

**An Examination of Marketing Effort and
Differential Advantage as Two models of Market
Share Determination in the Australian New
Passenger Car Market, 1983 to 1993.**

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**Submitted for the Degree of
Master of Business in Marketing.**

**University of Technology, Sydney.
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CERTIFICATE

I certify that this thesis has not already been submitted for any degree and is not being submitted as part of candidature for any other degree.

I also certify that the thesis has been written by me, and that any help that I have received in preparing this thesis, and all sources used have been acknowledged in this thesis.

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Errata.

An Examination of Marketing Effort and Differential Advantage as Two Models of Market Share Determination in the Australian New Passenger Car Market, 1983 to 1993.

By Joseph Brian Jonmundsson.

Page 3: Equation 1.1 should read: $S_i = M_i / \sum_{j=1}^n M_j$

Page 3: Naert and Weverberg should read Naert and Weverbergh.

Page 3: Gosh should read Ghosh.

Page 4: (ii) The sum of market shares must be unity.

Page 5: Equation 1.2 should read: $DA_i = (M_i / \sum_{J=1}^n M_j) - m1$.

Page 34: Weighted Average Market Share in Figure 3.3 is used to represent share of marketing effort.

Page 43: Equation 4.1 may be more easily read as: $x'^B / (x'^B + (1 - x')^B) - m1$,
where:

x' = the firm's share of marketing investments in particular marketing variables,
and
 $m1$ = concurrent market share.

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Abstract.

This thesis examines the concept of differential advantage and its relevance to the formulation of marketing strategy. It compares the model of market share determination, based on the possession of differential advantages in marketing mix variables, with one based on the concept of marketing effort. The two models are examined using data on new passenger car registrations collected from Idaps and Paxus¹ respectively, media spend from Bruce Tart and Associates, and later AIM Data², car dealerships from the Telecom Yellow Pages, and car models and new passenger car prices from Wheels Magazine, for the period 1983 to 1993. The above data was corroborated, where possible, by means of authoritative sources in the motor car industry in Australia.

The theory of market share determination, based on share of marketing effort is an attractive one. This thesis finds that the relationship between market share³ and share of marketing effort is positive, consistent and statistically significant. It confirms the place of marketing effort as a model of market share determination in the marketing literature.

Differential advantage is an index of competitive activity that is calculated by subtracting concurrent market share from share of marketing effort. The proposition, advanced by Cook and Rothberg (1990), is that increasing amounts of differential advantage are positively related to increasing levels of market share. This thesis does not support this proposition. At an overall level of analysis, the relationship between market share and differential advantage is a negative one. Only when a subset analysis is done, for small car makers, is there a weak but statistically significant and positive relationship between market share and differential advantage.

The overall negative relationship between market share and differential advantage may be explained in part by the economic uncertainty of a boom and economic recession during the period under consideration in this thesis. A further possible explanation is that the data may not have captured fully the relationship between market share and differential advantage. The data examined the relationship between market share and differential advantage with only four independent variables. A larger number of independent variables, or different ones, may have described the relationship more effectively. Such data was not available. A more fundamental conclusion that is supported by this thesis is that successful competitive strategy simply does not require share of marketing investments to be greater than concurrent market share. The place of differential advantage in the formulation of marketing strategy is questioned.

This thesis supports the value of competitive marketing effort in the formulation of marketing strategy.

¹ Idaps and Paxus are organisations that collected data on car registrations in Australia.

² AIM Data stands for Australian Independent Media Data.

³ Market share in this thesis refers to unit market share.

Chapter 1

1.0 WHY DIFFERENTIAL ADVANTAGE?

1.1 STATEMENT OF THE PROBLEM.

The problem that this thesis aims to resolve is whether or not strategy based on the possession of differential advantage leads to superior results as measured in terms of market share.

1.2 THE BACKGROUND TO STRATEGY BASED ON DIFFERENTIAL ADVANTAGE.

The words...

“Differential marketing advantages are the keys to success” (Cook 1983).

.....sparked this thesis into life.

A concept as clear and as concise as the above statement implies is one that is definitely worth the time and the effort to explore.

However, the promise of being a solution to all the problems encountered in the formulation of marketing strategy turns out to be not a clear-cut case. This contradiction will be explored in this thesis.

The background to the place of differential advantage, as a model of strategy making, is the beguilingly innocent word ‘Strategy’ (Pascale, 1984). Strategy making is a complex, on-going, iterative process of adaptation that occurs in an environment of constant change (Quinn 1991). This reality requires marketers to develop special capabilities in being able to assess and understand the implications of changes in the environment. The

capabilities that are required to understand the implications of change are also needed to address the issues involved in survival and growth.

The issues of survival and growth center around the concept of competitive advantage, that is the ability of a firm to offer superior value to its customers (Porter 1985, Day and Wensley 1988, Day 1990). Since this value has a competitive focus, the capability that marketing practitioners must possess is that of being able to beat the competition by finding ways of sustaining the competitive advantage of the business. Competitive advantage means nothing unless it is clearly articulated and presented in an effective way to the right audience. This involves the development of capabilities in understanding the association between marketing effort and outcomes (Day and Wensley 1988).

The issue of the quantity and quality of the marketing effort needed to propel a strategy towards success is a central one. No matter how good a product or service is, it seldom sells itself (Buzzel, Gale and Sultan 1975). Marketing effort is needed to bring the product or service to the attention of the appropriate consumers. The exploitation of competitive advantage requires the investment of considerable effort in making consumers aware of the benefits of a product relative to those of the competition. This involves selecting elements of the marketing mix in which to invest, and identifying what attributes best represent the benefits being sought by the consumer.

Models that address the issue of marketing effort are broadly known as market response models (Lillian, Kotler and Moorthy 1992). Two types of models are studied and contrasted in this thesis, one addressing relative marketing effort and the other differential advantage.

1.3 THE MARKETING EFFORT MODEL.

Marketing models that study the relationship between market share and marketing effort take the following form:

$$S_i = M_i / \sum M_j, \dots \dots \dots \text{(Equation 1.1)}$$

where,

S_i = Company i's estimated (unit) market share, and,

M_i = Company i's marketing effort.

M_j = The marketing effort of all companies.

Marketing effort is defined as the share of competitive investments by the company in marketing mix variables.

The relationship between market share and marketing effort has a considerable amount of empirical support:

Naert and Weverberg (1981) confirmed the relationship between market share and distribution intensity in the examining seven brands in the gasoline market.

Brodie and deKluyver (1984) in their study of the chocolate biscuit, toothpaste and liquid detergent markets also confirmed the relationship between market share and relative price, distribution intensity and share of advertising.

Gosh, Scott and Shoemaker (1984), applied the model to a study that further confirmed the relationship between market share and advertising, price, distribution, and lagged market share in the cold cereal market.

Leeflang and Reuyl (1984) in their study supported the relationship between market share and share of advertising and lagged market share in the German cigarette market.

Marketing effort models expressed in the form in Equation 1.1 above satisfy the requirement of logical consistency (Naert and Bultez 1973) in the estimation of market share for the following reasons:

- (i) The estimated market shares are non-negative.
- (ii) The sum of the estimated market shares are greater than zero, and less than or equal to one.

Theoretical support for logical consistency in the formulation of marketing models is strong.

“...We do not believe that predictive accuracy is the only important criterion for judging the value of a model. We would rather find the answer in the construct validity (ie. intrinsic meaningfulness) of these models” (Cooper and Nakanishi 1988, page 31).

This view is also shared by Lillien, Kotler and Moorthy:

“...On balance, we support Cooper and Nakanishi on the use of attraction models¹” (Lillien, Kotler and Morthy, 1992, page 672).

1.4 THE DIFFERENTIAL ADVANTAGE MODEL

Differential advantage is a modification of the basic marketing effort model, as shown on the following page:

¹ Marketing Effort Models, and Market Share Attraction Models are synonymous (Cooper and Nakanishi 1988, p.25).

$$DA_i = (M_i / \sum M_j) - m_1, \dots \dots \dots \text{(Equation 1.2)}$$

where,

DA_i = Company i's differential advantage.

S_i = Company i's estimated (unit) market share, and,

M_i = Company i's marketing effort,

M_j = The marketing effort of all companies, and

m_1 = Company i's current unit market share.

The differential advantage is obtained by subtracting the concurrent level of market share (m_1) from share of marketing effort ($M_i / \sum M_j$). The difference gives rise to an index called differential advantage.

The proposition that is made, with respect to differential advantage, is as follows (Cook 1983):

Where differential advantage is '+', market share will increase.

Where differential advantage is '0' market share will be maintained.

Where differential advantage is '-' market share will decline.

It is contended that increased share of marketing effort relative to current market share will, according to the Cook's hypothesis (*ibid* 1983) lead to an increase in market share via an increase in differential advantage **"...regardless of the response function"** (*ibid* 1983, p.73).

The concept of differential advantage is by no means well established or accepted (Chattopadhyay, Nedugadi and Chakravarti, 1985, Parasuraman and Varadarajan, 1985, Chakravarti, 1993). It is the aim of this thesis to attempt to resolve some areas of the debate. These areas will be considered fully in Chapter 4.

The exploration of differential advantage in the formulation of strategy will follow the steps outlined in the structure of this thesis, as shown next.

1.5 THE STRUCTURE OF THIS THESIS.

Chapter 2 compares and contrasts differential advantage with competitive advantage. This is done in order to resolve the issue of terminology. The two concepts are sometimes used interchangeably (*op cit* 1983). It is the purpose of Chapter 2 to demonstrate that the concepts are quite distinct and separate, and should not be regarded as being synonymous.

Chapter 3 addresses the importance of market share in determining the success or failure of competitive strategy. This chapter also examines the role of market share in the formulation of competitive strategy. The purpose of this chapter is to set a context within which the two models of market share determination - namely marketing effort and differential advantage - are examined.

Chapter 4 examines the origins and the applications of differential advantage to the analysis and formulation of strategy, and the criticisms directed at the concept.

Chapter 5 examines the data collected for the new passenger car market in Australia for the period 1983 to July 1993. This data looks at new passenger car registrations over the period, the amount invested in the media, the number of car models and dealerships. Details of prices for each car model were also collected, and these are included in the analyses in Chapters 6 and 7.

Chapter 6 examines the relationship between market share and share of marketing investment in media, car models, dealerships and price².

Chapter 7 analyses the relationship between market share and differential advantages in media, models, dealerships and price.

² The measure of price that is used in this thesis is Price Adjusted Brand Equity as defined by Cook and Rothberg (1990). This measure will be explained fully in the body of this thesis.

Chapter 8 summarises the main findings of this thesis. In particular, Chapter 8 aims to answer the question as to whether or not the possession by a firm of differential advantages in marketing variables is associated with competitive success. Chapter 8 also reviews the contradictions exposed in this thesis compared with the original work (*op cit* 1990). It also suggests areas for further research.

The analyses in this thesis will examine the relationship between market share and marketing effort, on the one hand, and market share and differential advantage, on the other, using both linear and categorical measures of the relationships. This is in contrast with the original work (*op cit* 1990) where arguments in favour of differential advantage in the formulation of marketing strategy were made on the basis of the analysis of categorical data only.

Chapter 2

2.0 COMPETITIVE ADVANTAGE v DIFFERENTIAL ADVANTAGE.

2.1 INTRODUCTION.

The terms competitive advantage and differential advantage have been used interchangeably (Cook 1983, p.74) when in fact they are distinct and separate concepts. The aim of this chapter is to clarify the terminology, and to make clear the distinction between the two concepts.

The first part of this chapter examines the concept of competitive advantage. The second part of this chapter examines the concept of differential advantage. The difference between the two concepts is then summarised.

2.2 COMPETITIVE ADVANTAGE.

Competitive advantage is essential to the formulation of successful strategy:

“...What business strategy is about - what distinguishes it from all the other kinds of business planning is the word competitive advantage. Without competitors there would be no need for strategy, for the sole purpose of strategic planning is to enable a company to gain, as efficiently as possible, a sustainable edge over its competitors” (Ohmae 1982, p.36).

The focus of competitive advantage is on the value that an organisation is able to create for its customers (Porter 1985). As will be seen in the following pages of this chapter, competitive advantage is a complex concept determined by how well a firm offers its product or services relative to the offer by its competitors, and by how customers evaluate the product or the service, again relative to that of the competition (Day and Wensley 1988).

The concept of competitive advantage is also concerned with the process of delivering value to the firm's buyers. This involves examining all aspects of the firm's value generating activities in order to ensure that the offer matches the determinants of a successful competitive strategy, namely that of differentiation or the provision of lowest cost (Porter, 1985).

The route to competitive advantage follows two well defined approaches:

1. The first looks to the sources of advantage, how they are presented to customers, and how they are evaluated (Day and Wensley, 1988).
2. The second examines the way in which value is delivered to customers through the firm's value chain (Porter, 1985).

The two approaches are discussed below.

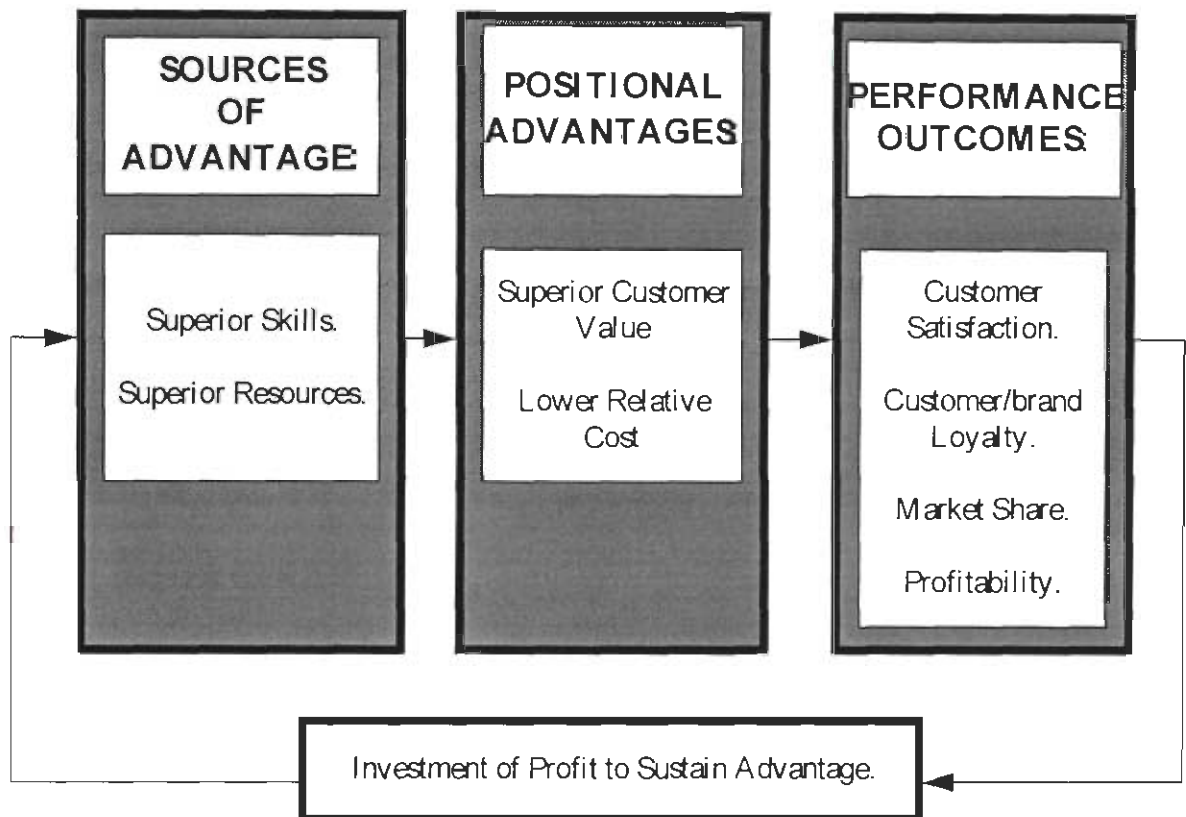
2.2.1 Sources, Positions, and Outcomes Model of Competitive Advantage.

There is no, as yet, agreed definition of the term competitive advantage:

“...There is no common meaning for ‘competitive advantage’ in practice or in the marketing strategy literature. Sometimes the term is used interchangeably with ‘distinctive competence’ to mean relative superiority in skills and resources. Another widespread meaning refers to what we observe in the market - positional superiority, based on the provision of superior customer value or the achievement of lower relative costs, and the resulting market share and profitability performance” (Day and Wensley 1988, p.2).

An integrated and comprehensive concept of competitive advantage, was proposed by Day and Wensley in 1988 and is shown in the Figure 2.1 below:

Figure 2.1 The Components of Competitive Advantage.

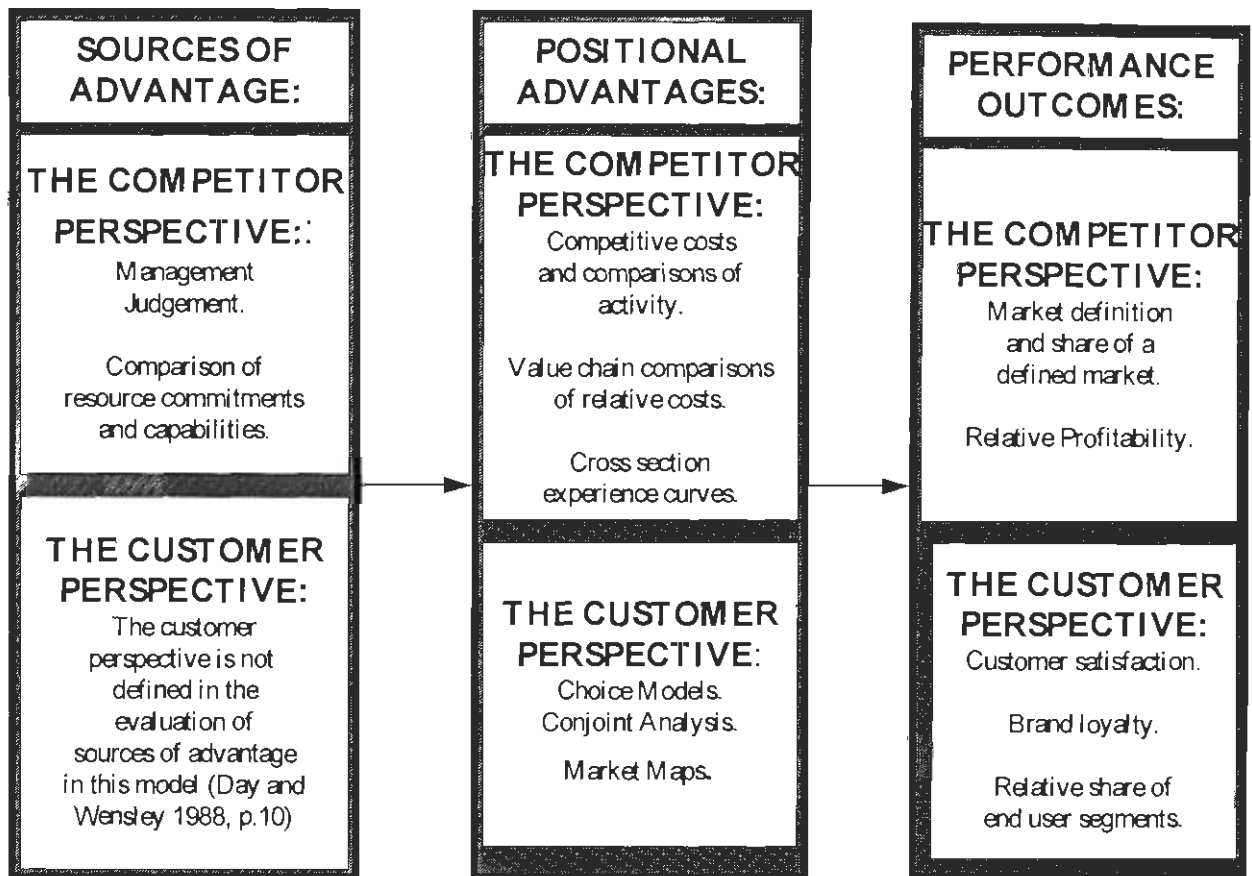


Source: George S. Day and Robin Wensley, "Assessing Advantage: A Framework for Diagnosing Competitive Superiority", Journal of Marketing, Vol 52 (April 1988) pages 1 to 20.

The elements in Figure 2.1 above are linked from performance outcomes to sources of advantage through the investment of profit. Superior profit allows the firm to continually upgrade its sources of competitive advantage, either in the form of access to resources or through sharpening its array of skills (*ibid* 1988).

The process by which competitive advantage is evaluated is shown in Figure 2.2 on page 11 below:

Figure 2.2 The Evaluation of Competitive Advantage.



Source: Adapted from George S. Day and Robin Wensley, Assessing Advantage: A Framework for Diagnosing Competitive Superiority, Journal of Marketing, Vol 52 (April 1988) pages 1 to 20.

Sources of advantage are evaluated internally, by management (judgement), and by comparing competitors resource allocations and commitments...

“...Superior resources are more tangible requirements for advantage that enable a firm to exercise its capabilities” (Day and Wensley 1988, p.10).

The tangibility of competitor’s investments in resources provides a basis for objective analysis:

“...Management is able to analyse these tangible commitments in terms of share of marketing effort and strategic investments” (ibid, p.10).

The analysis of skills focuses on...

“...the most distinctive encapsulation of the organisation’s way of doing business” (Peters 1984 quoted in Day and Wensley 1988, p.10).

The customer is missing, in terms of the evaluation of this part of the process...

“...None of the available literature, however, identifies a customer orientation or focus on customer satisfaction as an overriding theme in guiding and audit, or offers guidance on how to identify this package of skills” (*op cit* 1988).

Positional advantages (ie. differentiation or lowest delivered cost) are evaluated using both perspectives. Competitors costs are carefully monitored and measured by management. How value is delivered to the customer is carefully assessed by an examination of competitors’ value chains. Economies of scale and experience are also evaluated to measure the sustainability of the cost position taken by the competitor.

Customer’s reactions to positional advantages are measured through the use of choice models, conjoint analysis, and various market mapping approaches (Lilien, Kotler, Morthy 1992).

Performance outcomes are to do with the attainment of objectives as measured in terms of market share or profitability, and are internal to the firm. By contrast, evaluation of performance outcomes from the customer perspective, is achieved by the measurement of customer satisfaction, brand loyalty and share of product-use markets (Day, Schocker, Srivastava 1979).

Marketeers like to establish a direct link between sources and outcomes (*op cit* 1988). This link relies on the notion that relative effort, measured in terms of the skills used and/or the deployment of resources relative to the competition, corresponds to competitive advantage (*ibid* 1988). However, the notion of positional advantages plays a crucial role in translating the way in which a firm uses its skills and deploys its resources to achieve competitive advantage via the two arms of strategy, namely lowest cost or differentiation. The omission of positional advantages, makes the sources and

outcomes re-definition of competitive advantage a simple input - output model of strategy formulation.

The importance of positional advantages in the model of competitive advantage, advanced by Day and Wensley (1988), is emphasised by examining how the concept of the value chain (Porter 1985) provides another view of the link between sources and outcomes.

2.2.2 The Value Chain Model of Competitive Advantage.

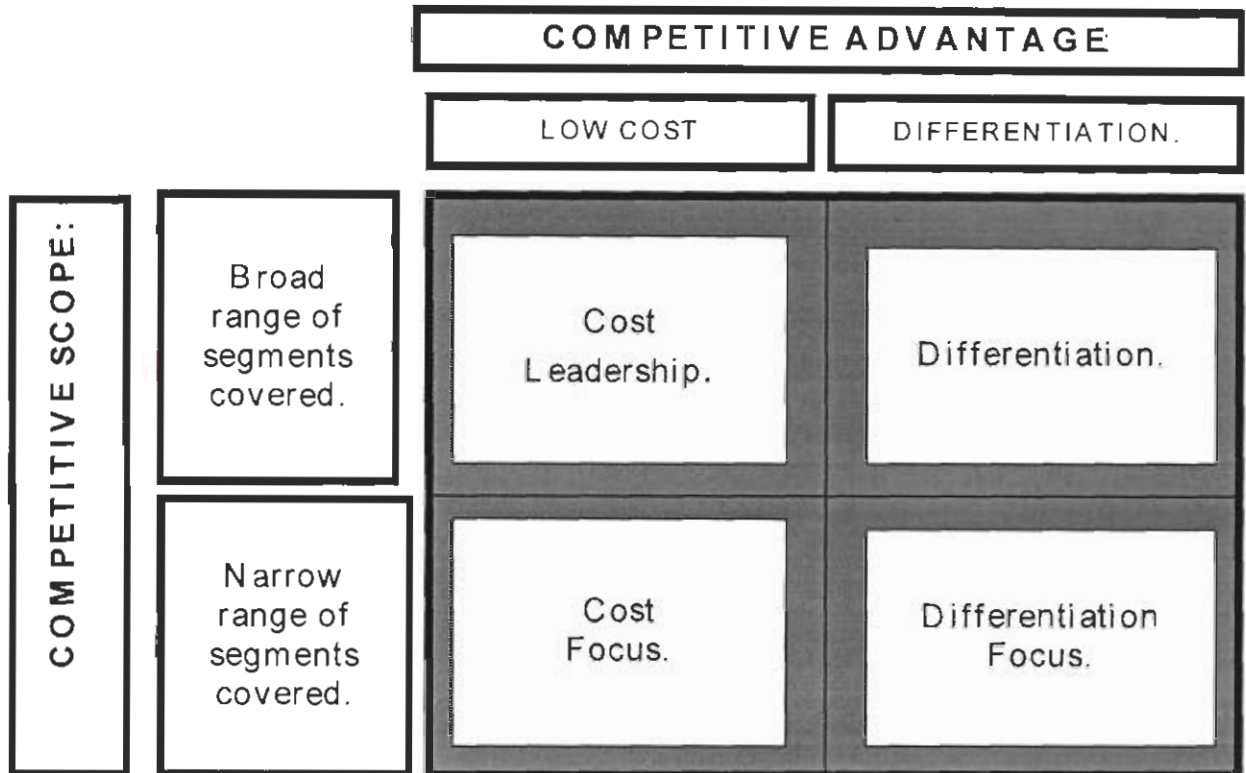
Porter's description of competitive advantage is that of creating value for the customer through lowest cost or differentiation, as mentioned previously. The path to the creation of value, as proposed by Porter, is a detailed one:

“...Value is what buyers are willing to pay, and superior value stems from offering lower prices than competitors for equivalent benefits or providing unique benefits that more than offset a higher price. There are two basic types of competitive advantage: cost leadership and differentiation” (Porter 1985, p.3).

Value for the buyer is specifically created through a firm's value chain in which value creating activities are examined from the point of view of their impact on the two basic determinants of competitive advantage¹, namely lowest cost or differentiation. The two determinants, combined with the selection of a broad or narrow scope of activities, defines a matrix of generic strategies by which competitive advantage is achieved, as shown in Figure 2.3 on page 14 below:

¹ It is recognised that a firm's value chain is part of a larger value system, involving suppliers, channels, and the buyer's value chain. The emphasis in this chapter focuses on a firm's own value creating activities in the context of defining competitive advantage.

Figure 2.3 Illustration of Generic Strategies Emerging From the Combination of Competitive Advantage and Competitive Scope.



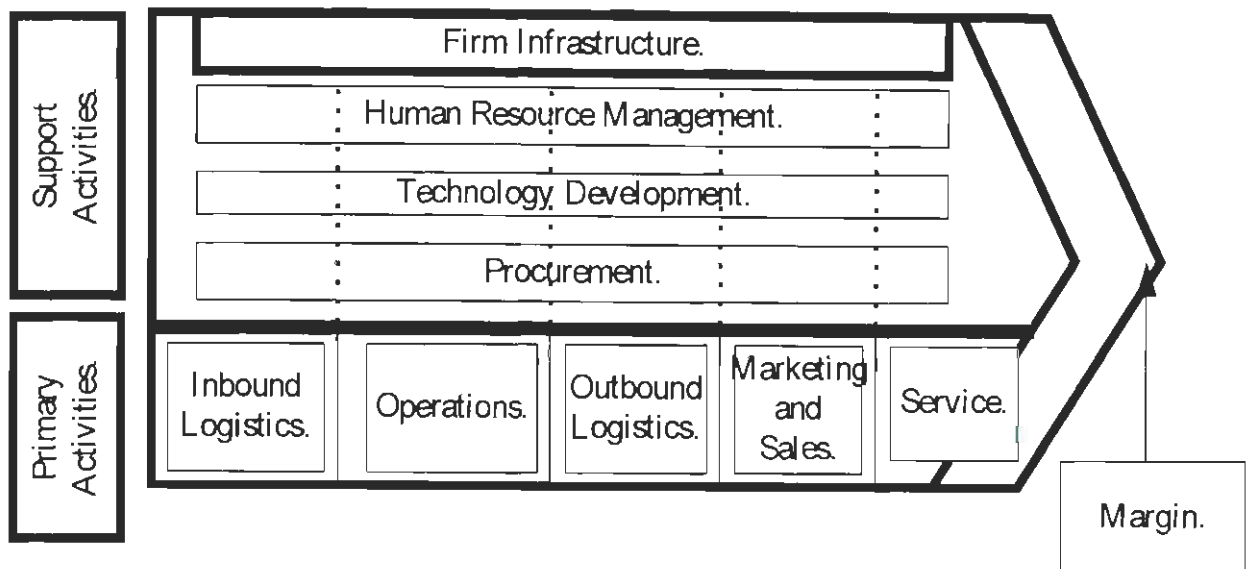
Source: Michael E. Porter, *Competitive Advantage, Creating and Sustaining Superior Performance*, 1985.

The implication of Figure 2.3 above is that the firm which pursues a strategy of being the lowest cost producer will develop distinctive skills in those activities which help to achieve this strategic position. Alternatively a firm that decides to pursue a strategic position of offering differentiated products or services will develop particular skills which achieve this objective (*ibid* 1985). The activities that do not position the firm on either dimension (of lowest cost or differentiation) fail to meet the definition of competitive advantage:

“...Being ‘all things to all people’ is a recipe for strategic mediocrity and below average performance, because it often means that a firm has no competitive advantage at all” (*ibid*, p.12).

A description of the value chain is shown in the Figure 2.4 on page 15 below:

Figure 2.4 The Firm's Value Chain.



Source: Michael E. Porter, *Competitive Advantage, Creating and Sustaining Superior Performance*, 1985.

In Figure 2.4 above, the firm's value chain is made up of three elements:

- (1) primary activities,
- (2) support activities,
- (3) the margin.

1. Primary activities are those that are involved with competition, and affect the communication and delivery of goods and services to customers in terms of their perception of value, being either lowest cost, or differentiation (*ibid* 1985, p.39).
2. Support activities provide the technological and human resource inputs to the primary activities, and can be seen from the diagram as operating across those activities, but also as being specific to any one activity. Thus marketing for example, would have its own stake in support activities providing people, technology to the function, and the procurement of means and materials. Infrastructure provides those generic activities that operate across and through the firm, such as general management, accounting, dealings with government (*ibid* 1985, p.40).

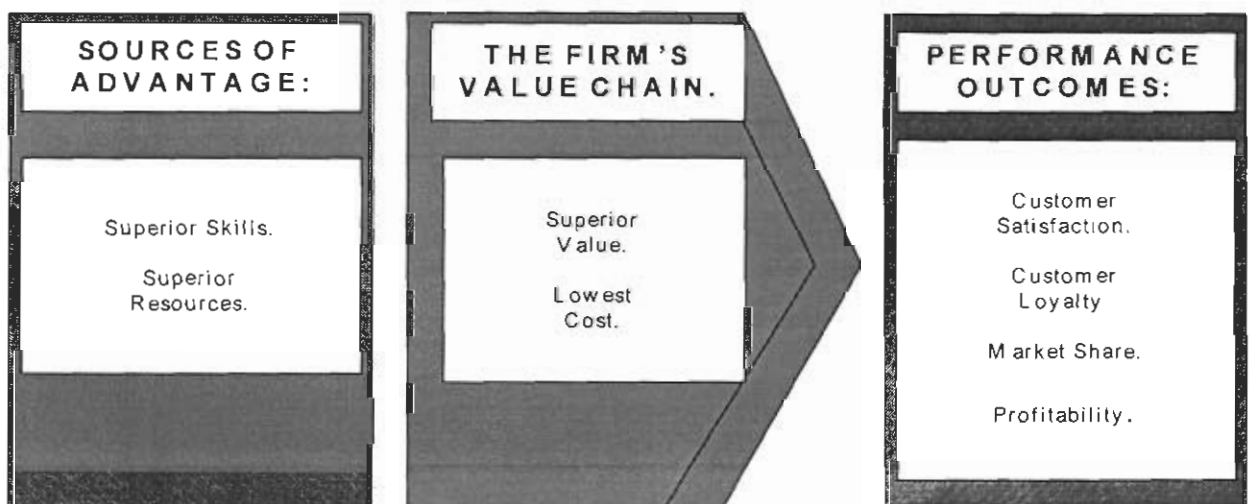
3. The margin is the difference between the value which is delivered to the customer and the cost of delivering that value (*ibid* 1985, p.38).

The value chain also provides a framework for competitor analysis. It can be used to probe the drivers of cost or differentiation, and to examine the relative weakness and strengths, of current and future competitors, on the two dimensions.

2.2.3 Putting The Two Concepts Together.

Porter's description of the value chain provides a more detailed explanation of the link between sources and outcomes of competitive advantage. The value chain takes the superior skills and resources described by Day and Wensley (1988) and shows how these are mediated through the value creating activities to define the two arms of generic strategy. The Figure 2.5 below demonstrates how the concept of the value chain is able to stand in place of the positional advantages that are part of Day and Wensley's model (*ibid* 1988).

Figure 2.5 Combining The Value Chain with the Model of Competitive Advantage.



Source: Adapted from George S. Day and Robin Wensley, "Assessing Advantage: A Framework for Diagnosing Competitive Superiority", *Journal of Marketing*, Vol 52 (April 1988) pages 1 to 20, and Michael E. Porter, "Competitive Advantage, Creating and Sustaining Superior Performance", 1985.

In the Figure 2.5 above, it can be seen that positional advantages can be translated into performance outcomes by using Porter's (*op cit* 1985) notion of the firm's value chain.

2.3 DIFFERENTIAL ADVANTAGE.

Differential advantage is an index which arises out of the difference between the share of investments in marketing effort and concurrent market share. Differential advantage, as a model of market share determination, has been described in Chapter 1 together with the central assumption that it operates regardless of the shape of the response function.

The idea of differential advantage is a simple one to apply and easy to interpret.

Access to differential advantage is via the exploitation of superior resources, or the more skilful use of those resources, although the literature to date has only looked at the relative quantum of resources rather than at their quality. Differential advantage provides for a normative decision rule; invest this much (relative to the competition, and in relation to the concurrent level of unit market share) and get so much in return. The model omits the intermediate stage which defines positions of advantage. Differential advantage simply links a modified model of marketing effort to market share and as such is a simple input - output model of market share determination.

2.4 SUMMARY.

Competitive advantage, as described by Day and Wensley (1988) and Porter (1985) is a comprehensive model which describes the way in which skills and resources are translated into positions of advantage, namely lowest cost or differentiation, and satisfactory outcomes, measured in terms of market share, profitability, and customer satisfaction

Differential advantage is an index that arises out of the difference between the firm's share of resources and concurrent market share. The proposition that has been advanced by Cook (1983) and Cook and Rothberg (1990) is that there is a positive relationship between this index and market share under all circumstances.

Differential advantage is a simple input - output model of market share determination. It is not concerned with the positional aspects of the model of competitive advantage articulated by Porter (1985) and incorporated into a comprehensive set of relationships by Day and Wensley (1988).

Competitive advantage and differential advantage are, conceptually, different models of market share determination.

Chapter 3 .

3.0 THE IMPORTANCE OF MARKET SHARE IN COMPETITIVE STRATEGY.

3.1 INTRODUCTION.

The importance of market share is very much at the centre of this thesis. There are a number of persuasive reasons for studying and understanding the place of market share. This chapter will examine the importance of market share both as an object of strategy and in the role that it plays in the formulation of marketing strategy:

1. Market share is a determinant of the success or failure of competitive strategy.
2. Market share is linked to the profitability of the firm. High market share is usually associated with high levels of profitability.
3. High and low levels of market share provide insights into the attributes of successful and less successful strategies.
4. Each point of market share has an economic value, and defines the attraction of the market for competitors.
5. There is an association in theory between market share and relative marketing effort This concept has been introduced in Chapter 1; it will be covered more fully in Chapter 6 of this thesis.

This chapter will look at each of the above points in turn.

3.2 MARKET SHARE AS A MEASURE OF COMPETITIVE SUCCESS OR FAILURE OF STRATEGY.

The achievement or non achievement of a market share objective is clearly seen as either a success or a failure of strategy:

**“...Market share forecast: 8.1%. Actual result: 7.6%. Verdict: Failure”
(Bonoma 1989, p.5).**

A market share forecast is a complex mixture of management expectations, often driven by the requirements and pressures of the bottom line (*ibid* 1989) The conventional way around the problem of expectations is to ‘sandbag’ the forecast; hold something in reserve:

**“...Promise little, gain much: success. Promise much but gain little: failure”
(Bonoma 1985, p.194)**

The establishment of a realistic marketing objective, as measured by market share, requires specific attention to the management of expectations:

“...The bane of the marketing manager is the senior manager who constantly thinks you expectations are low and stretches you for more, not on the basis of analysis or even hard thought, but out of habit or hubris. With this type of person, you have only one line of defence: terrifically sound analysis and homework in your planning and the justification of every assumptions and scenario you draw” (Bonoma 1989, p.6)

Whether or not driven by internal company political and economic pressures, once established, the success or failure to achieve an 'agreed' market share objective becomes the determinant of the success or the failure of strategy, and clearly this has implications for the particular, responsible manager in the firm.

The success or failure of strategy is clearly linked to the achievement or non-achievement of market share. The outcome has paradoxical consequences. The failure to meet market share expectations, by even a small margin, may lead to the abandonment of a product. A product that does well when compared against a low level of expectation may become a star, at least until its true potential is realised.

3.3 MARKET SHARE AND PROFITABILITY.

In a study using the PIMS database Schoeffler, Buzzell, Heany, (1974), identified a number of important relationships between market share and ROI.

Companies with high market share and superior product quality (a competitive advantage) achieved the highest ROI. Companies with superior products spend the highest amount on marketing relative to sales and achieve the highest ROI. No amount of effort would make an inferior product into a profitable one (*Ibid*, 1974). Similarly, companies with high market shares were also those that were best able to invest in R&D, achieving the greatest return, as measured in terms of ROI. The message is that large market share companies are better able to invest profit to upgrade and improve their products, thereby pursuing a strategy of renewing their competitive advantage.

An attraction of market share as an objective is that of the correlation that exists between market share and ROI (Buzzell, Gale, Sultan 1975). A high market share is usually associated with a high ROI. The suggestion from the PIMS study is that a difference of 10 percentage points of market share is associated with an approximate difference of 5 percentage points of ROI (*op cit*, 1974).

In the PIMS data base (*op cit* 1975), three reasons for the profitability associated with market share are given as follows:

1. **Economies of Scale.** Economies of scale are clearly contingent on gaining market share; large businesses simply become more efficient, and are able to operate at lower cost. This observation also involves the recognition of the reality of the learning curve operating to make the business more efficient.
2. **Market Power.** Large market share firms are able to bargain more strongly with their suppliers and thereby lower the costs of their inputs. There is also the suggestion that they are better able to achieve higher prices because of access to larger and superior resources to fund their marketing campaigns and branding programmes.
3. **Quality of Management.** It has been suggested that the correlation between market share and ROI reflects the joint outcomes of effective management (Jacobson and Aaker 1985). This results from the fact that effective management pays attention to the determinants of market share and ROI by generating successful marketing strategies, by confirming the link between programmes and profitability, by tracking, anticipating and pre-empting competitors, and by paying close attention to costs.

Market leadership, on its own, is not a necessary and sufficient condition for superior profitability (Woo 1984). The difference between successful and less successful market leaders is determined by:

1. The scope and scale of operations (ie. national versus regional).
2. The fragmentation and stability of the market in which the firm operates.
3. The kinds and quality of products supplied.
4. The quality and level of competition.

5. The firm's organisational focus.

“Objectives defined mainly by market share points are not always relevant to profitable performance” (ibid 1984, p4).

The above points (1) to (5) will be reviewed in Tables 3.1 to 3.5 below:

In a study of 112 business from 1972 to 1975 (ibid, 1984), the main differences between high ROI market leaders compared with their low ROI rivals were identified, and are summarised in the following tables:

Table 3.1 Sample Size And Respective ROIs For High Return Market Leaders And Low Return Market Leaders.

	High Return Leaders.	Low Return Leaders.
Number of businesses:	71	41
Pre-tax ROI:	>40%	<10%

Source: Adapted from Carolyn Y. Woo, (1984).

From Table 3.1 above, there were 71 market leaders with ROI of greater than 40%, and 41 market leaders with ROI of less than 10%, representing the two groups that were analysed.

Table 3.2 Elements of the Market Environment that Distinguish Between High and Low Return Market Share Leaders.

Market Environment:	High Return Leaders.	Low Return Leaders.
Regionally based businesses:	10%	24%
Fragmented markets (ie with > 20 competitors):	8%	24%
Market exits:	13%	20%
Market entries:	38%	32%

Source: Adapted from Carolyn Y. Woo, (1984).

In the Table 3.2 above, high return leaders were more likely to be national than regional in scope. They avoided fragmented markets, and operated in markets that were attractive as measured in terms of the small proportion of firms leaving the market, and the relatively large proportion entering the market..

Table 3.3 Product Characteristics that Distinguish between High and Low Return Market Share Leaders.

Product Characteristics:	High Return Leaders.	Low Return Leaders.
Production of durables or non-durables:	20%	27%
Value added:	High.	Low.
Supply of capital goods:	17%	39%
Supply of raw materials and components:	49%	22%

Source: Adapted from Carolyn Y. Woo, (1984).

In Table 3.3 above, twenty percent of the high return companies produced durable and non-durable goods. Twenty-seven percent of the low return companies produced the same kind of goods (*ibid* 1984).

Table 3.3 shows that the kind of product sold is a determinant of profitability. High value added products are more profitable than undifferentiated ones. Capital goods suppliers need to attend to details that are connected with product specification, service and customer support, and are less profitable than products that do not require this attention. Suppliers of raw material and components, on the other hand, are more likely to compete on the basis of volume and hence cost is the major determinant of success. Such products are less complex and require less product support (*ibid* 1984).

Table 3.4 Differences in Competitive Strategy that Distinguish between High and Low Return Market Share Leaders.

Competitive Strategy:	High Return Leaders.	Low Return Leaders.
Levels of product quality:	48%	31%
Prices compared with corresponding competitors:	Exceeded by 4% on average.	Exceeded by 7% on average
Costs compared with corresponding competitors:	2% below on average.	5% higher on average.
Product changes:	Less.	More.
R&D support.	More.	Less.
% of Process R&D	Higher.	Lower.
Selling and Advertising.	More.	Less.

Source: Adapted from Carolyn Y. Woo, (1984).

Table 3.4 above shows that high return market share leaders attended more to product quality than did their low return rivals. They were more conservative about pricing their products. They controlled costs more carefully. They had a more constant line of products, and were more forceful in supporting their products through R&D, and selling and advertising.

Table 3.5 Differences in Competitive Strategy that Distinguish between High and Low Return Market Share Leaders.

Organisational Flexibility.	High Return Leaders.	Low Return Leaders.
Sharing of marketing programmes with other lines of business:	39% of businesses shared > 80% of marketing programmes.	51% of businesses shared >80% of marketing programmes.
Sharing of marketing channels with other business units:	58% of business shared > 25% of marketing channels.	66% of business shared > 25% of marketing channels.

Source: Adapted from Carolyn Y. Woo, (1984).

From Table 3.5 above, high return market share leaders were more dedicated to the pursuit of their marketing objectives than their low return competitors.

From Tables 3.1 to 3.5, It is clear that there are in fact different kinds of market share leaders associated with quite different profit outcomes, according to the type of business they are in, the nature of the competition, and the degree of commitment to marketing.

3.4 THE ASSOCIATION BETWEEN MARKET SHARE AND STRATEGY:

The PIMS database has proved to be useful in providing an understanding of the association between market share and aspects of strategy in their impact on ROI. Some of these findings are as follows (Schoeffler, Buzzell, Heany 1974):

1. Business with large market shares tend to have a lower ratio of marketing expense to sales than those business that have lower market shares. It is suggested that this arises out of economies of scale that accompany strong market positions.

2. There is an association between market share and product quality. Product quality is associated with an improved ROI for both low and high market share firms suggesting that quality products do something to mitigate low market share. This seems to support the notion that quality in products or services is associated with the possession of an essential ingredient in competitive advantage:

“...It does not pay to promote a poor product” (*ibid* 1974).

3. High market share firms are better able to invest a greater amount of earnings in research and development compared with their lower market share competitors. The implication for strategy would seem to be that businesses with weak market share positions may have to seek new products without necessarily investing in R&D. Licensing of new products might be one such way..

4. A direct and negative association exists between investment intensity (ie. as measured by ratio of total investments to sales) and market share., As investment intensity decreases, ROI increases with higher levels of market share. Firms with weak market share positions are less able to invest to discover and sustain competitive advantage compared with their larger competitors. The negative

impact on ROI is compounded if high investment intensify is associated with high levels of marketing expenditure.

5. The highest level of average ROI is associated with high market share businesses, followed by low market share firms. Those businesses in the middle gain from neither the economies of scale associated with the larger firms, or the flexibility of the smaller firms (*ibid* 1974). This result is also true for average ROI associated with degrees of diversification. High levels of diversification are associated with the highest average return. Low levels of diversification are associated with the next highest level of average ROI. Those firms in the middle have the lowest average return.

6. Larger firms derive the best ROI from strong market positions than do smaller firms. Larger firms are able to provide more support for management, personnel and investments in marketing. Small competitors, and new entrants need to be aware of such resources among their larger rivals, and select strategies that do not take them into direct conflict (Ohmae 1988).

From the above, it is clear that market share, as well as being an objective of strategy, is also a lever of current and future competitive advantage.

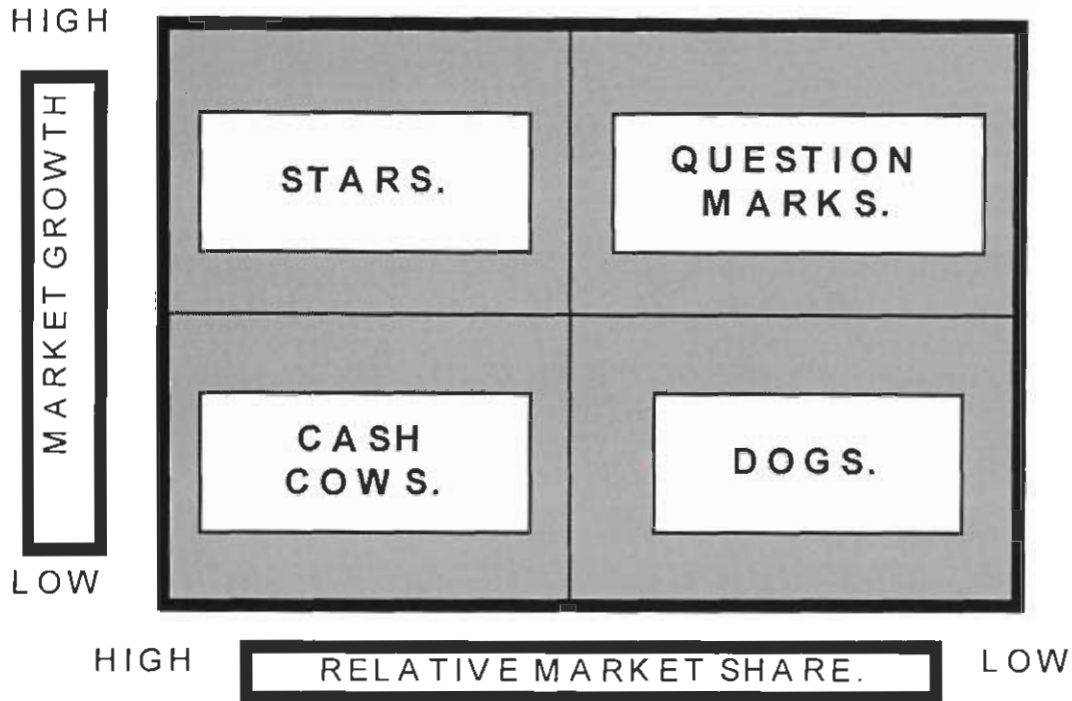
3.5 MARKET SHARE AS A COMPONENT OF STRATEGY FORMULATION.

Two models that incorporate market share into the formulation of strategy alternatives are (1) The Boston Consulting Group Matrix, and (2) The General Electric/McKinsey Matrix. Both of these models are discussed below:

3.5.1 The Boston Consulting Group Matrix.

The Boston Consulting Group approach is a closed system. Market growth, on one dimension, represents an numerical assessment of opportunities and threats. The other dimension, namely relative market share, represents a measure of business strength.

Figure 3.1 The Boston Portfolio Matrix:



Source: Philip Kotler, Marketing Management Analysis and Control 1988, p.41

The matrix in Figure 3.1 above represents a trade-off between the demands for cash, as represented by growth, and the availability of cash for investment, as represented by relative market share. The matrix provides an overview of how well the company has diversified its portfolio, and spread its risk. The labels that are used to describe positions in the matrix, and the corresponding interpretations, are as follows (Kotler 1988):

Table 3.6 Labels and Descriptions of the Boston Consulting Group Model.

Labels:	Descriptions:
‘Cash Cows’	Brands in low growth markets, but with high relative market shares. These products are profitable and may provide cash for other investments.
‘Dogs’	Brands with weak market shares in low growth markets.
‘Questions Marks’	These represent possible opportunities for investment, but need to be evaluated carefully in terms of ROI.
‘Stars’	A market leader in a high growth market. These later become ‘cash cows’.

Source: Philip Kotler, Marketing Management Analysis and Control 1988, p.41

The broad strategies that are suggested when using this approach are shown in Table 3.7 below:

Table 3.7 Broad Strategies Derived from the Boston Consulting Group Model.

<p>‘Stars’: Invest to maintain or increase dominance.</p>	<p>‘Question Marks’: Evaluate the opportunity carefully, and invest appropriately.</p>
<p>‘Cash Cows’: Maintain market position, and manage for earnings.</p>	<p>‘Dogs’: Manage for cash, or divest.</p>

Source: Philip Kotler, Marketing Management Analysis and Control 1988, p.41

It should be recognised that the strategies outlined in Table 3.7 above are ‘normative’. For a company is that does not have a fully diversified portfolio, the normative approach may be unhelpful. A company that only has a ‘Cash Cow’ may well be limited to keeping that ‘animal’ alive. The Boston Consulting Group matrix needs to be seen for what it is: a framework by which to gauge the competitive ‘health’ of the business. It is not a framework of normative prescriptions to be followed blindly.

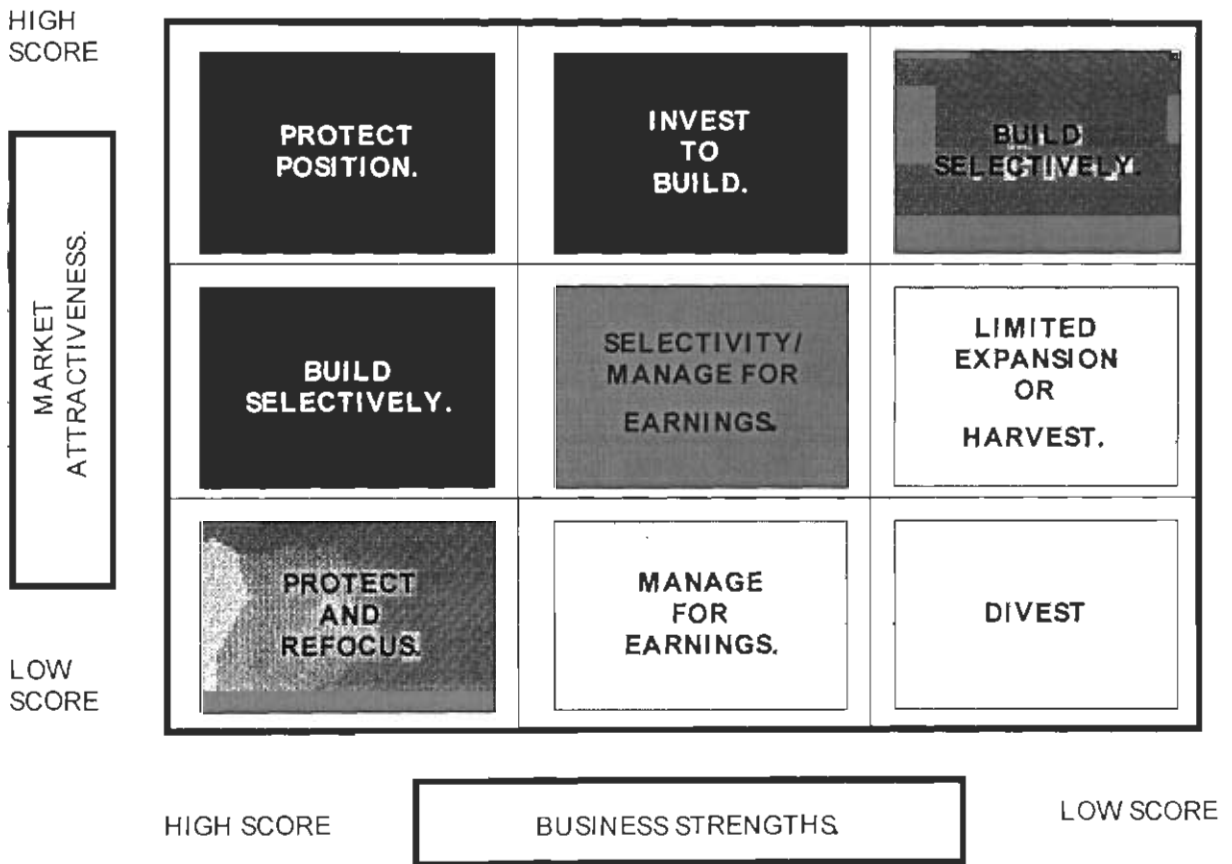
3.5.2 The GE, McKinsey Matrix.

The General Electric, McKinsey matrix is another qualitative approach to assessing the strengths, weaknesses and opportunities and threats of the business (*ibid* 1988). The two dimensions represent measures of market attractiveness and business strengths¹, respectively.

¹ Market share is one of the key factors that is taken into account in rating the firm’s competitive position (Kotler 1988, p45).

The factors representing market attractiveness and business strengths are identified within the firm. The factors are rated in terms of their importance. Scores are then assigned to the factors to capture the association between market attractiveness and business strengths.. The outcome of the process is a three by three matrix of strategic options as identified in Figure 3.2 below:

Figure 3.2 The General Electric, McKinsey Matrix of Broad Strategy Options.



Source: Philip Kotler, Marketing Management Analysis and Control 1988, p.45

The specific aspects of strategy associated with each of the above positions (*ibid* 1988) is shown in Table 3.8 on page 31 below:

**Table 3.8 Strategy Options Associated with the General Electric, McKinsey Matrix
More Fully Defined.**

Strategies:	Implementation:
Protect Position:	<ul style="list-style-type: none"> • Invest to grow the business. • Invest to sustain competitive advantage.
Invest to Build:	<ul style="list-style-type: none"> • Challenge for leadership. • Build on strengths. • Identify and resolve problem areas and weaknesses.
Build Selectively:	<ul style="list-style-type: none"> • Invest in attractive segments. • Build to deter competition. • Increase profitability by increasing productivity.
Build Selectively:	<ul style="list-style-type: none"> • Do the best with limited strengths. • Overcome weaknesses. • Withdraw if competitive advantage is lost, or significantly threatened.
Selectivity/Manage for Earnings:	<ul style="list-style-type: none"> • Focus on segments where profitability is sound, and risk is low.
Protect and re-focus:	<ul style="list-style-type: none"> • Manage for earnings. • Focus on attractive segments. • Concentrate on strengths.
Limited Expansion or Harvest:	<ul style="list-style-type: none"> • Examine ways to expand without risk. • Minimise investments.
Manage for Earnings:	<ul style="list-style-type: none"> • Operate in most profitable segments. • Minimise investments.
Divest:	<ul style="list-style-type: none"> • Sell to maximise cash earnings. • Withdraw.

Source: Philip Kotler, Marketing Management Analysis and Control 1988, p.44

As before, normative strategy options are generated that are based on management analyses and judgements of both the opportunities and threats confronting the business.

Although the ratings are expressed as numbers, they are simply a way of representing the qualitative judgements of management. The assessments are sensitive. Compromises among the managers may obscure the usefulness of the model.

3.6 THE VALUE OF MARKET SHARE.

Cook has suggested that the goal of marketing strategy is to maximise the net present value of market share:

“...The net present value of market share is the difference between long run marginal share value and share cost discounted at the organisation’s cost of capital. The goal of marketing strategy is to maximise this value” (Cook, 1985).

The concept is broken into two components, (1) that of the value of a market share point, and (2) that of the company marketing contribution:

3.6.1 The Value of the Market Share Point.

$$(VMS) = ((p - avc)Q)/100.....(\text{Equation 3.1})$$

where...

VMS = Value of a market share point,

p = price,

avc = average variable cost,

Q = primary demand.

3.6.2 Marketing Contribution.

Marketing contribution is calculated as follows:

$$z = (vms)(\bar{x}).....(\text{Equation 3.2}),$$

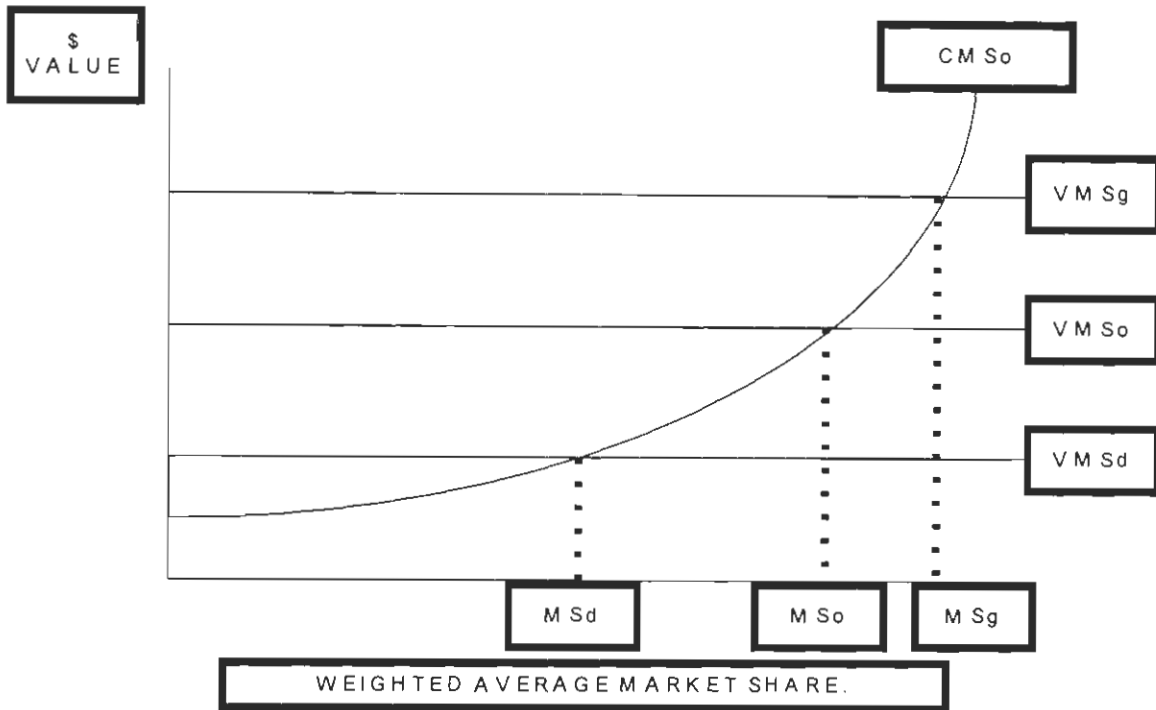
where...

\bar{x} = weighted average marketing capacity.

The approach outlined above maximises the marketing contribution where the marginal cost of gaining market share equals the marginal value of that share.

Figure 3.3 on page 33 below shows the relationship between marginal value and cost curves for optimum, growth and decline situations:

Figure 3.3 The Relationship Between the Value of Market Share and the Cost of Market Share.



Source: Adapted from Cook (1985)

In the Figure 3.3 above, the labels have the following meanings:

Weighted Average Market Share is also used to represent the average of the organisation's capacity to produce, distribute and promote the product, weighted by its effectiveness and relative price (Utsay and Cook 1984, p.97 quoted in Cook 1985, p.53). This assumes a linear relationship between marketing effort and market share.

VMS_g = Value of a market share point during market growth.

VMS_o = Value of a market share point at the optimum.

VMS_d = Value of a market share point when the market is in decline.

MS_o = Weighted average market share at the optimum point.

MS_g = Weighted average market share when the market is growing.

MS_d = Weighted average market share when the market is in decline.

CMS_o = The cost of a market share point at the optimum.

In Figure 3.3 above, the optimum is defined as the point at which the marginal value of a market share point equals the marginal cost of achieving that market share.

The proposition by Cook (*ibid* 1985) is that as the marginal value of market share increases (VMSg) faster than marginal cost (CMSo), it pays for the firm to increase its investments to a new optimum commensurate with a new value of market share (MSg), maximising profitability at the new point

Cook also states that the converse is true. As the marginal value of market share falls (VMSd), he suggests that it makes sense for the firm to reduce its costs (CSMo), and to minimise the erosion of profit.

“...the firm will reallocate its resources to more profitable opportunities. It may not seem intuitively obvious that a business should purposely decrease its share of a declining market, but it is rational” (Cook 1985 p.55).

The model proposed by Cook above leads to the following descriptions of strategy shown in Table 3.9 :

Table 3.9 Strategy Options Defined by the Relationship Between Concurrent Market Share and % Share of Marketing Investments.

Strategy:	Description:	Outcome.
% of competitive marketing effort > concurrent market share:	Build.	Market share will increase.
% of competitive marketing effort = concurrent market share:	Hold.	Market share will be maintained.
% of competitive marketing effort < concurrent market share:	Harvest.	Market share will decline.

Source: Cook and Rothberg (1990).

The main assumptions of the model are that, in the short-term, firms are able to (1) take their competitors' by surprise, (2) adopt strategic positions that cannot be followed, (3) possess opportunities in other markets that allow them to decrease their share of competitive marketing investments in a declining market.

The gap that emerges between marketing effort and concurrent market share, if assumptions (1) to (3) above hold true, describes the concept of differential advantage. (Cook 1983, Cook 1985, Cook and Rothberg 1990). The model proposed by Cook (*ibid* 1985) describes a transition between points of equilibrium that is associated with shifts in marketing effort. In that sense, the gap between share of marketing effort and concurrent market share is an index of competitive activity at the level of the individual firm or brand.

The marketing concept of contribution provides another perspective by comparison with the accounting one:

“...Company oriented planning and accounting methods are the innocent purveyors of marketing myopia. A market-led company should lay its plans from market segments, backward through competitive commitments, to achieve a realistic assessment of company resources and expected performance” (Cook 1985).

3.7 SUMMARY.

Market share has a central place in this thesis for several reasons:

1. Market share is an accepted measure of the success or failure of strategy (Bonoma, 1989).
2. An attraction of market share as a target at which to aim strategy is the correlation between market share and company profitability (Schoeffler, Buzzell, Heany 1974). Although the relationship between market share and profitability is well established, it is suggested that they are really the joint outcomes of good management (Jacobson and Aaker 1985).
3. Market share leadership is qualified by the fact that, of itself, it is not necessarily an indication of high levels of profitability (Woo 1984). Successful market share

leadership, is determined by the quality of the leadership with respect to the markets that are selected, the products that are supplied, the attributes of competitive strategy, and organisational focus.

4. Market share is a useful indicator of successful and less successful strategies. High market share firms are those that produce and market superior products, are better able to sustain investment in R&D, and provide more resources to management, production, and marketing.
5. Market share is a component of both the Boston Consulting Group Matrix, and an element of competitive position in the GE/McKinsey Matrix. The possession of a 'star', or the fortuitous situation of being well placed with a strong business in an attractive market point to a strategy of investment.
6. It is suggested that market share has an intrinsic value (Cook 1985). Marginal investment in market share can be matched with the marginal value of market share in order to maximise profit. The gap between marketing effort and concurrent market share gives rise to notions of build, maintain, and harvest strategies. These strategies are based on the assumption that firms are able to 'steal a march on their competitors' and increase their share of investments in marketing effort, or that they do have other options that allow them to reduce their share of investment in declining markets.

The gap that arises between marketing effort, and market share, when a firm embarks on a build strategy is called differential advantage. The gap is a transitional one until a new equilibrium of competitive investments is reached (Cook 1985).

Chapter 4 .

4.0 A REVIEW OF DIFFERENTIAL ADVANTAGE IN THE FORMULATION OF MARKETING STRATEGY.

4.1 INTRODUCTION.

This chapter examines the evidence in favour of differential advantage and the criticisms directed at the concept.

4.2 DIFFERENTIAL ADVANTAGE IN THE US CAR INDUSTRY.

Two studies were undertaken that looked at the relationship between market share and differential advantage over two time periods. These studies are presented below.

4.2.1 Differential Advantage in the US Car Industry - 1975.

The first study (Cook 1983) of the US car industry examined the relationship between market share and differential advantage based on data for the twelve months ending 1975. The reason that was offered for the US car industry's poor performance was the sustained negative differential advantages in the number of car models, the level of promotional investment, and the number of outlets (ie. dealerships).

Table 4.1 on page 38 below summarises the findings of this study:

Table 4.1 The Relationship Between Market Share and Differential Advantage in the US Car Industry in 1975.

Marketing Mix.	Share of Marketing Mix.	Unit Market Share	Differential Advantage
(a) Number of Car Models	74.7%	84.0%	-9.3%
(b) Investment in Media	68.7%	"	-15.3%
(c) The number of Dealers	79.3%	"	-4.7%
Average of (a) to (c).			-9.3
(d) Price ¹	92.8%	"	+8.8%
Average of (a) to (d)			-5.1%

Source: Adapted from Victor J. Cook Jr, Marketing Strategy and Differential Advantage, Journal of Marketing, Vol 47 (Spring 1983) pages 68 to 75.

In Table 4.1 above, differential advantages are calculated by subtracting concurrent unit market share from the share of investments in marketing mix variables.

Because of USAUTO's² average, negative differential advantage in car models, media and number of dealers it was asserted that the US car makers would sustain a loss of at least nine points of market share (the average of (a) to (c) in the above table). The Author's only comment with respect to price was that it was **"...unsustainable"** (*ibid*, p.74), although he did not say why. Using the same argument, the loss of market share for USAUTO should be in the region of five percentage points if price adjusted brand equity is included in the calculation.

4.2.2 Differential Advantage in the US Car Industry - 1973 to 1981.

The study of the US car industry for the period 1973 to 1981 (Cook and Rothberg 1990) examined two sets of relationships:

1. The relationship between market share and marketing effort.

¹ Price Adjusted Brand Equity (PABE) Relates Price To Market Share...

PABE = $mI + (1 - P/P^*)$, Where...

mI = Concurrent Unit Market Share,

P = Weighted Average Price For US Cars,

P* = Weighted Average Price For Foreign Cars.

² USAUTO is an abbreviation for US car makers.

2. The relationship between market share and differential advantage.

4.2.2.1 The Relationship Between Market Share and Share of Marketing Effort.

The relationship between market share and share of marketing effort is shown in Table 4.2 below (*ibid*, p.311).

Table 4.2 Relationship Between Market Share and Share of Marketing Effort.

Marketing Variables:	Spearman's Rank Correlation:
% Share of car models:	0.810
% Share of car dealerships:	0.890
% Share of media investments:	0.843
Price adjusted brand equity ³ :	0.984

Source: Victor J. Cook and Robert R. Rothberg, The Harvesting of USAUTO? From the Gasoline Crisis of 1973 to the Imposition of "Voluntary" Import Quotas in 1981, *Journal of Product Innovation Management*, 1990; 7; pages 310 to 322.

Table 4.2 above shows a statistically significant relationship between market share and share of marketing effort. This result is supported by the Theory Of Market Share Determination using the marketing effort model proposed by Kotler (1988).

The relationship between market share and share of marketing effort was also tested using a Multiplicative Competitive Interaction (MCI) model of market share determination (Lilien, Kotler, Moorthy 1992). Table 4.3 on page 40 below shows coefficients of market share elasticities estimated by means of the Multiplicative Competitive Interaction Model:

³ Price Adjusted Brand Equity relates price to market share as follows:

Price Adjusted Brand Equity = $m1 + (1 - P/P^*)$, where,

$m1$ = concurrent unit market share.

P = Weighted average price for US cars.

P^* = Weighted average price for Foreign cars.

Table 4.3 Parameter Estimation Using the MCI Model.

Marketing Variables:	MCI Coefficients:
Share of Car Models:	+0.12
Share of media investments:	+0.15
Share of car dealerships:	+0.07
Price adjusted brand equity:	+0.83

Source: Adapted from Victor J. Cook and Robert R. Rothberg, *The Harvesting of USAUTO? From the Gasoline Crisis of 1973 to the Imposition of "Voluntary" Import Quotas in 1981*, *Journal of Product Innovation Management*, 1990; 7; pages 310 to 322.

In Table 4.3 above, each of the estimated response parameters was statistically significant, positive and less than 1.

4.2.2.2 The Relationship Between Market Share and Differential Advantage.

The relationship between market share and differential advantage was stated in the following hypothesis:

"...changes in market share were statistically independent of the firm's concurrent differential advantages" (Cook and Rothberg 1990, p.317).

The relationship was analysed using the Chi-square test of statistical association. The result is shown in Table 4.4 below:

Table 4.4 Chi-square Test of Association Between Changes in Market Share and a Firm's Concurrent Differential Advantages.

Degrees of Freedom:	Chi-square statistic:	Statistical significance:
4	98.2	p<0.001

Source: Adapted from Victor J. Cook and Robert R. Rothberg, *The Harvesting of USAUTO? From the Gasoline Crisis of 1973 to the Imposition of "Voluntary" Import Quotas in 1981*, *Journal of Product Innovation Management*, 1990; 7; pages 310 to 322.

The conclusion of the study was:

“...changes in market share are systematically associated with changes in differential advantages to a degree greater than expected by chance causes. How robust is this finding? Very” (*ibid*, p.317).

Additional tests confirmed the rejection of the null hypothesis:

1. The null hypothesis regarding the relationship between market share and differential advantage was rejected at $p < 0.01$ regardless of the cutoff points selected.
2. A redefinition of the time frame from a one by one year basis of comparison to a two by two year basis of comparison did not change the results.

4.2.3 Gaps in the Analysis.

There are several concerns about the approach taken to the analysis in both studies:

A prior hypothesis was not proposed for the relationship between the market share and share of marketing effort in the study of the US car industry for the period 1973 to 1981. It may be that the authors thought that there was no need to do this. Theory already supports this relationship (Kotler 1988, and Cooper and Nakanishi 1988).

There is evidence to suggest that statistical outcomes may be as much influenced by the strategies used in the analysis of the data as by differences within the data itself. In a study that underlined this point (Renn and Vandenberg 1991), the authors reported that studies that used subgrouping techniques produced results that were different from those that used the full range of scores for independent and dependent variables. They recommended that strategies that used subgrouping [or coding] approaches should be abandoned in favour of those that looked at the full range of the data.

The Chi-square statistic provides, at best, an estimate of the strength of the association between categorical variables. It does not say anything about the type of association, or the direction of the relationship (Norussis, Marija. J 1993, p.311).

In rejecting the null hypothesis, the linear relationship between market share and differential advantage was not examined.

The null hypothesis was rejected for the overall situation. There was no analysis of the relationship between market share and differential advantages for each of the marketing mix variables.

The rejection of the null hypothesis was based on the concurrent relationship between changes in market share and different states of differential advantage. The analysis did not look at the relationship when marketing mix variables were lagged.

In the paper by Cook and Rothberg (*op cit* 1990) the authors state that response parameters were estimated using the MCI model of market share determination. It is not clear which approach to parameter estimation was used. The MCI model may be used with OLS and GLS methods of parameter estimation (Cooper and Nakanishi 1988).

Although it appears from the study (Cook and Rothberg 1990) that a statistical relationship has been established between market share and differential advantage, several criticisms and concerns have been outlined in terms of the analysis that was undertaken and the conclusions that were reached.

4.2.4 Criticisms of Differential Advantage.

Criticism has been directed at the proposition of a positive relationship between market share and differential advantage regardless of the (shape) of the response function (Cook 1983, p.73). It has been shown that the positive relationship between market share and

differential advantage can, in fact, be reversed if a non-linear response function is assumed (Chattopadhyay, Nedungadi, Chakravarti 1985, p.132).

The original work (Cook 1983) omits any evaluation of the effectiveness of the firm's marketing efforts, or the response elasticities among the marketing mix variables (Parasuraman and Varadarajan 1985, p.126). The omission of response elasticities was addressed in the later work (Cook and Rothberg 1990).

Further criticism is that the simple input-output model that links market share with differential advantage fails to address the dynamics of competitive strategy formulation:

“...that competitive advantage is derived from an analysis of the strengths and weakness of the business relative to those of the competition” (Ibid 1985, p.127).

The quality of the brand, the firm's reputation, the firm's experience and integrity are all overlooked by the concept of differential advantage.

Cook's response (1985) to these criticisms was to reformulate the model of differential advantage to take account of the problem of non-linearity by adding the exponent B:

$$[(M_i/\sum M_j)^B/(M_i/\sum M_j)^B + ((1-(M_i/\sum M_j)^B)] \cdot m_1 \dots \dots \dots \text{(Equation 4.1)}$$

where...

M_i = Company i's share of marketing investments.

M_j = The total of all marketing investments.

B = The response elasticity of marketing effort.

m_1 = the firm's or brand's share of unit sales.

The re-parameterisation of the differential advantage model did not solve the problem:

“...None of us, including Professors Parasumraman and Varadarajan who also wrote a comment on the paper were able to decipher Professor Cook's

meaning when he argued that a nonlinear measure of differential advantage would resolve the problem that we had pointed out. The reformulation would introduce an additional parameter (exponent B) into the model that did not conceptually require a relationship to the market share model exponent.

...with his new proposal Professor Cook merely moved the focus of attention away from the conceptual problem” (Chakravarti, 1993).

A key criticism is that the original research (Cook 1983) did not establish an empirical relationship between differential advantage and market share. This omission was addressed in a subsequent study by Cook and Rothberg (1990), although some concerns have been expressed regarding the method of analysis.

4.3 SUMMARY.

Differential advantage is part of an input-outcomes model of differential advantage. Differential advantage represents the input; market share represents the outcome.

Criticism is directed at the concept of differential advantage, namely the notion of managing differential advantages to achieve particular outcomes. The statement that the relationship between market share and differential advantage is a positive one regardless of the shape of the response function is incorrect. A reformulation of the relationship between market share and differential advantage, taking into account non-linearity, does not overcome the weakness of the concept.

The principal study (Cook and Rothberg 1990) that was undertaken to demonstrate the relationship between market share and differential advantage used categorical data to prove the point. Evidence exists to suggest that statistical outcomes may be as much the consequence of the technique used as the data analysed. The suggestion is made that statistical analysis should use the full array of data (both linear and categorical) in order to achieve more meaningful understanding of the relationship.

Chapter 5

5.0 THE NEW PASSENGER CAR MARKET IN AUSTRALIA.

5.1 INTRODUCTION.

This chapter presents the data that was collected on the new passenger car market in Australia. The data provides an opportunity to examine the propositions advanced by Cook (1983) and Cook and Rothberg (1990) regarding the place of differential advantage in the formulation of marketing strategy.

This chapter introduces the hypotheses to be examined in later chapters of this thesis.

5.2 DATA ON THE NEW PASSENGER CAR MARKET IN AUSTRALIA.

The data that has been collected covers the following areas of the new passenger car market in Australia:

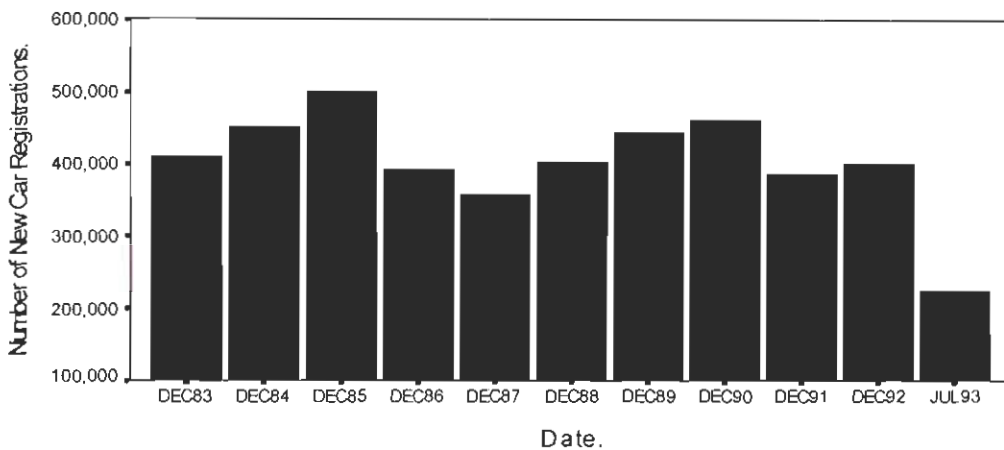
1. New passenger car registrations for each year from December 1983 to the period ending July 1993.
2. Media investments by manufacturer for each year from 1985 to July 1993. Media investments included metropolitan and regional television, national and metropolitan newspapers, regional newspapers, and national magazines.
3. The number of car models produced by each manufacturer for the period 1983 to July 1993.
4. Prices per car model for the mid-point of each year, for the periods 1983 to July 1993.
5. Tax rates on new passenger cars for the period 1986 to 1993.

The data consists of 227 observations of new passenger car registrations, investments in media, car models, car dealerships, and prices. The data is presented below.

5.2.1. *New Passenger Car Registrations.*

New passenger car registrations for the period ending December 1983 to the period ending July 1993 are shown in the Figure 5.1 below:

Figure 5.1: Data On New Passenger Car Registrations 1983 to 1993.



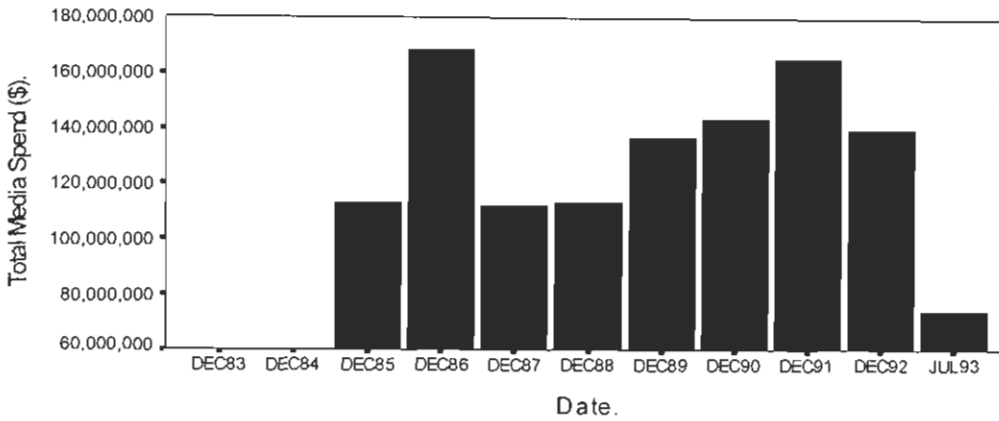
Source: Idaps, Paxus.

Figure 5.1 above shows a period of fluctuating fortunes for the car industry in Australia. The fluctuations reflect the economic boom of the late '80's and the recession from around June 1990 to December 1991 (Economics Department, National Australia Bank, Melbourne). Despite the fluctuating demand, overall demand did not increase over the period. This suggests that if gains were to be made by any one car maker, that the gains would be at the expense of a competitor rather from increased demand.

5.2.2 Media Investments In The Australian New Passenger Car Market.

Figure 5.2 below shows the total amount invested in media:

Figure 5.2: Data On Media Investments In The Australian New Passenger Car Market 1985 to 1993.



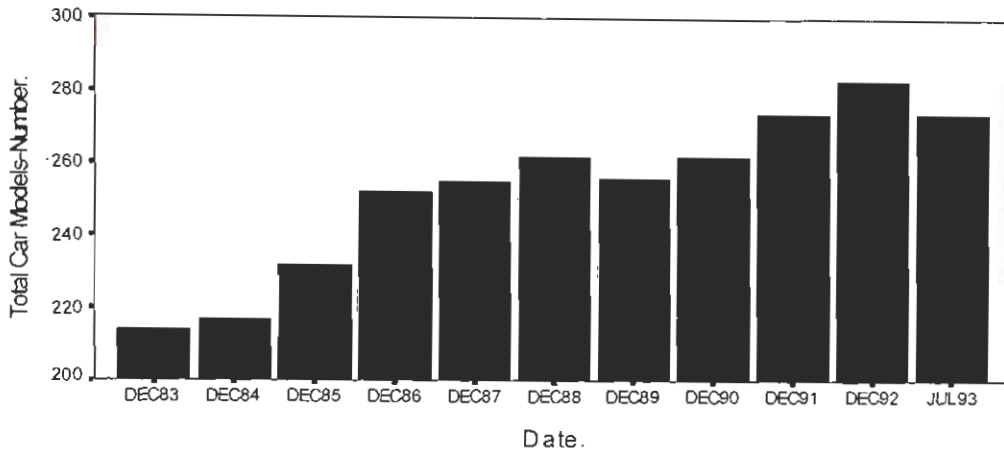
Source for Period 1985 to 1990: Bruce Tart and Associates.
Source for Period 1991 to July 1993: AIM Data.

Figure 5.2 above shows a generally volatile situation over the period for which data was available. Investments in media for the new passenger car market increased gradually from 1989 to 1991, but decreased in the following year. Annual investments in media increased by an average of 3 per cent per year over the period, suggesting an ongoing level of competitive activity.

5.2.3 Car Models In The Australian Passenger Car Market.

Figure 5.3 on page 48 below examines the number of car models registered in the Australian market between 1983 and 1993:

**Figure 5.3: Data Showing The Number Of Car Models Available In Australia
1983 To 1993.**



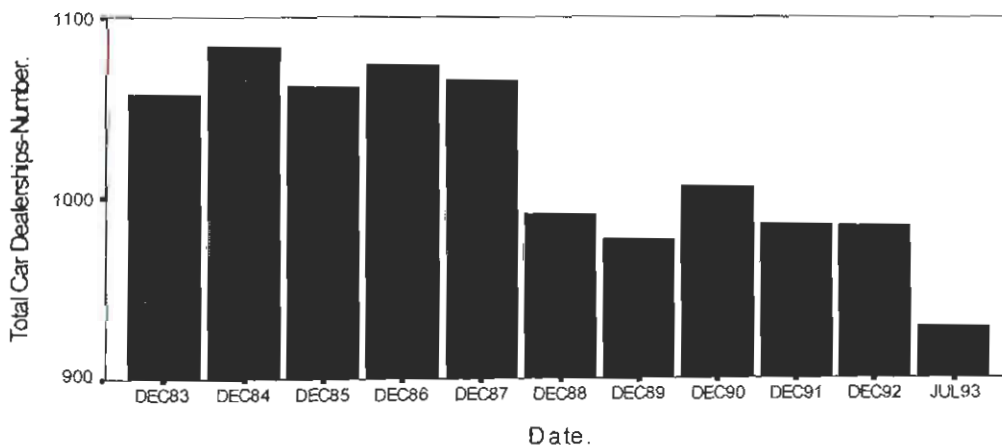
Source: Wheels Magazine.

Figure 5.3 above shows a steady increase in the number of car models offered to consumers over the years, suggesting a move to market segmentation, and the creation of greater choice for buyers.

5.2.4 Car Dealerships.

Figure 5.4 below outlines the number of metropolitan car dealerships available to service customers throughout Australia:

Figure 5.4: Data Showing The Number Of Metropolitan Car Dealerships 1983 To 1993.



Source: Telecom Yellow Pages.

Figure 5.4 above shows a declining trend in car dealerships over the years.

The number of car dealerships in Australia was estimated from the Telecom Yellow Pages for the December month of each year, for the major cities, excluding those in Tasmania.

The estimates were checked against data in the “Motorfacts” publication of the Motor Trades Association of Australia. Although the data in “Motorfacts” did not cover the full ten years for which data was collected from the Telecom Yellow Pages, some of the data was coincidental and used for validation.

In order to verify the accuracy of the data that was collected and presented above, comparison was made with available data from the Motor Trades Association of Australia. This is presented in Figures 5.5 to 5.7 and Figure 5.1 below:

5.2.4.1 Corroborating Data on Car Dealerships From The Motor Trades Association of Australia (MTAA).

Figures 5.5 to 5.8 below present data from the Motor Trades Association of Australia in order to validate the estimates of car dealerships made from the Telecom Yellow Pages.

Figure 5.5: MTAA Data On The Number Of Car Dealerships In Australia 1979 To 1992.

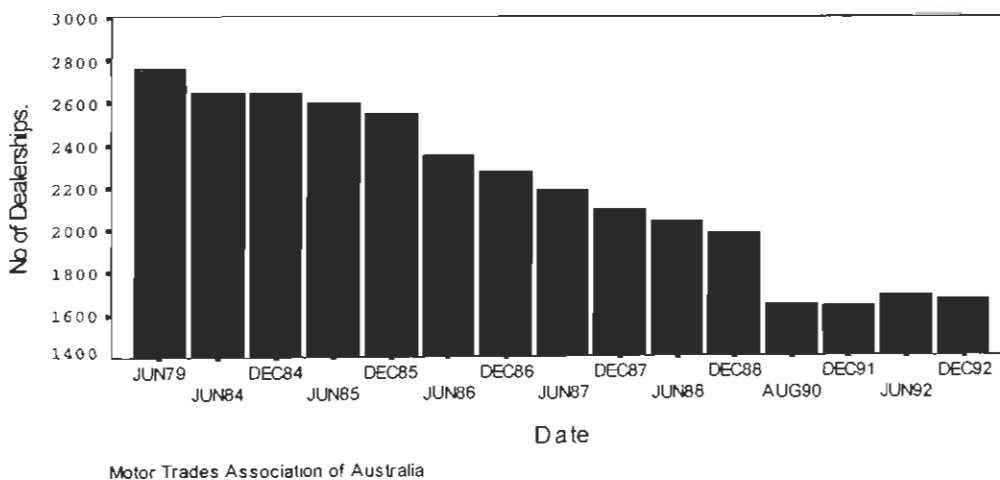
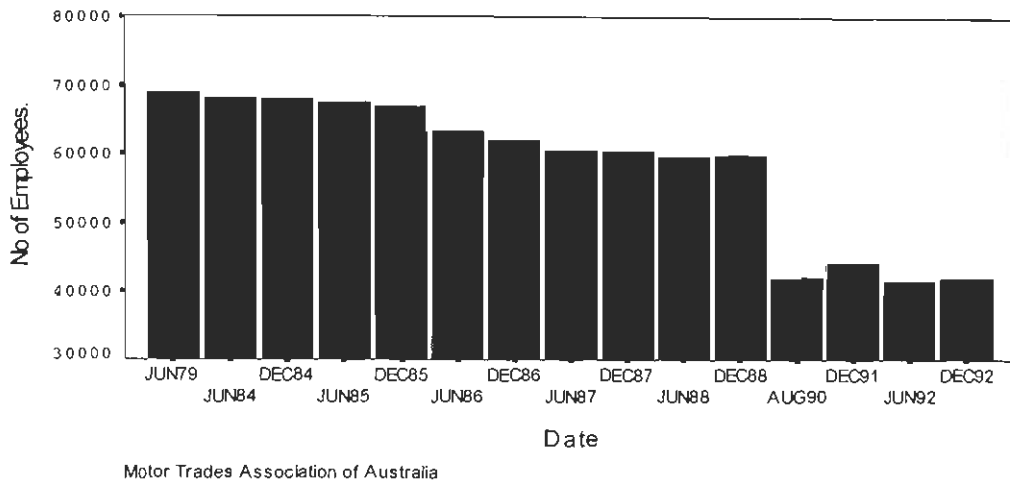


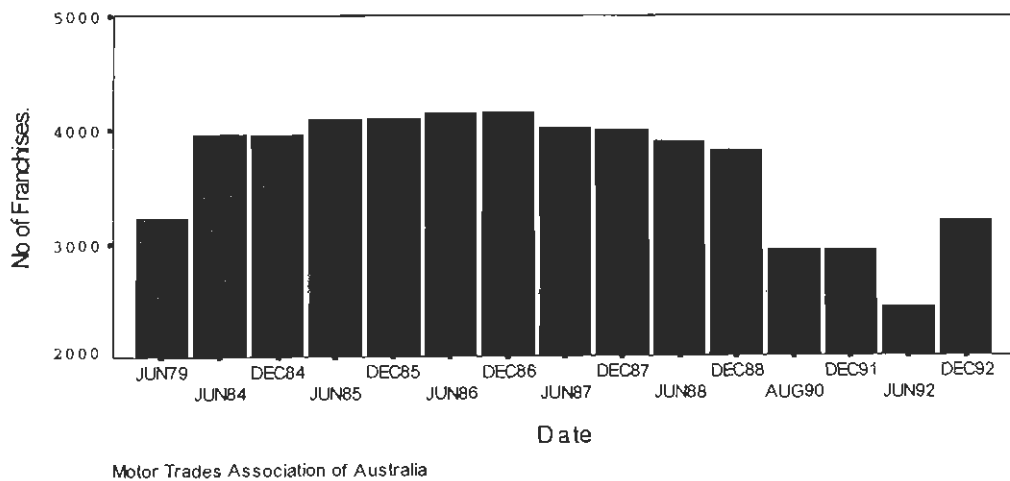
Figure 5.5 above confirms the trend to a smaller number of car dealerships found in the data collected from the Telecom Yellow Pages directory.

Figure 5.6: MTAA Data On The Number Of Employees In Car Dealerships In Australia 1979 To 1993.



In data in Figure 5.6 above suggests that the number of employees leaving this part of the industry stabilised over the period from 1990 to 1992. However, prior to that, the overall trend was a declining one, and tended to confirm the findings shown in Figure 5.4, page 48.

Figure 5.7 MTAA Data On The Number Of Car Franchises In Australia 1979 To 1993.



In Figure 5.7 above, the number of car franchises was stable over the period of June 1984 to December 1988, and declined after that. From December 1988 the number of franchises declined sharply, but improved in the second half of 1992.

Corroborating data on the number of dealership locations is shown in Figure 5.8 on page 51 below:

Figure 5.8: MTAA Data On The Number Of Dealer Locations In Australia 1979 To 1992.

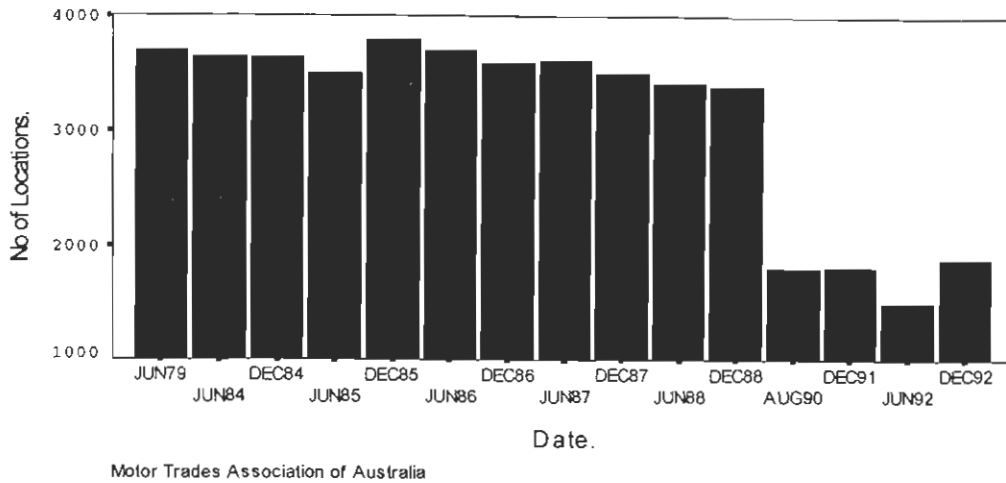


Figure 5.8 above confirms (overall) the declining number of outlets (dealerships) over the period 1979 to 1992.

5.2.4.2 Confirmation Of the Estimate of Car Dealerships Based on The Telecom Yellow Pages.

Table 5.1 below shows the correlation between the estimate of car dealerships, based on a count from the Telecom Yellow Pages, and the data obtained from the "Motorfacts" publication of the Motor Trades Association of Australia.

Table 5.1 Correlation of Telecom Yellow Pages Dealer Estimates with Motor Trades of Australia Data.

Motor Trades of Australia Data.	Pearson's Correlation Coefficient.	Statistical Significance.
Dealers:	0.8779	p=0.009
Employees:	0.8288	p=0.021
Franchises:	0.8288	p=0.021
Location:	0.8066	p=0.028

Source: Adapted from Motor Trades Association of Australia, Motorfacts, February 1993.

The relationship between the Telecom Yellow Pages estimate of car dealerships and the data available from the Motor Trades Association of Australia, in Table 5.1 above, is statistically significant and not due to chance. The Telecom Yellow Pages estimates are

confirmed by data in the Motorfacts publication of the Motor Trades Association of Australia.

5.3 CAR PRICES IN AUSTRALIA.

Matching the price of a particular car model to the new passenger car registration data was difficult. Car registration data was aggregated for some manufacturers in the source documents. Registrations of the Saab 900T and the Saab 9000 were combined in the original data, for example. This thesis used aggregated data¹ at the level of the manufacturer, in order to overcome this problem. Prices were calculated as the weighted average price per manufacturer. The weighted average price per manufacturer was calculated by dividing the cash sales for each manufacturer by the number of units sold by the same manufacturer, for each year.

5.4 TAX RATES ON NEW PASSENGER VEHICLES.

Table 5.2 next sets out the data on the rates of tax on ordinary and luxury vehicles. A vehicle purchased in 1993 at a value up to \$31,725 attracted a sales tax of 16%. A vehicle purchased at a higher price attracted a sales tax of 45% on the amount above \$31,725.

Table 5.2 Tax Rates On Ordinary And Luxury Passenger Vehicles.

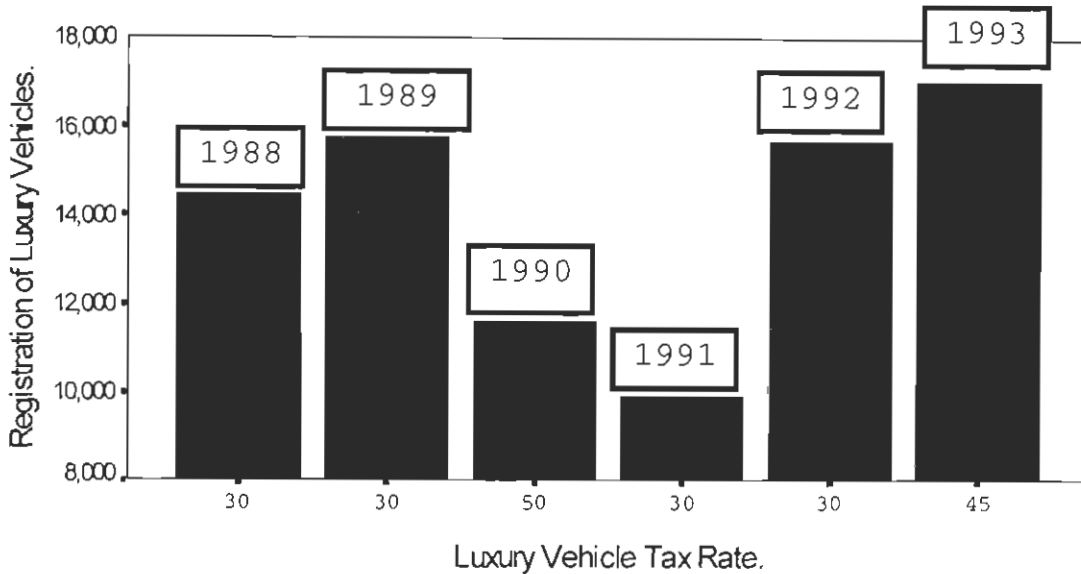
Financial Years:	Tax on Ordinary Vehicles:	Tax on Luxury Vehicles:	Threshold Wholesale Price Level:	Luxury Vehicle Registrations:
1986	20%	30%		
1987	20%	30%	\$19,896	
1988	20%	30%	\$23,334	14,455
1989	20%	30%	\$26,391	15,802
1990	20%	50%	\$27,793	11,613
1991	20%	30%	\$30,233	9,913
1992	15%	30%	\$30,505	15,696
1993	16%	45%	\$31,725	17,057

Source: The Motor Trades Association and the Australian Taxation Office.

¹ This level of aggregation was used in the original work by Cook and Rothberg (1990).

Figure 5.9 below examines the simple relationship between luxury vehicle registrations and the rates of luxury tax:

Figure 5.9: Data On Luxury Passenger Vehicle Registrations 1988 To 1993.



Source: The Australian Taxation Office.

Source: Motor Trades Association of Australia

As can be seen in Figure 5.9 above the effect of the tax rate on luxury vehicle registrations was mixed. When the luxury tax rate rose to 50%, the registration of luxury vehicles fell dramatically, and the lower level of sales persisted even when the tax rate was reduced to 30%. Raising the luxury tax rate to 45% apparently failed to dampen demand in 1993. It may be that the result of increasing the luxury tax to 45% will become apparent in the next period.

It needs to be pointed out that in 1991, the economy was fully in recession.

Imported cars are, on the average, more highly priced than locally manufactured cars, and attract a higher sales tax. In the United States, import tariffs were targeted at Japanese car makers in order to protect the domestic US car industry. In the study of the impact of differential advantage on the fortunes of the US car industry, the authors (Cook and Rothberg 1990) selected a period during which no restrictive trading arrangements were in existence between the US and Japan. It was not been possible to

select a totally ideal period, free of restraint such as differential tax rates on new cars, during which to prepare for this thesis.

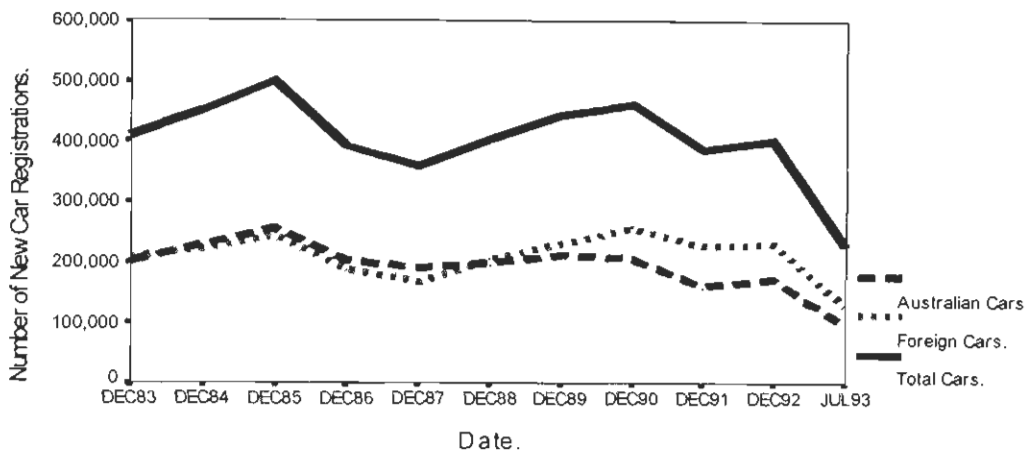
5.5 MARKET MATURITY.

Porter's criterion (1980 p.239) places the new passenger car market in Australia into the mature category. Porter's criteria are presented in bold lettering below:

1. **Slowing Growth means more Competition for Market Share.** Demand for new passenger cars, over the period 1983 to 1992 did not increase, despite fluctuating demand from one year to the next. Advertising expenditure increased by approximately 3 per cent from 1985 to 1992. This suggested an ongoing level of competitive activity.
2. **Firms in the Industry are Increasingly Selling to Experienced Customers.** At the end of September 1991 there was approximately one vehicle for every two Australians (Motorfacts 1992). Despite fluctuating demand, Australians buy an average of 400,000 new passenger vehicles per year. These figures suggest that owning a car is not a new experience for a substantial part of the Australian population.
3. **Manufacturing, Marketing, Distribution, Selling and Research Methods often undergo Change.** Model specifications have changed almost every year since 1989. The emphasis is to give customers more value for money with items such as air conditioning, rear disk brakes, spoilers, laminated windshields, central locking, compact disk players. Other competitive initiatives, such as the GMs (credit) card have been introduced (Motoring Section of the Sydney Morning Herald, 29 July 1995). The GM card offers the user an attractive cash discount on the purchase of a new Holden car.

4. **International Competition Increases.** Approximately half of all passenger cars that are sold in Australia are foreign² as shown in Figure 5.10 below:

Figure 5.10 Competition In The Australian Car Industry Between Australian And Foreign Cars.



Source: Adapted from Idaps and Paxus.

Increasing global standardisation on matters of performance, personal and environmental safety has lowered the barriers to international competition (Porter 1980, p.240).

5. **Dealer Margins Fall.** The data that has been collected for this thesis points to the reduction in the number of car dealerships over the years, suggesting a pressure on the profitability of dealership operations.

5.6 LIMITATIONS OF THE DATA.

The data that was collected for this thesis represents the best that could be found. It is not the best data that exists. It is likely that the highest quality data exists amongst the car makers themselves. It was not possible to obtain such data for this thesis. The results of the analyses that follow in later chapters of this thesis should be seen in this light. The following comment helps to put this problem into perspective:

In this study, Ford and Holden are taken as Australian cars.

“...In his letter Mr. Jonmundsson notes that he has good information on the media expenditure of each of the motor manufacturers in Australia. We would question the accuracy of the data he has because to our knowledge there is no accurate expenditure information available. AIM does collect data on the industry today, and prior to this another company TART Research provided a service. However both companies have been unable to identify the true expenditure of each manufacturer due to the number of ‘sponsorships’ that are a feature of the industry eg. Toyota’s sponsorship of ‘60 Minutes’ is not picked up in the figures.

While AIM is significantly advanced on the TART data, you should use it with extreme caution, particularly if you are trying to draw some conclusions about the relationship between advertising and sales” (C.G. Iles, 1993).

As has been mentioned previously, the period covered by this thesis includes an economic recession that corresponded with a slow-down in demand for new cars. It also includes a period during which tax rates on new cars fluctuated. Tax rates were also aimed at higher priced cars. These tended to be foreign cars. This is in contrast with the original work by Cook and Rothberg (1990) in which an almost perfect situation was selected during which there were no trade constraints between the two major rivals in the US market, namely the US and Japanese car makers. In defence of this thesis, it should be recognised that recessions and economic set-backs are a fact of life. Competition continues. This thesis therefore has an advantage of addressing competition in the car market in Australia during a realistic and current situation.

5.7 HYPOTHESES.

The hypotheses that are outlined below address the concerns that have been expressed regarding the existence of a statistically significant relationship between market share and differential advantage. The hypotheses seek to fill a number of gaps in the analysis (covered in Chapter 4), and improve the understanding of the concept of differential advantage.

5.7.1 Hypotheses Concerning The Relationship Between Market Share And Share Of Marketing Effort.

Hypothesis 1: Market Share is statistically independent of **concurrent** share of **marketing effort**, as measured as the share of investments in media, models, dealerships, and price adjusted brand equity.

Hypothesis 2: Market Share is statistically independent of **lagged** share of **marketing effort**, as measured as the share of investments in media, models, dealerships, and price adjusted brand equity.

5.7.2 Hypotheses Concerning The Relationship Between Market Share And Differential Advantage.

Hypothesis 3: Market share is statistically independent of **concurrent differential advantage**, as measured by the concurrent difference between the share of investments in media, car models, dealerships, price adjusted brand equity and concurrent market share.

Hypothesis 4: Market share is statistically independent of one-period **lagged differential advantage**, as measured by the difference between the lagged share of investments in media, car models, dealerships, price adjusted brand equity and market share.

The emphasis in hypotheses 3 and 4 is on the relationship between two continuous variables, namely market share and differential advantage.

Hypothesis 5: **Changes** in market share are statistically independent of the firm's **concurrent differential advantages**. This hypothesis was tested by Cook and Rothberg (1990) using the Chi-square statistic. It tested the null hypothesis on categorical rather than on continuous variables. This test is replicated in this thesis.

Hypothesis 6: Changes in market share are statistically independent of the firm's **lagged differential advantages**. This hypothesis is tested using the Chi-square statistic. This test was not done in the original work (*op cit* 1990)

Market share is measured as the share of vehicles sold. The share of marketing investments is analysed at the level of the manufacturer.

5.8 SUMMARY.

The passenger car market in Australia is a mature one.

Overall demand for new passenger cars did not increase over the period 1983 to 1993.

Investments in media increased at an average rate of 3 per cent for the period 1983 to 1993 suggesting a basic, ongoing level of competitive activity in the Australian new passenger car market.

The number of car models on offer in Australia increased over the period providing the customer with greater choice, and allowing the manufacturer to target discrete segments with particular models.

The estimated number of car dealerships declined over the period. This observation is corroborated by data that is available in the Motor Trades Association of Australia's "Motorfacts" publication.

Australians are informed buyers of cars. Approximately one car exists for every second Australian. An average of 400,000 new passenger cars is sold every year. Car makers are providing more value to customers with improved specifications and accessories.

Foreign brands account for approximately half the cars sold in Australia indicating that Australia is very much part of the global car market.

Chapter 6

6.0 THE RELATIONSHIP BETWEEN MARKET SHARE AND MARKETING EFFORT.

6.1 INTRODUCTION.

This chapter will analyse the relationship between market share and share of marketing effort for the following situations:

1. The **concurrent** relationship between market share and marketing effort, as represented by the share of investments in media, models, dealerships, and price adjusted brand equity (ie. Price).
2. The relationship between market share and one-period **lagged** share of marketing effort.

In addition to examining the relationship between market share and share of marketing effort in the above situations, possible approaches to resolving the problem of multicollinearity that was encountered in the data are explored.

6.2 THE CONCURRENT RELATIONSHIP BETWEEN MARKET SHARE AND MARKETING EFFORT¹.

6.2.1 The Correlation Between Market Share and The Share of Investments in Marketing Mix Variables.

Table 6.1 and Table 6.2 on page 60 below examine the correlations between unit market share, and share of marketing effort in relation to media, models, and dealerships and price adjusted brand equity (See page 61 for details of this measure of price).

¹ A small sample of the data showing unit market share, market share estimated in current dollars, and shares of investments in media, models, and dealerships may be found in the Attachment 1 to this thesis.

Table 6.1: Correlation of Market Share with Share of Investments in Marketing Variables (N=227).

Variables:	Pearson's Correlation Coefficient:	Statistical Significance:
% Share of Media:	0.8981	p<0.0005
% Share of Models:	0.7962	p<0.0005
% Share of Dealerships:	0.8093	p<0.0005
Price adjusted Brand Equity at time t:	0.9478	p<0.0005

Table 6.1 above shows a statistically significant and positive relationship between market share and share of marketing effort for each of the marketing variables.

Table 6.2 below repeats the analysis in Table 6.1 using Spearman's coefficient of rank correlation. This is used because it has the advantage of being able to cope with non-linearity in the data (Kitchens, 1987 p.109). This statistic was used in the original study (Cook and Rothberg 1990) for the same reason.

Table 6.2: Rank Order Correlation of Market Share with Share of Investments in Marketing Variables (N=227).

Variables:	Spearman's Coefficient of Rank Correlation:	Statistical Significance:
% Share of Media:	0.9280	p<0.0005
% Share of Models:	0.8086	p<0.0005
% Share of Dealerships:	0.8459	p<0.0005
Price adjusted Brand Equity at time t:	0.8563	p<0.0005

Table 6.2 above confirm the statistically significant and positive relationship between market share and share of marketing effort for each of the marketing mix variables seen in Table 6.1 previously.

Included in Tables 6.1 and 6.2 is a measure of price (called price adjusted brand equity) This measure was used in the original studies by Cook (1983), and Cook and Rothberg (1990) The expression is explained in Equation 6.1 on page 61 below:

Price Adjusted Brand Equity = $m1 + (1 - P/P^*)$(Equation 6.1)

where...

$m1$ = Concurrent unit market share.

P = The weighted price of a particular manufacturer.

P^* = The weighted average price of all manufacturers but excluding the price of the particular manufacturer whose market share is being examined (ie. excluding P^*).

The calculation of price adjusted brand equity is shown below:

Price adjusted brand equity = $30\% + (1 - \$25,000/\$40,000) = 67.5\%$,

Where...

Concurrent market Share:	30%
Price for the particular brand:	\$25,000
Weighted average price for all brands:	\$40,000

Equation 6.1 above (ie. price adjusted brand equity) relates price to market share. The lower a firm's price, the higher will be the price adjusted equity, in the sense that a lower price adds to the value of market share.

The analyses in Table 6.1 and Table 6.2, on page 60 examined the relationship between market share and each of the marketing variables separately. Strategy is more likely to be formulated with selected marketing variables working together (in the marketing mix) to achieve a specific marketing objective (Kotler 1988, p.70). The following tables examine the situation when market share is regressed on marketing variables, representing share of investments in media, models, dealerships and price adjusted brand equity, representing a multivariate relationship between market share and share of marketing effort.

6.2.2 Multiple Regression Analysis of the Relationship Between Market Share and Share of Marketing Effort.

Table 6.3 below sets out the results when market share is regressed on share of marketing effort in media, car models, dealerships, and price adjusted brand equity:

Table 6.3 Multiple Regression Output for Market Share Regressed on Share of Investments in Media, Car Models, Dealerships, and Price Adjusted Brand Equity (N=227).

Multiple R:	0.96273
R ² :	0.92685
Adjusted R ² :	0.92553
Standard error:	0.01925
F-Statistic:	703.193
Statistical significance of F:	p<0.0005

Table 6.3 above indicates a highly statistically significant overall multivariate relationship between market share and share of marketing effort.

Table 6.4 below examines the parameter estimates based on the multivariate regression analysis.

Table 6.4 Parameter Estimates using Multiple Regression with Market Share Regressed on Share of Investments in Media, Car Models, Dealerships, and Price Adjusted Brand Equity (N=227).

Variable:	β :	Std Error β :	Statistical Significance:	VIF:
% Share of Media:	0.3003	0.0529	p<0.0005	5.584
% Share of Models:	0.2913	0.0773	p=0.0002	3.687
% Share of dealerships:	-0.3862	0.1152	p=0.0009	4.549
Price adjusted brand equity at time t:	0.6402	0.0375	p=0.0005	5.829
Constant:	0.0143	0.0036	P=0.0001	

An immediate concern, in Table 6.4 above, is the negative sign for share of dealerships. The high values of the Variance Inflation Factors (VIFs) indicate a problem of multicollinearity in the data.

Although the statistics in Table 6.4 above would indicate a highly statistically significant multivariate relationship between market share and share of marketing effort, the contribution of each of the marketing variables towards the statistical relationship is compromised by the high VIFs. Although there is statistical ‘fit’, between market share and share of marketing effort, the estimated parameters provide little understanding of the relationship between market share and the individual marketing variables. In order to make an interpretation of the value of the parameters in the expression, a solution to the problem of multicollinearity, as represented by the high VIF values in Table 6.4 above, needs to be found.

6.2.2.1 An Excursion into The Problem of Multicollinearity in the Data.

Combining the marketing mix variables in a multiple regression equation brings with it the problem of multicollinearity as expressed in the Variable Inflation Factors (VIFs) for each of the marketing variables,

where....

$$VIF = 1/(1-R^2) \dots \dots \dots \text{(Equation 6.2)}$$

and...

R^2 = Coefficient of determination,

VIFs are obtained by regressing, in turn, one independent variable on the remaining independent variables. A VIF is equal to 1 when R^2_k is equal to 0, when X_k is not linearly related to the other X variables (ie. a VIF of ‘1’ indicates an absence of multicollinearity). A VIF in excess of 10 is taken as an indication of serious multicollinearity that may be unduly influencing the least squares estimates in a multiple regression expression (Neter, Wasserman, Kutner 1985). The situation is illustrated by the relatively high VIF values in Table 6.4 previously. This table indicates that it is difficult to make an interpretation of the value of the coefficients of the marketing variables in terms of their contribution to market share. This problem renders the

analysis of little value in achieving an understanding of the relationship between market share and variables representing marketing effort.

It has been suggested that multicollinearity is a fact of life:

“To listen to some scholars, a study of this sort would appear to be unnecessary. The arguments, as I understand them, are two. The first is that collinearity is simply not a problem: one need only conduct one’s experiments with data that are not collinear. This is clearly the argument of those who have the luxury of selecting their data by experimental design as is indeed the case in many sciences. But in non-experimental sciences, such as economics, oceanography, astrophysics, education, social psychology, and even some elements of biology, physics, and chemistry, collinearity is a natural flaw in the data set resulting from the uncontrollable operations of the data-generating mechanism and is simply a painful and unavoidable fact of life” (Belsley 1988, p.8).

6.2.2.2 Possible Solutions to the Problem of Multicollinearity.

Some solutions have been offered to overcome the problem of multicollinearity (Hair, Anderson, Tatham, Black 1987). The solutions are shown below:

- (1) Omit one or more of the highly correlated predictor variables and seek others to help the prediction.
- (2) Use the model with the highly correlated predictors for prediction only: no attempt should be made to interpret the partial regression coefficients.
- (3) Use the simple correlations between each predictor and the dependent variable to understand the predictor-dependent relationship.
- (4) Use more sophisticated methods of analysis, such as Bayesian Regression, or as a special case Ridge Regression, or regression on principal components.

The first of the above approaches is regarded as a non-solution:

“...If an investigator has reason for including a variate in the regression model in the first place, there is just that much reason for not excluding it capriciously. And if otherwise, the investigator has no reason for including the variate” (Belsley 1988, p.301).

The second of the above approaches has been dealt with already. The regression approach has achieved a ‘statistical fit’ but with no real understanding of the explanatory power of each of the independent variables.

The use of simple correlations (point 3 above) between the dependent variable and each of the independent variables has been done and shown in the previous tables (Table 6.1, and Table 6.2, on page 60).

The more sophisticated methods of analysis (point 4 above) are explored below:

(a) Introduction Of New Data. Finding new data in most instances is very challenging. The data used in this thesis was collected from a variety of disparate sources, and selection was guided by the original works of Cook (1983), and Cook and Rothberg (1990). Data on such variables as the performance, styling, and customer appraisals of new passenger cars, although very likely most important in achieving a greater understanding of the relationship between marketing effort and market share, could not be found for this thesis.

(b) The Pure Bayes Approach: This approach suggests the use of some subjective, prior information on the parameters of the model. No such information was available for this thesis.

(c) The Mixed Estimation Approach: This approach relies on the inclusion of prior or auxiliary data in the data matrix

$$y = X\beta + \varepsilon \dots \dots \dots \text{(Equation 6.3)}$$

where,

X is the data matrix of the independent variables,

β the coefficients of the X variables,

ε the error term, and...

...in this case it is assumed that the investigator can construct 'r' linear prior restrictions on the elements of β . As has been indicated above, such prior or auxiliary information was not available for this thesis.

(d) Ridge Regression: This approach has been suggested as one of several methods that been proposed to remedy the problem of multicollinearity by allowing biased estimators of the regression coefficients. This is based on the idea that...

“...when an estimator has a small bias, and is more accurate than an unbiased estimator, it may have a larger probability of being close to the true parameter value” (Neter, Wasserman and Kutner 1985).

The following equation provides the standardised coefficients of the ridge regression coefficients equation shown below:

$$b^R = (r_{xx} + KI)^{-1} r_{yx} \dots \dots \dots \text{(Equation 6.4)}$$

b^R = Standardised ridge regression coefficient.

where....

$r_{xx} = X'X$, where X' is the transpose of the X matrix.

K = is the biasing constant such that $K \geq 0$,

I = diagonal identity matrix.

$r_{yx} = X'Y$, where Y is the matrix of y values.

The X and Y variables are transformed to standardised measures by dividing through each deviation variable in units of its standard deviations. The coefficients of the standardised variables then needs to be transformed back to the original parameters by the expression:

$$s_y/s_x \dots\dots\dots(\text{Equation 6.5})$$

where....

s_y = standard deviation of Y, and

s_x = standard deviation of each X variable.

The merit of Ridge Regression, as a procedure, is that the estimates tend to be stable, and are little affected by small changes in the data on which the regression is based. A major limitation is that...

“...ordinary inference procedures are not applicable and exact distributional properties are not known²; in addition the choice of a biasing constant K is a judgmental one” (ibid, 1985, p.300).

“...In assuming $K = 0$ a prior mean of zero is imposed on β ...a value whose relevance will typically be a happy accident” (Belsley 1988 p.300).

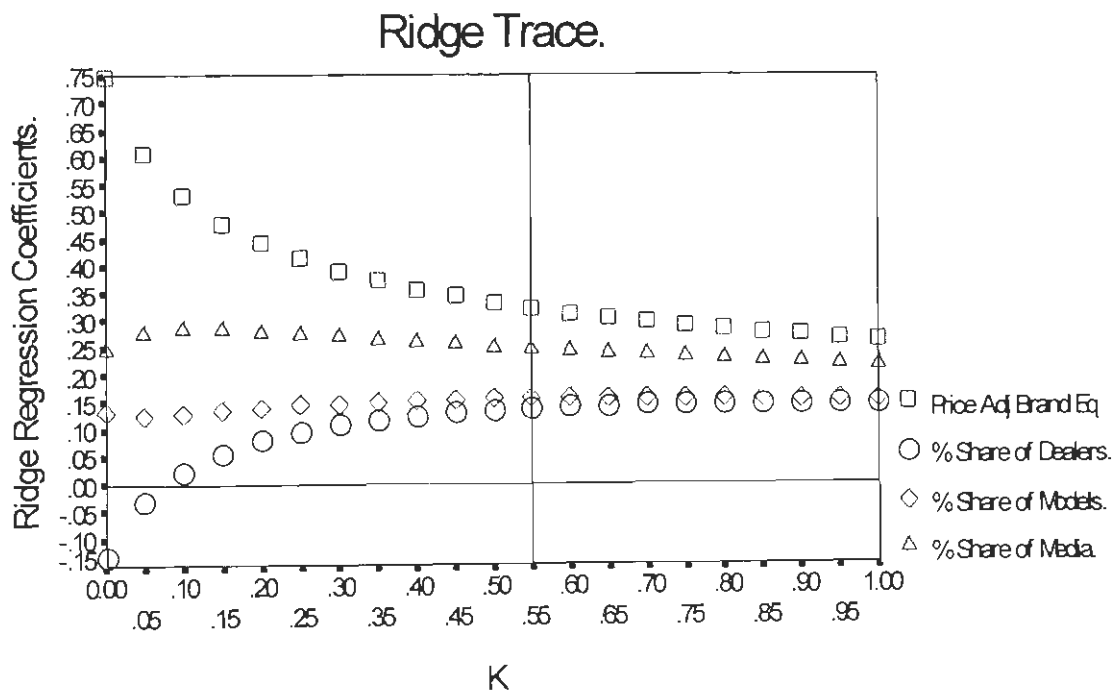
By exclusion, the option which will be explored in this thesis is that of Ridge Regression in attempting to overcome the problem of multicollinearity in the data.

² The makers of the SPSS statistical package do not agree that this is the case. The outputs from the SPSS program using Ridge Regression provide standard errors of the estimates for the independent and dependent variables, and also provide associated measures of statistical significance. In response to an inquiry from the writer regarding the validity of the distributional estimates that are provided in the output associated with the Ridge Regression procedure, the reply from SPSS was that “...our assumption is that the distributional properties we estimate are reasonably reliable”. Unfortunately, no argument was provided to support that point of view. This thesis will take a conservative approach by assuming, for the time being, that “ordinary inference procedures are not available”(ibid, 1985)

6.2.2.3 The Application of Ridge Regression as a Solution to the Problem of Multicollinearity.

Figure 6.1 below demonstrates the application of ridge regression to the exploration of the relationship between market share and share of marketing effort in media, models, dealerships, and price (ie. price adjusted brand equity) (SPSS for Windows, Advanced Statistics, Release 6.0, p.534). With increasing values of the biasing constant K, the coefficients of multiple regression become more stable for each variable in the ridge trace (See Figure 6.1, page 68). In line with expectation, the coefficient for share car dealerships becomes positive where in Table 6.4, (page 62) it was quite strongly negative.

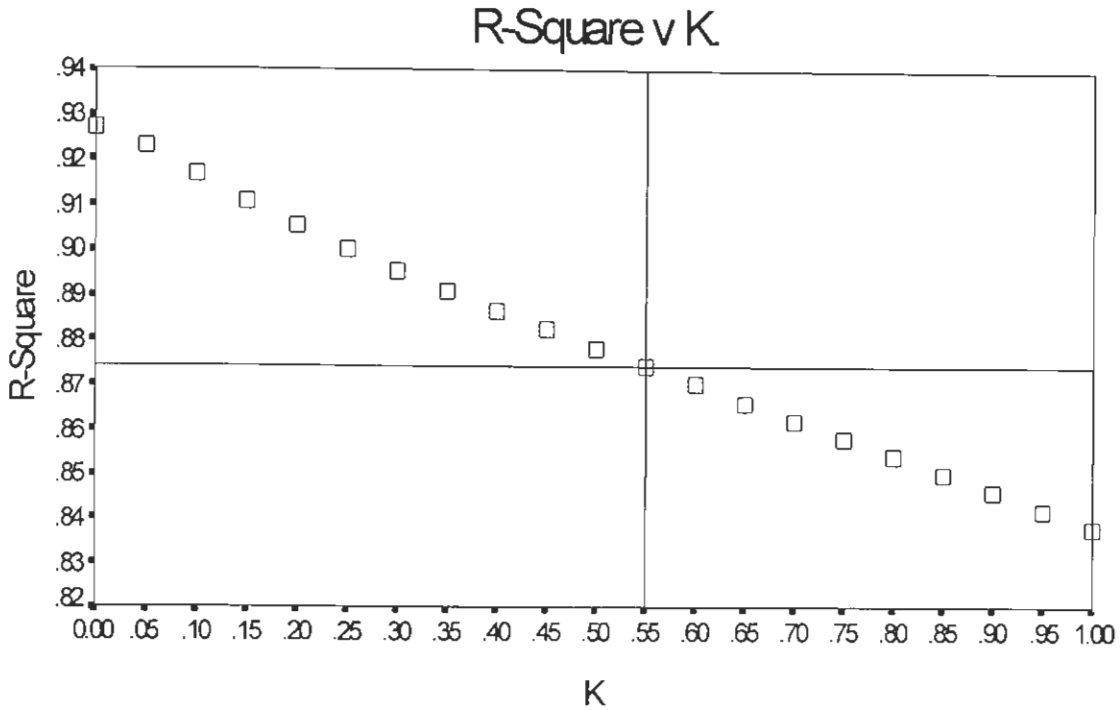
Figure 6.1 The Application of Ridge Regression to the Resolution of Multicollinearity in the Data³.



It needs to be recognised that, in exchange for the increased stability of the estimated parameters, that there is a loss of explanatory power, as measured by the Coefficient Of Multiple Determination (R^2) as shown in Figure 6.2 on page 69 below

³ Price Adj Brand Equity refers to Price Adjusted Brand Equity. For details of the calculation see page 61.

Figure 6.2 Explanatory Power, Using Ridge Regression, with Increasing Values of the Biasing Constant K.



Despite the loss of explanatory power shown in Figure 6.2 above, the results remain robust as shown in Table 6.5 below:

Table 6.5 Ridge Regression Output (With K = 0.55) for Market Share Regressed on Share of Investments in Media, Car Models, Dealerships, and Price Adjusted Brand Equity (N=227).

Multiple R:	0.9350
R ² :	0.8742

The parameter estimates associated with each of the variables has been moderated by the value of K as shown in Table 6.6 on page 70 below:

Table 6.6 Parameter Estimates using Ridge Regression with Market Share Regressed on Share of Investments in Media, Car Models, Dealerships, and Price Adjusted Brand Equity (N=227).

Variable:	β:	Standardised β	VIF:
% Share of media:	0.3013	0.2444	1.1274
% Share of models:	0.3451	0.1556	1.0364
% Share of dealerships:	0.4125	0.1387	1.0884
Price adjusted brand equity at time t:	0.2754	0.3216	1.1247
Constant:	-0.0089		

Eighty-seven percent of the variability in market share is explained by the marketing mix variables (See Table 6.5 on page 69 above). The benefit of Ridge Regression is that the contribution by each of the variables to market share is more clearly understood. The relative importance of the marketing variables is given by the standardised β -coefficients (Hair, Anderson, Tatham, Black 1987, p.20) that show that media and price adjusted brand equity are the two key variables in the relationship. This understanding is achieved by reducing or eliminating the effect of multicollinearity in the data. The VIFs in Table 6.6 above are close enough to 1 to suggest that the problem has been substantially resolved.

The relationship between market share and share of marketing effort was confirmed by means of the Multiplicative Competitive Interaction Model of market share determination. This was done to:

“...examine the elasticities for model share, media share, dealer share, and price adjusted brand equity” (Cook and Rothberg 1990, p.318).

6.2.3 Parameter Estimates Using the Multiplicative Competitive Interaction Model of Market Share Determination.

The authors (*ibid* 1990) did not specify which form of the MCI model was used; either the ordinary (OLS) or generalised least squares (GLS) method of parameter estimation. This thesis will use both OLS and GLS approaches applied to the model of market share

determination proposed by Cooper and Nakanishi (1988). This approach uses The Theorem Of Market Share Determination shown in Equations 6.6 and 6.7 below :

$$S_i = M_i / \sum M_j, \text{ for } i = 1, 2, \dots, n, \dots \dots \dots \text{(Equation 6.6)}$$

where...

S_i = the estimated market share of seller s_i .

M_i = the marketing effort of seller i .

M_j = the marketing effort of all sellers.

and...

$$M_i = \exp(\alpha_i) \prod_{k=1}^K X_{ki}^{\beta_k}, \dots \dots \dots \text{(Equation 6.7)}$$

where.....

X_{ki} = the value of the k th explanatory variable X_k for brand i .

K = the number of explanatory variables.

α_i = the constant level of brand influence for brand i .

β_k = the market share elasticity for variable k .

The formal development of the theorem of market share determination rests on the following assumptions (Bell, Keeney and Little 1975 p.137):

1. That marketing effort⁴ is non-negative and non-zero.
2. That a seller with zero marketing effort has no market share.
3. Two sellers with equal marketing efforts have equal market share.

⁴ The original equation by Cooper and Nakanishi (1988) used the concept of attraction. Since the concept of attraction and marketing effort are synonymous, marketing effort has been used in Equation 6.6 instead of attraction (*ibid* 1988, p.25).

4. The market share of a given seller will be affected in the same manner if the marketing effort of any other seller is increased by a fixed amount.

For the purpose of parameter estimation, Equation 6.7 above is linearizable with respect to the parameters but not the variables (Lilien, Kotler, Moorthy 1992). Using the following adaptation of the above equation, (Cooper and Nakanishi 1988, p.110) ordinary least squares regression can be used for parameter estimation:

$$\text{Ln}(S_i) = \alpha_i + \sum_{j=2}^m \alpha'_j d_j + \sum_{u=2}^T \gamma_u D_u + \sum_{k=1}^K \beta_k \text{Ln} X_{kit} + \varepsilon_{it} \dots \dots \dots \text{(Equation 6.8)}$$

The above expression transforms as follows where a **single** independent variable is involved:

$$\text{Ln}(S_i) = \alpha_i + \sum_{j=2}^m \alpha'_j d_j + \sum_{u=2}^T \gamma_u D_u + \beta_k \text{Ln} X_{kit} + \varepsilon_{it} \dots \dots \dots \text{(Equation 6.9)}$$

where...

m = the number of brands.

T = the number of time periods.

α'_j = estimate of baseline differences between brands ($\alpha_i - \alpha_1$), where brand 1 is an arbitrarily chosen brand,

ε_{it} = the error term for brand i at time t .

d_j = a dummy (brand) variable which take the value 1 if $j = i$, or 0, if otherwise.

D_u = a dummy (period) variable which takes the value 1 if $u = t$, or 0, if otherwise.

Where brand intercepts are not required (ie α'_j) and time varying dummy variables not needed, the equation is as follows:

$$\text{Ln}(S_i) = \alpha_i + \beta_k \text{Ln}X_{kit} + \varepsilon_{it} \dots \dots \dots (\text{Equation 6.10})$$

Both equations 6.9 (with brand intercepts) and 6.10 (without brand intercepts) will be used for parameter estimation in this thesis.

6.2.3.1 The Ordinary Least Squares (OLS) Method of Parameter Estimation.

Table 6.7 below examines the relationship between market share and marketing effort using the MCI Model, in this instance using the OLS approach for parameters estimation. The equation uses the natural log transformation of both the dependent and independent variables, and the method is that used by Cooper and Nakanishi (1988, p.110):

Table 6.7 OLS Parameter Estimates Using the MCI Model of Market Share Determination (N=227).

Log Variables	Parameter Estimates with Brand Intercepts.		Parameter Estimates without Brand Intercepts.	
	Estimated β		Estimated β	
Media \$:	0.4456	p<0.0005	0.8406	p<0.0005
No of car models:	0.9371	p<0.0005	1.8364	p<0.0005
No of car dealerships:	2.0214	p<0.0005	2.0970	p<0.0005
Weighted Average Price:	-1.8562	p=0.0026	-1.0908	p<0.0005

The estimated parameters (β) for each of the variables is positive, in Table 6.7 above, for investments in media, the number of car models, and car dealerships. The estimated parameter is negative for price. Each of the parameter estimates is statistically significant using the OLS approach. The result has face validity; the signs are in the expected direction. A positive association would be expected to exist between market share and investments in media, car models, and dealerships. Market share and price would be expected to move in opposite directions; as price goes up, market share declines.

6.2.3.2 The Generalised Least Squares (GLS) Method of Parameter Estimation.

Table 6.8 below looks at the same variables, but in this case the GLS approach is used to estimate the parameters of the regression equation:

Table 6.8 GLS Parameter Estimates Using the MCI Model of Market Share Determination (N=227).

Log Variables.	Parameter Estimates with Brand Intercepts.		Parameter Estimates without Brand Intercepts.	
	Estimated β		Estimated β	
Media \$:	0.2685	p=0.0114	0.6135	p<0.0005
No of car models:	0.1365	p=0.6544	1.3542	p<0.0005
No of car dealerships:	1.8879	p<0.0005	1.7297	p<0.0005
Weighted Average Price:	-0.9423	p=0.1246	-0.6965	p=0.0006

In Table 6.8 above, estimates of β are statistically significant and positive for media and dealerships, but not for models and weighted average price, when the MCI model is used with brand intercepts.

Parameter estimates, without brand intercepts, are positive and statistically significant for media, models, and dealerships, and negative and statistically significant for price.

The GLS approach to parameter estimation is specifically selected because it:

“...removes the autocorrelation in the data” (SPSS for Windows, Trends, Release 6.0 1993, p.125).

Autocorrelation in the data appears to be a greater problem when parameters are estimated with brand intercepts than when they are estimated without brand intercepts.

6.2.4 The Relationship Between Market Share and Share of Marketing Effort Using Categorical Variables.

Table 6.9 below shows the categories of data (ie. lower, middle and upper thirds of manufacturers according to market share, share of media, models, dealerships and price adjusted brand equity) for the purpose of the analysis.

Table 6.9 Categories of Market Shares⁵, and Share of Marketing Effort Among Car Makers.

Variables:	Lower Third of Manufacturers:	Middle Third of Manufacturers:	Upper Third of Manufacturers:
Unit market share:	≤0.2%	>0.2% and ≤1.6%	>1.6%
Share of Media:	≤0.6%	>0.6% and ≤2.7%	>2.7%
Share of car models:	≤1.8%	>1.8% and ≤4.3%	>4.3%
Share of car dealerships:	≤2.4%	>2.4% and ≤4.6%	>4.6%
Price adjusted brand equity at time t:	≤-0.6%	>-0.6% and ≤1.8%	>1.8%

Examining the relationship among the categories representing market share and share of investments in marketing mix variables produces the results shown in Table 6.10 below:

Table 6.10 Chi-square Test of Association Between Market Share and Share of Investments in Media, Car Models, Dealerships, and Price Adjusted Brand Equity (N=227).

Variables:	Pearson Chi-square:	Degrees of Freedom:	Statistical Significance:
% Share of media:	239.610	4	p<0.0005
% Share of models:	123.063	4	p<0.0005
% Share of dealerships:	161.619	4	p<0.0005
Price adjusted brand equity at time t:	222.755	4	p<0.0005

Table 6.10 above confirms a statistically significant relationships between market share and share of marketing effort for each of the marketing variables. An examination of the

⁵ The market shares set the boundaries between three equal size groups of manufacturers.

chi-square matrices confirms that the relationship is a positive between market share and each of the marketing variables.

6.3 HYPOTHESIS: THE CONCURRENT RELATIONSHIP BETWEEN MARKET SHARE AND SHARE OF MARKETING EFFORT.

Section 6.3 restates the relevant hypothesis and presents the conclusion based on the analysis undertaken in Section 6.2 previously.

Hypothesis 1: Market share is statistically independent of **concurrent** share of **marketing effort**, as measured as the share of investments in media, models, dealerships and price adjusted brand equity.

The evidence presented in Section 6.2 of this chapter points to the rejection of Hypothesis 1. There is a statistically significant, and positive relationship between market share and concurrent share of marketing effort.

6.4 THE RELATIONSHIP BETWEEN MARKET SHARE AND ONE PERIOD LAGGED SHARE OF MARKETING EFFORT.

6.4.1 The Correlation Between Market Share and Lagged Share of Investments in Marketing Effort.

Cook and Rothberg (1990) did not look at the relationship between market share and share of marketing effort when the latter was lagged in relation to market share. In order to complete the analysis, the relationship between market share and the share of lagged marketing effort will be examined in the remainder of this chapter.

Table 6.11 and Table 6.12 below examine the relationship between unit market share and each of the lagged marketing variables separately:

Table 6.11 Correlation of Market Share with Lagged Share of Investments in Marketing Variables (N=226).

Lagged Variables:	Pearson's Correlation Coefficient:	Statistical Significance:
% Share of Media:	0.8143	p<0.0005
% Share of Models:	0.7250	p<0.0005
% Share of Dealerships:	0.7204	p<0.0005
Price adjusted Brand Equity:	0.8744	p<0.0005

As before, (See Table 6.1, page 60) Table 6.11 above demonstrates a statistically significant and positive linear relationship between market share and share of marketing effort for each of the marketing variables. This result is also reflected in Table 6.12 below where the rank order relationship between market share and share of marketing effort confirms the statistical relationship between market share and lagged share of marketing effort.

Table 6.12 Rank Order Correlation of Lagged Market Share with Share of Investments in Marketing Variables (N=226).

Lagged Variables:	Spearman's Coefficient of Rank Correlation:	Statistical Significance:
% Share of Media:	0.8205	p<0.0005
% Share of Models:	0.7497	p<0.0005
% Share of Dealerships:	0.7548	p<0.0005
Price adjusted Brand Equity:	0.7764	p<0.0005

It needs to be noted that in each of the above tables (ie. Table 6.11 and Table 6.12) that the correlations between lagged share of marketing effort and market share are not as powerful as they are when the relationship between market share and concurrent share of marketing effort is examined (See Table 6.1 and Table 6.2 both on page 60). It may be that larger or smaller lags capture the relationship more effectively than just the one year lag that is examined in this thesis.

6.4.2 Multiple Regression of Market Share on One Period Lagged Share of Marketing Effort.

The results from regressing market share on share of lagged share of marketing effort, expressed as the share of investments in media, car models, dealerships, and price adjusted brand equity, is shown in Table 6.13 below:

Table 6.13 Multiple Regression Output for Market Share Regressed on Lagged Share of Investments in Media, Car Models, Dealerships, and Price Adjusted Brand Equity (N=226).

Multiple R:	0.88884
R ² :	0.79003
Adjusted R ² :	0.78623
Standard error:	0.03268
F-Statistic:	207.8855
Statistical significance of F:	p<0.0005

The result shown in Table 6.13 above is statistically significant although the overall 'fit' is not as good as for the concurrent situation (See Table 6.3, page 62).

Table 6.14 below sets out the parameter estimates for the lagged situation.

Table 6.14 Parameter Estimates using Multiple Regression with Market Share Regressed on Lagged Share of Investments in Media, Car Models, Dealerships, and Price Adjusted Brand Equity (N=226).

Lagged Variable:	β :	Std Error β :	Statistical Significance:	VIF:
% Share of Media:	0.2065	0.0898	p=0.0224	5.586
% Share of Models:	0.3498	0.1312	p=0.0082	3.686
% Share of dealerships:	-0.6827	0.1962	p=0.0006	4.582
Price adjusted brand equity:	0.6900	0.06373	p<0.0005	5.831
Constant:	0.02582	0.0062	P<0.0005	

The parameter estimates in the Table 6.14 above are statistically significant, but their meanings are compromised by multicollinearity as shown by the high values of the VIFs. As before, the approach to resolving this problem is the use of Ridge Regression.

6.4.2.1 Ridge Regression Applied to The Relationship Between Market Share and One Period Lagged Share of Investment in Marketing Mix Variables.

The relationship between market share and the share of investments in marketing mix variables using Ridge Regression to resolve the problem of multicollinearity is shown in Table 6.15 below:

Table 6.15 Ridge Regression Output for Market Share Regressed on Lagged Share of Investments in Media, Car Models, Dealerships, and Price Adjusted Brand Equity (N=226).

Multiple R:	0.8541
R ² :	0.7295

The overall result, as shown in Table 6.15 above is statistically significant, although the individual measures are somewhat weaker than those shown for the concurrent situation (See Table 6.5, page 69). Over seventy percent of the variability in market share is accounted for by the marketing mix variables representing share of marketing effort.

Table 6.16 Parameter Estimates using Ridge Regression with Market Share Regressed on Lagged Share of Investments in Media, Car Models, Dealerships, and Price Adjusted Brand Equity (N=226).

Lagged Variable:	β :	Standardised β	VIF:
% Share of media:	0.2692	0.2184	1.1303
% Share of models:	0.3219	0.1046	1.0273
% Share of dealerships:	0.3111	0.1453	1.0806
Price adjusted brand equity:	0.2678	0.3127	1.1270
Constant:	-0.0025		

Using Ridge Regression with $K=0.55$, the problem of multicollinearity has been practically eliminated, as shown in Table 6.16 above, by VIF values approaching 1. The contribution of each of the marketing variables to the relationship between market share

and marketing effort is easier to understand. As before, using the β -Coefficients, the key marketing variables are media and price adjusted brand equity.

6.4.3 Parameter Estimates Using the MCI Model of Market Share Determination where Marketing Mix Variable are Lagged for One Period.

The next section presents the parameter estimates using the MCI model of market share determination, with and without brand intercepts, and using both OLS and GLS approaches (Cooper and Nakanishi 1988, p.110)

6.4.3.1 The Ordinary Least Squares (OLS) Approach to Parameter Estimation For the One-Period Lagged Situation.

Table 6.17 below sets out the parameter estimates using the Ordinary Least Squares (OLS) approach to parameter estimation.

Table 6.17 OLS Parameter Estimates Using the MCI Model of Market Share Determination For The Lagged Situation (N=226).

Log Variables.	Parameter Estimates with Brand Intercepts.		Parameter Estimates without Brand Intercepts.	
	Estimated β		Estimated β	
Media \$:	0.1368	p=0.2845	0.7029	p<0.0005
No of car models:	1.4849	p<0.0005	1.7588	p<0.0005
No of car dealerships:	1.3613	p=0.0016	1.7532	p<0.0005
Weighted Average Price	-1.6679	p=0.0209	-0.8973	p<0.0005

Table 6.17 above shows that the parameter estimate for media spend was not statistically significant when this was done for brand intercepts. Parameter estimates for the other marketing variables were statistically significant, the signs were positive for car models and dealerships, and negative for price, as would be expected (Kotler 1988).

The parameter estimates, shown in Table 6.17 above, without brand intercepts were all statistically significant and the signs were in keeping with expectation: positive for media, car models, dealerships, and negative for price.

6.4.3.2 The Generalised Least Squares (GLS) Approach to Parameter Estimation For The One-Period Lagged Situation.

The GLS approach to parameter estimation using the MCI model is shown in Table 6.18 below:

Table 6.18 GLS Parameter Estimates Using the MCI Model of Market Share Determination For The Lagged Situation (N=226).

Log Variables.	Parameter Estimates with Brand Intercepts.		Parameter Estimates without Brand Intercepts.	
	Estimated β		Estimated β	
Media \$:	-0.2051	p=0.1076	0.0340	p=0.6602
No of car models:	1.2204	p=0.0004	1.0668	p<0.0005
No of car dealerships:	-0.0737	p=0.8868	-0.2962	p=0.1945
Weighted Average Price:	-1.1805	p=0.1083	-0.0107	p=0.9595

Table 6.18 above shows that the parameter estimates, with brand intercepts, is statistically significant for car models only. The estimate approaches statistical significance for media, but the estimate is unstable (ie. the sign is negative when in most of the previous analyses, it was positive). The parameter estimate for weighted average price approaches statistical significance; the sign, in this case, is consistent with the findings in the previous analyses in this thesis (ie. it is negative).

Parameter estimates, in Table 6.18 above, with no brand intercepts, are no more helpful in the interpretation of the data. The only estimate that achieved statistical significance is that for car models.

Removing autocorrelation of the residuals, as the GLS approach does (SPSS for Windows, Trends 1993, Release 60 p.125) shows that the only parameter estimate that is statistically significant is for car models. This is the case where the analysis is done with and without brand intercepts.

The GLS approach (*ibid* 1993, p.125) does not support the OLS estimates of the response parameters in the Multiplicative Competitive Interaction (MCI) model of market share determination in all instances.

Cook and Rothberg (1990) confirmed the relationship between market share and share of marketing effort using the MCI model of market share determination, and demonstrated that the response parameters had face validity. It needs to be said that, according in this thesis, the result depends on the analysis that is used (ie. either the OLS or the GLS method). The method that was used by Cook and Rothberg was not specified in their paper (*op cit* 1990).

6.4.4 The Relationship Between Market Share and One Period Lagged Share of Marketing Effort Using Categorical Variables.

Table 6.19 below examines the relationship between market share and share of marketing effort using the same categories as before (See Table 6.9, page 75):

Table 6.19 Chi-square Test of Association Between Market Share and Share of Investments in Media, Car Models, Dealerships, and Price Adjusted Brand Equity (N=226).

Lagged Variables:	Pearson Chi-square:	Degrees of Freedom:	Statistical Significance:
% Share of media:	171.509	4	p<0.0005
% Share of models:	106.910	4	p<0.0005
% Share of dealerships:	122.225	4	p<0.0005
Price adjusted brand equity:	164.458	4	p<0.0005

In Table 6.19 above, the relationship between market share and share of marketing effort (in this case lagged for one period) is statistically significant and positive for all variables. Inspection of the chi-square matrices confirms that the relationship between market share and share of marketing effort for each of the variables is a positive one.

6.5 HYPOTHESIS: THE RELATIONSHIP BETWEEN MARKET SHARE AND ONE-PERIOD LAGGED SHARE OF MARKETING EFFORT.

This section restates the hypothesis and the conclusions regarding the relationship between market share and lagged share of marketing effort.

Hypothesis 2: Market share is statistically independent of **lagged** share of marketing effort, as measured as the share of investments in media, dealerships and price adjusted brand equity.

The evidence presented in Section 6.4 of this chapter points to the rejection of Hypothesis 2. A statistically significant and positive relationship exists between market share and lagged share of marketing effort. The overall result, however, is not as convincing as for the concurrent situation.

6.6 SUMMARY AND CONCLUSIONS.

This summary presents the results of this analysis for the following situations:

1. Where the relationship between market share and share of marketing effort are examined for the **concurrent** situation.
2. Where the relationship is between market share and when share of marketing effort is **lagged by one period** (in this case, of one year).

6.6.1 The Relationship Between Market Share and Share of Marketing Effort for the Concurrent Situation.

The quality of the statistical relationship between market share and share of marketing effort depended on the analysis that was performed.

A simple correlation analysis demonstrated a positive and statistically significant relationship between market share and share of marketing effort.

When the analysis was done to establish the relationship between market share and the effect of share of marketing effort, represented by all of the marketing mix variables, namely share of marketing effort in media, models, dealerships, and price (either as weighted average price, or price adjusted brand equity), the overall result was statistically significant and positive. However, the result was confounded by the high level of multicollinearity that existed between the marketing variables. This made it difficult to understand the relationship between market share and share of marketing effort when this was looked at as a multivariate relationship.

Amongst a number of possible solutions that are available to resolve the problem of multicollinearity is Ridge Regression. Ridge Regression introduces a known bias into the estimation of the regression coefficients, and, depending on the value selected will substantially reduce the amount of multicollinearity in the data. There is a cost that is attached to this technique. As the value of the bias constant is increased, there is a loss

of explanatory power resulting in a lower value of the Coefficient Of Multiple Determination (R^2).

The merit of Ridge Regression is that it stabilises the estimated coefficients of the marketing variables and makes them easier to interpret in terms of the relationship with market share. Ridge Regression proved to be a useful technique in this thesis for resolving the problem of multicollinearity, and making the marketing variables more stable, and easier to interpret.

An issue that was not resolved is that of the distributional properties that are associated Ridge Regression. The practical application of this technique is reduced as a result

Parameter estimates using the Ordinary Least Squares method (OLS) confirmed the relationship between market share and share of marketing effort, although there were differences between the two methods. Parameter estimates using the Generalised Least Squares (GLS) approach was not so consistently supportive of the relationship between market share and share of marketing effort.

An examination of the relationship between market share and share of marketing effort was confirmed when the variables were categorised and analysed by means of the Chi-square analysis.

The balance of evidence points to a positive and statistically significant relationship between market share and share of marketing effort for the concurrent situation.

6.6.2 The Relationship Between Market Share and One Period Lagged Share of Marketing Effort.

Simple correlations between market share and lagged share of marketing effort in media, models, dealerships and price confirmed a statistically significant relationship.

Regressing market share on marketing variables representing the share of marketing effort in media, models, dealerships and price (ie weighted average price, or price

adjusted brand equity) also demonstrated an overall statistically significant relationship. The problem of multicollinearity in the data was encountered.

Ridge Regression was used to resolve the problem, and to identify meaningful relationships in the data.

In each of the analyses, the relationship between market share and share of marketing effort, although statistically significant and positive, was not as convincing as it was for the concurrent situation.

Parameter estimates using the OLS approach **with brand intercepts** were positive and statistically significant for models and dealerships. The parameter estimate was negative and statistically significant for price. The parameter estimate was not statistically significant for media.

Parameter estimates, using the OLS technique, **without brand intercepts** were statistically significant and positive for media, car models and dealerships. Price was statistically significant and negative, as expected.

GLS estimation, with and without brand intercepts, produced a positive and statistically significant result for car models only.

The relationship between market share and lagged share of marketing effort was confirmed as being statistically significant and positive when both sets of variables were categorical. (For the categories, see Table 6.9, page 75).

The evidence supports the existence of a statistically significant relationship between market share and lagged share of marketing effort.

In the overall analysis, OLS and GLS approaches to parameter estimation produced different results, although, in the main, supporting the statistical relationship between market share and share of marketing effort for both the concurrent and lagged situation.

The GLS approach aims to remove the effect of autocorrelation of the residuals in the analysis, and it is likely that this is the explanation for the different results.

Chapter 7

7.0 THE RELATIONSHIP BETWEEN MARKET SHARE AND DIFFERENTIAL ADVANTAGE.

7.1 INTRODUCTION.

This chapter will analyse the relationship between market share and differential advantage in media, car models, dealerships and price adjusted brand equity under the following circumstances:

1. The **concurrent** relationship between market share and differential advantage.
2. The relationship between market share and differential advantage when differential advantage is **lagged** for one period.

7.2 THE CONCURRENT RELATIONSHIP BETWEEN MARKET SHARE AND DIFFERENTIAL ADVANTAGE.

7.2.1 The Correlation Between Market Share and Differential Advantage.

Table 7.1 below examines the correlations between market share and differential advantages in media, car models, dealerships, and price adjusted brand equity.

Table 7.1 Correlation of Market Share with Differential Advantage in Marketing Variables (N=227)

Variables:	Pearson's Correlation Coefficient:	Statistical Significance:
Differential Advantage-Media:	-0.6827	p<0.0005
Differential Advantage-Models:	-0.9146	p<0.0005
Differential Advantage-Dealerships:	-0.9632	p<0.0005
Differential Advantage-Price adjusted Brand Equity at time t:	0.2762	p<0.0005

Although the correlations between market share and differential advantage for each of the marketing mix variables are statistically significant, the signs (except for price), in Table 7.1, are in the wrong direction compared with the original work (Cook and Rothberg, 1990).

Scatterplots that show the relationship between unit market share and differential advantage for media, car models, dealerships, and price adjusted brand equity are included in Attachment 3. These confirm (for the concurrent relationship between market share and differential advantage) that the relationship between market share and differential advantage is a negative one for all but price adjusted brand equity.

Table 7.2 below examines the correlations between market share and differential advantage using Spearman's Coefficient of Rank Correlation. This was used in the original work (*ibid* 1990) because it is a measure that is immune from non-linearity in the data:

Table 7.2 Rank Order Correlation of Market Share with Differential Advantage in Marketing Variables (N=227).

Variables:	Spearman's Coefficient of Rank Correlation:	Statistical Significance:
Differential Advantage-Media:	-0.0294	p=0.661
Differential Advantage- Models:	-0.4222	p<0.0005
Differential Advantage-Dealerships:	-0.4090	p<0.0005
Differential Advantage-Price adjusted Brand Equity at time t:	0.5641	p<0.0005

Using Spearman's Coefficient of Rank Correlation, in Table 7.2 above shows that a statistically significant relationship exists between market share and differential advantage in models, dealerships, and price adjusted brand equity. The relationship between market share and differential advantage in media is not statistically significant. Although a statistically significant linear relationship exists between market share and differential advantage in media (See Table 7.1), the rank order of the relationship is not evident in Table 7.2 above.

7.2.2 Multiple Regression analysis of the Relationship Between Market Share and Differential Advantage.

Table 7.3 below looks at a multiple regression output, using market share as the dependent variable, and differential advantages for media, models, dealerships, and price adjusted brand equity as the independent variables:

Table 7.3: Multiple Regression Output for Market Share Regressed on Differential Advantage in Media, Car Models, Dealerships, and Price Adjusted Brand Equity (N=227).

Multiple R:	0.97506
R ² :	0.95075
Adjusted R ² :	0.94985
Standard error:	0.01532
F-Statistic:	1066.473
Statistical significance of F:	p<0.0005

The results in Table 7.3 above show a statistically significant, overall association between market share and differential advantage.

The parameter estimates associated with the multiple regression analysis are displayed in Table 7.4 below.

Table 7.4 Parameter Estimates using Multiple Regression with Market Share Regressed Differential Advantage in Media, Car Models, Dealerships, and Price Adjusted Brand Equity (N=227).

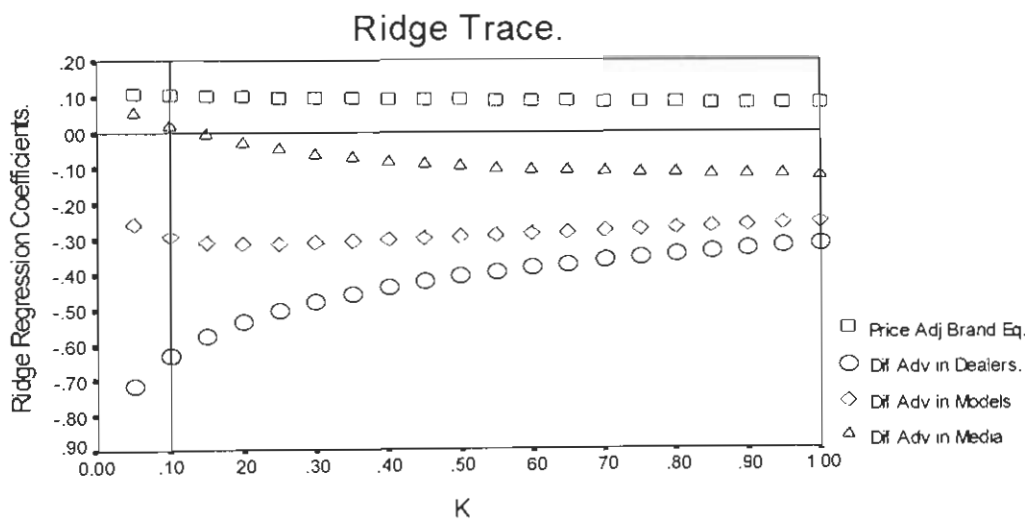
Variable:	β :	Std Error β :	Statistical Significance:	VIF:
Differential advantage-media:	0.1910	0.0541	p=0.005	2.729
Differential advantage-models:	-0.1950	0.0661	p=0.0032	9.250
Differential advantage dealerships:	-1.1890	0.0537	p<0.0005	7.187
Differential advantage-price adj brand equity at time t.	0.3069	0.0404	p<0.0005	1.173
Constant:	0.0424	0.0012	P<0.0005	

The parameter estimates in the Table 7.4 above are all statistically significant. The high VIF scores, particularly for car models and dealerships indicated that the estimates are highly correlated with the other variables, and that the parameter estimates are unstable (Neter, Wasserman, Kutner 1985).

As in Chapter 6, the approach selected to resolve the problem of multicollinearity is Ridge Regression as shown in Figure 7.1 below:

7.2.2.1 The Application of Ridge Regression as a Solution to the Problem of Multicollinearity - For the Concurrent Situation.

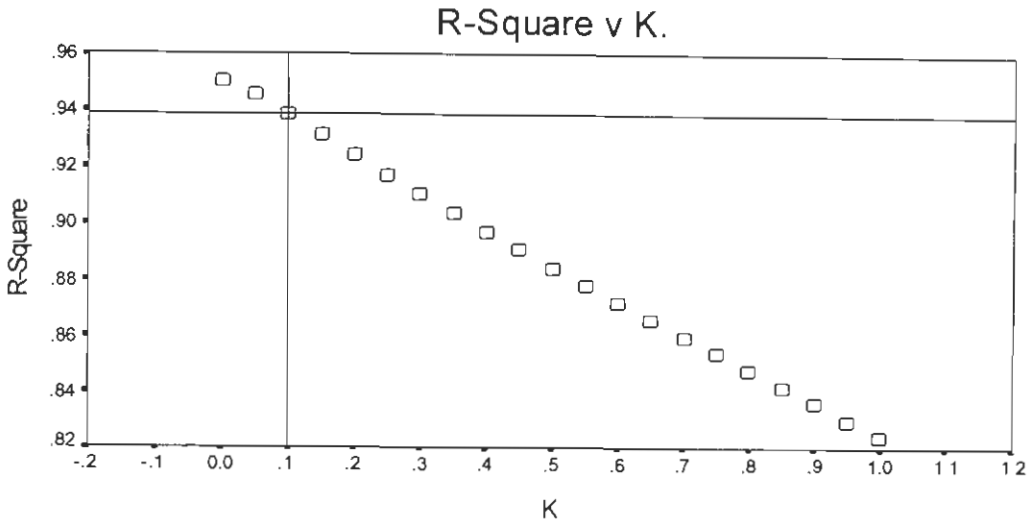
Figure 7.1 The Application of Ridge Regression (K=0.10) to the Resolution of Multicollinearity in the Data (Using Differential Advantage in Media, Models, Dealerships, and Price Adjusted Brand Equity as Independent Variables)



In Figure 7.1 above, differential advantage for price remains positive over increasing levels of the biasing constant (K). Parameter estimates for variables dealing with differential advantages in dealerships, models, and tend to negative values for higher values of K.

As was seen in Chapter 6, the loss of explanatory power that is evident when using Ridge Regression is shown in Figure 7.2 on page 92 below:

Figure 7.2 Explanatory Power, Using Ridge Regression (K=0.10), with Increasing Values of the Biasing Constant K.



A greater understanding of the coefficients of the regression equation is at the expense of the loss of explanatory power, as shown in Figure 7.2 above. Using a constant (K) of 0.10¹, the output using Ridge Regression is shown Table 7.5 below:

Table 7.5 Ridge Regression Output for Market Share Regressed on Differential Advantage in Media, Car Models, Dealerships, and Price Adjusted Brand Equity (N=227).

Multiple R:	0.96896
R ² :	0.93889

As can be seen from the Table 7.5 the overall association between market share differential advantage in media, models, dealerships and price continue to be powerful when a Ridge Regression analysis is performed..

The parameter estimates, and associated VIF values from the Ridge Regression procedure are shown in the Table 7.6 on page 93 below:

¹ A value of 0.10 has been selected in order to achieve the lowest possible VIF for each of the independent variables. Higher values of K (ie, greater than 0.10) result in some variables having VIF values of less than 1.

Table 7.6 Parameter Estimates using Ridge Regression with Market Share Regressed on Differential Advantage in Media, Car Models, Dealerships, and Price Adjusted Brand Equity (N=227).

Variable:	β:	Standardised β:	VIF:
Differential advantage-media:	0.0400	0.0183	1.960
Differential advantage-models:	-0.4281	-0.2942	3.806
Differential advantage dealerships:	-0.8416	-0.6274	3.222
Differential advantage-price adj brand equity at time t.	0.2611	0.10445	1.000
Constant:	0.0419		

The parameter estimates in Table 7.4, page 90 for differential advantage in media was quite strongly positive when multiple regression was done. After Ridge Regression (shown above), differential advantage in media was positive, but not strongly so. An examination of the ridge trace in Figure 7.1, page 91 showed that, with increasing values of K, that the parameter estimate for media tended to become negative, making it consistent with the other parameters in the expression..

Table 7.6 above indicates that ridge regression has substantially reduced, but not eliminated, the problem of multicollinearity in the data. However, two of parameters (models and dealerships) are strongly negative; media is just positive and price adjusted brand equity is positive. The result shows a mixed relationship between market share and differential advantage, and one that does not support the work of Cook and Rothberg (*op cit* 1990).

7.2.3 The Relationship Between Market Share and Differential Advantage Using Categorical Variables - The Concurrent Situation.

The following analysis examines two situations:

1. The first analysis examines the **concurrent** relationship between market share and differential advantage in media, models, dealerships and price adjusted brand equity using the Chi-square test of association.

2. The second analysis examines the relationship between the **change** in market share for one period over the preceding one and concurrent differential advantages in media, models, dealerships and price adjusted brand equity.. The Chi-square test of association is also used in this analysis.

7.2.3.1 Analysis of the **Concurrent** Relationship Between Market Share and Differential Advantage, Using the Chi-Square Test of Association.

The following set of analyses examines the relationship between categorical variables denoting low, medium, and high levels of market share (See Table 6.9, Chapter 6) and different categories of differential advantage in Table 7.7 below:

Table 7.7 Categories Of Differential Advantage.

Differential Advantage:	Category:
(Share of Marketing effort - Unit Market Share)>0:	Positive.
(Share of Marketing Effort - Unit Market Share)=0:	Neutral.
(Share of Marketing effort - Unit market share)<0:	Negative.

The categories of market share (See Table 6.9, Chapter 6) were analysed in relation to the different categories of differential advantage (shown in Table 7.7 above) to produce the results shown in Table 7.8 below:

Table 7.8 Chi-square Test of Association Between Market Share and Differential Advantage in Media, Car Models, Dealerships, and Price Adjusted Brand Equity (N=227).

Variables:	Person's Chi-square:	Degrees of Freedom:	Statistical Significance:
Differential Advantage-Media:	51.708	4	p<0.0005
Differential Advantage-Models:	126.137	4	p<0.0005
Differential Advantage-Dealerships:	118.633	2	p<0.0005
Differential Advantage-Price adjusted brand equity:	44.947	2	p<0.0005

Table 7.8 above confirms a statistically significant relationship between market share and differential advantages in media, models, dealerships, and price adjusted brand equity.

The concurrent relationship between market share and differential advantages in media, models, dealerships and price adjusted brand equity is a negative one. This is shown in Table 7.9 below: smaller car makers are shown to possess positive differential advantages, not the larger ones. It seems that large car makers do not require positive differential advantages to be successful.

Table 7.9 Analysis of The Association Between Market Share and Differential Advantage.

Differential Advantage in:	Positive Differential Advantage		Negative Differential Advantage.	
	Lower One-Third of Car Makers. N=	Upper One-Third of Car Makers. N=	Lower One-Third of Car Makers. N=	Upper One-Third of Car Makers. N=
Media:	65	34	5	40
Models:	76	24	0	49
Dealerships:	76	28	0	46
Price ²	12	49	64	25

Table 7.9 above clearly shows that positive differential advantages are more often associated with low market share firms than with their higher share competitors, a result that does not support the original work on the subject (*op cit* 1990).

Cook (1985) indicated that decisions to increase, or decrease, investment in marketing mix variables has the effect of creating a gap between a new level of marketing effort and current market share, in the short-term, until a new equilibrium between market share and marketing effort was found. The difference between the new level of competitive investment and current market share gives rise to the index called differential advantage. It was suggested in Chapter 3 that this index may be regarded as measuring (in the short term) competitive activity at the level of the individual firm.

² Price refers to Price Adjusted Brand Equity.

Table 7.9 above suggests that low share firms are more active in pursuing build strategies (ie marketing effort > concurrent market share (*op cit* 1990)) than are their larger counterparts. Positive differential advantages are more commonly associated with small market share firms as seen in Table 7.9 previously.

7.2.3.2 The **Concurrent** Relationship Between The Change in Market Share and Differential Advantage Using Chi-Square Analysis.

The analysis below examines the relationship between **changes**³ in market share and **different categories of differential advantage** (See Table 7.7, page 94). A positive relationship was demonstrated in the original work (*op cit*, 1990) between these variables. It was on the basis of the relationship between changes in market share and positive, neutral, and negative states of differential advantage that the proposition supporting the concept of differential advantage was based (*ibid* 1990).

Table 7.10 Chi-square Test of Association Between Change in Market Share and Differential Advantage in Media, Car Models, Dealerships, and Price Adjusted Brand Equity (N=227).

Variables:	Pearson's Chi-square:	Degrees of Freedom:	Statistical Significance:
Differential Advantage-Media:	9.767	4	p=0.0445
Differential Advantage-Models:	7.321	4	p=0.1199
Differential Advantage-Dealerships:	5.745	2	p=0.0566
Differential Advantage-Price adjusted brand equity:	9.975	2	p=0.0068

In Table 7.10 above, the overall relationship between changes in market share and different levels of differential advantage (ie. Positive, stable, or negative) are statistically significant for media, car dealerships, price adjusted brand equity, but not for car models. At an overall level, this analysis is, only in part, able to support the original of Cook and Rothberg (1990).

³ The change in market share is coded according to an increase (1), equality with (2), or a decrease (3) in relation to market share in the previous period.

Table 7.11 below examines levels of differential advantage with changes in market share.

Table 7.11 The Correspondence Between Differential Advantage and Changes in Market Share.

Variables.	Positive Differential Advantage.		Negative Differential Advantage.	
	'+' Change in Market Share.	'-' Change in Market Share.	'+' Change in Market Share.	'-' Change in Market Share.
	N=	N=	N=	N=
Media:	62	84	30	24
Models:	66	84	25	25
Dealerships:	71	85	21	25
Price ⁴ :	39	40	53	70

Although there is an overall statistically significant relationship between changes in market share and levels of differential advantage (with the exception of car models) for the marketing variables (See Table 7.10, previously), Table 7.11 above suggests that positive states of differential advantage are mostly associated with negative changes in market share. This aspect of this thesis does not support the work of Cook and Rothberg (1990).

Table 7.12 below summarises two findings in this thesis with respect to the relationship between differential advantage and (1) market share, and (2) change in market share.

Table 7.12 Relationship of Differential Advantage to Market Share and to Change in Market Share.

Characteristic of Differential Advantage:	Market Share Performance:
Differential advantage is '+'	Market share tends to be low.
Differential advantage is '+'	Change in market share is negative

The result in Table 7.12 above contradicts the work of Cook and Rothberg (1990) that reported a positive relationship between differential advantage and change in market share.

⁴ Price Adjusted Brand Equity.

Table 7.13 below examines the relationship between change in market share and market share when differential advantage is positive.

Table 7.13 The Relationship Between Changes in Market Share and Share of Car Makers When Differential Advantage is Constant.

Variable:	Differential Advantage = '+'.		
	Lower One-Third of Car Makers. N=	Upper One-Third of Car Makers. N=	Total.
'+' Change in Market Share.	52	68	120
'0' Change in Market Share.	40	15	55
'-' Change in Market Share.	129	62	191
Total:	221	145	366

The results in the above table are statistically significant as shown below:

Chi-Square = 22.171	P<0.005
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The analysis in Table 7.13 above confirms that positive differential advantage is related to lower market share firms and negative changes in market share. This is a contradiction of the work by Cook and Rothberg (*op cit* 1990).

The final analysis in this section returns to the original question, that of the relationship between market share and differential advantage?

In the previous analyses there is an overall negative relationship between market share and differential advantages in marketing mix variables. Specifically, Table 7.9, on page 95 indicated that positive differential advantages are more often associated with low share car makers. The question that remains to be asked is if there is a relationship between market share and differential advantages when the analysis is confined to the lower-one third of firms as measured in terms of market share?

The following tables set out the analyses between market share and differential advantages in media, models, dealerships and price adjusted brand equity for the lower one-third of car makers.

Table 7.14 Correlation of Market Share with Differential Advantage in Marketing Variables for the Lower-One Third of Car Makers as Measured in Market Share (N=76).

Variables:	Pearson's Correlation Coefficient.	Statistical Significance.
Differential Advantage-Media:	0.2863	p=0.012
Differential Advantage-Models:	0.0652	p=0.576
Differential Advantage-Dealerships:	0.4533	p<0.0005
Differential Advantage-Price Adjusted Brand Equity:	0.4668	p<0.0005

The same analysis is repeated in Table 7.15 below using Spearman's Coefficient of Rank Correlation.

Table 7.15 Rank Order Correlation of Market Share with Differential Advantage in Marketing Variables for the Lower One-Third of Car Makers as measured in Market Share (N=76).

Variables:	Spearman's Coefficient of Rank Correlation.	Statistical Significance.
Differential Advantage-Media:	0.4385	p<0.0005
Differential Advantage-Models:	0.0580	p=0.618
Differential Advantage-Dealerships:	0.4863	p<0.0005
Differential Advantage-Price Adjusted Brand Equity:	0.4708	p<0.0005

Table 7.14 and Table 7.15 demonstrate a statistically significant positive linear, but weak relationship between market share and differential advantages in media, dealers, and price adjusted brand equity, but not in models, when the analysis is restricted to smaller market share performers. Only at this subset does the analysis confirm the work of Cook and Rothberg (*op cit* 1990).

7.3 HYPOTHESES: THE **CONCURRENT** RELATIONSHIP BETWEEN MARKET SHARE AND DIFFERENTIAL ADVANTAGES IN MEDIA, MODELS, DEALERSHIPS AND PRICE ADJUSTED BRAND EQUITY.

Section 7.3 restates Hypotheses 3 and 5 for the concurrent relationship between market share and differential advantages in marketing variables, and sets out the conclusions based on the previous analyses.

Hypothesis 3: Market share is statistically independent of **concurrent differential advantage** as measured by the concurrent difference between share of investments in media, car models, dealerships, price adjusted brand equity and market share.

The evidence supports the (overall) rejection of Hypothesis 3. A statistically significant relationship exists between market share and differential advantage. However, it needs to be emphasised that, in this thesis, the relationship between market share and differential advantage is a negative one, for all the marketing variables except price adjusted brand equity. The negative association between market share and differential advantage, in this thesis, does not support the findings of the original work on this subject (Cook and Rothberg 1990).

A subset analysis shows a weak, but statistically significant, positive relationship between market share and differential advantage. This level of analysis supports the work of Cook and Rothberg (*ibid* 1990). This suggests that the new passenger car market is not a homogeneous one with respect to the relationship between market share and differential advantage.

Hypothesis 5: Changes in market share are statistically independent of the firm's **concurrent** differential advantages.

Hypothesis 5 is rejected. Changes in market share are dependent on concurrent differential advantages for three out of the four marketing variables examined in this thesis. The fine detail of the analysis, in this thesis, point to the fact that

positive differential advantages in marketing variables are associated with small share car makers and minus changes in market share. This result is different from that reported by Cook and Rothberg (*op cit* 1990).

7.4. THE RELATIONSHIP BETWEEN MARKET SHARE AND LAGGED DIFFERENTIAL ADVANTAGE.

7.4.1 The Correlation Between Market Share and One-Period Lagged Differential Advantage

In the following analyses, marketing mix variables were lagged by one period relative to market share. A new index of differential advantage was calculated as follows:

$$\text{Differential Advantage} = (M_{i, t-1} / \sum M_{j, t-1}) - m_{1t} \dots \dots \dots (\text{Equation 7.1})$$

Where,

$M_{i, t-1}$ = Company i's lagged marketing effort,

$M_{j, t-1}$ = The lagged marketing effort of all companies.

m_{1t} = The firm's or brand's concurrent share of unit sales.

Table 7.16 and Table 7.17 below examine the correlations between market share and lagged differential advantage for media, car models, dealerships and price adjusted brand equity

Table 7.16 Correlation of Market Share with Lagged Differential Advantage in Marketing Variables (N=226).

Lagged Variables:	Pearson's Correlation Coefficient:	Statistical Significance:
Differential Advantage-Media:	-0.5848	p<0.0005
Differential Advantage-Models:	-0.9079	p<0.0005
Differential Advantage-Dealerships:	-0.9558	p<0.0005
Differential Advantage-Price adjusted Brand Equity:	0.0374	p=0.576

Table 7.16 above shows a statistically significant relationship between market share and lagged differential advantages in media, models, dealerships. The relationship was not demonstrated between market share and price adjusted brand equity.

Table 7.17 below examines the rank correlation between market share and lagged differential advantages.

Table 7.17 Rank Order Correlation of Market Share with Lagged Differential Advantage in Marketing Variables (N=226).

Lagged Variables:	Spearman's Coefficient of Rank Correlation:	Statistical Significance:
Differential Advantage-Media:	-0.1521	p=0.022
Differential Advantage- Models:	-0.4353	p<0.0005
Differential Advantage-Dealerships:	-0.4565	p<0.0005
Differential Advantage-Price adjusted Brand Equity:	0.3214	p<0.0005

Table 7.17 above demonstrates a statistically significant relationship between market share and differential advantages with respect to each of the marketing variables.

As noted previously (See Table 7.1 and Table 7.2 on pages 88 and 89 respectively) the signs for all variables (except price adjusted brand equity) are negative in Tables 7.16 and 7.17 above.

7.4.2 Multiple Regression Analysis of the Relationship Between Market Share and One-Period Lagged Differential Advantage.

Regressing market share on one-period lagged differential advantages in media, models, dealerships and price adjusted brand equity produces the following results in Table 7.18 on page 103 below :

Table 7.18 Multiple Regression Output for Market Share Regressed on Lagged Differential Advantage in Media, Car Models, Dealerships, and Price Adjusted Brand Equity (N=226).

Multiple R:	0.97595
R ² :	0.95247
Adjusted R ² :	0.95161
Standard error:	0.01555
F-Statistic:	1107.164
Statistical significance of F:	p<0.0005

The result from the Table 7.18 above shows an, overall, statistically significant multivariate relationship between market share and lagged differential advantage for each of the marketing variables.

The parameter estimates that are associated with the multiple regression procedure are shown in Table 7.19 below:

Table 7.19 Parameter Estimates using Multiple Regression with Market Share Regressed on Lagged Differential Advantage in Media, Car Models, Dealerships, and Price Adjusted Brand Equity (N=226).

Lagged Variable:	β :	Std Error β :	Statistical Significance:	VIF:
Differential advantage-media:	0.0661	0.0430	p=0.1255	2.898
Differential advantage-models:	-0.1089	0.0630	p=0.0850	10.132
Differential advantage dealerships:	-1.1808	0.0537	p<0.0005	8.421
Differential advantage-price adj brand equity.	0.3224	0.0306	p<0.0005	1.400
Constant:	0.0422	0.0012	P<0.0005	

The high VIF scores point to the instability of the parameter estimates in Table 7.19 above, making it difficult to form any assessment of the relationship with market share. The sign for differential advantage in media has been reversed compared with the previous correlations (See Table 7.16 and Table 7.17)

7.4.2.1 The Application of Ridge Regression as a Solution to the Problem of Multicollinearity - For the Lagged Situation.

The problem of multicollinearity in the data, as shown by the high VIF values is again addressed using Ridge Regression.

Table 7.20 Ridge Regression Output for Market Share (K=0.15) Regressed on Lagged Differential Advantage in Media, Car Models, Dealerships, and Price Adjusted Brand Equity (N=226).

Multiple R:	0.96581
R ² :	0.93280

The overall multivariate relationship between market share and differential advantages in media, models, dealerships and price adjusted brand equity remains robust when calculated by means of Ridge Regression. In Table 7.20 above, over ninety per cent of the variability in market share is accounted for by differential advantages in the marketing variables mentioned previously.

Table 7.21 below, provides details of the parameter estimates using Ridge Regression together with the resulting improvement in VIFs

Table 7.21 Parameter Estimates using Ridge Regression with Market Share Regressed on Lagged Differential Advantage in Media, Car Models, Dealerships, and Price Adjusted Brand Equity (N=226).

Variable:	β:	Standardised β:	VIF:
Differential advantage-media:	-0.0244	-0.0142	1.787
Differential advantage-models:	-0.4355	-0.3228	2.949
Differential advantage dealerships:	-0.7331	-0.5714	2.676
Differential advantage-price adj brand equity.	0.2721	0.1544	1.049
Constant:	0.0421		

Ridge Regression has stabilised the coefficients and reduced, but not resolved completely, the problem of multicollinearity in Table 7.21 above. The parameter estimates are consistent with previous analyses (See Table 7.16 and Table 7.17 on pages 101 and 102 respectively), in that the signs for media, models, and dealerships are negative, and that for price, positive.

7.4.3 The Relationship Between Market Share and Differential Advantage Using Categorical Variables, for the Lagged Situation.

The next two analyses examine the relationship between market share and different categories of lagged differential advantage for each of the marketing variables (See Table 7.7 on page 94 for details of the categories).

1. The first analysis examines the relationship between market share and **lagged** differential advantage in media, models, dealerships and price adjusted brand equity using the Chi-square test of association.

2. The second analysis examines the relationship between the **change** in market share for one period over the preceding one and **lagged** differential advantages in media, models, dealerships and price adjusted brand equity. The Chi-square test of association is also used in this analysis.

7.4.3.1 Analysis of the Relationship Between Market Share and Lagged Differential Advantage, Using the Chi-Square Test of Association.

Table 7.22 below examines the categorical relationship between market share and differential advantages in marketing variables using the categories of market share shown in Table 6.9 of Chapter 6, and the levels of differential advantage shown in Table 7.7 on page 94 of this Chapter.

Table 7.22 Chi-square Analysis of the Association Between Market Share and Lagged Differential Advantages in Media, Car Models, Dealerships, and Price Adjusted Brand Equity (N=226).

Variables:	Pearson's Chi-square:	Degrees of Freedom:	Statistical Significance:
Differential Advantage-Media:	58.245	4	p<0.0005
Differential Advantage-Models:	119.457	4	p<0.0005
Differential Advantage-Dealerships:	125.284	2	p<0.0005
Differential Advantage-Price adjusted brand equity:	14.805	2	p=0.0006

Table 7.22 above confirms the statistically significant relationship between market share and lagged differential advantage for each of the marketing variables.

The relationship between market share and differential advantage is not a positive one, as shown in Table 7.23 below. Firms with low market share demonstrate the greatest association with positive differential advantage. This observation was also made for the concurrent situation (See Table 7.9, page 95).

Table 7.23 Analysis of the Association Between Market Share and Differential Advantage - The Lagged Situation.

Differential Advantage in:	Positive Differential Advantage:		Negative Differential Advantage	
	Low Market Share.	High Market Share.	Low Market Share.	High Market Share.
	N=	N=	N=	N=
Media:	68	30	5	45
Models:	76	23	0	52
Dealerships:	76	26	0	49
Price: ⁵	12	33	64	42

7.4.3.2 The Relationship Between Change in Market Share and Lagged Differential Advantage Using the Chi-Square Test of Association.

The final analysis examines the relationship between **change in market share** and the **lagged levels of differential advantage** in media, models, dealerships, and price adjusted brand equity.

Table 7.24 Chi-square Analysis of the Association Between Change in Market Share and Lagged Differential Advantage in Media, Car Models, Dealerships and Price Adjusted Brand Equity (N=225).

Variables:	Pearson's Chi-square:	Degrees of Freedom:	Statistical Significance:
Differential Advantage-Media:	19.169	4	p=0.0007
Differential Advantage-Models:	11.609	4	p=0.0030
Differential Advantage-Dealerships:	6.731	2	p=0.0345
Differential Advantage-Price adjusted brand equity:	43.400	2	p<0.0005

The analysis in Table 7.24 above supports the relationship between change in market share and (lagged) differential advantages in all of the marketing variables. The relationship between change in market share and differential advantages in the marketing variables is not a positive one as can be seen in Table 7.25 on page 108 below:

⁵ Price Adjusted Brand Equity.

Table 7.25 The Correspondence Between Lagged Differential Advantage and Change in Market Share.

Variable:	Positive Differential Advantage.		Negative Differential Advantage.	
	'+' Change in Market Share. N=	'-' Change in Market Share. N=	'+' Change in Market Share. N=	'-' Change in Market Share. N=
Media:	50	88	42	23
Models:	61	89	32	24
Dealerships:	68	89	25	24
Price: ⁶	9	55	84	58

The result in Table 7.25 supports the result reported previously (See Table 7.12, page 97). Positive differential advantages in marketing variables are most commonly associated with minus changes in market share. This is in contrast with the original work by Cook and Rothberg (*op cit* 1990).

Table 7.26 below examines the relationship between market share and change in market share when differential advantage is positive.

Table 7.26 The Relationship Between Changes in Market Share and Share of Car Makers When Differential Advantage is Constant (Lagged Situation).

Variable:	Differential Advantage = '+'		
	Lower One-Third of Car Makers. N=	Upper One-Third of Car Makers. N=	Total.
'+' Change in Market Share.	43	44	87
'0' Change in Market Share.	47	3	50
'-' Change in Market Share.	142	65	207
Total:	232	112	344

Table 7.26 confirms what has been found previously, that positive differential advantage is statistically significantly related to smaller share car makers and negative changes in market share:

⁶ Price Adjusted Brand Equity.

Chi-Square = 29.04	p<0.005
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The following tables in this section (Table 7.27 and Table 7.28) analyse the linear relationship between market share and differential advantages in media, models, dealerships and price adjusted brand equity for the lower one-third of market share firms:

Table 7.27 Correlation of Market Share with Differential Advantage in Marketing Variables for the Lower-One Third of Car Makers as Measured in Market Share (N=76).

Variables:	Pearson's Correlation Coefficient.	Statistical Significance.
Differential Advantage-Media:	0.2366	p=0.040
Differential Advantage-Models:	0.0298	p=0.798
Differential Advantage-Dealerships:	0.3836	p<=0.001
Differential Advantage-Price Adjusted Brand Equity:	0.3690	p<0.001

In Table 7.27 above, a weak but statistically significant linear relationship exists between market share and differential advantages in marketing mix variables for all except car models.

The analysis in Table 7.27 above is repeated in Table 7.28 on page 110 below, using rank-order correlation, with the same result, namely a positive and statistically significant but weak relationship between market share and differential advantage in all marketing variables except car models, when the analysis is restricted to the smaller share car makers.

Table 7.28 Rank Order Correlation of Market Share with Differential Advantage in Marketing Variables for the Lower One-Third of Car Makers as Measured in Market Share (N=76).

Variables:	Spearman's Coefficient of Rank Correlation.	Statistical Significance.
Differential Advantage-Media:	0.4361	p<0.0005
Differential Advantage-Models:	0.0812	p=0.485
Differential Advantage-Dealerships:	0.3902	p<0.0005
Differential Advantage-Price Adjusted Brand Equity:	0.3360	p=0.003

7.5 HYPOTHESES: THE RELATIONSHIP BETWEEN MARKET SHARE AND LAGGED DIFFERENTIAL ADVANTAGES IN MEDIA, MODELS, DEALERSHIPS AND PRICE ADJUSTED BRAND EQUITY.

Section 7.5 restates the Hypotheses for the relationship between market share and lagged differential advantage in marketing variables, and then presents the conclusions from the previous analyses.

Hypothesis 4: Market share is statistically independent of one-period **lagged differential advantage**, as measured by the difference between lagged share of investments in media, car models, dealerships, price adjusted brand equity and market share.

The evidence of Section 7.4 of this Chapter point to the rejection of Hypothesis 4. It is emphasised that the linear relationship between market share and lagged differential advantage is a negative one for the overall analysis. This result contradicts the work of Cook and Rothberg (1990).

A subset of small share car makers shows a weak, positive relationship between market share and differential advantage for three out of the four marketing variables. The result, at this level of analysis, supports the work of Cook and Rothberg (*ibid* 1990).

The overall analysis does not show a positive relationship between market share and lagged differential advantages in marketing variables. The fact that the overall relationship is a negative one does not support the original work on this subject (*ibid* 1990).

Hypothesis 6: Changes in market share are statistically independent of the firm's lagged differential advantages. This Hypothesis is tested using the Chi-square statistic.

Hypothesis 6 is rejected. Changes in market share are dependent on the firm's lagged differential advantages. However, as for the concurrent situation, positive differential advantages are associated with small share car makers, and minus changes in market share. This aspect of the work does not support that of Cook and Rothberg (*ibid* 1990).

7.6 SUMMARY.

This summary examines the relationship between market share and differential advantage for the following situations:

1. The **concurrent** relationship between market share and differential advantages in media, car models, dealerships, and price adjusted brand equity.
2. The relationship between market share and one-period **lagged** differential advantage.

7.6.1 The Concurrent Relationship Between Market Share and Differential Advantage.

Simple correlation analyses between market share and differential advantages in media, models, dealerships and price adjusted brand equity confirm a statistically significant linear relationship. The signs (except for price adjusted brand equity) were negative for each of the correlations, suggesting an inverse relationship between market share and

differential advantage. This is confirmed in the scatter plots that can be found in Attachment 3 to this thesis.

Regressing market share on differential advantage for each of the marketing mix variables produces a highly statistically significant multivariate correlation and coefficient of determination. However, multicollinearity was a problem making the parameter estimates from the multiple regression expression unstable.

Ridge Regression was used to overcome the problem of multicollinearity, and to stabilise the parameter estimates. This procedure confirmed the negative linear relationship between market share and differential advantages in dealerships and car models, and indicated a trend in this direction for media.

The overall relationship between market share and differential advantage was confirmed when the analysis was done of the variables in categorical form. However, a subset analysis showed that positive differential advantages were mostly associated with small market share manufacturers and negative changes in market share. This observation does not support the work by Cook and Rothberg (1990).

When the analysis was restricted to car makers with market share in the lower one-third of the range, a statistically significant, but weak, positive linear relationship between market share and differential advantages in all marketing mix variables (except car models) was observed. At the level of the small car maker in Australia, the analysis supports the work of Cook and Rothberg (*ibid* 1990)

7.6.2 The Relationship Between Market Share and One-period Lagged Differential Advantage.

The correlation analyses confirmed statistically significant relationships between market share and lagged differential advantages in media, models, dealerships and price adjusted brand equity.

Multiple regression analysis confirmed a highly statistically significant multivariate relationship between market share and differential advantages as independent variables. However, the problem of multicollinearity was encountered.

Ridge Regression was used to overcome the problem of multicollinearity. Although the problem (of multicollinearity) was not totally resolved, the problem was substantially reduced. Parameter estimates using ridge regression confirmed the negative relationship between market share and differential advantages in media, models, and dealers. The relationship was positive for price.

An analysis of the relationship, when both sets of variables were expressed in categorical form, confirmed a statistically significant relationship between market share and lagged differential advantages. However, a subset analysis, as for the concurrent situation, showed that small share manufacturers, and those showing negative changes in market share, were mostly associated with positive differential advantages. Again, the contradiction with the original work by Cook and Rothberg (1990) is noted.

When the analysis was restricted to the lower third of car maker (in terms of market share), a positive, and statistically significant, but not powerful, linear relationship was found between market share and differential advantages in all of the marketing variables except car models. This confirms the work of Cook and Rothberg (1990) based, however, on a subset analysis of the data.

One could speculate, based on the analyses in this Chapter, that the possession of differential advantages in marketing variables is not required for competitive success. Large share car makers, mostly do not possess positive differential advantages in marketing variables, but are clearly successful. Small share car makers possess positive differential advantages, but are not successful, in the overall situation. This analysis does not take into account segment differences; the data did not allow for segment level analysis. It may well be that lack of success at the overall level may be success at the segment level.

Chapter 8

8.0 MARKETING EFFORT AND DIFFERENTIAL ADVANTAGE - THE CONCLUSIONS.

8.1 INTRODUCTION.

This chapter sets out the conclusions to this thesis. In particular, it aims to answer the question that was asked at the beginning of this study, namely:

‘..Does the possession of differential advantages in marketing mix variables lead to superior result as measured in terms of market share?’.

In the process of answering this question, this chapter will compare and contrast differential advantage as a model of market share determination with that of an alternative model based on the share of marketing effort.

8.2 CONCLUSIONS REGARDING THE RELATIONSHIP BETWEEN MARKET SHARE AND SHARE OF MARKETING EFFORT.

This thesis confirms a consistent, statistically significant and positive relationship between market share and share of marketing effort. The relationship exists when market share is regressed on individual variables representing share of marketing effort with respect to investments in media, number of car models, the number of dealerships that are associated with each car manufacturer, and an index called price adjusted brand equity that has been explained in the body of this thesis.

A statistically significant and positive multivariate relationship also exists when market share is simultaneously regressed on the marketing mix variables mentioned in the previous paragraph. The problem of multicollinearity encountered with this procedure is resolved by using a method known as Ridge Regression.

The positive relationship between market share and share of marketing effort is also confirmed when marketing variables are represented as categorical ones.

The positive and statistically significant relationship between market share and share of marketing effort exists for the concurrent situation, and when marketing variables are lagged for one period.

Parameter estimates using the Ordinary Least Squares Multiplicative Competitive Interaction Model of market share determination (Lillien, Kotler, Moorthy 1992, p.670), with and without brand intercepts confirms the positive and statistically significant relationship between market share and investments in media, the number of car models, and dealerships. This relationship is negative for price, as expected. The Generalised Least Squares approach was not as uniformly positive as the Ordinary Least Squares method.

The results outlined above confirm the place of competitive marketing effort, as a model of market share determination, in the marketing literature.

8.3 CONCLUSIONS REGARDING THE RELATIONSHIP BETWEEN MARKET SHARE AND DIFFERENTIAL ADVANTAGE.

The answer to the question poised at the beginning of this chapter is that differential advantage in marketing variables is not uniquely associated with competitive success. The reasons for this result are summarised in the following paragraphs.

By contrast with the original works (Cook 1983, and Cook and Rothberg 1990), in which high market share was associated with positive differential advantages in marketing variables, this thesis found that an overall statistically significant and negative relationship between market share and differential advantages in media, car models, dealerships and price adjusted brand equity. A subset analysis shows that the possession of positive differential advantages was more often associated with small share car manufacturers than with their larger rivals. The relationship between market share and differential advantage, at this level of analysis, is weak, although statistically significant.

Why does this thesis not support the original work (*ibid* 1990) that identified a positive and statistically significant overall relationship between market share and differential advantage? There are several possible explanations.

- 1) One possible explanation is that car makers adopted a cautious approach to strategic investments in marketing during a period of economic uncertainty, and as a result, share of marketing effort was less than concurrent market share.

During the period 1983 to 1990, in Australia, the demand for new passenger cars fluctuated in keeping with the boom of the 80s and the recession of the early 90s. This was a period of uncertainty in terms of demand for new passenger cars that may have induced a state of caution in the minds of the managers who controlled the fate of the car industry in Australia during this period.

Differential tax rates applied to luxury versus standard cars. Most luxury cars were imported, and largely European, and partly as a consequence of the differential taxes, were more expensive. In a sense this situation might induce a paradoxical approach to the problem. Greater marketing effort would be needed to overcome the constraint imposed on demand by a discriminatory tax system. Foreign car makers are the victims of their own success; tax rates on 'luxury' cars have seemingly fluctuated in keeping with the success, over time, of this segment (See Table 5.2 in Chapter 5). This suggests that foreign car makers may be somewhat cautious of their own success in case they are 'punished' with new or altered taxes.

This thesis suggests that Australian car makers took a conservative approach to investments in media, although the number of new car models proliferated during the period that was studied in this thesis. The long term decline in the number of dealerships is indicative of the careful approach taken within the industry.

By comparison, the study of the relationship between market share and differential advantage in the US car industry (*ibid* 1990) used a period that was free from Voluntary Restraint Agreements between US and Japanese car makers. This period represented a...

“ ‘free market’ to study these forces (*ibid* 1990, p.311).

The Australian car market is not a ‘free’ one in the sense suggested above.

- 2) A second reason is that differential advantage may not be a requirement of successful competitive strategy.

Differential advantage, as a model of market share determination, assumes a departure from equilibrium between the share of investments in marketing variables and concurrent unit market share. Disequilibrium gives rise to an index representing the concept of differential advantage. A positive disequilibrium, according to Cook (1985) is evident when share of marketing effort is greater than concurrent market share. It is asserted that such a positive disequilibrium is associated with success as measured in the attainment of large market shares (*op cit* 1990).

This thesis does not support Cook’s proposition (*op cit* 1985) for the following reasons:

(a) In this thesis, there is a positive and statistically significant relationship between market share and share of marketing effort.

(b) The share of investments in marketing variables by large market share firms is generally less than concurrent unit market share. This shows that ‘successful’ firms were associated with negative differential advantages in marketing variables, not positive ones as proposed in original work on the subject (*op cit* 1990).

(c) From (a) and (b) above, successful competitive activity does not require that share of investments in marketing variables should be greater than concurrent market share; all that is required is that marketing effort should be greater than that of the competition.

3. A third reason may be that the marketing effort model of market share determination did not capture all the elements of the marketing mix that would bring about a state of equilibrium with market share. Attraction models of market share determination may provide an answer to this apparent contradiction. Such models examine the relationship between market share and the quantitative and qualitative aspects of marketing investments such as:

“ the effectiveness of advertising, the reputation of the company, the service given...” (Bell, Keeney, Little 1975, p.137).

Attraction models provide a bigger ‘net’ in which to capture marketing variables beyond marketing effort, that may better represent the relationship with market share than marketing effort alone.

4. A final possible reason is that the data used in this thesis, although the best that could be found, is not the best that is available. Such data is likely to be in the hands of the manufacturers. It is possible that the failure to support the original work (*op cit* 1990) is a problem of the data. In the absence of better data, and a replication of this study, it is difficult to argue. It is suggested that the results reported in this thesis should be regarded as indicative, rather than as absolute.

8.4 AREAS FOR FURTHER RESEARCH.

The following suggestions are intended to provide other approaches by which to examine the determinants of market share.

A useful study could be one that examined the relationship between market share and Market Attractions (*op cit* 1975). Such a study could involve the identification, selection, and incorporation of a wider range of variables than those represented by marketing effort, in this thesis. Such variables could examine issues such as product quality, customer satisfaction, and other qualitative variables not covered in this thesis. A study of this kind could examine the elements of market share determination more from the customer's perspective than from the competitor's perspective, as was done in this thesis. Such an approach could provide a useful contrast with this thesis in which the quantitative marketing variables only were considered.

This thesis used aggregated data because it was not possible to trace all investments in marketing variables to the individual brand. Also aggregation provided for a direct comparison with the original work (*op cit* 1990). For this reason it was not possible to examine the relationship between market share and marketing effort at the (product) segment level. A potentially useful replication and possible extension of this study could involve comparing the relationship between market share and share of marketing effort by segment. Such a study may indicate 'preferred' strategies for each segment. However, to make such a study worthwhile, it should go beyond the four variables used in this thesis. In addition a study of this kind should consider variables such as promotion, price discounts, the value of guarantees and warranties, the net price (ie. allowing for the value of the trade-in). By considering a wider selection of marketing variables, a study of this kind would provide for greater insights and understanding of the determinants of market share than was provided by considering only the four variables examined in this thesis. Such a study would require access to quality data. It is likely that cooperation from one or more of the major car makers could be needed.

8.5 SUMMARY.

This thesis has demonstrated a positive and statistically significant relationship between market share and share of marketing effort in the Australian market for new passenger cars.

The notion that success, as measured in attaining high levels market share, is related to the possession of positive differential advantage in marketing variables is not confirmed by this thesis.

Bibliography.

Bell, David E, Keeney, Ralph L, Little, John D. C, A Market Share Theorem (1975), *Journal of Marketing Research*, Volume XXII (May), Pages 136 to 141.

Belsley David A, *Conditioning Diagnostics, Collinearity and Weak Data in Regression* (1988), A Wiley-Interscience Publication, John Wiley and Sons.

Bonoma, Thomas V, (1985) *The Marketing Edge, Making Strategies Work*, The Free Press, A Division of Macmillan Inc, New York.

Bonoma, Thomas V, (1989) Marketing Performance-What Do You Expect? *Harvard Business Review*, September-October, Pages 4 to 7.

Brodie Rodrick, and Cornelius A deKluyver, Attraction Versus Linear and Multiplicative Market Share Models: An Empirical Evaluation (1984) *Journal of Marketing Research*, Volume XXI, May, Pages 194 to 201.

Buzzell, Robert D, Bradly T Gale, Ralph, G.M Sultan, (1975), Market Share-A Key to Profitability, *Harvard Business Review*, January-February, Pages 99 to 106.

Chakravarti, Dipankar, personal written communication with the author of this thesis, dated 10th May, 1993.

Chattopadhyay, Amitava; Prakash Nedungadi, and Dipankar Chakravarti (1985) Marketing Strategy and Differential Advantage-A Comment, *Journal of Marketing (Spring)*, Pages 129 to 136.

Cook Jr, Victor J, (1983) Marketing Strategy and Differential Advantage, *Journal of Marketing (Spring)*, Vol 47 pages 68 to 75.

Cook Jr, Victor J, (1985) Understanding Marketing Strategy and Differential Advantage, *Journal of Marketing (Spring)* Vol 49 pages 137 to 142.

Cook Jr, Victor J,(1985) The Net Present Value of Market Share, *Journal of Marketing, Volume 49*, Summer, Pages 49 to 63.

Cook, Victor J (1983), *Journal of Marketing*, Volume 47, Spring, pages 68 to 75.

Cook, Victor J. and Robert R Rothberg, (1990), The Harvesting of USAUTO? From the Gasoline Crisis of 1973 to the Imposition of “Voluntary” Import Quotas in 1981, *Journal of Product Innovation Management*, 7, Pages 310 to 322.

Cooper, Lee G, Masao Nakanishi, *Market Share Analysis*, 1988, International Series in Quantitative Marketing, Kluwer Academic Publishers.

Day, George S and Robin Wensley, (1988), Assessing Advantage: A Framework for Diagnosing Competitive Superiority, *Journal of Marketing*, Volume 52, April, pages 1 to 20.

Day, George S, (1990) *Market Driven Strategies, Processes for Creating Value*, The Free Press, A Division of Macmillan Inc, New York.

Day, George S, Allan D Shocker, Rajendra K Srivastava, (1979), Customer-Oriented Approaches to Identifying Product-Markets, *Journal of Marketing*, Volume 43, Fall, Pages 8 to 19.

Gosh Avit, Scott Neslin, Robert Shoemaker, A Comparison of Market Share Models and Estimation Procedures (1984), *Journal of Marketing Research*, Volume XXI, May, Pages 202 to 210.

Hair, Joseph F, Ralph E Anderson, Ronald L Tatham, William C Black, *Multivariate Data Analysis, With Readings*, (1987) 3rd Edition, Maxwell Macmillan International Editions.

Iles, C.G. (1993) General Manager - Media Relations and Merchandising, Mitsubishi Motors Australia Limited, 1284 South Road, Clovelly Park, Adelaide, South Australia 5001.

Jacobson Robert, David A Aaker, (1985) Is Market Share All That It's Cracked Up To Be? *Journal of Marketing*, Vol 49 (Fall), Pages 11 to 22.

Kitchens, Larry J (1987), *Exploring Statistics, A Modern Introduction*, West Publishing Company, 50 W. Kellogg Voulevard, St. Paul, MN 55 164-1003.

Kotler, Philip, (1988) *Marketing Management, Analysis, Planning, Implementation, and Control*, Sixth Edition, Prentice-Hall International Editions.

Leeflang Peter S. H, Jan C. Reuyl (1984) On the Predictive Power of Market Share Attraction Models, *Journal of Marketing Research*, May, Volume XXI, pages 211 to 215.

Lilien, Gary L, Philip Kotler, Sridhar K Moorthy, *Marketing Models* (1992), Prentice Hall International Editions.

Motorfacts, *A Year Book of Economic, Industry and Statistical Data on the Motor Trades in Australia for 1993*, Published by the Motor Trades Association of Australia, MTA House, 39 Brisbane Avenue, Barton, ACT 2600.

Naert Ph, and M Weverbergh, (1981), On the Prediction Power of Market Share Attraction Models, *Journal of Marketing Research*, Volume XVIII, May, Pages 146 to 153.

Naert, P. A. and A. V. Bultez, (1973) "Logically Consistent Market Share Models", *Journal of Marketing Research*, 10 (August), Pages 334 to 340.

Neter John, William Wasserman, Michael H Kutner, *Applied Linear Statistical Models, Regression, Analysis of Variance, and Experimental Design* (1985) Second Edition, Irwin, Homewood, Illinois.

Norusis, Marija J, *SPSS® for Windows®, Advanced Statistics, Release 6.0*, SPSS Inc, 444 North Michigan Avenue, Chicago, IL 60611.

Norussis, Marija J, (1993) *The SPSS Guide to Data Analysis for SPSS/PC+*, 2nd Edition, SPSS Inc, 444 North Michigan Avenue, Chicago, IL 60611.

Ohmae, Kenishi (1982), *The Mind of the Strategist, The Art of Japanese Business*, McGraw-Hill Inc.

Parasuraman A, and P. Varadarajan (1985), More on "Marketing Strategy and Differential Advantage", *Journal of Marketing*, Volume 49 (Spring), Pages 124 to 128.

Pascale, Richard T (1984) "Perspectives on Strategy: The Real Story Behind Honda's Success", *California Management Review*, Vol XXIV, No 3.

Porter, Michael E (1980) *Competitive Strategy, Techniques for Analysing Industries and Competitors*, The Free Press, A Division of Macmillan Publishing Co Inc, 866 Third Avenue, New York, NY 10022.

Porter, Michael E, (1985) *Competitive Advantage, Creating and Sustaining Superior Performance*, The Free Press, a Division of Macmillan Inc.

Porter, Michael (1991) *Coping with Fragmentation, The Strategy Process, Concepts, Contexts, Cases*, Second Edition, Prentice-Hall International Editions, Pages 618 to 619.

Quinn, James Brian (1991) "*Strategic Change: Logical Incrementalism*", The Strategy Process, Concepts, Contexts and Cases, Second Edition, Prentice-Hall Inc, Englewood Cliffs, NJ.

Renn, Robert and Robert J. Vandenberg (1991) Differences in Employee Attitudes and Behaviours Based on Rotter's (1966) Internal-External Locus of Control: Are They Valid?, *Human Relations*, Volume 44, Number 11, Pages 1161 to 1178.

Schoeffler Sidney, Robert D Buzzell, and Donald F Heany, (1974), Impact of Strategic Planning on Profit Performance, *Harvard Business Review*, March-April, Pages 137 to 145.

SPSS for Windows, Trends, Release 6.0, 1993

SPSS for Windows, Advanced Statistics, Release 6.0, 1993.

Utsey, Marjorie F, Victor J Cook (1984) "*A Marketing Strategy Paradigm for Case Analysis*" in 1984 AMA Educator's Proceedings, R. Belk et al., eds., Chicago, American Marketing, pages 96 to 100.

Woo, Carolyn Y (1984) "Market-share Leadership - Not Always So Good", *Harvard Business Review*, Ideas for Action Series, January-February, Pages 2 to 4.

ATTACHMENT 1:

**Table of Unit Market Shares and Share of Investments in Media, Car Models, and
Car Dealerships for the Seven Months ending July 1993.**

Seven Months Ending July 1993.

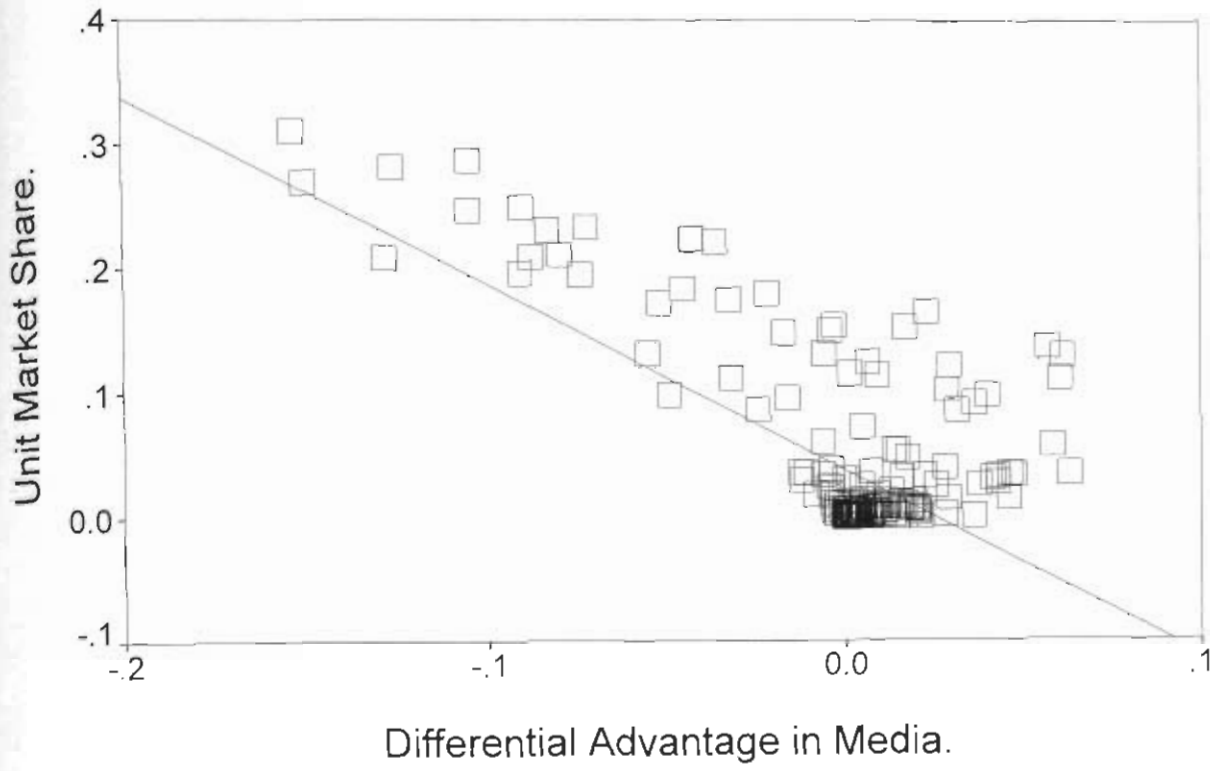
	No of New Cars Registered	Cash Sales of New Cars	Media spend	No of Car Models	No of Dealers.
Car Makers:	%	%	%	%	%
Alfa	.	.	.	.	.
Audi/VW	.19%	.32%	.11%	2.92%	2.69%
BMW	1.33%	3.29%	2.53%	5.11%	1.83%
Citroen	.01%	.02%	.07%	1.82%	.97%
Daihatsu	3.45%	1.86%	2.83%	2.19%	5.06%
Daimler	.	.	.	.	.
Ferrari	.00%	.00%	.	1.46%	.54%
Fiat	.	.	.	.	.
Ford	24.70%	25.29%	14.20%	11.31%	8.72%
FSM	.01%	.	.	.36%	.43%
GM-Holden	18.06%	17.15%	15.88%	7.66%	8.61%
Honda	3.42%	3.68%	5.64%	6.20%	4.84%
Hyundai	3.94%	2.46%	3.54%	3.65%	4.20%
Jaguar	.05%	.25%	.11%	2.19%	3.01%
Lada	.01%	.00%	.00%	.36%	1.29%
Lancia	.	.	.	.	.
Lotus	.	.	.	.	.
Maserati	.	.	.	.	.
Mazda	5.46%	6.01%	6.82%	5.84%	5.06%
Mercedes	.76%	3.02%	2.84%	5.11%	2.05%
Mitsubishi	13.25%	12.19%	12.66%	8.76%	7.86%
Nissan	3.60%	3.02%	8.24%	4.38%	6.67%
Peugeot	.13%	.17%	.69%	2.19%	4.31%
Porsche	.03%	.20%	.00%	3.65%	.65%
Renault	.08%	.07%	.18%	.73%	1.94%
Rolls	.00%	.04%	.01%	1.09%	.65%
Rover	.	.	.	.	.
Saab	.74%	1.15%	1.37%	2.92%	1.94%
Subaru	2.36%	2.41%	1.99%	5.47%	4.63%
Suzuki	1.15%	.64%	.80%	1.09%	4.84%
Toyota	16.57%	15.46%	18.86%	10.58%	8.72%
Volvo	.66%	1.28%	.63%	2.92%	4.52%
Other	.05%	.	.	.	3.98%
Total	100.00%	100.00%	100.00%	100.00%	100.00%

ATTACHMENT 2:

The Association Between Market Share and Differential Advantage.

Differential Advantage in Media.

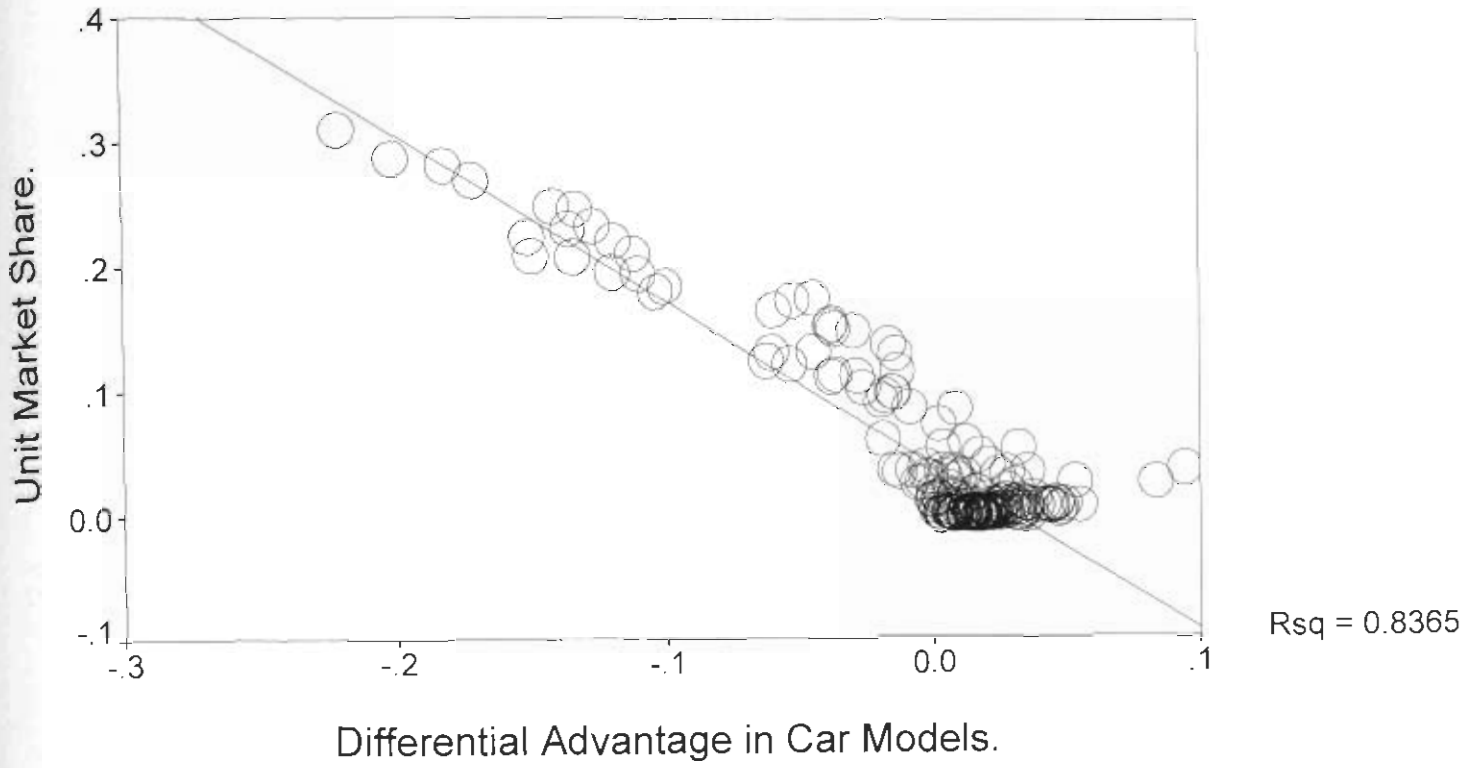
Unit Market Share and Differential Advantage.



Rsq = 0.4661

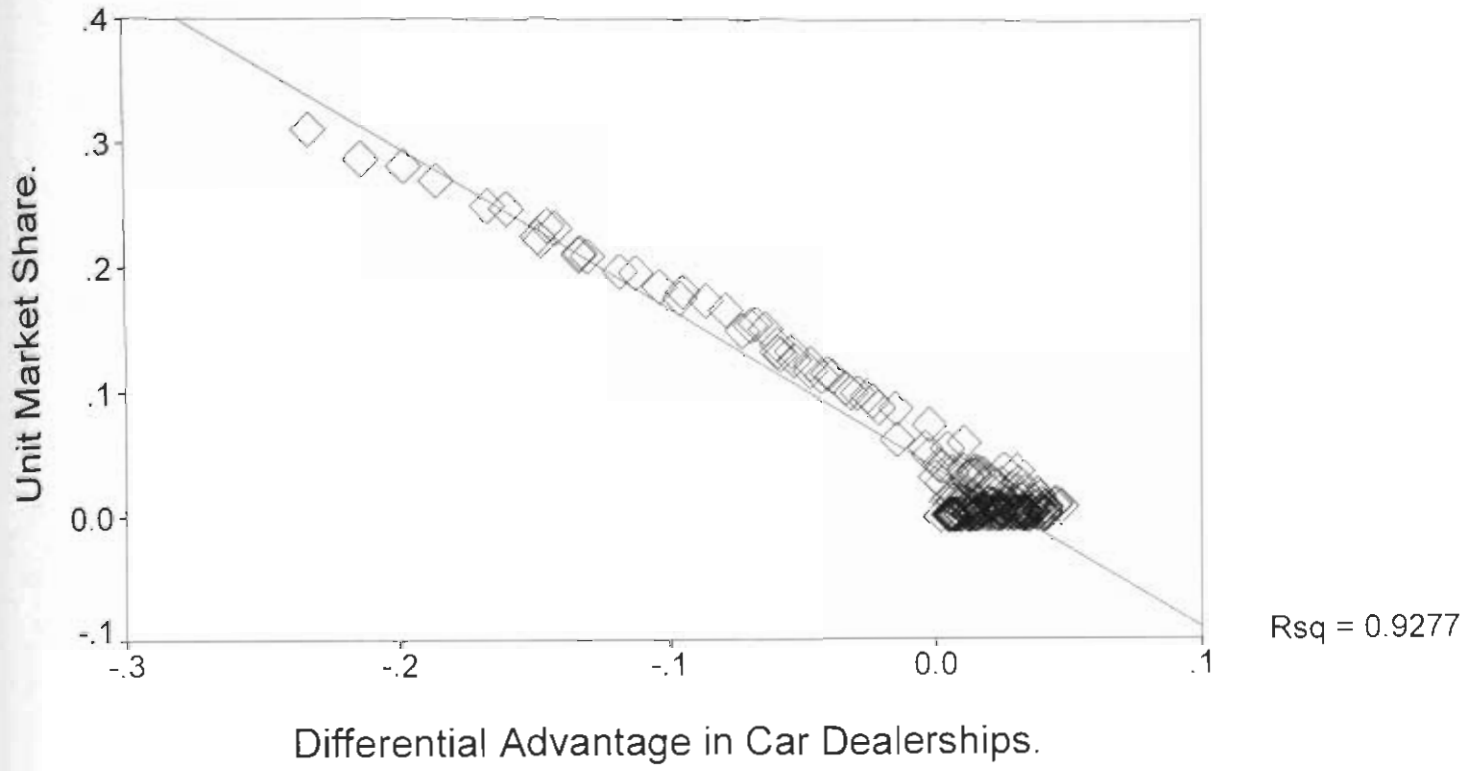
Differential Advantage in Car Models.

Unit Market Share and Differential Advantage.



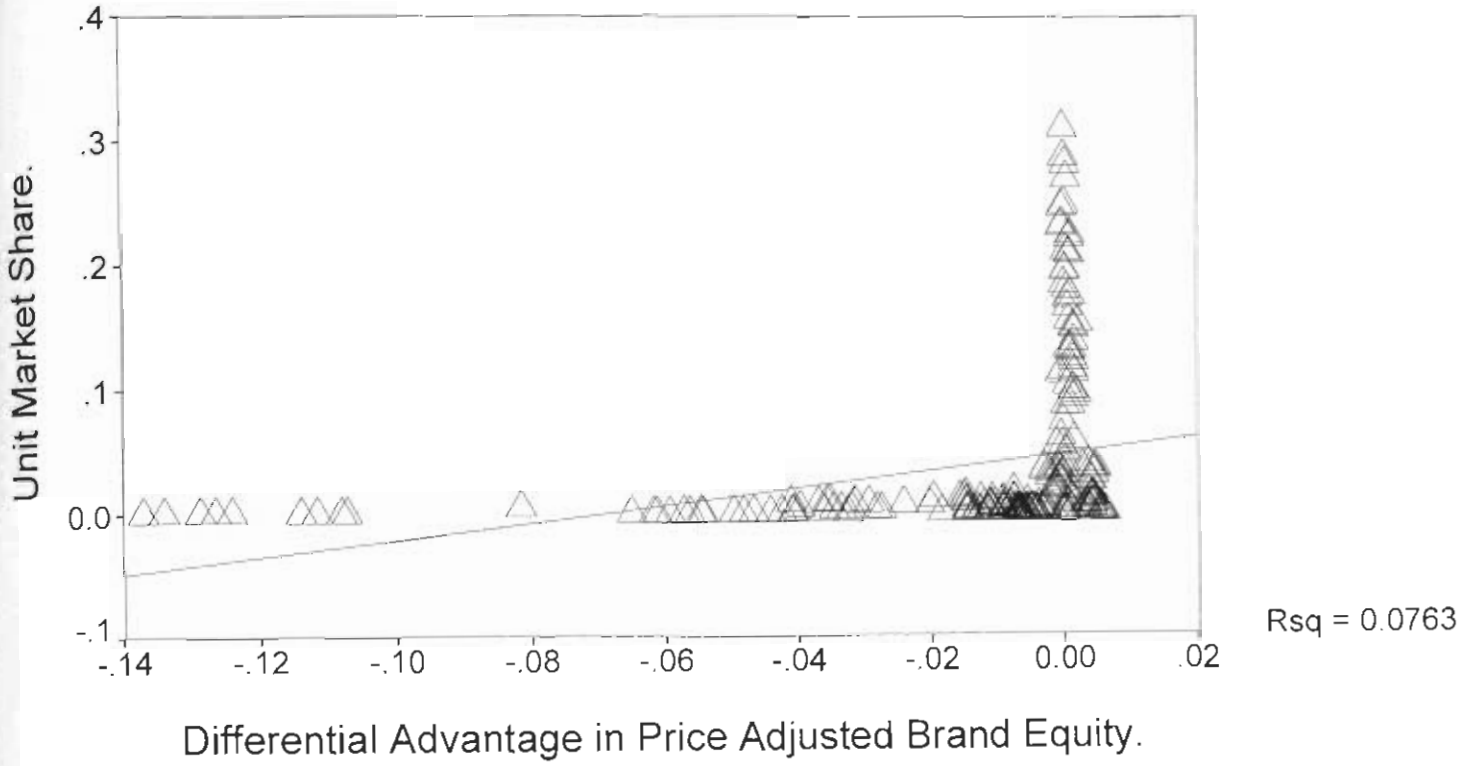
Differential Advantage in Dealerships.

Unit Market Share and Differential Advantage.



Differential Advantage in Price Adjusted Brand Equity.

Unit Market Share and Differential Advantage.



ATTACHMENT 3:

Sample Dataset of Differential Advantage Scores For Media, Car Models, Dealerships and Price Adjusted Brand Equity.

Sample of the dataset showing the differential advantage scores for media, car models, car dealerships, and price adjusted brand equity.

Abbreviations and meanings are as follows:

REGMS:	Share of unit car registrations.
MEDIASH:	Share of media spend.
DADVMED:	Differential advantage in media.
MODSH:	Share of car models.
DADVMODS:	Differential advantage in car models.
DEALSH:	Share of car dealerships.
DADVDEAL:	Differential advantage in car dealerships.
PABET:	Price adjusted brand equity.
DADVPT:	Differential advantage in price adjusted brand equity.

DATE	REGMS	MEDIASH	DADVMED
85	.00450	.01130	.00680
87	.00060	.00090	.00030
88	.00680	.02560	.01880
89	.00030	.00240	.00210
90	.02500	.02030	-.00470
87	.00130	.00190	.00060
93	.24700	.14200	-.10500
85	.01840	.01000	-.00840
88	.01320	.03250	.01930
89	.00250	.03070	.02820
93	.00010	.00000	.00000
93	.05460	.06820	.01360
85	.11660	.11800	.00140
86	.07320	.07800	.00480
87	.00130	.00460	.00330
88	.00070	.00370	.00300
89	.00030	.00010	-.00020
90	.00010	.00110	.00100
92	.00000	.00060	.00060
85	.01720	.01310	-.00410
86	.00420	.00180	-.00240
87	.13820	.19530	.05710
88	.00950	.02790	.01840

DATE	REGMS	MODSH	DADVMS
85	.00450	.03020	.02570
87	.00060	.01960	.01900
88	.00680	.04580	.03900
89	.00030	.00390	.00360
90	.02500	.01910	-.00590
87	.00130	.01570	.01440
93	.24700	.11310	-.13390
85	.01840	.03450	.01610
88	.01320	.01530	.00210
89	.00250	.02340	.02090
93	.00010	.00360	.00350
93	.05460	.05840	.00380
85	.11660	.10340	-.01320
86	.07320	.07540	.00220
87	.00130	.01960	.01830
88	.00070	.02670	.02600
89	.00030	.00780	.00750
90	.00010	.01530	.01520
92	.00000	.01770	.01770
85	.01720	.01720	.00000
86	.00420	.01190	.00770
87	.13820	.12160	-.01660
88	.00950	.03440	.02490

DATE	REGMS	DEALSH	DADVDEAL
85	.00450	.02070	.01620
87	.00060	.03380	.03320
88	.00680	.02120	.01440
89	.00030	.01230	.01200
90	.02500	.04970	.02470
87	.00130	.02630	.02500
93	.24700	.08720	-.15980
85	.01840	.05180	.03340
88	.01320	.02620	.01300
89	.00250	.03280	.03030
93	.00010	.01290	.01280
93	.05460	.05060	-.00400
85	.11660	.06970	-.04690
86	.07320	.07080	-.00240
87	.00130	.03000	.02870
88	.00070	.00710	.00640
89	.00030	.01020	.00990
90	.00010	.00700	.00690
92	.00000	.03350	.03350
85	.01720	.05560	.03840
86	.00420	.04560	.04140
87	.13820	.07890	-.05930
88	.00950	.03690	.02740

DATE	REGMS	PABET	DADVPT
85	.00450	.00073	-.00377
87	.00060	-.00848	-.00908
88	.00680	-.01740	-.02420
89	.00030	-.00369	-.00399
90	.02500	.02920	.00420
87	.00130	.00376	.00246
93	.24700	.24676	-.00024
85	.01840	.01758	-.00082
88	.01320	.01734	.00414
89	.00250	-.03219	-.03469
93	.00010	.00637	.00627
93	.05460	.05359	-.00101
85	.11660	.11808	.00148
86	.07320	.07322	.00002
87	.00130	-.00550	-.00680
88	.00070	-.05396	-.05466
89	.00030	-.00456	-.00486
90	.00010	-.12637	-.12647
92	.00000	-.00632	-.00632
85	.01720	.00962	-.00758
86	.00420	.00845	.00425
87	.13820	.13982	.00162
88	.00950	-.00140	-.01090