business, in a given time period to total sales by all competitors in the same market. The 'market' includes all of the products or services, customer types, and geographic areas that are directly related to the activities of the business. For example, it includes all products and services that are competitive with those sold by the business".

As pointed out by Abell (1980) the way that management defines its business is a matter of choice and is of the greatest strategic significance. The PIMS definitions make use of management's interpretation of 'served market' and hence of market share. Day (1983, p.54) criticises the PIMS approach on the basis that the analysis assumes there is only one relevant definition of market boundaries that gives an adequate picture of the overall competitive standing of the business or of the relationship of market share and profitability. While this criticism undoubtedly has merit, clearly for analytical purposes one definition is required and for strategy purposes the PIMS approach is the preferred option.

Performance

As discussed in section 2.1.2, the IO definition of good performance involves macro measures such as efficiency of output decision, progress, full employment of resources and equity. In contrast the PIMS definition of performance (Buzzell and Gale,

1987, p.28) is narrowly defined as business unit performance and includes return on investment (ROI), return on sales (ROS), growth, cash flow, value enhancement and stock price. Most PIMS studies (and many other studies) use ROI as the only measure of performance. Gale and Branch (1982, p.92) to some extent justified this view by showing that in a study using the PIMS data base ROI was highly correlated with return on sales, return on equity and cash flow to investment. Nevertheless, in an earlier paper (Gale & Branch, 1981), they pointed out that cash flow is an extremely important performance measure in its own right. Some authors have found it necessary to use more than one performance measure (see Cook, 1985) while others (eg. Bourgeois, 1985, p.559) use a single composite measure obtained by applying factor analysis to a number of conventional performance measures. Again, there appears to be no single universally acceptable measure of performance but where a single measure is used, ROI appears to be the most acceptable.

Strategy

If there is some debate on the precise definition of market share and performance in the literature this is dwarfed by the debate on a definition of strategy. The term 'strategy' has been defined in many ways and has a variety of meanings depending on the context in which it is used. In Game Theory strategy is defined as: (Basar and Olsder, 1982, p.6)

> "a decision rule which may depend on some as yet unknown event but which describes the action which must be taken once the outcome of the event is known".

The term strategy was taken from the military field where it has been in use for thousands of years. (Many authors in the strategy field use military terms when describing strategy. See for example Kotler and Singh, 1981; Clifford and Cavanagh, 1985; MacMillan, 1985) In the military sense strategy is defined as follows: (Liddell Hart, 1967)

a. Clausewitz : "the art of the employment of battles as a means to gaining the objectives of war"

b. Moltke : "the practical application of the means placed at a general's disposal to the attainment of the objectives in view"

c. Liddell Hart: "the art of distributing and applying military means to fulfil the ends of policy".

In management theory a number of definitions exist. For our purposes it is constructive to divide them into two categories : firstly, those that deal with management intention, and secondly, those that deal with the behaviour actually exhibited by the firm. Examples of the first category are:

> "the determination of the basic long-term goals and objectives of an enterprise, and the adoption of courses of action and allocation of resources necessary for carrying out these goals".
>
> (Chandler, 1962, p.13)

> "The policies and key decisions adopted by

management that have major impacts on financial performance. These policies and decisions are usually significant resource commitments and are not easily reversible".

(Buzzell and Gale, 1987, p.18)

As pointed out by Mintzberg (1978, p.935) these definitions treat strategy as (a) explicit (b) developed consciously and purposefully, and (c) made in advance of the specific decisions to which they apply. These macro plans still need to be translated into a series of small decisions and implemented before actual exhibited strategy changes (an interesting study was done on policy making and implementation by Allison (1971) showing that not all decisions which are made, even at the highest level, are implemented).

The second category of strategy definitions relate more closely to the actual exhibited behaviour of the firm. For example (Mintzberg, 1978, p.935) refers to the above definitions as "intended strategy" and defines "realised strategy" as "a pattern in a stream of decisions".

Hambrick (1983b, p.5) builds on this definition (and combines something of the other definitions) in defining strategy as:

> "a pattern in a stream of decisions (past or intended) that (a) guides the organisations ongoing alignment with its environment and (b) shapes internal policies and procedures"

The role of strategy is widely accepted as mediating on an organisation's interactions with its

environment (Andrews, 1971; Ansoff, 1969; Child, 1972; Miles and Snow, 1978) and to be of practical use to managers strategy's role relates to future courses of action and to change (Gould & Quinn 1990). Therefore, the definitions in the first category are more useful to practising managers. However, the researchers problem is diametrically opposed to this and is more acute. It is difficult enough to measure realised strategy but would be almost impossible to measure intended strategy (as well) on the scale required for statistical analysis. Researchers (eg. Hambrick, 1983a, 1983b; Miller, 1988; Tellis and Fornell, 1988; Woo, 1983, 1984; Woo & Cooper, 1981, 1982) usually go one step further and evaluate a business's strategy by evaluating a set of "strategy variables". (For example Galbraith & Schendel (1983) initially used 26 "strategy variable" and then applied principal component analysis and cluster analysis to PIMS data to come up with strategic typologies.) Clearly this approach is more in line with the second category of definitions as it is an attempt to measure "realised" strategy.

2.1.4 The Importance of Market Share

As mentioned in section 2.1.2 market share is one of the basic elements in both of the two main paradigms used in business studies. As such, it is clearly of fundamental importance to researchers in these areas. However there are other even more compelling reasons why the relationship between market share and profitability should be the subject of dedicated research and debate.

Firstly, the now ageing but still widely used BCG

product portfolio matrix rests on the assumption that market share and profitability are linked in a particular manner. This assumed relationship was articulated and investigated by Hambrick and MacMillan (1982) and the BCG assumption and the corresponding PIMS data are shown in figure 2.3.

Figure 1. BCG Matrix

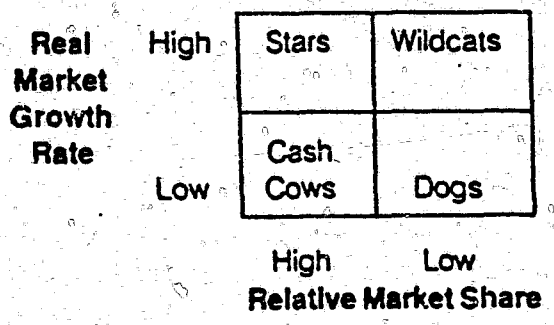

Figure 2. Relative Market Share vs. ROI Presumed by BCG Matrix

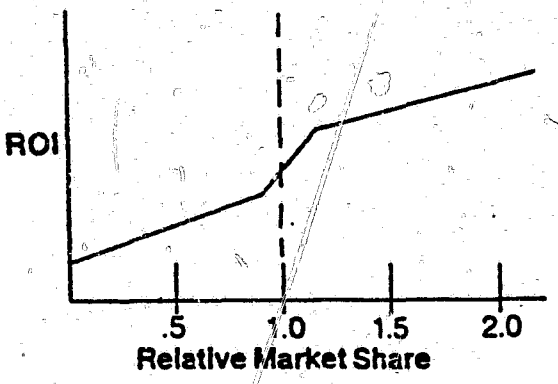

Figure 3. Relative Market Share vs. ROI for PIMS Industrial-Product Businesses

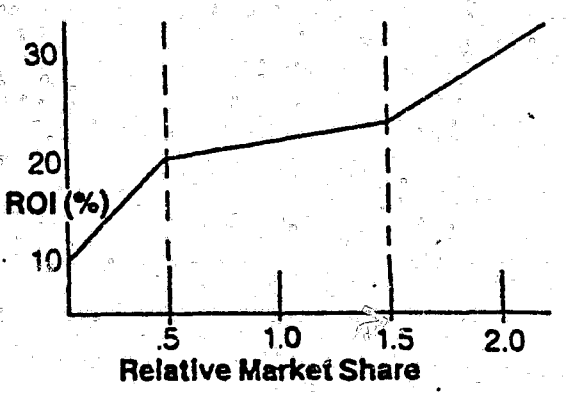

Fig 2.3 - BCG Assumed and Actual Market Share Relationships
(Source : Hambrick & MacMillan, 1982, p.87)

As can be seen by a cursory study of the two graphs in figure 2.3, the presumed relationship did not

hold exactly for the PIMS data. The overall trend in the relationship was the same but the differences led Hambrick and MacMillan to challenge and redefine the role of the 'dog' in the product portfolio. Although the BCG matrix has been criticised for being over simplistic (Hamermesh, Anderson & Harris, 1978, p.96) it is still widely used. There are also numerous other strategic planning grids which are more complex and yet still have a heavy emphasis on market share included in their 'market attractiveness' dimension. (See for example Abell and Hammond (1979, pp.173-259) for a discussion of some strategic planning grids including the 'Market Attractiveness and Business Position' model). All these are used as strategic planning tools and all rely to some extent on some (unproven and not necessarily understood) relationship between market share and profitability. Given the wide acceptance and extensive use of these concepts, (see for example Bettis and Hall, 1983; Hall, 1978; Gupta, 1984), any research providing insights into this area would be useful and important.

The second reason for studying the relation between market share and profitability and one which is primarily in the domain of Industrial Organisation Theory, is its effect on anti-trust policy. Here the question of causality is clearly paramount. If market share causes higher profitability by reducing costs due to (for example) economies of scale, then it may be in a particular country's best interest to allow mergers leading to higher market share companies. However, if on the other hand high market share causes higher profitability by collusive behaviour and thus forcing prices to rise to levels higher than would otherwise be the case,

then it would clearly not be in a country's best interests to allow mergers which would result in higher market share companies. (This involves the question of concentration versus market share which is further discussed by Gale & Branch, 1982). Although these questions have always been important, they are becoming more important as trade barriers shrink, information flows more quickly and more and more authors talk of global economies, global integration and global market shares (eg. Ohmae 1982, 1987, 1988; Porter, 1990; Buzzell, Quelch & Bartlett, 1992).

Thirdly, market share is used in strategy formulation as a contingent variable which dictates a particular stratigic approach - eg 'strategies for high market share companies' or 'the impact of market share on corporate turnaround strategies'. (See for example Bayvel, 1982; Bloom and Kotler, 1975; Hambrick and Schecter, 1983; Best and Kahle, 1985; Maher, 1984;) Clearly, this makes market share an important variable in its own right.

2.2 STUDIES SUPPORTING A POSITIVE RELATIONSHIP BETWEEN MARKET SHARE AND PROFITABILITY

In section 2.1 mention was made of the early work by Bain in 1951 which was followed up by Shepherd (1972) and Gale (1972). All of these studies used data which did not distinguish between individual businesses within a firm. For example Shepherd (1972, p.27) used data from the Fortune Directory. To try to get single business data, he eliminated firms with a "high degree of internal

diversification". However since his sample primarily covered the largest 500 firms in the USA, it is difficult to believe that internal diversification was not present to a large degree in the data. Despite these limitations Shepherd (1972, p.30) states that "throughout [the analysis] the market share association is positive and highly significant; its linearity is probable but not definite".

With the advent of PIMS, (see appendix I for historical overview and Buzzell and Gale, 1987; Anderson and Paine, 1978; Kehoe, 1983; for more background information), for the first time business unit level data was available with a wealth of strategic information all collected on the same basis. This data was used by Buzzell, Gale and Sultan (1975) (following up from work done by Schoeffler, Buzzell & Heany, 1974) to produce what turned out to be a classic paper on the subject of market share and profitability and one which was still being debated a decade later. The paper starts off by presenting the PIMS results of the correlation between market share and profitability (see figure 2.4).

Buzzell *et al* (1975, p.98) go on to state that there are "at least three possible explanations [for the correlation]:

- Economies of scale: The most obvious rationale for the high rate of return enjoyed by large-share businesses is that they have achieved economies of scale in procurement, manufacturing, marketing, and other cost components. A business with 40% share of a

given market is simply twice as big as one with 20% of the same market, and it will attain, to a much greater degree, more efficient methods of operation within a particular type of technology.

Exhibit I
Relationship between market share and pretax ROI

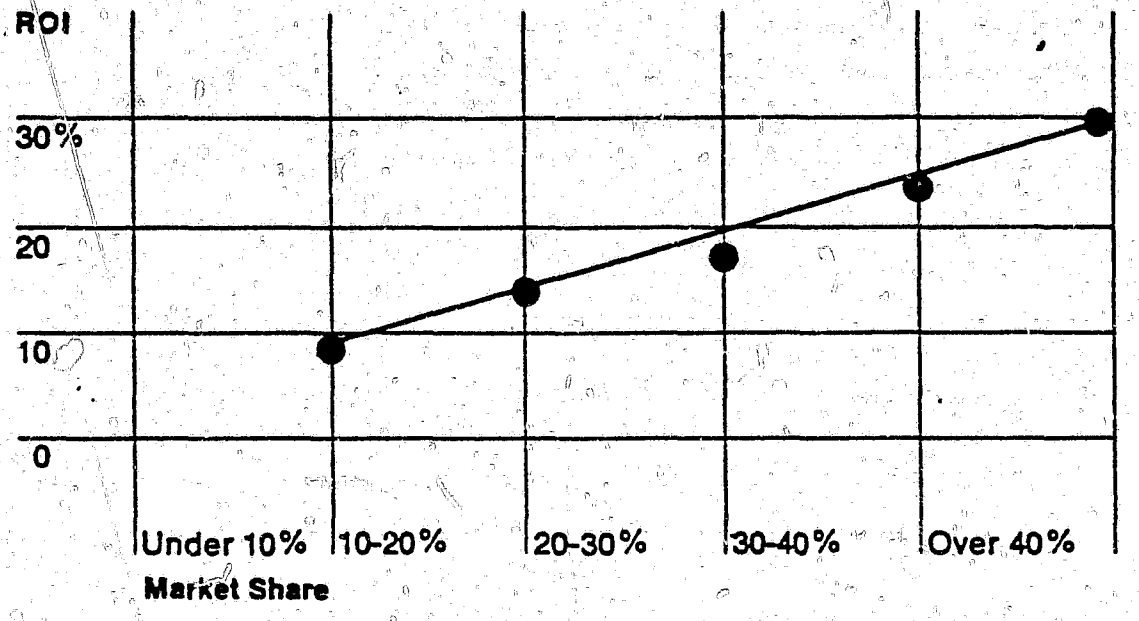

Fig 2.4 - The Relationship between Market Share and ROI
(Source : Buzzell *et al*, 1975, p.98)

Closely related to this explanation is the so-called "experience curve" phenomenon widely publicised by the Boston Consulting Group. According to BCG, total unit costs of producing and distributing a product tend to decline by a more or less constant percentage with each doubling of a company's cumulative output. Since, in a given time period, businesses with large market shares generally also have larger cumulative sales than their

smaller competitors, they would be expected to have lower costs and corresponding higher profits.

- Market Power: Many economists, especially among those involved in antitrust work, believe that economies of scale are of relatively little importance in most industries. These economists argue that if large-scale businesses earn higher profits than their smaller competitors, it is a result of their greater market power: their size permits them to bargain more effectively, "administer" prices, and, in the end, realise significantly higher prices for a particular product.

- Quality of Management: The simplest of all explanations for the market-share/profitability relationship is that both share and ROI reflect a common underlying factor: the quality of management. Good managers (including, perhaps, lucky ones!) are successful in achieving high shares of their respective markets; they are also skilful in controlling costs, getting maximum productivity from employees, and so on. Moreover, once a business achieves a leadership position - possibly by developing a new field - it is much easier for it to retain its lead than for others to catch up".

These explanations have been quoted in full because they are extremely interesting and will be examined in more detail later in this section. Before this is done, for the sake of continuity, an overview of

the rest of the paper will be given.

Buzzell *et al* then go on to explain how market share relates to ROI and make 4 points in this regard:

a) Sales to investment remains constant but profit/sales increases as market share increases.

b) Purchases to sales ratio decrease as market share increases.

c) Marketing costs decrease as market share increases.

d) Price (and quality) increase as market share increases.

The authors do not specifically state that there is a causal process at work but later in the paper discuss building, holding and harvesting strategies and imply in their building strategy that increased market share will result in increased profitability (i.e. causality). Also included in the paper is the assertion that the relationship is dependent on structural factors and that market share is more important (i.e. the correlation between market share and profitability is stronger) when buyers are fragmented and when purchases are infrequent (i.e. hinting at a contingency approach).

The paper made a huge impact on management and consultant thinking and, in some cases, was simplistically interpreted as putting forward a 'universal law' that higher market share caused higher profitability. This was widely criticised on

the basis that no universal laws can exist in the strategy arena because no two situations are exactly alike. Also many examples exist of low share firms which are highly profitable. (These are reviewed later in this chapter.)

The correlation between market share and profitability had been established by many authors but Buzzell *et al* raised two major issues:

1. whether there is a causal relationship between market share and profitability, and
2. whether the relationship is universally applicable.

These two issues are obviously critical to strategy formulation and to examine them in more detail we return now to the explanation given by Buzzell *et al* for the relationship between market share and profitability.

The first reason given is that of economies of scale, and this is linked to the experience curve phenomenon. The experience curve was derived from the learning-curve theory that arose from observations concerning the number of man-hours required for the production of aeroplanes at an Air Force base in Ohio in 1925 (Gluck, 1985, p.6). The observation was made that the production man-hours declined as the cumulative production volume increased. This concept was broadened by the Boston Consulting Group (BCG) into the experience curve concept. Experience curves, according to Hall and Howell (1985, p.197) "refer to the fall in costs which allegedly occur over the total life of a product ... and the cost affected are total costs".

The BCG applied this concept in the mid 60s and 70s to a number of situations including automobiles, refrigerators, Japanese beer and French vacuum cleaners (Kiechel, 1981, p.139). The view put forward by BCG in the mid 1970s was that the experience curve applied to all businesses and all functions and that a doubling of the number of units produced would result in a fall in costs typically of around 25% to 30%.

If one accepts the logic of the experience curve as put forward by the BCG in the mid 70s then the causal link between market share and profitability is clearly made. Also, it could be expected that this would be a universal phenomenon since the experience curve was thought to be universally applicable. However, subsequent research has made these assertions questionable. Firstly, Hall and Howell (1985, p.205) point out that although costs are observed to fall over time the reasons include factors like technological progress, reduction in input prices, and changes in internal efficiency which may have nothing to do with either scale or accumulated output.

This view is borne out by Hall (1980) who provides several examples of companies in mature industries that have enjoyed high profitability despite having low market share. Hall (1980, p.81) states that "high market share and accumulated experience are not essential for cost leadership in a mature market". Also, other authors have suggested that the experience curve is only applicable to certain industries or industries with certain characteristics. For example, Jacobson and Aaker (1985, p.11) state that experience curve effects are

found in industries with high levels of value added, continuous process manufacturing and high capital intensity, but not in other contexts, most notably service and extraction industries. Other authors (e.g. Ghemawat and Spence, 1985; Lieberman, 1989) have observed that due to spill-over effects, learning is an industry wide phenomenon and that individual firms have similar costs and therefore no competitive advantage. Despite the above qualifications the experience curve still has some applicability (see Ghemawat, 1985) and is widely used and built into economic models (eg. Dolan and Jeuland, 1981). However, in terms of a reason for the relationship between market share and profitability it is clearly now not thought to be as powerful as it was in the mid 70s.

The second reason given by Buzzell et al is that of market power. Although the authors use somewhat guarded language they seem to be referring to so-called oligopolistic co-ordination or collusion. This is very much in line with Industrial Organisation theory which asserts that concentrated market structures facilitate oligopolistic co-ordination and lead to monopoly-level prices. If this is correct, a weighted average of the profitabilities of all firms that comprise a concentrated market should exceed the competitive norm. The subject was researched extensively by Gale & Branch (1982, p.84) who point out that under this assertion the burden of maintaining prices by absorbing excess capacity usually falls heavily on the high share participants. Therefore profits should vary primarily with concentration and little or not at all with market share. Gale & Branch go on to argue that the opposing view asserts that

there are economies of scale which apply to a number of different facets of the organisation which should result in a positive relationship between market share and profitability. The authors then run a multiple linear regression with concentration, market share (and an interaction term) regressed against ROI using PIMS data. Their finding showed that market share contains far more explanatory power than concentration. Clearly this makes the second explanation of Buzzell *et al* somewhat unlikely.

The third reason given by Buzzell *et al* for the positive relationship between market share and profitability is quality of management. This is extremely interesting as this constitutes a spurious factor and implies that there is no causal link between market share and profitability. It appears as though the authors discounted this view to some extent because later in the paper (under building strategies) they imply a causal link. Perhaps of equal importance is the possibility that the relationship between market share and profitability is due to luck. Based on pure chance, a business may stumble onto a product strategy that proves to be successful. Rumelt and Wensley (1981) (and Lippman and Rumelt, 1982) took this view and showed that there is strong evidence of a stochastic effect (luck) and virtually no evidence of a direct effect. Thus they contend that the relationship could be due entirely to random processes.

From the foregoing argument it is obvious that the case for the proposition that higher market share causes higher profitability, is far from clear cut. The paper by Buzzell *et al* has been widely debated

(criticised and defended) by many authors and still some of the fundamental propositions remain unresolved.

In an attempt to resolve some of these basic concepts researchers turned their attention to the so-called mid-range theories. In section 2.1 it was pointed out that two views on business-level strategy have dominated the literature. Firstly there is the situational view which holds that no two situations are alike and therefore strategy is an alignment of environmental threats and opportunities with internal strengths and weaknesses (Andrews, 1971; Ansoff, 1969; Yavitz and Newman, 1982). Proponents of this view conduct in-depth case studies and industry studies. The second, and opposing view, is that universal laws of strategy exist and hold for all settings (eg. Buzzell *et al*, 1975). However, between these opposing views are mid-range theories, (eg Pitts, 1980; Pascarella, 1984; Hambrick, 1983; Miller, 1981; Miller and Friesen, 1977). According to Hambrick (1983c, p.213):

> "It should be possible to identify commonly recurring "settings" and to observe how different strategies tend to fare in each setting"

Hambrick, MacMillan and Day (1982, p.511) quote Bourgeois (1980, p.229) as stating:

> "The solution is for the researcher to abstract a smaller number of more encompassing conceptual categories with a broader range of generalisability".

This approach is known as a contingency approach or a situational approach. Ramanujam and Venkatraman (1984, p.139) differentiate between contingency and situational approaches as follows:

> "Contingency factors derived mainly from organisational theory have been tested as moderating influences in the relationships [affecting business unit profitability]. Examples of such contingent factors include environmental uncertainty, organisational goal structure, organisational technology, and product life cycle (PLC) stage ... Situational factors [on the other hand] ... include entry and exit barriers, low performance and turnaround, and low versus high market share effectiveness".

Many authors (eg. Hambrick, MacMillan and Day, 1982) combine the two categories and refer to them merely as contingency theories. Since the early 1980s this approach has been growing in popularity (eg. Galbraith and Schendel, 1983; Hambrick, 1983a; 1983b; 1983c; Woo and Cooper, 1981; 1982) and has grown to become "one of the methodological mainstays of work in strategic management" (Miller, 1988, p.239).

Phillips, Chang and Buzzell (1983) used this approach in conjunction with path analysis to explore some key causal paths in the PIMS data base. The "settings" that were used were simply the 6 business types (eg. consumer durables, consumer non-durables, capital goods, etc) that exist within PIMS. Their findings with regard to market share were interesting in that market share was shown to

have a significant positive causal effect on ROI in all businesses, but the mechanism by which this occurs varied according to the type of business.

> "In the case of consumer non-durables and materials businesses, relative market position influences ROI only by its effects on cost position... In the case of consumer durables and components business an opposite conclusion emerges. Market position influences ROI only via mechanisms other than costs... Finally, in the case of the capital goods and supplies businesses, relative market position influences ROI indirectly by its beneficial effects on relative direct cost position and directly via mechanisms other than costs".
>
> (Phillips *et al*, 1983, p.37)

Thus Phillips *et al* found that there was, in all businesses, a causal link between market share and profitability but that the mechanism was different for the different businesses. This to some extent explains why no satisfactory, "universal" explanation could be found for the correlation of market share and profitability found by Buzzell *et al* (1975). In an earlier study of 10 industries, Bass, Cattin and Wittink (1978, p.8) found similarly that increases in market share increased profitability although the extent of the increase varied across the industries.

In summary, it would appear that the correlation of market share with profitability is beyond dispute. Further, there appears to be strong evidence that a causal link between market share and profitability exists. However, despite much debate and many

theories, the mechanism by which market share influences profitability is not well understood or accepted.

2.3 STUDIES NOT SUPPORTING A CAUSAL RELATIONSHIP BETWEEN MARKET SHARE AND PROFITABILITY

The research presented in section 2.2 focused on papers supporting the view that higher market share causes higher profitability. In this section we focus on the opposing view.

Fruhan (1972) in his paper entitled "Pyrrhic Victories in Fights for Market Share" gave 3 examples from different industries which questioned the wisdom of aggressive market share increasing strategies. Although Fruhan's paper confirmed the correlation between market share and profitability in the industries concerned, he also pointed out the pitfalls and problems related to getting higher market share. In the early 70s the prevailing view from consultants and researchers was that low share business should either be grown into higher shares or divested. Specifically, according to BCG, low share businesses in low growth industries (dogs on the BCG product-portfolio matrix) "may show accounting profit, but the profit must be re-invested to maintain share, leaving no cash throw off. The product is essentially worthless, except in liquidation" (Hambrick & MacMillan, 1982, p.84). As pointed out by Woo and Cooper (1981, p.301) this advice is hardly helpful to a business manager of a low market share business!

The question of strategies for low market share businesses was first addressed in a meaningful way

by Hamermesh, Anderson and Harris in 1978 in a paper entitled "Strategies for low market share businesses". The authors challenged the prevailing view that low share business had two strategic options; to fight to increase market share or withdraw from the industry. Hamermesh *et al* examined 900 businesses from 30 major industries in "Forbes Annual Report on American Industry" and found numerous successful low share businesses. (They defined low share as being less than half the industry leaders share and successful as a company whose five year average return on equity surpassed the industry median.) From the successful low share companies Hamermesh *et al* selected three companies for closer analysis whose earnings were substantially higher than the industry median and in some cases were the highest performers in the industry. Despite the fact that the three companies selected were from substantially different industries, four common strategic characteristics were found: (Hamermesh *et al* 1978, p.98).

1. they carefully segment their markets,
2. they use research and development funds efficiently,
3. they think small, and
4. their chief executive's influence is pervasive.

The authors acknowledge that low share businesses do have some serious obstacles that must be overcome if the business is to be successful. These include small research budgets, few economies of scale in manufacturing, little opportunity to distribute products directly, little public and customer recognition, and difficulties in attracting capital

and ambitious employees. However, despite these obstacles Hamermesh *et al* (1978, p.102) comment as follows:

> "... we have found that a small market share is not necessarily a handicap; it can be a significant advantage that enables a company to compete in ways that are unavailable to its larger rivals."

This proposition was picked up by Woo and Cooper (1981) and investigated in a more systematic and statistically rigorous way. One of the major problems of the research done by Hamermesh *et al* is that despite the quality and depth of the analysis, the results are based on a sample of three. Clearly the chances of this being generalisable across all business with a low market share are statistically very small. Woo and Cooper approached the problem in a more generalisable way using the PIMS data base. Their research sought to identify strategies which had proven effective for low share businesses and were represented by two categories of decisions: (Woo and Cooper, 1981, p.302)

(1) product-market choices at the corporate level relating to participation in particular businesses (the corporate strategy decision)

(2) competitive strategy at the business level indicating how a business competes and allocates its resources, given the product-market choice in (1) (the business strategy decision).

The methodology used was to define 13 variables

which described the product-market-industry characteristics and 13 variables which describe the competitive strategy exhibited. (see figure 2.5)

Product-market-industry characteristics	Competitive strategy
1. Type or product	1. Relative price
2. Standardization of products	2. Relative quality
3. Importance of auxiliary services	3. Relative product breadth
4. Product life cycle stage	4. Relative emphasis on new products
5. Purchase frequency (end user)	5. Proprietary products
6. Purchase frequency (immediate user)	6. Proprietary processes
7. Geographic location	7. R&D intensity (product)
8. Industry value-added	8. R&D intensity (process)
9. Industry concentration	9. Relative advertising
10. Number of competitors	10. Relative sales force.
11. Real market growth	11. Relative vertical integration (backwards)
12. Industry growth	12. Relative vertical integration (forwards)
13. Frequency of product changes	13. Relative direct costs

Fig 2.5 - Variables representing product-market choice and competitive strategy
(Source : Woo and Cooper, 1981, p.303)

To highlight the findings pertaining to low share businesses the authors contrasted effective low share businesses with (1) effective high share businesses and (2) ineffective low share businesses. (Low share was defined as less than 20% of the combined share of the three largest competitors. Effective was defined as an ROI of greater than 20% and ineffective as an ROI of less than 5%.)

Woo and Cooper tested 3 main hypotheses and their findings are as follows:

Firstly, they tested whether the product-market choices of effective low share businesses were different to ineffective low share businesses and different to effective high share businesses.

Overall, their results showed that effective low share businesses were found to pursue product-market choices different from effective high share businesses. However, the environments of effective and ineffective low share businesses were not found to be significantly different.

Secondly, the authors tested whether within the same environment (defined by similar products, markets and industry characteristics), competitive strategies of effective low share businesses differed from those of effective high share businesses (within the same environment) and differed from ineffective low share businesses. Their findings showed a strong difference between the competitive strategies of effective low share businesses and effective high share businesses. (Some of the differences in strategy were that compared to high share businesses, low share businesses did less advertising and personal selling, spent relatively more on product R & D to maintain high quality standards and spent relatively less on process R & D.) The authors also found that the competitive strategies of effective low share businesses differed significantly from the strategies of ineffective low share businesses.

Thirdly, the authors tested whether groups of effective low share businesses operating under dissimilar product-market conditions pursue different competitive strategies. Although some differences were found, the authors did not believe that the differences were significant and therefore could not support their original hypothesis.

Woo and Cooper's work is interesting for two

reasons. Firstly, the methodology used (that of employing cluster analysis to define "environments" and strategy typologies) was very important as it added immeasurably to the debate concerning market share and profitability and has been used by many other authors since then (eg. Hambrick, MacMillan and Day, 1982; Hambrick 1983a; 1983b; 1983c : Galbraith & Schendel, 1983, Dess and Davis, 1984). Although cluster analysis had been used extensively in many other disciplines this was the first time it had been applied to market share and profitability. Secondly, the results obtained by Woo and Cooper are extremely important in that they show that small market share businesses can enjoy high profitability and that this is largely influenced by the strategy employed (business and corporate). These findings are interesting and clash directly with the conventional thinking of growing or divesting small market share businesses.

Woo and Cooper's (1981) work was followed up by Woo (1983) when she examined the strategies of 41 businesses which were market leaders but displayed poor performance. The focus of the research was to identify the factors which differentiated the low return performers from the high return performers. Four categories of explanatory factors were examined:

(1) market stability
(2) demand characteristics
(3) organisation commitments
(4) competitive strategy

Figure 2.6 shows the variables from the PIMS data base that were included in each category.

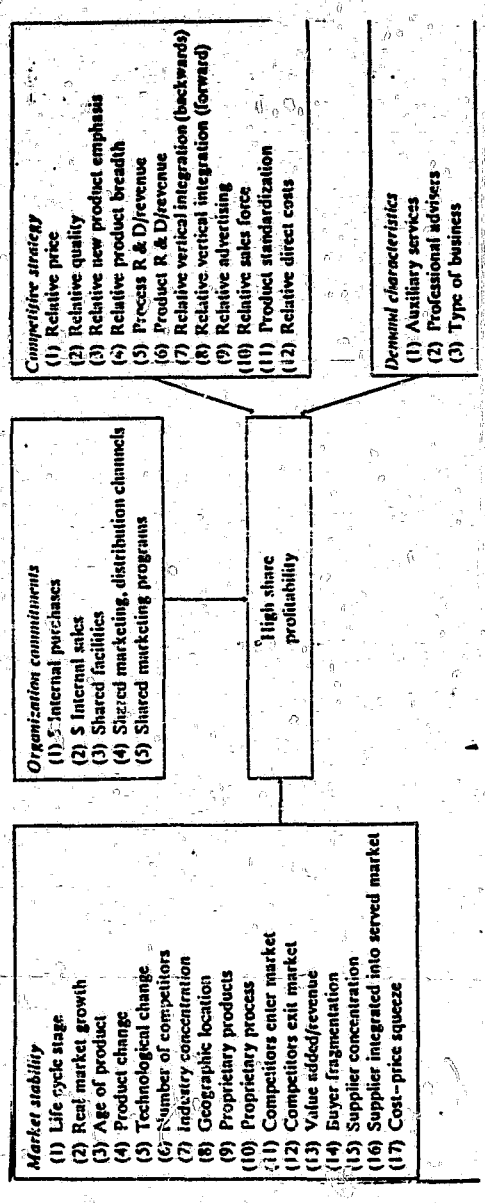

Fig 2.6 - Explanatory factors of high share profitability
(Source : Woo, 1983, p.126)

Again, Woo's methodology was based on contrasting low return businesses against high return businesses to highlight differences using cluster analysis. Woo found that the low return businesses operated more often in unstable markets and in markets where auxiliary services were important. Regarding organisational commitments, although none of the variables were statistically significant, low return businesses were associated with a greater degree of internal commitments. Competitive strategies for the two groups were significantly different, with high return businesses having distinctly lower costs than low return businesses.

While not disproving the correlation between market share and profitability, Woo's work does highlight caveats to the relationship. It appears that the relationship between market share and profitability is context specific, and in certain environments may not exist at all. Also it appears that the relationship is not "automatic" but is dependent on the competitive strategies adopted by the business. Woo (1983) clearly showed that not all high market share companies have high returns, and Woo and Cooper (1981) earlier showed that not all low market share companies have low return.

The work done by Hambrick, MacMillan and Day (1982), which examined the assumptions underlying the BCG product-portfolio matrix using the PIMS data base, supports this view. In general the findings supported the primary thesis of BCG i.e. businesses in the four quadrants of the matrix have quite different tendencies to generate or consume cash. The primary point of disagreement between Hambrick *et al* and BCG has to do with the performance of

Dogs. Hambrick *et al* (1982, p.94) summarise as follows:

> "· Dogs perform better than BCG has led us to believe. In fact, some Dogs perform very well.
>
> · Certain strategic factors are associated with high profitability amongst Dogs. The notable factors are low capital intensity, attention to efficiency, a narrow focus, high product quality and low to moderate prices.
>
> · Top management of a company can affect whether Dogs achieve their potential as long-term, reliable cash generators."

The strategies proposed by Hambrick *et al* is similar although not identical to the other authors. The various recommended strategies for low share businesses are summarised in Table 2.2.

Table 2.2 - Summary of strategies for low market share businesses

Hamermesh *et al* (1978):	· segmentation · R&D effective · think small · CEO influence important
Woo & Cooper (1981):	Product market choice important · less advertising · less personal selling · relatively more product R&D · high quality
Hambrick *et al* (1982):	· low capital intensity · efficiency · narrow focus · high quality · low prices · CEO influence important

These studies not only offer examples of low market

share businesses which are effective, but also give recommendations for strategy. The fact that each study arrived at different conclusions could either result from metholodogical limitations of the studies, or could point to the contextual nature of these strategic recommendations. While these studies do not constitute a comprehensive blueprint for strategy formulation for low share businesses they clearly cast some doubt on the causal relationship between market share and profitability. Supporting this view is a completely separate school of thought which holds that the relationship between market share and profitability is primarily due to luck or random events (as mentioned in section 2.2). Mancke (1974) first put forward this view when he proposed that the relationship between market share and profitability was due to the random outcome on each firm's capital budget. These random outcomes dictated the "success" of the firm in terms of growth and profitability. High growth ended up in high market share and high profitability hence explaining the correlation.

This theory is acknowledged by many authors (eg. Jacobson and Aaker, 1985; Lieberman and Montgomery, 1988; Lippman and Rumelt, 1982) and was tested using the PIMS data base by Rumelt & Wensley (1981). Their model was constructed to discriminate between so called 'direct' and 'stochastic' effects. To do this two equations were constructed : the first stating that return at the end of a 5 year period depends on the beginning rate of return and a number of factors affecting the change in return. These include the growth of marketing expenditure, the rate of change of prices, the growth rate of market share, the change in capacity utilization and

finally the unobserved stochastic shock (X). The second equation states that the growth in output depends on the prior level of growth (in the previous period), the overall industry growth, the initial market share, the initial rate of return, the economy-wide rate of growth, the rate of growth of marketing expenditure and prices and the unanticipated stochastic shock (X). Thus the equations are (Rumelt & Wensley, 1981, p.4):

$$R_5 = a_o + a_1R_2 + a_2GM + a_3GP + a_4GS + a_5DRYR + a_6DCU + a_7X + e_r \quad (1)$$

$$GQ = b_o + b_1GI + b_2GM + b_3GP + b_4R_1 + b_5S1 + b_6GQ_o + b_7GQYR + X + e_q \quad (2)$$

where

R_1, R_2, R_5 : Return on investment in years 1, 2 and 5 respectively.

DRYR : Average change in return for all PIMS businesses over the period.

DCU : Four year trend (regression fit) in capacity utilization.

GP : Four year growth rate in the price index.

GM : Four year growth rate in marketing expenditure.

GQ : Four year growth rate in marketing expenditure.

GQ_o : Prior growth rate measured as the growth rate of Q between years 1 and 2.

GQYR : Average GQ experienced by all PIMS businesses during the period.

S1 : Market share in year 1. Share is taken as the ratio of the business unit output (Q) to the unit output of the market.

GS : Four year growth rate in market share.

GI : Long term (last 10 years) growth rate in output of the relevant industry (not market).

The two equations could be estimated independently using ordinary least squares (OLS) but this would not take into account the common unobservable X which appears as a correlation between the residuals of (1) and (2). According to Rumelt and Wensley the appropriate technique is SUR (seemingly unrelated regression) which consists of a generalized least squares approach applied to several equations. The authors applied this technique to 976 businesses in the PIMS data base where 5 consecutive years of data were available. The authors found strong stochastic effects and concluded that the intrinsic value of market share has been grossly overstated.

The conclusion reached by Rumelt and Wensley is important and interesting but unfortunately, in the view of this researcher, the credibility of the work is marred by the lack of justification or logic for the inclusion of variables chosen in their model. The authors give no reasons or justification for their equations and no explanation for why certain variables were chosen while others omitted. Other authors have criticised the conclusions reached by Rumelt and Wensley. Jacobson and Aaker (1985, p.20) point out that Rumelt and Wensley's work lacks power and that "the conclusion might not stem from a lack of relationship but perhaps from an inability of the

approach to detect a relationship", i.e. the test could have a large Type II error in the detection of small market share effects.

Jacobson and Aaker (1985) use lagged ROI as a surrogate for firm specific factors occurring in previous periods that tend to be constant on a year-on-year basis and influence ROI and also (perhaps) market share. Jacobson and Aaker use a 3 phase approach starting with a simple ROI/market share regression, moving through the inclusion of lagged ROI to end up with a more complex model which includes other variables to reduce the impact of omitted factors. Their model was applied to the data in the PIMS data base and their findings showed that the direct effect of market share on profitability was much smaller than previously estimated. While Buzzell *et al* (1975) had found that a 1% change in market share caused a 0,5% change in ROI, Jacobson and Aaker (1985, p.20) estimate that a 1% change in market share would be associated with a 0,1% change in ROI.

In examining the construction of the models used by various researchers doing cross-sectional or longitudinal analysis of the PIMS data base one is struck by the divergence and lack of agreement or standardisation that exists concerning methodology, analysis procedure and (most of all) the explanatory variables. Table 2.3 shows a comparison of the explanatory variables used by a range of authors to construct equations to model essentially the same phenomenon.

Although there is some commonality, the vast range of variables included and omitted in the various

models, and the vastly differing conclusions reached by the respective authors, contributes more to confusion than to knowledge. It is very difficult to judge the merits of one analysis relative to any other because of differences in methodology and in explanatory variables. If one makes the assumption that these models are all correctly constructed and analyses and that the results are valid (considering the limitations of the model) then the only reasonable conclusion that can be arrived at is that the relationship between market share and profitability is highly sensitive to a wide range of "explanatory" factors. This conclusion in a sense supports the view that the effect of market share is context specific and that the factors describing the contextual settings are numerous and complex.

	1	2	3	4	5	6	7	8
Market share (and/or lagged MS)	X	X	X	X	X	X	X	X
ROI (lagged)	X	X						
Vertical integration	X				X	X		
Marketing expenditure	X	X				X		X
Capital utilization	X	X			X	X		
Relative price	X	X			X	X		
Relative cost	X							
Relative quality	X				X	X		X
Relative new product	X				X			X
Real growth	X	X	X	X	X		X	
Relative sales force exp	X				X			X
Relative advertising	X		X	X	X		X	X
Relative image exp	X							X
Change of ROI of all PIMS SBU's		X						
Prior growth rate		X						
Long term growth rate		X						
Industry concentration				X			X	
Economics of scale			X					
Investment intensity (cap. req)			X		X	X		
Financial leverage			X					
Profit variability			X					
Non-diversifiable risk			X					
Firm size			X	X			X	
% Employees unionised					X			
Receivables and Inventory/rev						X		
Employee productivity						X		
Relative compensation						X		
% purchased from 3 suppliers			X			X		
Relative product breadth						X		
Relative direct cost						X		
Manufacturing/revenue						X		
R & D/revenue						X		
Entry barriers							X	
Entry and exit of competition								X
Market share rank								X

1. Jacobson and Aaker (1985)
2. Rumelt and Wensley (1981)
3. Bothwell et al (1984)
4. Bass et al (1978)
5. Phillips et al (1983)
6. Prescott et al (1986)
7. Shepherd (1972)
8. Buzzell and Wiersema (1981)

Table 2.3 - Explanatory Factors in Market Share Models

2.4 DYNAMICS OF MARKET SHARE

The relationship between market share and profitability is given greater depth by considering the effect of changes in market share versus short and long term changes in profitability. In theory, if market share has value, it should be possible to "buy" market share by sacrificing current profits to obtain higher market share and later (presumably) tap the benefits by obtaining higher profits. The converse should also be true i.e. high market share could be "sold" by allowing market share to decline while taking increased profit. According to this theory it should not be impossible to simultaneously increase profit and market share.

Zeithaml and Fry (1984) investigated this using the PIMS data base and focused on the dynamics of changing market share in mature industrial businesses. Specifically their study explored concurrent changes in market share and profitability between:

(1) businesses realising simultaneous increases in market share and profitability (superstars).

(2) businesses sacrificing market share to secure increases in profitability (harvesters).

(3) businesses building market share at the expense of profitability (builders).

(4) businesses that showed declines in both market share and profitability (decliners).

Figure 2.7 shows the number of businesses in each category and the change in market share and ROI.

Research Framework, Descriptive Statistics, Dynamic Performance Situations

Change in Profitability (ΔROI)	Change in Relative Market Share (ΔRMS) Increasing (+1)	Change in Relative Market Share (ΔRMS) Decreasing (−1)
Increasing (+3)	I. Superstars $n = 106$ ΔRMS = 6.26 (6.97) ΔROI = 10.21 (5.99)	II. Harvesters $n = 52$ ΔRMS = −10.52 (14.25) ΔROI = 7.04 (3.24)
Decreasing (−3)	III. Builders $n = 52$ ΔRMS = 7.57 (8.43) ΔROI = −8.22 (3.63)	IV. Decliners $n = 84$ ΔRMS = −11.15 (14.26) ΔROI = −8.62 (4.06)

Figure 2.7 - Concurrent changes in market share and ROI
(Source : Zeithaml & Fry, 1984, p.845)

The first point which is of interest is the number of businesses which fall into the Superstar category, i.e. 106 out of 294 or 36%. These are businesses which simultaneously increased market share and profitability. Clearly this supports the theory that both market share and profitability depend on some spurious third factor and in the case of Superstars the third factor improved causing both

profit and market share to increase simultaneously. Also supporting this proposition, diagonally opposite to the Superstars are Decliners which are the next largest number i.e. 84. Again, these are businesses which are obviously related via a spurious third factors as both profitability and market share declined simultaneously. The Superstars and Decliners together make up 190 out of the 294 or 65%. (This result was supported by Heany (1985) with the additional observation however that most of those gaining market share started with high market share and most of those losing market share started with low market share!)

Ziethaml and Fry used a combination of environmental and strategic factors to investigate the differences between the four categories. Significant differences were found. For example, contrary to Heany, Superstars were later entrants to their markets than were businesses in other performance situations. They had less dominant positions in markets that were experiencing moderate growth. In terms of basic strategy, Superstars differentiated their products through higher price, quality and innovation. This innovation emphasised a higher percentage of new customised products, supported by a higher sales force expenditure.

Although this work of Ziethaml and Fry is interesting, of more importance for our purposes is the fact that well over half their sample seemed to have a spurious relationship between market share and profitability.

Another approach to the dynamics of market share has been to examine the order of entry compared to long

term survival or market share position (eg. Shaw and Shaw, 1984; Lieberman and Montgomery, 1988; Urban, Carter, Gaskins and Mucha, 1986).

The argument here is that if market share has real worth then the firm that gets into the market first should retain an advantage over other firms that enter later, even years or decades after the initial entry. The theoretical models reviewed in this section assume that there is initially an environmental change which either by luck, good judgement or exceptional proficiency is exploited by a particular (first mover) firm. This competitive asymmetry is then strengthened and enhanced by mechanisms known as "isolating mechanisms" or "enhancing mechanisms" (Lieberman and Montgomery, 1988, p.42).

Research done on the subject of first mover advantage has delivered varying results but in general findings have supported the view that there is a distinct advantage to first mover firms. Urban, Carter, Gaskin and Mucha (1986) studied 82 brands of products across 24 categories and found that there was a significant market share penalty for late entrants. In reviewing the methodology the authors comment that, if anything their methodology underestimated the magnitude of the penalty but despite this they obtained a significant result.

Shaw and Shaw (1984) studied 13 major firms in the Western European synthetic fibres industry and examined hypotheses based on the BCG experience curve concept and on the PIMS evidence of the relationship between market share and profitability. They found significant evidence that late entrants

to a market suffered a competitive disadvantage because they lacked the accumulated experience of the pioneering firms. For each of the three main synthetic fibres, acrylic, nylon and polyester, it was found that the early entrants who established major market shares early in the growth phase of the product life cycles were able to maintain that leadership nearly twenty years later. In contrast not only did almost all the late entrants fail to achieve significant market shares but they provided seven out of nine market withdrawals. The authors also point out that:

> "... the results for the three synthetic fibres are consistent with the expectations derived from both PIMS* and experience curve data. Firms with large market shares seemed less vulnerable ... (in adverse market conditions) ... than firms with small market shares. This was in spite of considerable product differentiation and consequent market segmentation. Firms which had acquired a large cumulative output reflected in persistent market leadership survived, while some of the late entrants with small cumulative output had to withdraw from the market".
>
> (Shaw and Shaw, 1984, p.78)

Ghemawat (1984) examined the capacity expansion process in capital-intensive industries. A theoretical model was developed which led to the conclusion that where cost differed significantly

* The PIMS data refers to the relationship between market share and profitability reported by Schoeffler *et al*, 1974; Buzzell *et al*, 1975; Buzzell and Wiersema, 1981.

across firms (because of experience curve or other effects) the lowest cost producer will tend to pre-empt the others in adding new capacity - thus entrenching a market leadership position. Part II of Ghemawat's paper examines the U.S. titanium dioxide industry in the context of the theoretical predictions of the model. In particular, Du Pont's strategy in titanium dioxide over the period 1972-77 is examined and found to accord with the predictions of the model.

The work of Ghemawat, Shaw and Shaw, and Urban *et al* clearly supports the view that market share has real worth and that market leadership positions are often retained for decades. However research by Lieberman (1989) showed, to some extent, contradictory results.

Lieberman studied the entry and survival rates of 39 chemical product industries in the United States. The data covered a 20 year period (starting in the early 60s) and the analysis focused on learning based cost advantages potentially held by incumbent firms. No evidence was found to support the view that entry decisions were sensitive to the cumulative production lead held by incumbents. Further, entrant survival rates were found to be unrelated to order of entry. However, survival was adversely affected when the leading incumbent held a large cumulative output advantage, or when entrants built plants of sub-optimum scale. Thus, a large incumbent lead in production experience did not deter new entry but did reduce the entrants probability of survival.

Lieberman's work can be interpreted as supporting the view that the market share profitability relationship is context specific. It is this author's view that the reason why entrant survival rates were not found to be related to order of entry in all cases is because in certain industry/contextual settings the effect of cumulative experience is much smaller than in other contextual settings. In the former case, the pioneering firm clearly gains very little competitive advantage from its initial high share position and overtime is unlikely to have a large difference in costs over later entrants. Also the vulnerability of any particular firm in the industry is likely to be approximately equal since no advantages accrue from cumulative experience. In the latter case, where cumulative experience causes significant cost reduction, clearly the pioneering firm will have a cost position significantly lower than other competitors. Also, via pre-emptive capacity expansion (as described by Ghemawat) the pioneering firm is likely to increase its cumulative experience advantage. In this case, as reported by Lieberman, entry may not be deterred but survival rates of late entrants are likely to be reduced.

A further indication that market share has real worth relates to the body of literature that exists concerning entry barriers. This discussion really forms part of the Industrial Organisation literature but, at this stage, it is sufficient to note that there is a large school of thought which holds that entry barriers allow the incumbent to earn above average profits. These entry barriers classically take the form of either installed capital capacity or a cumulative production lead or both (see

Schmalensee, 1981 or Gilbert, 1989). However, broadly speaking, an entry barrier can be any mechanism that shelters the incumbent from effective competition from other entrants.

> "Depending on the industry that you are in, it means that you're on the approved list, on the shelf, installed, imbedded in the specs."
> (Hanan, 1981, p64)

Lieberman and Montgomery (1988, p41) identify 3 broad categories of what they refer to as isolating mechanisms: (1) technological leadership, (2) pre-emption of assets, and (3) buyer switching costs. Within each category there are a number of specific mechanisms.

(1) **Technological Leadership**

Two basic mechanisms are considered in the literature. These are (a) advantages driven from the learning or experience curve, where costs fall with cumulative output and (b) success in patent R&D races, where advances in product or process technology are functions of R&D expenditures.

(2) **Pre-emption of scarce assets**

Here, advantage may be gained by controlling assets that already exist, rather than those created by the firm through development of new technology. Such assets may be physical resources or other process inputs. Alternatively, assets may relate to positioning in space, including geographical

space, product space, shelf space, etc. Three specific types of pre-emption are discussed in the literature (Lieberman & Montgomery, 1988, p44). These are (a) pre-emption of input factors, (b) pre-emption of locations space, and (c) pre-emptive investment in plant and equipment.

(3) **Switching costs and buyer choice under uncertainty**

With switching costs, late entrants must invest extra resources to attract customers away from the incumbent firm. Several types of switching costs can arise, as pointed out by Lieberman & Montgomery (1988, p46).

> "First switching costs can stem from initial transactions cost or investments that the buyer makes in adapting to the seller's product. These include the time and resources spent in qualifying a new supplier, the cost of ancillary products such as software for a new computer, and the time, disruption, and financial burdens of training employees. A second category of switching costs arises due to supplier specific learning by the buyer. Over time, the buyer adapts to characteristics of the product and its supplier and thus finds it costly to change over to another brand (Wernerfelt, 1985). For example, nurses become accustomed to the intravenous solution delivery systems of a given supplier and are reluctant to switch (Porter, 1980).

> A third type of switching cost is contractual switching cost that may be intentionally created by the seller. Airline frequent-flyer programs fit in this category".

In this context, entry barriers can be thought of as a sheltering mechanism, a barrier to competition or a sort of marketing "inertia" which protects the incumbent from attacks by any other participant. A recognition of this "inertia" has led many authors (eg Porter, 1985; Ward & Stasch, 1986 and Foster, 1986) to propose that the best time for attacking the market leader is at a time of technological innovation or discontinuity. This proposition accepts that there are potent "inertia" forces which an attacker would normally have to overcome and which are disrupted during a technological (or other) discontinuity.

2.5 MICROECONOMICS AND INDUSTRIAL ORGANISATION

No discussion of industry structure and market share could be complete without drawing from the wealth of information and knowledge embodied in the literature on microeconomics and industrial organisation. We will not attempt here to review this literature in a holistic manner, as such a review would be far too voluminous because of the shear quantity of literature available and would in any case be redundant as there are a number of excellent texts on the subject (eg Bain, 1959; Scherer, 1980; McGee, 1988). Instead we will draw from the literature only the material required to debate the specific subjects which are central to

this research. We will start with a review of the theory of monopoly power drawn from classical microeconomics and then move on to oligopoly models cost structures and in the next section game theory.

Monopoly Power

Monopoly has been called the perfect form of imperfect competition (van den Bogaerde, 1978, p347) "because not one of the conditions for perfect competition is complied with". In the debate of market share and profitability, monopoly clearly represents one extreme i.e 100% market share.

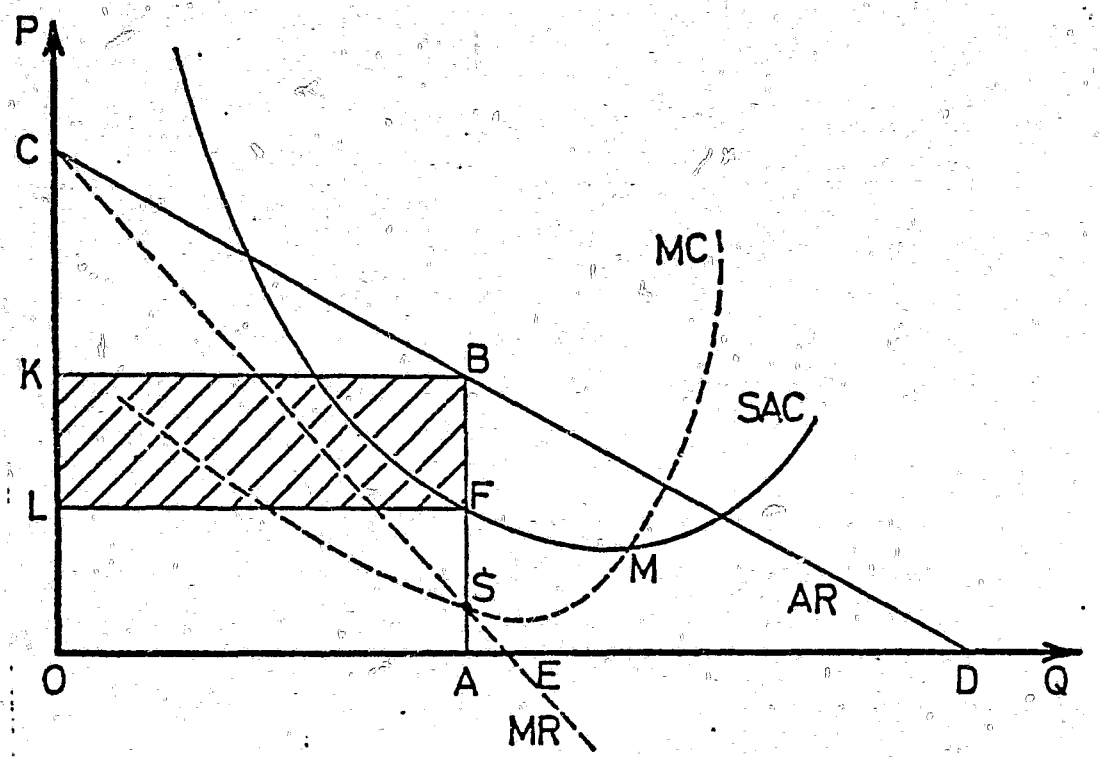

Fig. 2.8 Monopoly Price and Excess Profit in the Short Term
(Source : Van Den Bogaerde, 1978, p351)

Classical microeconomics focuses on price and quantity determination by monopolist in the short, medium and long term. Fig 2.8 shows the determination of price and quantity over the short to medium term.

In the short term, the monopolist can vary his output within the framework of his existing plant. The short term cost curve (SAC) and the corresponding short term marginal cost curve (MC) in fig 2.8 have the same properties as the corresponding curves of firms under conditions of perfect competition. The sales curve for the monopolist (equal to the market demand curve) is the average revenue curve CD and the corresponding marginal revenue curve MR is the curve CE. It can be shown that profit maximisation occurs at an output where marginal costs equals marginal revenue i.e at quantity OA. Seen graphically this means that the price charged will be represented by AB on fig 2.8 and the excess profit achieved by the monopolist is represented by the rectangle BFLK viz, excess price BF X volume OA.

The above analysis clearly shows that the monopolist uses market power to suppress the quantity produced and raise prices so that excess profits are made. This results in an inefficient resource allocation and the consumer is compromised. However it may be argued that monopolies are necessary in order to realize economies of scale which could outweigh the negative effects of monopolies. The consequences are illustrated in fig 2.9.

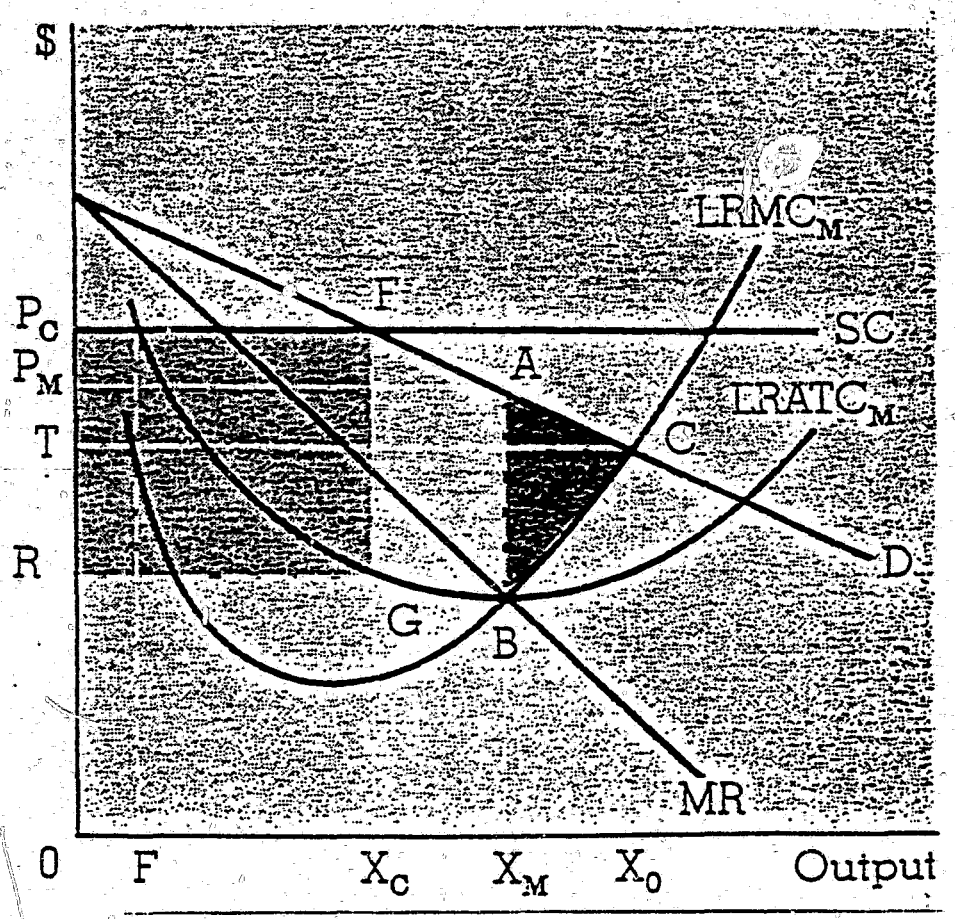

Fig 2.9 Monopoly with Economies of Scale
(Source : Scherer, 1980, p22)

A monopolist's long run average total cost curve is assumed to be LRATCm with associated marginal cost curve LRMCm. If, on the other hand, the industry were atomistically structured, with each member firm operating a plant designed to produce OF units of output at a unit cost of OPc, the long-run supply curve would be PcSc. Given these assumptions, the profit-maximizing monopolist (as per the previous

analysis) produces output OXm which is higher than the competitive supply OXc, and charges price AXm which is lower than the competitive price FXc. Clearly, it cannot be said that the consumer demands are satisfied less fully under monopoly in this case than they would be under competition. It is also worth noting that the monopolist still makes excess profits as represented by the rectangle RBAPm.

Both of the foregoing analyses show that monopolies make excess profits but leave us with this unresolved issue : do monopoly positions and their profits arise from economies of scale, or from the pursuit and exercise of market power? This question is important for this research as it specifies how market share might effect profitability. It is also crucial in setting antitrust policy towards dominant firms, and lies at the core of Industrial Organisation. If economies of scale were found to be large, they would pose an antitrust dilemma. Seeking to reduce monopoly power would entail a sacrifice of economies of scale. However, we will postpone debate on this subject until the theories of oligopoly have been reviewed.

The main feature of oligopoly as a market form is that the number of sellers is limited, so that firms are large relative to the extent of the market. Therefore, each seller has the ability to alter prices in the industry and an action by one competitor has a direct effect on all other participants. Every oligopoly theory must therefore specify how each firm behaves and how it assumes others will behave. Non-collusive theories assume that each firm maximises its own profits, and does not agree with its rivals to fix prices or output.

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The firms compete by searching for the profit-maximizing quantity or price.

There are a number of classical oligopoly theories and they are distinguished by their assumptions on how each rival assumes the other participants will behave. Another distinction is whether each firm assumes that the other firms' prices or output will change as a result of competitive action. The founding theory, and the forerunner of all other theories, is Cournot's theory, which assumes that the output quantity is the decision variable. We will now briefly review some of the more prominent oligopoly theories.

Cournot

In Cournot's theory, as in all oligopsony theory, what is critical is the treatment of rivals' responses. Detailed specification of a rival's reaction is what distinguishes classical oligopoly theories from later theories. The classical theories postulate how rivals behave and how each assumes the other will behave. The later theories assume that all participants have a goal or objective (e.g. maximising the total industry profitability) then infer which kind of behaviour is best suited to each goal.

Cournot dealt with a homogeneous product sold in a perfect, centralizing market, and took output as the variable to be manipulated by each rival. Each seller, acting independently, seeking maximum profits. At any moment each rival knows his own cost function, the total commodity demand, his own and his rival's output, and the market price. In

short, he knows the present situation.

Cournot's model has been viewed as the simultaneous solution of a system of equation and has also been extended to make it dynamic i.e have one firm move, then the other adjust and so on until equilibrium is reached. The model's assumptions are still valid under both views but it is simpler to assume a simultaneous solution.

To describe the working of Cournot's model let us examine the simplest case of oligopoly where two firms sell identical products. Each firm seeks to maximise profits. Call the sellers 1 and 2, the totals cost functions C_1 and C_2, and the total revenue function TR_1 and TR_2. They compete : Market price depends on the sum of their outputs, and a larger quantity sold by one firm leaves less for the other (at a particular price).

In Cournot's system, each seller assumes that the sum of his rivals' output will not change because he changes his own. Each seller takes as his own that part of the industry demand curve not satisfied by rivals. As a consequence, equilibrium comes through the sum of output decisions independently made, which is brought to equality with industry demand. In equilibrium, the market clears on price and no seller can independently improve his position.

Under these conditions price will be some function of the output of the two firms in the market.

$$P = F(q_1, q_2)$$

And for each firm, total revenue is the market price times its own output rate.

$$TR_1 = q_1 F (q_1 + q_2)$$
$$TR_2 = q_2 F (q_1 + q_2)$$

Profit for each firm, R, is total revenue minus total cost.

$$R_1 = TR_1 (q_1 + q_2) - C_1 (q_1) \text{ and}$$
$$R_2 = TR_2 (q_1 + q_2) - C_2 (q_2)$$

To find each firm's profit - maximizing output we differentiate (and set to zero) the profit function of each firm with respect to its own output rate q.

$$dR_1 / dq_1 = [dTR_1 (q_1, q_2) / dq_1] + [dTR_1 (q_1, q_2) / dq_2] [dq_2 / dq_1] - dC_1 (q_1) / dq_1 = 0$$

And similarly for the second firm.

For each firm the second term has two elements one of which, dq_2 / dq_1, shows how each firm's output is assumed to alter the output of the other firm. These derivatives are called conjectural variations and assumptions concerning them are the distinguishing feature of the various oligopoly theories. In Cournot's 1838 version firms act as though dq_2 / dq_1 is zero and thus we have :

$$dR_1/dq_1 = [dTR_1 (q_1, q_2)/dq_1] - dC_1 (q_1)/dq_1 = 0$$
$$dR_2 / dq_2 = [dTR_2 (q_1, q_2) dq_2] - dC_2 (q_2)\ dq_2 = 0$$

Putting these functions into shape to solve for q_1 and q_2, respectively, gives two reaction functions, one for each firm. The Cournot equilibrium solution is then obtained by solving the reaction functions simultaneously.

As an illustration, assume a linear demand function and a linear cost function for each firm. Market

price is determined by the sum of outputs.

$$\text{i.e} \quad P=200-q_1-q_2 \text{ (assume)}$$

For simplicity, assume that the total cost function for both firms are identical.

$C_1 = 10q_1$ and

$C_2 = 10q_2$

Using the above argument

$R_1 = (200-q_1-q_2)q_1-10q_1$

$dR_1/dq_1 = 190-2q_1-q_2 = 0$

Similarly for 2

$dR_2/dq_2 = 190-2q_2-q_1 = 0$

Solving the equations simultaneously gives

$q_1 = q_2 = 63,3$ and

$P = 200 - 63,3 - 63,3 = 73,3$

Cournot's analysis can be extended to far more complicated cases and can handle many competitors with differing cost functions. For a more detailed discussion of Cournot oligopoly see Daughety (1988). For our purposes it is worth noting that the price determined under Cournot's system is not equal to the marginal cost of the participants but is always greater than the marginal cost and is dependent on the number of participants in the oligopoly and on the price elasticity of demand. It can be shown (McGee, 1988, p66) that the price under the Cournot system is given by :

$$P = MC-P / (Ne)$$

where MC= marginal costs

N = number of participants

e = demand elasticity which is negative for a decreasing demand function

Clearly, price will only be equal to marginal costs in the limiting case where N or e tend to infinity.

Also, it has been shown that for a linear market demand, a single firm monopoly produces one-half as much as an industry under perfect competition, Cournot duopoly is two-thirds the competitive output, triopoly is three-forths, and so on. Since the demand function is assumed to be linear the following can be implied about prices and (assuming cost functions remain unchanged) profits.

Assuming a demand function of the form

$P = P_0 - q_c$ where p_0, C are constants.

Number of Parti-cipants	Proportion of competitive quantity q	Price	Price premium over competi-tive price	Average Market Share
1	½	Po-½qc	½ qc	100%
2	$^2/_3$	Po-$^2/_3$qc	$^1/_3$ qc	50%
3	$^3/_4$	Po-$^3/_4$qc	¼ qc	33%
4	$^4/_5$	Po-$^4/_5$qc	$^1/_5$qc	25%
5	$^5/_6$	Po-$^5/_6$qc	$^1/_6$qc	20%
	1	Po-qc	0	0%

It can be shown that the profit to sales ratio is proportional to the price premium, and therefore the relationship between profitability and market share for a cross-sectional study of different industries should be as shown in the last two columns of the above table. This is worth noting for the following reasons :

(i) There is a positive relationship between market share and profitability despite the fact that cost functions were assumed to be identical (i.e no economics of scale assumed).

(ii) The relationship is not linear.

For the purposes of this study, the above is by far the most important conclusion arising out of oligopoly theory. There are many other oligopoly theories which use Cournot's model as a basis but with different assumptions concerning the conjectural variations. For example :

Bertrand and Edgeworth developed various oligopoly models using price as the decision variable. Also the dominant-firm theories of Forchheimer and Von Stackelberg are relevant. In Von Stackelberg's theory, one firm is the leader and the other the follower. The follower acts exactly like a Cournot duopilist and the conjunctural variation term is zero for the follower. It assumes, correctly, that the follower always takes the leaders output to be constant, therefore assuming that $dq_l/dq_f = 0$. The leader knows that this is how the follower will behave and therefore the leader can choose his own output (which indirectly determines the follower's output) to maximise his profits. To do this the leader enters the follower's reaction function into his own profit function substituting it for the q_f term that appears there. The substitution makes the leader's profit solely a function of his own output - which can be duly maximised.

Although there are many more variations of the models discussed and many other models including

those of Chamberlain and Fellner the results produced by the models as far as market share and profitability are concerned are not markedly different from the Cournot model. The concepts relating to the construction of some of these models will be discussed further in the next section on Game Theory. Of more immediate interest to the theme of this research is the findings of the industrial organisation literature with respect to industry concentration and its relationship to profitability.

Industry concentration is a topic which lies at the heart of Industrial Organisation as a discipline and has been subjected to vigorous debate. In essence, classical economists believe that highly concentrated industries act like monopolies causing excess profits to be made in the industry and (worse) reduced output resulting in consumers being deprived of goods they would otherwise have. However, the results obtained from various empirical studies and the conclusions drawn by various authors are by no means unanimous in denouncing highly concentrated industries. There are a number of factors which contribute to the contradictory findings that have been reported. These include :

(i) There are many different ways of measuring industry concentration and frequently changing the way industry concentration is measured can completely nullify the results obtained from a particular study (see for example McGee, 1980, p328, where it is shown that Bain's work on concentration can be completely nullified by taking different measures of

concentration).

(ii) There is no agreement between the various researchers concerning base hypotheses, models, included explanatory variables or research methodology. This leads to research findings being highly specialised and makes comparisons of studies impossible.

(iii) There is also, of course, the real point at issue viz. are industries concentrated because larger firms are more efficient and therefore earn higher profits while at the same time discouraging new entry, or, are concentrated industries responsible for increasing prices and applying monopoly power? This is the issue of really major theoretic and practical importance which lies at the core of Industrial Organisation.

In addressing this issue, McGee (1988, pp304-310) identifies four hypothetical cases and constructs models to examine the hypotheses in detail. These are:

1. Oligopoly lowers cost without affecting price. Under these conditions McGee clearly shows that the oligopoly makes excess profits which precisely measure the value of resources saved through the greater efficiency of the oligopoly. Under these conditions producers are better off and consumers equally well off.

2. Oligopoly lowers cost and price. Under these

conditions both consumers and producers are better off due to the improved efficiency of the oligopoly over pure competition. Obviously these oligopolies are beneficial to the economy as a whole.

3. Oligopoly lowers costs, raises prices. This is the so-called "mixed trade-off case" which is supported by Cournot's theory. Under these conditions the producer is better off but the consumers less well off than would be the case under pure competition. If welfare is measured as the sum of consumer and producer surplus then (according to McGee, 1988, p307) it would not be surprising if a Cournot oligopoly turned out to be allocatively superior to pure competition.

4. Oligopoly price higher, costs the same. This is the most common and influential case of all trade-off cases and the ones quoted in text books. In this case, atomistic competition and oligopoly have identical costs and offer the same product, yet oligopoly price is raised above the competitive price. Thus the excess profit earned by the oligopoly is at the direct expense of the consumers. There is also an amount of reduced production which is lost to consumers but not translated into excess profits for the oligopoly. However, McGee points out, that unless entry is closed by law it is not obvious that this case is of any practical importance.

The above represent four possible options as to how oligopolies (or highly concentrated industries)

could influence the market. There is much debate in the literature about which is the most commonly occurring case with two strong schools of thought emerging - those who believe case 1 or 2 occur most often and those who believe case 3 or 4 occur most often.

The core of the debate centres around the efficiency differences between firms and especially whether larger firms are more efficient than smaller firms i.e whether economics of scale are significant.

In the early 70s most economists were of the view that "concentration" breeds monopoly performance" which is called the "structuralist" point of view. In 1974, Professor Leonard Weiss, a structuralist, reviewed in detail 81 published statistical studies about how structure and performance are related. With few exceptions a positive, statistically significant relationship between concentration and profitability was claimed. More decisively, Weiss (1989) examined the effect of industry concentration on **price**. Weiss' data is impressive and covers markets separated by location within the USA (cement, airlines, banking services, retailing), by time (auctions), or by the price of inputs (labour, beef). As Weiss points out, although the studies are "somewhat specialised, we feel that the effect of all these studies taken together is greater than their simple sum"

(Weiss, 1989, p1).

Weiss reviews 121 data sets and finds a significant positive effect of concentration on price in 62,8% of the data sets compared to only 3,3% of the data sets showing a significant negative effect (the rest

were insignificant - see figure 2.10 for details).

Industry or study	Number of data sets	Number of Data Sets with: Significant positive effects	Non-significant positive effects	Non-significant negative effects	Significant negative effects
Cement	7	5			2
Change in concentration	3	2	1		
Auctions	6	6			
Unions	2	2			
Change in CR Germany (prices)	1		1		
EEC (margins)	5[a]	3[a]	1[a]	1[a]	
Advertising space and time	7	2	2	2	1
Airlines	9	9			
Gas stations	26	20	5	1	
Supermarkets	2	2			
Rail freight rates	3	3			
Banking	49	21	20	7	1
Beef purchases	1[b]	1[b]			
Total	121	76	30	11	4
Percentage of total		62.8	24.7	9.1	3.3

a. Change in price-cost margin dependent.
b. Buying price so negative coefficient expected and found.

Fig 2.10 Effect of Industry Contraction on Price
(Source : Weiss, 1989, p267)

In his theoretical argument Weiss reviews the work done by Bradly and Gale (1982) in which the effect of concentration disappeared when market share was introduced and found it :

> "Less convincing than it might have been because they used only concentration and market share in their analysis"
>
> (Weiss, 1989, p8)

Incredibly, Weiss does not include market share as an explanatory variable in any of the studies reported on, and, once again, there is no commonality of method or models between any of the studies - thus making comparisons difficult. Despite these shortfalls Weiss' work does point to a positive correlation between price and concentration.

Shepherd (1983) examined monopoly profits with the express purpose of evaluating the significance of economies of scale, as opposed to market power. Shepherd accepted the existence of a correlation between market share and profitability and quotes his earlier study as the source (Shepherd, 1972). The difference between the cost of capital (assumed to be independent of market share and the actual profit is ascribed by Shepherd to "monopoly power" (see fig 2.11).

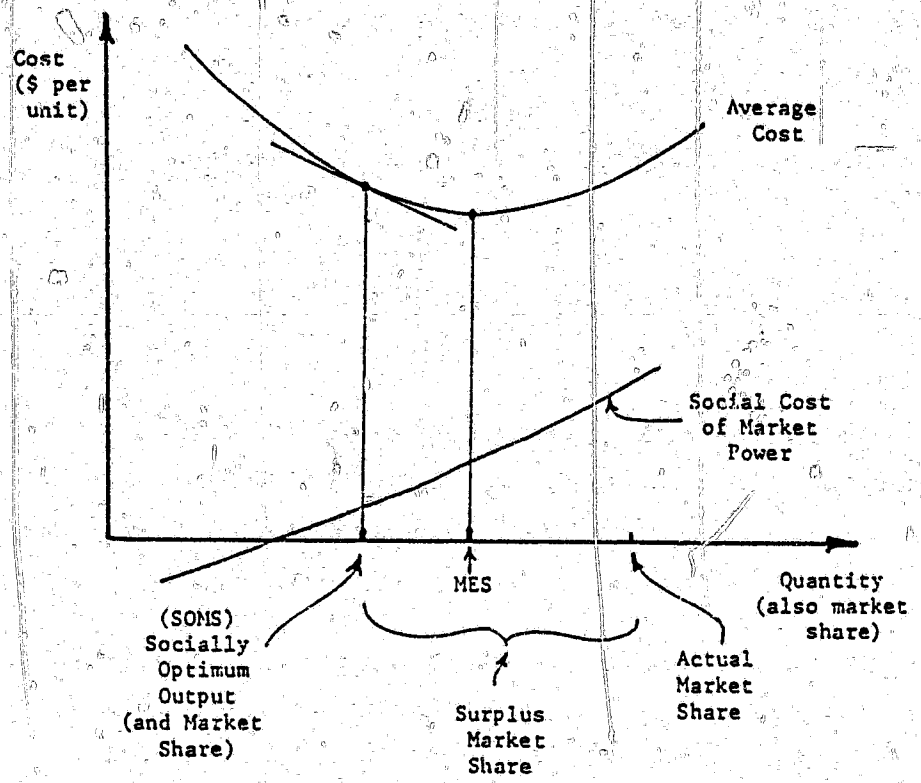

Fig 2.11 Relationship between Market Share and Rate of Return
(Source Shepherd, 1983, p171)

(Source : Shepherd, 1983, p171)

Shepherd's data covered large U.S industrial firms during 1960-1969 and the following methodology was used:

1. Firms with market shares of over 20% were identified.

2. Deviations in relative cross-efficencies and innovativeness were estimated.

3. Measures for actual scale economies were applied.

4. Cost effects of scale economies were isolated, and,

5. Economies of scale compared to other profit sources.

A total of 85 firms were analized and the conclusion reached is that :

"Economy of scale provided little efficiency basis for market shares above 20%, in a variety of U.S industrial markets in the 1960s".

(Shepherd, 1983, p196)

On the other hand, based on an in-depth study of 25 manufacturing industries in the UK, Pratten (1971, p313) finds that there are "important economies of scale in many industries". This view is supported by McGee, who, after reviewing the empirical evidence, comes to the conclusion that:

> "concentrated industries tend to be more profitable partly because firms with larger shares have lower costs, and partly because, for one reason or another, their prices have remained above **their own** costs - at least for a while"
>
> (McGee, 1988, p341)

McGee argues that within competitive industries and cartels alike, more efficient firms can be expected to become larger and more profitable. Unless they are more efficient, dominant firms or cartels of larger firms should have **lower** profit rates than smaller, outside firms that compete against them. Neither collusion nor conclusive oligopoly should be

expected to make larger firms more profitable than smaller firms, unless they are more efficient. McGee believes that economists have been slow in accepting efficiency as an explanatory factor and points out.

> "It may seem strange that Industrial Organisation so long ignored superior efficiency as a possible explanation of differences in profitability : the competition, cartel, dominant - firm, and Cournot models - all of the price models in fact - predict that lower cost firms will have larger market shares and higher profits"
>
> (McGee, 1988, p334)

In other words McGee suggests that the causality works the other way around. Low cost causes increased profitability which results in increased investment and therefore growth in market share. Where there are economies of scale present this process would obviously be accelerated and multiplied.

Clearly some economists (e.g Weiss) have not taken McGee's view regarding differences in efficiency and economies of scale and the controversy continues. For the purpose of this research it is worth noting that despite more than 50 years of debate and empirical study the two schools of thought continue and the issue remains unsettled.