UNIVERSITY OF STIRLING

AN INVESTIGATION OF PERFORMANCE AND PRODUCTIVITY IN PETROLEUM RETAILING IN MALAYSIA

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To Everyone

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ABSTRACT

The petroleum retailing industry in Malaysia has long been established since after World War II. The business environment of petroleum retailing industry is very much difficult with issues such as eroding real margins and rising costs that impact on the industry. The Malaysian petroleum retailing industry is a regulated industry and operating costs have been increasing for time to time. The automatic pricing mechanism was established in 1983 and the margins which were set by the government have never changed. However, the industry has grown and the market continues to be very competitive.

The operators or dealers of service stations are required to do something in the market in order to survive in the industry. There are many factors can influencing the performance and/or productivity in this industry. The owners or managers should have to know and identify the external and internal environments which can dictate or affect their operations. Based on the external and internal environmental factors, two groups of variables were chosen from both factors to investigate the effect and impact of these factors on the industry.

The study was conducted in two phases. In the first phase of the study, the researcher analyzed the common problems areas and the techniques used to approach these problems by service station owners and managers. With the initial stage completed, the researchers utilized this information in attempting to identify a methodology for analyzing performance and productivity of service stations. In the second phase of the study, the

survey with structured questionnaire was done in southern part of Peninsular Malaysia.

The results of this research, mainly based on the study of the performance and productivity show that both internal (in this study represented by owner/manager and store characteristics) and external (represented by location and competitive characteristics) environmental variables played the significant roles in performance and productivity of service stations in Malaysia. Interestingly, while both internal and external environmental variables are significantly related to performance, only internal environmental variables can predict the productivity. In other words, internal environmental variables are better predictors of performance than productivity by service stations in this industry. Beside that, the study also found that there is a differences between owner and manager regarding performance and productivity. As a conclusion, the researcher suggested that both measurement should be considered when any study need to be done on any industries especially in business and retailing in the future.

TABLE OF CONTENTS

CHAPTER EIGHT:

CHAPTER NINE:

LIST OF TABLES

LIST OF FIGURES

CHAPTER ONE

THE RESEARCH PROBLEM AND OBJECTIVES

1.0 Introduction

1.1 Preamble

Thirty five years ago, Malaysia achieved her independence from the British Government. To date, Malaysia is a young nation making its mark in the international trade only within the past decades. Malaysia is experiencing rapid expansion in it economy with the fastest rate of economic growth in the Asian-Pasific region over the past five years. With a population of 18 million and a Gross Domestic Product growing by 8.5 per cent per annum in the 1990s, Malaysia represents one of the most dynamic markets in the world (Euromonitor May 1994).

One of the factors which contributed to the success of the economy was the discovery of vast quantities of oil and gas while the world was facing the economic recession. In 1994, the production of crude oil increased 0.9 per cent to 653,400 barrels per day and natural gas increased about 15 per cent (Malaysia: Ministry of Finance 1994). However, the petroleum refining industry registered only a marginal increase of 1.5 per cent during the first seven months of 1994. Total output of refined fuel oil by the petroleum refineries amounted to 1.3 million tonnes while that of liquefied

petroleum gas totalled 682,393 tonnes. The output of gasoline for motor vehicles amounted to 986,532 tonnes (Malaysia: Ministry of Finance 1994).

Furthermore, Malaysia's robust and fast growing economy was fuelled by higher growth in energy supply of 9.8 per cent a year over the five years from 1988 until 1992 (Malaysia: Malaysian Business, March 1 1994). Standing out prominently was the oil and gas sector which contributed between 20 to 30 per cent in average to government revenue for the five years from 1989-1994 (Malaysia: Ministry of Finance 93). However the realities facing Malaysia are that crude oil demand and prices have declined although supplies from the country are increasing. In addition new oil fields are becoming smaller and often found in deeper waters, generally becoming harder to develop technically and are more difficult to justify economically. Because of that, unit costs have risen. Cost is a thorny issue in the industry. For instance, Shell Company in Malaysia have faced dramatic increases in the costs of fabrication, installation and other essential support services between 30 to 45 per cent from 1990 to 1994 (Malaysia: Malaysian Business, March 1 1994). According to Dunn (1994), the challenges facing the energy industry are so great that marginal improvements are no longer enough to guarantee success. There are two keys to survival in the current low oil prices situation; cost reduction and improved competitiveness (Malaysia: Nada Petronas, April 1994).

Oil multinationals in Malaysia view the granting of better fiscal and non-fiscal incentives for exploration and production activities as a positive step towards stimulating their upstream operations in an environment of low oil prices and escalating costs. Some of them have launched a massive effort towards cost containment through challenging conventional development techniques and applying new technology to reduce costs. In upstream business an effort is being made to reduce development costs by applying satellite or so-called 'minimum intervention' technology (Malaysia: Malaysian Business, March 1 1994). Another challenge that Malaysia had been facing is strong competition from neighbouring countries such as Thailand, Vietnam and mainland China. However, Malaysia is still in a good position to enter the export market because it has good investment incentices, good infrastructure and skilled manpower and is strategically located between China and India which have the greatest demand in volume.

Currently Malaysia's oil reserves stands at 4.3 billion barrels and will last about 19 years while production is over 600,000 barrels per day. Gas reserves are estimated at almost 77 trillion cubic feet with production at 2.4 billion standard cubic feet per day (Malaysia: NST April 11th, 1994).

On the other hand, the downstream sector of the business is particularly exciting with considerable growth in demand for more

sophisticated and environmental friendly products and with fierce competition between the various players. This calls for heavy investment in plant and infrastructure in the face of rising costs and static prices which have been practiced and faced in the market today. In the coming years, most oil companies will undoubtedly focus on gas and petroleum refining. Gas is the area which probably offers the greatest potential for the future.

An overall picture shows this industry has undergone a major tilt with the development of new players and alternative fuels, declines in traditional supply sources, more demanding health, safety and environmental requirements and as in western countries, the establishment of full-fledged supermarkets alongside with petrol stations. This may become a reality in the rest of the Asia-Pacific region where oil demand is projected to increase by four per cent per annum.

1.2 Background of the problem

The Malaysian economy continues to grow and with GDP growing by 8.5 per cent per annum and over US$2,200 per capita income, Malaysia represents one of the most dynamic retail markets in the world and one of ASEAN's fastest developing retail markets. Malaysia's economic growth has been allowed to feed directly into

earnings and spending power of the masses, as a result of low taxation and state spending (Euromonitor May 1994).

One sector which will get benefits from this economic growth is the retail sector. The retail sector in Malaysia is mainly made up of small mixed retailers, small family businesses and wet markets. The government also plays an important role in the shaping of the retail market. The government is directly involved in trying to make the capital city, Kuala Lumpur, the future shopping mecca in the Asian region (Euromonitor May 1994). Nowadays, the retail sector does not only consist of the traditional retailers but also department stores, supermarkets, small and medium sized speciality stores which are housed together in shopping malls and plazas in the urban areas. Mega malls, many with over a million square feet in retail area, are springing up. They have a vastly different look and function compared to their predecessors to meet the needs of changing times.

Domestic spending within the retail industry is rising sharply. Higher disposable incomes, a rapidly rising population, a reduction in import duties, and an influx of foreign investment and retailers has led to a dramatic expansion of the retail industry. Private consumption remains the motor for the dramatic growth and seems good for the retail sector. Growth is being seen in all product sectors, including food sales and transportation (including vehicles and petrol). Starting in 1980, the food sales

and transportation are the major section in the retail industry (see the detail in Chapter 3).

Between the two sectors, food and transportation, the latter sector has experienced phenomenal growth in the past decade (Euromonitor May 1994), and with the medium income groups now owning a car and faster growth in Malaysian motor industry, this sector is the most interesting sector for study. With good infrastructure (the nation's road transport network which has been decribed as among the best in the world), the growth in the number of households, coupled with increased wealth and consumer credit has resulted in major growth in sales of cars and the demand on petrol is also high. In 1993, the number of registered private vehicles increased to 6.7 million (Malaysia: Malaysian Business June 1st 1994) and consumed about 390,000,000 litres of petrol per month (Malaysia: NST 19th December 1994). In 1994, about 16,000 extra cars took to Malaysia's road each month (Malaysia: The Star 13th January 1995).

In the downstream sector, especially in retailing of petroleum to the local consumer, they consumed about 5.1 per cent per year which is more higher compared to 3 per cent for industrial countries (Malaysia: Ministry of Energy, Telecommunication and Posts 1985). The sales volume of three grades of petrol (premium leaded 97RON, regular leaded 85RON and unleaded 97RON) until

November 1994 had reached over 390,000,000 litres per month. Beginning from January 1995, the government decided to introduce only two grade structure of petrol (leaded 92RON and unleaded 97RON). RON is an acronym for Research Octane Number. It is the measurement of the "octane rating" of petrol. The higher the octane rating, the greater the protection against engine "knocking". Knocking damages engines over time (Malaysia: NST 31th December 1994).

In the petrolum retailing industry, the market was dominated by three major oil companies. Two are multinationals which were established in the market more than 100 years, Shell and Esso and the other was Petronas, the government controlled company. The total of service stations owned by three of them reached nearly 1700 stations over the nation (detail in chapter 3). The analysts estimated the industry will grow about 6 per cent per year, based on the 1991's market of about RM 4 billion. On the other hand, profit margins over five years averaged less than 4 per cent only and never changed because it followed the pricing mechanism set up by the government. This is a dilemma faced by the owners or dealers of service stations.

In business, it is very common to see some companies die or go out of business. Others survive but their growth appears to be restricted. Still others grow, develop and make good performance. Any research that identifies the factors having the greatest impact

on performance will aid executives in the decision-making process and improve probability of success. On the other hand, for business specifically in retailing industries, the decision making processes are commonly referred to as the formulation, evaluation and selection of the alternatives to solve the managerial problems. The owners and managers must wade through a plethora of data, information sources and studies that, more often than not, are confusing and sometimes outright conflicting. This state of affairs, coupled with the increasing complexity of the decision making environment, suggests the need for management in all functional areas to understand better the process of obtaining information for their decision making responsibilities. Retail chain store executives (owners and managers) especially in petrol retailing industries are constantly facing the problem of chosing a combination of decision making processes in their effort to achieve success. Although many executives are increasingly using more sophisticated tools for decision making, there still appear to be instances of decision by intuition, hunch or untested rules of thumb.

Further more, the elements of productivity are always related to profitability or success. Nowadays, productivity is a major concern across many segments of the business. After the ravages of inflation in the late 1970s and early 1980s and recession in late 1980s and early 1990s, the need to increase productivity appears to be more urgent. Knowing this major concern, the Malaysian

Government also had set up a centre for productivity for all sectors in Malaysia known as National Productivity Centre (NPC). Although the productivity is well-known in other sectors, especially manufacturing and theories are well developed in the industry, in retailing the valid methods of productivity measurement need further development (Ratchford and Stoops 1988).

After the general election in April 1995, Malaysian Government has set up a ministry for developing the interest in entrepreneurship and small business. This step shows that the interest among policy makers at federal levels in small and growing firms. Thus, there will be increasing interest in identifying the factors associated with the conduct and performance and/or productivity of the small, dynamic firm and the relationships among those factors. Unfortunately, the literature tends to be presciptive and lacks both theory and empirical base (Glueck and Mescon 1985; Robinson and Pearce 1984 in Keats and Bracker 1988; Cooper et al 1993). On the other hand, small firms are quite different from large firms in a number of ways, and in the researcher opinion, the theory and practice in the large firm cannot be used in the small firms (Storey et at 1987). So, one of the purpose of this research is to build on and/or expand the above argument by developing a model of small firm's (in this study, outlets or chain stores) performance and productivity.

On the other hand, previous research has also used a variety of performance and productivity measures, so making comparisions across studies is also more difficult. From the reviews, little effort has been done to determine whether the factors or variables that enhance one measure of performance are the same as those that lead to other measures. Furthermore, some researchers have a tendency to examine variables that were easy to study, rather than those that were important. There are also problems relating to the ways in which data have been analysed. For example, most of the earlier studies only used cross-tabulations or univariate analysis or in other hand, less sophisticated and very few used multivariate analysis (more details in Chapter five).

The following section will discuss further the problems faced by the petroleum retailing industry in Malaysia.

1.3 Statement of the problem

The purpose of this study is to contribute to better understanding of the problems involved in decision making process of retail chain store executives, and in particular in the petroleum retail industry. There are a number of variables or factors which can have an impact on the success of individual chain store units. They include such variables as product offerings; store location; strength, number and strategies of competitors; promotional

efforts; store factors such as store size, inventory level and number of employees; store manager characteristics including such factors as the store manager's experience, age, marital status and educational level; and market factors such as disposable income and population. All of these factors will be discussed deeply in chapter four and five. One main question is to answer which variables are involved in decision making process in petroleum retailing industry in Malaysia.

In Malaysia, the service stations were categoried in small business sector. Normally, the small business requires organized and systematic management in order to produce results. According to Drucker (1974), small business managerial needs to center around strategy formulation, the proper structure of managerial tasks and the presence of informational control systems.

The small business also needs its own control and information system ensuring that resources are implemented for maximum results. Drucker (1974) also specifically states that the information obtained should be related to the present condition of the firm and the present deployment of key resources to anticipate future developments, both to identify opportunities and to ward off potential danger.

One of the important characteristics is effective usage and interpretation of information. The degree of long run success will

ultimately depend to a great extent upon management ability to recognize its needs, to gather information, and to interpret, utilize and effectively interrelate the vast amount of information and assistance available from all sources (Creenden 1966).

However we cannot ignore the important of small business sector in economic aspects. For example, in US and Canada, 97 per cent of all businesses are catogerized as small and they employed 57 per cent of the workforce, produced 45 per cent of the GNP and created 67 per cent of the new jobs (Ibrahim and Goodwin 1986). Statistics have shown that over 80 per cent of all new jobs are created by small businesses (Hofer and Sandbery 1987). Approximately 785,000 0f all businesses in Australia employ fewer than 100 employees. These small businesses represent some 98 per cent of the total private interprises, and employ approximately 55 per cent of the total private sector employment and 80 per cent of small businesses are located in agriculture, wholesale, retail, business services and construction sectors (Kent 1994). In Malaysia, statistics about small businesses are unknown but from the number of establishment in 1990, 93.4 per cent are sole proprieter and partnership. This figure shows that most of the establishments are small businesses and employ not more than five employees per establishments (more detail refer to Chapter three).

Furthermore, the main problem facing by the small business sector is survival. There are a number of reports stated that each year many

of the small firms are forced to close their doors. For example, in 1980, there were 11,000 small business failures (Ibrahim and Goodwin 1987) and leaving behind US$14.64 billion in liabilities (Saladin and Nelson 1984).

In petroleum industry, the retailers do even more poorly than average of all retail establishment (Hand et al 1987). In the USA, one out of four retail petroleum service stations fails each year and 80 per cent of the failures are due to lack of ability to generate a profit (Bank of America 1971). In UK, the number of petrol stations has fallen from almost 40,000 in 1968 to just 16,951 at the end of 1995 (UK: The Sunday Times, March 3th 1996).

From my observation for the past few years, in Malaysia, this industry is the fastest growing compared to other industries. With large reserves of oil and gas, the potential development of the industry remain bright. Somehow it has become the surporting industry to other industries. Every industry needs power to operate, needs transportation to carry out their products for export or to reach their customer and consumer and all of them need fuel and the only resources they can get are from the petrol stations.

So how the dealers of service station in Malaysia survive? They are categories as small businesses but the amount of monies they have to spend is large compared to other categories of small businesses.

They have to find cash, bank guarantee and others to satisfy the oil companies before they are given the permission to run their service stations. To apply for a dealership, one has to show the oil companies enough working capital. For example, Mobil prefers those who can provide working capital of at least RM70,000 (US$28,000) and be able to secure a RM50,000 (US$20,000) bank guarantee. Caltex requires one to have RM100,000 (US$40,000) for working capital and a RM50,000 (US$20,000) cash security deposit. Petronas ask for RM100,000 (US$40,000) for working capital and RM50,000 (US$20,000) for bank guarantee (Malaysia: Malaysian Business April 1993). On the other hand, prices are controlled by the government and local people are not willing to work as pump attendant. One dealer tells that getting workers, and getting them to stay on, heads the list of problems. Another main problem which dealers have to bear with is the evaporation of petrol, being an invisible cost. According to one dealer, most of them have to write off another RM2,000 a month because of evaporation. In other aspect, they have to think or react just like other businessmen do, such as making decisions based on daily operations besides following the procedures set by the oil companies.

The main problem faced by the dealer, the owner or the manager, is how to make decisions when so many variables have to be considered? Which ones of the variables play the important parts in the business and which ones do not? If this one was important,

what would the level or degree of importance be? While previous studies have reported the causes of failure, little empirical research has examined businesses for common factors associated with a successful business (Ibrahim and Goodwin 1986). One of the main questions is why some firms succeed and the others not? All these questions need to be answered.

From the discussion mentioned above, the failure rate of the firms is high and many survivors achieved only marginal performance (Reynold 1987 in Cooper 1993). What is needed is a better understanding of the factors relating to survival and growth (Cooper 1993) but measuring performance presents a significant challenge for scholars (Chandler and Hanks 1993) and become an aggregate phenomenon in many researches (Hansen and Wernerfelt 1989) for many scholars. There is some agreement that it is appropriate for different fields of study to use different measures of business performance because of the differences in their research questions (Hofer 1983; Venkatraman and Ramanujam 1986 and Chandler and Hanks 1993). However, there are very limited research that has focused on the development of performance measures for small, emerging firms (e.g Robinson et al, 1986; Bruch 1990; Chandler and Hanks 1991 and Bruch and Vanderwerf 1992).

At least, there are two challenges inherent in performance research that require the development of appropriate performance estimators. Firstly, evidence suggests that some traditional measures may not be

appropriate. Due to the small starting base, growth rates are often enormous and erratic, producing extreme outliners that are difficult to deal with in statistical analysis (Walsh and White 1981). Conventional return measures (e.g ROE, ROI and ROA) also are problematic (Chandler and Hanks 1993). In small businesses, physical asset may be very low, therefore, a marginal business with a small investment/asset base could show remarkable returns compared to a relatively healthy firm with a more substantial asset or investment base (Walsh and White 1981). On the other hand, small business typically, also do not understand these terms and do not use these ratios. According to Miner et al (1984), to ask for these figures might have precluded any response at all.

Secondly, various financial performance variables appear to be capturing different dimensions of performance (Venkatraman and Ramanujam 1986) and considerable evidence suggests that variables correlated with firm performance change as the defination of performance changes (Von Hippel 1978; Cooper 1984; Abeele and Christiaens 1986; Begley and Boyd 1987 in Chandler and Hanks, 1993). As mentioned above, previous research has used a variety of performance measures but to make comparisions across studies are more difficult and produce contradictory results (as discussed in Chapter four and five).

In commenting on these aspects, Chandler and Hanks (1993) write (page 393):

These inherent difficulties make it even more crucial to identify, define, develop and validate appropriate estimators of performance. Researchers interested in the performance of emerging businesses must acquire data that meet the criteria of relevence, availability, reliability, and validity when the only attainable source of data is a self-administered evaluative questionnaire.

However, according to Adams et al (1993) and Cooper et al, (1994), differences in outlet performances can normally be associated with unique factors at the outlet level because the outlets may differ from one to another such as site location, neighbourhood characteristics and nearby retail establishments. The problem of establishing a reasonably consistent performance evaluation is heightened when a firm opens a large number of outlets and faces turnover at the supervisory level (Adam et al 1993). In addition, theoritical frameworks for analyzing influences upon firm performance are not well developed (Cooper 1993).

There is clearly a need for research on whether some variables are more important than others in explaining performance and how the variables should be operationalized. Also, in terms of managerial use, there is a need for performance models that can help in decision making process by the executives and helping the top management to review their current judgment-based performance.

On the other hand, the level of productivity in small businesses has declined rapidly all over the world. Many business people, social observers, economists, researchers and government officials are alarmed by the recent slow productivity in the world economy. This situation is acute in retailing, where productivity increases are reported to be chronically far less (Achabal et al 1984). In many parts of the world, productivity reflects the higher standard of living (Ingene 1982) and when productivity improves, thus profitability increases (Lusch and Soo 1984). According to Lusch and Soo (1984), in retailing, there is a direct relationship between productivity and profitability because in the short run, the price of input and output are relatively fixed. When the quality of output is high, the retail firm can achieve more per unit of input, and as a result, the firm becomes more profitable.

However, researches in retail productivity also face the same problems as performance and sometimes, more complex. The entire issue of Journal of Retailing (Fall 1984) was devoted to the topic of productivity, providing ample evidence of its importance and serious problem of its measurement. The valid method of productivity measurement for retail firms need futher development (Ratchford and Stoops 1988). Most current methods are based on index numbers that measure ratios of outputs to imputs (e.g most works of Bucklin 1977, 1978, 1981; Ingene 1982, 1984) and demand function (Ratchford and Stoops 1988). There is little effort that has been done to determine whether the factors or

variables that enhance one measure of performance and/or productivity are the same as those that lead to others. On the other hand, past research have been critisized by the tendency to examine variables that were easy to study, rather than those that were important (Cooper 1993).

The question is "how do we improve productivity?" This question cannot be answered validly without answering first the question, "What are determinants of productivity?" For summary, the question regarding perfor-mance and productivity are almost the same; which factors or variables can give an impact on performance and productivity? All these questions need to be answered, the researcher undertakes this research endeavour.

1.4 The conduct of the research

At first, my intention was to carry out fieldwork in more than one state in which the sample will be large enough although I know that was almost impossible. It was intended that the data which will be collected was mainly through interviews, secondary resources and questionnaires, if necessary and possible.

With the above objectives in mind, a pilot study was conducted in late Disember 1994 until late January 1995 in few places surrounding Stirling town in Scotland and in February 1995 at

Negri Sembilan in Malaysia. Unfortunately things did not go as expected. To get approval from the petroleum company for individual research was a complex process which was time-consuming, financially prohibitive and the bureaucratic. Without official access it was difficult to interview the dealers because they had already been warned by their company not to entertain anybody who came with an intention to interview any aspect of their businesses.

After fulfilling their requirement such as a letter from the university, a letter from my employer, a copy of my questionnaire, objectives of the study, at last after a month, I was given a letter asking the dealers to give access to necessary information but with very limited sample. The sample within one state consisted of 45 unit of service stations. I had no choice but to start my survey although I knew that the sample was very small in terms of sampling procedure.

In short, this research is based on structured questionnaires and some documentary data from various sources especially in petroleum industry. As much as possible, the available data have been read, understood, analysed, compared and located within the literature concerned.

1.5 The Purpose and the Importance of the Study

In summary, by interpreting data from the survey, this thesis focuses upon performance and productivity of retail petroleum industry in Malaysia. The objectives of the study, all relating to individual retail chain store units (this study was on petrol stations) are:

1. to determine the aggregate impact of the independent variables on the performance and productivity measures.

2. to identify the effect of major groups of predictor variables on the performance and productivity measures.

3. to identify those individual independent variables which have the greatest impact on the measures of performance and productivity.

4. to find out any differences between the owner and manager in an effort to achieve best performance and high productivity.

5. to develop several conclusions as to the value of using these independent variables to predict unit performance and productivity.

6. to identify different "types" of service stations and what differences between them toward performance and productivity.

7. to formulate some recommendations regarding a marketing strategy that chain store executives should consider in their efforts to improve the performance of their retail stores.

The questions stated above are meant to satisfy particular objectives. The choice of research questions in all studies are, in part, statements of personal biases of the researcher. This study is no different. Our choices of questions and assumptions are very personal choices and do not reflect the best or the only way this study can be undertaken. Important differential business success and performance based on some common set of criteria would assist evaluation and assessment of the significance of various variables incorporated in the research design.

From the sub-section 1.3 above, one of the central questions in business is why some firms succeed and others fail. If we can determine what factors influence firm performance, this is very useful for prospective entrepreneurs as well as their advisors and investors. If they know certain factors will increase the probability of success or failure, then they can make appropriate steps or actions in deciding to start or not to start at that time. At the general level it is felt that this effort of interest does not only apply to the executives but also to the students and the

administrator in economic and business administrations in Malaysia. A second group of interested readers would be the oil companies in Malaysia who are responsible for providing the products and the services to the public. The third and equally important group of readers would be the businessmen or the entrepreneurs who have interest to venture in this business.

1.6 Assumptions and limitations of the study

Carefull research procedures will be followed to prepare the questionnaire so that the questionnaire used is a valid and reliable instrument for measurement of performance and productivity that we are interested in. It is also assumed that the questionnaire will be answered with honestly and candor and there is no motivation to hide or distort information given by the respondents. Therefore the data obtained is valid and reflect the true performance and productivity of the executives.

There is an inherent limitation in the study of this nature due to a number of uncontrollable variables in the criteria used, samples and instrument. The samples will be limited to Petronas's petrol stations only due to limitations of time, money and other circumstances. The classification and definition of performance necessarily involves an evaluative act as determined by the criteria set. Special mention can be made of the problems of

obtaining true and accurate financial disclosures, especially on firm's income and volume of sales and it is predicted that some reluctance to divulge this information will be faced.

1.7 Framework of the study

This thesis is divided into nine major chapters as follows: Chapter 1 introduces the overall study. Chapter 2 reviews the history and development of petroleum in the world and in specific to Malaysia. Chapter 3 describes the retailing industry in Malaysia and the development of petroleum retailing in Malaysia. Chapter 4 and 5 review literature on performance and productivity of managers-/owners and part of the theoretical perspective for the empirical study. Chapter 6 describes the materials and methods to answer the problem of the study, in other words research methodology. Chapter 7 reports the research findings. Chapter 8 attempts to analyse and interpret the research findings in terms of their normative implications. The last chapter provides a summary of the study and presents the conclusions and recommendations.

CHAPTER TWO

DEVELOPMENT OF PETROLEUM INDUSTRY

2.1 Introduction

The main aim of this chapter is to provide an overall view of the various aspects of the petroleum industries especially in Malaysia. The need to focus on these industries is to identify and determine various variables which impact the business sectors especially in petroleum retailing. Discussions will focus on the development of the petroleum industries in Malaysia, petroleum history of Malaysia, some characteristics of the Malaysian petroleum retailing market and a brief introduction on development of the automobile industry in Malaysia. This is very important because the researcher would identified and highlighted the important variables in the industry. Lastly this chapter will focus on the overall future of the petroleum industry in the world. The last sub-topic mentioned above is important in order to examine and to show the trend of production and consumption of oil in the world market. These topics are related either directly or indirectly to one another.

2.2 The story of petroleum

All of us either directly or indirectly use oil and natural gas, which are sometimes referred to as petroleum. Most of us are familiar with the petrol or diesel that we put into our cars and the gas which is

used in our kitchens. The term petroleum comes from an old Greek word for rock, "petra", and Latin word for oil, "oleum". Since most oil is found in rocks, petroleum literally means rock oil (GPAD 1988: page 1).

In common usage, petroleum is broadly used to describe crude oil and natural gas. Oil and natural gas are also known as hydrocarbons because they are made up of the two elements, hydrogen and carbon. Crude oil is liquid hydrocarbon while gas is hydrocarbon in the gaseous form. Besides hydrogen and carbon, crude oil contains a number of other chemicals, such as sulphur, in varying quantities (GPAD 1988).

Crude oil from different parts of the world and indeed, from different parts of the same country, may differ widely in properties and characteristics. Oil produced in Malaysia for examples differs from Middle Eastern oil in texture and smell. Also, the colour could range from green or yellow to brown or black. Some oil is very sticky or heavy while others are thinner and lighter. The chemical contained in the oil also varies and the percentage also differs from one to another.

The world's petroleum story began on 28 August 1859, when Colonel Edwin Laurentine Drake drilled the world's first commercially successful oil well near a small American village called Titusville in northwestern Pennsylvania. Titusville became the site of the world's

first oil well and the true potential of petroleum was discovered, thus giving rise to the birth of the petroleum industry. It was soon followed by discoveries in other countries; Pakistan in 1866, Peru in 1869, India in 1890 and the Dutch East Indies (now Indonesia) in 1893 (GPAD 1988: page 3).

Today, oil and gas together supply about 60 percent of the world's energy needs (GPAD 1988). Most other industries depend on petroleum for their energy requirement. As a result, large amounts of money are spent on the petroleum industries. In 1993, two of the top five largest corporations in the world were oil companies (Fortune 1994).

The first step in the search for petroleum begins with the use of geological and geophysical data to locate areas that are likely to contain reservoir rock. Geological data are obtained by studying surface rocks, and subsurface rocks obtained from drilling holes. The more sophisticated geophysical methods include measure-ments of magnetic or gravity forces, radiometric or electrical characteristics, or accoustic (sound) wave propagation. Of these, the study of behaviour of sound waves to determine geological structures - sometimes referred to as seismic survey - is the predominant method and has been in use for 50 years (PAD 1984: page 4).

Once a potential petroleum reservoir is identified, tests and investigations are conducted. The data gathered may then be used to

construct a conceptual model of the geological structures to determine where petroleum accumulations are likely to be found. The final test is actual drilling.

Exploration drilling is the first step, and represents the climax of all exploration activities. Its purpose is to test the existence of oil or gas and the potential of prespective structures. If an exploration well is promising, appraisal wells are drilled to assess the size of the discovery. Should a discovery be found to be commercially viable, drilling rigs are displaced by fixed production platforms for the drilling of the development well. When drilling operations have been completed, a series of valves and gauges popularly known as "Chrismas Tree" are set at well-heads to control the flow of the oil and gas (Sarawak Shell Berhad 1978).

The petroleum industry may be broadly divided into its upstream and downstream sectors of operations. The upstream operations refer to the process of finding petroleum, extracting it from the ground and transporting it to the processing plants. Downstream operations are those that involve the refining and processing of petroleum, and the marketing (and the retailing) and manufacturing of products from petroleum (Figure 2.1).

2.3 The petroleum history of Malaysia

The petroleum industry in Malaysia had its beginnings in Sarawak and Sabah, the two states situated in East Malaysia (Figure 2.2). The early inhabitants of Sarawak and Sabah had long known of the existence of oil seepages in various parts of the states. The most numerous of these oil seepages were located around Miri in Sarawak. In 1882, the earliest official record of Miri oil was made by the British Resident of the Batam District, Mr Claude Champion de Crespigny (Sarawak Shell Berhad 1978). It was reported that the "earth oil" as it was called then was collected from the ground for various domestic uses. In those days, some 18 wells were dug by hand by the local inhabitants (GPAD 1988). In that time, the oil was believed to have medical qualities, especially as a cure for skin diseases. The thick tar-like residue found at the seepages was used to water proof boats. The oil was also used for lighting purposes, though this often had disastrous results for the attap and wooden houses.

No attempts were made to develop the Miri oil commercially until 1909. In that year, the Rajah of Sarawak (White King), Sir Charles Vyner Brooke, awarded the Anglo Saxon Petroleum Company the sole right to explore for petroleum resources throughout Sarawak (Rawlan 1969 and Payne 1960). This was the first petroleum licence awarded in Malaysia. This effort was made by de Crespigny's successor, Dr. Charles Hose, who became the Resident in 1888. Sarawak's oil industry owes much to him. Hose returned to Sarawak with Dr. Erb,

(the Royal Dutch/Shell Group of Companies' petroleum expert). Dr. Erb seems to have been impressed but cautious regarding prospects for oil. He carried out a general geological survey of a large part of northern Sarawak and reported back in person to the Anglo Saxon Petroleum Company confirming the existence at Miri of a dome-shaped, on symmetrical anticline with a steep eastern flank and numerous oil seepages. On 10 August 1910, a small group of oil men gathered on a hill overlooking the town of Miri. A wooden derrick was erected and using the old cable tool method, they started drilling into the ground. Drilling was a slow and laborious process, but on 22 December, oil was finally struck at 425 feet and brought into production (PAD 1984: page 6).

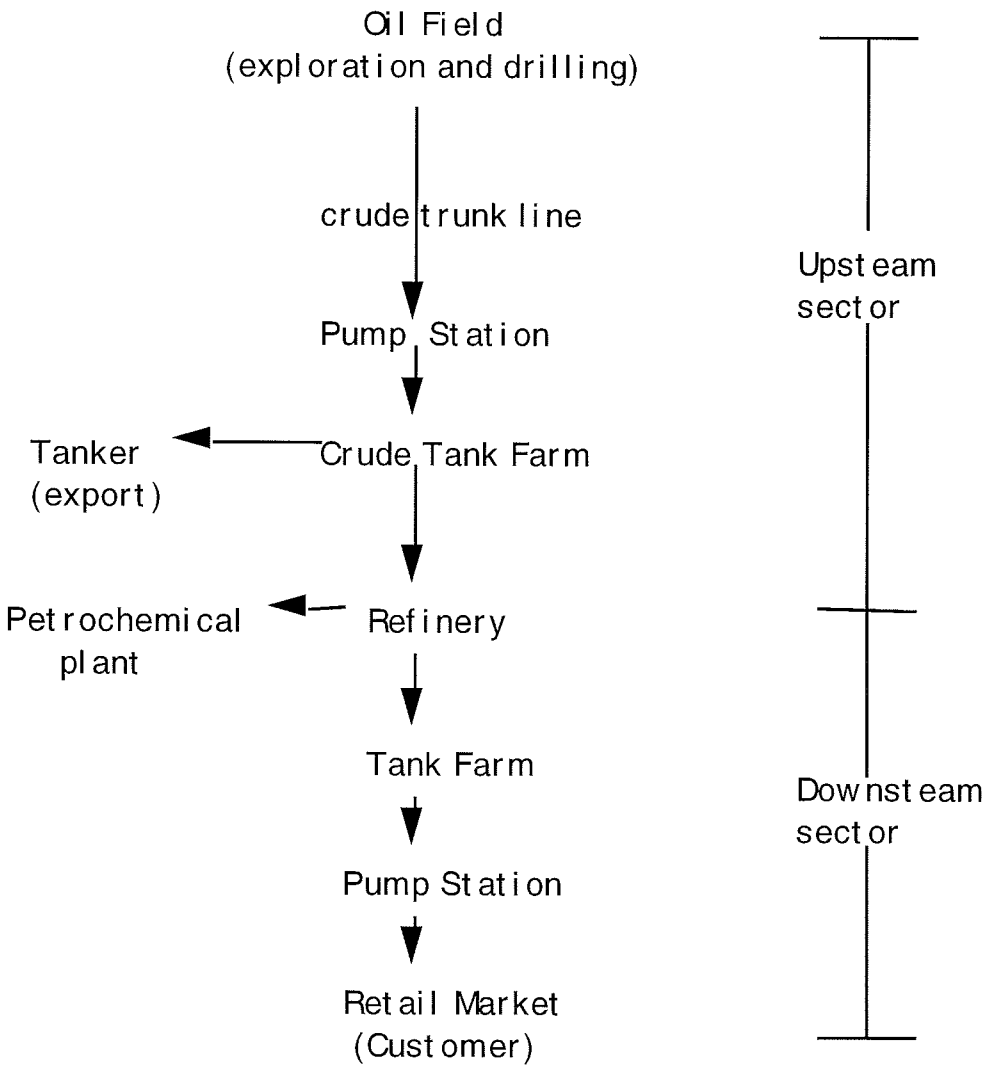
The Miri oil strike marked the beginning of the Malaysian Petroleum industry. The initial producion was only 83 barrels a day but this increased to a peak of 15,000 barrels a day in 1929 when futher drilling took the depth to 1096 feet. They called this Well no.1 or the Grand Old Lady of Miri (PAD 1984 and Sarawak Shell Berhad 1978). The first cargo of Miri oil was exported in April 1913. During the Japanese occupation of Sarawak (1941-1945), the Miri oil field was severely damaged.

Despite massive efforts of reconstuction, post-war production never returned to pre-war levels. The Miri field was finally shut down in October 1972. To date no other onshore oil field has been found in

Malaysia. During its life-span of 62 years the Miri field produced over 80 millions barrels of oil (Sarawak Shell Berhad 1978).

Figure 2.1

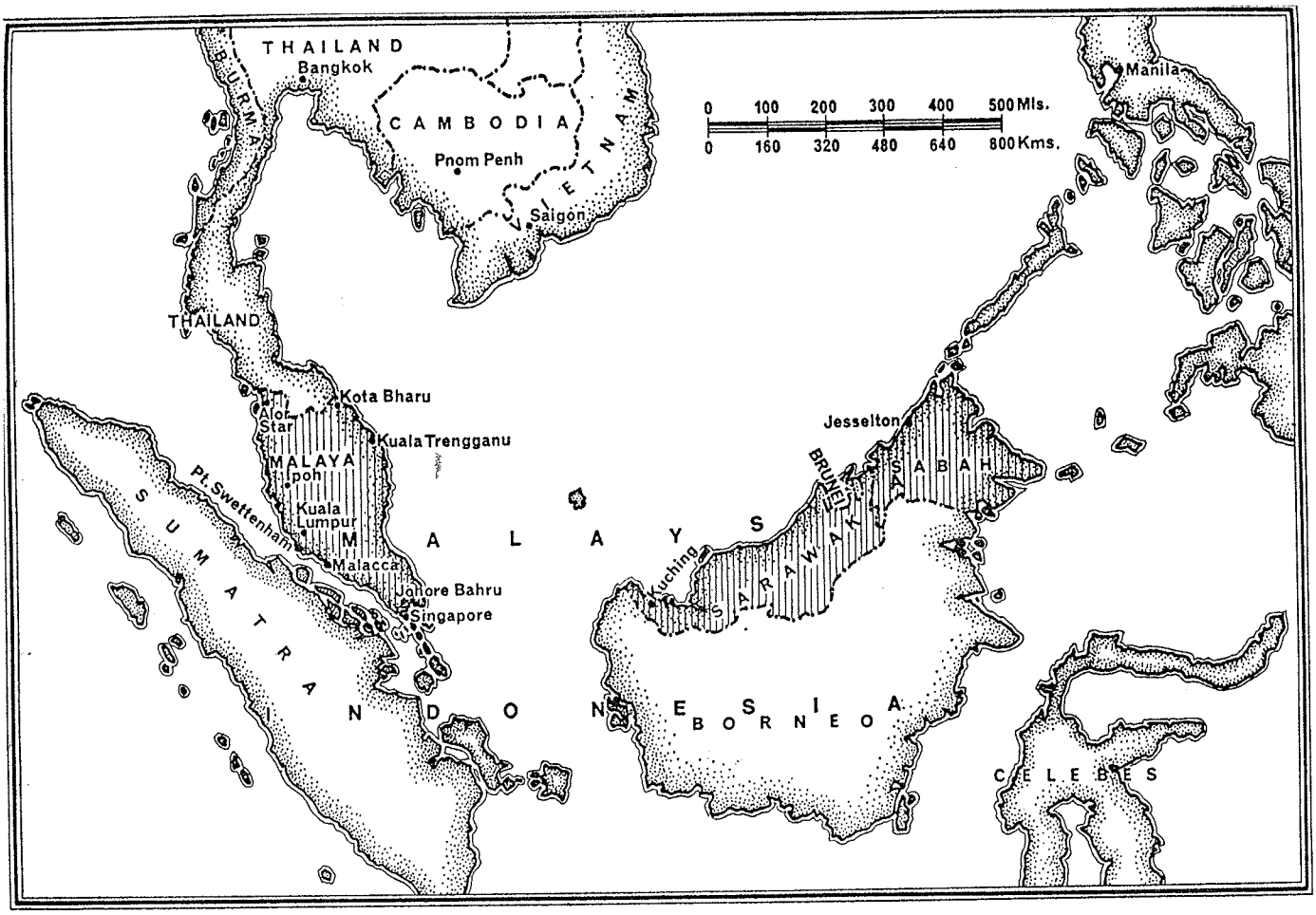
Flow Chart for Petroleum Industry



Source: Modified from Burger and Anderson (1989), pp 64

Figure 2.2

Location of Malaysia in Southeast Asia Region



The Miri success encouraged further attempts to discover other onshore fields. However, only traces of petroleum were found and these were not large enough to justify drilling activities. Consequently, by the 1950s, attention turned to the sea. This was made possible by new improvements in the developed countries of the west in offshore petroleum technology. Marine seismic surveys

were carried out for the first time in Sarawak in 1954. Similar surveys were conducted offshore of Sabah between 1955 and 1956. The shift to offshore began to show results when in 1962, oil was discovered in two areas offshore of Sarawak, the Patricia and Temana. However, Patricia was never developed, while Temana came onstream much later, in 1978. Other finds followed in rapid succession in the following years (GPAD 1988: page 9).

In the years after the 1962 discoveries, a great deal of attention was focussed on the development of the offshore oil industry in Sabah and Sarawak. Initially, the oil scene was dominated by Shell. However, many other foreign oil companies were soon attracted to the Malaysian oil patch. Between 1965 and 1969, four companies, namely Esso, Aquitaire, Oceanic and Sabah Teiseki Oil Company signed Petroleum Agreements with the State Government to operate offshore of Sabah and Sarawak (GPAD 1988: page 10).

Meanwhile, in Peninsular Malaysia, petroleum exploration activities began in 1968. In April 1968, Esso and Conoco were awarded concessions by the Government to explore for oil and gas off the east coast of Peninsular Malaysia. Three years later, in 1971, the first oil field was dicovered by Mobil. By the end of 1973, a total of 19 oil fields had been discovered in Malaysia's offshore areas, of which four had already been brought into production (GPAD 1988).

Consequently, Malaysian crude oil production increased from only 4,000 barrels per day in 1968 to 90,000 barrels per day in 1973 and increased by 4.8 per cent to average of 661,100 barrels in 1992 (Oil and Gas Journal, December 1992). Of the total crude petroleum to be produced in 1992, 56.2 per cent was expected to be from 13 oilfields in Peninsular Malaysia, with the remaining 43.8 per cent being produced by 10 oilfields in Sarawak and seven in Sabah. In 1992, the production of Malaysia's crude petroleum was projected to decline by 2.3 per cent to 637,200 bpd compared to 652,100 bpd estimated for 1991 because the policy of Malaysian Government is to be maintain the production. From 1993 onwards until now, the production of oil maintained at 643,000 bpd (Malaysia: Ministry of Finance 91/92, 1995).

In 1971, significant quantities of natural gas had also been discovered, notably in the Central Luconia Province offshore Sarawak (GPAD 1988). In line with the rising demand for gas, both in the domestic and the international market, total gross production of natural gas in 1991 is expected to increase by 17.1 per cent to 2,190 million standard cubic feet per day (mmscf/d). About 58.4 per cent of total gas production is expected to comprise non-associated gas produced by six gas fields and the remaining 910 nmscf/d being made up by associated gas from 30 existing oil fields in the country (Malaysia: Ministry of Finance 91/92).

By 1973, however, political developments in the Middle East gave the world its first "oil shock". For some months, nearly all oil importing countries of the world suffered shortages and hefty price increases. A second oil shock followed in 1978 as a result of the Iranian revolution with further increases in oil prices. These events were to change permanently the system of oil exploitation in nearly all oil producing countries. The Malaysian Government had become aware of the growing importance of the petroleum industry in Malaysia and the situation all over the world. As in many other developing countries, oil companies in Malaysia had been operating under what is known as a concession system. Under this system, large areas were made available to oil companies under very generous terms and the Government retained very little control. In return for these concessions, the oil companies paid a small royalty and taxes to the Government.

The trend towards government intervention in the industry began to gain momentum, and an important phenomenon emerged on the international petroleum scene: the creation of state petroleum enterprises or national oil corporations. Through this mechanism, governments became the predominant power in national and international petroleum policy, and in fact, became petroleum operators in their own countries. Malaysia, like other petroleum-producing countries, began to seek greater control and participation in the petroleum industries after the Arabs-Israel war in 1973. To achieve this objective, the Government decided to set up a national

petroleum corporation. This would be a Government-owned company that would run the industry like any other commercial company. The national corporation would ensure that Malaysian petroleum is properly managed so as to give the maximum short and long terms benefit to the nation. Thus, on 17 August 1974, PETRONAS or Petroleum Nasional Berhad was incorporated under the Companies Act 1965 as the national petroleum corporation of Malaysia. On 1 October 1974, the Petroleum Development Act was passed by Parliament to give Petronas exclusive ownership and control over all petroleum resources in the country. The Act also gave Petronas the power to process or refine petroleum, to manufacture petrochemical products and to market these items (GPAD 1988: page 12).

2.4 Legislation Development

For several years, petroleum held little more than fiscal interest for the government of producing countries. This was especially true of the developing countries like Malaysia, where the multinational oil companies maintained virtually complete control over petroleum resources. By and large, the only sovereign right exercised by a developing country was in the collection of taxes and royalties. It became generally accepted that in most developing countries, the petroleum policies adopted from the multinationals for exploitation and development of petroleum resources - which of course served mainly in the interest of the companies themselves.

In an attempt to spell out the optimum development strategy for the petroleum reserves, the Malaysian Government engaged an international consultant firm, Walter J. Levy (1965) to conduct a study which was completed in 1964. Consequently the government enacted the following legislations:

1. The Petroleum Mining Act, 1966
2. The Continental Shelf Act, 1966
3. The Petroleum (Income Tax) Act, 1967 and
4. Petroleum Mining Rules, 1968

The passing of the Continental Shelf Act enabled Malaysia to proclaim the ownership of natural resources beyond the territorial limits of the coastal states up to the water depth of 200 metres or deeper. Other Acts allowed the Government to establish its various agencies, provided the issue of exploration licences, the payment of royalities to the Federal and State Government, the payment of taxes and the sharing of profits (Chee 1981).

As mentioned in the previous (sub-topic 2.2), on 1 October 1974 the Petroleum Development Acts was passed by the Malaysian Parliament. These provisions implied an end to the concession scheme for the oil companies. The immediate functions of Petronas were to negotiate with the oil companies and the Federal and State Governments. Petronas and the oil companies such as Shell and Esso successfully concluded the production sharing contracts on the 30

November and 8 December 1976 respectively. On 3 May 1980, Petronas Carigali[1], Oceanic Exploration and Development Corporation and British Petroleum Development Limited concluded a production sharing contract with Petronas (Nada Petronas, May 1990). Meanwhile Petronas also succeeded in negotiating with the Federal and State Governments such as Sabah, Sarawak and Terengganu. By 1991, Petronas has concluded 37 production sharing contracts with 41 oil companies since the first production sharing contracts was drawn up in 1976. For the year 1991, a total of 62 exploration wells were expected to be drilled compared to 45 wells in 1990. Total investment in petroleum exploration by Petronas, Shell and Esso for 1991 was estimated at MR1.4 billion (Malaysia: Ministry of Finance 91/92). Petronas also predicted that private companies will spend about MR2.1 billion for oil and gas exploration, development and production in Malaysia during the fiscal year ending in March 1994. Petronas itself expects to commit about MR1.24 billion in the same fiscal year (Oil and Gas Journal, January 1994).

Beside production-sharing contract which Malaysia has followed, there are three more types of petroleum arrangements used throughout the world to express the legal relationship between a state and an oil company: the concession, the risk service contract and the service contract. It should be noted that more than one type of arrangement can be used by the same country.

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[1] One of the Petronas's subsidiaries

The concession provides for the total ownership by the concessionaire of petroleum produced, with the state entitled to compensation, usually in the form of income tax and royalty. The concession is the most widely used petroleum arrangement and there are a number of synonyms for this instrument, such as permit, licence and lease. The risk service contract is the least used compared to the concession and production-sharing contract. Under the risk service contract none of the production goes to the IOC (International Oil Corporation), the production goes to the host government. The IOC is then rewarded for having found production by a cash payment per barrel, or per cubic metre, or some similar measurement. The pure service contract is based on the oldest contractual relationship known to man: payment given for services completed. The service contract is rewarded with fee, usually cash for services (Barrows 1987).

2.5 Petroleum and the Malaysian Economy

Petroleum in its various forms is the world's prime source of energy. The transport industry is highly dependent on gasoline, diesel and jet fuels and all of them are petroleum products. Most factories are powered by fuel or natural gas. The electricity is largely generated from heat provided by burning petroleum. Besides these major uses, petroleum provides lubrication for machinery and yields bitumen for surfacing roads. The petroleum gases obtained from refining crude oil or processing natural gas are used for a number of purposes such as water-heating, air-conditioning or space heating, cooking and

incineration. Petroleum is also the raw material for petrochemicals which form the basis for numerous products of everyday use ranging from agricultural chemicals to pharmaceuticals, plastics to cosmetics.

Petroleum also has an important role to play in the Malaysian economy. In 1987, Malaysia's total energy consumption was about 293,000 barrels per day. Oil met 56 percent of this consumption while natural gas accounted for another 21 percent (Table 2.1.).

Malaysian crude oil is "light" and "sweet". These are terms oil men use to describe generally the high API degree and low sulphur content. Crude oil produced in Malaysia is therefore of a high quality and is much sought after in the world oil markets. In export context, Malaysia has been a net exporter of crude oil since 1976 (GPAD 1988).

Table 2.1

Energy Consumption in Malaysia 1987

Type of energy	Barrels per day	Percentage
Oil	165,000	56
Gas	61,000	21
Hydro	20,000	7
Coal	8,000	3
Others	39,000	13

Source: Department of statistics, Malaysia,1988 pp 15

As such, petroleum is also an important source of revenue for the country. The major buyers of Malaysian crude oil are Japan, South Korea, Singapore, Thailand and The Philippines (GPAD 1988). In 1985, exports of petroleum earned MR8.9 billion (GBP 2.1 billion) and 1990 it earned MR10.6 billion (GBP 2.6 billion) (Table 2.2). However, in 1993 the export earnings from petroleum fell to 6.6 per cent only (Malaysia: NST 1st April 1994).

Table 2.2

Malaysia gross exports of minerals commodities

(from 44% of total gross exports)

Minerals	1985 MR million	(%)	1990 MR million	(%)
Tin	1,595	4.2	902	1.1
Petroleum	8,989	23.5	10,637	13.4
LNG	2,319	6.1	2,228	2.8
Others	280	0.7	391	0.5

source: Department of statistics, Malaysia,1990, pp 24.

The Government also earns petroleum revenue in the form of taxes, royalties and dividends and that amount was increasing from year to year (Table 2.3). In 1987, the petroleum sector as a whole contributed some 36 percent of total federal government revenue (GPAD 1988). However, in 1992 the percentage declined to only 9 per

cent because of the introduction of new policy by government to maintain the level of petroleum exports and concentrating on local refinery activities (Malaysia: Ministry of Finance 1991/92).

Table 2.3

Malaysia export duties and income taxes on petroleum (1986 - 1992)

in million (Malaysian Ringgit)

Year	Export Duties	Income Taxes	Overall Tax Revenue
1986	1,076	1,761	14,682
1987	1,170	1,533	12,473
1988	1,149	2,208	14,708
1989	1,432	1,847	16,674
1990	1,910	2,644	21,244
1991	1,997	3,251	24,667
1992*	1,723	3,251	26,307

Source: Malaysia Economic Report 91/92, Ministry of Finance pp 46.

Note: * Budget estimates after November 1991 and £1 = MR4

The next section will discuss the development of transportation industry which has direct and indirect impact on petroleum industry as a whole.

2.6 Automobile and Road Transportation Industry

The incorporation of the Ford Motor Company in Malaya in 1926 marked the beginning of the automobile industry in Malaysia. The company started the operation with 16 persons in a shophouse rented in Singapore to carry out body touch-up and wheel fitment functions. The initial batch of 5,329 units were sold at a unit price of S$1,773.00 (Asian Auto, October 1976). By 1941 they had shifted to Bukit Timah Road where the present plant is located. During the Japanese occupation of Malaya, the plant was utilized by the Japanese to assemble Nissan trucks (Chee 1981).

Post world war two era saw rapid development which led to the plan to supply market in Peninsular Malaysia, Borneo and Singapore. Ford Company in Singapore then became the sole car assembler for the Malaysia-Singapore market. As a result of the separation of Singapore from Malaysia, trade barriers have been imposed in the form of import quotas to limit the import of cars from Singapore. Consequently, Ford Company appointed a local dealer, the Universal Car Sdn Bhd and assembled its cars in Malaysia (Chee 1981).

Following the recommendation of a Colombo Plan expert in 1963, the Malaysian Government had explicitly expressed the need to establish a motorcar assembly industry to provide the impetus for the industrialization programme. In 1964 a meeting was held between the representatives from the motor trade and government officials to

discuss the type of assembly plant appropriate to Malaysia. About 19 applications from both local and foreign firms were received for proposal to setting up the assembly plants and manufacturing the component parts of automobile. The project received no favourable response from both governments when Singapore was separated from Malaysia. Both governments changed from partners to competitors and each embarked on its own policy to attract the industry and the investors (Chee 1981: page 25).

After the separation, the Government of Malaysia wished to reassess the status of the automobile industry. As such, an international industrial consultant, A.D Little Inc.(1967) was engaged to carry out the study. The main finding of the study stated that it was still a worthwhile exercise to establish the automobile assembly industry in Malaysia because it could generate job oppurtunities, income and save valuable foreign exchange expenditure. The first policy was made by the government in 1966 to impose tariffs on imports of built vehicles and the need to obtain import licences for all distributors or dealers who intend to import vehicles into Malaysia. In 1967 the first assembly plant was set up in Batu Tiga, Selangor, known as Swedesh Motor Assemblies Sdn Bhd, one of the six companies approved by the government to set up assembly plants in Malaysia. By 1971 there were at least 25 different makers of foreign vehicles being assembled by these plants and at least 100 different models of passenger cars and commercial vehicles were available (IBRD 1971).

Nowdays, there are eight members of the Malaysian Motor Vehicles Assemblers Association (MMVAA) and they successfully assembled about 60,257 vehicles between January to July 1995 (Malaysia: NST 21st August 1995). This figure does not include the Protons and Kancils produced by Proton and Perodua, the local car manufactures. Table 2.4 shows the detail of the statistics.

The success of assembly plants gave the idea to the Malaysian Government to implement a national car project. This project which was the brainchild of The Right Honourable Prime Minister, Datuk Seri Dr. Mahathir Mohamad, was also fortunate to receive his constant personal attention and guidance. PROTON is a joint-venture company established on the 7th of May 1983 with an authorized capital of MR400 million and paid-up capital of MR150 million. Besides Heavy Industries Corporation of Malaysia Bhd (HICOM) which holds 70% equity, the other partners are Mitsubishi Corporation (MC) and Mitsubishi Motors Corporation (MMC) of Japan each holding 15% equity respectively (Proton 1984/85). These partners are renowned as among the world's leaders in the automobile industry and their participation facilitates the transfer of technology in this field.

While the plant was under construction, a nationwide contest was organized to provide the opportunity for the public to participate in naming the inaugural Malaysian car. The contest successfully attracted over 100,000 entries and on the 27th of June 1984, the

name - PROTON SAGA was declared the winner (Proton 1984/85 page 10). The plant has commenced its commercial production on the 1st July 1985. The marketing of the Proton Saga was undertaken by Edaran Otomobil National Sdn Bhd (EON). The production capacity is 80,000 units per annum under two shift operations and can be increased if the demand increases. The first year of production was 8,290 units increasing from year to year (Table 2.5). Currently the Proton cars are being exported to 18 countries with UK and Singapore being the largest markets (Malaysia: NST July 9th 1994)

Overall, the Malaysia's motorcar industry has progressed with the immense success of the Proton Saga and is still enjoying a buoyant economy. In 1994, new vehicles registered sales of an all time high of 200,435. This is way above what was then a record-breaking (in 1993) with 167,928 new vehicles registered (MMTA and The Star, May 13th 1995). Interms of market share Proton Saga still dominates the market with 70.9 per cent, followed by Honda and other well known brands (Table 2.6).

After the success with Proton, the second national car project was launched and the car called "kancil" (mousedeer) hit the road on 26 August 1994 (Malaysia: The Star, May 13th 1995) and the possible third venture with a French car maker is already on the drawing board.

Table 2.4

Malaysia Motor Vehicles Assembly

from January-July 1995

Plant	Units
Associated Motor Industries	6,719
Automotive Motor Manufacturer (Citroen, Pekan Rider, Isuzu, Mitsubishi, Tata)	10,908
Asia Automobile Industries (Mercedes and Madza)	2,509
Assembly Services (Toyota, Daihatsu, Hino, Ken-worth)	14,870
Kinabalu Motor Assembly (Isuzu and Suzuki)	1,766
Oriental Assemblers	8,465
Swedish Motor Assemblies (Volvo, Suzuki, Daihatsu and Renault)	3,943
Tan Chong Motor Assemblies (Nissan, Audi, Subaru and Volkswagen)	11,077
Total	60,257

Source: Malaysian Motor Vehicle Assemblers Association in NST, pp 22

Table 2.5

The production volume of Malaysian National Car (1985 - 1994)

Year	Production Volume
1985*	8,290
1986	17,000
1987	20,500
1988	30,600
1989	47,900
1990	74,200
1991	87,800
1992	105,700
1993	102,800
1994	118,100

Source: Proton's Annual Report 1985 and NST,9 July 1994

Note: * From July to December

Lastly, the following section will discuss the world oil market in the future. This is important to know the effect and trend to the industry especially to the Malaysia economy and the petroleum industry as a whole.

Table 2.6

Top 10 Makes - Passenger Cars and Percentage of Market Share in 1994

Manufacturer	Number of units	Market Share
Proton	110,505	70.9
Honda	10,523	6.8
Perodua*	8,880	5.7
Toyota	6,425	4.1
Nissan	5,661	3.6
Volvo	2,086	1.3
Ford	2,016	1.3
Mercedes Benz	2,010	1.3
Citroen	1,711	1.1
Peugeot	1,541	1.0

Source: The Star, May 13, 1995 supplement pp 4.

Note: * the second national car manufacturer (launched on Aug, 1994)

2.7 An overview of the World Oil Market in the Future

Worldwide demand will increase only 0.9 million bopd to 67.7 million barrels oil per day (bopd) in 1994, reported by Pike(1993). This follows a worldwide decrease in demand last year estimated at 0.2 million bopd. Over the next three years, according to Mr. Ait Laoussine, President of Energy Consultant Firm and former Algerian

Energy Minister, period of slow growth is forecasted. In remarks at the recent Oil and Money conference in London, published in Middle East Economic Survey, they estimated an annual rate of growth in demand of "less than 1%" in OECD area, with the developing countries and China growing at an average of around 4% and East Europe at 1-2% (Pike 1993).

According to Pike, the area of greatest growth potential is in the OPEC countries, and especially in OAPEC countries, where plans of many members for productive capacity increases should reach fruition in the next few years. Taken together, they will add some 3.5 million bopd of productive capacity of OPEC. And there is Iraq, where lifting of sanctions will add another 2 million bopd production currently absent from the world market. Thus, the possibility exists for another 5.5 million bopd production from OAPEC countries alone in the next years, without considering potential in lesser developed countries, such as Yemen. Additional development in Latin American countries, especially Venezuela and Colombia, and perhaps Mexico, could add as much as 2.3 million bopd to existing worldwide production over the next 5 - 10 years. And, over the next two years, North Sea production should climb to unprecedented levels, adding an estimated 700,000 bopd to the world market.

Finally, a statement made by Pike, the Federation of Soviet Union (FSU) cannot be overlooked as a potential source of increased production and exports. Even now with production falling for the

past several years, the FSU has increased exports with an additional 3.5 million bopd which can be added to the world market. And to this, 12 million barrels of additional daily production could be added to increase production from frontier areas in Asia-Pasific such as Vietnam.

In Middle East Petroleum and Gas Conference in January 1993 at Dubai, one of the presenter, Patrick J Ward, Chairman and Chief Executive Officer of Caltex Petroleum Corp, said that the major oil consuming countries east of Suez expanded their economic by 5 - 6 per cent per year and its more than 1 and 1/2 times average growth worldwide and they have become less dependent upon and less influenced by the economic problems of the US and other industrialized nations. Along with that economic vitality comes a growing appetite for oil. Asia-Pasific area average oil demand growth of 3.6% per year through 1999, nearly double what most economists expect for oil demand growth worldwide. Overall oil demand in the east of Suez region increased at nearly 6% per year from 1985 to 1990. He projected growth in demand for refined products to more than 19.5 million b/d by 2000 from slighty more than 14.5 million b/d in 1992.

Joint ventures between oil producing countries and oil marketers are boosting the flow of investment into the oil consuming sector. Malaysia, Thailand, Indonesia, Singapore and other countries in the South-east and South Asia have received large amounts of capital

from the flow of trade into Japan and the newly industrialized countries of the area. The transportation fuels will account for the most of the consumption gain, raising to 12 million b/d in 1991. Motor vehicle ownership will grow at an average rate of 4% per year (Ward 1993). In general, the Asia Pasific has the greatest growth potential for the oil industry (Malaysia: Malaysian Business, October 16th 1994).

In line with its development as a growth market for oil, Asia-Pasific has become a center of refining construction activity. Singapore is in the midst of a construction push, much of it focused on refinery upgrading capacity. In Japan, construction centers on upgrading capacity, some distillation capacity expansion and significant new methyl tertiary butyl ether capacity. At least two new refineries are in prospect in Indonesia, one in Bintan Island and another one in Balongan, West Java. In Taiwan, Chinese Petroleum Crop. is adding crude distillation and downstream processing capacity at its two refineries. Vietnam's state owned Petrovietnam wants to build its first modern grassroots refinery at Vung Tau with distillation capacity of 130,000 b/d. And in Malaysia, BHP Petroleum Pty, in joint venture with Chinese Petroleum Corp. and Petronas, plans a 150,000 b/d refinery at Bintulu, Sarawak. Petronas also plans a 100,000 sweet crude refinery at Malacca as part of an integrated complex that eventually is to have 100,000 - 130,000 b/d of sour crude capasity as well (Ward 1993).

2.8 Summary

The development of the petroleum industry and petroleum retailing industry in Malaysia were very signficant with the involvement of British companies. The two major companies involved from exploration to refinery and retailing were BP and Shell. There is not doubt that these two companies are the architect in developing the style of management and marketing in the industry. However after two "oil shocks", the government intervention began to gain momentum and an important phenomenon emerged on the international petroleum scene. Most of the petroleum-producing countries began to seek greater control and set up a national oil corporations. Malaysia also followed these developments by seting up its own national petroleum company, called as PETRONAS (Petroleum National) and passed several legislations.

As a result, in a couple of years petroleum became the important source of revenue which the government earned in the form of taxes, royalties and dividens. Today, Malaysia is ranked 21st in crude oil reserves, 19th in oil production and 12th in gas production (Malaysia: NST April 11th, 1994). This effort also shows that the Petronas plays an important role in this industry from time to time, from follower in the early 70's to the major competitor to BP and Shell in early 90's and now the second large after Shell in terms of number of service stations in petroleum retailing industry. Recently, Petronas took another major step ahead by listing it domestic

marketing arm, the Petronas Dagangan Bhd which controls about 399 service stations all over Malaysia (Data on November, 1993). The Petronas Dagangan Bhd also is the market leader in some major catogeries of refined white petroleum products which are liquid petroleum gas and aviation fuel with an estimated market share of 30.2 percent and 47 percent respectively (Malaysia: NST January 11th, 1994).

With experiencing the rapid expansion in economy, the demand for better life was also increasing. As mentioned previously in Chapter one, the transportation sector has experienced phenomenal growth in the past decade. With good transport network, increased wealth and consumer credit has resulted in a major growth in sales of car and consequently, the demand on fuel is also increasing. Today, Malaysia is one of the car production countries. Currently, Malaysian cars are being exported to 18 countries with UK and Singapore being the largest markets.

On the other hand, the world market always turns volatile and because of the lethargic oil market, some of the oil-producing countries and non-Opec such as China and Brunei Darus-salam would curb their oil production. However, some Opec countries produced a oversupply causing the prices to plunge below of pcychologically important US$13.00 a-barrel mark. The rest of the world is still largely mired in recession. the world demand for oil is unlikely to pick up significantly quickly.

In the next chapter, the overall picture of retailing industry are examined with particular emphasis on their important role in Malaysian economy.

CHAPTER THREE

THE MALAYSIAN RETAIL SCENE

3.1 Introduction

The purpose of this study is to identify and determine the factors or variables affecting the performance and productivity in the retail sector especially in the petroleum retailing sector. However, before examining this issue any further, it is advisable to provide the readers with a clear understanding of the relevant information on the overall picture of retailing industry, with regard to the country, the people, society and the most important, the economy. It is hoped that this approach will provide a clear basis for the study of this issue.

To begin with, a brief description of the historical background of Malaysia will be presented.

3.2 A Brief History

The course of Malaysian history and its people has been determined by its strategic position as one of the world's major crossroads from the early twentieth century until now (Figure 3.1). Geographically, Malaysia is situated between 1^{o} to 7^{o} north of the Equator in the

South-East Asia region with a tropical climate and the regime of the two monsoons. West Malaysia, which consists of the Malay Peninsular and several small islands surrounding it has an area of 50,806 square miles. East Malaysia, which consists of the states of Sabah and Sarawak, both on the island of Borneo, has a total area of 77,776 square miles. West Malaysia (formerly known as The Federation of Malaya), which consists of eleven states in the Peninsula of Malaya, achieved its independence from British Rule in 1957. It is situated at the southern end of the Asian Mainland, bounded by Thailand in the north and is accessed by a causeway to Singapore in the south (Figure 3.2) (Malaysia: Information Malaysia 1987). In 1963, Malaysia was formed when the Federation of Malaya merged with Singapore, Sabah and Sarawak. But two years later, Singapore left Malaysia to form an independent republic.

The early history of Malaysia probably dates back over 5,000 years ago. These early settlers were probably the pioneers of the general movement of people southwards from China and Tibet through Mainland Southeast Asia and the Peninsula of Malaya to the Indonesian archipelago and beyond. The first Malay settlers (known as Proto-Malays) had probably established themselves by 1,000 BC, to be followed by other immigrants such as the Deutero-Malays over the next few centuries, who came equipped with more advanced farming techniques and a new knowledge of metals. A new phase in the historical development began around the first century BC with the establishment of regular trading contacts with the world beyond the

Southeast Asia, especially China and the subcontinent of India. During that period, the culture, language, literature and social custom were influenced by the Hindu-Buddhist. The Hindu-Buddhist period ended with the penetration of Islam which was brought primarily by the Indian Moslem and the Arab traders. Once established as the religion of the Malays, Islam profoundly affected Malay society and their way of life (Malaysia: Information Malaysia 1987). In the early fifteenth century, the Peninsula of Malaya and Malacca which had became the central trade port attracted to the Europeans. One by one, the states in Peninsula and surrounding Peninsula fell to European Colonials, first in Malacca by Portuguese, then Brunei by Spaniards, Java by Dutch and lastly by the British in eighteenth century.

The modern history of Malaysia stated in the mid-eighteenth century. The British brought with them the resources and organization of the Industrial Revolution. The British took an active interest in the Malay States because the discovery of tin in the west coast states of Peninsula Malaysia, especially Perak and Selangor. In 1895, with the signing of Pangkor Treaty, Federated Malay States was formed with Kuala Lumpur as the capital city. This marked the beginning of the British rule in Malaya. The discovery of tin started the first wave of development in Malaya. With the rapid expansion of tin areas, the British Government built the basic infrastructure such as roads and railways along the rich tin belt of the west coast region

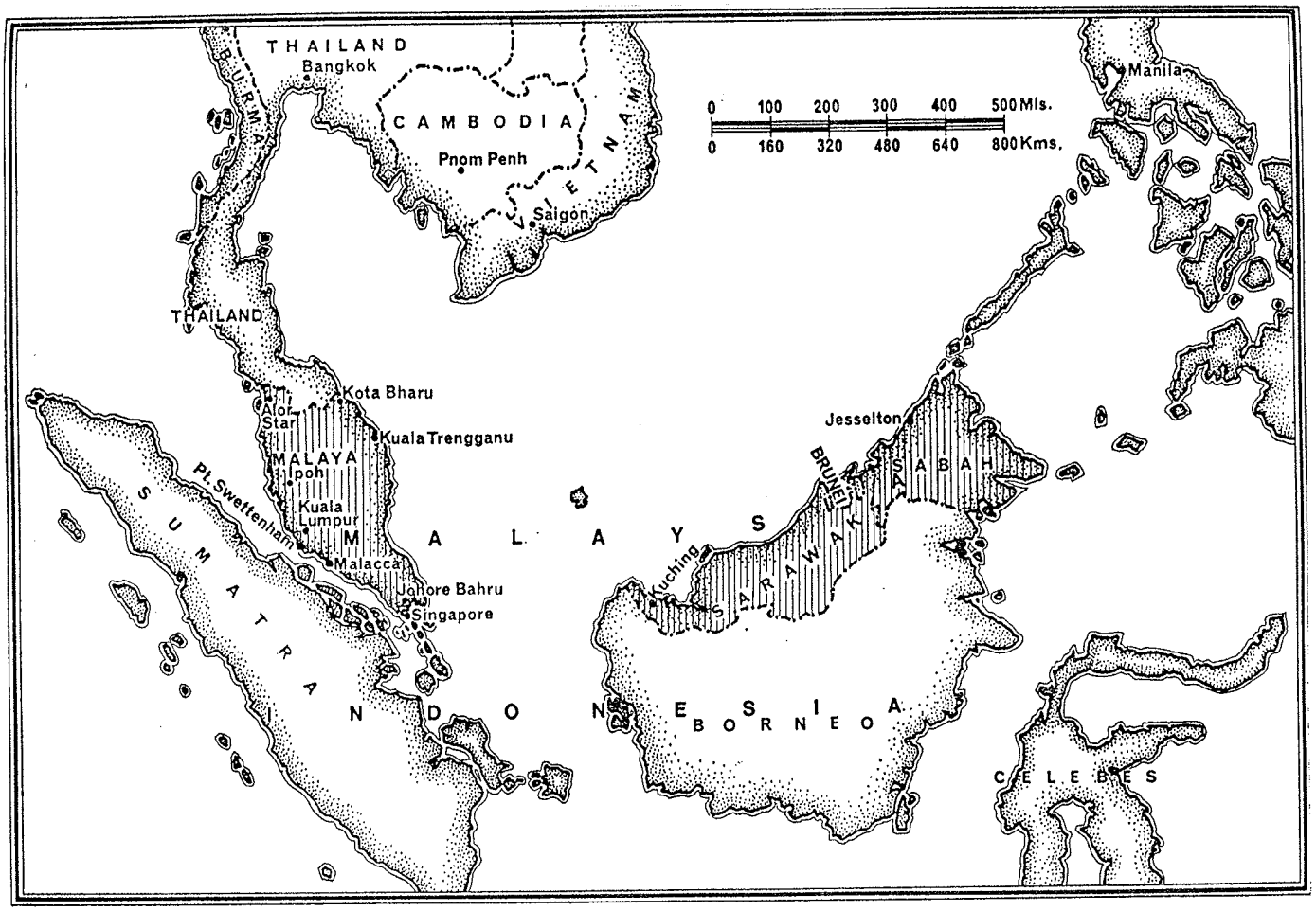
of Peninsula. From this belt, towns began to grow and flourished surrounding the tin mining areas.

The second wave of development in Malaya came after the introduction of rubber into Malaya in 1905. The plantations of rubber grew because of the widespread use of motorcars worldwide. As a result, the British brought in the Chinese immigrants who worked in the tin mines and Indian immigrants who worked in the rubber plantations to overcome the labour problems and to fullfil the world demand. By the end of the First World War, Malaya under the British Rule became a major producer and exporter of tin and natural rubber (Malaysia: Information Malaysia 1987).

The Japanese invaded Malaya in late 1941 but when the Japanese surrendered in 1945, Malaya once was again under the British rule. Although the British were able to resume their authority in the region after the collapse of Japan, they faced an entirely new political situation which forced them to adopt new policies. By the agreement of 1948, the British had committed themselves to preparing the way for the Federation's Independence. In 1955, the first federal elections were held. The alliance party which consists of three major parties; UMNO, MCA and MIC won the election, pledged to achieve independence and were successful in pressuring the British relinquish their sovereignty in August 1957.

Figure 3.1

Malaysia: The Strategic Location



After independence, the Government of Malaysia passed to a Parliament consisting of (1) a King or 'Yang Dipertuan Agong', elected by and from the rulers every five years, (2) a Senate or Upper house which members hold office for six years, two each to be elected by the

legislative assemblies of the eleven states, and other nominated by the King and (3) a House of representatives elected by the people every five years (Winstedt 1966). A Prime Minister, appointed by the King, chooses a cabinet, whose advice must be followed by His Majesty. Agriculture and land are matters for the state government, education and medical services for the Federal. But the Federal parliament can legislate on any subject to bring about uniformity, though to save face each state will separately adopt such legislation, such as a National Land Code. Judges are appointed by the King and appeal to the privy council is retained. In the several states each ruler must accept the advice of his Chief Minister or 'Menteri Besar' and Executive Council. The Chief Minister is responsible to his state legislative assembly, of which he must be a member.

Membership of these assembles is for five years. To give states some say in finance, monetary grants to them are discussed by a National Council, consisting the Prime Minister, the Federal Finance Minister and the Chief Minister of the various states. Penang, Malacca, Sabah and Sarawak have Governors appointed by the King after consultation with the local governments. Islam is the religion of the Federation with each ruler as the head of the religion within his state, but all citizens are equal before the law and enjoy freedom to practise their own religion.

Thus, a clear understanding of its historical background could provide a better picture of the present situation. The next section,

presents a brief description on Malaysia economy past, present and future.

3.3 Economy Background

3.3.1 The past

Basically Malaysia is an agricultural country and the world's largest producer and exporter of natural rubber and oil palm. Beside that, Malaysia also exported other agricultural commodities such as timber, cocoa, pineapple and pepper. However its share of the contribution of GDP has declined rapidly. For instance, in 1957 (the year of Independence), agriculture, forestry and fishing sectors together accounted for about 40 per cent of the value added in GDP and two-thirds of the country's export earning. In 1987, (thirty years later) its share reduced to about 21 per cent and in 1992, it reduced futher to about 16 per cent (Malaysia: Ministry of Finance, 1991/92). The reason for this is that the economy has been diversified into other sectors, especially the manufacturing and services sectors.

Malaysia is also a commodity minerals exporting country and one of the world's exporters of tin, petroleum and Liquidated Natural Gas (LNG). Like the agricultural sector, the minerals sector is also facing a decline in the contribution of GDP excluding petroleum. In 1985, this sector accounted for about 10 per cent of the value added in GDP

Figure 3.2

and in 1992, its share was reduced sightly to about 9 per cent and these figures included petroleum. Petroleum alone, contributed about 4 per cent in 1985, 6 per cent in 1992 (Malaysia: Ministry of Finance, 1991/92) and 7.5 per cent in 1994 (Malaysia: Ministry of Finance 1994).

By nature, Malaysia as a commodity and raw material exporting country is heavily influenced by the world's fluctuating market demand. In 1960's, 1970's and early 1980's, Malaysia was overdependent on the two primary commodities, natural rubber and tin. As a result, the country was exposed to economic instability due to wide fluctuations of world prices of these two commodities. In 1985, with a slump in the world economy, the price of these two commodities fell heavily, resulting in a decrease in the total amount of exports. To overcome these problems, the government has made it policy to diversify the economy into a broader base. Through the First (1965-1970), Second (1971-1975), Third (1976-1980), Fourth (1981-1985), Fifth (1986-1990) and Sixth (1991-1995) Malaysian Plan and the First (1971-1990) and Second (1990-2000) Outline Perpective Plan (OPP), provisions were made to provide and update the basic infrastructure to stimulate industrialisation. By the end of 1992, the manufacturing sector contributed almost 30 per cent of the value added in GDP and 59 per cent of the country's exports (Table 3.1).

In early 1985, Malaysia was facing its worst economic recession due to falling prices of natural rubber and tin. GDP growth for the year was an historical negative value of -1.5 per cent. While other developing countries were still facing the worst effect of world economic recession, Malaysia was very fortunate that the discovery of vast quantities of oil and gas reserves came at an appropriate time. Petroleum and gas rescued the Malaysia economy and in the middle of 1986, there were some encouraging signs of economic recovery. At

the end of the year, the GDP growth was at + 0.5 per cent (Malaysia: Ministry of Finance 1986). After that, the Malaysian economy has not looked back, growing higher and higher every year. An eight per cent GDP growth over eight years (1988-1996) means doubling the economy. Statistics show that if the country maintains this momentum, the GDP would triple by 2004 and might be four times that of 1987 by the year 2020 (Malaysia: NST, 27 Dec 1993).

Table 3.1

Gross Exports of Major Commodities and Contribution to Gross Domestic Product

Sector	1985(%)	1990(%)	1992(%)*
Agriculture	32.2	22.3	16.0
Minerals	34.5	17.8	9.0
Manufacture	32.1	59.3	30.0

Source: Ministry of Finance, 1990 and 1991/92

* Contribution to GDP

3.3.2 The Present and Future

Learning form the past, Malaysian policy makers launched Industrial Master Plans, for development of resource based manufacturing industry. The Malaysian government is trying to diversify the economic base, upgrading skills and technology in the industrial development process. This industrialisation programme will also build economic foundations as it will lead to an

improvement in export earnings. With relatively cheaper fuel in the world market, the prospect for a rapid growth looks bright. With cheaper raw materials domestically produced, cheap labour and being politically stable, Malaysia would appear to have a comparative advantage in the world market. As a result, the national income for 1993 is already at an estimated figure of RM8,350 (US$3,340). Given the forecast figures, Malaysia might have a Gross National Product per capita income of almost RM14,000 (US$ 5,600) by the year 2000 and perhaps more than RM36,000 (US$14,400) by the year 2020 (Malaysia: NST, 27 Dec 1993). In terms of purchasing power parity, it increased from US$5,416 to US$7,500 during the period from 1991-1993 and will futher increased to US$8,996 by 1995 (Malaysia: Malaysian Digest, December 1993).

Despite the slowdown in the world economy, the Malaysian economy grew at an impressive rate of 8.1 per cent a year during the first three years of the Sixth Malaysian Plan, exceeding the Plan's 7.5 per cent target. Its exports of goods and non-factor services grew by 10.6 per cent a year. During this period, all sectors of the economy surpassed the Plan target, with the exception of the agriculture and mining sector because of the depressed price of the major commodities as well as production constraints and low level of investment (Malaysia: Malaysian Digest, December 1993).

The manufacturing sector will remain as the backbone of the Malaysian economy, with growth projected at 13 per cent in 1994

compared to 12.5 per cent in 1993. In contribution to GDP, the manufacturing sector is expected to increase from 30.1 per cent in 1993 to 31.4 per cent in 1994. However, investment from foreign sources fell by 66.2 per cent from RM17.77 billion (US$7.1 billion) in 1992 to RM6.01 billion (US$2.4 billion) in 1993. Domestic investment also dropped to RM7.26 billion (US$2.9 billion) in 1993 from RM10 billion (US$4 billion) in 1992 (Malaysia: NST, 7th January 1994). The United States of America still emerged as the largest foreign investment in 1993 (Table 3.2). Further more, according to survey of 100 international companies based in Britain by Control Risks Group Ltd, Malaysia is the second after China, most attractive emerging economy in the world in terms of opportunity and operating environment (Malaysia: The Star, 3th October 1996).

The rapid economic development has also brought about the creation of 725,000 new jobs, with employment growing at 3.5 per cent a year. Unemployment, consequently declined from 5.1 per cent in 1990 to only 3.0 per cent in 1993. However, during 1990-1993, inflation averaged about 4.4 per cent per annum and peaked at 5.4 per cent in September 1993 (Malaysia: Malaysian Digest, December 1993).

KLSE Composite Index, one of the good indicators of economics, has almost doubled in the past 12 months from less than 600 points at the beginning of 1993 to more than 1,100 points at December 1993. If the growth is maintained, the number of companies on the exchange

and the market capitalisation may soon enable the KLSE to overtake the Taipeh and Seoul bourses. If the bouyancy remains, the KLSE might be number three in Asian securities market, behind Japan and Hong Kong (Malaysia: NST, Dec 27th 1993). Another factor which shows that the Malaysia economy is shifting to higher gear is the improving overall balance of payments. The 1994 Budget projected large surplus in the current account of RM1.5 billion in 1994 (Malaysia: NST, Febuary 7th 1994).

Table 3.2

Major Foreign Investor in Malaysia
in RM million

Foreign Investors	1992	1993
Indonesia	480.2	183.6
Denmark	235.8	14.8
Singapore	442.4	514.6
Taiwan	1,500.0	893.6
Japan	2,684.3	1,568.8
USA	3,298.7	1,739.8

Source: Malaysian Industrial Development Authority (MIDA)
Exchange rate: US$1 = RM2.5

After the clear overall information about Malaysia economy, we present the impact of this economy to the retailing sector. This approach will help the understanding and clear basis for the study of this issue.

3.4 The Retail Industry in Malaysia

3.4.1 The Importance of Retail Industry

The retailing industry in Malaysia plays an important role in the overall Malaysian economy. In 1992, its contribution to the Gross Domestic Product was 12 per cent with registered sales in excess of MR10,760 million (US$4,304 million), the third largest after manufacturing and agriculture industries (Table 3.3). About 1.3 million people were employed by 124,121 retail establishments (Malaysia: Ministry of Finance 1990, 91/92). The figures above probably underestimate the importance of the retail sector due to the small self-sufficient and cashless ecomony outside Peninsular Malaysia, but private consumption still accounts for some 54 per cent of GNP. Most of these retailers are small family operations and they continue to operate in fairly traditional ways. The average retail store employs less than 5 workers (Euromonitor 1994).

With eight per cent growth for the past eight years, the Malaysian economy has experienced steady growth. This has subsequently resulted in a gradual change in the Malaysian retailing scene. In the Fourth Malaysian Plan (1981-1985), retailing industry growth was about 6.3 per cent per year but in the first half of the Sixth Malaysia Plan (1991-1995), its growth was about 9.0 per cent per year, above the average of economic growth (Malaysia: Ministry of Finance 1991/92). From the comparison of Return on equity of major

Malaysian industries, the retailing sector grew from 14.4 per cent in 1989/90 to 34.8 per cent in 1991/92 (Table 3.4).

The characteristics of the Malaysian retail industry can be seen by looking at the number of establishments and the number of employees employed in the industry. However, the exact figures for this information are not widely available because the Department of Statistics, Malaysia stopped conducting retail and wholesale surveys in 1980. In 1990, however the Ministry of Finance conducted a similar survey. However, the researcher has no evidence whether both department and ministry used the same methodology for collecting the data as shown in Table 3.5. On the other hand, the researcher is positively sure that they are used the same data which are gathered by the Ministry of Trade and Domestic Affair and the Registrar of Companies (ROC). The survey done by the Ministry of Finance found that about 90 per cent of the retail industry consisted of stores which sold food related products, wet markets and speciality stores. The survey also found that about 82.3 per cent of retail establishments were categorised as having sole proprietor type of ownership in Peninsular Malaysia and it had increased to 5.6 per cent from 1980 (Table 3.5). Most of these retail establishments were small family-owned provision shops. On the other hand, the largest types of retail establishments were public or private limited 6 per cent (Table 3.5). This is not surprising because the public or private limited companies operated through large stores with high volumes of sales

compared to the sole proprietors which operated in small shops with low volumes of sales.

Table 3.3

Contribution of Retailing * to Malaysia Economy 1987-1990 in MR Million

Year	Retail GDP	% to GDP	% Change
1987	6,423	10.6	4.5
1988	6,988	10.5	8.8
1989	7,748	10.8	10.9
1990	8,754	11.1	13.0
1991@	9,717	11.3	11.0
1992@	10,760	11.5	10.7

Source: Ministry of Finance

Notes: * includes Wholesaling, restaurants and hotels

@ estimated by Euromonitor(1994) pp 69

Among the highest increases were the private and public Ltd companies which grew by about 234.4 per cent in ten years. Most of these were established chain stores, supermarkets and shopping complexes. This is not surprising especially in urban areas and housing estates. The only decrease is cooperatives and this is also not surprising because recently, some of the cooperatives face problems of mis-management and receiver-ship.

Table 3.4

Comparison of Return on Equity of Major Malaysian Industries in per centage

Type of industries	1991/92	1990/91	1989/90
Petroleum Prod.	60.7	75.5	62.6
Automobile Ass.	28.6	42.5	55.7
Motorcycle Ass.	35.8	39.8	30.8
Retailing	34.8	29.8	14.4
Cement	14.1	23.4	14.1
Banking/Finance	8.8	9.8	9.2

Source: PNB's Malaysian Corporate Performance

Note: Ass - Assembly

Prod - Production

In comparing the density of retail establishments among states in Malaysia - Perak, Johor and Selangor have the highest number of retail establishments because of the heavy concentration of population and that most of the big towns and cities are located on these three states (Table 3.6).

The retail sector accounts for 19 per cent of total employment, with some 1.3 million people employed directly in this sector in 1991 (Table 3.7). Employment in this sector is expected to increase at an average annual growth rate of 5.2 per cent up to year 2000, resulting in the total number of people working in this industry being 2,050,000 or 23 per cent of the total workforce (Euromonitor 1994). The vast majority of retail businesses employed few people. In 1980

the average number employed in each outlet was about 2.5. This number has risen to about three people per establishment due to the rapid growth of larger retailers, such as department stores and supermarkets, and the declining importance of the family shop (Euromonitor 1994).

Table 3.5

Number of Establishment 1980 and 1990 in Peninsular Malaysia

Types of ownership	1980	%	1990	%	Increase %
Sole Proprietor.	80531	89.5	85041	82.3	+5.6
Partnership	7148	8.0	11470	11.1	+60.5
Private & Public Ltd co.	1854	2.0	6200	6.0	+234.4
Cooperatives	389	0.4	215	0.2	-44.7
Other	115	0.1	405	0.4	+252.2
Total		100		100	

Source: Department of Statistic, 1982 and Ministry of Finance, 1990

In terms of market size, the retail sector represents a significant part of the domestic ecomomy. With strong growth and constantly rising wages (up some 40 per cent in real terms since 1985), the retail sector has experienced a phenomenal growth of over 10 per cent per year in real terms for the past five years (Euromonitor 1994). Sales of MR12,107 million in 1980 increased to MR31,575 million in 1991

(Table 3.8), an increase of over 160 per cent or almost double the rate of GNP growth.

Table 3.6

Number of Establishments by States in 1990

States	Number of establishments
Perlis	1,750
Kedah	10,162
Penang	9,659
Perak	14,893
Selangor	12,437
Federal Territory	6,452
Negri Sembilan	4,946
Malacca	4,465
Johor	14,190
Kelantan	10,261
Terengganu	5,273
Pahang	8,842
Sabah	5,188
Sarawak	4,503

Source: Ministry of Finance

On comparing retail sales by outlet function, the transport sector (vehicles and petrol) has experienced phenomenal growth in the past decade, and with the bulk of Malaysian families now owning an automobile, the trend will continue. The transport sector is the

fastest growing sector of the retail industry compared to others, especially the food sector (Table 3.9).

Table 3.7

Retail Employment 1987-1991

Year	Number employed	% of Workforce
1987	1,017,400	17.3
1988	1,070,300	17.9
1989	1,157,000	18.2
1990	1,239,400	18.7
1991	1,313,800	19.2

Source: Monthly Statistical Bulletin

Although the data are not up-to-date (the reason has been mentioned above), the trend is still the same because the growth in the number of households, coupled with increased wealth and consumer credit has resulted in a major growth in sales of these items.

Today, in the urban area, modern shopping centres with multi-storey buildings have begun to emerge together with provision shops, hawkers and bazaars operating side by side or inside the shopping centres itself. This is the contrast and difference between the city in the developing countries and the developed countries. This pattern of retail structure conforms to the "two circuit model" as suggested

by Santos (1975) and "informal and formal sector" by Tokman (1978) as reported by Othman (1987).

Table 3.8
Retail Sales 1986-1991
in MR Million

Year	Current Prices	% Change
1986	15,885	-
1987	16,917	6.5
1988	19,439	14.9
1989	23,385	20.3
1990	27,361	17.0
1991	31,575	15.4

Source: Euromonitor , May 1994

3.4.2 Development of Malaysia Retailing

The Malay Kingdom of Malacca which dominated both sides of the Straits of Malacca for hundred years marks the classical age of early marketing system in Malaysia. During that time, Malacca became an international port with the establishment of regular trading contacts with the world, which attracted many kind of traders - Indians, Sumatran, Javanese, Thai, Vietnamese, Chinese, Persian, Arabs, Buginese, Portuguese, Dutch and English (Provencher 1987 in Hj. Omar 1991). After the fall of Malacca to the Portuguese in 1511, the

marketing system was changed and influenced by the Europeans such as Portuguese, Dutch and British. The main purpose of the Portuguese was to maintain a permanent and strategic trading base. The same interests were also presented under the Dutch when they took over Malacca in 1691 (Young et al, 1980 in Hj. Omar 1991). During the British colonial, they brought the Chinese from the mainland of China and Indians from the subcontinent of India, who undoubtedly brought with them a marketing system similar to the ones in China and India, where hawkers, money lenders and bazaars existed since the earliest beginnings of cities in China and India.

Street vendors were popular during the British Rule. In town areas, open markets along the streets of residences and businesses were abundant. In the morning hours, when hawkers congregated, housewives made their purchases of daily supplies of fresh product such as vegetables, fruits and meat. These open-air markets were often messy and wet and the people called it "wet" market. In some areas, especially in small towns and villages, the wet markets were often found in the vicinity of small retail and provision shophouses and because of low overheads, goods were much cheaper and convenient for the people during that time. After independence, the government brought development into the retail sector especially to the wet markets, where they built proper premises to relocate most

hawkers and equip them with essential facilities of water, electricity and refuse disposal.

Table 3.9

Retail Sales By Outlet Function 1980
in MR million

Outlet Function	Retail Output	Share of Sales (%)
Vehicles/Petrol	4,028.6	33.3
Food	3,979.2	33.0
Electrical goods	1,019.8	8.4
Clothing/footwear	841.7	7.0
General merchandise	533.1	4.4
Jewellery/watches	482.2	4.0
Chemists	308.6	2.6
Furniture/furnishings	283.7	2.3
Books/stationery	200.6	1.7
Personal/household	189.5	1.6
hardware	134.2	1.1
Beverages	53.7	0.5
Tobacco	8.3	0.1
Total	12,063.2	100

Source: Department of Statistics, Malaysia 1980

In the early 1970's, the Malaysian economy experienced a steady growth and the retail industry underwent significant changes which presented retailers with new challenges and opportunities. Malaysian people started demanding convenience and a pleasant shopping environment. Therefore department stores and supermarkets were

introduced into the Malaysian retailing sector. In recent years, the modern, multi level shopping complexes are becoming the norm for shopping and has become the center of attraction in town areas. With the improvement of public transportation and logistic facilities, the trend for convenience and pleasant shopping will be continued further. Today, both the old and new forms of retailing exist side by side.

In the late 1980's, foreign retailers came with planned shopping centers and brought together a cluster of retail outlets and other facilities into a single building. The presence of these retailers, catering to the needs of both old and young people with different goods, made it possible for families to do their shopping under one roof (Lee 1984 in Chin and Teoh 1988). However in the early 1990's, the Malaysia retail company (based and incorporated in Malaysia) also went oversea to make investment in the retail sectors especially in the ASEAN countries such as Singapore and Indonesia.

3.4.3 Types of Retail Institutions

Retailers can be classified on the basis of their ownership, merchandise, size, affiliation, contractual, location, service, organizational, and operational characteristics. The diversity and complexity of business formats within the retailing industry preclude

development as a mutually exclusive classification that clearly differentiates each type of retailer (Lewison 1989).

For developing countries like Malaysia, some of the type of retail institutions does not exist, like those in the West or developed countries. The retail structure of developing countries can be classified in terms of traditional retail outlets and modern retail outlets (Othman 1987). The traditional retail outlets include stalls which sell merchandise by means of temporary or permanent small pitches; retailers who sell their merchandise by using small types of transportation such as push carts, tricycles, motorcycles, vans etc. and shops in a permanent building such as provision shops or bazaar. The modern retail outlets are normally located in suburban or urban areas close to or within high/middle income residential areas and in town centres (Othman 1987).

3.4.3.1 Traditional Retail Outlets

3.4.3.1.1 Hawkers

There are several definitions of the term 'hawkers' as is pointed out by McGee (1970) and some times it causes confusion and complication in fitting it into legal definitions in each and individual circumstances. In Malaysia, hawkers may be defined as any person who operates as a seller of goods in permanent or temporary pitches inside or outside premises or by any mode of transport such as bicyles, pushcarts, tricyles, pick-up trucks, vans,

motorcyles or even by foot from house to house (Adopted and modified from Beavon 1980 and Othman 1987). They also can be classified according to their location of business such as street hawkers, pedlars, bazaars, wet market, periodic market, night market and shopping hawkers (who operated inside the shopping complexes).

Dewar and Watson (1990) differentiate the hawker into five main catogeries: (1) nature of supply - which break bulk and deal in much smaller quantities and which directly serve the consuming public, (2) function - they are mixed and accommodate a wide variety of products and services, (3) degree of formality - a wide range of options exists for infrastructure from nothing to almost everything, (4) form - many different physical forms exists, and (5) time of operation - a range exists in terms of the pattern of periodicity (night markets, morning markets, weekend markets, and so on).

The actual number of hawkers operating all over Malaysia is quite difficult to estimate because some of them are active in seasonal time and without licenses. For example, during the fasting month of Ramadan (the 9th month in the Islamic calander), the number of hawkers increases with a majority of them selling cooked food for breaking the fast at the end of the day. A similar situation occurs during the tropical fruit seasons, especially in rural areas, with the number of stalls built along the roadsides increasing then disappearing when the season ends.

The operation of hawkers in Malaysia is controlled by the local council at particular district or town. Licenses are issued by the local council. However, there are also a large number of hawkers operating illegally especially at the area which are not controlled by the council and by some illegal immigrants from Indonesia, India, Bangladesh and Burma. There are some advantages of the hawkers. First, they can sell their merchandise at a low price and with a lot of choice and this is particularly true for food and drink. Some of them operate until late night and from very early in the morning. Secondly, they provides an alternative source of employment because in the hawking business, the initial capital outlay is low and require low skill and education level.

Thirdly, they provide an outlet for products which are not suitable for export or have defects and can be purchased cheaply from them. Lastly, to some people, hawking provides a first step towards starting up their own business. In researcher's observation, hawking becomes the training ground and the source for saving to start a new and bigger business. The disadvantages of the hawkers is that, they create a problem of traffic congestion along the road and health hazards to the customers (Othman 1987).

3.4.3.1.2 Provision Shops

The provision shop has a history stretching back to the early days of the Chinese and Indian migrants in Malaysia. They operate in fairly

traditional ways, being small, family-owned, working very long hours, with the owner and his family living in the upper storey of the shop and almost all of them sell food items (wet and dry) and household provisions. They can be found in all urban and rural areas because they normally draw their customers from the neighbourhood. It is possible to deliver purchased goods to the homes of customers. In some urban areas, they have been converted themselves into minimarket or specialized grocery stores to survive the strong competition of the supermarket.

The lack of successors is one of the problem in provision shop business. The owners of this traditional family business are finding it difficult to retain their children in the business because better education and affluence cause their children to take better paid jobs outside their family business. The other threat that they have to compete with are the supermarkets, since the supermarkets do not only offer variety of goods in cleaner and more pleasant surroundings but also at lower prices.

3.4.3.1.3 Bazaars

The bazaar also has a long history from the Malay Kingdom of Malacca, where traders from all over the world came to do a regular trading in the port of Malacca. The word 'bazaar' came from the arabic word which means market. Normally the bazaars can be found in urban areas, locating either near or in the old port or the town

which has similar historical background with the the Indian Muslims and Arab traders such as Johor Bahru, Malacca, Alor Star and Penang. This kind of bazaar operates daily, contains sundries where household wares, clothing and provisions are sold. The other kind of bazaar operates either on a nightly or weekly basis on a certain day or night of the week along roads which have been specifically closed for the purpose or in open spaces such as car parks and fields. Hawkers may carry and display their merchandise in the bazaars on push carts, tricycles, motor cycles, pick-up trucks, vans and tempory pitches where they are dismantled when the business finishes at the end of the day or by midnight. Merchandise sold here includes cooked food, household wares, clothing, fresh fruit and vegetables, books and magazines, toys and electrical goods.

Similar to the night bazaar, the weekly bazaar operates only during the day time on a specific day of the week and most of the merchandise displayed on this market are fresh fruit, vegetables and cooked food. Another type of this bazaar is organised and supervised by Federal Argicultural Marketing Authority (FAMA) to enable local farmers and fishermen to sell their products directly to customers. The products which they sell must be agricultural products cultivated from their land or caught by them or products made from agriculture sector. The products which are sold here includes fresh fruit and vegetables, eggs, fishs, beef, lamb, chicken, rabbits and etc.

New concepts of bazaar here also being introduced in Malaysia recently, probably by those people who have experienced it overseas. The concept of car boot sales and car marts or auctions have been introducted in one or two big towns such as Kuala Lumpur, Petaling Jaya and Shah Alam.

3.4.3.2 Modern Retail Outlets

3.4.3.2.1 Minimarts, chain stores and Convenience Stores

Changing social trends, higher income levels, expectations of better retailing standards have all contributed to the right climate for setting up these stores. Another factor is the development of many housing estates and new townships which no longer have facilities for wet markets. Mini-markets are the dry versions of wet market, carrying some essential non-foods and dry foods to complement its fresh product. They have more attractive display, better lighting and some of them use air-conditioning. In Malaysia, convenience stores, particularly in the food industry, normally refer to the foreign franchise systems such as famous American franchises of 7-Eleven and fast food outlets such as Kentucky Fried Chicken, Pizza Hut, McDonald's, A & W and local franchises such as Sate Ria, Yummy and Sate Anika. Most of the fast food outlets have made attempts to meet local taste by introducing to the local menu such as curry and porridge with fish, meat and vegetables such as beans sprout and mushrooms.

Besides restaurants, the specialist chain stores also have experienced rapid growth in recent years, specially based on fashion, such as U2, Giordano and JPS. International brand name stores from British companies such as Body Shop, Boots and Marks & Spencer also operate at apparel stores located in Kuala Lumpur's new shopping plazas. Local chain stores are also starting to make a significant impact on the retail sector such as Berjaya-Singer in electrical goods and furnitures, Moccis in home appliances and Multi-Purpose Holding (MPH) in books and stationeries.

The convenient stores and chain stores are characterized by the closeness of location, long hours, limited lines of fast-moving merchandise and higher prices than those which are found in the typical supermarket. These outlets emerged because of the desire of the customers for the advantages that could be obtained through this method of operation (Mason and Mayer 1981). By looking at the charateristics produced by them above, the researcher feels that the service stations (which the researcher is interested to survey) can be catorized into these retail institution (see later).

Recently, the catologue shop system which was introduced from the west, also made impact on the retailing sector. A few shops were opened to the customer in the big cities such as Kuala Lumpur, Malacca and Johor Bahru.

3.4.3.2.2 Department stores and Supermarkets

The introduction of self-service was a retail revolution especially in food retailing in Malaysia. Although, in developed countries the department stores and supermarket are not similar, in Malaysia, they are similar in many ways. In the early days, the department stores existed in the big town areas and they were influenced by the westerners. They offered fixed price policy and clean, organized products, mostly clothing. Then in the early 1970's, supermarkets mushroomed throughout the country, normally located in urban areas. The frozen foods and open-top refrigerated cases in supermarkets were new experiences for the local people. Merchandise sold in the department stores and supermarkets includes food and non-food items under one roof.

Whilst the definition of supermarket may vary, however in Malaysia, it is clear that the supermarket sector is experiencing rapid growth. According to Euromonitor (1994), they estimated that there were some 300 major supermarkets and 65 departmental stores in Malaysia, the bulk of these being controlled by major listed companies or cooperatives (Table 3.10).

Table 3.10

Number of Supermarkets and Department Stores 1987-1991

Number of Outlet	Supermarkets	Department Stores
1987	57	40
1988	78	44
1989	112	55
1990	203	60
1991	300	65

Source: Euromonitor estimates, 1994 pp 88.

3.4.3.2.3 Planned Shopping Center

In the late 1980's, foreign retailer (mostly Japanese) came and brought together a cluster of retail outlets and other facilities into a single building. Most of the shopping complexes have a large variety of recreational and dining facilities besides retail outlets, much like those in the developed countries. For most people, shopping complexes are places for family outing, social events or simply relaxation. This modern form of retailing only exists in big cities where the population is over 500,000 people, such as Kuala Lumpur, Penang and Johor Bahru. These shopping centers provide "one-stop" shopping policy and their popularity is on the rise. An interesting development is that, in one building we can find all types of retail outlets with a mixture of both traditional and modern, and from hawkers to supermarkets.

Many of the large trading groups are involved in planned shopping center and have well established connections with retailers and foreign companies. The most influential companies include Sime Darby and the Lion Group, which owns the Parkson stores chain. However several Japanese stores have been established including Sogo (which have MR1 billion commercial complex in Kuala Lumpur and the largest in the South-East Asia), Jusco, Yoahan and Isetan.

But Parkson is still the largest company and is estimated to control 25 per cent of the market share in department stores and supermarket business (Table 3.11). However, Jaya Jusco currently 75 per cent owned by AEON Group in Japan, which have six outlets, and applied for public listing in February 1996, is one of the more successful retailer in Malaysia and the main competitor in the market now. The company's forecast turnover for 1995-96 was RM440 million and RM100 million more for the 1996-97 fiscal year (Malaysia: The Star, 24th Oktober 1995).

Nowadays, shopping complexes have usurped squarely the function of olden-days community halls, coffee shops or shady trees. Shopping itself is no longer confined to purchasing goods but has evolved into a form of recreation. A survey found that 48 per cent of adults said going to shopping complexes was their favourite pastime (Frank Small Property Research 1994 in Malaysia: NST 31th August 1995). Shopping complexes have to tailor themselves to meet the change

and more and more are putting in amusements like cinemas, bowling alleys, theme parks and dining outlets. Some anchor tenants of shopping complexes also have remodelled themselves by adding in amidst the clothing, a cafe or even art galery. For example Isetan has a gallery; Sungei Wang Plaza has an audio-visual screen which plays music videos, National Geographic filmlets and cartoons; Yoahan the Mall has an amusement park and cineplex; Subang Parade has a cineplex and a family atmosphere and Alpha Angle calls itself the shop-play-see-eat shop.

Table 3.11

Major Department Store and Shopping Centre Sales 1991 in RM million

Company	Sales
Parkson Corporation	443.0
George Town Holdings	220.4
Mun Loong	219.7
Metrojaya	46.2
Isetan of Japan	17.3
Champion Shopping Centre	6.1
General Shopping Centre	3.6

Source: Company reports and Euromonitor (1994) pp 90.

There was also a preceptible trend towards suburban shopping where the complexes follow the customers out into the suburbs. For

example, Subang Parade is located in the Subang Jaya residential area, Alpha Angle in the Wangsa Maju housing estate and one Jaya Jusco mall was located in Taman Tun at Damansara, near Petaling Jaya and one near to the residential and tourist areas in Ayer Keroh, Malacca. These malls are more family-oriented and offer less in high-fashion items. The number of people caming to the complexes also increases. For instance, Sungei Wang Plaza which was situated in the premier shopping district of Kuala Lumpur, takes in 2.2 million shoppers monthly and Isetan has 20,000 a day and 40,000 on the weekends (Malaysia: NST 31th August 1994).

3.4.3.2.4 Non-store retailing

This kind of retailing was introduced in Malaysia in the late 1970's by westerners and in the form of party or catalogue systems (Othman 1987). This form of retailing is popular among housewives and working women where merchandise is being sold and displayed through parties or catalogues. Merchandise sold by these retailers includes cosmetics product, household wares, toiletries, accessories, jewels and antique products and sometimes religious products. In recent years, credit card companies mostly banks are also involved in non-store retailing by using mail order systems to increase their profit from credit card holders. The other type of non-store retailing is door-to-door household selling. It may be done by a salesperson canvassing a neighbourhood on a house-to-house basis, such as vacuum cleaners (e.g Electrolux) which have long been effectively

demonstrated and sold in homes. Recently, the most popular and the latest non-store retailing is the vending machine. This machine can be found in every premises such as petrol stations, bus stations, airport, shopping complexes, universities, schools and many more.

Recently, the mail order companies have introduced another concept of shopping, TV shopping, which was introduced locally last year (1995). It has gained fast popularity among Malaysians, since the number of commercials aired over the four channels are so frequent. There is a bright future in home shopping although at this moment it is still at the infancy stage. Now, there are three companies offering home shopping - TV Media, Mail Order Gallery and Kayla Beverly Hills. The main products include self-improvement, fitness, health and beauty, music and video, household and automotive products, which are mainly sourced from the United States such as USA direct, Home Shopping Network, Time Warner, Regal and K-Tel (Malaysia: NST 16th October 1995). Lastly with introduced the Internet, many Malaysian will experience purchasing products via computer at home or office. So far two company - Beta Interactive Service and AsiaConnect use the Internet networks by selling it products to the customers. However, Malaysian Internet Networks called "JARING" (Joint Advanced Research Integrated Networking) was controlled by government via MIMOS (Malaysia Institute of Microelectronic System).

After this review of the retailing sector in Malaysia, is the presentation of the development of service stations, the retail chain stores for the study of this issue.

3.5 Development of Service Stations

The imports of cars from Britain after world war I marked the beginning of the petroleum retailing sector in Malaysia. In 1929, the number of car in Malaysia was 433 units. From 1937-1948, Malaysia was an important market for Britain and the imports from Britain included 5,600 cars, 650 complete commercial vehicles and about the same number of commercial chassis (PEP 1950). Most of the cars were used by the British Officers, managers of tin mines and rubber estates and for tranportation in tin and rubber industries. Kuala Lumpur, the capital city, got its first service station in 1921 (Malaysia: Esso Production Malaysia Inc 1993).

Oil retailing in Malaysia began in the 1870s with an enterprising English merchant named Marcus Samuel who had a trading venture, Marcus Samuel & Company, imported rice, copra, spice, china and seashells from Far East to England and Eupore (Malaysia: Berita Shell, January 1991). During that time, he gained some confidence and decided to export Russian kerosene to the Far East. In 1892, he sent a ship, the SS Murex which was to transport in bulk, kerosene from the Black Sea port of Batom through the Suez Canal to the Far East. On

16 September 1892, the SS Murex unloaded 3,000 tons of Russian oil at Pulau Bukom, Singapore as the first tank station. The second storage tank was constructed in Butterworth, Penang and Penangites watched the first discharge of oil from the ship to the storage tank on shore. The presence of the second tank and the oil trade it brought, exercised considerable influence on the 'opening up' of Penang and the Malay states of the peninsula (Malaysia: Berita Shell, January 1991). From that day onwards, kerosene became the popular source of light to lighting up their houses.

In the early days for petroleum retailing, petroleum was sold by pumps which depended upon the garage attendant or mechanic to turn a handle and afterwards working out the charge. The actual quantity which goes into the tank was being shown to the motorist by means of clock-type counter displayed on the front of the pump. In town areas, petroleum was sold by the car selling companies or by the garages. However, in rural area petroleum (specially kerosene) was sold at the provision shops. During that time, most of the petroleum business was dominated by Shell and Esso.

At the end of 1957, the number of imported cars and other vehicles from Britain were (The Society of Motor Manufactures and Traders Ltd, UK 1958):

Cars (new)	9,045
Commercial Vehicles	3,445
Agricultural Tractors	542

Trucks	400
Total	13,432

The increase of imported cars and other vehicles from Britain contributed to the setting up of more suitable service stations in which more services can be provided to the motorist. During this time, the design of pumps began to adopt many of the features which we know today. They are electrically operated, quantities were more accurately measured and the attendant was spared a great deal of hard manual labour. Since the petroleum companies were beginning to seal pumps or tanks after delivery of oil to the dealer, the suspicions of customers began to disappear. The installation of pumps were increasing and guaranteeing of sales but it required an underground bulk storage tank.

The installation of underground bulk storage tank cost money which the proprietors or station's dealers might find difficult to provide. The petroleum companies offered to lend them the money and allow repayment to be done over a fixed period of time. The proprietors have to sign a contract by which they agree to take the petrol from their petroleum companies only for that same period and in order to encourge their efforts, they were usually allowed a credit on monthly sales.

After world war II, the Automobile Association of Malaysia (AAM) were established. Like other AA, they also campaign for better service

and supplies close as can be to the spot where those needs occur, for their members. After the successful introduction of the concept of 'American Filling Station' in Britain (Richardson 1977), the petroleum companies brought the concept to Malaysia. The concept includes petrol pumps, free air, free water and sell other petroleum product such as motor lubricating oil and its general aim to maintain cleanliness and efficiency. Due to improvement and consequent unfeasibility of simultaneous modernisation, the modern service stations operating under a single brand-name become the basis of petroleum campanies retail sales organisation. They usually comprise of an open forecount area with several pump islands, often covered by concrete canopies and normally well illuminated.

The forecourt consists of sales building, housing the dealer or tenant's office and a sales area for full range of automotive accessories and other merchandise. This "design" is attractively dressed in a standard decoration and the signalisation of the supplying company which is to be instantly recognisable to the motorist. The station may be owned by either the dealer who operates it or by the petroleum company itself, the latter ensuring not only better security of outlet but also stricter control of the standard of service offered. Nowadays, beside selling the petrol and lubricating oil, some service stations provide more services such as mechanic and repair, car wash, minimarket, toilet, prayer room (for moslems), vending machines, credit card facilities, telephone, phonecards, spare parts

and other car accessories. The evolution process facing by the service stations will discussed further in the next chapter.

In 1979, after the Iranian Revolution, Malaysia faced their first fuel crisis with a shortage of petrol. Malaysia National Petroleum company, Petronas, owned by the Government of Malaysia was asked to enter the petroleum retailing sector. In 1982, Petronas with its subsidairy Petronas Dagangan Sdn Bhd was involed actively and directly in this business. In 1983, the government established the pricing mechanism to control the prices of petrol and diesel which means that only the government can make the decision whether to increase or decrease the prices. Before July 1990, all service stations in Malaysia provided only two types of petrol, the premium (leaded) and diesel. Then, they introduced the unleaded petrol but the price for both the products are the same about MR1.13 per litre (0.27p). After the 1994 budget, when the government announced a price reduction, the unleaded was three cents cheaper than the leaded petrol as an incentive to futher protect the environment. Nowadays, service stations play an important role in giving petrol retailing services to motorists in Malaysia. The number of vehicles have increased more than six million from 1960s to the present day and 95 percent of this number use petrol or diesel for fuel. The registration of motor vehicles in Malaysia was also increasing from year to year (Table 3.12).

In the Malaysia petroleum retailing industry, there are seven dominant oil companies. The three major companies which compete side by side are Shell, Esso and Petronas and are involved in both the upstream and downstream sectors of the oil industry. The other three 'young' players which compete neck to neck are BP, Caltex and Mobil. The youngest and the newcomer is Fina which entered these businesses three or four years ago. Until May 1993, the number of service stations were 2,490 units (Table 3.13).

Table 3.12
Motor Vehicles Registered in Malaysia
(1987 - 1992)

As at year end	1989	1990	1991	1992	1993
Cars	1,658,567	1,811,141	1,986,751	2,117,217	2,247,290
Moto-cycles	2,848,717	3,035,930	3,257,542	3,477,750	3,695,234
Taxi/Hire cars	30,803	34,477	38,091	41,007	43,909
Buses	24,828	26,803	28,661	30,744	32,578
Goods Vehicles	349,757	380,330	418,142	447,013	468,518
Other Vehicles	159,134	174,048	188,508	202,042	212,165
Total	5,071,706	5,462,729	5,917,695	6,315,775	6,699,694

Source: Malaysia: The Sunday Star, March 12 1995 pp 37

Shell's refinery business (Shell Refining Company Berhad) and Esso's downstream sector (Esso Malaysia Berhad) are listed on the KLSE and

Table 3.13

Number of petrol kiosks according to petroleum companies in Malaysia. *

Company's Name	Number of units
Shell	872
Esso	498
Petronas	435
Caltex	300
BP	178
Mobil	178
Petmal (Fina)	29

Source : Department of Domestic Trade
Ministry of Domestic Trade and Consumer Affair

Note: * until May 1993

they are ranked 15th and 22th respectively interm of sales in 1994 for listed companies in KLSE. (Malaysia: Malaysian Business 1st September 1994). Petronas remains as a quasi-goverment concern and has already listed its domestic marketing arm, Petronas Dagangan Bhd on KLSE main board in March, 1994 and have plans to list Petronas Gas sdn bhd, a subsidiary responsible for gas business next year (Malaysia: NST 12nd January 1994). During the listing process, Petronas Dagangan bhd offered 94.5 million shares for sale at RM2.80 per unit (Malaysia: NST 12nd January 1994) and the current share price is MR7.30 (Malaysia: The Star (Internet) 23th September 1996). The Petronas Dagangan Bhd has also forecasted a pre-tax profit of RM95.01 million and RM104.93 million for the years

ending March 31, 1994 and 1995, respectively (Malaysia: NST 21nd January 1994). Recently, Petronas was ranked 251st among the 500 international companies including those in America, Europe and Japan (Fortune, July 1994 and Malaysia: NST 25th July 1994).

Petronas, Shell and Esso intend to set up more service stations in an effort to grab the top position in the petroleum retail market and currently they have been setting up an average of 30 service stations per year (Malaysia: NST 8th February 1994). However, the younger players which consist of BP, Caltex and Mobil plan to build between 10 to 12 stations per year in the growth areas (Malaysia: NST 18th March 1994) in order to vie with each other and their more formidable competitors - Shell, Esso and Petronas. The current strategies adopted by all the players in this industry was introduced the convenience round-the-clock store for customers, particularly for motorists who for come quick stop for snacks, drinks and necessities. The Shell called theirs Select, the Mobil called theirs Mobil Mart, Esso called theirs Tiger Mart, BP called theirs BP Shop, Caltex called theirs Star Shop but Petronas still keeps away and only encourage their dealers to do it by their own.

In 1991, the market share of gasoline and petroleum products were worth about RM10 billions and RM4 billions came from the retail market of service stations (Wong 1993a). In 1993, the petrol sales total were 4.31 million litres and diesel sales were recorded at 6.31 million litres (Malaysia: NST 14th October 1994). The industry analysts preceived the industry to grow by at least 6 per cent

annually until 1995 (Wong 1993a). However, according to Permodalan Nasional Berhad's Malaysia Corporate performance 1991/92 report, operating profit margins over the last five years for petroleum products at service stations averaged less than 4 per cent. This figure was hardly satisfactory by any businessman's measure. The Malaysian petroleum business was also a regulated industry with an automatic pricing mechanism was establish in 1983, However, the margin which were set by the government and then have never changed. For example, every RM1.13 litre of petrol that were sold to the customers, the service stations make a gross margin of slightly more than 5 cent, so a service station which can sell 10,000 gallons a month can only enjoy a net profit of RM1,000 (Wong 1993b). This shows that the Malaysian petroleum retailing market has grown but the competition is tough and if the service stations are only depending on the sales of petrol, they are facing the difficultly to survive or succeed. However, in the customer's point of view, they get the benefit from this competition such as oil products are in adequate supply, prices are low and new products and services continue to come to the market.

3.6 Summary

During the British rule in eighteenth century, they played a very important role in the Malaysian economy. They brought with them the resources and organization of the Industrial Revolution. They

took an active interest in Malaysia by developing the tin and rubber industries until Malaysia was known in the world as a major producer and exporter of the both commodities. After the independence, the Malaysian economic was still over-dependent on both the commodities. As a result, the country was exposed to economic instability due to wide fluctuations of world prices of these two commodities and other agriculture products. However, after learning from this mistake, Malaysia is trying to diversify the economic base by industrialisation programme. These effort were very sucessful with the support from the discovery of large quantities of oil and gas, the main resources of the industry energy.

Thus, the Malaysia economy has performed well after it charted a historical negative value in 1985. The economy grew at an impressive rate of 8.1 per cent a year during the period from 1991- 1993. The prospects are just as good or even better. One of the factors which contributed to the success of Malaysia economy was the discovery of vast quantities of oil and gas reserves, as mentioned above. In 1992, crude petroleum and petroleum products contributed 12 per cent from RM23.45 billion of export earnings from primary commodities. In terms of return on equity, petroleum products gave 60.7 per cent return, the highest return compared to the other types of industries.

In petroleum retailing sector, the industries started after the imports of cars from Great Britian in late 1920 and the first service station was built in 1921. During the independence year, the total number of

imported cars and other vehicles were 13,432 units. At this time, most of the petroleum businesses was dominated by Shell and Esso. After the Iranian Revolution, Malaysia faced their first fuel crisis but the world faced the second "oil shock". These events marked the beginning of government intervention in the petroleum industries especially in retailing. During the crisis, Malaysia National Petroleum Company, PETRONAS was asked by the government to enter the petroleum retailing sector. Nowadays, in the petroleum retailing sector, there are seven dominant oil companies, six of them are multi-national companies and the Petronas.

According to the market analysts, the market share in 1991 was worth RM4 billion and was expected to grow by at least 6 per cent annually. Although, the Malaysian oil industry has grown tremendously but the market continues to be very competitive. There are several factors which make the market more competitive such as the number of service stations increasing every year, the price being controlled by the government, the introduction of the new products and services from time to time, the inceasing number of motor vehicles and the development of better infrastructure such as roads and highways. The main problem to be answer right now, if the market continues to be very competitive, is how the managers or the owners of service stations can expect something from the business and how can they survive in this kind of situation and what are the factors that can contribute to their success? If they can survived, how

can we or they know it? In other words, how can we measure their success or performance?

In the next chapter, performance and productivity measures and factors affecting the performance and productivity are examined with particular emphasis on their use and effect in retailing as general and specific, especially in petroleum retailing industry.

CHAPTER 4

LITERATURE REVIEW I:
RETAIL STORE PERFORMANCE AND PRODUCTIVITY

4.1 Introduction

The objective of this chapter is to investigate the importance of a number of key variables in understanding the factors affecting the performance and productivity of chain stores. This chapter begins with the concept of performance and productivity and shows how it can be used as the fundamental tool in the retail industry. This is followed by a review of the measurement used by various researchers in searching for the best measurement which can be used in retailing sector especially in the petroleum retailing sector. This will provide a frame of reference for analysing the factors which influence the performance and productivity of the chain store especially in service stations. Lastly, the definition of petroleum retailing and the method used by the previous researchers will also be discussed.

Measuring performance presents a significant challenge for scholars (Chandler and Hanks 1993). There are several challenges inherent in performance research in order to develop appropriate performance estimators. These challenges will be discussed further in Chapter six. First, the opening part of this chapter will present the definition of performance.

4.2 Defining performance

This chapter begins with definition of performance. Performance has been defined in two distinct ways (Campbell 1991). Campbell (1991) defined performance as behaviour relevant to the organisation's goal. He also suggests that when behaviour is not observable, performance can only be known by its effects, that is sales. Alternatively, Kane (1986) defined performance as "a record of outcomes achieved in carrying out the job function during the specified period". Levy and Sharma (1993) summarize that in selling situations sales volume is compatible with both definitions. Thus, the behaviour of salespeople and their sales volume should be interrelated. In the writer's opinion, this is not true in all industries, especially in retailing, where elements of cost can also give impact on success of the business.

This view is supported by Ingene (1982), who states that if one is interested in measuring or defining performance or productivity, "the level of current sales is irrelevant". Sales only reflect actual customer demand, which is distinct from the firm's output capability. In another research, Green et al (1995: page 4) defines performance, as the degree of market success attained by a product at market maturity or the point at which market boundaries change and the most common performance dimensions used are profitability and market share. In job performance models, performance is a function of ability, motivation and opportunity. Such models have been verified in organizational settings where the

individual abilities and motivation are moderated by opportunity in predicting individual performance (Chandler and Hanks 1993: page 78). For that argument, the performance of business founder (Schein 1978 in Chandler and Hanks 1993), and owner is measured by the performance of the organization. In another view, Venkatraman and Ramanujam (1986) define performance as a subset of the overall concept of organizational effectiveness which reflects the perspective of strategic management.

Campbell (1991) also suggests that performance is to be distingushed from *effectiveness* and *productivity*. He say *effectiveness* refers to the evaluation of the results of performance. By definition, the variance in the measurement of effectiveness is controlled by more than the actions of the individual plus error and dollar amount of sales is the obvious example. On the other hand, he quotes Mahoney's definition of *productivity* as the ratio of effectiveness to the cost of achieving that level of effectiveness. For example, the same level of sales may be achieved far more cheaply by one firm than another. These concepts are quite distinct in their scope, according to Goodman (1985) a hierarchical relationship may be seen to exist between them. According to Mahoney (1980), total productivity has its sub-components just as performance does, such as the productivity of capital, the productivity of technology and the productivity of labour. The further details of productivity will be discussed in the next section on productivity and productivity measures.

Lastly in his article, Campbell (1991) gives the complete concept by introducing which he calls as *utility*. Utility is defined as the value of a particular level of performance, effectiveness or productivity. All of these utilities are value judgements, and they can only be determined through some policy-capturing method that reflect the collective values of those deemed appropriate judges, itself being a political decision. For example, for a board of directors, the utility of particular profit levels (an effectiveness measure by his definition) may bear no resemblance to its dollar amount. In the writer's opinion, other parties such as stakeholders, customers etc. also play an important role in determining the utility.

Furthermore, Venkatraman and Ramanujam (1986) catogeried performance into two concepts - one narrow and one broad. The narrowest conception of performance on the use of simple outcome-based financial indicators are assumed to reflect the fulfillment of the economic goals of the firm. The broader conceptualization would emphasise indicators of operational performance such as market share, product quality, value added and other measures of technological efficiency. However, in retail performance, Mc Goldrick (1990: page 122) looks at performance from two crucial perspectives. First, the assessment of image is examined as the means of evaluating the marketing performance from actual and potential customers. Second, means of analysing the financial performance using more traditional tools of cost and profit analysis.

4.3 Performance Measures

4.3.1 Measurement of Performance

From chapter one, it is important that research efforts should concentrate on the factors influencing performance in every situation faced by the companies. However, in order to identify and substantiate the correlates and antecedents of performance, it is imperative to identify the most relevant performance dimensions and move towards the use of common performance estimators. According to Chandler and Hanks (1993), relevant, reliable, and valid measures of performance are essential to explore vital relationships between independent variables and success and to develop sound performance theory.

Measuring the performance of firms is of interest because they are a major source of job creation and because improvement in performance is critical to their survival and growth (Brush and Vanderwerf 1992). Furthermore, the whole concept of the measurement of performance is sometimes questioned and in some cases regarded as being subjective and futile. However, performance can be evaluated using non-judgmental (or outcome) and judgmental measures (Campbell 1991). The non-judgmental measures use objective data that do not need abstraction or synthesis by the person collecting the data and are extensively used such as sales volume. The judgmental measures, however require an

individual to make a judgment about the performance level of another individual or of themselves and are used to measure both outcomes and behaviour. Judgmental evaluations are accomplished by collecting, weighing, and using information to make statements about the person being rated (Levy and Sharma 1993).

According to Van De Ven and Morgan (1980 in MacDougall1993), they argued with regard to organizational performance that:

"Performance is a complex construct that reflects the criteria and standards used by decision makers to access the functioning of an organization. As this definition suggests, performance is a value judgement on the result desired from the organization at different level of analysis..... and .....often change over time"

The purpose of performance measurement is to help guide the performance of tasks (Benham 1981 in MacDougall 1993). He argued that the role of the expert in the performance measurement was to help managers but not to tell them how to run their businesses. The key reason being that managers were ultimately responsible for performance, not advisors (MacDougall 1993). According to Dess and Robinson (1984), research that includes a consideration of organizational performance must address two issues: (1) the selection of a conceptual framework from which to define performance and identification of accuracy, and (2) available measures that operationalize performance.

A typical scheme for a research programme as suggested by Parker (1991), for investigating organisational performance is given in Figure 4.1. The choice of performance measure depends on the objectives of the research programme, but at the same time the performance selected will determine the particular aspects of performance that the researcher concentrates upon; in other words, it determines "What is important" in the research study. Figure 4.1 shows the type of performance measures available to researchers and is grouped as "internal" or "external". External measures are those where the data are usually available in public documents such as annual reports and accounts or the financial press. By contrast, internal measures may necessitate access to internal management data or the preparation of questionnaires directed at staff or customers.

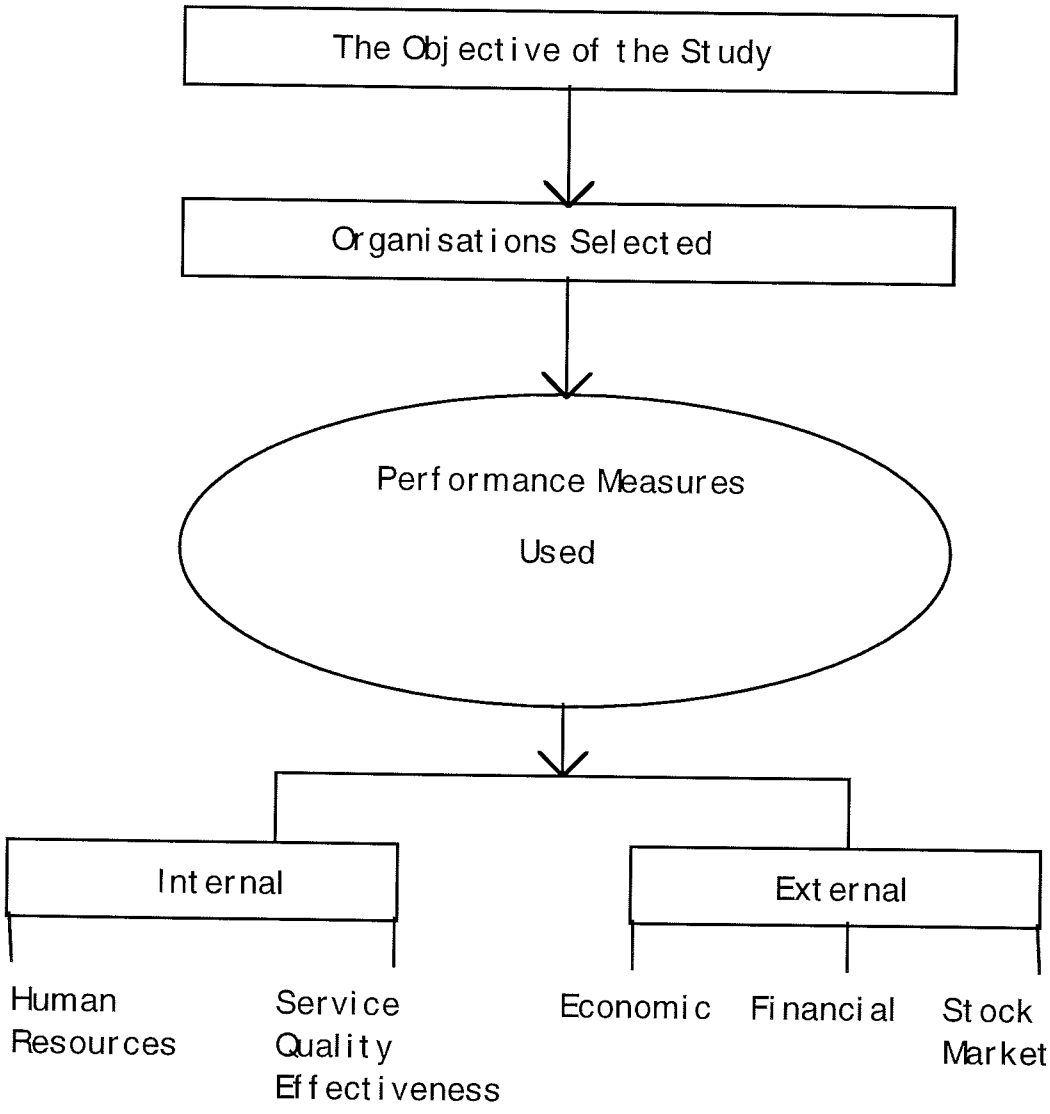
The author states that in external, he divided it into three factors : financial, stock market and economic. In financial, the author used financial ratios as a tool to measure the performance. Stock market, however, which reflects the investors' perceptions of the company's performance are reported extensively in the financial press. These include earnings per share, dividend yield, dividend cover and the price/earnings ratio. So far, as the stock market's judgement is coloured by the underlying profitability and financial soundness of the company, the picture provided by these ratios should accord with that given by the financial ratios drawn from Annual Reports and Accounts. Economic, according to Parker, was less known to most management researchers. The author suggests that partial and total

factor productivity are the performance measures used by the economists. Partial factor productivity measures consider the impact on output of a change in one input. The most common partial factor is labour productivity which can be expressed in terms of the numbers of persons employed or where labour utilisation varies, for example man hours employed. On the other hand, total factor productivity measures the relationship between the volume of output of all factors. For this measure, the researchers must struggle with the complexities of aggregating and evaluating heterogeneous capital inputs such as manhours, fuel inputs, raw materials, land and building, plant and machinery.

As far as the Internal factor is concerned, Parker (1991) divided into two catogeries: service quality/effectiveness measures and human resources. Some organisations feel that quality of service or the effectiveness of delivery or customer satisfaction may be more important than financial and economic performance. It is usually straight-forward to identify which quality or effectiveness indicators are appropriate for the purposes of the research. Obtaining the necessary information to be able to compare performance on this score either over time or between organisations is comparatively problematical. In studies of non-profit organisations such as police, hospital, post office, the effectiveness may be much more relevant than financial and economic efficiency. Lastly, the human resources, a different but related approach is to consider management policies which have an impact on the workforce. In this category, some

Figure 4.1

Schema for Investigating Organisational Performance



Source: David Parker (1991) pp 10

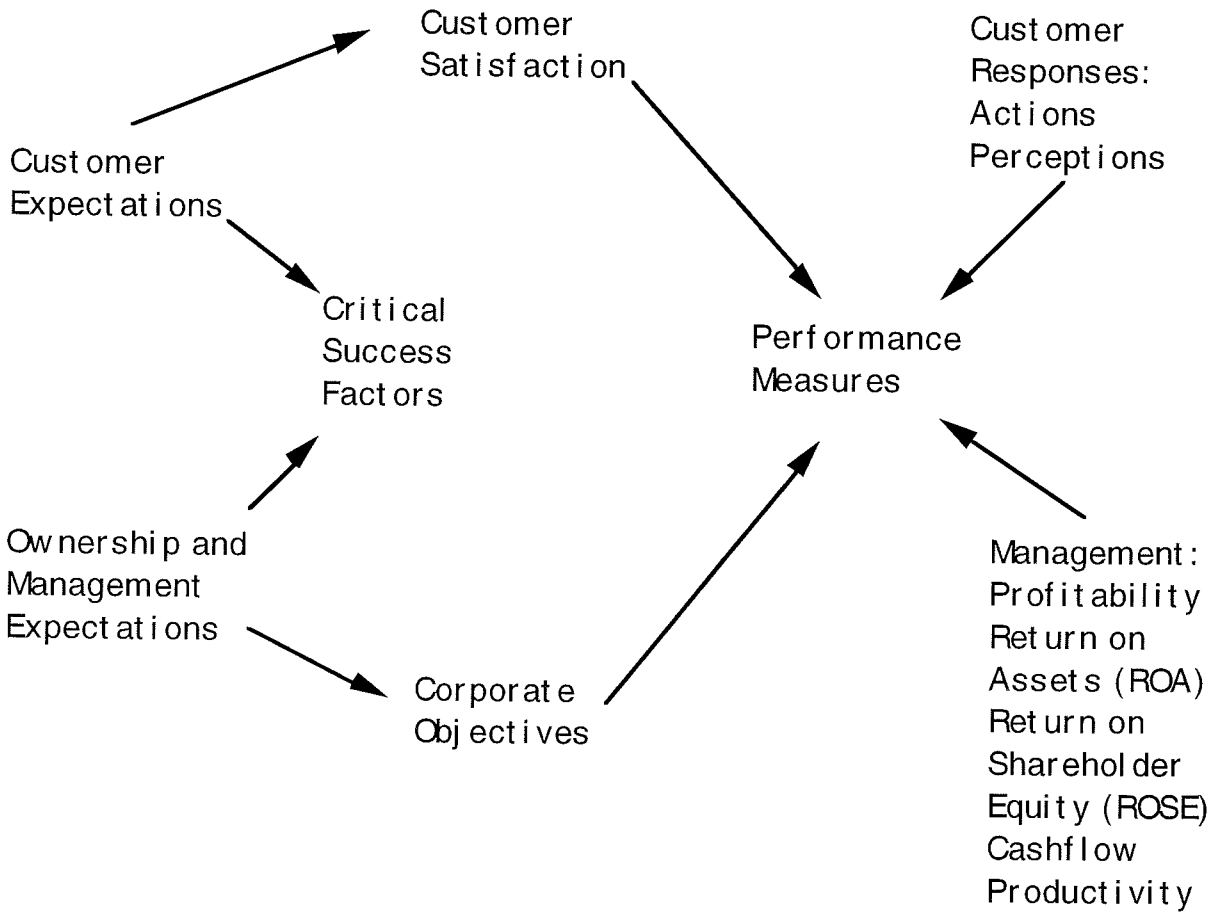
researchers may be interested in personnel policies, labour participation in management decisions, continuity of employment, wages and so on.

The schema suggested by Parker above was parallel with Walters' views (1994). He says that for management to implement strategy they must be aware of the major performance components of the business and how those are related with each other internally and how they are coordinated to achieve successful performance externally. Walters (1994) also suggests a framework for developing integrated performance measures (Figure 4.2). It is suggested that corporate success is a combination of meeting customer sastifaction criteria and the achievement of corporate performance requirement.

In firm performance, there are two major streams of research on the determinants of performance, one is based primarily upon an economic tradition. This tradition emphasized on the importance of external market factors in determining firm success. The other line of research builds on the behavioral and sociological paradigm and determines organizational factors and how they fit with the environment as the major determinants of success (Buzzell and Gale 1987 and Hansen and Wernerfelt 1989).

Figure 4.2

Developing Performance Measures



Source: Walters (1994) pp 142

The CIMA funded some research into performance measurement in profit-based service industries by Brignall, Fitzgenald, Johnston and Silvestro (1991). This 2.5 year piece of research proposed that:

" ..... the managers of every service organisation need to develop their own set of performance measures across six dimensions to monitor the continued relevance of their competitive strategy."

These six factors cover the following dimensions; competitiveness, financial, quality, flexibility, resource utilisation and innovation. Competitiveness and financial measures reflect the results or success of the chosen strategy whilst the remaining four dimensions reflect the means used to achieve this success. Brignall, Fitzgerald, Johnston and Silvestro (1991) recommend the following (page 6):

Dimensions of performance	**Types of measure**
1. Competitiveness	1.Relative market share and position 2.Sales growth 3.Measures of customer base
2.Financial	1.Profitability 2.Liquidity 3.Capital structure 4.Market ratios
3.Quality of service	1.Reliability 2.Responsiveness 3.Aesthetics/appearance 4.Cleanliness/tidiness 5.Comfort 6.Friendliness 7.Communication 8.Courtesy

	9.Competence 10.Access 11.Availability 12.Security
4.Flexibility	1.Volume flexibility 2.Delivery speed flexibility 3.Specification flexibility
5.Resource utilisation	1.Productivity 2.Efficiency
6.Innovation	1.Performance of the innovation process 2.Performance of individual innovators

According to CIMA (1991), far less research has been carried out into performance measurement in service industries and the CIMA research highlights five key differences between manufacturing and service as follow:

1. the common presence of the customer in the service delivery process
2. the intangibility of many service aspects
3. the heterogenity of service staff performance and customer expectations
4. the usual simultaneity of service production and consumption, and
5 the perishability of many services

The use of ratio methods to examine trading performance has been discussed by many researchers such as Ingene and Lusch (1981) and Davies (1984). This method is generally employed at the macro and micro scale to examine two-dimensional relationships such as the number of store per capita, sales per household and sales per employee. At the micro scale, the indicator includes sales per square foot, sales per capita and sales per checkout (Jones and Mock 1984). In strategic marketing and management, the Profit Impact of Marketing Strategies Project (PIMS) has stimulated a wide range of research (Buzzell and Gale 1987). They used two measures of profitability: profits as a percentage of Sales (ROS) and profits as percentage of investment (ROI). However, for some purposes, they also used a business unit's net cash flow (cash generated minus cash used) as a supplementary performance measure. In retail planning, however, only a few studies have investigated the strategic success factors (Hildebrandt 1988, Kotha and Nair 1995). As noted above, the consideration of performance in most previous literature is limited to financial performance. In meta-analysis study done by Noel et al (1990), they concluded that financial performance can be catogerized into six main relationships - industry concentration, growth, market share, size, capital investment intensity and strategic factors.

On the other hand, several researchers have suggested that subjective performance measures may be appropriate given the restrictions imposed by objective measures (e.g Cooper 1984; Dess and Robinson 1984; Gupta and Govindarajan 1984; Stuart and Abetti 1987;

Chandler and Hank 1993, Box et al 1993 and Tan and Litschert 1994). The research using these measures has consistently denigrated the use of objective measures of performance.

Several researchers have used a weighted satisfaction with performance measure (e.g Covin et al 1990 and Sapienza 1989,1992 and Tan and Litschert 1994). Chandler and Hanks (1993) using three separate approaches. The first measurement approach was designed to measure growth and business volume in broad categories. In measure growth, three items were used (1) perceived growth in market share, (2) change in cash flow and (3) sales growth. Three business volume measures were used (1) earnings including the salary of the manager/owner (2) sales and (3) net worth. The second approach used a weighted satisfaction with performance index to measure how much emphasis was placed on each measure for decision making purposes (no consideration, slight emphasis, some emphasis, substantial emphasis, a great deal of emphasis) for individual components of the scale. The components of the scale were (1) sales growth, (2) return on sales, (3) cash flow, (4) return on investment, (5) net profits, (6) return on assets, (7) growth in market share, (8) growth in the net worth of the company.

In new technical ventures study, Stuart and Abetti (1987) chose to measure initial success in two ways: (1) quantifiable and (2) subjective. The initial quantified success is measured as a combination of sales and employment growth, profitability, return

on equity, sales/employee and sales/assets. Initial subjective success is measured as a combination of attaining original expectations, probability of survival, ability to attract outside capital, employee satisfaction and contributions to society. In the same line, Lussier (1995) also used both the quantitative and qualitative managerial factors such as experience in management and industry, education, staffing and planning that may contribute to success and failure.

The third measure is comparing the performance of their companies to the performance of competitors, which they were aware of, and are at about the same age and stage of development. This approach can be done by using the same components of the scale in the second measure. The other subjective measure used by researchers is average annual increase in employment (Davidson, 1989; Miner et al, 1989 and Box et al, 1993). In addition, Cooper et al (1994) used another three performance outcomes: (1) failure, (2) marginal survival, and (3) high growth and only one of the three dummy variables can be equal to 1.

In the researcher's opinion, the researcher suggests that the small firms are unique entities from the large firms as susgested by Storey et al (1987). So, it seems appropriate to suggest the possibility that performance may have a different set of meanings for small firms than for large firms. However, this may imply a number of interpretations and appropriate measurements, depending on the

nature of the question of interest, the industry within which the organisation operates, etc (Keats 1988).

From the above discussion, there are many ways to measure performance but still no single measurement was agreed by everybody. Any measurement suggested by someone is subjected to criticism. In a meta-analysis study done by Brush and Vanderwerf (1992), they found that there are more than 35 different measures of performance in articles from two leading business journals between the 1987 to 1988 issues and the most popular measures were "change in sales", "operating business/discontinued business", "changes in employees", and "profitability" such as return on sales, return on investment and net profit.

However, according to Retail Insights (1993, page xi), there are seven principles for good performance measurement:

(1) all measures must be directly linked to company strategies

(2) all measures must address the cause of current results or forecast future results

(3) all measures must be custom-designed for the user

(4) measurement reports must be brief, clear, graphic, quickly interpretable, widely distributed and thoroughly digested

(5) measurement reports must provide more than current results: competitive, comparative base-line and trends should be included

(6) the frequency of measures and reports must consider the cycle time for meaningful changes or results to occur

(7) the distribution of reports must consider the need for teamwork and the opportunity for the entire organization to participate in the performance improvement process.

Next, we discuss the performance measures in retailing, the area where the researcher has chosen to study.

4.3.2 Performance Measures in Retailing

What are the performance measures in retailing? In commenting on this aspect, Lusch (1982) states that the ultimate measures are financial. In the writer opinion's, this is not always the case as not all businesses are looking for money; some of them such as non-profit organisations have different goals and objectives. In addition, financial measures do not place value on non-financial dynamics, such as innovation, learning and change and fail to measure "value" factors such as human resources, customer confidence and brand loyalty (Retail Insights 1993). However, Lusch also said that societal

goals are also important, however, in the long run, social and profits goals are consistent. Retailing is extremely competitive and therefore, if the retailer wants to continue earning an attractive financial return, the firm must do what society wants. When consumers stop patronizing a retail store, there is an indication that the retailer is not doing as good a job as it once did at providing wanted goods and services at prices customers are willing to pay. Therefore, in a competitive retail environment, there is a direct correlation between societal and financial return (Lusch 1982).

Next, we will overview the model suggested by researchers to be used in order to measure the performance in retail sector.

4.3.3 Retail Performance Model

According to Lusch (1982), the standard financial performance criteria in retailing can be partitioned into three groups: (1) Profitability, (2) Liquidity and (3) Growth. In profitability, profit performance can be clearly specified by using the strategic profit model, focusing on three important financial ratios: profit margin, asset turnover and financial leverage. Liquidity, however, represents the firm's ability to meet its current payment obligations. Liquidity, according to Lusch, is crucial to the retailer for two reasons. Firstly, if a retailer has too much liquidity, then the working capital is not being fully utilized. If this is the case, attractive options for using this

working capital are probably being ignored or discarded in order to minimize the risks of being insolvent. Secondly, not enough liquidity can mean that a retailer may not be able to take advantage of opportunities to purchase merchandise at attractive prices when suppliers need to move inventory rapidly. Financial analysts generally use three financial ratios to evaluate liquidity: current ratio,quick ratio and acid-test ratio. The last criteria suggested by Lusch is growth. The high performance retailer cannot be one that experiences average or below average growth, it must be significantly greater than industry average. To achieve this position, one must increase sales by at least 1.5 times the industry rate of growth.

Lewison (1991) also emphasizes ratio analysis as a tool to analysing the performance of retailers. He said ratios can be grouped into two general categories: operating ratios and financial ratios. The operating ratios express relationships among elements of the income statement. They are used to judge how efficiently the retailer is generating sales and managing expenses. To obtain operating ratios, an element of the retailer's income statement is divided by another element and multiplied by 100. For the financial ratio, he suggests three key financial areas of concern and they are liquidity, leverage and profitability. Liquidity determines whether the retailers can meet payment obligations as they mature. It means possessing sufficent liquid assets that can be quickly and easily converted to cash to meet scheduled payments or to take advantage of special merchandising opportunities. The leverage ratio measures the

relative contributions of owners and creditors in the financing of the firm's operations. Like Lusch, Lewison also suggested the strategic profit model (SPM) for measuring an overall assessment of a retailer's performance in terms of profits.

The formula for SPM is

Profit Margin X Asset Turnover =
Return on Assets X Financial Leverage =
Return on Net Worth

Source: Lewison (1989)

where *profit margin* is net profit (after taxes) divided by net sales. This ratio measures the after-tax profit per dollar of sales.

Asset turnover is net sales divided by total assets, it measures the productivity of the firm with respect to asset utilization.

Return on asset is net profit (after taxes) divided by total assets, it measures the return on all funds invested in the firm by both owners and creditors.

Financial leverage is total assets divided by net worth, it indicates the relative owner/creditor contributions in the firm'ss capital structure.

Return on net worth is net profit (after taxes) divided by net worth, it measures the return on funds invested in the firm by its owners. Beside SPM, there are other retail performance models and are typically implemented at the department or store level (Larson and Lusch, 1990). The SPM, the first model mentioned above is a useful tool for evaluating and interrelating some of the performance impacts at the store or strategic business unit (SBU) level. The second model is strategic retail resource model (SRM). The strategic retail resource model interrelates the efficiencies of the retail resource trinity such as inventory, space and labour.

The three retail resource efficiencies are inventory efficiency (IE), space efficiency (SE) and labour efficiency (LE). These three efficiency measures are defined as follows:

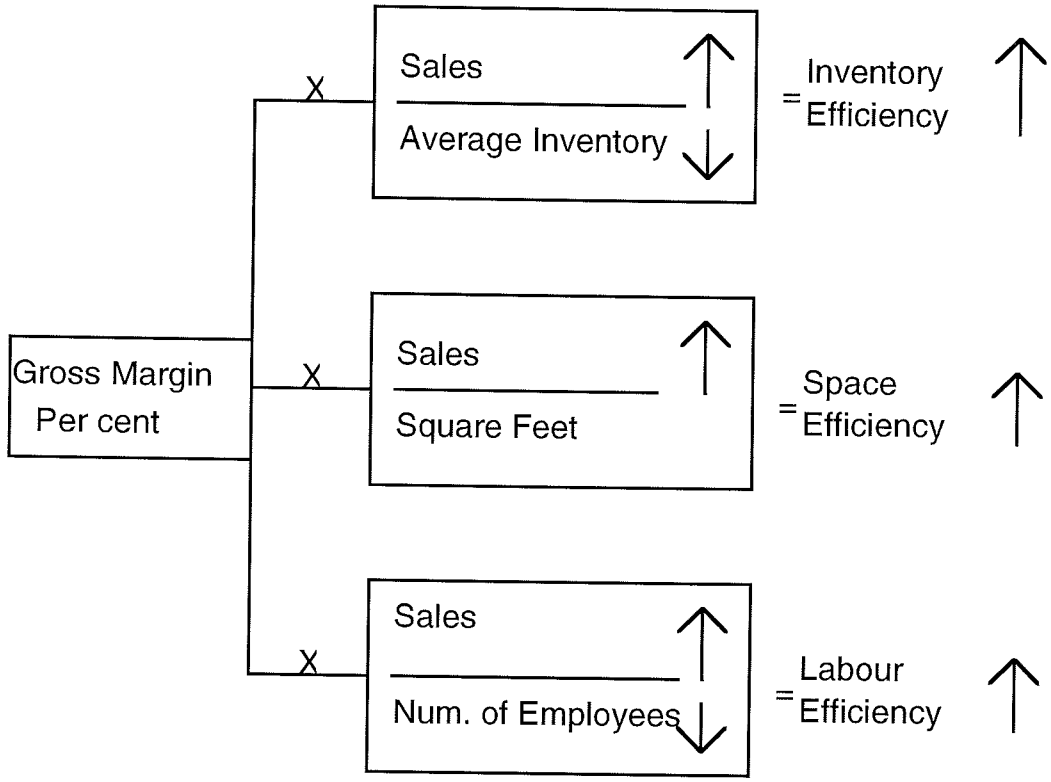
(1) IE = GMP x sales/average inventory investment
(2) SE = GMP x sales/square feet of selling space
(3) LE = GMP x sales/number of full-time workers

The GMP = The gross per cent is equal to sales minus cost of goods sold divided by sales.

The relationship for inventory, space and labour efficiency can be shown as (Figure 4.3):

Figure 4.3

The Relationship for Inventory, Space and Labour Efficiency



Source: Larson and Lusch (1990) page 25

The third performance model is inventory item model. The inventory item model uses an individual item as its unit of analysis. The model is designed to minimize the total cost of ordering, storing, shipping, and selling an item, as it is passed from vendor to retailer to customer.

Consider a retail inventory item, and let:

p = retail price per unit

C = FOB origin cost per unit

d = average markdown ($)

m = expected per cent of units marked down

U = annual sales forecast

f = freight cost per unit

If freight costs and markdowns are treated as part of cost of goods sold, effective annual gross margin is sales multiplied by gross margin per unit, or:

$$U(p - (C + f + md) \quad \ldots\ldots(1)$$

Further, Let:

S = order processing cost per order

Q = standard order quantity, vendor to retailer

h = inventory carrying cost (per cent of item value/year)

r = expected daily sales rate (U/days open per year)

r_{mx} = maximum daily sales rate

t = lead time (days)

Annual order processing cost is simply orders per year multiplied by cost per order, or:

$$(U/Q)S \quad \ldots\ldots(2)$$

and the annual cost of storing cycle, pipeline and safety stock is:

$$hCQ/2 + hCrt + hCt(r_{mx} - r).....(3)$$

And, the retailer's annual total cost (TC) of handling the item is

$$U(C + f + md) + US/Q + hCQ/2 + hCrt + hCt(r_{mx} - r)....(4)$$

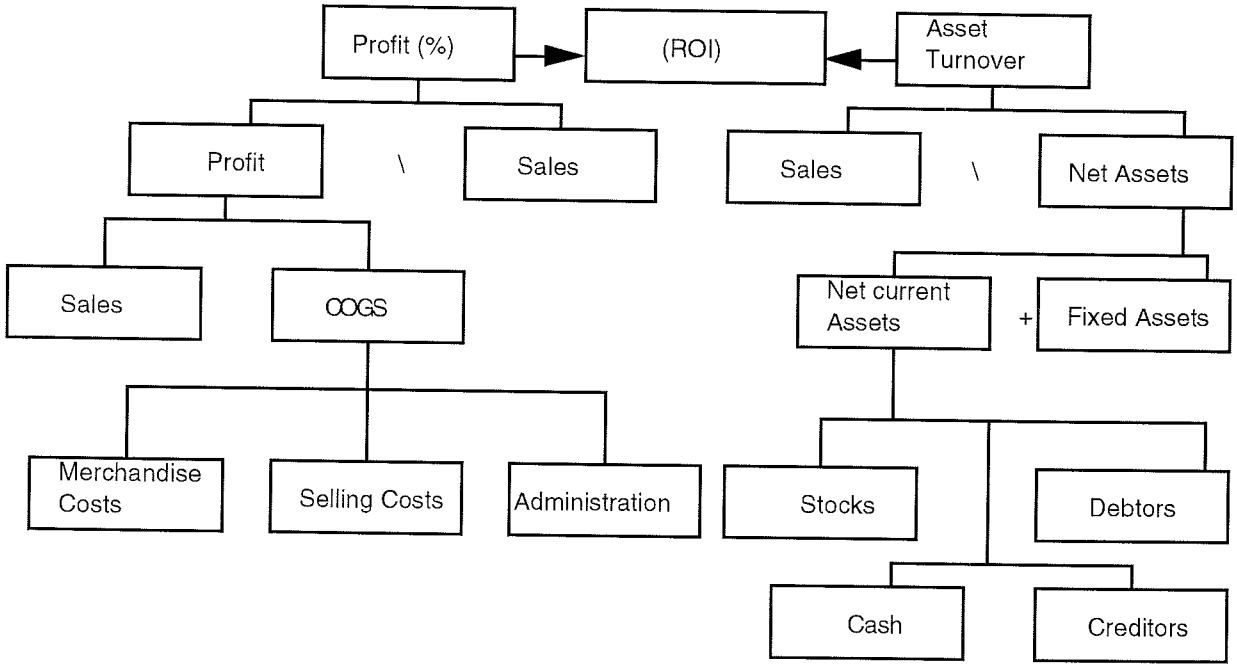
The forth performance model is DuPont Model. This model basically operates by using the 'return on investment' (ROI) concept as a major managerial analytical tool. The ROI concept developed by DuPont in the 1960's has since been used successfully on widespread basis for evaluating company or profit centre performance (Walters and White, 1987).

The lower section of the figure, using data from the balance sheet, develops the asset turnover ratio. The upper section of the figure, using data from the profit and loss account, develops the profit margin on sales. Individual expense items are aggregated to produce a cost of goods sold. This is deducted from sales revenue to produce a level of profit (tax can be included), before (or after) tax profit is divided by sales. This gives a percentage profit margin on sales. When the asset turnover is multiplied by the margin on sales, the product is the percentage return on investment (ROI) or return on capital employed (ROCE) in the firm, depending upon which denominator has been used in calculating the asset turn (Walters and White 1987).

The relationship of all the variables used in this model can be show as (Figure 4.4):

Figure 4.4

DuPont Model



Source: Walters and White (1987) page 104

However, all the models mentioned above cannot explained and identify the factors influencing them as a variable or the degree of level (how much they can be influenced) from the equation but they can be the dependent factors for searching the factor that influence them. On the other hand, we also need good accounting records in order to use all the formulas in the models and need the average cost for individual items to put in the equation (for the inventory item model). However, this is impossible for small businesses where their accounting records are questionable and normally not a good source

for research data. Further more, only a few researchers or writers use the SPM and SRM as a measurement for performance in their researchs. For instance, the PIMS used only two measures from profitability concept, ROS and ROI (Buzzell and Gale 1987) and financial ratios such as ROA (Cronin Jr and Skinner 1984; Reidenbach and Moak 1986). The typical measures of success used by retailers are sales and profits (Kelly et al 1993) and the most popular unit of measurement in retailing is sales, in terms of total sales (Albaum 1967; Davies 1973; Cottrell 1973; Hise et al 1983; Moriarty 1985 and Anderson 1985) or volume of sales in monetary values (Ingene and Brown 1987; Levy and Sharma 1993 and Adams et al 1993) or average sales growth (Acar 1993, McGee et al, 1995).

However, according to Kelly et al (1993), sales volume is a short-term measure of the local success and competitive strength of each store. However, in practice researchers have limited choices because most of the data tend not to be available (Ingene 1983). In other approach, Robinson (1973) used the number of gallons per day and per week as a measurement of performance in service stations sector. On the others hand, Cottrell (1973) used controllable and non-controllable expenses such as wages, utilities, employee benefits, maintenance and repair by the use of square feet of selling space and total sales per square feet. According to Cottrell, this method states expenses as a function of unit size and the intensity of its use, and a sufficient measurement for short-run forecasting.

In addition, although many studies have employed accounting measures (some already have been mentioned above), there are significant difficulties in an attempt to use accounting measures to assess the performance of small firms. There are many comments and suggestions for future research (e.g Fioritto and LaForge in Box et al 1993) mentioned that small firm owners are reluctant to share accounting information with researchers. Further more, small firm or businessmen typically do not think in these terms and do not calculate these ratios (Miner et al 1989). A suggestion from above limitation, average annual increase in employment (EMPGRO) (Davidsson 1989; Miner, Smith and Brocker 1989) and other subjective measurement such as percentage increase in sales, percentage increase in employees and increase in absolute number of employees (Cooper et al 1989) and failure, marginal survival, high growth (Cooper et al 1994) have been used in previous studies of performance. In the study of success and failure in business, Lussier (1995) used non-financial factors such as capital (adequate - inadequate), planning (specific - no plan), marketing (unskilled - skilled) to develop a model for prediction of young businesses.

One of the models which can be considered to be used is the regression model, to determine the factors that influence the performance of retail outlets (Ghosh and McLafferty 1987). This model was used in performance of retail outlets such as clothing departments (Hise et al 1983); banks (Ghosh and McLafferty 1987); grocery stores (Morphet 1990, Kelly et al 1993); and multibusiness

outlets (Adams et al 1993). The advantage of this model is that they allow the systematic consideration of some characteristics in a single framework (Ghosh and McLafferty 1987). Furthermore, regression models provide a quantitative measure of the relative impact of these variables on firm performance.

On the other hand, Bowlby, Breheny and Foot (1984) suggest that there are two main types of techniques which have been adopted in retail problems; (i) the store-turnover forecasting techniques and (ii) spatial marketing techniques. Store-turnover forecasting technique would be the most useful where retail performance is a function of the location of outlets, where the market is outlet dominated. Spatial marketing technique will be most useful where the performance of an outlet is more dependent on being in the right general location, with the right socio-economic structure, than the local catchment area characteristics. Store-turnover forecasting techniques are intended to forecast store performance from the knowledge of existing stores in the same retail chain, According to Breheny (1988), such techniques which have their origin in academic geography, usually include various forms of what are called 'analoque' techniques, in which an analogy is drawn between the performance of existing stores and a proposed store. Multiple regression analysis has been used to extend this analoque principle (Breheny 1988: page 49).

In this study, service stations are categoried as outlet dominated and it would be appropriate to use the store-turnover forecasting

technique as suggested by Breheny (1988). With some modification, extensions and variables, existing models can be made more useful to end-users (Beaumont 1988).

In this study, regression analysis was used to estimate the relationship between the independent factor (X_i) and the performance factor (PF). The development of regression models is based on two assumptions: (1) that the performance of a store is significantly affected by the manager/owner characteristics, the store characteristics, the location characteristics of the site and the competition characteristics (as discussed in Chapter 5) and (2) that these underlying factors can be isolated by systematic analysis. The general form of these models can be written as follows:

$$Y = b_0 + b_1X_1 + b_2X_2 + b_3X_3 + ...b_nX_n + e$$

where Y (the dependent variable) is the measure of the performance of a store and the X_S (independent variables) are measures of factors hypothesized to influence store performance. The parameter b_0 is the intercept term and b_1, b_2 .....b_n are the regression coefficient corresponding to each independent variable and e denotes a random disturbance term (Hise et al 1983, Ghosh and McLafferty 1987 and Mendenhall and Mc Clave 1981).

In this study, combination of forward and backward stepwise regression was used to determine which of the independent variables

were to be included in the final regression equation for each of the performance factors. Forward stepwise regression is based upon adding variables one at a time, whereas backward stepwise regression starts with including all the variables and then deleting variables one at a time. The creterion for adding (deleting) variables is to select the variable which increases (reduces) the sum of square errors the least (most). The two procedures do not necessarily yield the same equations with the same number of corresponding variables. For both forward and backward regressions considered, the agreement was very similar and the equation with the largest adjusted R^2 was selected (Hise et al 1983 and Mendenhall and McClave 1981).

Also in this study, the researcher tried to use the estimated regression equation to forecast performance. This is done by determining the values of different explanatory variables in the model for the new store and substituting these values in the regression equation to predict the expected level of performance. The regression coefficients can also be used to stimulate the likely impact on the performance of existing stores, when any one or more of the variables are changed.

However, despite the useful insight this model provides, at least two types of main problems arise: (1) multicollinearity and (2) heterogeneity in the types of stores. Multicollinearity arises where two or more of the independent variables are intercorrelated. The multicollinearity problem is a question of degree (Hise et al 1983) and a significant problem in many studies (Ghosh and McLafferty

1987). Several diagnostic tests can be performed to check for the level of multicollinearity. According to Ghosh and McLafferty (1987), one way to detect this is to examine the tolerance values. The tolerance of an independent variable equals 1 minus the multiple correlation between that variable and all other independent variables in the model. Thus, tolerance value close to zero (0) indicate high level of multicollinearity. Another way to test for multicollinearity is split-half analysis. The data set is randomly divided into two or more groups, and separate regression models are computed for each sample. If there is a significant multi-problem, the results from the different samples will tend to be different in terms of their regression coefficient and goodness of fit.

Ghosh and McLafferty (1987) also suggest that a number of steps can be taken to reduce the multicollinearity impact on the results. However for further discussion, please refer to texts written by Johnston (1972) and Malinvaud (1980) or articles by Lord and Lynds (1981) and Alpert and Bibb (1974). The most obvious step is to reduce the number of predictor variables by eliminating those that are the main sources of collinearity. Another way of reducing the number of independent variables is to use factor analysis or principal component analysis, which allow the researcher to express the underling structure of the data in a parsimonious manner (Ghosh and McLafferty 1987) and using goodness of fit of the model to test the overall significance of the model (Lussier 1995).

A second problem in applying regression analysis involves the heterogeneity of stores in the sample. The problem can be solved by using the segmentation criteria (Ghosh and McLafferty 1987), by classifying the outlets into homogeneous groups. For example, Jones and Mock (1984) classified the outlets into five groups based on their location and separate regression models were calibrated for each group of stores. Because of the differences in the geography, the factors related to performance differed among the groups. On other example, Davies (1973) found significant differences in the variables affecting sales between clothing outlets located at corner sites and those located in the middle of the block.

For summary, after careful analysis, the writer felt that in this study, the performance was viewed as objective measures representing sales such as volume of sales, number of gallons and financial ratios such as return on investment, return of sales and etc or subjective measures representing percentage of growth in market share, change in cash flow, sales growth, average annual increase in employment and etc. Although other measures might be preferable, these were viewed as reasonable approximations given data limitations. In this study, the researcher tried to use both the objective and subjective measurement of performance and to assess the relative importance of these measurements on external and internal factors as suggested by Parker (1991) and Walter (1994). In addition, from the above discussions, little effort has been done to integrate the two factors and evaluate the relative effect of each on firm performance.

After understanding performance and its measurement, next we look at productivity and its measurement.

4.4 Defining the Productivity

The story of how a product or service is produced and distributed is one of the most fascinating in the history of mankind. It helps to explain how industry has made people, natural resources, and technology grow more interdependent. Of course, all this has a physical significance. The fact is that the world is experiencing a period of severe inflation which materially affects everybody. The only way to cure this economic illness is to find ways and means to increase output and at the same time reduce cost and expenses. This is what productivity is all about (Mahanti 1980). Until now, an operational definition of productivity has been elusive and much debated. If we look at the production concepts, Chen and McGarrah (1982) define productivity as a ratio of output produced per unit of resource (worker-hours or machine-hours of services, quality of material or energy units) consumed by the process. This is parallel with definitions made by Bloom (1972), Mark (1980) and Good (1984), productivity may be defined as the relationship of real output to real input. These is a technical relationship between output per unit time and input of various resources per unit time. This relationship can be expressed as,

$$Q = f(L,K,.....)$$

where Q is the quantity of output per unit time, and L and K are the quantities of labour, capital and other resources utilized per unit time.

Most researchers, particularly those with an economic orientation, also have defined productivity as an output-to-input relationship expressed in a variety of ways and some of them have discussed the appropriateness of many of the alternative measures of output and input (e.g Bucklin 1981; Ingene 1982, 1984; Goodman 1985; Achabal, Heineke and McIntyre 1984,1985; Ortiz-Buonafina 1992 and Woodman et al, 1996). According to Chen and McGarrah (1982), productivity may also be defined to measure a firm's performance in terms of financial or economic significance - for example, the dollar value of a unit of product or service delivered divided by the dollar value of labour, materials or capital utilized by the firm's work processes. From the research mentioned above, productivity can be discussed in either macro terms such as entire economies or industries, or in micro terms such as individual firms or businesses.

In fact, according to Mahanti (1980), productivity is the art and science of thinking smarter, not working harder. Productivity improvement must be based on:

(a) better organisation,

(b) better technique and tools,

(c) creative approaches

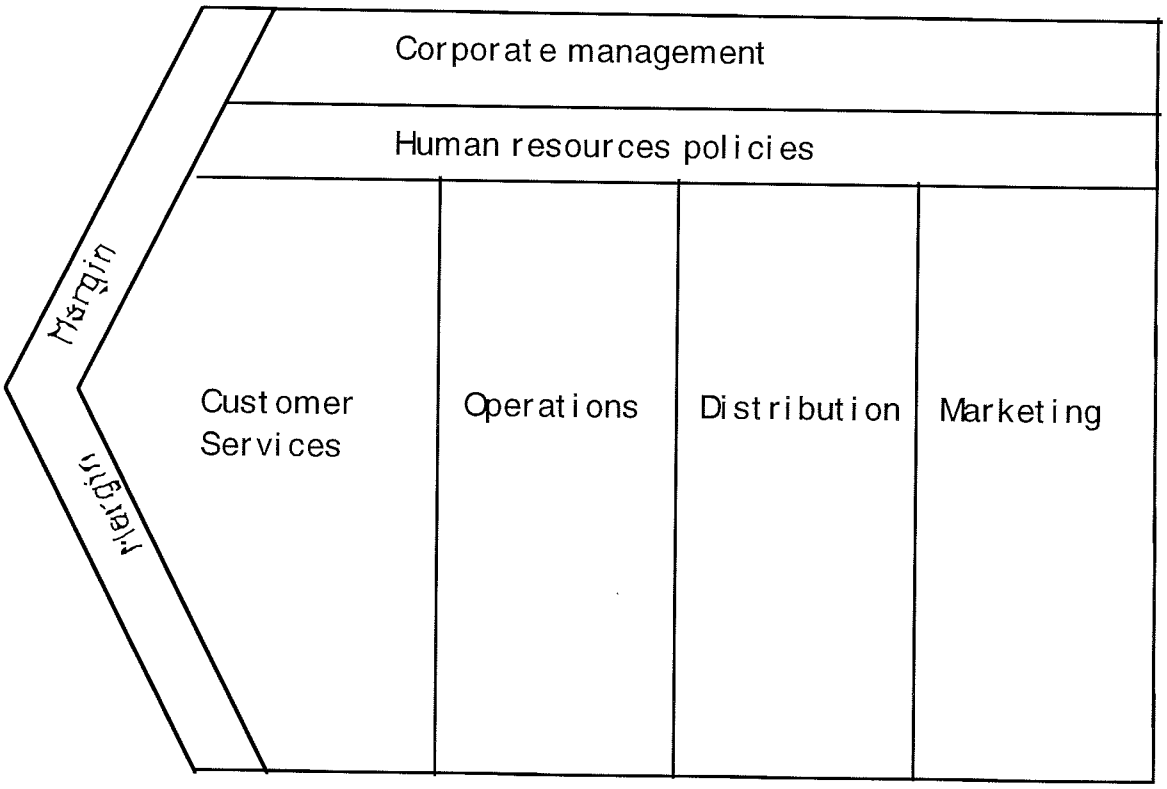
Good (1984: page 82) states that there are two schools of thought in productivity improvements. One school argues that productivity improvements occur only when (1) the same amount of services is delivered at lower cost or (2) more services are provided for the same or lower cost to customers. Another school holds that a productivity improvement occurs when a retailer achieves a cost reduction which is passed on to the customer, regardless of service level.

In discussing the productivity, according to Walters (1987), everybody cannot ignore the concept of 'competitive advantage' and 'differentiation' which have appeared in strategy literature frequently in recent years. These two concepts were introduced by Porter (1985) which has focussed on managements' attention on the concept of the value chain. Walters (1987) said that Porter's value chain is useful in identifying the activity areas within which productivity improvements can be made. The model of value chain shows the major activity areas and it represents the proportion of total costs and margin for which activity accounts (Figure 4.5). From this model, those areas which need attention or correction can be identified. Walters (1987) also suggests that the notion of the value chain can be extended into a value-added chain and developes the link between two chains. Futhermore, Walters says that differentiation can be created in a number of areas and based upon positively identified

customer needs and desires, it can be effective in increasing competitive advantage. He also said that value chain analysis can offer improved productivity via cost reduction and trade off analysis.

Figure 4.5

The Value Chain Model



Source: Porter (1985), page 46

Stark and Bottoms (1980) summarize that the overall productivity and efficiency of a productive activity ultimately depend on the efficient organisation of labour, capital investment, technology and

raw materials, on the one hand, and cost of resource inputs, on the other. They listed some important factors which can affect productivity, as follows (page 106-107):

(a) the need for standard against which productiveness can be matched, such as targets for output, sales, profits, manpower performance, and machine efficiency
(b) performance of the management team
(c) performance of the labour force
(d) utilisation of the labour force
(e) utilisation of plant and equipment
(f) technology
(g) utilisation of materials
(h) cost of labour, capital technology and raw materials
(i) prices of final products and services
(j) speed of through-put of materials and made in parts.

Lastly, according to Walters (1994) there are many particular needs and situations that precipitate productivity measurement efforts and some of the more frequent applications, they report are (page 229):

(a) identifying productivity declines for 'early warning'
(b) comparing productivity across individuals, unit, organizations and industry to make management decisions

(c) linking management and labour in productivity improvement efforts to build common awareness and responsibility

(d) demonstrating productivity gains to interested stakeholders

(e) supporting incentive and bonus plans with objective productivity data.

4.5 Productivity Measures

4.5.1 Measurement of Productivity

There is no single measure or best measure of productivity. To quantify and to analyse a company's problems and improvement opportunities is like diagnosing a patient. A doctor will also make various tests before making his diagnosis and prescribing the proper medicine. Similarly, there is an array of productivity and related measures which throw light on different aspects of performance.

Based on the above argument, the different industries need different measurements of productivity. A very successful business-man once said that 'the secret of success is to copy success'. It is, indeed, the key of the learning process to acquire knowledge from accumulated experiences and comparable standards, and to apply the lessons in

practice. This principle applies to productivity as well as to other aspects of life.

In the study on performance and productivity measurement at IBM, Mahanti (1980) identified the following requirements for the measurement system (page 219):

(a) It must be simple and understandable
(b) It must be usable at all levels of the organisation: field offices, staff functions, management, etc
(c) It must be transparent to organisational structure: IBM subsidiaries in countries are not all organised in the same way. So a measurement system should be capable to these different organisations.
(d) It must have a sound database structure and permit tracking over time.
(e) It should identify efficient and inefficient areas so that the cause and effect of relationships can be investigated.

In addition, in small business, people seem to be confused about just what productivity means and how it should be measured (Saladin and Nelson 1984). Because of the confusion surrounding the meaning and measurement of productivity, small business managers, in general, do not understand the significance and the impact productivity actually has on their businesses.

Furthermore, the measure of productivity especially in service sectors of industry such as retailing is inhibited by the lack of definitive input and output measures. According to Meyer and Olsen (1989), this measures are complicated by the fact that each service transaction is heterogeneous and produced and consumed simultaneously. Next, we look at the measurement of productivity in terms of output and input.

4.5.2 The Measurement of Output

The measurement of output raises some of the thorniest issues to be found in the study of productivity (Bucklin 1978). The concept of output may be given substance in simplified fashion by assessing the production of tangible goods. According to Bucklin (1978) in manufacturing, output is represented by the quality of such items produced by the organization over some specified period of time and measurement is accomplished by counting the units produced. This is fundamentally incorrect. The attributes are not so much determined by the tangibility of a product but also by the characteristics which permit certain types of services to become available upon use. Based on an example given by Bucklin, if a factory produces a television set, measurements of output are not only on the number of television sets but also include picture clarity, economy of operation, freedom from failure, longevity and attractiveness of cabinet style. In other words, total real output for

any organization depends not only upon the number of units constructed, but upon the array of attributes built into each.

For retailers, they add mostly 'service utilities' such as time, place, assortment to the core product, and such factors are much more difficult to measure (Achabal, Heineke and McIntyre 1984). In other words, the output of retailers is an 'extended product'. In retailing, the retailers purchase manufactured goods and sell in the retail market. These goods are transformed by the retailers into completely different commodities, although their physical appearance is often unchanged. The good that is offered by the retailers, now has been imbedded into a vector of attributes such as customer service levels, return policies, location, shopping of atmospherics etc, which the retailers have created as part of their overall strategy of the organization. In other words, the "retail production" is a process that transforms manufactured goods, along with various types of labour and capital, into complex offerings which the retailers hope that the customers will demand (Achabal et al, 1984).

The definition and measurement of output is necessary before the other measures can be derived (Goodman 1985) and both the input and output indicators for services must be quantifiable if productivity is to be measured (McLaughlin and Sydney 1990). Achabal et al (1984) states that productivity measures in theory are logically independent of actual sales. But while taking an organizational perspective, they suggested a long-run return on

investment as the appropriate goal. However, this aspect is also critised by others (see Goodman 1985). According to Good (1984), productivity can be stated in terms of any other factor of production, such as output per dollar of capital invested. A dollar measure of output is the best proxy for the true output of marketing, and services rendered to customers (Bucklin 1978, Ingene 1982). However, gross margin per man hours is found to be the best general measure of productivity from the management's perspective (Ingene 1984). While, Hawkins et al (1987) define marketing output for an individual firm as relative market share times relative price.

A Retail Council of Canada Study (1978) defined productivity as operating and economic performance, rather than in the more classical sense, because of the confusion surrounding appropriate productivity measures. Bucklin (1978) has identified a number of physical measures of output that can be used to determine marketing productivity. They include the number of transactions performed, physical units sold, value added and sales. Doutt (1984) suggests that an output is viewed as dependent upon factors representing labour (i.e man-hours worked per week); capital (insured or replacement value of facilities and equipment); and service output (capital investment reflected by the extent of customer capacity). On the other hand, Hawkins, Best and Lillis (1987) define the marketing output for an individual firm as:

Marketing output = (Relative market share) X (Relative price)

4.5.3 The Measurement of Input

The measurement of input, if not all, is facing the same problems associated with outputs. The measures of input appears to be just as confusing (Good 1984). Suggested measures include hours of labour employed, number of employees, wages, salaries and benefits paid for labour productivity and current assets, square feet of selling space, land in production and level of research and development and advertising for capital productivity (Bucklin 1978). According to Bucklin (1978), the number of man hours is the best input measure.

Lusch and Ingene (1979) argued and summarized that the most robust measure of output is value added and the most robust measure of input are physical, rather that monetary. Value added was defined as the surplus available to pay for labour, furniture and fixtures, and equipment. Value added was calculated as the establishment's net operating income before taxes and extra-ordinary income plus wages, salaries, and benefits paid plus interest charges plus leased equipment charges plus the firm's allowance for depreciation (Good 1984). On the other hand, Hawkins, Best and Lillis (1987) suggest marketing costs such as absolute dollar amount or relative to sales are the appropriate concept for marketing input.

According to Good (1984), it is evident that whether value added or sales is used as the measure of output, the results tend to be quite comparable. This view was supported by Marion et al (1979) and

they also suggested the relationship appears to be monotonic, although the actual numerical value determined for each measure are quite different. For that reason, Ortiz-Buonafina (1992) used value added as a sales per employee in his study.

Lastly, considerable debate has taken place regarding appropriate measures of input and output to be used in determining productivity. Measurement problems are presented in any study of productivity and both output and input variables can be represented in various alternative ways (Doutt 1984). However, productivity measurement can be carried out at any level within an organization (Walters 1994).

For summary, the researcher is, of course, limited in terms of available data and comparability of units of measure. Since there is a death of theoretical and empirical research in the area of retail sales performance, it was deemed necessary to use more empirically based approaches in the selection of initial items (Bush et al 1990). Given these conditions, under the total factor productivity model, output may be described as a multiplicative function of various inputs (Nadiri 1970 in Doutt 1984). In this case, input was viewed as independent factors representing labour such as number of workers and man-hours worked; capital such as insured or replacement value of facilities and equipment and lastly, service output such as capital investment reflected by the extent of customer capacity, such as the number of pumps and bays. For this study, a few measures will

considerably be used. For instance, labour producivity such as sales per employee and volume of litre sold per employee, and capital productivity such as sales per pump or island and volume of litre sold per pump or island will be use to measure the service station productivity. On the other hand the sale-based measure of productivity is somewhat flawed, it has been judged to be a good measure (Ingene 1984) and it is widely used in practice (Magi and Julander 1996). Although other measures might be preferable, these were viewed as reasonable approximations given research limitations such as time and appropriate data were not available. Lastly, according to McLaughlin and Sydney (1990: page 49), productivity analysis is meaningful only when the levels of both inputs and outputs are free to fluctuate in response to managerial decisions.

4.5.4 Productivity model

From the above literature, a widespread confusion exists in the definition, nature and especially the method of measurements of productivity. According to Ghobadian and Husband (1990), paradoxically the confusion surrounding the concept of productivity is probably due to the fact that the subject attracts the interest of people with varied backgrounds and tremendously different perspectives. Nevertheless, in recent years a number of models which were capable of measuring the productivity have been developed and can also be classed as quantitative and qualitative. Mohanty and

Rastogi (1986) conducted an in-depth survey of productivity measurement models. They identified eight different techniques and all these models attempted to relate a measure of output to a measure of input. Ghobadian and Husband (1990) also add another one by using the engineering concept of efficiency. The primary differences between these models were the definition and method of measurement of output to a measure of input. The summary and comparison of various models according to some important criteria is presented in Table 4.1 which was situated for convenience due to its size at the end of this chapter.

However all the techniques used in the models mentioned in Table 4.1 were based on the technological concept of efficiency. Most of these models have been adopted by service sector of industry without consideration of distinct differences between service and manufacturing. Retailing delivers both products and services in which each transaction is dependent upon the various aspects such as customer satisfaction, after sale service, pleasant atmosphere, packaging and etc. Therefore, it is very difficult to develop measures or standards of productivity that are applicable in a variety of retailing settings. In the next sub-chapter, we will focus on measurement of productivity in the retailing sector.

4.6 Productivity measures in Retailing

The productivity record in service activities lags below that of other industries (Mc Cammon and Hammer 1974 and Doutt 1984). Mc Cammon and Hammer (1974) also present a dilemma, they left unanswered questions of why productivity in retailing lags behind other sectors of the economy. For example, looking at US experience between 1968-1978, the average growth rate in labour productivity for all United States industries was 1.41 per cent, whereas the growth of retail labour productivity during that time period was 0.76 percent annually (US Department of Commerce 1981 in Lusch & Soo 1984). They, however, suggest that lagging retail productivity may lead to a self-feeding cycle. This effect leads to low relative wages in retail jobs which, in turn, attract only the marginal worker and for this worker it may become more difficult to increase labour productivity, one of the most important elements in measuring the total productivity.

Although the definition of productivity is straightforward, the problem in retailing is how it should be measured (Magi and Julander 1996). In manufacturing it is easy to measure the tolerances or functionality of the finished products, but in retailing much of the end product quality is in the eye of the customer (McLaughlin and Sydney 1990). Throughout history, retail merchants have sought ways to improve productivity and thus increase profitability. In retailing there is a direct relationship between

productivity and profitability (Lusch and Soo 1984; Magi and Julander 1996). This is because in the short run, the price of resource inputs (capital and labour) and outputs (merchandise and services) are relatively fixed. Consequently, the higher the quality of output the retail firm can achieve per unit of input, the more profitable the firm will be (Lusch and Soo 1984).

According to Lusch and Soon (1984), in the 1980's, the need to increase productivity in retailing appears to be even more urgent. This pressing need is in large part due to the serious negative impact that the ravages of inflation in the 1970s and early 1980s had on real profit. However, is it enough simply to measure productivity in order to improve it? Definitely, we would say that the answer is no. Measuring productivity is the first step and needs necessary steps to improve it. Lusch and Soon suggested that improving productivity must be accompanied by two additional steps: (1) identifying the correlates of productivity and (2) developing and implementing a strategy to improve it.

Relatively little research attention has been paid to productivity problems in service industries, especially at the firm establishment level (Doutt, 1984). Two detailed studies of productivity in major subsectors of retailing have been completed one by Fuchs (1968) and the other by Schwartzman (1971) as reported by Bucklin (1978). According to Bucklin, Schwartzman employed a margin-weighted model of output and both his output and input data were derived

from the US Censes of Business. On the other hand, Fuchs employed data from the revised US Department of Commerce series on trade output. Despite substantial differences in methodologies and time periods in the two studies, the estimation for productivity growth in the major types of retailing are remarkably similar. The main findings from the both researchers mentioned above, show gains in service station efficiency to be the best in retailing compared to others subsectors.

However, in productivity measures, the most current methods to measure productivity are based on index numbers that measure ratio of output to input (Bucklin, 1978). On the other hand, these measures are hindered by problems of defining output (See Achabal et al 1984; Goodman 1985). Achabal et al (1984) suggest using some recently developed theoretical and empirical techniques taken from economics. Ratchford and Stoops (1988) took the suggestion by using a household production model of demand and supply of sellers' services which was introduced by Ehrlich and Fisher (1982).

Ratchford and Stoops (1988) used the data provided by a medium-sized nine-unit retail chain which specializes in four major merchandise: books, office supplies, art supplies and fine stationery. They have found that the results indicated that poor labour productivity was not the source of the problem because there were a number of changes in the way labour was organized in the store (including increased self-service). This study suggests that the firm's

problems were mainly due to poor positioning relative to the market and possibly due to ineffective advertising. They also said that the method proved to be a valuable diagnostic tool. However, this study only focuses on input of productivity and the labour. They should extend to other inputs such as materials and capitals. On the other hand, the generation of dollars of sales volume becomes the basis of measure of productivity of a specific location (Kelly et al 1993). They argued that as sales volume increases, the impact on profits, return on net worth, sales per square foot and other measures of productivity can be computed as they each relate to sales volume. In the reseacher's opinion, not all productivity measures are related to sales volume, others type of measurement can also be computed from other sources which will be discussed in the following sub-topic.

4.7 Performance and productivity in chain stores

In non-retailing industries, a large number of studies have been conducted based on the factors that affect their performance, especially in the area of return on investment (Schoeffler, Buzzell and Heany 1974; Buzzell, Gale and Sultan 1975). However, in the business sector, especially in strategic and management, the Profit Impact of Market Strategies Project (PIMS) has stimulated a wide range of research (Buzzell and Gale 1987) but only a few such studies have been done in the retailing sector.

The studies of performance and productivity in chain stores of the previous researches can be summaried as shown in Table 4.2 situated for convenience due to its size at the end of this chapter.

After carefully analysing and taking the results of other studies into account, the researcher can observe the following: Firstly, most of the studies lack available data across different competitors or business units (stores). Secondly, most of the studies use a limited number of variables which the majority are operative rather than of strategic importance. Thirdly, most of the researchers discussed briefly the problems which they faced by using the appropriate model or measurement. All the problems mentioned above can be overcome by building up larger data bases and discussing further about the problem which arises by using the model to analysis and predict the performance. Further discussion on these issues will be presented in the next chapter.

As summary, from the discussion in this chapter, performance and productivity as a term or as a concept is preceived differently by different people. In a firm, people play different roles, say that of entrepreneurs, managers, workers, customers, suppliers, politician, etc. Although these people commonly recognise that performance and productivity have a major influence especially on socio-economic, they have varying perceptions about the process of performance and productivity management and measurement. The concepts of performance and productivity have been classified in a

variety of ways (e.g McGoldrick 1990, Campbell 1991, Walters 1994). The first school of thought contends that performance should be distingushed from productivity. The second school of thought, by contrast, suggests that productivity is a useful indicator or subset of performance.

In this study, the researcher agreed with the first school of thought, performance is to be distingushed from productivity. There are a few reasons. First, by definition, performance can be definied in a broad concept in financial or non-financial terms, objective and subjective. But in productivity, there has been a tendency to 'borrow' concepts and measures of productivity from manufacturing industry only, although these may be less appropriate as measurement. Secondly, in productivity, measurement models vary with the type of sector. For example, separate models have been proposed for the manufacturing, service and agricultural sectors. Thirdly, performance measures can be broadly be classed as quantitative and qualitative. In productivity, it can be measures in quantitative but a limitation of most qualitative measures. Among the popular qualitative method in productivity is the Appraisal Method (Mohanty and Rastogi 1992). Such a measure can sometimes be useful within a plant, but cannot be used for comparisons with other plants because of its nonstandard structural forms. From the above reasons, in this study, the researcher tries to use both measurements, performance and productivity in one study.

Next, we present the previous findings on productivity and performance in petroleum retailing sector.

4.8 Productivity and Performance in Petroleum Retailing

This study explores the productivity and performance in service stations in Malaysia. There are three main reasons why petroleum retailing is worthy of study, especially to Malaysia. Firstly, the cost of petroleum in Malaysia is the primary variable expense associated with operating automobiles. The automobiles are the main mode of transportation in Malaysia. If the price or demand of petroleum is not stable, it will affect the other industries and finally, the socio-economic aspects such as purchasing power and standard of living in Malaysia. Secondly, petroleum is the largest exporting mineral commodities and it is a concrete expression of balance of trade and payment for 20 years from now. Thirdly, many governments and countries in the world use petroleum as their weapon in international conflicts and this will become a threat to the Malaysian economic and political stability.

Before we go further, we need to define what is petroleum retailing. Definition of **petroleum retailing** used in this study refers to the 'petrol' or 'gas' or 'service' or 'filling' stations which can be defined as "a retail establishment at which vehicles are serviced especially with

gasoline, oil, air and water and where services can be obtained, as repair, maintenance, or replacement of electrical or mechanical devices" (Morris 1980). However, because of the evolution called as 'dialetic evolution' (see sub-topic 4.9 in this chapter for further detail), this definition can be expended, where most of the stations now sell automotive and non-automotive products, refreshments (minimart and vending machines), car washing facilities plus more credit plans such as credit and debit cards and non-profit facilities such as toilet and prayer room for moslems (specifically in Malaysian context). Burchell-Davies (1991) defines this as "convenience-store" petrol station that sell a variety of non-petroleum products, such as food, newspapaer, soft drink and basic groceries beside petroleum products.

After the review of the literature on petroleum retailing sector, the researcher feels that the studies of petroleum retailing can be divided into several focusing groups as follow:

1. **Petroleum retail marketing mix** (Livingston & Levitt 1959; Claycamp 1966; Churchill, Ford & Ozanne 1970; Ford, Ozanne & Churchill 1971, Robinson & Hebden 1973, Slade 1983 and 1986, Goodchild and Noronta, 1987 and Burchell-Davies 1991).

2. **The shift to self-service** (Anderson 1965; Globerman 1978; Michell 1980 and US Department of Energy 1981).

3. **The Operation of gasoline stations** (Claus and Hardwick 1972, Friedman & Carey 1975; US Department of Energy 1981; Marcus & McLean 1982, Greco 1988 and Chamber and Jones 1993).

4. **The Structure and regulation of Gasoline Retailing** (Ingene & Brown 1987; Slade 1983 and Ong, Elliott & Armstrong 1991)

5. **Performance and/or Productivity** (Albaum 1967, US Department of Labour 1975 and Hand et al 1987)

From the groups mentioned above, only three studies are focused on performance and productivity in the service stations sector. One early exploratory field study in performance by Albaum (1967) focused upon the relationship between the sales success of businesses in marketing activities and certain interaction characteristics of their personnel. He observed a sample of 14 retail service stations located in one metropolitan area and found that there is a strong relationship between measuring success in terms of sales performance and key behavioral-attitudinal traits of dealers and attendents. The most important criteria is dealer attitude and adequacy of services and accessories. His work also found that "average time to reach car" had no carry-over effect on sales success because customers in better stations had to wait longer than the ones in the poorer stations. Although, Albaum acknowledged the dealer attitude and adequacy of

services and accessories, no statements have been made about the statistical significance because the sample is not a randomly selected sample and the problems by using the model is not high-lighted.

In 1975, the US Bureau of Labour Statistics initiated work on the measurement of productivity in service stations (Bucklin 1978). The output was based on 80 per cent of sales of gasoline and 10 per cent each for both automotive repairs and sales of other petroleum products. The labour inputs was based only on employment. The result shows that the employment shrank rapidly and the total hours worked also declined. This may reflect the reduction in the sales of gasoline during that period and probably hours open as well. It also may reflect the appearance of important technological change. Although, the methodology is sophisticated and these surveys provided a significant improvement in accuracy of labour projections, the bureau agreed that the data may overstate the level of actual work, creating a slight upward bias to the resulting index over time as vacation, holidays and sick leave increase. The method of this study was based on index number that measure ratios of output to inputs. This approach is useful but these measures are hindered by problems of defining the output (Ratchford and Stoops 1988) and confounding economies of scale with productivity change (Achabal et al 1984; Goodman 1985).

Hand et al (1987) carried an ex-post-facto field study where seventy-five personal interviews were conducted with service station dealers,

distributors, oil company executives and accountants specializing in their service station business. A total of twenty-four independent variables were identified and grouped in the six variables classes which were personal characteristics, planning characteristics, financial characteristics, customer relations or service, control and location. They observed a sample of 112 full-service gasoline dealers and found that full-service, high-total volume stations, time spent with customer are important variables related with performance. In addition, their work also found that experience is not necessarily the best teacher but diligence in work (long hours) may be more important. However, like Albaum (1967), no statements have been made about the statistical significance but they suggest that future research should be directed to rigorous hypothesis testing in substantially larger sample sizes.

On the other hand, after careful analysis from the literature reviews, paying particular attention to the type of performance measures, the researcher provides a summary of petroleum retailing researchs focusing primarily on academic studies (Table 4.3 which was situated for convenience due to its size at the end of this chapter). From the table, most of the studies used the empirical approach of non-judgmental performance measures, although most of the studies were not indirectly had objective to do so.

However most of the studies mentioned below have been limited to the supply-side and price competition in oligopolistic market in the

US and other developed countries. Academic literature on the performance of the service station is very limited. Most of the academic literature originated in the USA and the emphasis is entirely on the US petrol markets or biassed on developed countries petrol markets. A very limited approach on the studies try to focus on other petroleum products or non-petroleum products which were sold at the service station.

In the petroleum retailing industry, petrol (the main product in the industry) is a low margin product (Brown 1988) and price is no longer the key factor in petrol retailing (Fox 1986). On the other hand, the mark-up of other retail goods is 18 per cent (Brown 1988). Brown (1988) also had calculated that for every 1000 gallons of petrol sold, there was US$150 of non-fuel sales. According to Hand et al (1987) typical full-service station generates 75 per cent of its revenue from gasoline sales and 25 per cent from TBA (tires, batteries and accessories). Because of the disparity in margins between the two types of sales, however, approximately 56 per cent of the gross profit for a station is generated by gasoline revenue and 44 per cent of the gross profit is generated by TBA (Bank of America 1971 in Hand et al. 1987).

However Burchell-Davies (1991) found that many of the non-fuel items will be expanding rapidly but their individual contribution to total profitability is very small. MMC's (1990) own study of the five major oil companies which resulted from managed retail outlets in

1988 showed a gross profit contribution of 62 per cent to forecourt activities whilst the shop was 38 per cent. According to MMC (1990), shop contribution had been climbing steadily since 1986 by about 2 per cent per annum. Report by Euromonitor (1996), however shows that petrol still remains the largest selling product for service stations. In 1994, sales of petrol accounted for 87 per cent of service station turnover. Burchell-Davies (1991) comments on this development, saying that petrol retailers have to be more innovative in their marketing strategies and they must not rely on accepted practises or just quickly develop "convenience-store" just because everybody else is.

The evolution of the petroleum retailing industry mentioned above can be depicted in the Figure 4.6. At the early stage, petroleum retailing was dominated by the small "mom and pop" outlets which served limited markets. This is called thesis in evolution. This begot an antithesis, the full service station which offered lower fuel prices, sold automotive accessories and provided credit to customers. However, these two institutions adopting and evolving into the type of petroleum retailer that dominated during the 1960's under national brand names such as Texaco and Standard in the US and BP and Burmah in the UK (Maronick and Walker 1978 and Euromonitor 1996).

Their strategies were avoided price competition, offered repair and maintenance, sold other non-fuel products and added more credit plans for customers.

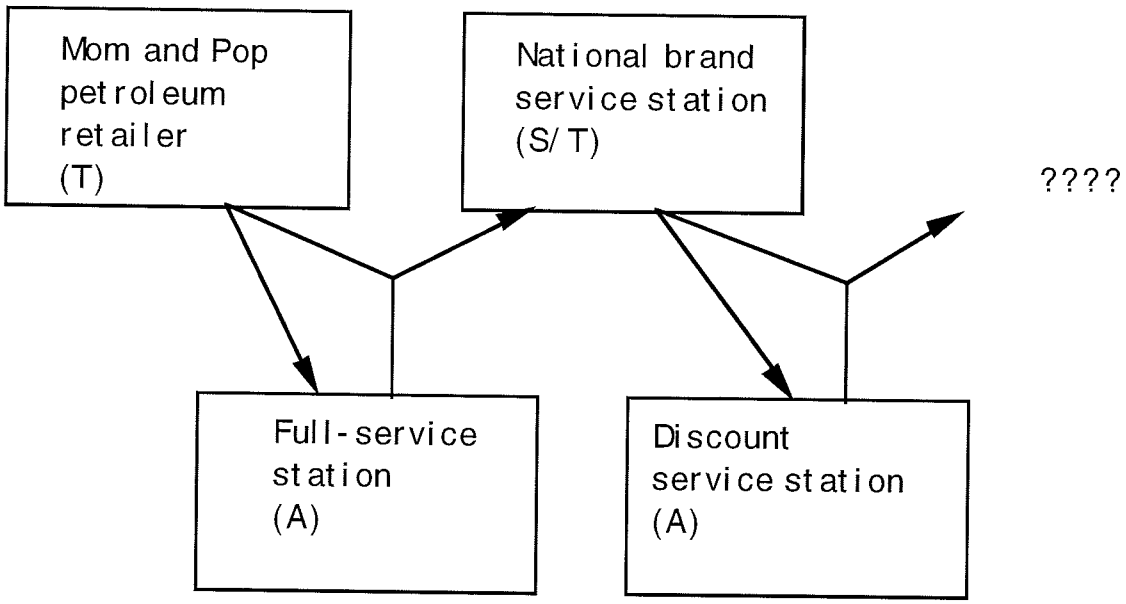
In the early 1970's, the full service stations were replaced by the discount stations. This antithesis firms share two important things although they operate the same like regular manned stations. First, they forego the fancy frills and repair services and second, they concentrate mainly on pumping as much cheaply as they can (Business Week, 13th May 1972 in Maronick and Walker 1978).

Perhaps the next antithesis will be service stations operated with using coin or card-operated pumps with minimal services and facilities and use low prices as a main strategy. In developed countries, a few such outlets already are in operation. However in Malaysia, the thesis and antithesis was not so clearly identified because some stations can be catogoried in both categories, retain their thesis or antithesis identity, and survive and succeed. Due to lack of labour, starting in January 1997 most of the stations especially in big cities (in Klang valley) were converted to self-service.

From the above discussion, there is clearly a need for research on the petroleum retailing sector focusing not only on the petroleum products but also on other non-petroleum products in explaining performance and productivity and how the factors or variables should be operationalized.

Figure 4.6

Dialectic Evolution of Service Stations



Dialectic Evolution of Service Stations
Source: Maronick and Walker (1978) page 250
Note: (T) = thesis, (A) = antithesis

4.9 The Dialectic Evolution of Performance and Productivity

Before the researcher ends this chapter, it is better to highlighted the possible the dialectic hypothesis of performance and productivity research change. In the researcher's opinion, the examination is necessarily because of it historical and conceptual aspects as discussed in the previous sections. Evolution occurs over relatively long periods of time (Maronick and Walker 1978). From discussion in

this chapter, the researcher can observes, where possible, the trend of studies done in performance and productivity to support the researcher's observation. Although the accurate and precise measurement of performance and productivity research changes are difficult or impossible due to a lack of continuous observation.

Theories of retail institutional change have been classified in a variety of ways by researchers and scholars. According to Brown (1987: page 182), three approaches can be discerned. The first, environmental theory, contends that changes in retailing are a function of developments in the sosioeconomic milieu. Cyclical theory, the second suggests that change takes place in a rhythmic fashion and is characterized by the recurrence of earlier trends. The third school of thought, by contrast, focuses attention upon interinstitutional conflict which occurs when new forms of retailing emerge, develop and disrupt tradional trade practices. The dialectical theory mentioned in this chapter was categorised in the conclict theory by Brown (1987).

In the researcher observations, by looking at the trend, the development of the studies and researches in performance and productivity were followed the hypothesis based on Hegel's dialectic process or in other words, the dialectic hypothesis of retail institutional change. The evolution of productivity and performance researches has occurred over relatively long periods of time. During the late 1960s and early 1970s, there has been increased interest in

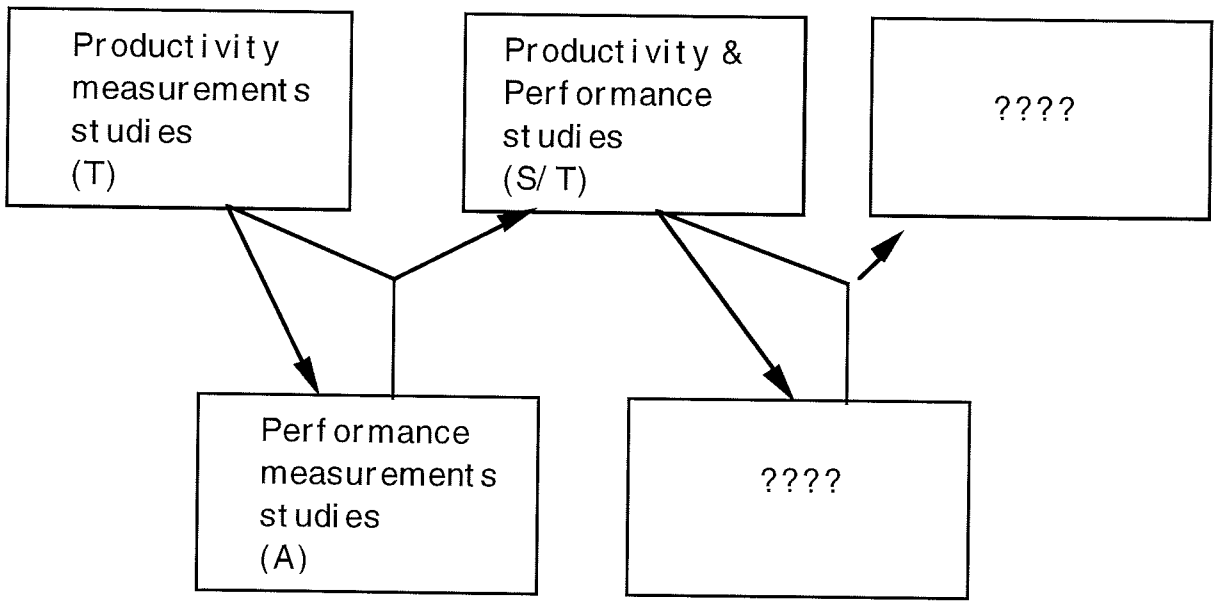
productivity at all sectors and industry levels. However the studies of productivity in business has appeared to lag behind that of manufacturing. The studies of productivity at this time concentrate on a managerial perspective (e.g Bucklin 1977, 1978). However, measurement problems arise whenever the concept wanted to apply to business and retailing. As mentioned previously, an entire issue of Journal of Retailing (Fall 1984) was devoted to the topic of productivity in retailing, providing an ample evidence of its importance and receiving particular attention.

As mentioned previously, in early 1960's and 1970's, many researchers are concern about productivity in various industries. In the dialectic process, all the ideas about productivity and its measurements produced by the scholars in that time called the 'thesis'. However, when the theory about productivity wanted to apply to other industries such as service sectors especially businesses and retailing, it is much more debated and received more attention. In this case, the dialectic model implies that scholars mutually adapt in the face of competition from "opposites". Thus the challenged by other scholars with a differential advantage, an established researchers will adopt strategies, tactics and new ideas in the direction of that advantage. The innovator among them, tends to upgrade or modify the theory or produce new idea over time. As a results, they produced another term called performance. This happened in the 1980's and continues to the present day. In the

dialectic model, a negation from the 'thesis' (in this case - productivity) called the 'antithesis' (in this case - performance).

Figure 4.7

The Dialectic Evolution in Performance and Productivity Measurements



Dialectic Evolution of Performance and Productivity studies
Source: Adopted from Maronick and Walker (1978) page 250
Note: (T) = thesis, (A) = antithesis
(S/T) = synthesis

The other scholars, meanwhile, do not remain complacent. In this study, the researcher tried to combine both thesis and antithesis into a new idea. In doing this, the researcher moves toward the "negated"

institution. As a results of these mutual adaptations, the both measurements was applied in one study. By doing these things, they become indistinguishable and finally termed the 'synthesis'. Based on the findings, the researcher suggested that both measurement should be considered when any study needs to be done on any industries especially in business and retailing in the future. The dialectic process for both measurements are shown in Figure 4.7 and comparison between performance and productivity are shown in Appendix 1.

4.10 Summary and Discussions

From the literature reviews, the researcher found that there is not a single measure or the best measurement of performance and productivity. Each variables has strengths and weaknessess. Measurement problems are present in any study of performance and productivity and the measurement can be presented in various alternative ways. There are also variety of performance and productivity measures that have been utilized. There is also a widespread confusion which exists due to the fact that this subject attracts the interest of many researchers with varied backgrounds and different perspectives. On the other hand, there is no comprehensive theory available to explain the high performance of smaller firms (Schneider and Lenzelbauer 1993).

From the discussion in this chapter, no uniformly accepted measure of performance exists. Many previous research studies of firm performance can be catogeried into two major measurement of performance. Many studies have employed objective measurement especially accounting and/or finance measures although information that is acquired is not directly comparable because of the different accounting systems and reluctance to share information by the owners. Survival verses discontinuance has often been used but some firms survive are marginal while others outstanding. Growth measures, considering sales or employee and size growth also have often been used. However, recent studies on performance used performance as a qualitative dependent variable or subjective measurement. These also depend, upon how the index was weighted or the expectations of the entrepreneur/owner-/founder or the manager.

In productivity also, measures can broadly be classed as quantitative or qualitative. Basically, definition of productivity falls into three categories such as technological, engineering and economic concepts. Therefore, it is very difficult to develop measures or standards of productivity that are applicable in retailing. As a result, these research study was designed to identify and measure the impact of variables likely to influence productivity of the retailing. The researcher also tried to use both measurements in this study to compare where the best measurement can be used in this industry. According to Sapienza, Smith and Gannon (1988), they found no

significant correlations between subjective measures to objective measures. This study has a limitation in terms of available data and comparability of units of measure. Because of that, the researcher suggests to use empirically based approaches in the selection of the initial items. The measurements which have been discussed in this chapter will be considered to be used in this study. This study also tries to focus on non-petroleum products besides the petroleum products in searching the best variables which can give impact on performance and productivity in petroleum retailing industry in Malaysia.

This study also found that the development of researches in performance and productivity follows the dialectical theory of institutional change as suggested by Gist (1968). Gist's dialectical model maintains that an existing 'thesis' is challenged by its 'antithesis' and a 'synthesis' eventually emerges from the melding of the two. The researcher suggests that a 'synthesis' is a study which combine both performance and productivity in one study. This 'synthesis' becomes the thesis for a new round of negation and assimilation, and the dialectical process will continue. In researcher's intention, this study will use both performance and productivity in petroleum retailing industry in Malaysia.

Form the reviews, there are two school of thought about relationship between performance and productivity. The first, suggests that productivity is a subset to performance. The second, contends that

productivity and performance are two different things and should be distingushed from each other. In this study, the researcher supported the latter because (1) not all variables use to measure performance, can also be use to measure productivity; (2) in many studies, performance have been classified into quantitative and qualitative measures but productivity only can be measured by quantitative especially by ratio but very hard to found in qualitative as mentioned in this chapter.

The next chapter will review more details on the factors or variables affecting the performance in retail stores, which an emphasis on the petroleum retail sector

Table 4.1

A Summary and Comparison of Productivity Models

Researcher(s) and date	Type of measurement	Special features
Gold (1971)	Partial Productivity Measure	@ developed a series of ratio between physical and financial ratio
Craig and Harris (1973)	Total Productivity Measure	@ first model in total productivity @ total output equal to total sales plus change in total inventory
Hines (1976)	Total Productivity Measure	@ suggested no single measure can be used in an organization
Mundel (1976)	Total Productivity Measure	@ discussed the change in technology but no answer proposed
Taylor and Davis (1977)	Total Factor Measure	@ introduced a value added concept@ new capital concept based on ROI
Roll and Sachich (1981)	Partial Productivity Measure	@ tried to accommodate change in technology by using labour

Sumanth and Hassan (1982)	Total Productivity Measure	@ linked productivity to superior and inferior products
Riggs (1983)	Total Productivity Measure	@ introduced concept of team productivity
Ghobadian and Husband (1990)	Labour Productivity Measure	@ used production function and econometric techniques

Table 4.2

Performance and Productivity in Chain Stores

Researcher(s) and date	Retail industry or respondents	Main Findings (Independent Variables)
Baumol and Ide (1962)	-	Inventory level and variety of merchandise had a positive effect on sales and profits
Olsen and Lord (1979)	Bank Retailing	Median household income and total retail square footage were found to be significantly related to checking account deposits
Ingene (1982)	Grocery stores	Mobility, wage rate, income and size of household were found to be significantly related with productivity
Hise et al (1983)	Clothing Stores	Number of employees, inventory levels, fixed asset, experienced manager found to influence performance

Cronin and Skinner (1984)	Supermarket chains	Retailer's leverage and liquidity position, marketing strategies have a significant effect on profit performance
Anderson (1985)	Shopping center anchor	The number of anchors and location was positively associated with profits and sales.
Hildebrandt (1988)	Household panel	Price image is a significant impact to explain the variability in budget spending
Ortiz-Buonafina (1992)	Superstores	Increase in per capita income, population growth, average wage rate had a positive influence
Adam et al (1993)	Multi outlet business	The number of retail outlets and seasonality are positively correlated with sales

Table 4.3

A summary of Petroleum Retailing Research methodologys

Researchers and date	Research Approach	Type of research	If Empirical: Type of of performance Measure	If Empirical: Type of sample	Number of sample
Albaum (1967)	Descriptive	Empirical	Non-judgmental & Judgmental	Dealers, &Employees, Customers	14
Churchill (1970)	Descriptive	Empirical	Non-judgmental	Prices	434
Claus and Hardwick (1972)	Descriptive	Empirical	Non-judgmental	Service Stations	-
Robinson (1973)	Descriptive	Empirical	Non-judgmental	Prices and trading st.	30
US Dept of Energy(1981)	Descriptive	Empirical	Non-judgmental & judgmental	Oil dCompanies	-
Marcus & McLean (1982)	Descriptive	Empirical	Judgmental	-	-
Slade (1986)	Descriptive	Empirical	Non-judgmental	Dealers	-

Hand et al (1987)	Descriptive	Empirical	Non-judgmental	Dealers	112
Ingene & Brown (1987)	Descriptive	Empirical	Non-judgmental	Dealers	126
Greco (1988)	Descriptive	Empirical	Non-judgmental	Franchisee/ or managers	32
Ong el at (1991)	Descriptive	Empirical	Non-judgmental	Oil companies Dealers	208
Chambers & Jones (1993)	Descriptive	Conceptual	Judgmental	Oil company	1

CHAPTER 5

LITERATURE REVIEW II:

FACTORS AFFECTING PERFORMANCE AND PRODUCTIVITY

5.1 Introduction

This chapter develops from the previous chapter (chapter 4) and is mainly based on relevant published literature identified in the first instance by a systematic review of the journals, periodicals, theses and other sources.

It seems clear from the previous studies referred to in chapter four that there are factors affecting the business outlet performance and productivity that depend on some operational characteristics. This section reviews studies of the relationship between the characteristics and the performance/productivity. It begins with the factors affecting performance and productivity which concentrate on four major characteristics - managers, stores, location and competition. At the end of this chapter, the writer has described and discussed the conceptual framework of the study so that the following chapter can build on this chapter for the primary research.

5.2 Factors Affecting Performance and productivity

A review of the literature shows that there is presently little research carried out on the factors influencing performance and productivity

in the petroleum retailing sector in Malaysia. However, some insight into the problem can be gained from the studies already conducted in USA, UK and other developed countries as mentioned earlier. It is also important to note that much of the work of previous studies is probably based on the experience of theories or concepts that might not be applicable to less industrialised countries such as Malaysia. Therefore, it is desirable to investigate the factors influencing performance and productivity in the Malaysian context. This study can be considered as a pioneer study in Malaysia. It will have to rely on variables that are highly and consistently accepted in many previous research studies.

There are many factors which can influence the business outlet performance and productivity. Many academicians, writers and researchers have written about the factors which influence performance and productivity. These have been reviewed extensively from the available literature on the subject and presented below.

In reviewing the literature on factors influencing performance and productivity, it should be born in mind that this kind of research has been studied with a variety of different kinds of methodology. For instance, some studies take place in industrialised countries such as USA (Albaum 1967 and US Department of Labour 1975), UK (Davies 1973), and Canada (Good 1986). The studies also take place in various retailing sectors such as banks (Olsen and Lord 1979 and Reidenbach and Moak 1986), fabric stores (Walters 1988),

fashion/fashion accessory stores (Bush et al, 1990) and retail supermarket chains (Cronin Jr and Skinner 1984; Ortiz-Buonafina 1992 and Adam et al, 1993). With regard to research method, some studies used regression models (Albaum 1967; Cottrell 1973; Hise et al, 1983; Adam et al, 1993 and Lussier 1995) whereas researchers like Hildebrandt (1988) assess performance by interviewing the customers as a panel.

After finding results, many writers and researchers suggested that the variables which influence the performance can be classified into several groups or categories. For instance, Cottrell (1973) suggested that the profit performance was affected by four types of constraints: various social, demographic and economic parameters in the external environment; the presence of the other retail units of like nature; the configuration of the individual unit, including hours open and its price level; and the level of managerial effort.

Martin (1967) who did a study of savings and loans in a new submarket, suggested that the variables influencing performance can be catogerised into four groups such as population, economic and demographic, competitive and penetration and site characteristics. The study on banking retail done by Clawson (1974) suggested three general blocks of variables - population, competition and branch should serve as indicators and/or determinants of branch savings performance.

There are four major classes of predictive variables that determine the success of a retail establishment. These are the psychophysical variables, the social psychological variables, the transportation variables, and the economic factors (Claus and Hardwick, 1972). On the other hand, Hise et al (1983) said that the independent variables can be classified into controllable/uncontrollable, short-run/long-run and reversible/irreversible.

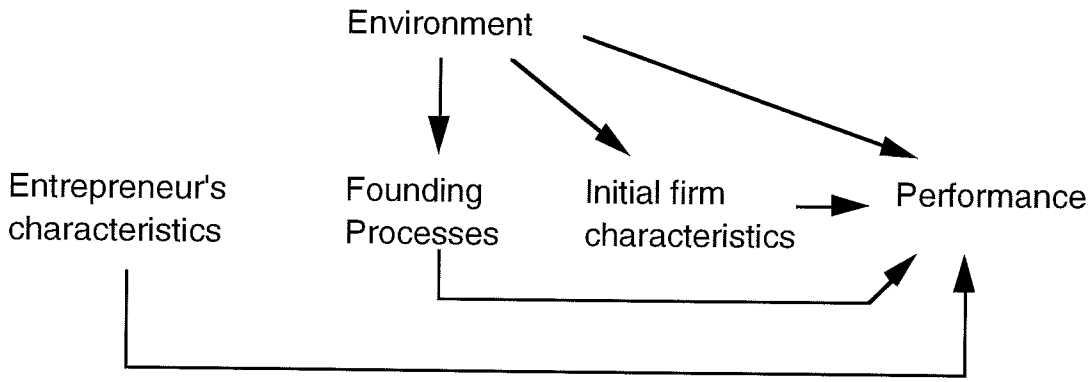
According to Cooper (1993), theoretical frameworks for analyzing influences upon firm performance are not well developed. In 1981, he suggests that influences upon the entrepreneurial decision can be encapsulated in three groupings, antecedent influences, the type of incubator organization and general environmental issues. However in 1993, he reviewed his suggestions, and concluded that the approach to analyze firm performance can be studied at start-up by four sets of variables: entrepreneurs' characteristics, founding processes, environ-mental conditions, and initial firm attributes - all of which appear to influence performance (Figure 5.1).

Ackoff (1970 in Kotha and Nair 1995) and Hansen and Wernerfelt (1989) have formulated a model of system performance:

Performance of system = f [Controlled variables or Strategy variables and Noncontrollable variables or Environmental variables].

Figure 5.1

Theoretical Frameworks For Analysis



Source: Cooper (1993) page 243

Although controlled variables employed by firms can be captured along many dimensions (e.g Porter 1980), the researcher utilizes Mohan-Neill, Hills and Narayana (1990 in Mohan-Neill 1995) classification scheme because it shown to be appropriate in the Malaysian context. The noncontrollable variables also can be captured in many dimensions (e.g Hise et al 1984), however the researcher utilized Walters and White (1987) scheme because they have been tested intensively in the U.S.A and U.K and have proven to be the most important variables studied in retail sector (e.g Jones and Simmons 1990).

In conclusion, taking into account these suggested categories as variables influencing performance and theoretical frameworks suggested by Cooper (1993) and model of system performance

(Ackoff 1970 and Hansen and Wernerfelt 1989) as above, for the purpose of this study, the variables influencing performance and productivity can be classified as follows:

(a) Internal environment which can be divided into two characteristics:
    (1) Manager/owner characteristics
    (2) Individual store characteristics, and

(b) External environment which can be divided also into two characteristics:
    (1) Location characteristics
    (2) Competition characteristics

These characteristics were chosen because of the environment in which retail organizations operate is changing continually and often dramatically. To be successful retailers, the business must 'fit' its environment and no business operates in a vacuum. All retail organizations are subject to environmental pressures and the successful retailers of the future will be those who are alert to emerging opportunities and threats caused by the environmental changes. Since actual performance reflects different external and internal environments, and from that point, according to Cottrell (1973) the environmental effect is commingled. In addition, the environmental pressures have been forcing companies to look for

ever more effective ways to reduce costs, maintain margins and increase competitive advantage (Bennison, Clarke and Pal 1995).

Keats and Bracker (1988) also suggest that the environment cannot be ignored in an attempt to explain performance. Successful organizations are those that best adapt to fit the opportunities provided and constraints imposed by their enviroments (Kalleberg and Leicht 1991). Further more, many empirical studies investigate the performance or productivity or strategic management relationships by excluding the role played by the environment (Ortiz-Buonafina 1992, Kotha and Nair 1995). In addition, empirical studies examining the relative impact of environment on performance and productivity in Malaysia are rare or virtually non existent. So that, in this study the researcher addresses some of these concerns by examining the relative effects of the environment.

Chandler and Hanks (1994) believe that the relationship between owners and firm performance requires research and theory development at three levels of analysis: individual, organizational and environmental. On the other hand, businessmen must fill two predominant roles regarding environment. First, they scan their environments, select promising opportunities, and formulate strategies for taking advantage of these opportunities. Second, they must interact with the environment to acquire and utilize resources (Chandler and Hanks 1993). A number of factors have been found to

improve productivity in retailing, and one of them is environmental conditions (Ortiz-Buonafina 1992).

On the other hand, the researcher tries to follow suggestions made by Hise et al (1983) to find out the effect of less controllable, more long run and less reversible factors such as location and competition on the performances of retail business outlets. Breheny (1988) also suggests that the relative performance of stores in a retail chain will depend on the internal characteristics of each outlet. Cooper (1981) concludes that the antecedent characteristics (such as genetic factors, family influences, educational choices, and previous career experiences) are the "most extensively measured". In addition, the performance of a business founder/owner is measured by the performance of the organisation (Schein 1978) which is influenced by the environment (Tsai, MacMillan and Low; 1991).

For summary, in this study, the researcher will use the characteristics which were mentioned above because they have some significant history in the literature, capture many elements of performance phenomena, are appropriate for analysis at the firm level, are largely influenced by control and uncontrollable variables and are available in data collection in Malaysian context.

The following sub-section identifies a number of variables discussed widely in most of the previous research on the categories of performance and productivity specially in the retailing sector.

5.2.1 Characteristics of Managers and Owners

The performance of the firm may reflect the higher productivity, problem-solving skills, and favourable access to networks associated with the general background of managers or owners (Cooper et al 1994). Research on managers/owners differs in terms of entrepreneurial characteristics and performance which has received and continues to receive a considerable amount of attention (for example, see contributions by Cooper et al (1989) and (1994); Stuart and Abetti (1990); and Fischer et al (1993)). There is also a broad and growing literature that examines characteristics of entrepreneurs and, in some cases, relates these to the performance of their firms. However, the empirical findings and recommendations that have been reported are diverse and often contradictory. In other words, findings are by no means consistent across all studies. The uncertain findings have been discussed and presented below.

Birley and Norburn (1987) in their review, comment that (page 352): *Cooper (1981) provides a useful framework for studying the "influences upon entrepreneurial decision". He suggests that they can be encapsulated in three groupings, antecedent influences (genetic factors, family influences, educational choices, and previous career experiences); the type of incubator organization; and general environmental factors such as current economic conditions, and availability of capital. He concludes that the antecedent characteristics are the "most extensively measured".*

Parallel to the statement made by Birley and Norburn (1987) above, a number of researchers have reviewed the background of managers and owners. Certain background and demographic variables may also have an effect on the behaviour of managers/owners and thus influence the performance of the firm. Items such as the existence of role models, age, some form of displacement, and significant education and training have been identified as factors. The managers/owners experience has also been found to be an important factor. However, in many cases, managers/owners who had more education, more management experience, more relevant industry experience, and more initial financing tended to do better (Vesper, 1980 in Cooper, 1989).

Furthermore, firms (which are setup by owners) are closely related to the organizations from which the managers/owners had come or worked previously did better, presumably because the managers/owners could draw upon technical and market knowledge gained during the previous jobs (Roberts 1972; Cooper and Bruno 1977 in Birley and Norburn 1987 and Lussier 1995). Cooper and Dunklebery (1981) report that 67% of their respondents had two jobs or less. Ronstadt (1984) found that 80% of his sample had previous work experience. These findings suggest at least some relationship between managers/owners characteristics and long-term success.

Birley and Norburn (1987) suggests that successful entrepreneurs are older than the median United States population and have more

formal education. Ibrahim and Goodwin (1986) conclude that the successful manager is, on average, forty year old. In a survey of 890 founders of small businesses, Cooper and Dunkleberg (1987) found that 66% of the sample had more than a high school education. Bates (1995) found that greater owner age, a broad proxy for work experience, is expected to benefit firms. However, Stuart and Abetti (1990) and Lussier (1995) showed that the age of the managers/owners had no relationship with performance.

The studies in background or lifetime characteristics of the individual managers/owners or entrepreneur in previous researches can be summarized as below (Table 5.1).

Education is one of the most widely studied, and conclusions regarding education have changed over time. The studies of Hise et al (1983), Birley and Norburn (1987) and Cooper et al (1994) suggest that the managers/owners who are more educated have an impact on the success of firms. However, Stuart and Abetti (1990) and Lussier (1995) found that the education level of the managers/owners was negatively related to performance. Ibrahim and Goodwin (1986), made a conclusion that the successful managers/owners have a college education. Cooper and Dunkelbery (1987) also reported a US sample of entrepreneurs with significantly higher level of education than the general population. In a survey of 2845 member of National Federation of Independent Business (NFIB) in US, Cooper et al (1989) found that 52% of the sample had

Table 5.1

Individual Characteristics of the Managers/owners

Date	Researcher	Family	Education	Age	Sex	Experience
1983	Hise et al	@	@	@		@
1986	Ibrahim & Goodwin		@	@		
1987	Birley & Norburn	@	@	@		@
1989	Cooper et al		@	@	@	@
1990	Stuart & Abetti		@	@		@
1993	Fischer et al		@		@	@
1993	Box et al		@	@		@
1994	Chandler & & Hanks			@		@
1995	Lussier	@	@	@		@

attended three or more business classes. Indeed, Teach, Tarpley and Schwarz (1985) report that 47% of their sample had advanced degrees. In a longitudinal study of 1178 small firms, Dunkleberg et al (1987) found that 64% of the founders had more than 12 years of formal education. Further more, higher levels of education increase

the success of individuals in terms of earnings (Robinson and Sexton 1994).

The results of studies which touched upon previous career experiences are entirely concerned with tenure. Birley and Norburn (1987) report that a general trend is for managers/owners and small businessmen to start their firms after a protracted period of employment in other organizations. Box et al (1993) and Fisher (1992) found that years of experience were correlated with firm performance. Stuart and Abetti (1990), Robinson and Sexton (1994) and Lussier (1995) have obtained similar results that showed performance was strongly positively associated with managers/ owners experience and the previous management level. However, Cooper et al (1994) found that experience did not have significant effects.

In terms of social/family background factors, marital status is found to be significant with performance (Hise et al 1984). The number of children is also found to be correlated positively with performance. Birley and Norburn (1987) found that the number of children is found to be significant for owners and managers of "high flyer" companies. The presence of children has a significantly positive influence on earnings of men (Robinson and Sexton 1994). As for the comparisons of females and males with respect to performance and productivity, Fischer et al (1993) found that men's businesses constantly outperformed women's. However, Kalleberg and Leicth

(1991) concluded that there are no differences in earnings growth between businesses headed by men and women. Rosa and Hamilton (1994) also found that there is no significant difference at all with regard to sex on business services. Robinson and Sexton (1994) also found that men are three times higher in terms of increased earning potential.

In addition to the background of the managers/owners, numerous researchers have investigated the psychological characteristics of the managers/owners. Begley and Boyd (1987) used five psychological attributes such as the need for achievement, locus of control, risk-taking propensity, tolerance of ambiguity and Type A behaviour. Friedman and Rosenman (1974) defined the Type A Behaviour Pattern (TABP) as - an action-emotion complex that can be observed in any person who is aggressively involved in achronic, incessant struggle to achieve more and more in less and less time, and if required to do so, againts the opposing efforts of other things or other persons. They found that the relationships between psychological attributes and financial performance are few but suggestive such as internal locus of control relates to a low liquidity ratio. According to Begley and Boyd (1987) the TABP is an exaggerated stylistic response to environmental challenge. Major pattern elements include impatience and irritabiity, time urgency, driving ambition, accelerated activity and generalized competitiveness. Stuart and Abetti (1990) have been conducting a personality measure by using a variety of psychological test

instruments from the Jackson Personality Inventory (JPI) and Jackson Personality Research Form-E (PRF-E). However, they found that personality was not a factor in firm performance. On the other hand, in a study done by Box et al (1993), they found that locus of control and need of achievement were proposed as potential predictors of firm performance.

In behaviour studies, Stuart and Abetti (1990) found that the "opportunist/craftman" dimension was very weakly correlated with performance. They also found that lack of personality profile doesn't affect performance. Hofer and Sandberg (1987) report that there are four behavioural factors which seem to be the keys to a successful entrepreneur: 1) their ability to recognize the needs of a changing environment; (2) their motivation to act on these perceptions; (3) their ability to take effective individual action based on these perceptions; and (4) their ability to motivate others to behave in a similar manner. Study done by Ibrahim and Goodwin (1986) has provided empirical evidence that behaviour such as intuition, extrovert, risk taking, creativity, flexibility, a sence of independence and a high value of time is perceived as the key to success factors in small business. In another study, the "craftsmen" had lower growth rates and the "administration" or "opportunistic" managed their firms in more formal and also more adaptive ways and their firms showed greater growth (Filley and Aldag 1978; Smith 1967 in Cooper et al 1989).

In addition to the background research, the psychological characteristics and behavioural variables, another interesting approach is productivity. In a study to determine relationship between marketing and financial sector, net sales per employee is a measure of the productivity of the retailer's labour force. This output criteria is found to be a significant indicator of profit performance (Ingene 1982 in Cronin and Skinner 1984). However, the research conducted by Bucklin (1978) suggests that the number of man-hours is the best input measure and Ingene (1984) suggests another measure, gross margin per man-hour as the best general measure of productivity from the management's perspective. In another perspective, education variables for both labour and management were found to be insignificant in regression analysis (Good 1984). Regression was also used by Fisher et al (1993) to examine predictors of productivity indicators suggest that women's lesser sales per employee of their firms. Schneider and Lenzelbauer (1993) used the traditional measures of labour productivity, net output per employee, found that small firms have a significantly lower productivity than large ones.

While these studies (mentioned above), give clues as to the characteristics of the owner/manager or entrepreneur, most are descriptive rather than analytical. Where comparative studies have been conducted, they have tended to be parochial (only comparing those within the sample who have been successful with those who have been unsuccessful). For that reason, in this study, the researcher

Table 5.2

Characteristics of the Individual Store

Researcher(s) and Date	Inventory Level	Store size	Number of Counters	Age of Store	Number of employees
Martin(1967)		@			
Davies(1973)		@			
Robinson & Hebden (1973)			@		@
Cottrell (1973)		@	@		
Clawson (1974)		@		@	
Olden & Lord (1979)		@			@
Hise et al (1983)	@	@		@	@
Cronin & Skinner (1984)		@			@
Ibrahim & Goodwin (1986)		@		@	
Cooper et al (1989)		@			@
Simkin (1990)		@			@
Adam et al (1993)		@		@	

attempted to make a comparison between the entrepreneur/owner with the manager because the researcher believes that there may have been differences.

On the other hand, previous research on demographic characteristics of entrepreneurs has not provided conclusive evidence of differences between owners and non-owners (Brockhaus 1980; Sexton and Bowman 1983 in Chandler and Hawk 1994). For the above reasons, this study suggests that a manager/owner variable serves as moderator of the relationship between environmental variables and performance and productivity as illustrated in Figure 5.2.

After understanding the characteristics of managers and owners, next we look at the second characteristic, stores characteristics.

5.2.2 Characteristics of Stores

Beside managers/owners characteristics, the store character-istics are also important variables relating to performance of the store/chain unit. The physical attributes of the store must match the requirements of the retail company and of its consumers/customers (Simkin 1990). However, as with the managers/owners characteristics, the empirical findings and recommendations in these characteristics also have been reported as diverse and often contradictory. The details of the findings are presented below.

One of the most distinguishing characteristics of the firm is size (see contributions by Cottrell 1973; Olsen and Ford 1979; Ibrahim and Goodwin 1986; Cooper et al, 1989; Simkin 1990; Adam et al, 1993; Lussier 1995 and Coates et al 1995). For example, Cooper et al (1989), did a study about relationships between the managers/owners and the initial size of the firms by measuring the number of full-time and part-time employees. They found that small ventures showed larger percentage increases growth in sales, higher percentage increases in employment and a greater increase in the absolute number of employees. They also found that larger firms tended to have more education, more management experience and goals that were more managerial in nature. Furthermore, the size of the retail floor space, measured by retail square footage, gross selling area and gross floor area had a positive correlated with performance (Martin 1967; Cottrell 1973; Davies 1973; and Olsen and Lord 1979 and Coates et al 1995).

In earlier study by Baumol and Ide (1962), the inventory level and the variety of merchandise has a positive effect on sales and profits. A similar result was obtained by Hise et al (1983) who found that store variables such as inventory levels, number of employees and fixed assets have positive impact on sales. In retail fashion stores studied by Coates et al (1995), they found that the floor size significantly explains the variation in turnover. In the relationship between age and survival and success, Carroll (1983) concluded that the death rate of business organizations declines with the increasing

age and this is supported by Kalleberg and Leicht (1991), their results showed older companies were less likely to go out of business. However, the stepwise regression procedure did not identify age of store to be significant (Adam 1993).

Interior and exterior design of stores also had significant effect on firm performance. Results in a study done by Anderson (1985) indicated that the old design had higher profits and sales per square foot than the new design stores. These is supported by Clawson (1974), who found that exterior attractiveness has positive impact on performance.

In automobile-oriented retailing study, Claus and Hardwick (1972) also found that layout features such as 1) grade of arteries and streets, 2) sign placement, 3) curve-site visibility, 4) layout and 5) placement in relation to traffic flow directly affect the performance of a site in terms of gallonage. In 1973, Cottrell found that the number of checkout counters had a significant relationship to sales. In the same year, Robinson and Hebden found that the number of lanes in a petrol station had a significant impact but not the number of pumps or attendents. In the same study, Robinson and Hebden (1973) also found that the number of hours a store is open is revealed as an important determinant of sales. In another service stations study, the number of employees per pump at a station and annual wage rate per employee have significant impacts on performance (Ingene and Brown 1987). In a study about new product

development programs, top performing banks have more formalized and better structured programs than average or below-average performers (Reidenbach and Mock 1986).

The studies in store characteristics can be summaried in Table 5.2. In summary, it is clear that the relative performance of stores in a retail chain will depend on the internal characteristics of each store.

In productivity studies of the retailing industry, space productivity (net sales per square foot of selling space) has been identified as an important determinant of profitable performance for retailers (Rosenbloom 1981 in Cronin and Skinner 1984). In 1984, Cronin and Skinner used space productivity as dependent variables and found that it had a positive effect on leverage, meaning that increases in this marketing outcome lead to increases in the total debt to net worth (leverage) ratio. This however, according to them, gives a condition that negatively impacts profitability. Cronin and Skinner warned that retailers using this measure as a criteria for guiding the selection and evaluation of marketing strategies should do so with caution.

However, Doutt (1984) found that size of store as measured by its selling floor space appears to be the most important variables in explaining differences in productivity across all stores. Good (1984) found that the relationship between size and labour productivity is nonlinear. This finding was supported by Lusch and Soo (1984), who

found that labour productivity increases as store size increases but only up to a point, after which it declines. In grocery stores study, Ingene (1982) found that size of the stores were negatively significant with labour productivity. Doutt (1984) also used capital (insured or replacement value of facilities and equipment) and service output (number of customers) as independent variables and the findings showed that capital investment had important effects upon productivity, while service output was not found to be significant.

On the other hand, Walters (1994) suggests using productivity-led differentiation in the company's resources (i.e the property, labour, inventory and managerial expertise). According to Walters (1994), performance measures from these productivity will be demonstrated by a superior return on sales, gross margins, operating margins and cash generation.

The opening time of a store has some influence on productivity. Thurik (1984) found very interesting findings; weekly opening time has a negative influence on scale adjusted labour intensity for supermarket and small retailers but positive influence for hypermarkets. Higher inventory investment per square foot would not be associated with higher labour productivity (Lusch and Soo 1984). They argue that having more merchandise for the customer to select from does not result in more productive employees but neither does it harm labour productivity. Lusch and Soo (1984) also suggested that different forms of legal ownership have different

impacts on labour productivity. However, Doutt (1984) found that ownership type was not a significant influence on productivity. In hospital productivity, Woodman et al (1996) found that hospitals using fewer items of equipment (less technology) but using high pre-prepared vegetables (high costs) were found to be slightly more productive.

After the discussion on the internal environmental, we swith our attention to the external environmental factors.

5.2.3 Characteristics of Location

Location characteristics focuses on the subset of three concerns - people, place and physical distribution (Jones and Simmons 1990). However, Jones and Simmons also suggested the location of consumers, their numbers and relative affluence are the starting points in an equation that determines the number and variety of retail outlets. Hise et al (1983) also suggests that more long-run and less reversible factors such as location will be important to find out in future research. On the other hand, Jones and Simmons (1990) found that service stations were relatively insensitive to location. No two retail locations are quite alike in terms of the surrounding road conditions, so the most detailed study of these is warranted (McGoldrick 1990).

Discussion of a location decision begins with the notion of the market, where:

Retail sales = f(market)

and a market is a set of consumers which are grouped in four aspects of describing or segmenting a market that is useful for retail location studies (Jones and Simmons, 1990):

(1) market size
(2) the level of income
(3) demographics
(4) lifestyle

The studies which measure location characteristics of the individual store can be seen below. Whilst they are limited in nature, they do indicate the factors which other researchers have considered as important measures of the firm performance.

From Table 5.3, it will be seen that the data regarding demographics and market size are very important and tend to support the view of the three secrets of success in retailing which are location, location and location (Brown 1993). The earlier studies of Martin (1967) and Claus and Hardwick (1972), support that demographic and market size are the important factors associated with performance. Martin (1967) found that population, mean household size, percentage of

population, elderly, social rank, percentage of white collar workers, household income have positive impact on performance. In research into retail banks, Olsen and Lord (1979) obtained similar results stated that the number of employment level in the study area is positively correlated with performance. Davies (1973), Clawson (1974) and Morphet (1991) found that population size are highly significant with performance. However, Cottrell (1973), Jones and Moch (1984) and Chow (1995) found that population is a poor explanatory variable for forecasting trading level. The research conducted by Leblang (1993) led to the conclusion that age, sex, lifestyles, income and occupation, demographics appears to be an accurate predictor of total sales.

Neighbourhood types are more important. Research indicates that nonfoods mark up a smaller percentage than average percentage of sales in "black" neighbourhood and a greater percentage than average percentage of sales in "small town" areas, since the shopper here is not exposed to as many outlets as his urban counterpart (Cottrell 1973). Nonfoods do not sell as well in "shopping center locations" because of the availability of this merchandise from other units in the center (Cottrell 1973).

Table 5.3

Location Characteristics of the Individual Store

Researcher(s) and Date	Demographic	Number of housing units	Number of employment/ income	Type of Population/ neighbourhood
Martin (1967)	@	@	@	@
Claus & Hardwich (1972)	@	@	@	
Davies (1973)	@			@
Clawson (1973)	@	@		
Cottrell (1973)	@		@	@
Olsen & Lord (1979)			@	
Simkin (1990)	@	@	@	
Adam et al (1993)	@	@	@	

Older, income per capita, total urban retail expenditure, level of expenditure and some other indicator of customer demand (for example, distance to nearest car park, distance to bus/train station) also become much more significant with performance (Clawson 1974 and Davies 1973). On the other hand, percentage of households with higher income, percentage of housing units are negatively correlated with sales (Adam et al, 1993). In a service station research by Claus and Hardwick (1972), they found that household density and the type of housing are the key factors in the service station model.

The location of a business is also associated with performance. Hise et al (1983) found that firms/stores located in larger malls and large market areas are positively related with performance. Birley and Westhead (1990) found that firms located in the prosperous and buoyant markets were positively associated with high rates of small business growth and performance. Birley and Westhead (1990) also found that firms which diverse customer bases and which have added significant number of new customers are positively associated with performance.

Claus and Hardwick (1972) also found that relevent key factors vary from store to store and for service station, factors such as the type of traffic artery, traffic volume, traffic purpose, traffic origin (local. tourist, etc.) are particularly sensitive to site considerations. This findings are parallel to the service station study done by Jones and Simmons (1990). They reported that the weight factors such as

traffic flow and access to the site are more highly important than the trade area characteristics. However, Robinson and Hedsen (1973) found that the traffic flow is not significant with performance. Coates et al (1995) also found that location, measured in an alphabetic type of data, was not significant with performance. In a study done in China, Chow (1995) concluded that mobility which was measured by the availability of transport has a positive and significant effect on the sales performance.

A review in developing model for location, Simkin (1990) found that net selling space area entries, store frontage and prominence, refurbishment level, rent and rates, delivery predicting arrangement were the important factors in predicting the performance potential of retail stores. Some key factors in selecting the best location were viewed by Cooper (1994). In conclusion, he suggested a 10-point list of factors. This 10-point list includes critical factors and questions to answer during the site selection process. The factors are shown as:

(i) Community characteristics
(ii) Labour force
(iii) Transportation
(iv) Operational cost
(v) Environmental factors
(vi) Government factors
(vii) Telecommunications
(viii) Quality of life

(ix) Relocation services

(x) Incentives

There are two factors which are critical in determining the optimum location of any automobile-oriented establishment 1) trade area and 2) trapping points. Both factors, according to Claus and Hardwick (1972), are dependent upon automobile traffic patterns. For any trade which are computations, Claus and Hardwick (1972) suggest the following ten variables:

(i) Population density:

e.g - Number of households, number of persons

(ii) Income:

e.g - Households, average per capita

(iii) Automobile registrations

e.g - Area number, average number of autos per household

(iv) Type of Area

e.g - residential, commercial, etc.

(v) Type of Housing (Zones and uses)

(vi) Growth characteristics of area (potential)

(vii) Number of competitors in area

(viii) Sales volume of competitors in area

(ix) Credit representation in area

e.g - number of bank cards, travel card, gasoline credit cards, charge accounts, etc

(x) Area representation of company

On the other hand, Claus and Hardwick (1972) suggested that the primary for trapping point evaluation are:

(i) Traffic volume

(ii) Type of artery

e.g - main street, freeway, etc.

(iii) Speed of traffic

(iv) Type of potential customer

e.g - Shoppers, commuters, tourists, etc.

(v) Intersection characteristics

e.g - traffic control devices, lane widths, number of lanes, on-street parking, etc.

Studies in productivity also, found some relationship between location and productivity. For instance, in a hotel survey, the average lengths of stay are much longer in the resort hotels than in the town hotels (Doutt 1984). Doutt explains that a longer average length of stay involves less labour per value of sales, because considerable labour is required by departure and arrivals of residents. Lusch and Soo (1984) found that there is a relationship between store location (measured by Likert skill) and labour productivity. In another study, the average household income and household size are associated with a rise in labour productivity but not in the growth of population (Ingene 1982). Ingene (1982) also found that mobility (the availability of private transportation) is an important determinant of labour productivity in grocery stores.

In the following sub-section, the researcher will present the characteristics of the competition in respect of each of the variables studied.

5.2.4 Characteristics of Competition

If competition could be easily defined then it would be a simpler task to measure existing competition within an area (Mc Goldrick 1990). In the same view, Kelly et at (1993) said that the identification of competitors is not straight forward, much less an assessment of a particular competitor's impact on sales or profits. Berenyi (1982) defined competition as a state of rivalry existing among several business firms seeking to sell the same or similar goods, rewards or satisfaction. According to Simkin (1990), competition has two roles regarding performance:

(1) it attracts purchasers of a particular good to the shopping centre

(2) it competes for such business with the branch being located or assessed

Competitors were selected, because they appeared likely to be a useful source in practice (Brush and Vanderwerf 1992) and consistent with literature on competitive strategy (Porter 1980).

According to Brush and Vanderwerf (1992), it was speculated that competitors would be aware of and interested in the performance of new ventures in their industries. One of the most distinguished characteristics in competition is the number of competitors (see contribution by Martin 1967; Davies 1973; Olsen and Lord 1979; Hise et al, 1983; Anderson 1985 and Adam et al, 1993). For example, Hise et al (1983) found that the coefficient for 'primary competition' that is the number of similar stores in the same shopping center, was negative in explaining return on assets and contribution income, but not sales. In studies parallel to research reported by Hise et al (1983), the results showed that the number of main competitors was positively associated with profits (Claus and Hardwick 1972; Davies 1973 and Anderson 1985). A retailer with similar products, prices, promotions and policies located within a trade area geography is a more direct competitor than a retailer either located outside the trade or one with dissimilar products within the same trade area (Kelly et al, 1993).

In contrast, other research which was more oriented towards bank retailing, Clawson (1974) and Olsen and Lord (1979) found that the number of competing branches and branches located in the vicinity of competitors' main or executive offices are shown as suffering a relative disadvantage and had a negative impact on performance. In addition, Anderson (1985) reports that anchor competitors had a significant negative impact association with sales and profitability. Store per capita also has a positive effect on the sales per

store/worker (Chow 1995). This suggests that the retail sector is competitive and individual store seek areas which have lower stores per capita in order to generate greater performance. However the presence or absence of the major competitors has no significance with the turnover of retail chain selling fashion clothing in the UK (Coates et al, 1995).

Previous research suggests that some characteristics of competitors such as distance, price offered, stamp promotion are not significant direct impact on the firm performance (Claus and Hardwick 1972; Robinson and Hebden 1973 and Wendell and McKelvey 1981). However, competitors' sale volume, competitors' size characteristics and prominence and degree of competition over various period product groups have an important impact on performance of the firm (Claus and Hardwick 1972 and Simkin 1990). Growth in sales with market expansion is a measure of competitive strength and distance has been used to measure placement of competition location (Kelly et al 1993). From study done by Hise et al (1983), they suggest that future site selection considerations should be made in larger malls that have a minimized number of primary competitors.

Porter (1980) suggests that firms are aware of the activities of their competitors. Further research suggests comparing the performance of their companies to other companies by age and stage of development (see Sapienza et al, 1988 and Chandler and Hanks

1993). Performance relative to competitors appears to be a relevent concept, but its disclosure rate is lower (Chandler and Hanks 1993). In addition, Chandler and Hanks (1993) found that the performance relative to competitors and satisfaction with performance indices are more highly correlated with each other than they are with the more direct measures of performance.

The studies in competition or competitors characteristics can be summaried as below and considered important measures of the performance of the firm.

Studies in productivity shows that wage rates have a positive relationship with labour productivity (Ingene 1982; Van der Hoeven 1982; Doutt 1984; Lusch and Soo 1984 and Thurik 1984). Firstly, it is assumed that the wage rate per establishment is an indicator of the quality of labour used. Secondly, a high price of labour is assumed to stimulate efficient utilisation of available labour. In search for marketing productivity, Hawkins, Best and Lillis (1987) found that the number of competitors has significant impact on productivity. Ingene (1982) also found that competition from "mom and pop" grocery stores boosts labour productivity in regular grocery stores. However, the innovation (the electronic cash register) was not found to have a significant effect on productivity (Good 1984).

Table 5.4

Competition/Competitors Characteristics

Researcher(s) Date	Number of Competitors	Distance from Competitiors	Market Size for Competitors
Martin (1967)	@		
Robinson & Hebden (1972)	@	@	
Davies (1973)	@		@
Cottrell (1973)	@	@	@
Clawson (1974)	@		@
Olsen & Lord (1979)	@		@
Hise et al (1983)	@		
Cronin & Skinner (1984)			@
Anderson (1985)	@		
Adam et al (1993)	@		

5.3 Discussion

The review of the literature in this chapter provides a clear understanding on factors affecting the performance and productivity

of the firm. This kind of research has been studied with a variety of different kinds of methodology such as ones that take place in various industrialised countries, various sector of businesses and various data collecting methods. On the other hand, the literature is highly fragmented.

Many writers and researchers suggested that the variables which influence performance and productivity can be classified into several groups or categories. After taking into account various suggested groups or categeries, in this research basically, there are two main categories which can give an impact on performance and productivity - the internal and external environment. In this study, after careful analysis, the researcher has limited the scope of the environment factors into four characteristics - two in each environment factors. There are managers/owners characteristics, store characteristics, location characteristics and competition characteristics. The importance of these characteristics and why these characteristics have been choosen have been discussed in sub-section 5.2 in this chapter. Furthermore the influence of environmental uncertainty may limit our ability to predict individual firm performance. However, the researcher has reasons to believe that the strong influence of the environment may also present opportunities for the research. In this study, the researcher might examine more explicitly the factors influencing the ability of the firm to function in turbulent environments.

The managers/owners characteristics deal with things such as the background of the managers or owners. These variables include age, family background, education, sex, experience etc. The store characteristics are those factors which surrounds the store or physical atrributes of the store. In the retailing sector, it is easy to understand the importance of store variables such as the size of the store, design, number of facilities provided, number of counters, their productivity etc.

The location characteristics include such things as demographics, market size, lifestyle and income. The factors which influence a customer to stop at a particular site are extremely complex and are still not completely understood. The competition characteristics are those factors which stores have to compete with other stores to attract customers. These variables include the type of product, facilities and services available and the number of competitors nearby.

It cannot be over emphasized that no one set of variables can be used to rate a retail store. All of the variables interact and any change in one set of variables will affect the others in some way.

The present study was also written with a bias to Malaysia. Many of the generalizations made by the previous studies will lose some of their significance when applied to Malaysian context. However, this study may be considered as a pioneer study in Malaysia, it will have

to rely on variables that are highly and consistently accepted in many research studies from all over the world. Given the limitations described above, this study should be considered as an exploratory investigation.

Literature reviews also provide the basis for the development of a conceptual framework to understand the factors effecting the performance and productivity of chain store/firm. In an attempt to bridge all the literature, the researcher develops a conceptual framework to integrate existing literature on retailing environments. This will be discussed in the next sub-section.

5.4 Conclusions and The Conceptual Model

Therefore, on the basis of the above discussions and the concept of the aspects of this research and in order to facilitate clear thinking on the research problem involved in determining the factors affecting performance and productivity, the researcher has created one simple analytical model which enables one to see the problem in a clearer perspective. This model has been synthesed to form overall guidance for the empirical investigation. The researcher has chosen to call this schematic model the environments of retailing performance-/productivity model or ENREP Model (Figure 5.2).

Starting at the top, the framework considers profit, level of control/concern, performance and productivity measurement and

specific factors affecting performance and productivity. It is important to recognize that there are often multiple objectives including quantitative ones for performance and productivity measurement. The researcher will briefly describe each component of the framework and then discuss the hypotheses for the specific factors included in the model at the next chapter.

a. Profit

Although the researcher focuses on performance and productivity, it is important to recognize that generating profit is the ultimate objective of the firm. The sales and the impact of those sales on profitability are clearly important. It is also clear that the viability of the chain store is dependent upon its achieving (and maintaining) an acceptable level of profitability - seen as an acceptable level of management and, where applicable to the investors. There is a close relationship between productivity and profitability (performance). Empirical studies have shown a strong relationship between profitability and productivity (Lusch and Soo 1984). According to Lusch and Soo, findings also show that the study of labour productivity does not ignore an important performance dimension-profitability. In this model, the researcher feels that there is also a relatioship between productivity and performance.

b. Performance and productivity measurement

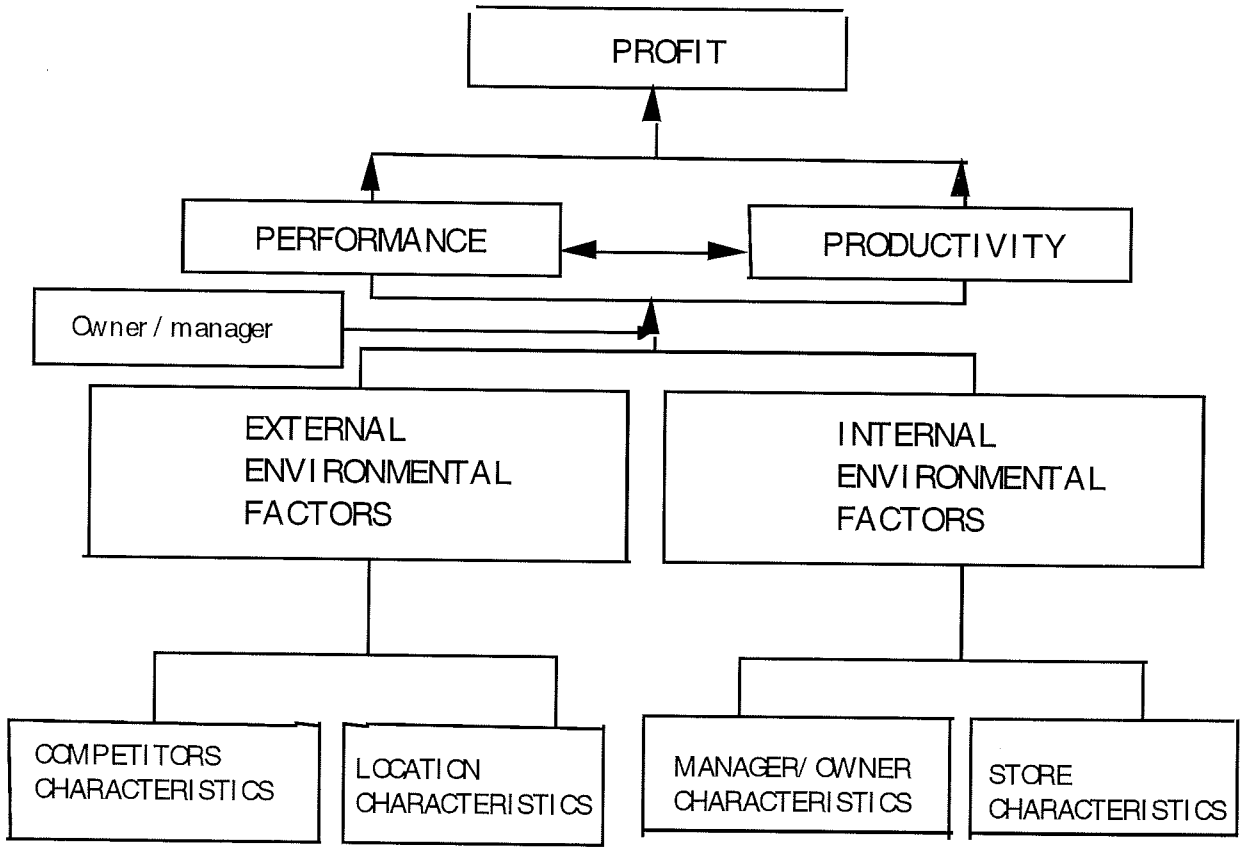
As mentioned in section 6.6.2, only three performance measurements were chosen from the literature reviews to measure the performance of the petrol stations. Although other measures might be preferable, these were viewed as reasonable approximations given research limitations. The researcher calls the three performance measurement as 3-S, for "Stay" (number of litres sold), "Survival" (total number of sales of non-fuel product) and "Success" (average annual increase in employment).

c. Level of control/concern

As indicated in figure 5.2, the factors affecting performance and productivity may be classified under two types of environmental factors - internal and external. Within each environment, there are two levels of concern. The internal environmental factors are concerned with some factors that manager/owner have power to control inside the firm and external environmental factors are concerned with some factors that manager/owner have little or no control.

Figure 5.2

Conceptual Model: ENREP Model



d. Factors affecting performance and productivity

Drawing upon typologies and studies discussed in the literature reviews in these chapter, the researcher propose the specific factors that impact performance of the petrol station. In addition, the researcher proposes to include the labour productivity measure into the model, to confirm and strengthen the appropriateness of the factors affecting performance which are used in the model. In this

model, the researcher considered only those factors in figure 5.2 under both the external and internal environment that are of direct concern to the manager/owner of the petrol station. These factors have greater relevance in terms of the day-to-day activity and decision making for the manager/owner.

e. Dummy variable

The effect of the environment on firm is widely acknowledged in the literature (e.g Zahra 1996, Box et al 1993). The environment also affects manager/owners' decision making and to counteract uncertainty. One primary purpose of this research is to explore how important manager/owner variable affect the relationship between environmental variables and performance/productivity. In this model, dummy variable (Manager = 0, Owner = 1) may moderate the relationship between the two groups of predictors - external and internal environment variables and firm performance and productivity.

From the discussion above, the model enables the researcher to see more clearly the problem situation and guide for developing research methodology which will be discussed in the next chapter.

From the literature reviews, there have been several articles and research studies that review the extant literature and considers the extent to which there seem to be clear variables of performance and

productivity for retail firms. There are some consistent findings, but there are also many differences across studies. Many research to date has tended to focus upon variables that are relatively easy to gather information about or to measure and many leave much unexplained variance. Some of the variables that we need to study may be relatively obscure, sometimes because the entrepreneurs/owners-/founders/managers wish to keep a low profile or because of the strategic information advantages of obscurity. Other variables may relate to unique events and thus be overlooked (MacMillan and Katz, 1992 in Cooper 1993). In summary, studies in performance are frequently vague on precise specification of their variables, and according to Hall (1994) is more difficult if any attempt is to validate their results. In this study, the researcher tried to construct and test three models of performance, the first from internal factors, the second from external factors, and the third an integration of the other two and lastly one model from the base model and also four same models of productivity, focusing on labour.

From the ENREP Model, the researcher has two major issues to consider in the testing of the proposed model. First is the construction of the relevant samples, in this case, samples from the petroleum retailing sector. Second is to select an appropriate analytical technique. The first issue, that of appropriate samples, according to Susbauer (1979), he suggests concentration on classes of firms that most easily identified, manipulated and evaluated. Taking a suggestion made by Susbauer (1979), the service stations

which have the same brand/company will be chosen for the sample. In addition, from chapter four, Fuchs (1968) and Schwartzman (1971) found that service station efficiency is the best in retailing compared to other subsectors. Second, there are a number of techniques which are reasonable candidates for the analysis of data associated with this model. Also from chapter four, the regression model provides a relatively basic building block for model construction and it will be used for the development of the model in this study.

In the next chapter, we shall switch our attention to more specific discussion of research methodology and the both issues mentioned in this chapter regarding the testing of the model will be discussed further. The chapter will discuss more about conducting the research to determine various factors and variables which can give impact on performance and productivity of service stations in Malaysia.

CHAPTER 6

RESEARCH METHODOLOGY

6.0 Introduction

Retailers have to determine what and how they are going to retail, where outlets are to be located in respect of the market and the competition and how the retail operations are going to be organised. These questions and decisions are magnified when placed in the context of expanding a retail business or when certain companies are successful at certain times and places.

.....Professor Leigh Sparks (1990: page 25)

and.....

The causes of enterprise failure or success are not universal. But the idea of objective appraisal, of survey, of research into fundamental causes is universally applicable. Even a crude and simple study may reveal hitherto unsuspected difficulties or opportunities.

..... Joseph E. Stepanek (1960: page 32)

It is in the definition and spirit of the observations cited above by Sparks and Stepanek, that the researcher undertakes this research endeavour.

The previous chapter has presented a frame of reference for analysing the factors which influence the performance of the chain store units especially in petroleum retailing. Basically, this study will determine the various factors or variables which have an impact on performance and productivity of service stations in Malaysia. The collection of data has been made in Malaysia for a period of three months (this duration was allowed by the researcher's sponsor). This study will focus on one organization only which is involved in the petroleum retailing and is also controlled by the government. This organization was chosen because it is the only player in the industry which was incorporated under a special law and has been passed by the Parliament of Malaysia. The other players were multinational companies which have been involved in this industry in Malaysia for more than a century and have already established themselves in the world market.

This chapter will explain how the population and sampling procedure is made and the conduct of the pilot study to test the research area, which was done in the Stirling area and nearby towns and in Malaysia before the actual field work started. Lastly, the conduct of the research in the actual survey is also presented. The questionnaire and variables used in the questionnaire will also be explained. The statistical methods used as well as the measurement for the analysis of the data are also explained. Furthermore, the objective of this chapter is to examine the development of the research design and strategy used in the study. This development is

based on several previous studies in similar fields. The research design is a means to guide the researcher in the collection and gathering of relevant data so as to solve the research problems and achieve the research objective in this study.

Firstly, the opening section of this chapter presents an overview of the concept of research and is followed by the discussion of research questions of this study.

6.1 Research Methodology Overview

6.1.1 Defining Research

Research has been defined by many authors in the research methodology field. For example, Ariff (1993) defines research as "a systematic and organised effort to investigate a specific problem that needs a solution". Research can also be defined as a systematic, and careful inquiry or examination to discover new information or relationships, and to expand or verify existing knowledge for some specific purpose (Dlakwa 1990). Webster's International Dictionary (1986) defines research as:

" A critical and exhaustive investigation or experimentation aimed at:

* discovery of new facts and their correct interpretation

* revision of accepted conclusions, theories, or laws in the light of newly discovered facts, or
* practical application of such new or revised conclusions, theories or laws."

Research can be classified by different aspects, such as the field of study, the purpose of the work, the approach taken, and the general nature of the research (Dlakwa 1990). Howard and Sharp (1983) classified research into what they call the common classification: (a) to review existing knowledge, (b) to describe some situation or problem, (c) to construct something new, and (d) to explain. Ary (1990) classified them into four categories - descriptive research, experimental research, historical research and philosophical research.

Along the same lines, Ahmad (1993) specify the types of research which he calls as the traditional classification as:

a. Basic/pure/theoretical/fundamental
   * discovery of new theory - not easy; needs ingenuity, imagination and perseverance
   * Development of existing theory - improvement by:
     @ relaxing some assumptions
     @ reinterpreting the theory
     @ extension

b Applied research

* apply known theories and models to practical problems
* tests empirical content of a theory
* tests basic assumptions

However most of the writers classified research into two major categories, quantitative and qualitative research (e.g Easterby-Smith et al, 1993 and Kent 1993) according to the kind of data collected, although the distinction between them is not always clear (Easterby-Smith et al, 1993). Van Maanen (1983: page 9) defines qualitative methods as 'an array of interpretive techniques which seek to describe, decode, translate and otherwise come to terms with the meaning, not the frequency, of certain more or less naturally occurring phenomena in the social world'. Strauss and Corbin (1990: page 17) define qualitative research as 'any kind of research that produces findings not arrived at by means of statistical procedures or other means of quantification.' The most fundamental of all qualitative methods is that of in-depth interviewing (Easterby-Smith et al, 1993) and the other are observation and diary methods.

According to Kent (1993), there are two types of qualitative research: group discussions and depth interviews. The key difference between them is that depth interviews are on a one-to-one basis between researcher and respondent and group involve several respondents together with the researcher in the same place at the same time.

On the other hand, quantitative research is geared primarily to the collection of quantitative data, which arise as numbers (Kent 1993). One important feature of this research is that the process of data collection becomes distinct from analysis (Easterby-Smith et al 1993). Most of them involve formal questionnaire technique such as face-to-face interviews, telephone interviews, postal research, or various forms of experimental or quasi-experimental research (Kent 1993). According to Cowan (1990), the quantitative methods have a dual role. The first role is to describe a relationship in a way that can make understanding easier (the modelling role). The second is to assess the strength and validity of any relationship defined (the testing role). Where as, Speed (1994) concludes that in a good research, good quantitative analysis has a relatively limited role.

In the researcher's view, the research such as the present study can be classified as applied research because the researcher wants to use the existing model in helping to solve a problem and in establishing whether a hypothesis is acceptable or not. The present study will also use the quantitative data because the methodology chosen by the researcher was structured question-naires with face-to-face interviews and most of the data will be applied in the existing model. Furthermore, the duration of the field work was short and it was impossible that in-depth interviews could be carried out (the reason will be discussed further in the next sub-topic in this chapter). As for the summary, this research will be categoried as a quantitative research.

6.1.2 Research Approach

Many different methods can be employed in exploring a problem situation and in helping to solve a problem. If the purpose of the research is to become more familiar with phenomena, to gain new insights, to formulate a more specific research problem; then we call it *exploration*. If we want to portray accurately the incidence, distribution and characteristics of a group or situation; then we say our research is *description*. If we want to investigate the relationship or association between character-istics, then our purpose is to *explain or predict;* study character-istics instead of variables (Ary 1990).

There is a great variation in research methods, including case-based inductive studies, cross-sectional survey research and longitudinal studies. For all studies the central problem has been the lack of well-developed theories of causal relationships (Vanderwerf 1989; Hisrich 1988 in Cooper 1993). This makes it difficult to interpret the spotty and sometimes inconsistent findings to date (as discussed in chapter five). The researcher also has no intention to discuss further details about every aspects and concepts behind each of the categories of the research which are mentioned above but likes to make some comparison about the advantages and disadvantages while using the type of research.

For summary, Table 6.1 which was situated for convenience at the end of this chapter shown the application and the advantages-/disadvantages of using the type of method.

Thus, after reviewing the concept of the research and the type of research, the researcher will be able to discuss and develop the research design so that it can relate what kind of research is suitable to use for answering the problem of the study.

6.2 Review of Research Method

So far there is only one study in Malaysia related to petroleum retailing industry, done by Chee (1981). However this study focused on an econometric analysis of demand for gasoline using price as the main variables. This study can be considered as a pioneer study in Malaysia on factors affecting the performance and productivity in service stations. However, this study will have to rely on methodologies that are highly and consistently accepted in many research studies in other countries. Previous research in the UK and the USA, in the area of performance and productivity in retailing, used mainly questionnaire administered by an interviewer and observer. A variety of test instruments specially prepared or borrowed from previous research or other disciplines of knowledge such as sociology and phychology were also being used.

Table 6.1 indicates that the most common method of data collection is questionnaires, although other methods such as secondary data are possible. However many researchers used one or a combination of questionnaire, interview and secondary data techniques. After a careful analysis from the literature reviews, paying particular attention to the type of performance and productivity measures in Chapter four and five, the researcher felt that personal interview with structured questionnaire and supported by secondary data will be utilised, following the suggestion made by Chandler and Hanks (1993).

This research was designed to explore specific predictors of firm performance and productivity for the purpose of beginning the development of a contigency theory describing firm performance and productivity. The researcher has chosen to use the survey research method in this study to gather the primary data. This method of data collection has the advantages of versatility (the ability of a technique to collect information on the many types of primary data of interest), speed and low cost.

This method will be using a data collection instrument, a self-administered evaluative questionnaire followed suggestion made by Chandler and Hanks (1993). The questionnaire will be used in a survey research by collected information on performance and productivity measurement, characteristics of the manager-/owner, location, store and competition of the service stations. This data

collection technique, in which questions are asked in a face-to-face interview with exactly the same wording and is exactly the same sequence for all respondent. Kinnear (1983) calls this data collection methods as 'structured-direct'. However, beside the questionnaire, the secondary data also will be collected. For this research, the secondary data (some already be mentioned in Chapter two and three) come from a variety of sources, such as government publications, oil companies reports, in-house oil companies publication, bulletins and periodicals with related to petroleum and retailing industry.

Futhermore, this research was an exploratory field study. According to Kerlinger (1973), exploratory field research has three basic purposes: (1) to discover significant variables in the field of situation, (2) to discover relationships among variables, and (3) to establish a basis for future rigorous hypothesis testing. This study attempts to fill each of the three criteria.

6.3 Research Hypotheses

From the conceptual model (Figure 5.2) in Chapter five, in summary the researcher suggest that performance and productivity of service station is related to four groups of potential variables: the owner/managers, the station, location and the competition-/competitors. According to Chandler and Hanks (1993), classifying

data into a limited number of catogeries also overcomes difficulties associated with extreme outliners.

6.3.1 Characteristics of the owner/managers

In characteristics of the owner/managers, two variables are selected to reflect the characteristics: training and experience. All of these serve as proxies for life experiences and excess to networks and other resources that bear upon the prospects for success of individual chain service stations.

Previous research on experience and training suggests that background of owner/managers should be related to firm performance. Despite some criticism of the approach to the study of owner/managers and entreprenership (Cooper 1993), a significant body of evidence suggests that aspects of the owner/managers characteristics may have direct bearing on the performance of the firms that they found (Shaver and Scott 1991; Cooper et al, 1994).

Experience is one of the most widely studied variables. Presumably experience is related to knowledge, skills, problem-solving ability, discipline, motivation and self-confidence. These may enable the manager-owners to cope with problems and thereby be more successful. The researcher would expect that the level of experience would be relevant, althought prior findings pertaining to this

variable are mixed. For instance, it has been reported that performance was strongly positively associated with managers-/owners experience (Stuart and Abetti 1990 and Box et al, 1993) however Cooper et al (1994) found not. A study for service stations found that number of years as a dealer and number of year of station experience before becoming dealer was significant with high performance service stations (Hand et al, 1987). In layman practice, the rule "the more you have, the more likely you are to be successful" are followed because the entrepreneur's "staying power" is increased (Hand et at, 1987). Despite the inconsistency of prior findings, the researcher hypothesize that experience would be positively related to performance.

H_1: A manager/owner years of experience before become a dealer is positively correlated with service stations performance and labour productivity.

In regard to the training, the researcher expect the manager/owners to have had fewer opportunities to develop relevant experience by training. Their breadth of training would better prepare them for the wide range of problems. Training may also provide the opportunity to cultivate skills for monitoring diverse functions and interacting with different constituents. Similar to experience, training may also serve as a proxy for greater motivation, confident and aptitude for solving problem. No studies have reported negative relationships

(Aziz 1977; Humam 1988 and Cooper et al, 1989). In this study, the researcher hypothesize that the number training attented is related positively to performance and productivity of service station.

H_{2a}: The number of training received by manager/owners before becoming the dealer is positively correlated with service stations performance and labour productivity.

H_{2b}: The number of training received by manager/owners after becoming the dealer is positively correlated with service stations performance and labour productivity.

In labour productivity, as the wage rate rises, labour productivity will rise (Ingene 1983). The annual wage rate provides a measure of employee quality, since higher-paid, full time employees are more capable and turnover is less frequently than do lower-paid part-timers (George 1966; Takeuchi 1977 in Ingene and Brown, 1987). In gasoline retailing study done by Ingene and Brown (1987), they found that output in productivity was high at stations which pay a higher annual wage. In this study, researcher hypothesize that the wage received by employees is related positively to performance and productivity of service station.

H3: Wage received by station's employees is positively correlated with service station performance and labour productivity.

6.3.2 Characteristics of the store

A number of studies have noted that the characteristics of the store are also important variables relating to performance and productivity. One of the most distinguished characteristics of the store is size (Cottrell 1973; Olsen and Ford 1979; Ibrahim and Goodwin 1986; Cooper et al 1989; Simkin, 1990 and Adam et al 1993). Size is clearly related to the financial and human resources that must be assembled and may have a bearing upon the subsequent ability of the firm to survice and grow (Cooper 1989). Two studies also suggest that firm size is clearly related to subsequent survival rate (Birch and Mac Cracken 1981 and Teity 1981). They suggest that survival odds, the prospects for expansion, and even the need for management experience are all related to size (Timmons 1985).

In productivity research, size plays an important part in productivity. Lusch and Soo (1984) empirically studied the relation between three traditional economic correlate of productivity. One of them is size and found that labour productivity increases as store size increases but only up to a point, after which it declines. However

Ingene (1982) found evidence of negative relationship between average size of grocery stores and labour productivity. In supermarket survey, the non-food sales share usually increases with increasing scale (Thurik 1984). From the studies, the relationship between productivity and size can be positive or negative.

For summary, it has been posited that size of the store is related to the eventual performance and productivity of the firm. The following hypotheses is proposed:

H4: Build-up area (size) in square feet of the service stations is positively correlated with service stations performance and labour productivity.

H5: There is a positive relationship between performance and labour productivity and inventory of non-fuel products in the service station.

H6: Number of employees is positively correlated with service stations performance and labour productivity.

A number of studies also have noted that the store which have several number of checkout counters has a significant relationship to performance (Claus and Hardwick 1972 and Cottrell 1973). The number of counters is some measure of peak load processing

capability and customers who shop during the busy period frequent that store, which promises the shortest processing time. For service stations, the number of lanes or bays has a significant impact (Robinson and Hebden 1973 and Claus and Hardwick 1972). Commuters, tourists and shoppers may prefer the shortest service to pumps the petrol into their vehicles and will not tolerate the long queue. In this study, the researcher hypothesize that the number of bays and islands are positively correlated with service stations performance and productivity.

H7: The number of bays is positively correlated with service stations performance and labour productivity.

H8: The number of islands is positively correlated with service stations performance and labour productivity.

6.3.3 Characteristics of the location.

Location is one of the most widely studied in retail sector. A number of studies have noted that location are more important variables and a critical issue in the ultimate success of a retail establishment (Davies 1973; Olsen and Ford 1979; Burns 1992 and Coates et al

1995). Although a good location is unlikely in itself to compensate for mediocre overall strategy, a poor location can be a deficit that is very difficult to overcome (McGoldrick 1990). A small physical difference between locations can exert a major influence upon the stores' accessibility and attractiveness to customers. In addition, service stations are relatively insensitive to location (Jones and Simmons 1990). Goodchild and Noronha (1987) found strong correlation between residential distributions and traffic patterns. Prior researchs has found and although not uniformed, support for the relationship between location and performance and productivity. The following hypotheses are proposed:

H9: The traffic density where the service stations situated will be positively correlated with service stations performance and labour productivity.

H10: There is a positive relationship between service station location and performance and labour productivity.

6.3.4 Characteristics of the competition/competitors

In regard to the competition/competitiors characteristics, the researcher might expect the number of competitiors and the distance from competitors are significant impact on firm performance. Prior findings pertaining to these two variables are again mixed although

they were more likely then not to corroborate the previous expectations. For instance, it has been reported that number of competing stores located in the vicinity competitors' main offices are shown at suffering a relative disadvantage (Clawson, 1974 and Olsen and Ford, 1979). Findings on distance from competitors have been mixed, with Claus and Hardwick (1972) and Robinson and Hebden (1973) reporting no direct impact on firm performance and Anderson (1985) finding that distance has a significant negative impact on firm performance. The researcher hypothesize that service stations which have more competitors nearby and distance between them are more closer have a negative impact on their performance and productivity. However for competitor's size variables in this study, the researcher hypothesize that the existence of such a relationship without indicating a direction.

H_{11a}: There is a negative correlation between number of competitors with same brand and service stations performance and labour productivity.

H_{11b}: There is a negative correlation between number of competitors with different brand and service stations performance and labour productivity.

H_{12}: There is a negative correlation between distance from the nearest competitors and service stations performance and labour productivity.

H13a: There is a relationship between size of same brand competitors and service station performance and labour productivity.

H13b: There is a relationship between size of different brand competitors and service station performance and labour productivity.

6.3.5 Summary of Measures and Hypotheses

Table 6.2 (situated for convenience at the end of this chapter) summarizes the measures and hypotheses empirically tested. Each of the independent variables listed in Table 6.2 was hypothesized to be signficantly related to the performance and labour productivity in the petroleum retailing industry. It will be helpful to note several things. Firstly, the measure of performance was catogeried into 3-S: stay (volume of litres sold), survival (total of sale of non-fuel product) and success (average growth in employment). This measurement was selected because so far, they have demonstrate empirically the "best" measurement in retail performance studies. On the other hand, this approach may overcome some of the

problems caused by the unwillingness to disclose information (Chandler and Hanks 1993). In order to minimize the above effect, both subjective (success) and objective measurements (stay and survival) were applied in this study.

Secondly, the measure of productivity was sales per employee. Sales per employee was selected as the measure of output for a pair of reasons: (1) It represents the physical units weighted by price and these weights implicitly reflect different levels of service; and (2) It demonstrates the best predictive validity in retail productivity studies and a first step in a thorough analysis of marketing productivity (Ingene 1982).

On the hand, total employees was selected in both performance and productivity measures because, (1) that figure was the only reasonable measure of labour input available in the data collection, (2) since channels of distribution are labour intensive, the most common indicator is labour. Given these justifications, the input measure of labour productivity is used here and is defined as full-time equivalent employees in retailing.

The following sub-chapter will explain the design of research used in this research.

6.4 Research Design

6.4.1 Sampling and Sampling Method

As mentioned in section 6.3, this study uses the survey research method. The researcher found that there were problems both of identifying and defining our sample universe since there was out-of-date source where the list of Petronas service stations could be obtained. However, Petronas also produced a map of location of all the Petronas service stations over Malaysia but the publishing date was in 1991. The population of Petronas service station in Malaysia based on the map was 345 units but the latest figure are 399 units (until November 1993). The location of service stations varied from those centrally placed in highly urbanized areas, to those in small towns and villages. The final figure for population of service stations was obtained from the Department of Domestic Trade, Ministry of Domestic Trade and Customer, Kuala Lumpur (where the licences for operation service station can be obtained). Only those established before January 1994 were examined. Any new service stations which established after or in January 1994 were excluded from the data set. This step was taken to ensure that only stations which are already operated more that one year are included, so that at least they are experiencing one fiscal year of operation and their performance can be measured.

However, the researcher decided to concentrate the study on a fair sized sample drawn from a map produced by Petronas. At the first place, the researcher suggested the survey area is triangular in shape with the city of Kuala Lumpur, Malacca and Johor Bahru at each apex. This area consist of five states which are divided into two zone of administration by the company. The reasons behind this are discussed below. On the other hand, the oil company given the permission only on one state as shown in Figure 6.1. There was a population of 45 service stations in the area. None of these participated in the pilot study. One dealer refused to suppy usable data especially data regarding his performance and four stations were excluded because they operated less than one year (established only after January 1994). The final sample in this survey was 40 service stations which three of them are still under the oil company's controlled and are managed by one manager, the staff of the oil company.

In selecting this sample, the researcher were aware that it can be criticized for attempting to make generalizations outside the geographic area because the sample is small. According to Hand et al (1987), prescriptions derived from the case studies can be to narrow; those derived from very large samples or databases can be too generic. Hatten, Schendel and Cooper (1977) addressed the problem by stating "an emphasis on homogeneity of the sample focuses on the selection of more 'like' data - a step which reduces the ability of the researcher to generalize from the results, but which increases the

confidence in the estimated parameters". The service station (from same brand) is the unit of study in this research and consider as homogeneity data. This approach supported by Hofer (1977, page 784), proposing a theory that deals with homogeneity at the business level, suggesting that the development of business-level strategic theory requires a smaller, less complex set of variables, the identification of the lowest common denominator, and recognition of the variables' impact on performance. In other word, Hofer's theory will improve productivity in firms both large and small by improving their strategic choices.

However, there are few significant facts why these geographical areas were chosen as follow:

(1) the areas were the most developed areas in Malaysia where it linked two capital cities of two countries, Kuala Lumpur at the north and Singapore city at the south. On the other hand, the opening of North-South highway will shorten the driving time between two cities by about three to three and half hours at the speed limit of 110 kmh. By the opening of the highway also, it will attracted the tourists especially Singaporeans to enter Malaysia by road. According to Malaysia Tourism Board about 28,000 Singaporeans entered Malaysia by road very month but this figure do not include day-trippers to Johor Bahru (Singapore: NST December 31, 1994). The state which the survey was conducted, is the centre of attraction for the

tourists and where the facilities of refining was situated. It was also situated in the centre between Kuala Lumpur and Singapore. The journey from Kuala Lumpur takes about one and a half hours and from Singapore about two hours.

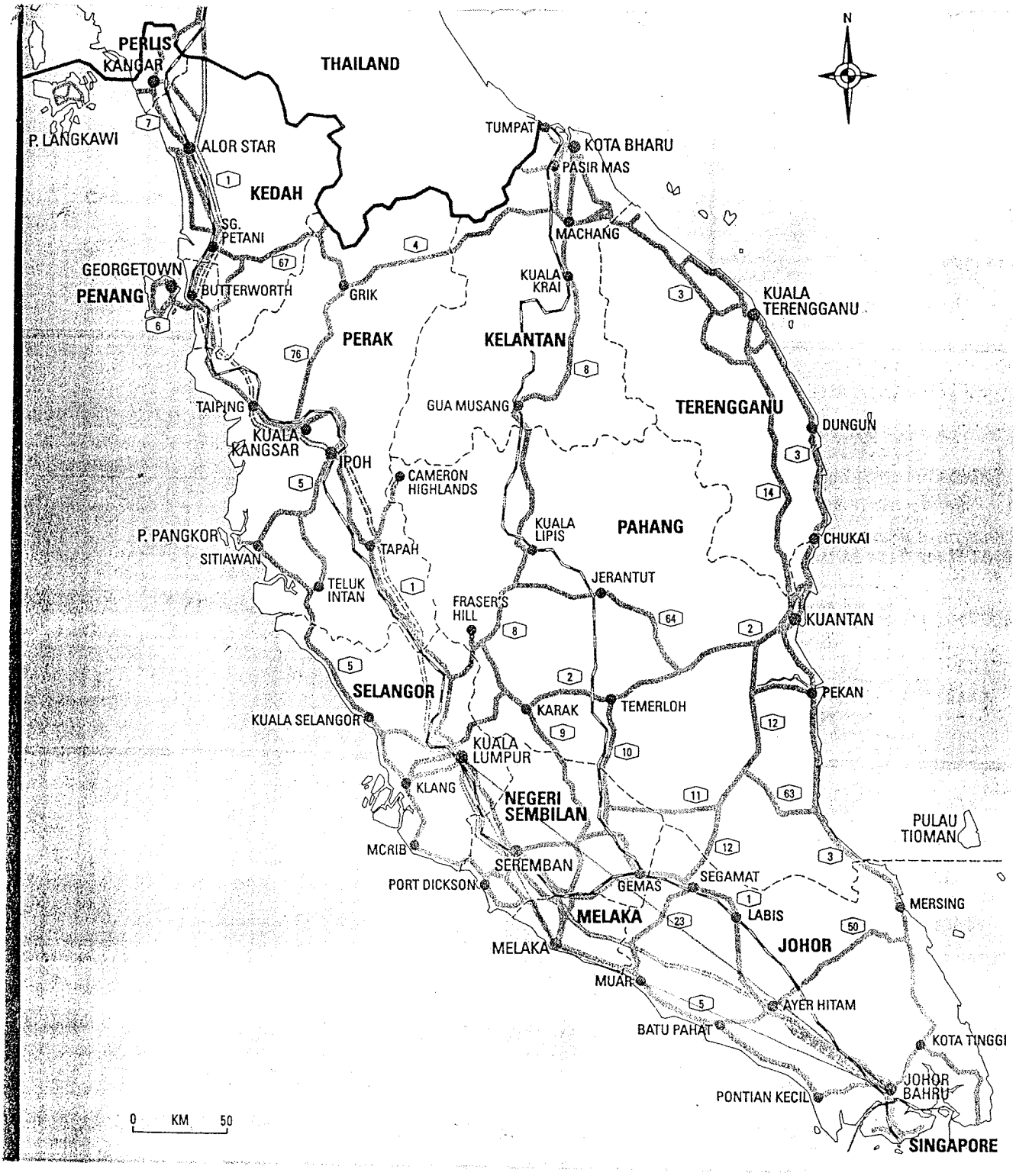
(2) the area contains all the variables which interested to survey in the study such as various location and competitors. In terms of geographical locations, these areas are still the biggest market of petroleum retailing and well spread. Most of the oil companies will continue to expand their marketing network in these areas (Malaysia: Malaysian Business April 16, 1993).

(3) the accent and dialect of the language in these areas are more similar compared to the other parts or areas. This is important to reduce the error of research instrument especially the questionnaire.

(4) easy to carry out a research because the infrastructure such as road and telephone are well-developed and is easy to access to the respondents. With permission of oil company and a cover letter from them, the respondents gave good cooperation during the fieldwork. They already knew, we are coming to interviewing them.

Figure 6.1

The Sample Area approved by Oil Company for FieldWork



6.4.2 The Variables and Operational Definitions

According to Isaac and Michael (1974), in social science research there are three categories of variables: independent, control and dependent. They assert that independent variables are known as input, mainpulated, treatment or stimulus variables; the control variables are known as background, classificatory or organismic variables; and the dependent variables are known as outcome or response variables.

In this research, the main dependent variables are performance variables such as the number of litres of petrol sold for objective measurement and average annual increase on employment and average annual growth in sales for subjective measures and measure of productivity was value added per employee. From research perspective (discussed in chapter 4), traditional measures such as ROI, ROA or other financial ratios might easily have been used as well. The main problem is that the small businesses typically do not think in these terms and do not calculate these ratios. To ask for these figures one might have precluded any response at all (Miner et al, 1989).

The independent variables include a set of charisteristics of the manager and employees, competition, store and location (Figure 5.2: the conceptual model). The control variables incorporated include items such as age, sex of manager, years of experience, etc. The detail

of which are avaiable in the questionnaire (Appendix 2). It is the relationship of the independent, as well as some of the control variables, to the dependent variables which constitutes the main focus of the empirical study.

In this research, **performance** is herewith understood to refer to the performance of a petrol station as measured by the following factors:

1. Monthly growth in sales of non-petroleum product

This is derived from the notion that the total sales of non-petroleum products will be directly related to the ability of manager or owner to choose profitable lines of activity and to combine factors in an efficient manner. On the other hand, this measure is choosen because there are lack of information about their accounting system or their accounting were not proper maintance. The objective of using this measure is to measure the "survival" level of the service station in the industry. The ringgit value of sales in thousand of ringgit reported for the most recent year (1994 fiscal year), divided by the number of years the firm has been in business to form the dependent variable in this study. This measurement has been used in petroleum/gasoline service station by Albaum (1967); Ingene and Brown (1987) and Hand et al (1987).

2. Number of litres per month

This is derived from the notion that this number will show the importance of their business and must be controlled to get minimum amount or cash flow for "stay" or existence in this industry. The number of litres sold (for unleaded, leaded and diesel) were asked and becomes the second dependent variable in this study. This measurement has been used in petroleum retailing study done by Hand et al (1987).

3. Average annual increase in employment

This measurement has been used in previous studies of manager/owners performance (Davidson 1989; Miner et al, 1989 in Box et al, 1993). Normally, growing firms add incremental employees as backlog increases, although there is a 'log effect'. So that employment growth may slightly understate performance increases (Box et al, 1993). On the other hand, employment increase is a particularly important goal of society in general (Birch 1987) and reasonable to assume that employment growth mirrors firm revenue growth (Box et al, 1993). The objective of using this measure is to measure the "success" of the service station in the industry. These indexes is described as the number of employees reported for the most recent year (1994), divided by the number of years the firm has been in business (Miner et al, 1989).

In retail productivity, research could concentrate on labour productivity, capital productivity, service productivity or total factor productivity. In this study, the researcher chooses only to study **labour productivity**. Why only labour? Firstly, the measurement of total productivity is relatively primitive and may be misleading (Lusch and Soo 1984) and are usually used for the study of technology change (Bucklin 1978). On the other hand total productivity requires the development of an input index and are based on subjective criteria (Lusch and Soo 1984). Secondly, when comparing capital, service and labour, the time commitment is relatively shorter for labour than capital and service. Furthermore, capital and service in petroleum retailing in Malaysia were provided by the oil company itself and the dealers are asked to contribute only minor contribution in capital and services. Thirdly, labour is more controllable and flexible and petroleum retailers or managers must learn to manage their labour better. Whereas, this only input is which the dealers have more to concentrate in their daily operation because of labour-intensive practices (no self-service) in petroleum retailing industry in Malaysia.

6.4.3 The Assumptions and Limitations

For the purpose of current study, the researcher have made the following assumptions:

1. the location, store, manager and competition characteristics factors examined in the study were assumed to have constituted important influences on the performance and productivity of the petrol station.

2. the reasons for selecting a national petroleum company - PETRONAS were assumed to have been related to one or more of the listed factors and will give a unique result compared to other multinational companies which have invested in the petroleum retailing industry in Malaysia and to maintain the homogeneity of the sample. This step will increase the confidence in the estimated parameters (Hatten, Schendel and Cooper 1971 in Hand et al, 1987).

3. the performance and productivity measures used in the study were assumed to be the best measurement after careful analysis and taking the results of the other studies into account as stated in chapter four.

4. the survey instrument and the structured interview format used is a valid and reliable instrument for the measurement of the values and attitudes that the researcher is interested in. It is also assumed that the interview questions were answered with honesty and candor and that there was no motivation at 'gaming' or to hide or distort information by respondents. The assumption is, therefore, that the data obtained are valid and, if properly interpreted, reflect the true performance of the petrol stations.

There is an inherent limitation in a study of this nature due to a number of uncontrollable variables in the criteria used, samples and instruments. More over, any interpretation of the result is limited to a thorough understanding of the nature of the groups, range of applicability, reliability and the characteristics of the criteria and different functions served by the tests.

The current study was limited geographically to the one state in the southern part of Peninsular Malaysia, due to limitations of time, money and other circumstances. Participation in the survey was limited to the managers or owners of Petronas petrol station known as a dealer. A dealer is defined as an individual who leased a service station from the oil company. The survey respondents consented to respond individually to questions posed and personal interviewed by the researcher based on the survey instrument developed and validated for the study.

By sampling, the researcher do not claim that the sample on which conclusions are based fully covers the petroleum retailing industry in Malaysia. Strictly speaking, a more comprehensive survey should probably include all Petronas petrol station dealers and other oil companies. On the other hand, concentration on existing dealers is also justifiable on the grounds that in practice, at any time, this is the reality with which management, government and others have to deal.

Due to the multiplicity of dependent variables involved in this inquiry and unique nature of respondents sampled, caution must be used in the extension of the findings and conclusions of this study. It is noteworthy, for instance, the performance and productivity measures used necessarily involved an evaluative act as determined by the criteria that the researcher has set.

Further more the requirements of various companies may need different performance and productivity measurement depending in the nature of the businesses, its organization, etc, but to the extent that the researcher has captured the common underlying factors, the data and therefore the findings are assumed valid.

6.4.4 Data Gathering

The research design developed for the current study identified the nature and limited the scope of the data source required to answer the research questions. The sample for the empirical research is made up of managers and/or owners of Petronas petrol station. Each survey respondent shall agree to provide the information included on the questionnaire developed and administered in compliance with the research design. Although the data were obtained on a direct basis via individual interviews, each participant was assured anomymity in exchange for cooperation and for candid responses.

The interviews were conducted in field between February and May 1995. In order to ensure that the researcher could collect information with maximum reliability and validity, the following measures were taken:

1. the questionnaire was translated into Malay language. The translations were also edited by knowledgeable experts to ensure their comparability as to the salience and meaning of concepts, as well as for functional equivalence and linguistic equivalence. Care was taken at all stages, however, to ensure that the terms and words used would be easily understood by the ordinary person. However, each respondent was questioned in either the English or Malay Language, according to his or her expressed preference.

2. the responses obtained from each participant were recorded immediately to assure accuracy. The researcher avoided further clarification of each survey item other than that included parenthetically on the survey instrument to assure the comparability of the reported data.

3. pre-test of questionnaire were conducted in both area, Stirling, in Scotland and the state of Negeri Sembilan, in Malaysia. This detail will be discuss in the next sub-topic in this chapter, sub-topic 6.5.7.

6.4.5 The Questionnaire

One of the prerequisite to design a good questionnaire is deciding what is to be measured (Fowler 1986). There are basically three main approaches to developing initial indicators in questionnaire design (de Vaus 1990). These are

(1) using measures developed in previous research;
(2) using observation or unstructured interview; and
(3) using informats from the group to be surveyed

Questionnaire items for this research were initially developed based on measures developed in previous researches made by researchers including Claus and Hardwick (1972), Hise et al (1983), Ghosh and McLafferty (1987), Hand et al (1987), Chisnall (1991), Box et al (1993) and Adam et al (1993). The final version of the questionnaire items however were modified to fit this particular context of research and thus they had gone through pilot testing and evaluation.

On the other hand, before the questionnaires were developed, a series of personal interviews were conducted with oil company executives and academicians. Three criteria were applied in developing the questionnaires, included: (1) test administration between 10 to 15 minutes, (2) elimination of variables with apparent low predictive value, and (3) a questionnaire easily understood by the service station managers or owners.

The questionnaire was first developed in the English Language and then translated in the Malay Language. The questionnaire which was translated in the Malay Language were used in the fieldwork. Main headings of the instrument items in the questionnaire are demography, business background, location, competitors and performance of the business. The questions have been kept to the minimum as possible, so that the respondents will not find it difficult and boring to answer all of them. To make it more attractive and professional in appearance, it was designed in such way and printed by the printing company.

To increase reliability, the questionnaire was carefully developed through two pretests and checked twice by the supervisor. One of the major concerns of the study was response rate. From discussion of availability, response rate was satisfacted. On the other hand, the questionnaire length was limited to increase the response rate and at the end the trade-off was made.

The final questionnaire included forty nine questions and seven from it was observation questions which could be administered by the interviewer itself. Five of the questions requested responses on a five-point Likert-type scale. These questions dealt with general opinion about environmental factors which are affecting their businesses. Sixteen questions are concerned with the background of their businesses and their competitors. Fifteen of the questions requested the respondents to answer specifically on their performance and

productivity elements such as the number of gallons sold in a month, volume of sales in a month and the average number of workers and etc. The first three questions mentioned above were considered to be a surrogate for performance variables. Lastly, six questions were also asked for the social and psychological characteristics of the managers or owners. A total of thirty-nine independent variables were identified and grouped in the four classes as described in chapter five.

6.4.6 Rating scale and Indices Construction

The instrument utilized allowed a determination of factors or variables which has impact on performance. In this research, the combination of scaling techniques such as semantic differential by Osgood et al (1957) and 'agree-disagree' scale, originally evolved by Likert (1932) will be used. The variables selected for scalar rating included relationship with oil company and staff, perceptions toward their service provide to customers, quality of merchandise and store atmosphere. For instance, in the questionnaire, the subjective perceptions of relationship with the oil company were rated: (a) strongly agree, (b) fairly agree, (c) agree, (d) disagree and (e) strongly disagree.

However, most of the question used open-ended techniques, because retailers are encouraged to respond to characteristics that do not

necessary comprise the answer they have of the store being studied (McGoldrick, 1990) and because the nature of this study tried to find the figures that were suitable for the statistical model used in this study. The combination of these two techniques use the open-ended question first than scaling technique as suggested by McDougall and Fry (1974), in order to help elicit the most relevant dimensions to be scaled (Mc Goldrick 1990).

6.4.7 The Pilot Study

According to Fowler (1986), every questionnaire should be pretested. For this reason, the primary pretesting was done in Scotland. The preliminary questionnaire designed for the pilot test were sent personally to the four service stations at Stirling town and its surrounding area. The interview was conducted by using the structured questionnaire. In the testing, they were asked to respond as to what they thought about the questions and the questionnaire as a whole. Any difficulties such as problems of understanding the questions, prognosis of possible reactions to the questions and other suggestions for improvement found during the test was taken seriously and used them to modify the questionnaire.

The results acquired from the pilot study in Scotland were finally satisfactory. However most of the items used in the questions were focused on the situation in Malaysia. The researcher felt that it was

necessary to conduct one more pilot study in Malaysia because the nature of the business between Malaysia and Scotland seems to be different. Most of the stations in Scotland belonged to the hypermarkets and superstores. In Malaysia, most of the stations are run by individuals and can be categoried as a small business rather than national or international companies. Before starting the actual survey, the researcher conducted another pilot study base on Malaysian context. Six stations were chosen in Negeri Sembilan (the neighbouring state of Malacca) and the interview was conducted with the same questionnaire used in Stirling. From the pre-test in Negeri Sembilan, some changes have been made and used to design the final version of the questionnaire.

6.4.8 Statistical Analysis Techniques

A detail appreciation of statistical theory and mathematical methods and a broad experience in the application of alternative technique are necessary qualification for successful store analysis to provide management with both an explanation of the factors affecting performance and the generation of sound impact assessment (Beaumont 1988: page 103). Mahmoud (1984) found that even simple quantitative methods performed better than the unstructured intuitive assessment of experienced management (and that the use of subjective judgment to adjust values from quantitative forecasts often reduced accuracy). Although the amount

of literature and evidence relating directly to store evaluation, particularly as part of a comprehensive programme, is sparse, it is reasonably clear that the methods are available and can be developed to aid existing store evaluation (Breheny 1988).

In order to model effectively the complexities of market place as they relate to retail performance, a multivariate approach must be adopted (Jones and Mork 1984). According to Fenwick (1978), there are a few retail evaluation models which have been reported in the literature (some has been discussed in Chapter four), yet many researchers have presented 'guidelines' for model building without describing the details of a particular case. The most common approaches in order to store performance modelling have utilized either gravity-based models or stepwise regression analysis. However, in spite of attempts to ensure that appropriate statistical assumptions are met, many of these studies display common problems of multi collinearity and small sample sizes in relation to a large set of predictor variables.

Given the focus of the study and the various and somewhat inconclusive methods of analysis offered in the literature on statistical analysis, the researcher decided to analyse the data using quantitative techniques with the supplementation of the statistical analysis wherever applicable. For the testing and analysis, all the data collected in the interviews and secondary data were precoded or subsequently coded to fit into computer program such as The

Statistical Package for Social Sciences (SPSS) with window version. This package was used to make all the computations in this study.

A direct association of every quantifiable factor with performance and productivity will be analysed using descriptive technique of analysis. In utilising the statistical technique, some clarifications have to be made. Since all variables used in the study include all three categories of data (nominal, ordinal and interval/ratio), different technique of measurements have to be applied. Chi-square and Fisher Test are usually used for nominal data. For independent variables, their strengths of association with the performance and productivity will be analysed using the Pearson Product Moment Correlation Coefficients (Pearson r). Lastly a regression model is used to present an explanatory analysis incorporating those independent variables which 'a priori' are expected to have influenced the relative performance and productivity of the sample.

When testing specific hypotheses, the basic statistical technique used was multiple regression analysis. All critical ratios were tested for significance at the 0.10 and below of level of confidence. Other basic statistical analysis will also be used according to suitability such as cross-tabulations and descriptive statistics. By using the quantitative analysis, it is the researcher's highest hope that a detailed exploration and explanation would be revealed in assessing the effects of internal and external environmental variables on

performance and productivity. The analysis of these issues will be systematically carried out from Chapter Seven to Chapter Eight.

6.5 Summary

This chapter has elaborated on the research methodology used in the study. The research design adopted for the current study required a descriptive-elemental research approach. Structured interviews were conducted on an individual basis with the respondents in order to provide the data required to answer the research questions formulated for the study. The instrument was formulated based on previous researches made by researchers and academicians in related field. These research questions were designed to determine the factors affecting the performance of individual petrol station. The findings obtained for the current study were also compared with those reported from an earlier study.

The questionnaire was pre-tested before the actual field work. The actual field work was conducted for about four months and the response was very encouraging. On the other hand, the sample was small because the oil company has limited the area of the study by their own reason. The assumptions on which the research design was based and the limitations which constituted the parameters of the study were identified to clarify the scope of the current study. The various processes and procedures were also mentioned, by which the

data were organized before they were subjected to statistical analysis. Both descriptive and inferential statistical were made on the data. The results of these analysis will be presented in the next chapter.

Table 6.1

Summary Research Methods in Retailing

Method	Application (example)	Sample Size	Major advantage(s)*	Major dis-advantage(s)*
Secondary data	Hise et al (1983)	132	Convenient, draws on analyses of others	Data frequently unavailable, in-appropriate or incomplete
Questionnaire & interview	Box et al (1993) Chandler & Hanks (1994)	800	Convenient	Data of question able reliability
Unstructured observation	Churchill et al (1970)	434	Enables researcher to understand new dimensions and to probe	Non-systematic (may lose important data, can't replicate), inefficient
Structured observation	Albaum (1967)	18	Enables researcher to understand new dimensions and to probe, to be systematic	Inefficient (consumes much researcher time) difficult to interpret some activities

Case studies	Chamber & Jones (1993)	1	Allow for intense probing, efficient, re - cording by researcher	Parts of job not covered by the data, inter- pretation difficult, non- continous

Source: Modified and adopted from Mintzberg (1973) in Gill and Johnson, 1991

Table 6.2

Summary of Measures and Hypotheses

Hypotheses	Independent Variables	Measures	Relationship hypothesized
H1	Managers	Year of experience before	Positive
H2a	Managers	Number of training received before	Positive
H2b	Managers	Number of training received after	Positive
H3	Employees	Wages	Positive
H4	Store	Build-up area	Positive
H5	Store	Inventory	Positive
H6	Store	Number of employees	Positive
H7	Store	Number of bays	Positive
H8	Store	Number of islands	Positive
H9	Location	Traffic density	Positive
H10	Location	Six locations	Positive
H11a	Competition	Number of competitors same brand	Negative

H11b	Competition	Number of competitors different brand	Negative
H12	Competition	Distance with nearest competitor	Negative
H13a	Competition	Size of competitors with same brand	?
H13b	Competition	Size of competitors with different brand	?

CHAPTER SEVEN

RESEARCH FINDINGS AND ANALYSIS I

7.1 Introduction

This analysis chapter deals with the results drawn from the study of performance and productivity of petroleum retailing industry in Malaysia. Therefore, this analysis chapter is constructed into two parts. The first part deals with the results drawn from the performance analysis of the industry, and the second part (next chapter) deals with the results drawn from the productivity analysis of the industry. However, before the researcher presents the findings of the study, it is appropriate to present the method and model that have been chosen to analyse the data.

From Chapter five, the researcher has presented the conceptual model of the study. The independent variables in the study were catogerised into four major groups which contain a large number of variables appropriate for the survey. In the literature from Chapter four and five, the traditional method of performance and productivity measurement have suffered from an excessive subjectivist analysis and an inability to consider simultaneously the impacts of multiple variables. For these reasons, many researchers and practioners in retailing and business sector have sought more sophisticated statistical methods. Chief among these methods have been multivariate analysis such as multiple regression, discriminant

analysis, factor analysis, canonical analysis and causal modelling (Bobko 1991). Furthermore, in order to model effectively the complexities of the market place as they relate to retail performance, a multivariate approach must be adopted (Jones and Mock 1984).

From discussion in Chapter four and six, multiple regression was chosen for analysing the survey data in this study. The advantage of this model is that it allows the systematic consideration of a variety of variables in a single framework and can provide a quantitative assessment of the relative impact of the variables (Ghosh and McLafferty 1987). It is computerized for speedier, more flexible analysis, rapid testing (Curry and Moutinho 1992) and easier to interpret (Coates et al 1995). Moreover, according to Rogers (1992: page 6), this model has six key strengths as a tool:

(a) it provides an objective discipline for evaluation by different market analysts. This is important for successful delegation, particularly in the larger retail firms.

(b) from a strictly statistical point of view, the technique is said to have a known error rate. In theory, regression analysis does provide a plus and minus error factor but, in practice, it does not. This is because of the potential existence of important variables outside the model.

(c) the technique is purpose-built for each store or retailer and is not a generic "black box" as other models.

(d) the method has a particular value to retailers who have a segmented customer appeal since the key demographic variables relevant to the retailer are identified and analysed by the technique.

(e) it provides an evaluation of existing store performances through residual analysis.

(f) once developed, it is very easy to use.

These models are most successful in predicting performance levels of low-order convenience goods where customer behaviour is relatively simple (Jones and Simmons 1990). The data collection of this study has been done in the same region and same time frame, so that this model are most appropriate to be used in this analysis. According to Jones and Simmons (1990), different settings require a new calibration if the site location were not within the same general environment.

For developing the model in this study, existing service stations are statistically compared with measures of those variables expected to influence the level of performance and productivity, either positively or negatively. The result of this analysis is the development of a

linear, statistical equation such as that exemplified in Chapter four. For the purpose of this study, this model will take the following form:

$$Y = f(M, S, L, C)$$

where Y is performance or productivity measurements, and the M, S, L and C are independent variables represent the manager/owner characteristics, store characteristics, location characteristics and competition characteristics. Furthermore, the development of this model is based on two assumptions: (1) that the performance and productivity of the service stations is significantly affected by the four characteristics mentioned above and (2) that these underlying factors can be isolated by systematic analysis.

There are two alternative approaches to implementing this model (Theil 1971 in Adam et al 1993 and Ghosh and Mc Lafferty 1987). A common procedure is to start with a large number of potential variables and then use "stepwise" regression or other similar methods to identify the variables most highly related to performance and productivity. The second approach is to first select a small number of variables likely to form a significant subset and directly enter these into the model to measure their relative impact on performance and productivity. The set of variables to be included can be ascertained from past studies or represent the analyst's judgment and management considerations (Ghosh and Mc Lafferty 1987). However, principal component or factor analysis techniques (Davies 1973;

Ghosh and Mc Lafferty 1987 and Hall 1994), or bivariate correlation (Birley and Westhead 1990) can also be used to select the variables to be included in the regression model.

In the researcher's opinion, using a statistical model approach was more useful than judgment because not every variable found significant in one survey or management considerations can also be significant in other surveys or organizations. This view was supported by Adam et at (1993). They said that the operation and maintainance of the statistical model should be relatively easy. Whereas, running a regression with so many variables would not have provided any degrees of freedom (Hall 1994) because each time a variable is added to the equation, a degree of freedom is lost from the residual sum of squares (Norusis 1993). Due to this, the standard error may increase and the test of overall regression decreases and this will effect the "best" possible model for the test.

In the researcher's opinion, for this study the second approach using statistical method will be more appropriate to be used in this analysis. For that reason, two approaches were adopted. Firstly, variables were tested using bivariate correlation to identify or to seek guidance which one of the variables was most important and associated with performance and productivity. Secondly, a stepwise regression analysis was employed in order to explore the relationships between the significant variables and the performance and productivity measures. This approach was adopted from work done

by Birley and Westhead (1990) because of strong methodology and clarity regarding specification. However, the second approach using the judgment suggested by Ghosh and Mc Lafferty (1987) will also be used in the hypothesis testing and the comparison between the both approaches will be available. The comparison will show which approaches are suitable for measuring performance and productivity in retail sector and hopefully the researcher can find the "best" approach towards searching for the "best" model. In other words, the model will predict performance and productivity more accurately than random guessing.

The next section will first introduce the background of the sample under study before the actual presentation of research findings and their analysis.

7.2 Background of the Sample

Based on the research hypotheses which are described in chapter six, respondents from managers/owners of petroleum retailing industry were questioned with 51 questions to indicate their performance and productivity in the industry and their opinions about the overall industry as a whole. For the analysis of control variables (mostly demographic), all respondents were asked to indicate their demographic profiles. The summaries of the variables are shown in Table 7.1 (at the end of the chapter). Our final sample consisted of a

total of 40 managers/owners made up of 24 owner/owner cum manager (which can be consider an entrepreneurs) and 16 managers which employed by the owners itself or other organizations.

The mean age of the sample as a whole is 40 years old, the youngest among the sample is 25 and the oldest being 56. The mean number of children they have is 4, which the minimum children was 0 (there are two respondents who were not married) and the maximum was 12 children. Of the total sample, 37 or 92.5 per cent is male and only 3 or 7.5 per cent is female.

For the service stations, the mean age of the station is 5 years old. As previously mentioned, the sample came from the national oil company which have a very short history in the industry. The majority of legal status of the stations about 87.5 per cent were sole proprietorships. The existence of a high percentage of sole proprietorships has been mentioned in Chapter Three. Furthermore, the oil company preferred to give franchises to sole proprietorships firm compared to partnerships company. According to oil company (by interview), this happened because the failure rate of other legal status were higher compared to sole proprietorships. The minimum initial capital was as low as MR100,000 (US$40,000) although the mean is MR256,450 (US$102,580). The spread appears to have been substantial as measured by its relatively high standard deviation. For instance, the minimum start-up capital is MR100,000 (US$40,000) and the maximum is MR1,700,000 (US$680,000). This is so because

Table 7.1

Analysis Showing the Background of the Sample

	Variables	Frequency	Percentage	Mean
1	Position in business			
	Owner/owner-cum-manager	24	60.00	
	Manager	16	40.00	
2	Age of dealer			
	25-30	10	25.00	40
	31-35	2	5.00	
	36-40	5	12.50	
	41-45	11	27.50	
	46-50	10	25.00	
	51-56	2	5.00	
3	Number of children			
	None	2	5.00	4
	1-3 children	18	45.00	
	4-6 children	17	42.50	
	7 and above	3	7.50	
4	Sex			
	Male	37	92.50	
	Female	3	7.50	
5	Age of station			
	1-3 years	13	32.50	5
	4-6 years	15	37.50	
	7-9 years	7	17.50	
	10-11 years	5	12.50	
6	Ownership status			
	Sole ownership	35	87.50	
	Private Limited Company	1	2.50	
	Public Limited Company	3	7.50	
	Cooperative	1	2.50	
7	Initial Capital			
	MR100,000 - 130,000	19	47.50	MR256,450
	MR130,001 - 160,000	9	22.50	
	MR160,001 - 190,000	9	22.50	
	MR190,001 - 220,000	3	7.50	
	More than MR220,001	5	12.50	

there are three stations run by the management of oil company. For them, their capital included the cost of construction plus the working capital. Whereas, the their dealers have to provide the cash flow monies or working capital only minus the construction costs and other costs.

Besides the nine variables mentioned in the background above, there are another thirty variables which is used to predict the service station's performance and productivity and which can be grouped into four major areas or characteristics as mentioned in Chapter Six. All the variables chosen were found to be very important variables which has impact on performance and productivity from the previous studies as mentioned in Chapter five. From thirty nine variables, eleven variables were included as manager/owner variables, twelve were included as store/firm variables, seven variables were catogerised as location variables and lastly, nine variables were included as competitive variables. All the variables used in this study are identified with their mean, standard deviations and units of measure in Table 7.2 (situated at the end of the chapter).

All the variables mentioned in Table 7.2, will be used in the analysis by their abbreviator names and defined in the Appendix 3. These names will be used in the rest of the study.

7.3 Performance of the Petroleum Retailing Industry

In this section each of the variables hypothesized to be associated with performance is tested using bivariate and multivariate correlation which was suggested by Birley and Westhead (1990) and regression analysis which have been used widely in performance (e.g Davies 1973; Hise et al 1983; Ghosh and Mc Lafferly 1987; Adam et al 1993 and Zahra 1996). All these variables are discussed in the Chapter six and defined in the appendix. The objective of the analysis is to seek guidance and to delimit the level of importance of specified measurable factors presumed to be associated with service station performance. This step was taken because this study used small samples and the researcher tried to minimize the effect of collinearity as possible through variable selection following advice suggested by Speed (1994).

In this study, performance was divided into three catogeries, first by using the number of litres sold (VOLITRE) to measure how far the stations can "stay" in the industry because the main business is selling petrol. If the station cannot sell the petrol, they will suffer as long as they stay in the industry. The second measurement of performance is using the volume of sales of non-petroleum products (SALENP). This measurement was used to measure the level of "survival" in the industry. To survive in the industry, it's not enough to sell only the petrol but also other products and services such as garage service, minimart and so on. The last measurement is to

measure the "success" by using the average annual increase in employment (EMPGRO). The number of employees increasing by year will show the development of the firm by introducing new products or services. It is reasonable to assume that employment growth mirrors firm revenue growth (Box et al 1993). Normally, when the new products or services was offered, they will need the extra staff to operate or for maintenance.

Before further analysis can be made, few steps were taken to ensure the assumptions of the models and data were not violated. With a small sample, the first two assumptions (normality and homo-scedascity) are almost certain to be violated (Speed 1994). To know whether the violation occured, the data is analyed using residual plot, stem-and-leaf plot and boxplot (Norusis 1993). From the analysis by using the residual plot, the stem-and-leaf plot and the boxplot, there is evidence of a violation of assumption.

The residual plot can conveniently identify points that are influential in the determination of the particular regression coefficient. The stem-and-leaf plot can identify cases with extreme values and boxplot can determine median, length of the box, so that we can know the observed value are skewed either positive or negative. These techniques were chosen because their increased popularity is due to the decreasing cost of computer time, allowing these computer intensive methods to be more widely accessible (Speed 1994).

For that reason, an alternative model was formulated by using logs to transform the dependent variables (VOLITRE, SALENP and EMPGRO) so that the current model will be more adequate. According to Norusis (1993) linearity can be achieved without any effect on the distribution of the dependent variable if alteration was made on independent variables and further more to eliminate heteroskedasticity (Barkham 1994).

Taking suggestions made by Norusis (1993) and Barkham (1994), logs was used on the dependent variables and the results show an improvement on linear fit. According to Step (1994), transformation of data is one of the useful tools in ensuring the maximum effectiveness of regression-type technique. The new alternative model will take the following form:

$$\text{Log}(Y) = a + b_1X_1 + b_2X_2 + b_3X_3 + \ldots\ldots\ldots + b_iX_i$$

After the transformation, the first analysis was begin with bivariate correlation on the surrogate variables.

7.3.1 Bivariate correlation analysis on the variables.

As mentioned in the beginning of this chapter, the researcher has chosen the second approach which used statistical methods. The second approach begins with analysis of bivariate correlation as

suggested by Birley and Westhead (1990). Table 7.3 (situated for convenience due to its size at the end of this chapter) shows the Pearson product-moment correlation corfficients between number of litres sold (VOLITLE) and each of the 39 surrogate variables. Twenty two of the surrogate variables were associated with the number of litres sold at the 0.10 or higher level of significance. The ten surrogate variables found to be highly statistically associated (at the 0.000 level of significance) with dependent variable (LOGVOLITLE) were BAYS, CAPITAL, EXPMONTH, HOPEN, HSTAY, INVENTORY, ISLANDS, NUMS, OSHIPS and STAFFNOW. Only four (EXPETROL, NUMCOB, CAPITAL and NUMP) of the significant correlations were not in the direction of expected sign.

Table 7.4 (again situated at the end of the chapter) shows that twelve of the surrogate variables were associated at the 0.01 level of significance with the volume of sales of non-petroleum product (SALESNP) and further four at the 0.05 level of significance and only one at the 0.10 level of significance. The three surrogate variables found to be highly statistically associated (at the 0.000 level of significance) with dependent variable (SALESNP) were CAPITAL, STAFFNOW and NUMS. Eight of the significant correlations were not in the direction of expected sign and four of them were same variables from Table 7.3 (EXPETROL, NUMCOB, CAPITAL and NUMP).

Table 7.5 (also situated at the end of the chapter) indicates that five surrogate variables were associated with the third dependent

performance measure - average annual increase in employment (LOGEMPGRO) at the 0.01 level of significance and further three (CAPACITY, HOPEN and HSTAY) at the 0.05 level of significance and eight at the 0.10 level of significance. Only three (EXPBEFORE, STAFFNOW and EXPMONTH) of the surrogate variables were found to be highly statistically associated (at the 0.000 level of significance) with the dependent variable (LOGEMPGRO). Six of the significant correlations were not in the direction of expected sign and three of them were the same variables found in the Table 7.3 and 7.4 (EXPETROL, CAPITAL and NUMP).

From Table 7.3, 7.4 and 7.5, the results comfirmed that some of the variables are more important than others in explaining performance of service stations and performance in the retail sector and this is affected by a multitude of factors or variables. In other words, the variables best explaining the variation in the volume of litres sold (VOLITRE) were different from those related to sale of non-fuel products (SALENP) and average growth in employment (EMPGRO). However, the results are remarkably consistent. Thus, performance measured in terms of VOLITRE, SALENP and EMPGRO are characterized by both internal and external characteristics. There is also some indication that internal characteristics were the most important factors explained variation in performance, as reflected in the number of variables which have significant with performance. For example, in VOLITRE model, sixteen from twenty two variables were

significant compared with only six out of fifteen variables were significant from external characteristics (see Table 7.3).

However, "significant" does not always mean "important" (Lussier 1995). For example in the bivariate test (Table 7.3), one finds that experience before become a dealer was significantly greater ($p > 0.001$) than quality ($p > 0.10$). However, in equation 1, quality was one of the important variable in VOLITRE but experience was not in the equation. These show that the bivariate results could have been reversed in multivariate analysis (more results in the next sub-section). This result also shows that variable which has lower level of significant does not always mean that particular variable was not "important" at all. For that reason, the lower level of significant (e.g 0.10 level) will be used in the further analysis this study. From this study, the finding also suggests that many generalizations or findings made by the previous studies lost some of their significance when the variables were applied and tested in Malaysia. These findings will be discussed further in the discussion section.

In order to identify further about the importance of significant variables found in this analysis, further analysis will be carry out in the next section.

7.3.2 Multivariate correlation and regression analysis on the variables.

In order to explore the multivariate relationships between the performance measures and the surrogate variables, and to test hypotheses detailed in the research literature, the data were further subjected to multiple correlation and regression analysis. This statistical technique was chosen because it allows the association of each independent variable with the performance indicator to be examined while controlling for the effects of the other independent variables. The multivariate regression equations presented below were calculated using the 'stepwise method', and the technique starts by regressing the variables with highest correlation against the dependent variable. A new independent variable is added or deleted at each step in order that the null hypothesis of no explanation can be rejected. The stepwise method was chosen because it is more susceptible to sample-specific error than the regular multiple regression (Bobko 1991). It has greater potential for capitalization on change (Freedman 1983 in Bobko 1991) and it can produce results that are specific to the sample employed (Hall 1994).

When a regression analysis was run for VOLITRE with 0.05 as the limit for variable inclusion, only five variables entered the equation. However, when the limit was relaxed to 0.10, there are six variables was entered the step-wise regression equation. The results also improve R^2 from 0.84 to 0.86 and reduce the standard error from

0.78 to 0.75. From this test and discussion in section 7.3.1 above, the 0.10 level of significance was the selected level for the inclusion of significant independent surrogate variables. Furthermore, this level of significance was chosen because this study used a small sample and the researcher was afraid that some of the important variables will be excluded if using the higher level of significance such as 0.01 or 0.05 level of significance (as shown from the test mentioned above). Moreover, a few retail researchers especially in petroleum retailing such as Ingene and Brown (1987) and Acar (1993) also used this level in their study.

7.3.2.1 Volume of litre sold of the service stations (LGVOLITRE)

The present question to be addressed is: how well does each of the variables perform in predicting performance? This issue was examined via multiple regression equations in this section. Equation 1, below, is based on the 19 surrogate variables found to be statistically associated with volume of litre sold at the 0.01, 0.05 and 0.10 level of significance in Table 7.3. Equation 1 which was contains the seven independent surrogate variables - BAYS, EXPETROL, EXPMONTH, HSTAY, INVENTORY, OSHIPS and QUALITY is statistically significant and has a high adjusted R^2 value of + 0.91. This equation then explains 91 per cent of the variation of volume of litres sold among service stations in this study. The adjusted R^2 is felt to be a

better indicator than significance level as an accurate description of the value of the equation (Hand et al 1987). This also indicate the amount of dependent variable where the variation was not explained. In this case only 9 per cent. The values for R^2 and adjusted R^2 are large in this findings and if compared with other value reported in the literature, the value is relatively very high. However according to Morphet (1991), the high value for R^2 does not mean that large errors will not occur. As mentioned earlier, after taking the logarithm of the dependent variable, there is no evidence of a lack of fit in the equation.

Those variables having a positive effect on volume of litres sold are number of bays (BAYS), expenditure per month (EXPMONTH), hours stay in business (HSTAY), inventory of non-fuel product (INVENTORY) and quality of services offered (QUALITY). One (HSTAY) of the positive variables is manager/owner variables, three (BAYS, EXPMONTH and INVENTORY) are firm variables and one (QUALITY) is a competitive variable. An increase in any of these variables is expected to increase the volume of litres sold. The amount of increase expected would differ for each variable on the basis of the regression coefficients.

The positive sign for BAYS was expected. BAYS reflects the ease of access and the likely service time. In other words, it contributed towards the physical attractiveness of a site. This variable has highly significant coefficients and suggests that the current importance

placed on site appearance by oil company is justified. However, the model neither defines "specific" nor gives an exact number of bays needed to be "stay" in the industry. Therefore direct interpretation of the variable and its coefficients may be misleading. HSTAY is revealed as an important determinant as its coefficients is highly significant. It indicates that if managers or owners willing to stay more longer in the station for an additional 5 hours, this will produce an increase of 100 litres. INVENTORY has a positive significant with performance. It reflects the adding value to the station operation in the face of the competition. The impact of INVENTORY suggests that managers and owners need to ensure that their stations are stocking an adequate products and any stockouts must be avoided. If high demand items are not avaliable, a substitute product must be purchased. Otherwise, other stations will be visited in search of the desired item.

The positive sign for EXPMONTH was expected because these industry require relatively large amounts of expenditure where services labour is the major factor input. In order to minimized the cost, the owners will work for below the opportunity cost of their labour so as to earn a capital reward at a latter date. The only competitive variable has significant with performance is the QUALITY. The impact on quality suggests that managers and owners need to ensure that their station are selling quality products and provide quality services. If any of the products or services offered are inadequate in the perception of the customer, it must be improved immediately.

The variables having negative impact are year experience in petroleum industry (EXPETROL) and ownerships (OSHIPS). These represent one of the manager/owner variables and one of firm variables. The volume of litre sold equation shows that ownerships (OSHIPS) has the strongest effect, followed by number of bays (BAYS) in term of beta coefficients. In this sample, high volume of litre sold is most often found in stations owned by "right ownership". As mentioned in the early chapter (Chapter six), the oil company preferred the station to be run by sole ownerships. BAYS became the second important variable in this equation. Both variables also showed highly significant effect in the correlation analysis.

The regression coefficients also show the numerical relationship between each variable and performance. They show the nature and magnitude of impact that each variable has on the performance measure (Ghosh and McLafferty 1987). For example, the volume of litres sold model shows that a MR6 increase in expenses in a month is estimated to raise volume in litres sold by about 10,000 litres. Similarly, as mentioned earlier, an increase of five hours in the business is expected to increase volume of litres by about 100 litres.

From the result, one finds that experience in petroleum industry before was significant at the negative sign. This was unexpected, since many previous studies stated that experience is the best teacher (e.g Fischer 1992 and Box et al 1993). Should one conclude that a potential owner or manager should stop gaining experience from this

industry before he or she becomes a dealer? Perhaps not. These differences may instead indicate the difference between oil company's managers and the managers or owners (who gained experience from other organizations beside petroleum related companies). Their experience which give skills relevant to oil company but not quite as suitable as general management in petroleum retailing industry. In other words, they did not have any experience to operate the stations in daily basis. Thus, it is not the amount of experience but the type of experience that is important. It should be remembered that this negative sign found for these variable may be a reflection of the manager's burdens of dealing with complicated activity. According to Barkham (1994), starting and running a company is a complicated activity. Thus the stations managed by the managers from oil company may require more time to become successful.

Furthermore, most of the stations which were sent back by the dealer are facing difficulties in business for many reasons. It is difficult for the managers to "turnaround" a station in a short period of time. In this study, there are three stations managed by the staff of oil company in the sample. On the other hand, the result was supported study done by Box et al (1993) and McGee et al (1995). They found that the experience which owner/managers gained previously from the organization (in the same industry) will help them in the business they set-up. However the use of experience variable was not significant in the Cooper et al (1994) and Lussier (1995) model. With

the discrepancies among studies, further model testing is needed to provide reliability and validity in the future studies.

Equation 1:

Volume of litre sold by surrogate variables (all nineteen significant variables at p = 0.01, 0.05 and 0.10)

$$Y = 9.34 + 0.26(BAYS) - 0.05(EXPETROL) + 0.00006\ (EXPMONTH)$$
$$(24.99)\quad (6.41)^{***}\quad (-3.52)^{**}\quad (4.41)^{***}$$

$$+ 0.05\ (HSTAY) + 0.00004\ (INVENTORY) - 0.31\ (OSHIPS)$$
$$(2.04)^{*}\quad (2.22)^{*}\quad (-4.23)^{***}$$

$$+ 0.18\ (QUALITY)$$
$$(2.99)^{**}$$

Multiple R = 0.96 Adjusted R^2 = 0.91

Standard error of the estimate = 0.26 n = 40

Note: For the equations the figures in the parentheses are t value

* Significant at the 0.05 level of significance

** Significant at the 0.01 level of significance

*** Significant at the 0.001 level of significance

It can be inferred from equation 1 that service stations which have sufficient number of bays, have adequate number of inventory of

non-petrol product, have same level of quality with competitors, with maintaining the expenses, registered with proper legal entity and having an owner or manager which worked hard and have a few years experience in petroleum retailing will record the highest rates of volume of litre sold and can "stay" in this industry.

7.3.2.2 Volume of sales of non-fuel products of the service station (LGSALESNP)

Equation 2 is based on the eighteen surrogate variables found to be statistically associated with volume of sales of non-fuel products at the 0.01, 0.05 and 0.10 level of significance. This equation has a high adjusted R^2 value of + 0.67 and a standard error of 0.78. Five independent surrogate variables are stated in equation 2: AGEM, AGEST, BUILDUP, CAPITAL and STAFFNOW. This indicates that the equation presented above explains 67 per cent of the variance in sales of non-fuel product for service stations in this study.

The variables having a positive impact on sales of non-fuel product are age of manager (AGEM), age of station (AGEST), size of buildup area (BUILDUP) and number of employees (STAFFNOW). Of the four variables included in this equation, there are three (AGEST, BUILDUP and STAFFNOW) firm variables and one (AGEM) from manager/owner variables. Only one firm variable has a negative effect, the amount of capital invested in the business (CAPITAL). Equation 2 shows that

STAFFNOW has the strongest effect, followed AGEST and AGEM. Although other variables (CAPITAL and BUILDUP) are also important, however they showed little effect in the equation.

The age of manager reflects the previous working experience. Greater owner or manager age, a broad proxy for work experience, is expected to benefit firms. At an empirical level, evidence on relationship between age of manager/owner and performance is somewhat mixed. Our result support the positive sign of AGEM. These result supported findings found by Box et al (1993) and Bates (1995). AGEST also has a positive effect on performance. Existing studies identify that performance is positively correlated with firm longevity (e.g Cooper et al 1989, Chandler and Hanks 1994, Bates 1995). In other words, older and mature firms have higher performance over time than the younger. These finding also supported conclusion from Carroll (1983) and Kalleberg and Leicht (1991), they concluded that the older companies were less likely to go out of business.

The positive sign for BUILDUP was expected because it related to the financial and human resources which show the subsequent ability of the firm to perform. The impact of BUILDUP suggests that managers and owners need to ensure that their station are big enough to provide adequate services and any unadequate services must be avoided. STAFFNOW also reflects the size of the firm. This finding suggests that a sufficient number of employee must be provided to handle all services offered to the customers especially at the pumps

(for petrol sales) and checkout counters (for payments and inventory sales).

The negative sign for capital was unexpected. Do better station not need capital to grow or expend? In fact that there are differences between stations run by individual and oil company itself. As previously mentioned in this chapter, the individual dealers only provided the working capital whereas the oil company not only provided the working capital but also the construction cost and others related cost. Together, the amount of money spent by the oil company was bigger. Furthermore, the station which was operated badly by the individual was "sent back" to the oil company. However, the oil company was not willing to close the station in order to maintain the share market. The station which was sent back was still in business although making losses. With higher capital but low performance, the negative sign was found in these relationship.

Equation 2:

Volume of sales of non-fuel products by surrogate variables (all 18 at p = 0.01 , 0.05 and 0.10)

$$Y = 5.62 + 0.05(AGEM) + 0.10\ (AGEST) + 0.00008\ (BUILDUP) -$$
$$(6.81)(2.99)^{**} \qquad (2.41)^{*} \qquad (2.82)^{**}$$

0.000001 (CAPITAL) + 0.12 (STAFFNOW)

(-3.59)*** (2.80)**

Multiple R = 0.84 Adjusted R^2 = 0.67

Standard error of estimate = 0.78 n = 40

Note: For the equations the figures in the parentheses are t value

* Significant at the 0.05 level of significance

** Significant at the 0.01 level of significance

*** Significant at the 0.001 level of significance

It should be remembered that this negative sign found for these variables may be a reflection of the manager's burdens of dealing with the rapid change. Thus the stations managed by the staff's oil company might required more time to recover from losses and become successful. However, similar significant findings of the effects of capital were reported by Bruderl et al (1992) in their study of German firms, Cooper et al (1994) in their study of United States firms and Abdullah (1993) in her study on small textile and clothing firms in Malaysia. The interesting finding in this study was that the result was parallel with the result found in the Abdullah's study. The both studies found similar significant finding with regard of capital. In the researcher opinion, capital may influence performance through undertake more ambitious strategies such as pricing strategies, heavy promotion and advertisement or reflect better training and more extensive planning.

Again, it can be inferred that service station which are mature in age, having an area big enough to provide services, have adequate capital or cashflow to run the business, with sufficient number of staff and the mature in age for owner or manager will record the highest volume of sales of non-fuel products and will "survive" in the industry in the long run.

7.3.2.3 Average number of employee per year in business of service station (LGEMPGRO)

In this measurement, the average annual increase in employment was used to measure the "success" of service station. This measurement was different from the previous two mentioned above, because this measurement was categorised into subjective measurement while the previous two were in objective measurement. The reason for using both measurement is to compare which one can describe the "best measurement" for the performance. In this analysis, the researcher takes a set of number of employee per age of station as the dependent variables and included age of station as one of the independent variables. However, this situation may create serious statistical problems (Hughes and Serpkenci 1984). The following approach was developed to overcome the problem where some modification was made on the model. The new model is of the form:

$$LogY = a + b_1X_1 + b_2X_2X_1 + b_3X_3X_1 + ...b_iX_iX_1$$

where X_1 is the age of station became the constant in the equation.

Equation 3 is based on the fifteen surrogate variables found to be statistically associated with LGEMPGRO at the 0.10, 0.05 and 0.01 level of significance in Table 7.5. This equation is statistically significant, has an adjusted R^2 value of +0.81 and a standard error value of 0.19. The interpretation of this equation is that some of the variables have a positive effect while others have a negative effect. The variables with a positive effect are experience before become a dealer (EXPBEFORE) and number of employees (STAFFNOW). Of the two variables having positive impact, one (EXPBEFORE) is a manager/owner variables and one (STAFFNOW) is firm variables. Those variables having a negative effect are number of islands (ISLANDS) and capital invested in the business (CAPITAL). The regression equation indicate an adjusted R^2 of 0.81. This indicates that 81 per cent of the variation in average number of employee per year in business is explained by this equation.

In this equation, the number of islands has the strongest effect, followed by the number of employees. Others, although are important but showed little effect on the equation. Number of employees again shows an effect in this model. The owners and managers know that overstaffing is clearly disadvantageous. However, the following questions are subjects for future research. Are high

performer stations more selective in their hiring? Do high performer stations use different approach in term of recruitment methods than the low performers? The negative sign for capital was unexpected but the reasons was same as in the equation 2. While the negative sign for number of islands was not expected. Perhaps oversupplied number of islands is clearly disadvantageous as it increases the station's fixed costs because it need extra workers and maintenance costs. The level of employee growth was measured subjectively. The difference in number may be due to other factors which this study was not designed to address.

In term of experience, other researches has shown conflicting results, sometimes negative and sometimes positive. Ours results support the latter conclusions. The positive sign for number of years experience before becoming the dealer was expected because it will help them run their own companies and familiarize with the market and technology. Their breadth of experience would better prepare them for the wide range of problems confronting their present businesses. Previous researches has revealed that experience was strongly related to performance (Birley and Norburn 1987; Stuart and Abetti 1990, Box et al 1993 and McGee et al 1995). Therefore, these result supports that experience contributes to performance and firms are getting benefit from experienced managers/owners. This is due to the fact that firms are likely to have the technical and managerial capacity to produce and market the products. However, it cannot be expected to come from the relatively inexperienced owners or managers but

from those with sound business experience, technical skills as well as the requisite access to capital resources with a greater vision about future markets.

It can be inferred from equation 3 that to be "success" in this industry, the manager or owner must have enough experience before becoming the dealer, have sufficient capital to run the business, an adequate number of islands and enough number of employees.

Table 7.6 summarizes the findings and models empirically tested in equation 1, 2 and 3 and also shows the important variables (order entered) which had the greatest impact on the three performance measures. The regression equation characterictics of volume of litre sold indicate an R^2 of 0.91 which explains 91 per cent of the variation of volume of litre sold among service stations in this study. Using the same impact of the equation (based on which variable enters the equation first), there are seven variables in the equation. The variable with the greatest effect are number of bays (0.26), type of ownership (- 0.31), amount of expensive per month (6.0×10^{-5}), amount of non-fuel inventory (4.0×10^{-5}), number of year experience in petroleum industry (-0.05) and so on in a descending order as shown in Table 7.6.

Equation 3: Average annual increase in employment by surrogate variables (15 variables at p = 0.01 , 0.05 and 0.10)

$$Y = 2.03 + 0.004\ (EXPBEFORE) + 0.018\ (STAFFNOW)$$
$$(2.80)^{**} \qquad (9.16)^{***}$$
$$- 0.04\ (ISLANDS) - O.00000007\ (CAPITAL)$$
$$(-7.04)^{***} \qquad (-3.12)^{**}$$

Multiple R = 0.90 Adjusted R^2 = 0.81

Standard error of estimate = 0.19 n = 40

Note: For the equations the figures in the parentheses are t value

* Significant at the 0.05 level of significance

** Significant at the 0.01 level of significance

*** Significant at the 0.001 level of significance

The regression equation characterictics of volume of sales of non-fuel products indicate an R^2 of 0.67 which explains 67 per cent of the variation of volume of litre sold among service stations in this study. Using the same impact of the equation (based on which variable enters the equation first), there are five variables in the equation. The variable with the greatest effect are number of staffs (0.12), amount of capital invested (-1.0×10^{-6}), age of the dealer (0.05), buildup area (8.0×10^{-5}) and number of year firm in this business (0.10).

Table 7.6

Summary of variables in Performance of Service Station

Performance measures	Significant variables
1. Volume of Litre Sold (STAY) Objective Measurement Adjusted R^2 = 0.91	1. BAYS (+) 2. OSHIPS (-) 3. EXMONTH (+) 4. INVENTORY (+) 5. EXPETROL (-) 6. QUALITY(+) 7. HSTAY (+)
2. Volume of Sales of non-fuel products (SURVIVE) Objective Measurement Adjusted R^2 = 0.67	1. STAFFNOW (+) 2. CAPITAL (-) 3. AGEM (+) 4. BUILDUP (+) 5. AGEST (+)
3. Average annual increase in employment (SUCCESS) Subjective Measurement Adjusted R^2 = 0.81	1. STAFFNOW (+) 2. ISLANDS (-) 3. CAPITAL (-) 4. EXPBEFORE (+)

The regression equation characterictics of average growth in employment indicate an R^2 of 0.81 which explains 81 per cent of the variation of volume of litres sold among service stations in this study. Using the same impact of the equation (based on which variable enters the equation first), there are four variables in the equation. The variables with the greatest effect are number of years experience before become dealer (0.004), number of staffs (0.018), number of islands (- 0.04), amount of capital invested (7.0×10^{-8}) and number of years experience before become dealer (0.004).

From the above table, number of employees (STAFFNOW) and amount of capital invested (CAPITAL) are found to be important variables which can give impact on performance in both objective and subjective measurement. This finding supported the study done by Abdullah (1993) and Bates (1995), found that employees and capital was a highly significant determinant of firm survival. The important of both variables can be highlighted by comments of the respondents in this study. One respondent stated, "Normally, limited capital is our main problem and good employees was very hard to find." While another respondent commented, "Getting workers, and getting them to stay on, heads the list of problems". "My turnover is high and these workers only use this as a temporary stepping stone," agrees another dealer.

Clearly, the store characteristics may explain part of the variance in performance measures and owner/manager characterictics became

second important factor after the store characteristics. Both characteristics came from internal environmental factor. Two groups of independent variables from external environment employed, location and competition have produce limited results and should, be explored in much greater detail than was possible in this study. The values for R^2 and adjusted R^2 are large in these findings and if compared with other value reported in the literature, the values are relatively very high. These values suggest that the variables selected from previous studies and used again in this study were very important variables in retail sector and prove the external validity of the model. The result also appears to support the argument of homogeneity. The selection of 'like' firms increases the ability of the researcher to identify specific sets of characteristics that describe a firm. This result also supported Hofer's (1977) view on development of business-level strategic theory that requires a small and less complex of variables. Further analysis will be carry out in the next chapter to determine their important attribute in the industry.

Finally, the findings presented in this study indicate that both external and internal environment facing by petroleum retailing industry played significant roles in the performance of service stations. In other words, this study suggests that the internal environmental factors are important with respect to the performance of service stations in Malaysia rather than external environmental factor. The stepwise regression model found that thirteen internal environmental factors were found in the three performance model

compared to only one found from the external environmental factors. This finding confirms the observations of Cottrell (1973) and Acar (1993), whom argued that factors affecting the growth and performance of a firm may be viewed in two catogories: factors related to the external and internal environment. However, further analyses will be made in the next chapter to highlight the relative importance of both environmental variables.

In term of type of measurements, objective measurement is more appropriete to be used because the number of variables found in objective measurement is more (in term of number of variables included in the equation) compared to subjective measurement and the indicator shown the better value of the equation (in term of the value of R^2). In the VOLITRE model, there are seven variables included in the model. Furthermore in SALENP model, there are five variables. However in EMPGRO model (the only subjective measure in the study), there are only four variables were included in the model.

In term of value R^2, the highest value was found in VOLITRE model but the value of R^2 in EMPGRO model was higher than the value of R^2 found in the SALENP model. The results found here also support findings found by Dess and Robinson (1984). They suggest that objective measures are preferable to subjective measures of organizational performance. However, Dess and Robinson (1984) and Sapienza et al (1988) have indicated that subjective measurements

can be useful when objective measures are unavailable. Further discussion will be continued in the final chapter.

7.3.3 Analysis of hypotheses testing in performance of service stations

The set of hypotheses concerning the impact of independent variables on performance in retailing was developed in the chapter Six. There are thirteen hypotheses already developed earlier. The hypotheses are divided into two groups: the internal environmental factors (manager and store) and the external environmental factors (location and competition). The former reflect the "controllable factors" and the latter include "uncontrollable factors". From Chapter six, one of the purpose of an exploration study was to establish a basis for future rigorous hypothesis testing. Using these constructs, we developed other regression models to examine the impact of internal and external environmental on performance. As mentioned earlier in this chapter, the first approach suggested by Ghosh and Mc Lafferty (1987) will be used in this section. The stepwise regression will be replaced by 2-stage regression in order to put all variables in one equation. The variables used in this section were selected by using judgment and management consideration and were found to be very important variables which impact on performance from the previous studies.

7.3.3.1 Hypotheses testing for internal environmental variables

Following the model developed earlier in this chapter, the relationship between firm performance and productivity and the independent variables (internal and external environmental variables) are modeled as follow:

$$Y_t = a + b_0 Yt^* + b_1 X_1 + b_2 X_2 + \ldots\ldots b_n X_n + e$$

Y_t is the performance measure (VOLITRE, SALENP and EMPGRO). X_n are independent variable for the firm. Y_t^* is the subjective performance measure (managers/owners were asked the overall performance of the firm in recent year by Likert scale 1 = very satisfactory to 5 = very unsatisfactory). Jacobson (1990) argues that models investigating the performance relationship may be misspecified because they fail to account for the impact of 'unobservable' effects on performance. In order to account for such 'unobservable' effects suggested by Jacobson (1990), the researcher includes the valuation from owners/managers themselves on their own stations. The researcher assumed that only owners and managers themselves knew 'exactly' about their own performance in absence of any other measures. These views was supported by Tan and Litschert (1995). They said that the managers have knowledge of comparable firms' performance. In studies done by Birley and Westhead (1990), Adam et al (1993) and Tan and Litschert (1995),

they included these type of variable because they believed the manager only had extensive first-hand knowledge of each store and its environment that could not be fully captured by other variables used in the model. On the other hand, the validity of this procedure has been established by previous studies (e.g Baird et al 1990 and Adler et al 1992).

In order to highlight the importance of the external and internal environmental effect on performance, the researcher entered the external and internal variables separately first and lastly both together in the model. By these approaches, the researcher estimated twelve regression models to investigate the relationship/hypotheses between these independent and dependent variables. Nine of these models are baseline or restricted models where either the control, internal or external environmental are regressed independendently on the dependent variable. The other three are full models that include both external and internal environmental variables. The testing can also give us opportunity to confirm which one of the approaches mentioned in the earlier part of this chapter are more appropriete.

Table 7.7 (again situated at the end of the chapter) reports the results for the first performance measure models (VOLITRE). Here, Model 1 is the baseline model where control variables are the independent variable. Model 2 and 3 are restricted models where the internal and external environmental variables are the independent

variables. Model 4 is the full model where all variables are introduced simultaneously.

Table 7.8 (again situated at the end of the chapter) reports the results for the first performance measure models (SALENP). Here, Model 1 is the baseline model where control variables are the independent variable. Model 2 and 3 are restricted models where the internal and external environmental variables are the independent variables. Model 4 is the full model where all variables are introduced simultaneously.

Table 7.9 (situated at the end of the chapter) reports the results for the first performance measure models (EMPGRO). Here, Model 1 is the baseline model where control variables are the independent variable. Model 2 and 3 are restricted models where the internal and external environmental variables are the independent variables. Model 4 is the full model where all variables are introduced simultaneously.

For convenience to the reader(s), the summary of hypotheses (Table 6. 2) in Chapter 6 was again presented here and renumbered to Table 7. 10.

Hypothesis 1 predicted that number of year's experience before become a dealer will be positively related to firm performance. Results indicate that experience is positive but not significantly related to EMPGRO. However results also indicate that the

relationship fails to reach statistical significance in both VOLITRE and SALENP model and is negatively related. While arguments have been presented from a positive and negative relationship in prior studies (e.g Birley and Norburn 1987, Fisher 1992, Box et al 1993, Cooper et al 1994), our results suggesting a lack of relationship between experience and performance are perhaps due to the sample consisting of managers from the oil company which have experience in the industry but in managing the poor performance stations. Moreover, most of the respondents have experience from unrelated fields such as experience in teaching, army, civil service and only a few have experience in small business. Furthermore, managing the service station is their first experience in business for the majority of the respondents.

However, these findings are consistent with the study done by Cooper et al (1994), suggesting that results found in the context of all industry sectors and geographical regions are also 'true' in one industry sector. These findings also supported study done by Bruderl et al (1992), where general management experience is weakly or not related to performance. As mentioned before, the type of experience is more important than the amount of experience.

Table 7.10

Summary of Measures and Hypotheses

Hypotheses	Independent Variables	Measures	Relationship hypothesized
H1	Managers	Year of experience before	Positive
H2a	Managers	Number of training received before	Positive
H2b	Managers	Number of training received after	Positive
H3	Employees	Wages	Positive
H4	Store	Build-up area	Positive
H5	Store	Inventory	Positive
H6	Store	Number of employees	Positive
H7	Store	Number of bays	Positive
H8	Store	Number of islands	Positive
H9	Location	Traffic density	Positive
H10	Location	Six locations	Positive
H11a	Competition	Number of competitors same brand	Negative
H11b	Competition	Number of competitors different brand	Negative
H12	Competition	Distance with nearest competitor	Negative
H13a	Competition	Size of competitors with same brand	?
H13b	Competition	Size of competitors with different brand	?

Hypothesis 2a predicted that number of courses attended before becoming a dealer will be related positively to firm performance. With the exception of Model 2 (Table 7. 7) for VOLITRE and also model 2 (Table 7. 9) for EMPGRO, the researcher finds that number of courses attended before becoming a dealer is not significant and is negatively related. The results found here indicate that number of courses attended before becoming a dealer is not positively related to firm performance. Hence, the researcher cannot find strong support for hypothesis 2a.

Perhaps the lack of positive relationships between number of courses attended before becoming a dealer and all performance measures (VOLITRE, SALENP and EMPGRO) could be argued that all courses provide by the oil company are introductory or basic courses. The researcher assumed that some of the dealers had attended the same courses conducted by different organisations before becoming a dealer. This argument was supported by hypothesis 2b. Hypothesis 2b predicted that number of courses attended after becoming a dealer will be positively related to performance. With the exception of model 2 (Table 7.9) for EMPGRO, the researcher find that the number of courses attended after becoming the dealer is significant and positively related to performance. Thus, our findings provide some support for hypothesis 2b. Normally, courses provided by oil company or other organisations after becoming a dealer are more appropriate for the dealer and the contents are more "advance" compared to courses conducted before becoming a dealer.

Hypothesis 3 predicted that average salaries for employees per month will be positively related to performance. Given that high salary will attract more productive worker, the productive worker will produce good performance, the positive signs in the models are in the expected direction. Results indicated that this variable was positively related to the performance but fails to reach significance. The lack of significance of this variable was perhaps due to the policy taken by the dealer association in employing foreign workers at the "basic rate" which was supported by the majority members of association and the oil company. Therefore, our findings provide partial support for Hypothesis 3.

Hypothesis 4 predicted that buildup area of the service station will be positively related to performance. Since bigger spaces suggest more services could be provided for customer, the positive signs in the models are as expected. Results in Table 7.8 and 7.9 indicated that buildup area was negative and not significantly related to performance but positive in Table 7.7, however was not significant. This finding fails to support this hypothesis because many service stations cannot fully utilize the area due to lack of capital or their plans was rejected by the oil company to develop further the surrounding area of the stations. One dealer said that, "My plan to increase services such as mart or garage was rejected because they (oil company) was not trust my capability to run the project. My thinking was based on business thinking and the officer's (oil company's staff) thinking was based on administration".

Hypothesis 5 predicted that the amount of inventory will be related positively to firm performance. With the expection of Model 4 (Table 7.8) for SALENP, inventory has negative effect on performance and not significance. Given higher the amount of inventory will create more sale in petroleum and non-petroleum products, the positive signs in the models are in the expected direction. As previously mentioned in the Chapter five, the oil company did not persuade their dealers to open the mini mart or other related services, whereas the other competitors already done. For the moment, the oil company itself did not have any concrete plan to increase sales by introducing more non-fuel products which was found very significant with performance in the previous analysis.

Hypothesis 6 predited that the number of employees will be related positively to firm performance. Results indicated that number of employees is positive and significantly related to all performance measures. This finding was consistent with other studies (e.g Tan and Litschert 1994, Bates 1995). Hence, the research finds strong support for Hypothesis 6. Hypothesis 7 predicted that the number of bays will be related positively to firm performance. Results indicate that this relationship fails to reach statistical significance in both SALENP and EMPGRO models but not in VOLITRE. Thus, in the context of this industry the researcher find partial support for Hypothesis 7.

Previous researches have presented a positive and significant (e.g Cottrell 1973, Robinson and Hebden 1973), our results suggesting a

lack of relationship between number of bays and performance are perhaps due to the limited number of bays which can be built in the stations due to the limited space. The dealer cannot add one bay when the number of customers increases or closes one when the number of customers decreases, alike to what has been happening to supermarkets. If the dealer wants to increase/build one bay, it will involve more capital investment whereby many dealers agreed that it is not possible.

Hypothesis 8 predicted that number of islands will be positively related to performance. This variable is positive but fail to reach significance in the VOLITRE and SALENP models. However this variable is negatively and significantly related to EMPGRO model. In other words, as many islands provided by the dealer, the dealer has to employ more staff and at the end it will increase the overall cost. Furthermore, if the number of islands is increased but the number of staff remained the same, the same staff will have to work more with the same amount of salary. At the end, they may leave the job. The turnover is one of the main problems faced by the dealer. One dealer explained, "The workers using station employment as a stepping stone while waiting for the more convenience jobs". Thus, our findings do not provide some support for Hypothesis 8.

In summary, these results suggested the strong role played by the internal environmental (manager and store characteristics) on firm performance. The regression results regarding hypothesis 6 and 7 are

generally consistent with the result in equation 1, 2 and 3, respectively as previously mentioned. Generally, the findings were consistent with prior studies (Hise et al 1984 and Adam et al 1993) suggesting that store characteristics were more important factor affecting firm performance. However, more studies in examining the internal environmental and its influence on performance in the Malaysian context are needed for the future conclusions.

Having investigated the impact of internal environmental variables on performance, the researcher now wishes to discuss the role played by external environmental variables in influencing firm performance.

7.3.3.2 Hypotheses testing for external environmental variables

There are seven hypotheses created in this section. Hypothesis 9 predicted that number of traffics will be positively related to performance. Given that more number of traffics flow in front of the station, more change there will be patronizing the station. Thus, contrary to prior arguments regarding number of traffics (Jones and Simmons 1990), the results found here indicated that the number of traffics was negatively and significantly related to performance in SALENP model but not significant in the VOLITRE and EMPGRO. However, this finding supported the work done by Robinson and Hedsen (1973), who found that the traffic flow is not significant with

performance. Thus, our findings do not provide any support for Hypothesis 9.

Hypothesis 10 predicted that location will be positively related to VOLITRE, SALENP and EMPGRO. Our results indicate a negative relationship between location and all the performance. However, it fails to reach statistical significance. The lack of significance of this variable is perhaps due to the location types are broad surrogates. They may reflect (on average) different levels of competitive, intensity, different levels of trade population density or any number of other things. Future research should attempt to measure location variables better. Thus, our findings do not provide any support for Hypothesis 10.

Hypothesis 11a argued that the number of competitors from same oil company will be negatively related to firm performance. Given that the same brand station situated nearby will intensify competition among each other in the industry.With the exception of model 4 (Table 7.9), the researcher found that the number of same brand name station situated near each other has positive and significant effect on performance. This result was surprising and not expected. The result found here indicated that the number of same brand name station situated near each other is not negatively related to performance. Perhaps the lack of negative relationship between number of same brand name competitors and performance can be attributed to the behaviour of customers which was loyal to the

brand name. From the study, it was found that they seem did not care so much about the facilities provided by the stations but that it must be the same brand name.

Hypothesis 11b predicted that the number of competitors from different brand name is negatively related to performance. With exception of Model 2 (from Table 7.7 , 7.8 and 7.9) and Model 4 (from Table 7.9), our findings indicate that this variable fail to reach statistical significance. Therefore, our findings provide partial support for Hypothesis 11b. This finding is consistent with the results based on the bank study as reported by Clawson (1974), Olsen and Lord (1979) and retail home improvement firm as reported by Adam et al (1993).

Hypothesis 12 predicted that distance from the nearest competitor will be negatively related to performance. With the exception of model 3 (Table 7.9), our findings indicate that the distance variable is not negatively related to service station performance. Perhaps the lack of negative relationships between distance from nearest competitor and performance can be attributed to the specific or 'best' location. In retailing industry especially petroleum retailing, it is common to see service stations from different brand name operating side by side in the same location because of the strategic site and normally of marketing potentials. Thus, our findings do not provide any support for hypothesis 12.

Hypothesis 13a predicted that there will be relationship between size of same brand name competitor to service station performance. Given that the bigger size in term of area belonging to the service station, will provide more services, more services means will attract more customers. The results found here indicated that the size of same brand name competitor is positively significant with performance except model 4 (Table 7.8 and Table 7.9). Thus, our findings provided some support for hypothesis 13a.

Hypothesis 13b predicted that there will be relationship between size of different brand name competitor to service station performance. As previously mentioned in hypothesis 13a, the more bigger station will attracts more customers. Additionally, service stations in the industry were strongly encouraged by their franchiser or oil companies to introduce more services and products. With exception of VOLITRE (Table 7.7) and EMPGRO (Table 7.9), the researcher found that the size of different brand name competitor has a negative effect on performance. However, there is no significant relation. On the other hand, VOLITRE and EMPGRO showed the positive significant. This result was surprising and was not expected. Thus, the bigger size of the competitor will thereby affect the performance of the service stations. Perhaps the result again shows that the importance of location in the industry. The 'good' and 'strategic' location will help the small stations to survive when competing with bigger station. Hence, our findings provide some support for hypothesis 13b.

In summary, comparing the results in the hypotheses testing and the results produced by the "step-wise" regression, there are a few contradiction findings interm of the significant variables. However, overall results were consistent across the study.

In term of approach, comparing between the two approaches, first approach introduced in the early part of the chapter (Equation 1, 2 and 3) produced better results where the value of R^2 are more higher. In summary, the results of this study have provided insight into some prediction variables that have an important impact in explaining the variation in three performance measurement. Sixteen independent variables have been as hypothesized. It has also been shown that, seven of the sixteen variables in the VOLITRE and EMPGRO models conform to their predicted signs. Similarly, nine of the sixteen variables in the SALENP were supportive or partially supported the hypotheses. Two of the four unpredicted findings relate to competitive variables are significant to the performance. On the other hand, both internal and external environmental variables played significant roles in the performance of the service stations in Malaysia. However, again in this analysis the internal environmental variables showed better predictors of firms' performance than external environmental variables. A Summary of the findings for all hypotheses is presented in Table 7.11.

Table 7.11

Results of Hypotheses

Hypotheses	volitre	salenp	empgro
H1: EXPBEFORE	Not significant	Not significant	Not significant
H2a: COURSEB	Not significant	Not significant	Not significant
H2b: COURSEA	Not significant	Confirmed **	Not significant
H3: SALARY	Not significant	Not significant	Not significant
H4: BUILDUP	Not significant	Not significant	Not significant
H5: INVENTOR	Not significant	Not significant	Not significant
H6: STAFFNOW	Confirmed*	Confirmed**	Confirmed***
H7: BAYS	Confirmed**	Not significant	Not significant
H8: ISLANDS	Not significant	Not significant	Confirmed*
H9: TRAFFICS	Not significant	Confirmed**	Not significant
H10: LOCATION	Partly significant*	Not significant	Not significant
H11a: NUMP	Confirmed*	Confirmed**	Not significant
H11b: NUMNP	Not significant	Not significant	Not significant
H12:DISTANCE	Not significant	Not significant	Not significant
H13a: SIZEP	Not significant	Not significant	Not significant
H13b: SIZENP	Confirmed*	Not significant	Confirmed*

Note: *** significant with level of 0.001

** significant with level of 0.05

* significant with level of 0.10

This finding confirms the study done by Acar (1993), who also found that factors affecting the growth and performance of a firm may be viewed in both internal and external environment factors. An internal environment variables were important significant factors to explain performance. As previously mentioned, no single firm can operate in "vacuum". There are always variables which impact inside and outside the particular firm.

7.4 Summary and Discussion

The aim of this chapter is to study the interrelationship between all the variables in the performance of a sample of service stations in Malaysia by using cross-sectional analysis. Three performance measurement were used in the analysis - number of litres sold, volume of sale of non-fuel products and average growth number of employee per year in business. The analysis follows the three sequential steps, all using the multivariate analysis - bivariate correlation analysis, multivariate correlation analysis and multiple regression analysis. The reasons why this analysis was chosen have been mentioned in the early stage of this chapter. The main limitation faced in this study was that the sample was small. The discussion about this limitation will be highlighted in the final chapter.

However, the results of this analysis have provided insight into some prediction factors that have an important impact in explaining the variation in the three performance measurements. The model found that the following factors were the most significant in the analyses: BAYS, OSHIPS, EXMONTH, INVENTORY, EXPETROL, QUALITY, HSTAY, STAFFNOW, CAPITAL, AGEM, BUILDUP, AGEST, ISLANDS and EXPBEFORE. Therefore, the study concludes that these factors are the most important in the performance of individual chain service stations in Malaysia. The study also found that most independent variables analysed in this chapter tend to have generally affected the three dependent variables to an equal degree. However, a sharp distinction is found for the number of staff and the amount of capital invested in the business. STAFFNOW is observed to be significantly positive associations with LGSALES and LGEMPGRO, while CAPITAL is observed to be significantly negative with the both performance measures. In this analyses too, the independent variables were not able to account for some percentage of the variation in the performance. The researcher believes that there are more important factors or variables excluded in this analysis. The analysis for productivity will be reported in the next chapter.

Basically, this analysis provided level of performance variation explained by the regression equations. Of the four groups or characteristics employed - manager/owner characteristics, store characteristics (in internal environmental variables), location characteristics and competitive characteristics (in external

environmental variables) - store characteristics were the most important in explaining the variability in the three performance measurements. If we look at the first three performance measures entered into each of the regression model, number of employees is the most important variable in explaining variation in sale of non-fuel products and average employee per business year. While the number of bays was first in explaining volume of litres sold.

The manager/owner's year experience before become a dealer and year experience in petroleum industry appear to be an inverse relationship with performance measures. Year experience before becoming a dealer has a positive impact on average employee per year but year experience in petroleum industry has a negative relationship with volume of litres sold. On the other hand, the results show that the independent variables significantly related to performance changes as the defination of performance changes. This finding supported the results from the previous researches (e.g Hise et al 1983, Birley and Westhead 1990, Box et al 1993, Chandler and Hanks 1993, Coates et al 1995).

In the analysis of bivariate correlation, the results are remarkably consistent. There are a few variables were not significant in the expected sign. The variables were year experience in petroleum industry, number of courses attended before becoming the dealer, number of competitors which have same brand name and amount of capital invested in the business. There are also four important

variables significant at level of 0.10, appeared in all three performance measures. The variables were number of bays and capital invested in business (store characteristics), hours spent in business (manager/owner characteristics) and monthly expenditure (competitive characteristics). Therefore, the study concludes that these factors or variables are the most important in the performance of the service stations in Malaysia. However, no variables represent the location characteristics appeared in all the measurements. Moreover, there is no evidence in this study that type of customer, type of neighbourhood and volume of traffics can give impact on performance or productivity as reported by previous studies especially in petroleum retailing sector. Again, there is no evidence that number of training received and number of year in education are significant to performance.

From the findings also, many variables found significantly in the previous researchs were losing their significance when applied to the Malaysia context. However this findings also supported suggestion made by Jones and Mock (1984), said that stores in different business environments will perform according to different criteria. Furthermore, the findings suggested that the independent variables significantly related to performance change as the defination of performance changes.

This happen not in this study only but in other studies (e.g Cooper 1991, 1994, Lussier 1995). There are several possible causes for this.

First, there is the wide variation across sample such as different industries sector, sampling size, different geographical area and different objectives and interests. Second, lack of consistency across studies (including this study) may also reflect the different ways in which performance and productivity has been operationalized including objective and subjective assessments. Some studies associated performance and/or productivity with "survival", "growth", "profits", "failure", "rate of return" and so on (e.g Tan and Litschert 1994, Kotha and Nair 1995, McGee et al 1995). A third problem relates to the analytical methods that have often been used. We can find studies used univariate analysis, brivariate analysis and multivariate analysis (e.g Birley and Westhead 1990, Bruderl et al 1992, Box et al 1993, Denning and Freathy 1996). Different methods need different assumptions, limitations and approaches. The final problem is comparison arise when researchers included some variables which can only be observed during start-up or/and after start-up the business or variables that easy to study. According to Cooper (1993), this may not be same as focusing upon the variables that most bear upon performance and productivity.

In this study, the researcher employed multivariate analysis techniques to understand the impact of internal and external environment variables on performance and productivity. It is important to remember that the model's recommendation must be viewed directionally rather than applied to a given situation.

Whereas, the results are purely exploratory and generalizations must await further replications based on larger sample sizes.

Various combinations of the 39 surrogate variables could account for 67 per cent to 91 per cent of the variation in the three performance variables analyzed. In discussing the practical value of regression analysis, Davies (1977) and Morphet (1991: page 343) suggest that a company does well if its forecasts are accurate 80 per cent and it will "break even" if its forecasts are accurate 60 per cent. The results from three model of performance has already been suggested that the three an adjusted R^2 from 61 per cent for EMPGRO, 81 per cent for SALENP and 91 per cent for VOLITRE are very favourably with the results of comparable studies and the value suggested by Davies and Morphet above.

Again in the hypotheses testing, the findings indicated that both internal and external environment variables played significant role in the performance of service station. Store characteristics from internal environment variables appeared to be the most important variables in prediction of performance. Number of employees and number of islands have significant impact on performance. In other words, internal environment variables are better predictors of firm performance than external environment variables in this industry. Finally, considering the absence of data on various important variables such as costs - land rents, taxes, advertising and promotion, and so forth - it seems that a reasonable start has been made in

understanding the factors affecting the performance of retailing sector specially in petroleum retailing industry in Malaysia.

The next chapter will continue on the analysis for productivity and analysis of the variables in terms of classification of service stations and hypotheses about the differences between manager and owner of the service stations.

Table 7.2

Descriptive Statistics

of independent variables

	Variables	Mean	SD
	Manager/owner characteristics		
1	Age of manager/owner	40.62	8.13
2	Number of children	3.87	2.27
3	Number of years experience before become a dealer	5.17	4.39
4	Number of years experience in petroleum industry	1.65	3.10
5	Number of hours stay in office per day	8.50	2.52
6	Level of education	3.55	1.45
7	Marital status	1.15	0.48
8	Number of courses attended before become a dealer	1.65	0.74
9	Number of courses attended after become a dealer	0.97	1.49
10	Gender	1.07	0.28
11	Number of year in education	11.70	2.34
	Store characteristics		
12	Age of station	5.20	2.99
13	Number of bays	6.95	1.32
14	Buildup area	15437.50	4705.68
15	Capacity of petrol storage facilities	90300.00	32113.74
16	Amount of capital invested	256450.00	343028.36
17	Expenses incured per month	8100.00	3717.94
18	Number of hours station open per day	17.62	3.89
19	Volume of inventory of non-fuel products	6170.00	2944.72
20	Number of islands	4.07	0.57
21	Number of services offered	5.95	1.89
22	Type of ownerships	2.25	0.71
23	Number of pumps	9.40	2.88
24	Number of employees now	8.77	3.38
	Competitive characteristics		
25	Distance from nearest station	4.88	8.71
26	Land value of present site	1287750.00	436186.78
27	Number of competitor from different company	1.92	1.54
28	Number of competitor from same company	0.80	0.72
29	Quality of services compared to nearest station	2.15	0.77
30	Size of competitor from different company	1.72	0.68
31	Size of competitor from same company	1.75	0.67
32	Total of service planned for future	1.57	1.20
33	Average salaries for employees	412.00	97.78

	Location characteristics		
34	Birth rate of local area	25.01	4.30
35	Type of customer	2.95	0.71
36	Location of the station	3.02	1.12
37	Type of neighbourhood	2.52	0.88
38	Placement on the street	2.57	1.03
39	Number of traffic at peak hours	1183.70	727.07

Table 7.3

Correlation Coefficients between "VOLITLE" in the Petroleum Retailing Characteristics

Independent Variables	Expected sign	Pearson Correlation Coefficient (r)	Level of Significance of 'r'
AGEM	+	0.4200	0.007***
CHILDREN	+	0.2227	0.167
EXPBEFORE	+	0.5149	0.001***
EXPETROL	+	-0.3841	0.014**
HSTAY	+	0.7215	0.000***
LEVELE	+	0.0874	0.592
MARITAL	+	0.0705	0.666
NUMCOB	+	-0.O224	0.891
NUMCOA	+	0.2257	0.161
SEX	?	-0.0830	0.610
YEARE	+	0.0518	0.751
AGEST	+	0.0207	0.899
BAYS	+	0.7583	0.000***
BUILDUP	+	0.4282	0.006***
CAPACITY	+	0.5234	0.001***
CAPITAL	+	-0.6057	0.000***
EXPMONTH	+	0.6711	0.000***
HOPEN	+	0.6300	0.000***

INVENTORY	+	0.5769	0.000***
ISLANDS	+	0.5527	0.000***
NUMS	+	0.7155	0.000***
OSHIPS	-	-0.5543	0.000***
PUMPS	+	0.4931	0.001***
STAFFNOW	+	0.6683	0.000***
DISTANCE	-	0.1733	0.285
LANDVALUE	+	0.4365	0.005***
NUMNP	-	-0.1756	0.279
NUMP	-	0.0777	0.634
QUALITY	+	0.2753	0.086*
SIZENP	?	0.4193	0.007***
SIZEP	?	0.1911	0.237
TOTSP	?	-0.0598	0.714
SALARY	+	0.4150	0.008***
BRATE	+	0.4654	0.002***
CUSTOMER	+	0.0814	0.618
LOCATION	+	-0.3585	0.023**
NEIGHBOOR	+	-0.0323	0.843
ROADL	?	0.1964	0.224
TRAFFIC	+	0.2133	0.186

Note: *** significant with level of 0.01,

* *significant with level of 0.05

* significant with level of 0.10

+ =positive relationship,

- =negative relationship

?=indicate that the reviews does not provideany strong expectations as to sign

All variables was tested by 2-tailed

Table 7.4

Correlation Coefficients between "SALENP" in the Petroleum Retailing Characteristics

Independent Variables	Expected sign	Pearson Correlation Coefficient (r)	Level of Significance of 'r'
AGEM	+	0.4339	0.005***
CHILDREN	+	0.3567	0.024**
EXPBEFORE	+	0.4920	0.001***
EXPETROL	+	-0.2793	0.081*
HSTAY	+	0.5125	0.001***
LEVELE	+	-0.1721	0.288
MARITAL	+	0.1607	0.322
NUMCOB	+	-0.0662	0.685
NUMCOA	+	0.3688	0.019**
SEX	?	0.0914	0.575
YEARE	+	-0.2149	0.183
AGEST	+	0.3328	0.036**
BAYS	+	0.4770	0.002***
BUILDUP	+	0.4599	0.003***
CAPACITY	+	0.2230	0.167
CAPITAL	+	-0.5889	0.000***
EXPMONTH	+	0.4428	0.004***
HOPEN	+	0.4008	0.010***

INVENTORY	+	0.4666	0.002***
ISLANDS	+	0.4999	0.001***
NUMS	+	0.5824	0.000***
OSHIPS	-	-0.4318	0.005***
PUMPS	+	0.1381	0.395
STAFFNOW	+	0.6101	0.000***
DISTANCE	-	0.0319	0.845
LANDVALUE	+	0.2513	0.118
NUMNP	-	-0.1185	0.466
NUMP	-	0.1230	0.450
QUALITY	+	0.2188	0.175
SIZENP	?	0.1011	0.535
SIZEP	?	0.0838	0.607
TOTSP	?	-0.0928	0.569
SALARY	+	0.1378	0.397
BRATE	+	0.3263	0.040**
CUSTOMER	+	0.1233	0.448
LOCATION	+	-0.1710	0.291
NEIGHBOOR	+	0.1182	0.467
ROADL	?	0.1807	0.265
TRAFFIC	+	-0.0764	0.639

Note: *** significant with level of 0.01,

** significant with level of 0.05

* significant with level of 0.10

+ =positive relationship, - =negative relationship

? =indicate that the reviews does not provide

any strong expectations as to sign

All variables was tested by 2-tailed

Table 7.5

Correlation Coefficients between "LOGEMPGRO" in the Petroleum Retailing Characteristics

Independent Variables	Expected sign	Pearson Correlation Coefficient (r)	Level of Significance of 'r'
AGEM	+	o.1697	0.295
CHILDREN	+	0.0677	0.678
EXPBEFORE	+	0.5437	0.000***
EXPETROL	+	-0.1143	0.483
HSTAY	+	0.3876	0.013**
LEVELE	+	0.1724	0.287
MARITAL	+	0.2133	0.186
NUMCOB	+	0.1146	0.481
NUMCOA	+	0.0690	0.672
SEX	?	0.1225	0.451
YEARE	+	0.1650	0.309
AGEST	+	0.1346	0.408
BAYS	+	0.2826	0.077*
BUILDUP	+	0.2925	0.067*
CAPACITY	+	0.3935	0.012**
CAPITAL	+	-0.2976	0.062*
EXPMONTH	+	0.6060	0.000***

HOPEN	+	0.3749	0.017**
INVENTORY	+	0.4801	0.002***
ISLANDS	+	0.2783	0.082*
NUMS	+	0.4644	0.003***
OSHIPS	-	0.0077	0.962
PUMPS	+	0.2977	0.062*
STAFFNOW	+	0.6117	0.000***
DISTANCE	-	0.0956	0.557
LANDVALUE	+	0.4921	0.001***
NUMNP	-	0.0996	0.541
NUMP	-	0.1379	0.396
QUALITY	+	0.0264	0.871
SIZENP	?	0.2526	0.116
SIZEP	?	0.2926	0.067*
TOTSP	?	0.1166	0.474
SALARY	+	0.3013	0.059*
BRATE	+	0.2374	0.140
CUSTOMER	+	0.1935	0.232
LOCATION	+	-0.0345	0.833
NEIGHBOOR	+	0.1470	0.366
ROADL	?	0.2361	0.143
TRAFFIC	+	0.2436	0.130

Note: *** significant with level of 0.001,

** significant with level of 0.05

* significant with level of 0.10

+ =positive relationship, - =negative relationship

? =indicate that the reviews does not provide any strong expectations as to sign

All variables was tested by 2-tailed

Table 7.7

Results of the 2- Stage Least Square Regression Analysis: Dependent Variable- VOLITRE

	Dependent variable: Volume of litre sold			
	Base	Internal	External	Full
	(1)	(2)	(3)	(4)
Constant	12.82***	8.13***	13.15***	8.63***
	(0.38)	(2.21)	(0.62)	(1.00)
Valuation	-0.28**	-0.15	-0.53***	-0.20*
	(0.12)	(0.18)	(0.10)	(0.16)
Internal:				
EXPBEFORE		O.02		-0.01
		(0.03)		(0.03)
NUMCOB		0.02		-0.03
		(0.12)		(0.13)
NUMCOA		0.05		0.07
		(0.07)		(0.06)
SALARY		9.07×10^{-4}		9.33×10^{-4}
		(1.16×10^{-3})		(9.23×10^{-4})
BUILDUP		9.30×10^{-6}		1.12×10^{-5}
		(2.21×10^{-5})		(2.25×10^{-5})
INVENTORY		-2.12×10^{-5}		-5.01×10^{-5}
		(7.36×10^{-5})		(4.84×10^{-5})
STAFFNOW		0.02		0.04*
		(0.04)		(0.03)
BAYS		0.50		0.33***
		(0.33)		(0.07)
ISLANDS		0.14		0.17
		(0.20)		(0.22)

External:				
TRAFFIC			4.59×10^{-5}	1.67×10^{-4}
			(1.43×10^{-4})	(1.29×10^{-4})
LOCATION			-0.16*	-0.11
			(0.09)	(0.07)
NUMP			0.27*	0.25*
			(0.14)	(0.13)
NUMNP			0.02	-0.17
			(0.08)	(0.07)
DISTANCE			0.004	0.012
			(0.01)	(0.01)
SIZENP			0.31*	0.34*
			(0.16)	(0.14)
SIZEP			-0.06	0.04
			(0.15)	(0.16)
Adjusted R^2	0.11	0.61	0.56	0.76
F-test	5.60**	7.79***	7.23***	8.44***

Note: *** significant with level of 0.001,

** significant with level of 0.05

* significant with level of 0.10

Standard errors in parentheses

Table 7.8

Results of the 2- Stage Least Square Regression Analysis: Dependent Variable - SALENP

	Dependent variable: Volume of Sales of non-petroleum product			
	Base (1)	Internal (2)	External (3)	Full (4)
Constant	12.65***	9.82***	14.01***	10.76***
	(0.40)	(1.73)	(0.62)	(1.88)
Valuation	-0.99***	-0.76***	-1.10***	-0.70***
	(0.14)	(0.21)	(0.15)	(0.22)
Internal:				
EXPBEFORE		-O.05		-0.08
		(0.05)		(0.06)
NUMCOB		-0.08		-0.36
		(0.20)		(0.24)
NUMCOA		0.21*		0.23**
		(0.05)		(0.11)
SALARY		2.22×10^{-3}		9.88×10^{-4}
		(1.67×10^{-3})		(1.73×10^{-3})
BUILDUP		4.10×10^{-5}		-4.47×10^{-6}
		(3.69×10^{-5})		(4.22×10^{-5})
INVENTORY		-4.20×10^{-5}		4.16×10^{-5}
		(7.63×10^{-5})		(9.08×10^{-5})
STAFFNOW		0.08*		0.15**
		(0.07)		(0.06)
BAYS		0.09		0.08
		(0.14)		(0.14)
ISLANDS		0.41		0.35
		(0.36)		(0.42)

External:				
TRAFFIC			-3.3×10^{-4}	-5.6×10^{-4}**
			(2.18×10^{-4})	(2.42×10^{-4})
LOCATION			-0.09	-0.009
			(0.13)	(0.14)
NUMP			0.43*	0.55**
			(0.22)	(0.25)
NUMNP			0.02	-0.14
			(0.12)	(0.12)
DISTANCE			0.01	0.02
			(0.02)	(0.02)
SIZENP			-0.15	-0.30
			(0.24)	(0.26)
SIZEP			-0.32	-0.17
			(0.23)	(0.30)
Adjusted R^2	0.56	0.59	0.58	0.66
F-test	50.56**	6.57***	7.89***	5.55***

Note: *** significant with level of 0.001,

** significant with level of 0.05

* significant with level of 0.10

Standard errors in parentheses

Table 7.9

Results of the 2- Stage Least Square Regression Analysis: Dependent Variable - EMPGRO

	Dependent variable: Average growth in employment			
	Base (1)	Internal (2)	External (3)	Full (4)
Constant	2.26***	2.03***	2.09***	2.04***
	(0.12)	(0.07)	(0.11)	(0.07)
Valuation	-0.02*	-0.02***	-0.04***	-0.02
	(7.5×10^{-3})	(7.3×10^{-3})	(9.0×10^{-3})	(8.0×10^{-3})
Internal:				
EXPBEFORE		3.64×10^{-3}		1.16×10^{-3}
		(2.48×10^{-3})		(3.27×10^{-3})
NUMCOB		2.90×10^{-3}		-2.46×10^{-4}
		(7.05×10^{-3})		(0.01)
NUMCOA		-1.05×10^{-3}		5.18×10^{-3}
		(5.08×10^{-3})		(6.29×10^{-3})
SALARY		-1.31×10^{-5}		2.24×10^{-5}
		(6.42×10^{-5})		(9.29×10^{-5})
BUILDUP		-9.55×10^{-7}		-9.32×10^{-7}
		(1.40×10^{-6})		(1.85×10^{-6})
INVENTORY		-1.39×10^{-6}		-1.21×10^{-6}
		(4.06×10^{-6})		(5.18×10^{-6})
STAFFNOW		0.02***		0.02***
		(0.003)		(0.003)
BAYS		0.004		8.46×10^{-3}
		(0.006)		(6.30×10^{-3})
ISLANDS		-0.02*		-0.03*
		(0.02)		(0.02)

External:				
TRAFFIC			2.05×10^{-5}	-2.17×10^{-5}
			(1.37×10^{-5})	(1.51×10^{-5})
LOCATION			-0.01	-0.005
			(8.84×10^{-3})	(0.09)
NUMP			0.01	-9.26×10^{-4}
			(0.02)	(0.01)
NUMNP			6.78×10^{-3}	6.80×10^{-3}
			(8.34×10^{-3})	(6.42×10^{-3})
DISTANCE			-3.0×10^{-4}	1.01×10^{-3}
			(1.75×10^{-3})	(1.23×10^{-3})
SIZENP			0.04**	0.02*
			(0.02)	(0.02)
SIZEP			0.01	-0.01
			(0.01)	(0.02)
Adjusted R^2	0.05	0.76	0.39	0.77
F-test	2.90*	13.64***	4.12***	8.72***

Note: *** significant with level of 0.001,

** significant with level of 0.05

* significant with level of 0.10

Standard errors in parentheses

CHAPTER EIGHT

RESEARCH FINDINGS AND ANALYSIS II

8.1 Introduction

This chapter continues from the previous chapter. The aim of this chapter is to produce new combinations of the data and to test further about relationships or differences between managers and owners. The multiple regression analysis from the previous chapter supports the combination of factors or variables contributing to performance, but they provide little illumination as to the profile of the service stations in the sample. The analysis used in this chapter will help to extend further which service stations with a particular combination of characteristics are likely to succeed in this industry. Because of the limitation of the sample and data, any differences between the managers and the owners will be tested with other method of analysis besides multiple regression analysis.

This chapter begins with bivariate and multivariate analysis for productivity. Hypotheses testing for productivity measures will follow next. Then, it continues with analysis for searching types of service stations by using another type of multivariate method such as factor and cluster analysis. This is followed by analysis to identify any differences between managers and owners in terms of performance and productivity. Further analysis will continue to determine whether the managers/-owners can also give impact on performance and productivity as a predictor and/or moderator. Finally, this

chapter will compare the relative effects on importance of the environmental variables which was used in the study.

8.2 Productivity of the Petroleum Retailing Industry

In the previous chapter, performance measures were examined and particular variables were identified which have impact on performance of service stations in Malaysia. This section in this chapter, continues the analysis of factors which have impact on productivity of service stations in Malaysia. Following the same method as in performance, in this section, each of the variables hypothesized to be associated with productivity is tested using bivariate and multivariate correlation as suggested by Birley and Westhead (1990) and regression analysis which has been used widely in productivity (e.g Ingene 1982; Lusch and Soo 1984; Doutt 1984; Good 1984; Hawkins et al 1987).

In this study, sales per employee was used to measure the productivity in service stations. The reason why this ratio was chosen has been mentioned in Chapter six. This model has the same problem as with the model in equation 3 from Chapter seven. This measurement was modified from a study done by Ingene (1982) and followed the suggestion made by Lusch and Moon (1984). However, because there are same variables used in both sides of an equation, the equation will be modified. According to Hughes and Serpkenci

(1984), when some terms are common on both sides of an equation, they will create serious statistical problems. The new equation is of the form:

$$LogY = a + b_1X_1 + b_2X_2X_1 + b_3X_3X_1 + ...b_iX_iX_1$$

where X_1 is the number of employee became the constant in the equation.

8.2.1 Bivariate correlation analysis on the variables

In this section, each of the variables hypothesized to be associated with productivity is tested using bivariate and multivariate correlation. Same as performance, these variables names will be used in the rest of the analysis. The objective of the analysis is to seek guidance and to delimit the level of importance of specified measurable factors presumed to be associated with productivity.

Table 8.1 (situated for convenience due to its size at the end of the chapter) shows the Pearson product-moment correlation coefficients between productivity (PVITY) and each of the 39 surrogate variables. Eight of the surrogate variables were associated with productivity at the 0.10 level of significance and a further three at the 0.05 level of significance and only one (CAPITAL) at the 0.001 level of significance. Five of the significant correlation variables (EXPETROL, CAPITAL,

OSHIPS, DISTANCE and NUMP) were not in the direction of expected sign and three of them (EXPETROL, CAPITAL and NUMP) were same variables found in the Table 7.3, 7.4 and 7.5 in the performance measures.

The results from this analysis have provided insight into some prediction variables that have an important impact in explaining the variation in productivity measurement. They were identified as the productivity measure of service stations. However, as mentioned previously, "significant" does not always mean "important" (Lussier 1995). For example in the bivariate test (Table 8.1), one finds that capacity of storage was significantly ($p > 0.05$) same as bays ($p > 0.05$). However, in equation 4, bays was one of the important variable in PVITY but capacity was not in the equation. These show that the bivariate results could have been reversed in multivariate analysis (more results in next sub-section). This result also showed that variable which have higher level of significant does not always mean that particular variable was not "important" at all. The results also comfirmed that variables used in this study were lost some of the significance when the variables applied and tested in Malaysia. For example, a research done at Guatemala, one of the developing country, by Ortiz-Buonafina (1992), found that population growth rate is significant to productivity but not significant in this study.

8.2.2 Multivariate correlation and regression analysis on the variables

In this section, the same procedure applied to the performance in the previous chapter was applied in productivity analysis. Equation 4 is based on the 12 surrogate variables found to be statistically associated with productivity at 0.01, 0.05 and 0.10 level of significance. This equation is statistically significant, has a high adjusted R^2 value of + 0.31, and standard error of estimate value of 0.51. This indicated that the equation presented below explains 31 per cent of the variance in productivity for the service stations in this study. However, this value also indicated the amount of dependent variable where the variation was not explained. In this case, the value was 69 per cent.

The values for R^2 and adjusted R^2 in this study was relatively low compared with other value reported in the literature. This finding shows that productivity in the retail sector is affected by a multitude of factors. Generally speaking, the variables chosen in the analysis are not the only influence on productivity. It can be correctly assumed that the proxy variables did not measure all the complex phenomena that determine productivity in the service stations sector. If a more valid measure of productivity is available to the researcher, better results might have been achieved. Additional variables should be identified for evaluating and measuring the productivity of different channel types and specific retail sectors in the future study.

Researcher's assumption about variables affecting the performance, can also affect the productivity is not always true. This study shows that there are three catogeries of variables, (1) which can give effect only on performance, (2) which can give effect only on productivity and, (3) which can give effect on both. However, this study fails to identify the second group of catogeries. Further discussion will be discussed in the final chapter.

Only two variables were included in this equation. The variable that has a positive impact is number of bays (BAYS), a variable from firm variables and has a negative impact is capital (CAPITAL) which is also from firm variables. Therefore, the study concludes that these factors or variables are the most important in the productivity of the service stations in Malaysia. Furthermore, an increase or decrease in any of these variables is expected to increase or decrease in labour productivity of service stations. The amount of increase or decrease expected would differ for each variables on the basis of the regression coefficients. These findings also suggested that firm variables were the most important variables in explaining the variability in the productivity measurement.

The positive sign for number of bays was expected because the more bays the station has, it will cut the "queue time" for the customer to fill their tank. This finding supported studies done by some researchers who reported that the number of bays or checkout counters as a contributing factor for performance and productivity

(eg Cottrell 1973, Robinson and Hedden 1973). However, the negative sign for capital was unexpected. Given more capital will create high productivity, the positive sign in the equation is in the expected direction. For example, if the station invests in electronic cash registers, auto teller pumps, attractive shelving, better lighting, or most other forms of capital, the job of employees will be made easier and their productivity will rise. As previously mentioned in equation 2 from Chapter seven, this is due to the fact that the capital provided by the oil company was bigger than that contributed by their dealers. However the stations which were run by them are facing some problem of management and legal status. In order to maintain the sharemarket in terms of number of stations, the oil company has to run the station even though they are facing losses.

There were some interesting findings concerning the association of the variables investigated in these equation. Only two variables are included in the equation. However, these variables are related each other. BAYS reflects the physical attractiveness of the site. Indirectly, BAYS come from CAPITAL and with CAPITAL, it may allow service stations to increase investment in machinery and facilities. One of the facilities is the number of bays. If a service station invests in bays with attractive design, better sign, better pumps or other forms of capital related to the bays, the job and task of employees will be more easier and indirectly their productivity will rise. This finding also supported findings from other studies, which found that capital

is associated with labour productivity (e.g Lusch and Moon 1984 and Doutt 1984).

Equation 4: Sales per employee by surrogate variables (12 variables at p = 0.05 and 0.10)

$$Y = 9.93 - 0.0000007\ (CAPITAL) + 0.006\ (BAYS)$$
$$(-3.33)^* \qquad (2.45)^*$$

Multiple R = 0.56 Adjusted R^2 = 0.31

Standard error of estimate = 0.51 n = 40

Note: For the equations the figures in the parentheses are t value

*Significant at the 0.05 level of significance

It can be inferred from equation 4 that service station whose management has been using the money properly and having sufficient number of bays will record the highest productivity level in the industry.

Table 8.2 summarizes the findings and models empirically tested in equation 4. The regression equation characterictics of volume of sales of non-fuel products indicate an R^2 of 0.31 which explains 31 per cent of the variation of average growth of employment among service stations in this study. Using the same impact of the equation (based on which variable enters the equation first), there are only two

variables in the equation. The variables with the greatest effect are amount of capital invested (- 7.0 X 10^{-7}) and number of bays (0.006).

Table 8.2

Summary of variables in Productivity of Service Station

Measurement	Significant variables
Productivity Sales per employee Adjusted R^2 = 0.31	1. CAPITAL (-) 2. BAYS (+)

Form this finding and compared with the findings in Chapter seven, there are variables which can give impact on both performance and productivity and there are variables that only give impact on performance and not productivity and vice versa. In this study, there are variables which can give impact on performance but not productivity. However, the researcher cannot find variables that can give impact only on productivity but not on performance. This situation can be describe by Venn diagram in Figure 9.1 in the final chapter. Clearly, more research is needed in this area to further investigate the relationships between dependent variables and independent variables. The research design could be further refined by other measures of performance and productivity.

8.2.3 Analysis of hypotheses testing in productivity of service stations

A set of hypotheses concerning the impact of manager/owner characteristic, store characteristics, location and competition characteristics on productivity in retailing has developed in chapter six. The hypotheses are divided into two groups: the internal environmental factors (manager and store) and the external environmental factors (location and competition). The former reflect the "controllable factors" and the latter includes "uncontrollable factors". The summary of the hypotheses were shown in the Table 6.2 in Chapter six. However, for convenience to the reader(s), the summary of hypotheses (Table 6. 2) in Chapter six was again presented here and renumbered to Table 8. 3.

Following the same procedure for performance in Chapter 7, the hypotheses were tested with 2-stage least-square regression technique and shown on Table 8.3 which was situated at the end of the chapter. The impact of 'unobservable' effects suggested by Jacobson (1990) was also used in the productivity analysis for all models. However, the valuation in productivity cannot be used and is replaced by performance valuation because the respondents seemed to be confused about what productivity means. This approach was supported by Saladin and Nelson (1984), because they found that small business managers, in general, do not understand the significant and the impact productivity on their businesses and there

are still of the confusion surrounding the meaning and measurement of productivity.

Table 8.4 situated for convenience due to its size at the end of this chapter reports the results for productivity measure model. Here, Model 1 is the baseline model where control variables are the independent variables. Model 2 and 3 are restricted models where the internal and external environmental variables are the independent variables. Model 4 is the full model where all variables are introduced simultaneously.

8.2.3.1 Internal environmental variables

Hypothesis 1 predicted that number of years of experience before becoming a dealer will be positively related to firm productivity. Results indicate that number of years of experience before becoming a dealer is negative and not significantly related to productivity. Thus, in the context of this industry the researcher find no support for hypothesis 1. Our results suggesting a lack relationship between number of years of experience and productivity are perhaps due to the acquisition of experience by most of the dealers who came from different types of experience such as experience in army, experience in other type of retail store or cooperative and experience in civil service. Given different types of experience, it is difficult for the owners and managers to adopt and use such experience to the

petroleum retailing. Moreover, majority of the dealers or managers are going through "first" experience by managing their own businesses. As mentioned previously in Chapter seven, the type of experience is more important than the amount of experience.

Hypothesis 2a predicted that number of courses attended before becoming a dealer will be related positively to productivity. With exception of Model 2 (Table 8.4), the researcher find that number of courses attended before becoming a dealer has no effect on productivity. However, it is negatively related to productivity. As previously mentioned, courses attended by the owners or managers before becoming a dealer are normally "basic" courses. Some of them may have attended the same course at other places in the past. Thus, the researcher find no support for hypothesis 2a. Hypothesis 2b predicted that number of courses attended after becoming a dealer will be positively related to productivity. This variable is positively related but fails to reach significance in the model. In other words, more courses attented after becoming a dealer, will give an impact to their productivity. Thus, the researcher finds some support for hypothesis 2b.

Hypothesis 3 predicted that salary will be related positively to labour productivity. Conventional ecomonic theory holds that wages are related to productivity (Lusch and Soo 1984). As higher wages are paid, the station can attract a higher quality of labour, which will boost labour productivity in the future. Furthermore, increases in the

Table 8.3

Summary of Measures and Hypotheses

Hypotheses	Independent Variables	Measures	Relationship hypothesized
H1	Managers	Year of experience before	Positive
H2a	Managers	Number of training received before	Positive
H2b	Managers	Number of training received after	Positive
H3	Employees	Wages	Positive
H4	Store	Build-up area	Positive
H5	Store	Inventory	Positive
H6	Store	Number of employees	Positive
H7	Store	Number of bays	Positive
H8	Store	Number of islands	Positive
H9	Location	Traffic density	Positive
H10	Location	Six locations	Positive
H11a	Competition	Number of competitors same brand	Negative
H11b	Competition	Number of competitors different brand	Negative
H12	Competition	Distance with nearest competitor	Negative
H13a	Competition	Size of competitors with same brand	?
H13b	Competition	Size of competitors with different brand	?

average wage rate are seen as reflecting increased efficiency in the use of inputs. Results indicate that this relationship fails to reach statistical significance in the model. Therefore, in comparison with the results in the other retail stores (e.g Ingene 1982, Lusch and Soo

1984 and Ortiz-Buonafina 1992), the results for the petroleum retailing suggest no such negative relationship. Thus, our finding provides partial support for hypothesis 3.

Hypothesis 4 predicted that built-up area (is measured by as total square feet of space) will positively related to productivity. Given that stations can have increasing returns and increasing returns would result in raising the levels of labour productivity, the positive signs in the model is in the expected direction. This variable is negative and not significantly related to labour productivity. Ingene (1982) argued that store size does not continue to have an effect on labour productivity at macro level. In this context, Ingene (1982: page 81) notes:

> *With fewer stores the average consumer will be further from a store because the stores are geographically more dispersed. It is known from location theory that a customer's demand decreases with distance from a store and aggregate demand decline. With lower sales but the same number of employees, labour productivity must be lower.*

The lack of relationship between built-up area and productivity can be explained by the fact that the area was not fully utilized by the owners or managers or even the oil company itself. Some stations

have a lot of space but the facilities provided or services offered are the same as the stations which have limited space. However, this finding partially supported the results based on studies done by Lusch and Soo (1984) and Good (1984). They found that labour productivity increases as store size increases but only up to a point, after that it declines. In other words, the relationship between size and labour productivity is nonlinear.

Hypothesis 5 predicted that inventory of non-fuel products will be positively related to labour productivity. Given that when a station has a large assortment of mechandise, then a customer entering the station will be more likely to find the item that he or she is seeking while his or her car is filling the fuel by the station's attendant. This probability will increase the productivity of labour since employees can sell two different products at one time. However, the full model (Model 4) did not support this hypothesis (negatively but not significant). In other words, the station which has more inventory of non-fuel products does not result in more productive employees but may harm labour productivity. Perhaps more non-products inventory will increase sales but at the same time the customer may need extra help in finding the appropriate items. From Table 8.4, Model 2 shows the positive sign but model 4 shows the negative sign. Thus, there is no net positive and negative influence on labour productivity. However, this finding is consistent with the results based on hardware retail firms as reported by Lusch and Soo (1984).

Hypothesis 6 predicted that number of employees is positively related to labour productivity. Given that increases number of employees will increase sales. Furthermore, employment size must reach certain limit in order to begin to take specialization of task such as mechanic work, car-washing and store keeper as well as to enhance customer through reduced waiting time by helping the customer filling the fuel or other related services. Results indicate that this variable is significant but negatively related to labour productivity. This result suggests that the number of employees must reach a certain point. After the point, the productivity will decline. In this industry, it may also be possible in some cases, the sales holding to constant by reduction in personnel through some steps or strategies such as improved scheduling practices and reduction in shift hours. However, all these adjustments require strong management skills from the owner or the manager. With these adjustments, the problem related difficulties to employ workers could be kept to minimal. This finding supported statement made by Hall et al (1971), more employees in larger stores are less efficient because they cannot be kept fully occupied.

Hypothesis 7 predicted that the number of bays will be positively related to labour productivity. Results indicate that number of bays is positively and significantly related to productivity. Hence, the researcher find strong support for hypothesis 7. Hypothesis 8 predicted that the number of islands will be positively related to labour productivity. This variable is positive but not significantly

related to labour productivity. Therefore our findings provide partial support for hypothesis 8. Hypothesis 7 and 8 measure the scale, another economic variables which was correlate with productivity. Hall et al (1971) have argued that as scale increases, the functions of the different people engaged can be more specialized, with a consequent increase in potential productivity. This findings is consistent with results based on the studies in other retail sector as reported by Doutt (1984).

In summary, these results suggested that the strong role played by internal environment variables on labour productivity. Having investigated the impact of internal environmental variables on productivity, the researcher now discuss the role played by external environmental variables in influencing labour productivity.

8.2.3.2 External environmental variables

Hypothesis 9 predicted that the volume of traffic will be positively related to productivity. Given that with high customer traffic, station can achieve better productivity with less effort, the positive sign in the model is in the expected direction. With exception of model 3, the researcher finds that the number of traffic flow has negative effect on labour productivity but fails to reach significance level. Our results suggested a lack of positive relationship between the volume of traffic and productivity are perhaps due to the

improvements on road condition and fuel consumption technology designed by the car manufacturers. Given the better road and maintenance services provided by authorized party, the travel time was more short. As a result, driver could save some of the fuel. Therefore, the demand for the fuel was less compared to the previous one. Thus, the researcher finds no support for hypothesis 9.

Hypothesis 10 predicted that there is relationship between station location and labour productivity. Results found here indicate that this variable is not significant and negatively related to productivity. The lack of positive relationships between location and productivity could be explained because the location types are measured by broad surrogates and probably poor surrogates. Essentially, what the researcher desire to measure is the quality or attration of the location. If we use a dummy variable, to examine the impact of different type of location on productivity, each interacting with X_1, support would be found for this hypothesis. Using 0.05 as an acceptable significant level, we see that two types of locations are associated with labour productivity, one (highway or motorway is positively associated) and another one (sub-urban is negatively associated). In order of the magnitude of impact, these types are (1) location on the highway, which is associated with an additional MR0.038 in marginal sales per employee and (2) location in sub-urban area, which is associated with minus MR0.41 in marginal sales per employee. This is very small value and we cannot speculate about the meaning of these location coefficients. They may reflect

something such as different level of competition or any number of other things. Future research should attempt to measure location variables better. However, this hypothesis was consistent which research done by Claus and Hardwick (1972) and Jones and Simmons (1990) found that location is very sensitive to the service station.

Hypothesis 11a predicted that the number of competitors from same brand name will be negatively related to labour productivity. Result indicates that the number of competitors from the same brand name is positive and not significantly related to labour productivity. Thus, the researcher find no support for hypothesis 11a. A lack of relationship between the number of competitors from same brand and productivity is perhaps due to behaviour of the customers. If there are two stations from same brand name operated in the same area or location, the loyal customer will not be particular about the services. They can visit any one of these stations. What is important to them, is that the station must carry the brand that they prefer. Hypothesis 11b predicted that the number of competitors came from different brand name will negatively be related to labour productivity. Given that the competitors will do anything to generate more sales, encourage customers to purchase more goods in larger quantities per trip and indirectly should affect the station.

Table 8.5

Results of Hypotheses

Hypothesis	Result(Productivity)
H1: EXPBEFORE	Not significant
H2a: COURSEB	Not significant
H2b: COURSEA	Not significant
H3: SALARY	Not significant
H4: BUILDUP	Not significant
H5: INVENTORY	Not significant
H6: STAFFNOW	Confirmed*
H7: BAYS	Confirmed**
H8: ISLANDS	Not significant
H9: TRAFFICS	Not significant
H10: LOCATION	Not significant
H11a: NUMP	Not significant
H11b: NUMNP	Not significant
H12: DISTANCE	Not significant
H13a: SIZEP	Not significant
H13b: SIZENP	Not significant

Note: *** significant with level of 0.001

** significant with level of 0.05

* significant with level of 0.10

Moreover, competition will not always influence employee efficiency, although it should generally affect labour productivity (Ingene 1982). The result indicate that the number of competitors from different brand name is not negatively and significantly to labour productivity. Perhaps the lack of negative relationship between the number of competitors from different brand name and productivity could be attributed to the actions taken by the competitors in selecting the best site location. As previously mentioned, it is normal in this industry, the different brand name stations operated side by side at strategic location. Thus, the researcher finds no support for both hypotheses.

Hypothesis 12 predicted that the distance from the nearest competitor will negatively related to labour productivity. Given that the more closer the station to the competitor, the competition is more intense among them in the industry. The result found here indicates that the distance from the nearest competitor is not negatively related to productivity. As previously mentioned in hypothesis 11a and b, the competitors will select the best site although the site already has a few stations.

Hypothesis 13a predicted that the size of competitor which came from same brand name will have an impact on productivity. Result in Table 8.4 indicate that size of competitor which came from the same brand name is positive but not significantly related to productivity. Thus, we find some support for hypothesis 13a.

Hypothesis 13b predicted that the size of competitor which came from different brand name will also have an impact on productivity. The researcher finds that the size of competitor which came from different brand name has no effect on productivity. Although it is a positive sign but not significantly related to productivity. Thus, our finding provides some support for hypothesis 13b.

In summary, the findings presented in this section indicate that both internal and external environmental variables played significant roles in the productivity of service stations in Malaysia. Sixteen independent variables have been as hypothesized. It has also been shown that, nine of the sixteen independent variables were supported or partly supported (are of the correct sign and are nearly significant) the hypotheses. However, why are there inconsistencies within the literature and discrepancies within the literature and this study? Almost each of the major variables identified in the literature as factors affecting performance and productivity. As mentioned previously in chapter seven, there are several possible causes for the inconsistence in existing studies. First, the sample was collected from different variation such as sectors, sizes, geographical areas, objectives and etc. Second, the definition and measurement of performance and productivity may various accross the studies. Finally, method and analysis of the studies also varies because different method and/or analysis need different interpretations, assumptions, limitations and approaches.

Interestingly, the researcher finds that the competitive variables such as size, number and distance were positively related to productivity and nearly significant. In other words, strong competition among the service stations will boost their performance and productivity in the industry. This finding was supported by Denning and Freathy (1996). However, internal environmental variables are better predictors of performance and productivity than external environmental variables deployed by service stations in this industry. A comparison of relative effects will be use to highlight the important of both environmental variables at the end of this chapter.

8.3 Searching Types of Service Stations by Using Factor and Cluster Analysis

Whilst the stepwise multiple regression analysis provides useful insight into combination of factors which has an impact on performance and productivity, another method of multivariate analysis - factor analysis was chosen to search for "types" of service station which remains an inherent assumption of linearity. Factor analysis used to identify a relatively small number of factors that can be used to represent relationships among sets of many interrelated variables (Norusis 1993). In this section each variables is tested using factor analysis which have been used in performance and productivity studies (e.g Birley and Westhead 1990; Tan and Litschert 1994).

For this analysis, principal components analysis (PCA) was used in order to produce new combination of the original data. Anti-image correlation matrix was used to select the best independent variables which can illuminate the inter-relationship between the collection of variables. To obtain the good factor analysis, some of the variables (with small values) might be considered to be eliminated from the set of variables being analyzed. As a consequence, the reference axes were rotated in order to isolate more meaningful dimensions. After quartimax rotation the final nine factors out of a total 28 factors accounted 80.2 percent of the total variance. The final model was found to be an appropriate factor-analytic model as indicated by Bartlett's test of sphericity equal to 802.25 with very significance of 0.00000 and the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy is 0.60 which Kaiser (1974) characterizes as "mediocre" measurement of adequacy. However, this value indicate that a factor analysis may not be a good idea, since only 60 per cent of correlations between pairs of variables can be explained by the other variables (Norusis 1993). According to Norusis (1993), the comfortable value is 0.80.

From the Table 8.6 (situated for convenience due to its size at the end of the chapter), based on the basis of component loadings, the nine factors were given by the analysis. However, the researcher was unable to identify any combinations of variables from the factor analysis. Further more, some combinations do not confirm to the variable groupings and suggested that the measurements on these

parameters were inadequate and difficult to interprete. Therefore, the researcher dropped the factor analysis from further analysis due to lack of factor analysis confirmation.

On the other hand, it is clear from this evidence that variables which can give impact on performance and productivity of service stations have meaningful expression in terms of firm characteristics. Although it is useful to describe the pattern of each single factor, but it does not show classification of "type" of service stations (Birley and Westhead 1990). Furthermore, Table 8.6 reveals that there were a few of the component scores summarized with a single indicant. Again, use of principal component analysis is not appropriate because the revealed components cannot be well summarized by single variable (Ingene and Brown 1987). In further analysis, the K-cases cluster analysis (known also as partitioning techniques) was used to group similar service stations. The goal of cluster analysis is to identify homogeneous groups (Sleight and Leventhal 1992 and Norusis 1993).

From preliminary analysis of cluster (used hierarchical techniques), four group of stations was found but in order to satisfy the assumptions of non-parametric analysis such as the chi-squared technique, the groups were reduced to three clusters. In this analysis, the number of cluster was specified to three interpretable clusters - "low", "average" and "good" stations. The initial cluster solution and the center values were obtained from the cluster solution. The cluster mean for each variable was compared, in order to give a descriptive

label to each of the three cluster or firm types and the results was shown in Table 8.7 (situated for convenience due to its size at the end of the chapter).

From the results in Table 8.7, the three "type" of stations were given the following descriptive labels:

Cluster 1: The service stations are the smallest station compared with the other two in term of number of bays, buildup area, capacity of storage, inventory of non-fuel products, number of islands and number of staff employed. Most of them are owned by oil company and managed by their own staff. According to the oil company, the stations facing difficulty to continue the business due to number of reasons such as legal and poor location. The strategy for the oil company to maintain all this stations is to capture the market share in this industry rather than the "social" purposes. The researcher called these type of stations as "The smalltime" which means amateurish or inefficient.

Cluster 2: There are seventeen stations which are the earliest to be operated but now facing few problems with location, where most of them are situated in

residential area, facing the lowest number of traffic and low land value. However, majority of them realize these problems and are planning to increase the number of services in the future. The researcher called these type of stations as "The survivor".

Cluster 3: Nineteen large stations, mostly situated near the highway area do not face much competition. Manager/owner has more experience before becaming a dealer, willing to stay longer in office and attended a few courses after becaming a dealer. The number of staff is almost twice from cluster 2 and willing to give more salary to employees. Number of services provided, amount of expenses per month were more higher compared to cluster 1 and 2 and the hour of business open to public also was longer. The researcher called these type of stations as "The prominent".

From these results, it is clear that the bigger the station (in terms of number of facilities offered and number of employees), situated with low competition level, good location and having "hard working" managers/owners tend to do well in this industry. This finding parallel with study done by Abdullah (1993) and Bates (1995), they

found that surviving firms were the larger firms in the sense that they began operations with greater financial capital investments and number of employees was higher among the survivors. Overall, the results of the study support the previous studies that size of the firm play a important role in performance and productivity (e.g Cooper et al 1989; Simkin 1990; Adam et al 1993 and McGee et al 1995).

The next stage of the analysis is to compare performance and productivity between the identified types of service stations. The aim was to test whether the cross-sectional analysis presented any statistically significant differences between the type of the service stations and performance and productivity.

The data were subjected to exploratory cross-tabulation analyses. According to Birley and Westhead (1990), the use of the cross-tabulation technique also allows the inclusion of a further performance and productivity measures which had not been possible to be used in the previous analysis. This technique indicates whether or not the distribution for one variable differs significantly for other value or level of the other variable(s).

The chi-square technique requires that the expected frequencies in each cell should not be too small. When they are too small, the test may not be properly or meaningfully used (Siegel and Castellan, Jr. 1988). In this analysis, chi-squared test is not suitable because the number of frequencies is too small. Therefore, the Fisher exact

probability test will be used (Siegel and Castellan, Jr. 1988). In order to satisfy the assumptions of the cross-tabulation technique (in this case - Fisher exact test), the groups were reduced to 2 x 2 contingency table which "the smalltime" remains in one group (type 1) but "the survivor and the prominent" were grouped together in another group (type 2). The results are shown in Table 8.8.

Table 8.8 shows that both objective and subjective measurements give no significant differences between type of service stations and performance. High performer stations had made high volume of litre sold and sale of non-fuel products and vice versa from low performers. In terms of productivity, high performer stations also had high productivity compared to low performer, however, no significant differences were found at 0.01 or 0.05 level but nearly significant at 0.10 level. Also no significant differences were identified between type of stations and average employment growth (subjective measurement). This result supported the study done by Birley and Westhead (1990), they found that there was no statistically relationship between type of small businesses and performance (measured by objective measurement). Although this research used only one industry, whereas the study done by Birley and Westhead (1990) used a sample from a wide variety of industries but the finding produces the same results. On the other hand, our data do not permit us to inquire into the strength and/or relative importance of those variables found to discriminate between high-

and low-performer stations. Further research using the same multivariate techniques with large data is suggested

Table 8.8

Types of Service Stations and Performance Differences

	Type 1 "Low Performers"	Type 2 "HighPerformers"	Significance Level@
Volitre - Low	10.0% (4)	45.0% (18)	0.11
- High	0.0% (0)	45.0% (18)	
Salenp - Low	10.0% (4)	40.0% (16)	0.11
- High	0.0% (0)	50.0% (20)	
Emprog - Low	7.5% (3)	2.5% (1)	0.61
- High	47.5% (19)	42.5% (17)	
Pvity - Low	10.0% (4)	42.5% (17)	0.11
- High	0.0% (0)	47.5% (19)	

The figure in the parentheses are frequencies/no.of cases.

@ Two-tail test

The result from chapter seven also indicates that several variables on one performance measure can also be found in other performance measure. This provides some indication of commonalities among the measures. Relationships between measures are highlighted further by the intercorelations between measures displayed in Table 8.9.

Table 8.9

Analysis of Intercorelation between the Performance Measurement

	VOLITRE	SALENP	EMPGRO
SALENP	0.6924**		
EMPGRO	0.3559*	0.0777	
PVITY	0.8449**	0.5493**	0.1916

** Significance at 0.01

* Significance at 0.05

As can be observed from the correlation matrix, subjective measure (EMPGRO) was not significant with two other objective measures (SALENP and PVITY) and however, significantly with Volitre at 0.05 significance level. Variable STAFFNOW and CAPITAL which can be found in VOLITRE, also exist in EMPGRO. This shows that commonalities exist among the measures although the results provide little support that differences were found between objective and subjective in performance. However, this study does not suggest that subjective measures are convenient substitutes for objective

measures of performance. Previous finding (in chapter 7) found that the objective measures produce "better" results and supported the views by Dess and Robinson (1984), their use is strongly supported and encouraged. On the other hand, there is no comparison of productivity measures because the data was not sufficient enough to run the analysis. Finally, although the objective measure(s) would be preferred, this finding suggests that a researcher might consider using a subjective perceptual measure of performance in future study under specific condition such as accurate objective measures are unavailable.

From the Table 8.9 above, in term of relation between performance and productivity, one can question the direction of causality, whether performance effects productivity or vice versa. In researcher opinion, both ways are correct. There are, however, several arguments supporting our interpretation. First, it may be argued that firm with high performance help a firm select good productive worker so that at the end, their productivity will increase. On the other hand, firm with high productivity will create high performance.

8.4 A Comparison of Performance and Productivity between Owner and Manager

The next stage of the analysis is to compare between owner/owner-cum-manager and manager-not-owner regarding their performance

and productivity. The aim was to test whether there are any differences between them in terms of performance and productivity in petroleum retailing industry. However, due to the limitation of the sample and will violate of the assumptions of the technique, the test using multiple regression analysis was not possible to determine the variables which can differentiate between the two: managers and owners. The technique has a weakness whereby it requires a database of at least 30 stores per model (Rogers 1992). In this case, if we divide the data for owners and managers, the data will be smaller than 30. Therefore, it is irrelevant to the model and analysis. The other analysis will be used and discuss in the following paragraphs.

Before examining further the differences between owners and managers, it is appropriate to employ statistical technique to begin analyzing the differences between groups by examining univariate statistics. Table 8.10 contains the means and standard deviations for independent variables for owner/owner-cum-managers and manager-not-owners.

From Table 8.10, the average age of owner/owner-cum-managers is 43 years old and 37 years old for manager-not-owners. Owners/owner-cum-managers have more children, more experience before becoming the dealers, stay more longer in store and attended more courses after being the dealer than manager-not-owners. From this results, the owner/owner-cum-managers are more motivated than the manager-not-owners. This result was supported by Miner et al (1989)

Table 8.10

Summary of mean and standard deviation of owners and managers

Variables	Owners	Managers
AGEM - mean	42.79	37.37
SD	7.35	8.37
CHILDREN	4.37	3.12
	2.39	1.89
EXPBEFORE	5.54	4.62
	4.61	4.13
HOPEN	18.58	16.19
	3.93	3.45
HSTAY	8.96	7.81
	2.05	3.04
LEVELE	3.62	3.44
	1.73	0.89
MARITAL	1.12	1.19
	0.45	0.53
NUMCOA	1.08	0.81
	1.47	1.56
NUMCOB	1.58	1.75
	0.65	0.85
OSHIPS	2.00	2.62
	0.00	1.02

and Abdullah (1993), they found that task motivation and success level was higher among entrepreneurs/owners than the managers. From the observations, researcher found that some manager-not-owners may have recognized their limitations early and used whatever that come from the oil companies without putting out so many questions. But some owner/owner-cum-managers feel that the business is their business, they have to do well because they have a responsibility to fulfilled. This idea was transferred to their staff and because of that, their productivity was higher compared to the manager-not-owners. One respondent stated, "This is my business, my income is from this business, my family too depends from this business, my workers also depend on this business. I know that I must do well in this business and I have no other to go".

On the other hand, the data were first subjected to exploratory cross tabulation analyses. The chi-squared values and levels of significance found in this comparison are reported in Table 8.11. The chi-squared test was used in this analysis because the data satisfied the assumptions of the chi-squared technique. According to Cochran (1954) and Siegel and Castellan, Jr. (1988), when N (number of sample/ population) is between 20 and 40, the chi-squared test may be used if all expected frequencies are 5 or more.

The results provide little support that differences were found to exist between owner and manager in terms of performance and productivity. There is the difference in productivity but not in

performance at $p < 0.10$. However, this finding is consistent with the other findings in the literature. Willard et al (1992) also found that there is no significant differences in performance were found between founder-managed and professionally managed firms. On petroleum retailing study by Hand et al (1987), the statistical results indicate that the "high performers" and "low performers" have virtually no characteristics in common. Also no significant difference between managers and founders in management style and work pattern study done by Birley and Norburn (1987).

Within the constraints of the small sample of data, further test was carried out by using discriminant analysis to identified the "good" predictor variables which can give impact for both groups. The stepwise analysis again were used and only minimization of Wilks' lambda will be considered. From the analysis, four variables have identified as an important variables to differentiate between the owner/owner-cum-managers and manager-not-owners. The variables were OSHIPS, CAPASITY, EXPETROL and STAFFNOW. The eigenvalues is 0.72 and according to Norusis (1990) the large value of eigenvalues are associated with "good" functions. The results are presented in Table 8.12. The first variable to enter is the type of ownerships, followed by capacity of storage facilities. Differences between owner and manager can also be explained by number of years experience in petroleum industry and by number of employees. The negative coefficients of the type of ownerships confirm the differences between owner and manager, because normally station owned by owner is

categorized as sole ownership and by manager is mixed between sole ownership, private limited or cooperative.

Table 8.11

Comparison of Owners and Managers on performance and productivity

	Owner/owner-cum-manager	Manager-not-owner	Chi-Square and Significance
Performance:			
Volitre: High	32.5% (13)	22.5% (9)	x^2= 0.016
Low	27.5% (11)	17.5% (7)	S = 0.89
Salenp: High	30.0% (12)	22.5% (9)	x^2= 0.150
Low	30.0% (12)	17.5% (7)	S = 0.70
Emprog: High	30.0% (12)	25.0% (10)	x^2= 0.606
Low	30.0% (12)	15.0% (6)	S = 0.43
Productivity:			
High	35.0% (14)	12.5% (5)	x^2= 2.824
Low	25.0% (10)	27.5% (11)	S = 0.09*

* Significance at 0.10, The figure in the parentheses are frequencies/no.of cases.

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However, the negative coefficients of the number of employees could be different in policy of hiring employee or other aspects of human resource management, or to different in style of management or organizational cultures. Future research should be examine in these topics. In other study, number of employees found not significant differences between founders and professional managers (Willard et al 1992). This contrast occurred because the study done by Willard et al (1992) used a sample from high-tech manufacturing firms which always used capital intensive. Whereas in this study, the sample was chosen from services or retailing industry which was used labour intensive. Storage capacity and number of years experience in petroleum industry are line with the preceding ones. This findings

support the findings from other researchers (e.g Hise et al 1983, Fisher 1992, Box et al 1993)

Table 8.12

Discriminant Analysis between Owner and Manager

Step	Variable entered	F to enter	Wilks' lambda	discriminant f. coef.*
1	OSHIPS	9.05	0.808	-0.90
2	CAPACITY	4.78	0.715	1.13
3	EXPETROL	3.88	0.645	0.67
4	STAFFNOW	4.01	0.579	-0.57

Note: * Eigenvalue = 0.73; canonical correlation = 0.65 (p = 0.0006); percentage of cases correctly classified = 77.50%

The result in Table 8.12 shown that number of employees again played the important role in differentiation between managers and owners. This suggests that the selection of the employees possessing certain characteristics which can have an effect not only on performance and productivity of the businesses but also on performance and productivity of the managers or owners. Thus, further suggesting that proper attention should be given to the recruiting and employee selection process. However, problem of selecting the appropriate employee becames the major problem in the industry especially in Malaysia because (1) local people were not willing to work as pump attendants any more and (2) the present

government's policy has discourage Malaysian employers to employed foreign workers in any sectors including petroleum retailing sector (Malaysia: The Star, September 30th, 1996).

The important of owner/owner-cum-managers and manager-not-owners can also be tested by using the regression model which was developed in the Chapter seven. From Chapter seven, we already developed the regression model for three performance measurements and one productivity measurement. A number of authors (e.g Sharma, Durand and Gur-arie 1981, Cronbach 1987, Box et al 1993 and Zahra 1996) advocate the use of moderated regression analysis when investigating contingency relationship since it allows the interaction terms to be explicitly examined. Moderated regression analysis was used since it suggested that relationship between individual variables and performance was moderated by an additional independent variable (McGee et al 1995). The reasons for choosing this analysis, (1) this analysis has been used very little in marketing-related studies, (2) it is an analytic approach which maintains the integrity of the sample (Sharma et al 1981) which out split the sample into subgroups, (3) partial F-tests for increments in R^2 for cross-product terms are valid even when the terms are correlated, thus minimizing the effects of serious multicollinearity (Cohen and Cohen, 1975 in McGee et al 1995). According to Chandler and Hanks (1994), this analysis suggests that the multiplicative interaction term should explain significant variance

above and beyond that explained by the original variables. This perspective can be represented in the following equations:

Equation from Chapter 7: $Y = a + b_1X_1 + b_2X_2 + e$.....(I)

Equation for this analysis: $Y = a + b_1X_1 + b_2X_2 + b_3X_1X_2 + e$.....(II)

From the equation I, if b_2 is not '0', X_2 is not a moderator variable but simply an independent predictor variable. From the equation II, if b_2 is '0' and b_3 is not '0', X_2 is a moderator variable. The F test is use to see if addition of one more variable to an existing multiple regression (from Chapter seven) will significantly increase the predictability of the crition (Jaccard et al in Chandler and Hanks 1994). According to Chandler and Hanks (1994), this step will effect the result of multicollonearity but Cronbach (1987) demonstrated that this is not a substantive problem. Dess and Priem (1995) suggest that introduction this analysis (three-variable model) will likely improve our understanding of the relationship between independent variables and performance and/or productivity.

Following the Sharma et al (1981) method for determining a moderator, the MANOWNER variable (Manager = '0', Owner = '1') was used and entered into the equation one, to determine if the variable is one of the predictor variables. At this step, there was no significant increase in r-squared, thus the MANOWNER was not a predictor. In the following step, the researcher tested the cross product of

MANONWER with each of the predictors in the equation and tested again using the step-wise regression analysis. The only cross product that give significant increase in the model was MANOWNER x EXPETROL, increasing adjusted r-squared from 0.92 to 0.93 and F test from 61.73 to 64.57. This is a very significant increase to 0.0000 level although this is very minimum increase. From this result, the MANOWNER give a significant impact on volume of litres sold. The results are shown in Table 8.13.

The second and third performance measurement and productivity measurement were also tested using the same step as first performance measure. In the sales of non-fuel products, the cross product between MANOWNER x BUILDUP increasing adjusted r-squared to 0.70 and F test from 14.00 to 16.07. From this result (Table 8.14), the MANOWNER also give a significant impact on sales of non-fuel products.

The third measurement is average annual increase in employment. In this analysis, the cross product between MANOWNER and STAFFNOW found to be moderator. The cross product increasing adjusted r-squared from 0.81 to 0.84 and F test from 34.84 to 36.81 when it entered into the regression equation. This is a significant increase ($p > 0.0000$). The results of the moderated model are shown in Table 8.15.

Table 8.13

Contingency Model of Firm Performance: Volume of Litres Sold

Volitre = 9.38 + 0.27 BAYS - 0.00007 EXPMONTH - 0.00006 INVENTORY - 0.28 OSHIPS + 0.06 EXPETROL 0.14 QUALITY + 0.08 SIZENP - 0.07 (MANOWNER X EXPETROL)

Predictor	S.D	t-ratio	sig t
Constant		23.72	0.0000
BAYS	1.32	7.37	0.0000
EXPMONTH	3717.94	5.43	0.0000
INVENTORY	2944.72	3.08	0.0043
OSHIPS	0.71	-4.20	0.0002
EXPETROL	3.10	1.36	0.1825
QUALITY	0.77	2.19	0.0361
SIZENP	0.68	1.12	0.2732
(MANOWNER X EXPETROL)	5.08	-2.60	0.0142

Multiple R^2 =	0.97
R^2 =	0.94
Adjusted R^2=	0.93
Standard error =	0.23
F-test =	64..57 (61.73)
Significant F =	0.0000

Table 8.14

Contingency Model of Firm Performance: Sales of Non-Fuel Products

SALENP = 5.99 + 0.16 STAFFNOW - 0.0000016 CAPITAL + 0.07 AGEM + 0.000086 BUILDUP - 0.002 AGEST - 0.08 HOPEN + 0.05 (MANOWNER X BUILDUP)

Predictor	S.D	t-ratio	sig t
Constant		6.81	0.0000
STAFFNOW	3.38	2.82	0.0038
CAPITAL	343028.36	-4.06	0.0011
AGEM	8.13	3.78	0.0011
BUILDUP	4705.68	3.16	0.0373
AGEST	3.00	-0.02	0.0574
HOPEN	3.89	-1.63	0.0856
(MANOWNER X AGEST)	10122.30	1.08	0.9168

Multiple R^2 =	0.86
R^2 =	0.75
Adjusted R^2=	0.70
Standard error =	0.74
F-test =	16.07 (14.00)
Significant F =	0.0000

The different result was found in analysis of equation 4. For productivity measurement, MANOWNER found to be predictor, increase the adjusted r-squared from 0.31 to 0.38 and reduce F test from 8.28 to 7.43. This is a significant increase ($p < 0.0005$). From this result, MANOWNER gives a significant impact on productivity. The results are summarized in Table 8.16. However, the sign is negative. The interpretation of the equation in Table 8.16, decrease in owners/managers variable is expected to increase the productivity. In other words, owners and/or managers should give some "freedom" for workers or their staff in term of work which they should do or don't. Further study should look at relationship between the workers and the managers/owners and the management style or approach use by the managers/owners.

According to Box et al (1993), the findings must be cautioned in interpreting or attempting to generalize. The clear observation from this finding, found that the different unit of measurement of performance and productivity given the different type of variable for the MANOWNER variables. In both objective and subjective measurement of performance, the MANOWNER variable can be categorized as a moderator variable. On the other hand, in terms of productivity measurement, the MANOWNER variable is found to become a predictor variables not a moderator. This may be an important finding, since remarkably no studies of firm performance and productivity have included owners and managers as a potential predictor or moderator.

Table 8.15

Contingency Model of Firm Performance: Average Growth of Employment

EMPROG = 2.00 + 0.024 STAFFNOW - 0.042 ISLAND - 0.00000006 CAPITAL + 0.003 EXPBEFORE - 0.002 (MANOWNER X STAFFNOW)

Predictor	S.D	t-ratio	sig t
Constant		32.68	0.0000
STAFFNOW	3.37	7.18	0.0000
ISLAND	0.57	-7.68	0.0000
CAPITAL	343028.36	-2.38	0.023
EXPBEFORE	4.40	2.42	0.021
(MANOWNER X STAFFNOW)	108.27	-2.11	0.042

Multiple R^2 =	0.91
R^2 =	0.84
Adjusted R^2=	0.81
Standard error =	0.18
F-test =	36.81 (34.84)
Significant F =	0.0000

Table 8.16

Contingency Model of Firm Productivity: Sales per Employee

P

VITY = 10.35 + 0.007 BAYS - 0.00000011 CAPITAL - 0.36 MANOWNER

Predictor	S.D	t-ratio	sig t
Constant		36.84	0.0000
BAYS	30.54	2.58	0.0138
CAPITAL	1811453.85	-2.25	0.0302
MANOWNER	59.79	-2.06	0.0464

Multiple R^2 =	0.61
R^2 =	0.38
Adjusted R^2=	0.33
Standard error =	0.48
F-test =	7.43 (8.28)
Significant F =	0.0005

In productivity analysis, MANOWNER is negatively correlated with productivity. This result confirmed the results in Table 8.11, where there were the differences between the managers/owners and productivity.

The owners and owner-cum-managers are found to be more productive than managers. Simplistic ally, owners/owner-cum-managers generate higher productivity because they are involved with day to day operation and feel that they have responsibilities to fulfill such as to motivate for further growth and development. This finding was parallel with a study done by Abdullah (1993) about small textile and clothing firms in Malaysia. As mentioned previously, one respondent stated, "This is my business, my income came from this business, my family also depends on this business, my workers also depend on this business and I know that I must do well in this business," while a second respondent commented, "My feet are already stuck in this business, I have no choice and my future depends how far I should go and they (employees) are important to me and my business".

After we discussed the important effect of managers and owners on the contigency model which included both internal and external environment variables, the next section will focus on the relative importance of both variables on the model.

8.5 A Comparison of the Relative Effect

The final stage of the analysis is to highlight the relative importance of the both environmental variables. Thus, the researcher compare the full model with the restricted models containing either the

internal or external environment. This method is presented by Kmenta (1971), utilized by Schmalensee (1985) and operated by Hansen and Wernerfelt (1989) and Kotha and Nair (1995). The researcher's analyses are consistent with procedures used by the researchers mentioned above but will be using the Fisher test rather than F-test (Hansen and Wernerfelt 1989) or chi-square test (Kotha and Nair 1995) because of the small sample. Specifically, the researcher determines the relative importance of a set of variables over another, by performing Fisher test involving both the full and restricted models. The results are shown in Figure 8.1, 8.2, 8.3 for the performance measures and Figure 8.4 for the productivity measures.

Figure 8.1 shows that the results for VOLITRE model. The restricted model containing the internal environment variables is a significant improvement over the base model (X^2= 25.07, 1 d.f, p = 0.000). Furthermore, the restricted model containing the external environment variables is also a significant improment over the base model (X^2 = 21.78, 1 d.f, p = 0.000).

The inclusion of both the internal and external environment variables improves the full model significantly over the internal model (X^2 = 21.78, 1 d.f, p = 0.000) and the external model (X^2 = 24.75, 1 d.f, p = 0.000).

Figure 8.1

Variance Decomposition Model:

Volitre for presence of factors effects

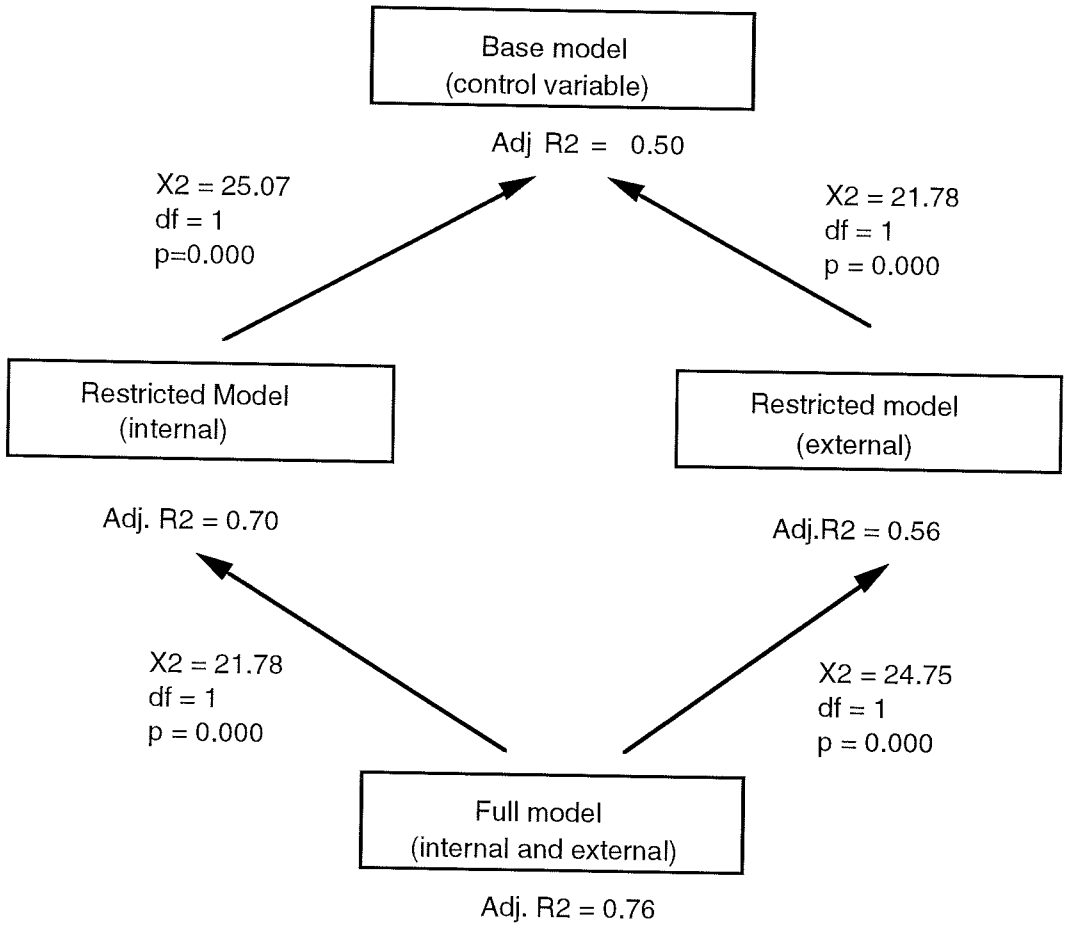


Figure 8.2

Variance Decomposition Model:

Salenp for presence of factors effects

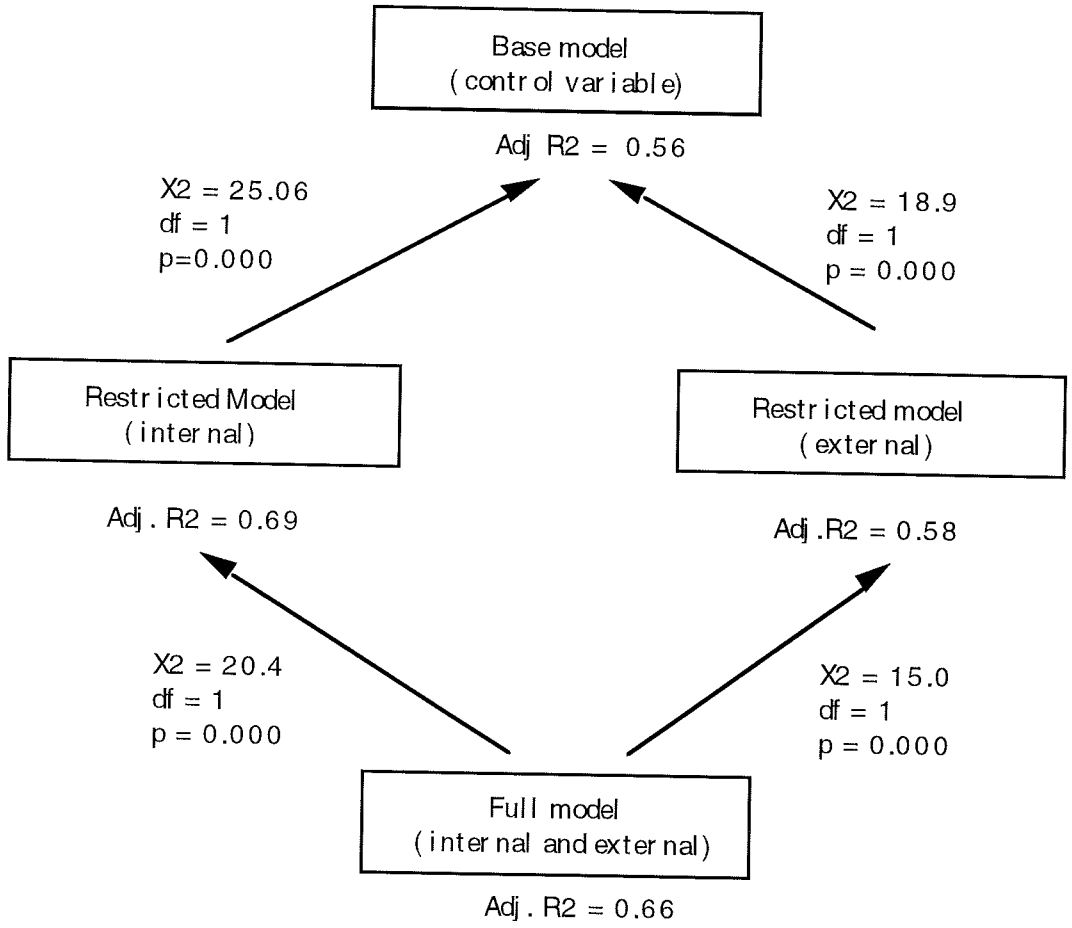


Figure 8.2 shows that the results for SALENP model. The same result was shown by the SALENP model. The restricted model containing the internal environment variables is a significant improvement over the base model (X^2= 25.06, 1 d.f, p = 0.000). The restricted model containing the external environment variables is also a significant impromen over the base model (X^2= 18.90, 1 d.f, p = 0.000). The inclusion of both the internal and external environment variables

improves the full model significantly over the internal model (X^2 = 20.40, 1 d.f, p = 0.000) and the external model (X^2 = 15.00, 1 d.f, p = 0.000).

Figure 8.3

Variance Decomposition Model:

Empgro for presence of factors effects

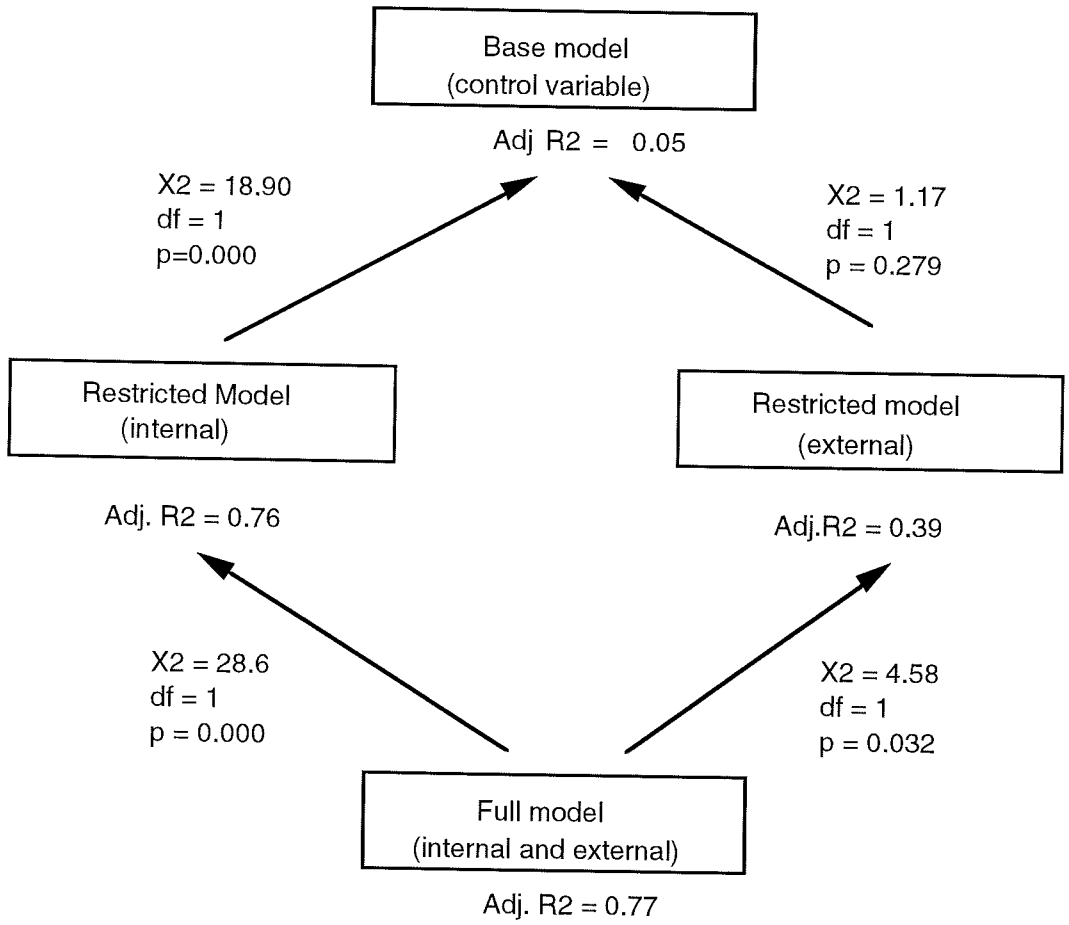


Figure 8.3 show the results for EMPGRO model. By including the internal environmental variables, they have significantly improved the restricted internal environment model over the base model (X^2 =

18.9, 1 d.f, p = 0.000). On the other hand, the restricted external environment variables improved over the base model but not significant (X^2 = 1.17, 1 d.f, p = 0.278). Whereas the full model is significant at 0.05 level over the restricted external environment model (X^2 = 4.58, 1 d.f, p = 0.032), it is a significant improvement over the restricted internal environment model (X^2 = 28.6, 1 d.f, p = 0.000).

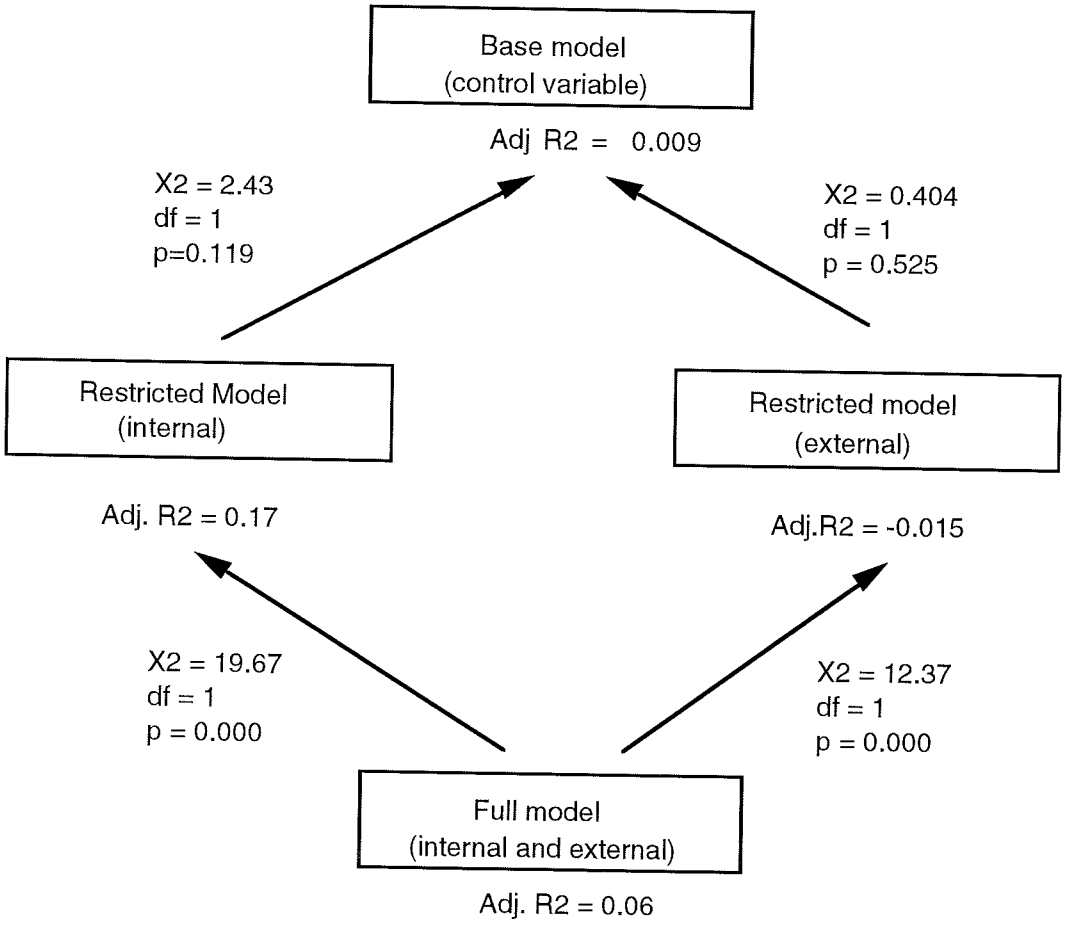
Figure 8.4 shows the results for productivity model. The restricted model containing the internal environment variables is not a significant improvement over the base model (X^2 = 2.43, 1 d.f, p = 0.119). Further more, the restricted model containing the external environment variables is also not significant improvement over the base model (X^2 = 0.404, 1 d.f, p = 0.525), even though it improves the value of R^2. The full model is significant improvement over both the restricted internal environment model (X^2= 19.67, 1 d.f, p = 0.000) and the restricted external environment model (X^2= 12.37, 1 d.f, p = 0.000).

Besides the internal and external environment variables, the researcher has included valuation variable made by the owners and managers as a control variable in all the models. The researcher find that the valuation made by owners/managers is negative and significant in the performance measurement but not in the productivity. This result indicating valuation does influence the performance. In productivity model, productivity valuation made

Figure 8.4

Variance Decomposition Model:

Pvity for presence of factors effects



by owners/managers was not included in the model because in the pretest, most of the respondents do not exactly know what is productivity all about. By using the performance valuation in productivity model, the result was not very encouraging, as shown in Figure 8.4.

These results suggest three important things. Firstly, performance in the petroleum retailing industry in Malaysia is impacted by both internal and external environment variables. Secondly, the relative effect of the internal environment variables are stronger than the external environmental variables in predicting performance. And thirdly, the models are approximately orthogonal, suggesting that these are indeed two independent effects.

Next, we discuss availability, reliability and validity because it is important to the new research like this one which was done in developing country.

8.6 Measures of Availability, Reliability and Validity

In this study, the researcher measured performance using three different measures and one measurement for productivity. According to Chandler and Hanks (1993), the most relevant performance dimensions are those used by owners or managers to drive business decision making. The researcher used two approaches to identify the most relevant performance measures. First, the researcher used both objective and subjective measurement to compare which the one that can describe the best measurement for performance. Second, the researcher have compared owners and managers regarding the important variables which have impact on their performance and productivity.

In term of availability, the performance and productivity measures were assessed by comparing disclose rates with respect to the percentage of managers/owners responding. As discussed in Chapter four and five, a major issue in measuring performance is the willingness to disclose information. In this study, only one respondent from 45 respondents is not willing to give information and excluded from the analysis. Ninety seven per sent provided information on the three performance and one productivity measure. Overall, the researcher was satisfied with the percentage in the response.

After comparing availability and reliability of the measurements, the researcher evaluated the validity of the measures. If firm performance measures are to be useful in studying the performance of emerging businesses, it is important that they be externally valid (Messick 1978 in Chandler and Hanks 1993). According to Chandler and Hanks (1993), evidence for the external validity can be provided when the constructs in question are correlated with external variables (which have been shown by previous research). Therefore externally valid firm performance and productivity measures should be correlated with independent variables suggested by previous research.

Regression analysis can provide evidence of relationships between the measures of performance and independent variables that have been shown by previous research (Chandler and Hanks 1993). In this

study, the researcher already choose the independents and dependents variables that have been related to in previous studies as discussed in Chapter four and five. From Chapter seven, characteristics of managers/owners, firm, location and competitive provide evidence of external validity. All sets of variables have been shown to be related to defined measures of firm performance and productivity. The correlation between the independent variables range from r = - 0.48 to r = 0.52. From the results, scale intercorrelations are high and can be distorted by problems associated with multi-collinearity.

However, the problems were minimized by other methods which have been shown in Chapter seven. The independent variables are related to performance and productivity measures and the value of R^2 were higher compared to recent research (e.g Kotha and Nair 1995, Lussier 1995). This showed that the internal validity was proven. The results also show that the independent variables significantly related to performance change as the definition of performance changes. These findings have implications for research that will be discussed in more detail in the next chapter.

8.7 Summary and Discussions

This chapter has discussed the variables that were thought to be important in determining the service stations' productivity. The

findings from productivity measures indicate that only internal environmental variables played significant roles in the productivity of service stations. Only two variables out of thirty nine variables explaining the variations in productivity. The stepwise model found that the following factors were most significant in the analysis: amount of capital invested in the business and number of bays. Therefore, the study concludes that these factors are the most important in the productivity of the service stations in Malaysia. In this analysis, the independent variables were not able to account for 69 per cent of variations in the productivity. As mentioned above, the two variables which were explained the variations are the number of bays and the amount of capital invested in the business and both were categoried in the store characteristics. This also give the evidence that the store characteristics were very important not only in performance but also in productivity. These findings point to the store characteristics as being very important to predict the best performer and the high productivity of service stations.

In the analysis of bivariate correlation, the results are consistent with the results produced by performance measurements. There are same variables found in performance that are not significant in the expected sign. The variables were year experience in petroleum industry, number of competitors which have same brand name and amount of capital invested in the business. The earlier part of the empirical analysis in this chapter has demonstrated the application of the regression models. Since the regression model adopted in this

study has the similar advantage, a similar explanation for this may be appropriately referred to the concluding section of Chapter seven.

This study has allowed us to identify a few factors that characterize service stations from their performance and productivity. The analysis follows four important steps - factor analysis, cluster analysis, discriminant analysis and cross-tabulation (Fisher exact test and chi-squared analysis). Besides that the moderated multiple regression has also been used to analysed the effect of manager-/owner variable in the regression model. While performance or productivity has been the subject of several previous studies, this is the first to address the combination between the two in developing countries like Malaysia.

In the factor analysis, there is evidence found that the variables can group together in terms of firm characteristics. However, the analysis is not strong enough to obtain the classification. In order to obtain a classification of service stations, cluster analysis was used to group similar stations. The cluster analysis conducted in this study identified three "type" of service stations characterized by internal and external environmental variables. From this analysis, all the stations were grouped into "good", "average" and "poor" and the researcher called them with "the smalltime", "the survivor" and "the prominent" according to their grouping attitudes. The results from this analysis also suggest that "big" stations in term of space, services

and employees were doing better in both performance and productivity.

The discriminant analysis established a few important variables in determining the differences between managers and owners. The researcher found that differences in ownerships, station's capacity of petroleum storage, past experience in the industry and number of employees have important implications to measure performance and productivity between managers and owners. The chi-squared analyses identified significant differences between the "type" of service station and objective measurement of performance but not in subjective measurements (when ratio measurement was used). This result supported the finding in Chapter seven, stated that objective measurement is more appropriate to use in performance and productivity studies.

The contingency model (developed in this chapter and used for testing moderator in this chapter also) is a first step in the direction of creating an empirically based explanatory model of performance and productivity. This study suggests the importance of owners and managers with respect to the performance and productivity. Although in this study, there is no significance found in performance, the effect of managers/owners as a moderator is very important. According to Sharma et al (1981), type of moderator influences the "strength" of the relationship and the strength of the relationship between dependent and independent variable will depend on the

size of the error term. In other words, the greater the error, the smaller the degree of relationship and vice versa. In performance measures, owners/managers hold important implications for understanding and predicting performance because the owners/managers will affect the impact of any independent variables towards performance. However, in productivity, owners/managers were acting just like other independent variables.

The performance and productivity measures operationalized in this research have good availability, reliability and external validity. Evidence of the external validity of the measures is provided by regression analysis showing independent variables identified and substantiated by previous research to be related to performance and productivity.

In comparison to the relative effects between internal and external variables, the study suggests that the relative effects of the internal variables are stronger than the external variables. This finding confirmed the earlier finding in the study, shows that the internal environmental variables were more significant and important variables investigated in the study in relation to the performance and productivity of the service stations using the multiple regression analysis.

Throughout, this study has focused on one input, labour and its productivity variables. This is due to the fact that labour is likely to

be the only variable factor available to a retailer, especially service stations in Malaysia where they are still in labour-intensive, this focus on labour productivity appears justifiable. However, the approach taken in this study could be easily extended to several inputs if the data are available. On the other hand, one way to determine sources of measured productivity would be to incorporate consumer, retailer and labour variables. The customer characteristics include, for example car ownership and education; variables that measure competitive on the retailer might be cost cutting; and variables that might make labour more or less productive, such as age, education, part- vs full-time. In short, added variables are needed if the valid methods of productivity measurement for retail firms want to be improved or developed. Furthermore, in order to the extent that these findings can be generalized to other developing countries, future study should stimulate comparative studies.

In this study, the researcher employed multivariate analysis techniques to understand the impact of internal and external environmental variables on productivity. It is important to remember that the model's recommendation must be viewed directionally rather than applied to a given situation. Management judgment is still needed when applying the model. For example, the study found that the number of bays has a greater impact on productivity. However, the model does not define specific number, five or six or how many bays are sufficient for each station in order to achieve high productivity. On the other hand, the use of proxy

variables to measure several concepts introduced deficiencies in the studies cited (Ingene 1982), as well as in this study. The model could be greatly improved by more precise measurement. On the other hand, it is difficult to obtain accurate data for developing countries, as exact statistics on retail activities are usually not avaiable.

The next chapter will discuss with further details about the overall findings and summary of the exploratory studies which have been presented in Chapter seven and this chapter.

Table 8.1

Correlation Coefficients between "PVITY" in the Petroleum Retailing Characteristics

Independent Variables	Expected sign	Pearson Correlation Coefficient (r)	Level of Significance of 'r'
AGEM	+	0.2923	0.067*
CHILDREN	+	0.2270	0.159
EXPBEFORE	+	0.2067	0.201
EXPETROL	+	-0.1810	0.264
HSTAY	+	0.3034	0.057*
LEVELE	+	0.2685	0.094*
MARITAL	+	0.0861	0.597
NUMCOB	+	0.0525	0.748
NUMCOA	+	0.1030	0.527
SEX	?	0.1550	0.340
YEARE	+	0.2532	0.115
AGEST	+	0.0245	0.881
BAYS	+	0.3196	0.044**
BUILDUP	+	0.2486	0.122
CAPACITY	+	0.3313	0.037**
CAPITAL	+	-0.4440	0.004***
EXPMONTH	+	0.2633	0.100*

HOPEN	+	0.2366	0.142
INVENTORY	+	0.2345	0.145
ISLANDS	+	0.2199	0.173
NUMS	+	0.2091	0.195
OSHIPS	-	0.0047	0.977
PUMPS	+	0.2925	0.067*
STAFFNOW	+	0.1610	0.321
DISTANCE	-	0.2048	0.205
LANDVALUE	+	0.2118	0.190
NUMNP	-	-0.0603	0.712
NUMP	-	0.0734	0.653
QUALITY	+	0.3958	0.011**
SIZENP	?	0.2850	0.075*
SIZEP	?	0.1792	0.269
TOTSP	?	0.0319	0.845
SALARY	+	0.2818	0.078*
BRATE	+	0.2413	0.134
CUSTOMER	+	0.1950	0.228
LOCATION	+	-0.0052	0.974
NEIGHBOOR	+	0.2035	0.208
ROADL	?	0.2676	0.095*
TRAFFIC	+	0.1947	0.229

Note: *** significant with level of 0.001,

** significant with level of 0.05

* significant with level of 0.10

+ =positive relationship, - =negative relationship

? =indicate that the reviews does not provide any strong expectations as to sign

All variables was tested by 2-tailed

Table 8.4

Results of the 2-stage Least-square Regression Analysis Dependents Variables-Productivity

	Dependent variable: Sales per employee			
	Base (1)	Internal (2)	External (3)	Full (4)
Constant	10.26***	9.19***	10.35***	9.19
	(0.34)	(0.07)	(0.39)	(0.63)
Valuation	-0.009	-0.02	-0.03*	-0.002
	(0.02)	(0.02)	(0.02)	(4.0×10^{-3})
Internal:				
EXPBEFORE		-2.80×10^{-4}		-2.0×10^{-3}
		(3.0×10^{-3})		(4.0×10^{-3})
NUMCOB		4.0×10^{-3}		-5.0×10^{-3}
		(0.01)		(0.02)
NUMCOA		5.0×10^{-3}		4.0×10^{-3}
		(8.0×10^{-3})		(0.01)
SALARY		1.4×10^{-4}		9.01×10^{-5}
		(8.4×10^{-5})		(1.20×10^{-4})
BUILDUP		-1.98×10^{-7}		-4.48×10^{-7}
		(2.44×10^{-6})		(3.84×10^{-6})
INVENTORY		9.25×10^{-7}		-4.46×10^{-6}
		(4.60×10^{-6})		(7.53×10^{-6})
STAFFNOW		-0.02***		-0.02*
		(0.007)		(0.01)
BAYS		0.03**		0.03**
		(0.01)		(0.03)
ISLANDS		0.02		0.03
		(0.02)		(0.03)

External:				
TRAFFIC			5.70×10^{-6}	-1.54×10^{-5}
			(1.42×10^{-5})	(2.42×10^{-5})
LOCATION			-0.007	-0.01
			(0.01)	(0.01)
NUMP			0.02	0.02
			(0.02)	(0.02)
NUMNP			4.82×10^{-5}	4.02×10^{-4}
			(8.00×10^{-3})	(0.01)
DISTANCE			2.52×10^{-4}	4.22×10^{-4}
			(0.001)	(0.002)
SIZENP			0.02	0.002
			(0.02)	(0.02)
SIZEP			0.01	0.002
			(0.01)	(0.03)
Adjusted R^2	-0.02	0.17	-0.02	0.07
F-test	0.34	1.81*	0.93	1.17

Note: *** significant with level of 0.001,

** significant with level of 0.05

* significant with level of 0.10

Standard errors in parentheses

Table 8.6

Standardization of service stations characteristics using a quartimax rotated principal components analysis

Varia-bles	Factor 1	Factor 2	Factor 3	Factor 4	Factor 5	Factor 6	Factor 7	Factor 8	Factor 9	Communality
NUMS	0.86									
INVE	0.83									
HOPE	0.82									
STAF	0.81									
LAND	0.79									
ISLA	0.76									
EXBE	0.74									
HSTA	0.73									
EXPM	0.70									
PUMP	0.69									
BAYS	0.66									0.80
YEAR		0.94								
LEVE		0.89								
TRAF		0.61								
AGEM		-0.60								
SALA		0.46								0.70
EXPE			-0.83							
CAPA			0.71							0.77

TOTS				0.76						
CAPI				-0.62						0.88
CUST					0.77					0.77
ROAD						0.81				
NUMC						-0.47				0.76
SIZN							0.66			
BRAT							-0.57			0.79
SIZP								0.86		
BUIL								-0.62		0.82
LOCA									0.84	0.78
Eigen value	8.79	3.55	2.49	1.69	1.30	1.25	1.18	1.17	1.02	22.4
% v/ce	31.4	12.7	8.9	6.0	4.6	4.5	4.2	4.2	3.7	80.2

Table 8.7

Cluster Characteristics of Service Stations

Variables	Cluster 1 "Poor" (Smalltime)	Cluster 2 "Average" (Survivor)	Cluster 3 "Good" (Prominent)
AGEM	34.2	38.8	43.6
CHILDREN	2.2	3.8	4.3
EXPBEFORE	1.0	3.0	7.9
EXPETROL	4.5	1.3	1.3
HSTAY	4.0	7.7	10.2
LEVELE	3.5	3.4	3.7
MARITAL	1.0	1.2	1.2
NUMCOB	1.8	1.6	1.7
NUMCOA	0.0	0.8	1.3
SEX	1.0	1.2	1.0
YEARE	12.0	11.3	11.9
AGEST	3.7	5.6	5.1
BAYS	5.2	6.6	7.5
BUILDUP	12,250	14,441	17,000
CAPACITY	55,250	87,529	100,157
HOPEN	13.0	15.7	20.3
INVENTORY	2,875	4,705	8,173
ISLANDS	3.5	3.8	4.4

OSHIPS	3.5	2.0	2.2
PUMPS	8.0	7.6	11.3
STAFFNOW	4.5	6.8	11.4
BRATE	20.4	24.9	26.1
CUSTOMER	2.7	3.0	2.9
LANDVALUE	1,150,000	877,058	1,684,210
LOCATION	4.0	3.2	2.6
NEIGHBOUR	2.5	2.5	2.6
ROADL	2.0	2.6	2.6
TRAFFIC	1,103	926	1,430
DISTANCE	3.1	4.1	6.0
EXPMONTH	3,750	6,264	10,657
NUMNP	2.7	1.7	1.9
NUMP	0.5	0.8	0.8
NUMS	3.2	5.0	7.3
QUALITY	1.2	2.4	2.0
SALARY	352	395	439
SIZENP	1.2	1.6	1.9
SIZEP	1.5	1.6	1.9
TOTSP	1.0	2.0	1.3
Number of stations in the cluster	4	17	19

CHAPTER NINE

CONCLUSIONS AND RECOMMENDATION

9.1 Introduction

Performance and productivity are two important aspects in retail business today. There are many parties interested in performance and productivity according to their own interests. The investors, the shareholders, the customers, the suppliers, the competitors or even their own staff are also interested with firm performance and productivity. Many governments are also interested to find out the overall performance and productivity for the own country for many reasons. In Malaysia, the government has already set-up a centre for productivity and the Ministry of Finance have a unit for monitoring the overall performance of industries in Malaysia.

However, there are so many variables or factors that can have an impact on performance and productivity. Retailers are facing so much data and information but they are also facing the problem of choosing a combination of decision making processes in their efforts to achieve good performance and high productivity. In recent years, Malaysian Government and businesses are more concerned about these two aspects. This concern is shown being the interest among policy makers at federal levels for government and board levels among managers/owners. Thus, there will be increasing interest in identifying the variables or factors associated with the conduct,

performance and productivity of firms and relationships among those factors.

However, from the literature reviews in Chapter four, the researcher concluded that the measurement problems are present in any study of performance and productivity. Further more, in developing countries such as Malaysia, it is difficult to obtain accurate data and statistics on performance and productivity of the industries usually are not available. In this study, the researcher is, of course, limited in terms of available data and comparability of the units of measure. The researcher found that an operational definition of performance and productivity also has been elusive and much debated. In Chapter four, has been discussed in some detail, one of the troublesome problems associated with performance and productivity measurement. For the purpose of this study, the researcher assumed that a considerable amount of theorizing and empirical research has been done on the correlates of performance and productivity.

Given all these conditions, the included variables in this investigation was approached with measures that would be obtainable, consistent across units in the study population, and reasonable approximations of the model's elements. Thus, in the study of performance and productivity, it was hypothesized that both measurements could be expressed as a function of a set of independent variables standing in a reasonable proxies for components of the general model. The researcher has adopted a

model suggested by Ackoff (1970) and Hansen and Wernerfelt (1989). They expressed that performance as a function of a set of controlled or strategic variables and noncontrolled or environmental variables. The researcher also followed observations by Cottrell (1973) and Acar (1993), who argued that factors affecting performance may be viewed in factors related to the external and internal environment. The researcher assumed that productivity also will follow the same concept as performance. At the end, the researcher used both models for the purpose of the study.

Consequently, this study has also tried to analyse and answer the problems faced by the retailers above. The aim of this study is to suggest a multi-dimensional approach to understanding the effect and impact of variables by providing empirical evidence which can describe firms from their performance and productivity. However this approach can be viewed in terms of how quickly the owners and managers can adapt and learn from the experience of dealing with the two environments (internal and external) within which the firm does its business.

Having stated the required conceptual clarifications in Chapter Five and the research's main hypotheses in Chapter Six, the study focuses on the elaboration of the following objectives as previously mentioned in Chapter One: firstly, to determine the aggregate impact of the independent variables on the performance and productivity measures; secondly, to identify the effect of major

groups of predictor variables on the performance and productivity measures; thirdly, to identify those individual independent variables which have the greatest impact on the measures of performance and productivity; fourthly, to find out any differences between the owner and manager in an effort to achieve best performance and high productivity; fifthly, to develop several conclusions as to the value of using these independent variables to predict unit performance and productivity; sixth, to identify different "types" of service stations and what differences between them towards performance and productivity; last but not least, to formulate some recommendations regarding a marketing strategy that chain store executives should consider in their efforts to improve the performance of their retail stores. The first six objectives were addressed in the previous chapters of the thesis. The last objectives will form the basis for this final chapter.

This chapter summarises the study and its findings (from Chapter seven and eight), draws conclusions, points out implications for both practitioners and academics and evaluates the limitations of the work.

9.2 Summary and Synthesis of the findings

This is an exploratory study with a relatively small sample size. Nevertheless, the findings are broadly consistent with those presented

by other researchers who have attempted to analyze the diverse range of interrelated factors associated with performance and productivity. This study suggests that a variety of factors - related to the external and internal characteristics and work in "combination" and together they influence the performance and productivity of petroleum retailers.

This section of the chapter recapitulates the findings from both primary and secondary research. As the findings have been summarised at the end of the relevant chapters and in the interests of conclusion, the discussion that follows does not go over the results with respect to differences in performance and productivity.

9.2.1 The measurement problems

As mentioned previously, measurement problems are present in any study of performance and productivity. A wide variety of performance and productivity measures have been reported in the literature. However, based on limitations of data and information about retail industry in Malaysia, performance and productivity was viewed as dependent upon factors representing "stay" (volume of litres sold), "survive" (volume of sales of non-fuel products) and "success" (average employment growth) and productivity (volume of sales per employee) in this study. Although other measures might be preferable, these were viewed as reasonable approximations given

data limitations. In particular, these measures were based upon nonproprietary data available to the interviewed personnel.

On the other hand, the researcher has not suggested that only the measurements mentioned above are suitable for petroleum retailing industry or in other retail sectors. A measurement technique that considers only one or a few of the resources used may result in limitations and potentially inaccurate performance and productivity measurements. However, by combining measures of performance and productivity, a better understanding of retail sector could be gained, thus enabling better decision-making for store managers and owners. For example, the station with low performance but high productivity could be advised to lay off some personnel, while the station with high performance and low productivity actually could gain from employing more staff.

As discussed in Chapter Eight, sales-based measures of labour productivity do not always provide dependable guidelines for retail managers or owners. According to Magi and Julander (1996: page 40), the core problem is that these measures do not measure productivity in isolation, but contain information on external efficiency, i.e how the firm's offer is received by the market, as well. In the researcher's opinion, when such different types of information are combined into ratios, it becomes very difficult to interpret them.

Furthermore, the lack of results in productivity in this study does not imply that managers or owners should stop all efforts concerning productivity improvements. Productivity program-mes should be considered with greater care. Managers and owners should learn more about the overall concepts of productivity because past studies found that they do not understand the significance and the impact of productivity on the businessess and are still confused about the meaning and measurement of productivity.

Lastly, it has to be recognized that a satisfactory measurement for performance and productivity in retailing remains elusive. An encompassing theory to explain performance and productivity in retailing needs to be developed. With the discrepancies among studies, further model testing is needed to provide reliability and validity. However, the evidence presented in this study confirms the view that we should be exploring frameworks that better describe the heterogeneity within the retailing sector.

9.2.2 The importance of internal and external environmental variables

Based from previous studies, two variables from each environment were selected. The purpose of selecting limited number of catogeries is to overcome difficulties associated with extreme outliners. The internal environment consists of manager/owner characteristics such

as age, experience and other personal characteristics; and store or firm characteristics such as years in business, number of employee and so on. The external environment includes location characteristics; for example, traffic volume, population, type of neighboorhood and type of location and competitive characteristics such as number of competitors, size of competitors and quality provided by competitors and etc.

The findings presented in this study indicate that both internal (in this study represented by owner/manager and store characteristics) and external (represented by location and competitive characteristics) environmental variables played significant roles in performance and productivity of service stations in Malaysia. Interestingly, while both internal and external environmental variables are significantly related to performance, only internal environmental variables can predict the productivity. In other words, internal environmental variables are better predictors of performance than productivity in this industry. On the other hand, it is also possible that the lack of significant relationships between external environmental variables and productivity occurs because sales of petroleum and non-petroleum products at the service stations are influenced by sources of competitive advantage other than those investigated in the study, such as location and store characteristics. On the other hand, consumers seem to be more loyal to certain types of firms. This is true for this study when there is a significant on

performance between two same brand station situated near each other.

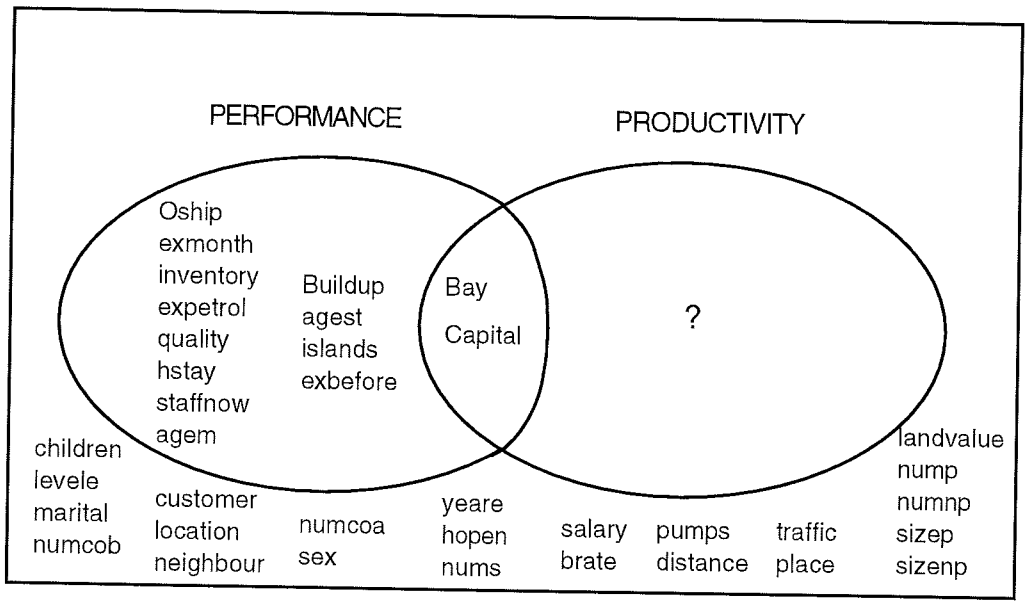
However, all the variables selected in this study were selected from previous studies. From the findings, some of the variables were lost their significance when applied to Malaysian context. This study in which measures of performance and productivity of service stations were used are limited, mainly because the data were difficult to obtain and small sample size were used. In this study, different combinations of variables are associated with each of the performance and productivity measures, suggesting that multiple indicators should indeed be used in studies of this type. The significant and insignificant variables found in this study are shown in the Figure 9.1.

From the Figure 9.1, there are variables that can give an impact on both performance and productivity. There are also variables can give impact on performance but not productivity. However, this study fails to identify the variables which could give an impact on productivity but not performance. The variables considered here do have the advantage of being visible and relatively easy to assess by owners, managers, entrepreneurs and advisors. However, future studies are needed to uncover and highlight further the roles played by the internal and external environment in explaining performance and productivity. According to Cooper et al (1994: page 393), future research can move beyond these easily accessible variables to

examine spesific skills, behaviour, and cognitive processes that theory suggests may be related to performance and productivity.

Figure 9.1

The Venn Diagram



Significant and non-significant variables in the study

9.2.3 Marketing Strategy and Implementation

The characteristics found in the study suggest that marketing strategies can be instituted and manipulated by the managers or owners. As previously mentioned, manager/owners charac-teristics and store characteristics were the more powerful in predicting service stations performance and productivity compared with location and

competitive characteristics. For instance, the impact of services provided by the service stations such as inventory, bays, islands and pumps suggests that service station management need to ensure that all kind of services offered to customers are of an adequate interms of stocking, quality and product lines.

Checkout systems linked with all services and products are likely to be helpful in stations for increasing the efficiency. In other words, the stations must be bigger in terms of size and number of services provided. Similar significant findings of effects of larger size were reported by various studies as mentioned in Chapter five. Size suggested in the study can be represented by number of employees, capital outlays, number of services offered to customers, built-up area, number of bays, pumps, islands and capacity of inventory for both fuel and non-fuel products. In the researcher's opinion, the most prominent strategy with size to develop a convenience store format. This format can form in various ways depend on operator, location and site type. Further this form does not necessarily follow one single set of pattern.

This study also finds that number of employees were found to be an important and positively influence on performance and productivity of service stations. This finding suggests that service stations management needs to consider whether their station is employing a sufficient number of employees to handle customer checkout, to accommodate peak periods of customer traffic, to maintain adequate

inventory levels, and to serve all kind of services provided. For oil companies, hiring policies should also be implemented to focus upon prospective managers with good attitute towards business, having an experience before in business, mature and willing to work hard with long hours.

Although location and competitive characteristics were less powerful in predicting service stations performance and productivity, but they are needs to be considered in assessing the potential performance and productivity. For location, management can have an influence before they make any decisions. Results of this study indicated that locating stations nearby with competitors is advantageous. A possible reason for this result is that the "clustering" of service stations increases the level of comparison in services, type of product offered and other factors affecting store patronage decisions.

However, in certain places or locations such as sub-urban and motorway, competition sould be avoided. Thus it appears that stations located in sub-urban were heavily dependent on the neighboorhoods. However, the number of neighboorhoods was small in the sub-urban areas. On the other hand, stations situated on the motorway were dependent only on commuters and majority of them, do not have a neighboorhood.

9.2.4 The Influence of sole operator status

On the other hand, one of the main objectives in this study is to test for differences between managers and owners on performance and productivity. Results from this study provide little support that the performance and productivity of owners would be greater than managers. Differences were found to exist between owners and managers, but only on productivity ($p > 0.10$). However, our results also indicate that owners score higher (in terms of percentage) than managers in all productivity and performance measures. As for the relatively better performance and productivity shown in the service stations, two explanations may be extended. Firstly, the selecting process for ownership by the oil company is based on merit and this could account for the main difference as compared to a less rigorously selected somebody as manager by the owner. Secondly, it could be assumed that the owner is also motivated to ensure a good performance in the station which he or she operates. Since his or her personal income will depend on the progress of the service station. However, an assumption of low motivation or low interest among managers need to be more carefully investigated in the future.

Another issue highlighted by this research is that the influences of owners and managers on performance and productivity. Our research has suggested that there were differences between service stations managed by owners or managers. Owners and managers were significantly correlated with productivity and were uncorrelated with

performance. On the other hand, owners and managers appear to moderate or influence the relationship between the predictors and performance.

From a managerial perspective, any decisions made by owners or managers will affect the whole firms directly or indirectly. So that, oil companies should give proper attention to the recruiting and employee selection process for both dealers and managers. A comprehensive selection process should be drafted and immediate implementing by the oil companies is necessary. This study also suggests that owners-cum-managers were most important "personnel" because many studies found that the high-performing firms were guided by owners-cum-managers (e.g Begley and Boyd 1986,1987; Willard et al 1992). Even Drucker (1985) acknowledges that most people can do both entrepreneurial and managerial work.

Why is there so little differences between owners and managers on performance and/or productivity? Several explanations are possible. The financial indicators (performance measures) used in this research are based on self-report data, which cannot be checked for accuracy. Confidential reports can be derived from annual income tax but it very hard to get in Malaysia and the accurate statement can be questionable. However, it is fair to assume that many filers attempt to minimize taxable income rather than to present an accurate statement of income. Another explanation is that the statistical analysis used in the study. This study based on small

samples, only limited appropriate statistical tools are used to analyze the data. The results may be different when using the large data with high degree of statistical analysis tools such as other types of multivariate analysis. Further more increased total sample size will permit a more reliable statistical interpretation of the contingencies of high and low performing and productive stations.

Finally, advanced management practice, using enhanced performance and productivity measurement techniques, could enable retail managers to meet the challenges of an increasingly competitive market more effectively.

9.2.5 The influence of research methods

A multiple regression analysis and 2-stage regression analysis were conducted in order to examine postulated relationships between performance and productivity and the specified set of independent variables. Chi-square and Fisher test were also performed for differences between the two sample groups (e.g owners and managers, low-performers and high-performers). As mentioned previously in Chapter seven, these methods were chosen because the traditional method of performance and productivity measurements have suffered from an excessive subjectivist analysis and an inability to consider simultaneously the impacts of multiple variables. Further more, it is important to remember the the model's recommendation

must be viewed directly rather than applied to a given situation. On the other hand, the results are purely exploratory and generalizations must await further replications based on larger sample sizes.

As was outlined in Chapter six, survey research, upon which this study is based, is plagued by the whims of self-reporting. Although for general studies, the researcher felt that it will have to rely largely on this method, perhaps it is possible to focus on narrowly-defined areas such as a more longitudinal approach. Further, the researcher wished to carry out a sectoral study because there is a much greater opportunity to estimate the population size and have an opportunity to use an accurate up-to-date sample frame.

Furthermore, greater attention should also be paid to the measurement of the importance of produce data which is more amenable to parametric statistical analysis. Refinements such as these were not possible in the current study because of the nature of the research, the state of knowledge at the time and space restraints on the questionnaire.

Although methodology and statistical limitations may have influenced the findings of the study, an alternative explanation is that different combinations of variables are found associated with each performance measures. These findings suggesting that multiple indicators of performance and productivity should be used in studies of this type. For example, some executives may pay more attention to

sales growth than volume of sales. As a result, this attention may gear their actions accordingly. Furthermore, the combination of both a quantitative and a qualitative methodological approach to the research proved valuable. The personal interviews not only provided an important means of expanding but also they were highly supportive of the results.

However, this research has some inherent weaknesses with methodology. First, the data were cross-sectional. Although the cross-sectional design captures relatively strong relationships between environmental variables and performance and productivity, the evidence is correlational rather than causal. As mentioned before, the longitudinal study will be suitable in order to imply causality. Second, the data may suffer some restriction of range. There is some evidence that stations are not adequately represented in the sample because stations represent a limited geographical area. As mentioned earlier, future research should seek to deal with the geographical limitations present in this study.

9.2.6 Theoretical Implications of the study

Overall the findings in the study have important implications for the theoretical debates and the study of the performance and productivity of small businesses and retailers especially in developing countries. The performance and productivity of individual chain

stores is not merely related to the external factors but also to the internal dynamism of chain stores themselves. Since the findings verify many empirical studies carried out in the developed countries, they are important to have a place in the theoretical debate. It is extremely pivotal to include these variables in the overall discussion as part of the wider theoretical explanation. This is one of the reasons why retail experts integrate these both variables as among the key elements in the development of individual chain store units or small firms. It is hoped that from this emerging recognition of the important internal and external factors for the success of retailers that much more empirical studies will be carried out elsewhere in developing countries.

Notably, there is a need to refine the conceptual and operational definitions of performance and productivity especially in retailing sector. Field studies and surveys can help to identify additional components of performance and productivity in retailing. Also, understanding the strucure of the relationships among the variables requires further exploration. Defining this sequence can inprove our understanding of the interplay between performance and/or productivity within specific environments. More multiple indicators of performance and productivity could be used for this purpose. Subjective measurement of productivity also needs to be developed.

Based on our findings, a few background variables such as sex and education of the owners/managers should not be considered as

priorities or important variables in performance and productivity. The study has proven that they have no influence on the performance or productivity of the individual chain stores. Nevertheless, some consideration should be given to the age and experience of the owners/managers and the firms which have a "bigger" station. In particular, owner-cum-manager with more experience either in general business or in the same industry as well as sufficient number of employees may be accountable for such consideration. This is due to the fact that service stations are likely to have the technical and managerial capacity to produce and market their products. However we cannot expect that it came from the relatively inexperienced entrepreneurs but from those who have sound business experience as well as having the requisite access to capital and/or human resources with a greater vision for future markets.

Finally, the present model hypothesizes several determinants of retailers' performance and productivity. This model is developed from variety of theories such as in strategy, entrepreneurship and organization theory. It provides a novel formulation of relationships among owner/manager characteristics, store characteristics, location characteristics and competitive characteristics and performance and productivity outcomes. The researcher hopes that it will inspire further development and extension of theory base in the retailing, for it is only with a solid grounding in theory that empirical research can proceed in a meaningful fashion.

9.2.7 Policy Implication

The Malaysian Government has stated its strong commitment and interest to the promotion of small firms in attempting to tap their potentialites within the overall industry strategy. This can be seen clearly in the five years of national plans from the first (1965-1970) until the seventh (1996-2000) and the industrial master plan (1986-1995). Further more, government has already set-up a centre for productivity called as National Productivity Centre (NPC). Ministry of International Trade and Industry (MITI) and Ministry of Finance, were working together and monitoring the performance of all sectors in Malaysia.

However, the government policy toward small firms has not been translated into effective action. Results from few studies (e.g Mahmud 1977 and Abdullah 1993) concluded that the effectiveness of the agencies involved in trainning and developing the small firms was limited, overlapped and fragmented. To ensure the effective implementation of any policy, MITI, Ministry of Finance and Ministry of Consumer Affair and Internal Trade should establish a separate agency with specific and more powerful task to promoting small firms. These agencies also need a strong authority with more legislative power and financial resources at the national level and need to be fully coordinated. Our findings show that financial resources is one of the main problems faced by the small firms especially in the petroleum retailing sector.

From this study, several variables associated with performance and productivity are amenable to policy intervention. First, the government can encourage the formation of new buildings, modern outlets with high quality facilities, large volume petrol stations that have higher performance and productivity than new and small stations. This can be achieved in the long run by introducing better fiscal and non-fiscal incentives for exploration and production activities. Second, as mentioned above, the government could extend financial support for the growth of high-technology stations by continuing to provide financial assistance to technology-based new stations. This is parallel for implementing "self-service" stations beginning 1st January 1997. Statement made by the Entrepreneur Development Ministry to launch the Small Entrepreneurs Financing Fund in November 1996 will step up efforts to expand the present stations to "self-service" stations because the amount of money involved is very large. For example, in implementing "self-service" stations, PETRONAS invested around RM18 million (Malaysia: The Star June 8th, 1996) and ESSO invested around RM50 million (Malaysia: The Star May 16th, 1996).

In addition, if the objective of public policy is to encourage the survival of petroleum retailing businesses then "the survivor" (cluster 2) obviously needs assistance in order to improve the business acumen of the management team. New development in convenience retailing developed by oil companies could be encouraged and

developed between stations in this cluster in order to increase operating efficiency and direct competition between sites.

On the other hand, there has been ample evidence from this study that small firms (service stations in this study) possess several socio-economic attributes and potentialities. In the researcher's opinion, they can be promoted to achieve a better balance in industrial development in the future. The attributes listed are that:

(a) small firms could strengthen the country's industrial-base (in this case - petroleum industry) which has potential to developed in the recent years. Normally, service stations produce a large number of relatively low wage payments and make relatively low capital incomes, and so its impact consists of relatively small increases in income for a relatively large number of people. These firms also are seen as a major outlet for the absorption of the unskilled workers especially from East Malaysia (Sabah and Sarawak) where the level of unemployment is quick high and this will solve the employment problem in the West Malaysia.

(b) they provide an excellent training ground for the development and upgrading of entrepreneurship skills especially for the owners and managers. The service stations enable them to acquire further experience and to improve his ability gradually with the growth of the firm. Admittedly, a great number of new entrepreneurs will fail in the first few years, but their behaviour is

very significant to the society, in that it becomes apparent that those who are talented and are prepared to take a risk can become active irrespective of their social background.

(c) they also provide high quality of services and products which benefits the market especially customers in the long run. They also can upgrade retail technologies by using on-line point of sales which can fasten the tranfer of technology from abroad.

At macro level, these findings may also be useful for formulating public information policy. To date, government investigations of retail structure have been descriptive (e.g Ministry of Finance and Department of Statistic). The researcher suggests that service industry must be divided further to smaller categories such as retailing, transportation and health service. Such an approach yields meaningful information if variation is random or cross-sectional. This study has established that a substantial proportion of the cross-sectional variation is determined by internal and external environmental variables. Thus, policy implication based on descriptive studies are not apt to be as accurate as might be desired.

Next, we need to note a number of limitations of the findings associated with this study.

9.3 Limitations of the Findings

The results of this study have provided insight into some variables and factors that have an important impact in explaining the variation in performance and productivity measurements by using the multiple regression analysis. However, the multiple regression is by no means the perfect solution, because it requires access to considerable data, cost and effort in process for developing the equations or models. It has been also criticized because of its static representation of a dynamic industry and the problems associated with forecasting beyond the range of the sample characteristics.

However, beside weaknesses and limitations about the technique, some researchers have confirmed that this technique is an appropriate technique for calculating firm performance (e.g Coates et al 1995) and productivity and amongst the most popular technique in marketing research (Speed 1994). Lehmann (1989) said that understanding regression makes learning other multivariate procedures much easier.

Furthermore, there are still level of unexplained variables in the regression models or/and equations. In this study, it is range from 4 per cent to 49 per cent. In addition, because of the focus on the content variables, the study may offer an incomplete picture of the performance and productivity relationship. The researcher believes that there are more important variables excluded in this study. It will be important to find out in the future studies, to include others

important variables which are less controllable such as various marketing strategies of competitive firms, government influence factors on the industry, as well as various internal environment factors such as motivation or attitute factors, objectives and goals of the manager/owners and also the oil companies. Further, more moderator variables should be introduce to explore the moderating effect between the dependent and independent variables. In the researcher's opinion, if this quasi-moderating relationship is empirically supported, the variables that impact performance and productivity in different environments can be better understood.

Another important limitation is that the use of a small sample, although the researcher believes that there are no hard and fast rules about the absolute minimum number of observations required to utilize the regression technique. However, a smaller sample size is going to make it harder to find a significant relationship. A few scholars suggest that this technique at least needs about 30 unit of stores per one equation. In this study, an important step was taken to minimize the violation of the data by using the transformations.

As previously mentioned in Chapter seven, after using the transformations, the data were fit to the technique. The results also show the strong relationship between the independent and dependent variables, although according to Mason and Perreault (1991) type II error (accepting the hypothesis that performance or productivity estimates are linearly related when in fact they are not)

will increase at minimum levels when using the small sample size. According to Mason and Perreault (1991), if the sample size ranged from 30 to 100, and R^2 is higher than 0.75, the percentage of type II error occur will be 1 per cent only. In this study, the R^2 ranged from 0.84 to 0.91 in performance measures, so that the effects of collinearity and type II error would be less. However, in productivity measure, the R^2 is 0.31 and according to Mason and Perreault (1991), the percentage of type II will occur at this value is between 15 to 55 per cent. From this value, there are possibility type II occur in productivity measures up to 55 per cent.

In summary, Speed (1994) suggested an advice for researchers with small sample and the findings from this research has shown that the advice was very helpful and comfirmed for improvement in the analysis. The advice was (page 96):

1. firstly to eliminate as much collinearity as possible through variable selection, meaning that careful investigation of the data is important.

2. secondly, research that only has access to small samples should concentrate on relationships that the researcher has reason to believe are strong.

We should also note that this study focuses upon performance and productivity by cross-section survey. Means for the sample in this

study were only around 5 years in business. It may be that these kinds of businesses require longer periods to demonstrate their possibilities. Further more, during the early stages, these periods (normally three years) which is often characterized by turbulance as reflected in a higher rate of failure (Bruderl et al 1992, Cooper et al 1994). Future research can move beyond this time by monitoring longitudinal survey over the first three years after launch to overcome the turbulance period of the firms.

In this research also, both subjective and objective measurements were used in performance. Reliable and valid measures of organizational performance are of prime importance to researchers studying small businesses. In the researcher's opinion, reliability of measures by different sources proved useful information between objective and subjective measures. For instance, in few studies, information given by archival sources in objective measures is high compared to those given by competitors. In this study, two objective and two subjective measures were used. Table 8.5 in Chapter Eight indicates a pairwise correlation between objective and subjective measures. The findings from this study suggest that the objective measures produce "better" results. However, this study does not suggest that the subjective measures was not appropriete at all. If the objective measures were not available then the researcher might consider the subjective measure in performance study.

On the other hand, the findings suggested that the independent variables significantly related to performance change as the definition of performance changes. The researcher used three different measurement of performance and all of them produced different results except a few similar variables such as number of employees and number of bays. In the researcher's opinion, the main problem in categorising the performance measurement is that there has been no standard procedure to quantify the concept of performance. Normally, it is a subjective issue that is often open to criticism. As mentioned in Chapter four, it is not surprising that many of the researchers and their research methodologies indicate that a conceptual and/or operational definition of variables, though it is a very essential part but is not necessarily accurate or true.

However, operational definitions are never completely until the end of the world. In any research, they are necessary but rarely sufficient because of the complex and rich ideas contained in the theoretical construction in this field. This may be among the valid reasons why many researchers measure a variable in different way as discussed in Chapter four and five.

Furthermore, because firms' environmental perceptions may depend on past performance or productivity, one firm may see a particular trend as favourable, whereas others may view the same trend as unfavourable. Thus, the other shortcoming of this study is that it has ignored this variable because difficulties to obtain the data. Future

research designs should control for the impact of past performance and productivity.

Next section we discuss further about the implication for future research and implication to practitioners.

9.4 Implication for Future Research

The equations 1, 2, 3 and 4 in chapter seven and the contigency models 1, 2 and 3 in chapter eight are a first step in the direction of creating an empirically based explanatory model of performance and productivity. Since the retailing sector remains an important sector in the Malaysian economy for the previous years, further development and testing of empirically derived models of performance and productivity should be an important research objective.

Suggestions for extending this exploratory study in the future research include replication on other geographic regions or in the whole country, using data from other sectors in retailing or other retailers, using larger data sets, introducing extra variables, or using the more deeper or detailed of independent variables-/external or internal environmental factors. As previously mentioned, different combination of variables are associated with each of the performance measures. It is suggested that multiple indicators should be used in

studies of this type because some executives may pay more attention or prefer one performance measure to other performance measure.

As mentioned previously, the results were also presented to indicate the amount of dependent variables variation which was not explained. In the study, the surrogate variables were not able to account for 4 per cent of variation in volume of litres sold until 49 per cent of variation in productivity. Although product assortments, prices and promotion are the same for all service stations in this study, the researcher believes that there are more important variables excluded in the analysis. A variety of factors need to be considered before we can adequately predict small firm performance and productivity. Further researchers should also consider more fine-grained measures and/or variables of the environment. For example, rather than using an overall measure of manager/owner background, researchers should assess manager/owner's perceptions of their overall business aspects such as their evaluation toward staff, relationship with suppliers and customer loyalty.

This study suggests that store characteristics are the most important factor which can give an impact on performance and productivity. However, other factors such as location and competition have received limited attention in terms of specific variables or number of variables used and should, perhaps, be explored in much greater detail than was possible in this study. In many studies, competition seems to have a more complex influence on performance. This

argument was supported by Denning and Freathy (1996), they said that the competition in petroleum retailing has becomes increasingly competitive with the declining number of sites retailing petrol. In the researcher's opinion, when the clustering of stores increases the potential for multipurpose and comparison shopping, it attracts a larger number of customers. As a result, stores in retail clusters perform better than stores in isolated sites. In the case of other fields of study, customer attitudes, satisfaction and perception and human resource management also need to explore in order to find the impact on the performance and productivity in retailing petroleum industry.

This analysis also dealt with only one type of store and was cross-sectional in nature. Additional research on performance and productivity in retail sector should be expanded to different types of stores or chain stores such as franchise stores, specialities stores and other small businesses. In Malaysia, local chain stores such as Berjaya-Singer, Parkson, Satay-ria, Kedai Telekom, Moccis besides other oil companies chain stations also should be studied and compared the impact with other famous foreign and international frachises such as Bata, 7-Eleven, KFC, Shakey Pizza, McDonald's etc. The longitudinal studies also should be done in order to assess the impact of time and technique.

In this study, volume of sales; volume of litres; employment growth and sales per employee address an important facet, other

performance and productivity dimensions are also important. There is a need to identify measures that make sense for certain characteristics such as industry conditions, start-up circums-tances and policy from companies or government. In this aspect, the researcher recommended that panel studies should be performed to evaluate the measurements of performance and productivity particularly in the retailing sector or small businesses. On the other hand, in this study, performance and productivity data came from interview with managers and owners and some reports from oil companies. There are several parties such as suppliers, franchisers, customers, who may care about and have differing perceptions of performance and productivity. Maybe data from other parties also are important to determine performance and productivity.

In this study, the results from the productivity were "not so good" if compared to the results from the performance measures. This happens because the researcher has chosen only one resource used to produce goods and services - labour. It may result in limitations and may be potentially inaccurate for productivity measurement. A total-factor productivity model that relates organizational output to all input resources is recommended for future study. In this case, the researcher recommends that the total-factor productivity ratio can be expended to include four categories of resources: labour, materials and purchased services, utilities and capital. However all the information mentioned above need a good financial data.

On the other hand, the researcher feels that both the total-factor and partial-factor productivity measures could enable managers to obtain a comprehensive picture of productivity changes within a firm or across an industry. When each of them was assessed by managers, the manager could identify the relationship between them. For example, improvement in labour could be offset by decline in supplies and materials. Although labour productivity improved, total productivity of a firm could decline because other resources were used less efficiently.

From the findings also, the researcher found that a number of important questions are unanswered in this study. Some unanswered questions require further research such as:

(a) Do such background variables as age, education, training remain constant over time?
(b) Do store characteristics remain an important variable of performance and productivity after a few years a service station has been in business?
(c) What happens when the employment growth tends to stabilize or go down?
(d) What happens when some of the stations introduce the self-service concept in the future or the government reviews the price mechanism policy?

(e) Might competitors, suppliers, customers also be accurate assessors of performance? How might these sources rate across response characteristics?

In Malaysia, it is well known that the industry was controlled by the government. As mentioned in Chapter three, this industry is a regulated industry where the government controlled the pricing of the petrol. However these variables (e.g government regulations and taxes) were not used in the study. However in previous studies, these variables have been shown to have an impact upon retail structure (e.g Ingene and Brown 1987). Future research should examine these variables at both state and federal level. Another aspect which also should be examined is the relationship between the franchisor oil companies and the franchisee petrol station operators. In Malaysia, the franchise system practice by the oil companies is complicated by the diverse types of ownership, modes of operations and by government supervision and regulation which was heavily in favour of franchisors.

Furthermore, the results presented in chapter seven and eight were drawn from one retail chain store at one point in time and limited access of the data. Generalizing the results to same or other retail firms should be done with caution because first, the study was done in one particular geographical area and second, the sample size was small. However, the methods and techniques used to identify the factors influencing selected performance and productivity are very

useful, appropriate and relatively straightforward. In this case, the researcher strongly urges other researchers or practitioners in this sector to pursue similar analysis for their own interests or operations.

Finally, the growing body of empirical studies in performance and productivity may offer opportunities for meta analysis. This methodology has not received much attention (Cooper 1993). In the researcher's knowledge to date, there was only one meta analysis for performance but it was done ten years ago. On the other hand, no meta analysis have been done for productivity although the issue of measurement have risen in the whole issue of Journal of Retailing in 1984.

9.5 Implications for Practitioners

In Malaysia, the retailing sector plays an important role in the national economic. The petroleum retailing sector also became the back bone of the other industries in Malaysia. Most of them need fuel to continue their day-to-day operations whether direct or indirect activities. Their performance and productivity has substantial impact on other sectors in the economy. It has been difficult to predict performance and productivity of a particular station or their owner/manager with a high degree of accuracy. Our equations and models from this study suggests that there are a number of variables

or factors that might play an important part in the performance and productivity of their firms.

Oil companies may wish to explore further the background of their managers/owners of the station before giving them opportunity to run the business or to ensure that they have a background related to success in the business or to evaluate the performance before considering any extra funding to the present owners or managers. It seems reasonable to suggest that managers of corporate-owned stations or hired by owner or founder should be judged not on the basis of sales relative to stations in other markets, but on the basis of sales relative to expected sales given the external environment characteristics. For example, some competitive characteristics (e.g QUALITY) have been found to affect station sales adversely. On the other hand, relationship between managers/owners and their stores' performance and/or productivity should be considered when formulating any policies regarding the promotion, dividends, rewards or other incentives to them. The investors also may want to know further the whole business to ensure that they invested in the right sector or industry because most of the major oil companies in Malaysia are listed on the stock market.

Additionally, the present managers or owners especially in the retail sector should attempt to understand the factors that have the greatest effect on the performance and productivity levels of their stations or stores. After that they can make appropriate adjustments

or decisions to maximize their performance and/or productivity in order to achieve success in the industry. At the end, the managers and owners themselves would benefit because failures could be reduced and the suffering that goes with failure could be avoided. The results from this research identified the factors having the greatest impact on performance and/or productivity will also aid founders or owners in the decision making process and improve an early stage of start-up firm's probability of success. For example, the store that is low performing could be advised to lay off some personnel, while store with high labour productivity and relatively low profitability actually could gain from employing more staff.

The prospective entrepreneur/founder/owner must look at the list of variables in the model and subjectively assess the strengths of the proposed business or station for each variables. A system of rating the variables can be used. The overall rating can be assigned to the probability of best performer or high productivity. With mix strengths on variables, the other decision criteria previously used by other parties such as investors, governments, lenders, customers become increasingly important. This is what the investors want because this informations will cumulate substantial value. This is what the governments wants because these are the firms that can expand employment and contribute to a prosperous economy.

However, when all the interested parties use the model from this study, it is important to realize that the model is not intended to

replace existing default risk prediction techniques such as cost-benefit analysis, ratio analysis and other financial techniques. On the other hand, the model should be employed in conjunction with the present techniques to avoid default. The model also does not provide numerical guidelines for variables distinguishing low performer-/productivity from high performer-/productivity. Judgment is still needed when applying the model to assign a probability. For example, from the finding the variable CAPITAL shows that the amount of capital invested in the business have a greater impact on performance and productivity. However, the model neither defines "specific" amount of money (how much?) nor gives a sample working paper or business plan (how to do it?) needed to be successful or how to be good performer in the industry.

However, from a managerial standpoint, the existing units of businesses may also be evaluated on the basis of the model. These values provide an indication of the level of performance and productivity for each existing firm. These values also provide a yardstick against which actual performance can be compared. The difference between forecasted and actual performance shows the degree to which an outlet is performing better or worse than expected. For managers/owners, this information is useful to them, who can identify the strong and weak performers in the firm's network.

In addition, the estimated regression equations can also be used to forecast performance and productivity at new locations or sites. This is done by determining the values of different explanatory variables in the model for the new sites. After that substituting these values in the model to predict the expected level of performance and productivity at the new sites.

In the petroleum retailing industry, the market has undergone a series of major transformation in recent years. This has not happened in Malaysia only, but the rest of the world (see Chapter two and three). The industry as a whole, can be characterized as having low sales growth, moderate profitability and many competitors. Introduction of services such as the acceptance of major credit cards, 24-hours opening, car washes, garages and an extended range of merchandise have become the norm. As mentioned previously, competition already identified as a major threat by this study and other studies. However, competition has prompted a variety of initiatives from existing service stations and the most prominent is the convenience store format. On the other hand, according to Slade (1986), various types of service stations face different demand curves, the strategies that they practice are not the same. This study suggests that the bigger size is better. Bigger size can be achieved by building bigger convenience store and introducing more products or other services such as post office, pharmacies and souvenirs such as postcards, maps, and other mementos because the

motorways in Malaysia are used heavily by the tourists from local and abroad.

Furthermore, the findings in term of size also lead to some practical recommendations for oil companies. First, a new service station should not start too small. Although smallness reduces the risk of a financial disaster, it also increases the mortality rate of business. In this sector also, there is evidently a certain minimum start-up size, and it does not make much sense to begin a business below this level. For the present station, utilize and maximize all the area surrounding the station (especially built up area) by introducing new services or expand present services. In other word, avoid a "kiosk" type of station and build over 30 square meters of station which The Institute of Grocery Distribution, United Kingdom classifies as "convenience plus" station.

The final conclusions to be drawn from this study have strong implications in a global setting, where new economic relationships appear to provide fertile opportunities for international retailing. More than two-thirds of the world's markets are in less developed countries, where environmental conditions (the variables studied in this research) differ from the more developed countries. In the petroleum retailing industry, the international market was not new for them especially for the multinational oil companies. However, for the companies in Malaysia, the international markets create new opportunities to the retail sector especially in petroleum retailing.

For example, the Malaysian national oil company, PETRONAS has invested in both upstream and downsteam sectors in India, China, Thailand, Vietnam, South Africa and Philippine. Crest Petroleum Bhd, new firm involved in gas and petroleum sector has opened its first service station in Uzbekistan with venture by Uzmal (Uzbekistan National Oil Corporation). Renong Berhad and Mekar Idaman Sdn Bhd, construction firm have been invited to develop a gasfield and pipeline in Turkmenistan.

9.6 Contributions and Conclusions

From the discussion above, there are several major practical implications from this study. Accurate identification of the factors or variables benefits any practitioners especially entrepreneurs and managers and others parties related directly or indirectly to particular firms or organizations. In no way does the researcher imply that variables considered here are the only ones contributing to performance and productivity. However, the variables selected in this study are relatively easy to assess because the difficulties to get relevant data and the nature of the study (cross-sectional and exploratory).

This research seeks to make a number of contributions to the performance/productivity literature. First, dimensions of factors identified by previous researchers have been operationalized and empirical evidence for the model used in this study achieved a high

level of predictive power based on value of R^2. Second, the results suggest that there are variables which can give an impact on both measurements and there are variables which can give an impact on performance but not productivity and vice versa. The findings suggest that both should be considered when any study needs to be done on business organisation, and variables related to one are not necessarily related to the other, indicating the importance of considering both.

Third, this study explicitly models the effect of considering multiple measures of performance and productivity. It defined three catogeries of performance and one for productivity and used an estimation approach that allowed potential differences in predictors and moderators among managers and owners. This approach enabled us to explicitly test rather than assume homogeneity and identified the predictors that were particularly important for achieving good performance and high productivity.

Finally, while the number of studies examining either performance or productivity in developed countries as mentioned previously in Chapter four, a few have investigated both performance and productivity together in their study in developed countries (e.g Cronin and Skinner 1984, Willard et al 1992). This study is unique in that it identifies the variables which impact both performance and productivity in a developing country in one study. Furthermore, this is the first study which has investigated the relative impacts of

environment variables on performance and productivity over a long-time horizon in the retailing industry. Furthermore, in the researcher's observations, the studies and researches in performance and productivity followed the another hypothesis based on Hegel's dialectic process as mentioned previously in chapter four.

Although there are some inherent weaknesses, the research overcomes several serious hurdles. Future comparative research needs to address systematically problems and limitations found from this research. Such research should be based on samples of business carefully selected from well-defined populations and followed over time. Such studies need to recognize that only important variables are divergent aspects of performance and productivity determined by processes at several levels of environment analysis, including the industrial context of an organization, the organization itself, and the individual manager or owner (or entrepreneur, founder) or other parties which have an interest in the organization.

The clear conclusion is that we must use care in interpreting prior research. On the other hand, better theoretical frameworks for retailing are also needed so that we can be able to think about the variables directly or indirectly affecting performance and productivity. From this understanding, it should guide us about what factors are of general importance across all retail stores or organizations. So that we can consider in meaningful ways why firms may differ and at the end, help us to develop typologies that can

illuminate differences across types of retail firms. To date, only one article (Dess and Priem 1995) tried to develop theoretical on performance base on 'third variables'.

Lastly, although there are major challenges in predicting performance and productivity, some progress has been made. From the previous studies, we seek to build upon what has been done and increase understanding of factors bearing upon performance and productivity. All researchers and practitioners need to be sensitive to the problems and limitations arise from the studies. My hope is that we can continue our creativity and innovation and work towards less rigor. In conclusion, the researcher hopes the success of the models described here, even with the obvious limitations, will provide encourgement for any work yet to be done.

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APPENDIX 1

OBSERVATION FOR PERFORMANCE AND PRODUCTIVITY RESEARCHS

PRODUCTIVITY	PERFORMANCE
1960's	
Fuchs (1968)	Baumol and Ide (1962)
	Albaum (1967)
1970's	
Nadiri (1970)	
Gold (1971)	
Schwartzman (1971)	
Bloom (1972)	
Craig and Harris (1973)	
McCammon and Hammer (1974)	
Hines (1976)	
Mundel (1976)	
Taylor and Davis (1977)	
Bucklin (1978)	
Retail council of Canada (1978)	Olsen and Lord (1979)
1980's	
Stark and Bottom (1980)	
Mark (1980)	
Mahanti (1980)	
Bucklin (1981)	
US Dept of Commerce (1981)	
Ingene (1982)	
Roll and Sachich (1981)	
Sumanth and Hassan (1982)	
Chen and McGarrah (1982)	
Riggs (1983)	Hise et al (1983)
Lusch and Soo (1984)	Cooper (1984)
Saladin and Nelson (1984)	Cronin and Skinner (1984)
Doutt (1984)	Anderson (1985)
Achabal et al (1984)	
Goodman (1985)	
Mohanty and Rastogi (1986)	

Hawkin et al (1987)

Walter (1987)

Ratchford and Stoops (1988)

Buzzell and Gale (1987)
Stuart and Abetti (1987)
Hand et al (1987)
Hildebrandt (1988)
Sapienza (1989)
Davidson (1989)
Miner et al (1989)
Hansen and Wernerfelt (1989)

1990's

Ghobadian and Husband (1990)

McLaughlin and Sidney (1990)

Ortiz-Buenafina (1992)

Kelly et al (1993)

Walters (1994)

Woodman et al (1996)

Larson and Lusch (1990)
Covin et al (1990)
Birley and Westhead (1990)
Sapienza (1992)
Gopala and William (1992)
Willard (1992)
Brush and Vanderwerf (1992)
Adam et al (1993)
Acar (1993)
Chandler and Hank (1993/4)
Box et al (1993)
Schneider et al (1993)
Cooper (1994)
Tan and Litschert (1994)
McGee et al (1995)
Lussier (1995)
Kotha and Nair (1995)
Coates et al (1995)
Bates (1995)
Chow (1995)
Zahra (1996)

APPENDIX 2

DEPARTMENT OF MARKETING
UNIVERSITY OF STIRLING

Questionnaire:

FACTORS AFFECTING PERFORMANCE OF INDIVIDUAL CHAIN SERVICE STATIONS IN MALAYSIA PETROLEUM RETAILING INDUSTRY

Febuary - May 1995

January 1995

Rohaizat Baharun,
Department of Marketing,
School of Management,
University of Stirling,
FK9 4LA Scotland, UK

Dear Sir/Madam,

I am a student for a PhD at University of Stirling, Scotland. My chosen topic is petroleum retailing in Malaysia. Part of my research consists of a interview and survey of the leading dealers of petroleum.

You and your station was chosen from a sample of all Petronas Stations in Malaysia. In order that the results accurately represent all the stations, it is very important that each questionnaire be completed.

It would be greatly appreciated if you could cooperate by answering the questions and interview by myself or my representatives. It must be stressed that any information or assistance that you give will be kept confidential and will be used for academic purposes only.

If you have any questions about the study, please write or call. The telephone number is 06-734022.

Thanking you in advance for your time and kind coorperation.

Yours Sincerely,

Note about the Questionnaire:

FACTORS AFFECTING PERFORMANCE OF INDIVIDUAL CHAIN SERVICE STATIONS IN MALAYSIA PETROLEUM RETAILING INDUSTRY

Please note that this questionnaire has been designed to be as short as possible and each item has been inserted with a particular research objective in view and has also been designed to be as straight forward as possible.

It would be greatly appreciated if all questions would be answered by all respondents. However, if respondents are unable or unwilling to answer any questions, then please do not allow this to affect replies to the other questions. If there are some details the respondents cannot remember precisely, please give reasonable estimates or leave a blank.

Any comments on any aspect of the questionnaire or any other points relevant of the questionnaire would be welcomed. The answers will retain absolutely confidential and will not be associated with your identity at any stage.

Thank you for your assistance in answering the questions.

Station Name:_____
Address :_____

SECTION A: OBSERVATION DATA

Interview Instructions: In this section, please make an observation by yourself. If your not sure about anything, please asks the respondent or any station's staff about it. Please think carefully about the question and record the information in the appropriate space.

Q1. Number of islands

Q2. Number of pumps

Q3. Number of bays

Q4. Placement on the street

[ ] Corner lot
[ ] Exposed center lot
[ ] Hidden center lot
[ ] Open space (No other building nearby)

Q5. Where is the station situated?

[ ] Business district (in town area or main street)
[ ] On a highway/motorway
[ ] Residential area
[ ] Near shopping center
[ ] Other,(specify)_____

Q6. The type of neighbourhood surrounding the station?

[ ] Business area
[ ] Mix of business and residential
[ ] Residential
[ ] Mix of residential and industry

Q7. The traffic speed infront of the service station?

[ ] Less than 20km/hour
[ ] Between 20 - 50 km/hour
[ ] Between 50 - 80 km/hour
[ ] More than 80 km/hour

Q8. Other services beside petrol/diesel products that the service station provided?

[ ] engine and lublicant oil
[ ] car wash
[ ] car accessories
[ ] mini-mart (soft drinks, confectionery and tinned food)
[ ] garage services
[ ] telefon and felefon card
[ ] toilet
[ ] prayer room
[ ] map and newpapers
[ ] vending machines

SECTION B: BUSINESS BACKGROUND

Interview Instructions: Read the introductory statement below to the respondent. Make sure that she/he is aware of what is expected of her/him. Then, read each of the statement slowly and when the respondent understands the statement, provide her/him with the alternative answers.

Message to respondent: We are interested in finding out about a number of things related to your business. Please answer the following question as accurately as you can.

Q9 What is the legal status of your business?

[ ] Partnership
[ ] Sole ownership
[ ] Private Ltd Co.
[ ] Public Ltd Co.
[ ] Cooperative
[ ] Others

(specify):_____

Q10 In what year, this station was first operated?

_____

Q11 Who established this station?

[ ] Myself
[ ] My parent
[ ] Someone else
[ ] Owned by oil company or other organization
[ ] Other(specify):_____

Q12 How many hours did your station open for business in a day?

_____ hours

Q13. What is your main type of customers

[ ] Shoppers

[ ] Mix of shoppers and commuters

[ ] Commuters

[ ] Mix of commuters and tourists

Q14. How many hours you spend in the business per day?

_____ hours

Q15. Roughly, how many years of management experience before became the dealer?

_____ years

Q16. Roughly, how many years of petroleum industry experience before became the dealer?

_____ years

Q17 How much capacity of the petrol in your storage facilities?

_____ litres

Q18. How much inventory of non-fuel products in your station now?

MR_____

Q19. What is the land value of your station?
MR _____ per square meter

Q20. What is the number of other stations which are same brand name within 2 miles radius

_____

Q21. What is the number of other stations which are different brand name within 2 miles radius

_____

Q22. What is the distance of your station from the nearest station?

_____km

Q23. What is the size of the nearest service station (in terms of floor space) which is same brand name?

[1] more bigger
[2] same size
[3] more smaller

Q24. What is the size of the nearest service station (in terms of floor space) which is different brand name?

[1] more bigger
[2] same size
[3] more smaller

Q25. Do you spend some money on promotion of your station?

[ ] yes

[ ] no

If yes, can you tell me, how much did you spend in a month?

MR_____

SECTION C: QUESTIONS ON PERFORMANCE AND PRODUCTIVITY.

Interview Instructions: Read the introductory statement below to the respondent. Make sure that she/he is aware of what is expected from her/him. Then, read each of the statement slowly and when the respondent understands the statement, provide her/him with the alternative answers.

Message to respondent: We are interested in finding out about the performance of your business. Please listen carefully and try to answer each as accurately and truthfully as you can.

Q26. The commission that you received from the oil company for one litre sale of petrol for

Leaded _____

Unleaded _____

Diesel_____

Q27. How much capital did you invest when you started in this retail business?

MR_____

Q28. What is the estimated value of your business asset now?
MR_____

Q29. What is the total sales of your business in a month?
MR_____

Q30. From Q29, can you tell me the percentage of sales in
Petroleum products _____%
Mini-mart _____%
Garage/wash/accessories_____%
Others _____%

Q31. What is the number of litres petroleum sold in a month?
MR_____

Q32. From Q31, can you tell me the percentage of sales in
Leaded _____%
Unleaded _____%
Diesel_____%

Q33 How do you rate your current sale?
[ ] very satisfactory
[ ] satisfactory
[ ] stagnant
[ ] unsatisfactory
[ ] very unsatisfactory

Q34. How much the total expenses (cost of operation) per month?

MR_____

Q35. What is the estimated total size of the station floor space?(include all services - bays,office,workshop etc).

_____ square meter

Q36. How many staff do you have?

Now		First year of operation	
Full-time	_____	Full-time	_____
Part-time	_____	Part-time	_____
Family member help	_____	Family member help	_____

Q37. What is the average salary of your staff?

MR_____

Q38 Have you ever attended any courses before became a dealer?

[ ] Yes

[ ] No

If yes, what kind of courses did you attended in the first time?

[ ] courses conducted by higher learning institute (e.g. university)

[ ] courses conducted by oil company

[ ] courses conducted by government agencies

[ ] courses conducted by private organization

[ ] Other (specify):_____

Q39. Have you ever attended any courses since you started this business?

[ ] Yes

[ ] No

If yes, how many courses did you attended in a year?

_____ and

how long the longest courses (duration)?

_____days

Q40 How do you rate the general quality of the courses?

[ ] very satisfactory

[ ] satisfactory

[ ] average

[ ] unsatisfactory

[ ] very unsatisfactory

SECTION D: QUESTIONS ON OPINION OF BUSINESS

Interview Instructions: Read the introductory statement below to the respondent. After she/he understands what is expected of her/him in this section, read each of the statements in the section slowly and clearly. At the end of each statement suggest the five categories of answers that been provided.

Message to respondent: We are interested in your opinions about a number of things related to your business operation. Please answer the following question according to your true beliefs.

Q41. Do you agree that price mechanism which are introduced by the government 10 years ago affected your business?

Strongly disagree 1 2 3 4 5 Strongly agree

Q42. Normally in business, good relationship between dealer and oil company (supplier) was exist. What are your feelings about this?

Strongly disagree 1 2 3 4 5 Strongly agree

Q43. In this business also, good relationship between firm and their staff always be maintence. What are your feelings about this?

Strongly disagree 1 2 3 4 5 Strongly agree

Q44. Do you think, the products in your station was similar quality compare to your competitors

Strongly disagree 1 2 3 4 5 Strongly agree

Q45. Do you think, your station offered (in terms of facilities) was similar compare to your competitors

Strongly disagree 1 2 3 4 5 Strongly agree

Q46. Do you think, the number of products carried/offered in your station was similar compare to your competitors

Strongly disagree 1 2 3 4 5 Strongly agree

Q47. Please rank in order of importance the features that help complement the packaging of the petrol or your think the most important to increase your performance. (Note: 1 is the most important)

[A] convenience-store facilities	1st [ ]
[B] fast delivery pumps	2nd [ ]
[C] 24 hours service	3rd [ ]
[D] high quality car wash	4th [ ]
[E] clear signage	5th [ ]
[F] point-of-sale terminals	6th [ ]
[G] covered forecourts	7th [ ]
[H] credit cards	8th [ ]

Q48 In the future, what is other service might you provide or introduce at your service station?

[ ] engine and lublicant oil
[ ] car wash
[ ] car accessories
[ ] mini-mart (soft drinks, confectionery and tinned food)
[ ] garage services
[ ] telefon and felefon card
[ ] toilet
[ ] prayer room
[ ] map and newpapers
[ ] vending machines

[ ] other(speficy):_____

SECTION E: DEMOGRAPHIC DATA

Interview Instructions: Read the introductory to the respondent. Be considerate and polite as you ask these questions.

Message to respondent: We are almost finished. In this section we have a few personal question to ask. Please take your time and answer each question as truthfully as possible.

Q49. Your age: _____years

Q50 . For how many years were you in school altogether
_____ years

Q51 . Sex:
[ ] Male
[ ] Female

Q52 . At what level did you leave school or complete all your studies?
[ ]. Primary six
[ ]. SRP
[ ]. SPM
[ ]. STPM
[ ]. Diploma
[ ]. University Degree
[ ]. Professional course
[ ]. None

Q53. Marital Status:

[ ]. Married

[ ]. Divorced/widowed

[ ] Bachelor/never married

Q54. Number of children: _____

Q55. We would welcome any further comments either about this questionnaire or about matters relating to your business.

SECTION F: Secondary data

Interview Instructions: Do not ask or answer this following questions.For the purpose of the office only

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a. Number of population where the station situated

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b. Traffic volume(Average number of vehicles per hour)

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c. Population growth rate

APPENDIX 3

SERVICE STATION CHARACTERISTICS VARIABLES

Name of Variables	Defination
AGEM	Age of dealer (years)
AGEST	Age of station (years)
BAYS	Number of bays
BRATE	Birth rate (recent year)
BUILDUP	Size of build-up area (square foot)
CAPITAL	Total of investment (in first year)
CAPACITY	Capacity in storage of petroleum (litres)
CHILDREN	Number of children
CUSTOMER	Type of customer
DISTANCE	Distance from the nearest station (km)
EXPETROL	Experience in petroleum industry (years)
EXPBEFORE	Experience before became dealer (years)
EXPMONTH	Expenses per month (Malaysia Ringgit)
HOPEN	Number of hours station open
HSTAY	Number of hours spend inbusiness

INVENTORY	Total of inventory of non-fuel products(Malaysia Ringgit)
ISLANDS	Number of islands
LANDVALUE	The present market value of land (Malaysia Ringgit)
LEVELE	Level of education
LOCATION	Location of service station
MARITAL	Marital status
NEIGHBOUR	Type of neighbourhood
NUMCOA	Number of courses attented after becaming the dealer
NUMCOB	Number of courses attented before becoming the dealer
NUMNP	Number of competitors different company within 3 miles radius
NUMP	Number of competitors same company within 3 miles radius
NUMS	Number of services offered to customer
OSHIPS	Legal status of the business
POSITION	Position in business
PUMPS	Number of pumps

QUALITY	Quality of services offered compared to nearest competitor
ROADL	Placement on the street
SALARY	Average salary of the workers
SALES	Total sales in a month (Malaysia Ringgit)
SEX	Sex of dealer
SIZENP	Size of nearest station different company (1 = bigger 2 = same size 3 = smaller)
SIZEP	Size of nearest station same company (1 = bigger 2 = same size 3 = smaller)
STAFFNOW	Number of present staff
TRAFFIC	Traffic volume at peak hour
TOTSP	Number of services planning to offer in the future
VOLITRE	Number of litres sold
YEARE	Number of years in education