DEREGULATION OF THE LIQUID FUELS SECTOR IN SOUTH AFRICA

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Hons. B. Com. (PU vir CHO)

Dissertation submitted at the Potchefstroomse Universiteit vir Christelike Hoër Onderwys in partial fulfilment of the degree

Magister Commercii

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Potchefstroom

1998

PREFACE

The liquid fuels sector with regard to retail petrol prices is of extreme importance to South Africa. Fuel is the engine of the economy, without it the country will come to a standstill. Therefore issues around deregulation or re-regulation are important to the country and its people. This study aims to determine what the possible outcome of partial deregulation of the retail petrol price in South Africa may be as opposed to the regulation that currently exists.

I would like to thank a few individuals who contributed to the success of this study. Many thanks to Professor J.H.P van Heerden, my promoter, who guided me in the right direction and who gave me insight in the study to create a meaningful structure.

My thanks to my employer, the Department of Minerals and Energy, who provided me with a bursary and so enabled me to take this opportunity. Without it I would not have been able to do the study.

My appreciation to Elsa du Toit who supported me and contributed to the success of the study.

I would also like to thank the Ferdinand Postma library as well as the library of the Department of Minerals and Energy for their assistance with regard to the references.

Many thanks to my parents and family for their support and interest during my study years. I would like to contribute this study to my husband Chris, who supported me and never complained about the time that I took while I was busy with this.

The success of this study is attributed to the ability provided to me from The Lord.

TABLE OF CONTENTS

PREFACE 1

CHAPTER ONE 1

INTRODUCTION 1

CHAPTER TWO 3

AN OVERVIEW OF THE SOUTH AFRICAN LIQUID FUELS SECTOR 3

2.1 RAW MATERIAL RESOURCES 3

2.2 STRUCTURE OF THE LIQUID FUELS SECTOR 3

2.2.1 Refining industry 3

2.2.2 Synthetic fuels industry 5

2.2.2.1 Sasol 5

a) Sasol One 5

b) Sasol Two 6

c) Sasol Three 6

d) Government's Involvement in the Synthetic Fuels Industry with regard to Sasol 6

2.2.2.2 Mossgas 9

2.2.3 Central Energy Fund (Pty) Ltd 9

2.2.4 Strategic Fuel Fund Association (SFF) 10

2.2.5 Soekor 10

2.2.6 Wholesale industry 11

2.2.6.1 Wholesale prices 11

2.2.6.2 Wholesale margin 12

2.2.7 Retail industry 12

2.2.7.1 Service Station Rationalisation Plan (RATPLAN) 13

2.2.7.2 Retail Price Maintenance (RPM) 13

2.2.8 Fuel transport 14

2.3 REGULATION IN THE LIQUID FUELS SECTOR 15

2.3.1 Legislation 15

2.3.2 Regulatory measures applied 14

2.4 AN OVERVIEW OF THE PETROL PRICE COMPOSITION 18

2.4.1 International dimension (In-Bond-Landed-Cost and the Rand / Dollar exchange rate) 18

2.4.2 Transport costs 20

2.4.3 Delivery cost (Service differential) 21

2.4.4 Wholesale (marketing) margin 21

2.4.5 Retail margin 21

2.4.6 Equalisation Fund 22

2.4.7 Fuel tax and the Customs and Excise levy 23

2.4.8 Road Accidents Fund (RAF) 23

2.5 COMPETITION IN THE LIQUID FUELS SECTOR 23

2.5.1 The level of South African petrol retail prices (excluding tax) compared with world prices 23

2.5.2 The oil industry's profitability 24

2.5.3 Entry and exit cost 24

2.5.4 Evidence of fluctuations in market shares and prices 25

2.5.5 The Herfindahl index (HHI) 25

2.6 CONCLUSION 27

CHAPTER THREE 28

AN OVERVIEW OF THE LIQUID FUELS SECTOR IN AUSTRALIA 28

3.1 RAW MATERIAL RESOURCES 28

3.2 THE LIQUID FUELS INDUSTRY 28

3.2.1 The refining industry 28

3.2.2 Wholesale industry 29

3.2.3 The retail industry 30

3.2.4 Vertical arrangements 32

3.2.5 Transport 33

3.3 COMPETITION IN THE LIQUID FUELS SECTOR 33

3.3.1 The level of Australian retail prices 33

3.3.2 Industry profitability 34
3.3.3 Entry and exit cost 35
3.3.4 Evidence of fluctuations in market shares and prices 39
3.3.5 Conclusion 40
3.4 REGULATION OF THE LIQUID FUELS SECTOR 40
3.4.1 Government legislation and regulations 40
3.4.2 Price control in petroleum product markets 41
3.4.3 Surveillance of petroleum products by the Prices Surveillance Authority (PSA) 41
3.4.4 The impact of price regulation 42
3.4.4.1 Price volatility 42
3.4.4.2 City-rural price differentials 43
3.5 CONCLUSION 44
3.5.1 Theoretical findings 45

CHAPTER FOUR 47

VIEWS OF DIFFERENT STAKEHOLDERS IN THE LIQUID FUELS SECTOR IN SOUTH AFRICA AND AUSTRALIA 47
4.1 A SUMMARY OF THE VIEWS OF THE DIFFERENT STAKEHOLDERS IN THE LIQUID FUELS SECTOR IN SOUTH AFRICA 47
4.1.1 Business and individual members of the business delegation 48
4.1.1.1 Business 48
4.1.1.2 The South African Petroleum Industry Association (SAPIA) 48
4.1.1.3 Sasol 48
4.1.1.4 The Fuel Retailers Task Group (FRTG) 48
4.1.1.5 Petronet 48
4.1.1.6 South African Agricultural Union (SAAU) 49
4.1.1.7 Afrikaanse Handelsinstituut (AHI) 49
4.1.1.8 South African Chamber of Business (SACOB) 49
4.1.2 Labour (unions) 49
4.1.3 Government 50
4.1.4 Institute of Policy and Social Research (IPSR) 50
4.1.5 Summary of the viewpoints of the stakeholders 50
4.1.6 Comparison of theoretical findings (p. 50) with the general views of the stakeholders 51
4.2 A SUMMARY OF THE VIEWS OF THE DIFFERENT STAKEHOLDERS IN THE LIQUID FUELS SECTOR IN AUSTRALIA 54
4.3 CONCLUSION 55

CHAPTER FIVE 56

EMPIRICAL RESULTS 56
5.1 EMPIRICAL STUDY 56
5.2 REGRESSION RESULTS OF THE SOUTH AFRICAN (GAUTENG) EQUATION 57
5.2.1 Interpretation of Regression Results 58
5.3 REGRESSION RESULTS OF THE AUSTRALIAN (CANBERRA) EQUATION 59
5.3.1 Interpretation of Regression Results 61
5.4 WALD TEST OF RESTRICTION IMPOSED ON PARAMETERS 62
5.4.1 Wald test on the regression coefficient of South Africa (Gauteng) and Australia (Canberra) 62
5.4.2 Wald test on the regression coefficients of South Africa's (Gauteng) regressions for two periods 63
5.4.3 Interpretation of Regression Results 64
5.4 CONCLUSIONS 67

CHAPTER SIX 69

SUMMARY 69

APPENDICES 1 TO 3 72

OPSOMMING 76

OPSOMMING 77

REFERENCES 80

REFERENCES 81

LIST OF TABLES

TABLE 1: REFINERY AND SYNTHETIC FUELS PLANT PRODUCTION CAPACITIES 4
TABLE 2: MARKET SHARES OF WHOLESALE MARKETERS IN 1996 11
TABLE 3: THE HERFINDAHL INDEX 26
TABLE 4: QUOTAS OF AUSTRALIAN PETROLEUM COMPANIES 31
TABLE 5: COMPARISON OF THEORETICAL FINDINGS (P. 50) WITH THE VIEWS OF THE STAKEHOLDERS 51
TABLE 6: REGRESSION COEFFICIENTS FOR THE RETAIL PETROL PRICE SPREAD IN SOUTH AFRICA (GAUTENG) 58
TABLE 7: REGRESSION COEFFICIENTS FOR THE RETAIL PETROL PRICE SPREAD IN AUSTRALIA (CANBERRA) 60
TABLE 8: WALD TEST BETWEEN THE ELASTICITIES OF THE COST IN SOUTH AFRICA (GAUTENG) AND AUSTRALIA (CANBERRA) 62
TABLE 9: REGRESSION COEFFICIENTS FOR THE RETAIL PETROL PRICE SPREAD IN SOUTH AFRICA (GAUTENG) 63
TABLE 10: WALD TEST FOR SOUTH AFRICA (GAUTENG) BETWEEN THE FIRST PERIOD (JANUARY 1985 TO DECEMBER 1987) AND THE SECOND PERIOD (JANUARY 1988 TO DECEMBER 1996) WITH REGARD TO THE COST VARIABLE 65
TABLE 11: WALD TEST FOR SOUTH AFRICA (GAUTENG) BETWEEN THE FIRST PERIOD (JANUARY 1985 TO DECEMBER 1987) AND THE SECOND PERIOD (JANUARY 1988 TO DECEMBER 1996) WITH REGARD TO THE PP1 VARIABLE 65
TABLE 12: WALD TEST FOR SOUTH AFRICA (GAUTENG) BETWEEN THE FIRST PERIOD (JANUARY 1985 TO DECEMBER 1987) AND THE SECOND PERIOD (JANUARY 1988 TO DECEMBER 1996) WITH REGARD TO THE GROUP VARIABLE 66

LIST OF FIGURES

FIGURE 1: PETROL RETAIL PRICE (93 OCTANE) 24

LIST OF APPENDICES

APPENDIX 1: FITTED AND REAL VALUES OF RETAIL PETROL PRICES IN SOUTH AFRICA (GAUTENG) FROM JANUARY 1988 TO DECEMBER 1996 73
APPENDIX 2: FITTED AND REAL VALUES OF RETAIL PETROL PRICES IN AUSTRALIA (CANBERRA) FROM JANUARY 1988 TO DECEMBER 1996 74
APPENDIX 3: FITTED AND REAL VALUES OF RETAIL PETROL PRICES IN SOUTH AFRICA (GAUTENG) FROM JANUARY 1985 TO DECEMBER 1987 75

CHAPTER ONE

INTRODUCTION

The motivation for this study is that with the easing of sanctions and the desire to open the economy to investment and trade, the Government faces the task of reforming the sector (International Energy Agency, 1996:171). The reason why any Government intervene in sectors of the economy is to make sure that such a sector develops in a way that ensures a healthy industry, continued supply of products and reasonable prices to the end consumer (International Energy Agency, 1996:171). Any change to the current system must, particularly in a developing South Africa, where unemployment is an important factor, deliver a guaranteed better overall deal for the country and all its people. The main aim of this study is to determine what the possible outcome of partial deregulation of the liquid fuels sector, with regard to retail petrol prices, will be in South Africa as opposed to regulation (the current situation). The emphasis will be on what the major determinants of the retail petrol price will be if the price is less regulated in South Africa. This will be done by using the Australian situation as a benchmark.

Chapter two gives an overview of the liquid fuels sector in South Africa, this includes all the different bodies as well as the refining, wholesale and retail industries that are directly involved in this sector. It then goes on to describe the regulation that is prevalent in the liquid fuels sector with a description of how the retail petrol price is comprised. This chapter also includes a view on how much competition there is in the liquid fuels sector. A comparison between the regulated environment of the liquid fuels sector in South Africa with that of other countries is then made, with the emphasis on retail petrol prices.

Chapter three gives an overview of the liquid fuels sector in Australia. Australia was chosen as a benchmark country because in many regards there are similarities between the two countries' liquid fuel sectors. The liquid fuels sector in Australia is described, including refining, wholesale and retail. A section also covers the regulations and competition that are prevalent in the Australian liquid fuels sector. The chapter ends with theoretical findings as to what may possibly happen in South Africa's liquid fuels sector (based on what has happened in Australia).

Chapter four gives a summary of the opinions of different stakeholders (business, Government and labour) in the liquid fuels sector in South Africa, with regard to regulation or deregulation of the

sector. The views of the stakeholders in South Africa are then compared with the theoretical findings in chapter three. A summary of views of the Australian stakeholders are also given on the issue of regulation and deregulation in Australia's liquid fuels sector to make it clear that Australia's system is still not perfect for all of its stakeholders.

In chapter five regression models are used to determine the major determinants of the South African retail petrol price as well as the Australian retail petrol price. Comparisons are then made as to what the differences (with regard to elasticities of major determinants of the retail price of petrol) are between a country where the liquid fuels sector is regulated and a country where it is partially deregulated. This is done to see how deregulation can influence elasticities. It appeared that South Africa's liquid fuels sector has also changed over time, hence the elasticities of determinants of the retail petrol price, between two different periods, in South Africa are also compared.

CHAPTER TWO

AN OVERVIEW OF THE SOUTH AFRICAN LIQUID FUELS SECTOR

This chapter aims to describe the South African liquid fuels sector, to give a background of how the sector is structured at the moment and the reasons why it was done this way. The reason for this is to get an idea of the extent of Government intervention in the South African liquid fuels sector. Firstly, a short description of the raw material resources in South Africa will be given. This will be followed by a description of the South African liquid fuels sector, which include the refining industry, the synthetic fuels industry, the Central Energy Fund association (Pty) Ltd, the Strategic Fuel Fund, Soekor, the wholesale industry and the retail industry. This will be followed by a short description of the modes in which fuel is transported. A summary of the regulation in the liquid fuels sector as well as the regulatory measures that are applied will be given. A description of the current retail petrol price mechanism, that is how it is calculated will then be given to give insight to the fairness thereof. The question of competition is one of the cornerstones of those that are for deregulation, therefore paragraph 2.5 will be dedicated to this issue.

2.1 RAW MATERIAL RESOURCES

Apart from limited gas and oil reserves in the Mossel Bay area South Africa does not have significant commercially exploitable gas or crude oil reserves (Trollip, 1996:4-12). About twenty billion litres of liquid fuels are consumed in South Africa annually. The demand for liquid fuels is partly met by synthetic fuels (synfuels) that are produced largely from coal and a small amount from natural gas. Synfuels may be defined as fuel that is produced from raw materials. The rest of the demand is met by products refined locally from imported crude oil (Trollip, 1996:4-12).

2.2 STRUCTURE OF THE LIQUID FUELS SECTOR

2.2.1 Refining industry

Prior to 1954, all fuel consumed in South Africa was imported in refined form. The imported fuel was distributed by BP, Shell, Mobil and Caltex, which were then operating as wholesale marketers (International Energy Agency, 1996:178).

LIST OF TABLES

TABLE 1: REFINERY AND SYNTHETIC FUELS PLANT PRODUCTION CAPACITIES 4
TABLE 2: MARKET SHARES OF WHOLESALE MARKETERS IN 1996 11
TABLE 3: THE HERFINDAHL INDEX 26
TABLE 4: QUOTAS OF AUSTRALIAN PETROLEUM COMPANIES 31
TABLE 5: COMPARISON OF THEORETICAL FINDINGS (P. 50) WITH THE VIEWS OF THE STAKEHOLDERS 51
TABLE 6: REGRESSION COEFFICIENTS FOR THE RETAIL PETROL PRICE SPREAD IN SOUTH AFRICA (GAUTENG) 58
TABLE 7: REGRESSION COEFFICIENTS FOR THE RETAIL PETROL PRICE SPREAD IN AUSTRALIA (CANBERRA) 60
TABLE 8: WALD TEST BETWEEN THE ELASTICITIES OF THE COST IN SOUTH AFRICA (GAUTENG) AND AUSTRALIA (CANBERRA) 62
TABLE 9: REGRESSION COEFFICIENTS FOR THE RETAIL PETROL PRICE SPREAD IN SOUTH AFRICA (GAUTENG) 63
TABLE 10: WALD TEST FOR SOUTH AFRICA (GAUTENG) BETWEEN THE FIRST PERIOD (JANUARY 1985 TO DECEMBER 1987) AND THE SECOND PERIOD (JANUARY 1988 TO DECEMBER 1996) WITH REGARD TO THE COST VARIABLE 65
TABLE 11: WALD TEST FOR SOUTH AFRICA (GAUTENG) BETWEEN THE FIRST PERIOD (JANUARY 1985 TO DECEMBER 1987) AND THE SECOND PERIOD (JANUARY 1988 TO DECEMBER 1996) WITH REGARD TO THE PP1 VARIABLE 65
TABLE 12: WALD TEST FOR SOUTH AFRICA (GAUTENG) BETWEEN THE FIRST PERIOD (JANUARY 1985 TO DECEMBER 1987) AND THE SECOND PERIOD (JANUARY 1988 TO DECEMBER 1996) WITH REGARD TO THE GROUP VARIABLE 66

The Durban and Sasolburg refineries import crude oil through the Single Buoy Mooring (SBM) point near Durban, which is a privately owned facility operated by a consortium of oil companies. The Milnerton refinery obtains its crude oil requirements through Saldanha Bay.

International oil companies owned about 62% of crude oil refining capacity in South Africa in 1996 (Trollip, 1996:4-21).

2.2.2 *Synthetic fuels industry*

The Government was convinced in 1947 of the importance of the production of fuel from indigenous raw material. The reason was mainly because of the fact that South Africa had no proven crude oil reserves and was dependent on international crude oil supply. A licence was granted by the Government to produce synfuels in terms of legislation that granted a measure of protection to the proposed synfuels industry (Trollip, 1996:4-24).

2.2.2.1 Sasol

a) Sasol One

It was believed internationally that oil reserves would become exhausted after the second world war. Projections were that reserves would only last for approximately 12 to 15 years (Department of Mineral and Energy Affairs, 1993:33).

Production at the Sigma coal mine at Sasolburg was completed and commenced in 1955. Sasol concluded an agreement with the rest of the Oil Industry (which later became known as the Blue Pump Agreement) whereby Sasol was allowed only one pump per service station in a limited geographical area to market its entire fuel production.

Government suggested a second Sasol Oil-from-Coal installation to the Sasol Board during the 1960s. Since oil prices were low at that time, it would not have been economically viable, and Sasol suggested that the Government should satisfy its strategic objectives by a strategic crude oil storage programme. The strategic crude oil storage programme lead to the construction of the Natref Crude Oil Refinery in which Sasol (52,5%), Total (30%) and the National Iranian Oil Company (17,5%) had a shareholding.

b) *Sasol Two*

The first international oil crisis in 1973, when the price of oil increased from $3 to about $12 per barrel (Trollip, 1996:4-25), preceded the announcement of Sasol Two. The Arab Israeli War and the consequent Arab boycott of the United States prompted this crisis. The high oil prices and the uncertainty about security of supply of oil made it economically viable to establish a new synthetic fuel installation in South Africa. The first synthetic fuel from Sasol Two was produced in 1980.

c) *Sasol Three*

Strikes in the Iranian Oil Fields during October 1978 led to a substantial drop in exports of Iranian crude oil. Iran was the second largest exporter in the world. World oil prices soared to levels as high as $48 dollars per barrel at times (Department of Mineral and Energy Affairs, 1993:36).

There was a shortage of crude oil world wide. South Africa was more than 90% dependent on Iranian Crude Oil at that time and a scramble to obtain other sources of supply in a hostile world of sanctions, started.

In 1979 the Sasol Three project was announced which was essentially a duplication of the Sasol Two fuel from coal plant. The first synthetic fuel from Sasol Three was produced in 1982.

The Sasol group was privatised in 1979 (International Energy Agency, 1996:171).

d) *Government's Involvement in the Synthetic Fuels Industry with regard to Sasol*

Government played an integral part in the establishment of Sasol One, Two and Three, because of the strategic importance of transport fuel and the magnitude of synthetic fuel operations. Government's involvement in Sasol's synthetic fuel operation can be summarised in the following three categories:

- **Financial assistance**

  The State provided financial assistance for Sasol by means of share capital and commercial loans.

- **The Marketing of Synthetic Fuel**

  Sasol currently produces 31% of South Africa's transport fuel demand from synthetic sources and another 14% from crude oil refining. Hence, Sasol produces 45% of the country's transport fuels. Government approved the establishment of single brand service stations (where only one brand could be sold at a service station outlet). This approval was made subject to the stipulation that Sasol would be allowed to market its petrol through its own pump on the driveways of these service stations. Sasol has a market share of 9.23% (International Energy Agency, 1996:179).

  Sasol was requested not to establish its own service station network, to ensure the most cost effective way to distribute petrol in the consumer's interest. Sasol was assured that it would be able to rely on Government intervention in future to compel the petroleum marketers to purchase the necessary Sasol production for marketing through their own distribution networks.

  Subsequent to the above discussion Sasol negotiated a Supply Agreement with the rest of the oil industry. This agreement stipulated that the oil companies purchased Sasol's production at a producer price based on the In-Bond-Landed-Cost. Sasol had to agree not to market a defined range of petroleum products directly to consumers except as allowed for in terms of the Blue Pump Agreement.

  Compensation for lost refining margins (also referred to as "synthetic levy"), that were paid to crude oil refiners, and was tied to the synthetic fuel production of Sasol Two and Three, dates back to 1984. The oil industry applied for an increase in marketing margins at that time. In justification they quoted the decrease in international refining margins as well as the forfeiture of the refining margin on the synthetic fuel volumes they agreed to purchase. An extensive study

was done by auditors and subsequently the marketing margins applied for was approved but at a lower level. The "synthetic levy" diminishing with time was also introduced. The synthetic levy was a compensation to the oil companies for the market share loss to Sasol (Department of Mineral and Energy Affairs, 1993:41). This synthetic levy was officially terminated in August 1993 (Department of Minerals and Energy).

- **Tariff protection**

The Equalisation Fund levy is raised on imported petroleum products as well as on products manufactured from imported crude oil. Synthetic fuels are exempt or partially exempt from this levy, depending on the international price of crude oil. This levy enables the Synthetic fuel producer to achieve higher nettback prices (to the extent of the levy differential) than importers or producers using imported crude oil.

At first the protection framework provided for protection to enable the achievement of a nettback price equivalent to $23 per barrel (up to October 1993) derived crude oil. Protection was automatically reduced when crude oil and product prices rose, and at a derived crude oil price of $23 per barrel or higher protection was eliminated. When the derived crude oil price exceeds a level of $28,70 per barrel 25% of the additional income accrues to the state until the full benefit derived from protection since July 1989 has been eliminated. When the derived crude oil price is below $23 per barrel, protection is achieved by a lower Equalisation Fund levy being imposed on fuels produced from indigenous feedstocks than on imported fuel or fuel produced from imported feedstocks. The floor price was reduced to $21.40 during 1993 and in December 1995 the Government decided to reduce it in two stages in 1996, and to phase it down to $16 dollar per barrel by July 1999 (International Energy Agency, 1996:187).

The Government does not pay the synthetic fuels industry any subsidies. Protection is effectively achieved in the same manner as other local industries through higher nettback prices made possible through the duties or levies that is applied by Government on imported products or feedstocks. The protection that

the synthetic fuels industry enjoys will also decline gradually as crude oil and product prices increase.

2.2.2.2 Mossgas

The Mossgas project was one of a few synfuels projects proposed to the Government in the late 1980s. A target level of self-sufficiency of 40% of liquid fuel requirements (petrol and diesel), which was achieved after the completion of Sasol 3, was to be maintained for the future, in terms of the energy policy of that time. The reason for this strategy was mainly because of the increasing isolation of South Africa and the United Nations oil boycott in reaction to South Africa's apartheid policy.

At present the upliftment of Mossgas fuels by the oil industry is taking place without a formal long-term agreement. The wholesale price paid for Mossgas products is a lower price based on the commercial value of these products to the oil industry, it is not import parity prices. The prices paid is determined by the value of these products in the export market using Mediterranean postings plus transport differentials. Mossgas is compensated by the State to bring the revenue it receives from these sales up to the In-Bond-Landed-Cost.

2.2.3 Central Energy Fund (Pty) Ltd

The Central Energy Fund (Pty) Ltd was established by an act of parliament. It is responsible for the administration of the Central Energy Fund, the Equalisation Fund and the Strategic Fuel fund. The Central Energy Fund (Pty) Ltd holds the following three energy entities:

- Soekor, the oil and gas exploration and production company and offshore regulatory body;
- Mossgas, the gas-to-synthetic fuels plant; and
- Strategic Fuel Fund Association (SFF), which owns and manages the strategic oil facility and stocks and handles state-acquired oil imports.

The Central Energy Fund is financed by levies on petroleum products. It has the function of promoting the production of liquid fuels from local resources. The Equalisation Fund is also financed from levies on the sales of petroleum products and has been used to finance premiums on the procurement of oil, tariff protection for Sasol and Mossgas and the

equalisation of domestic fuel prices in view of short-term fluctuations in international oil prices.

2.2.4 *Strategic Fuel Fund Association (SFF)*

"The main objective of the Association, which was established on 18 June 1964, is to: 'carry on the business of promoting, conducting, establishing, facilitating, guiding and assisting, by the establishment of a fund or funds and/or in any other manner whatsoever, the location, procurement, storage, production and/or exploitation of fuels, materials, products and commodities which are or may become of strategic importance to the Republic of South Africa not for gain but solely in the communal interest of the general public, and to perform any other acts towards this end'. SFF Association provides administration services to the Central Energy Fund." (Central Energy Fund, 1994 to 1995:36).

The Strategic Fuel Fund Association (SFF) is a subsidiary of the Central Energy Fund, a wholly state-owned company. It used to co-ordinate the acquisition of all crude oil imports to South Africa. Until very recently, all the crude oil used by the crude oil refining process was purchased by the Strategic Fuel Fund (SFF) and resold to the refineries. During the oil embargo era the policy on stockpiles stipulated that stocks must be sufficient to cover the country's total needs for up to two years. This objective has been modified with the aim of having stocks sufficient to cover three months' import requirements (BP, 1995).

In 1993 the Government decided that the oil companies should be responsible for handling up to 80% of the country's crude oil import requirements. State-to-state oil purchase deals will be handled by SFF, for example from Iran and Egypt, and companies can buy from it should they choose to do so.

At the end of 1995 the strategic stock was approximately 45 million barrels of crude oil (enough to cover import requirements for six months) (International Energy Agency, 1996:188).

2.2.5 *Soekor*

In 1965 Soekor was founded as the National Oil Exploration Corporation responsible for promoting and if necessary itself, undertaking exploration of oil for South Africa. One of the

reasons for this exploration was part of the national strategy to reduce the country's level of dependence on the importation of crude oil.

Soekor acts as an agent of the Government to do the following:

- allocate areas within its exclusive off-shore lease to others for exploration. This is subject to ministerial approval;
- regulate and supervise the conduct of other exploration companies. It serves at the same time as the resource conservation engineer or regulator for production (at Mossgas); and
- promote exploration.

2.2.6 Wholesale industry

The market share of each wholesale marketer was as follows in 1996:

Table 2: Market shares of wholesale marketers in 1996

MARKET SHARE (%)		
	Diesel	**Petrol**
BP	17	16
Caltex	18	19
Engen	25	26
Sasol	1	8
Shell	19	18
Total	15	12
Zenex	5	3

Source: Department of Minerals and Energy, 1996, part 5

Three new oil companies were formed in 1997 namely Afric Oil, Tepco and Exel.

2.2.6.1 Wholesale prices

The wholesale marketers obtain refined products at In-Bond-Landed-Cost from the refineries (including Sasol). These products are currently transported to approximately 200 depots throughout the country either by pipeline, rail tank cars, road or coastal transport or a combination of these modes. There are agreements between members of the oil industry on a

joint venture and hospitality basis that avoid duplication of depots, thereby improving efficiencies and reducing the cost of storage and transport.

2.2.6.2 Wholesale margin

The wholesale or marketing margin is monitored and controlled by the state using a formula known as Marketing Petroleum Activities Return (MPAR). To regulate the liquid fuels sector's profitability, a rate of return approach on capital employed is followed by the Department of Minerals and Energy. A return of 15 per cent, before interest and tax on assets employed, is allowed to the liquid fuels sector. The wholesale margin will only be adjusted when the actual rate of return of the liquid fuels sector on marketing activities varies outside the range of 10 and 20 per cent. Marketing of petroleum activities (MPAR) are petroleum-related activities outside the refinery gate. It is based on the acquisition at In-Bond-Landed-Cost and other related activities, for example storage, transportation, distribution, marketing, administration of the relevant products and income from service stations.

The allowed asset base is composed of fixed and current assets as per the annual financial statements, with assets valued at historic cost unless otherwise stated. Income is calculated after the provision for normal and additional depreciation and a cost of sales adjustment (Lambrechts *et al*, 1993:19).

2.2.7 Retail industry

During the 1950's a great number of service stations were opened with the result that many were not pumping enough petrol to cover their costs. The reason for this irrational growth was the fact that the Government provided a standard profit for service stations based on assets. Aspirant service station owners opened sites even if it was not needed, because the returns on the investment were guaranteed. The Government had to provide an equally rapid growth in profits to stay in line with the rapid growth in the number of petrol stations. In 1996 there were approximately 4 900 service station outlets with about 45 000 forecourt workers and 100 000 direct consumers (International Energy Agency, 1996:193).

2.2.7.1 Service Station Rationalisation Plan (RATPLAN)

The RATPLAN was put in place to limit the number of new sites opened every year. The RATPLAN controls the retail end of the oil industry. It is an agreement between the oil companies, service station owners and the Government, and it was put in place in 1960. The RATPLAN ensures that petrol is distributed economically and orderly throughout the country. The RATPLAN also ensures that basic repair facilities are readily available throughout the country. In terms of the RATPLAN vertical integration of the oil industry is prohibited. This has facilitated the establishment of a large, economically viable small business sector. The RATPLAN also facilitates the entrance of quite a number of black small business entrepreneurs into the service station industry. The sale of fuel on credit is also prohibited by the Department of Minerals and Energy as a further cost saving measure.

The objectives of the RATPLAN is (Department of Minerals and Energy, 1993:17):

- To ensure that fuel is provided nationally at a reasonable price by maintaining a country wide network of viable petrol outlets.
- To ensure that basic essential service facilities are available at petrol outlets for the convenience and cost benefit of the motoring public.
- To promote increases in average site petrol sales and thus reducing the need for margin increases, thereby improving the viability of dealers.
- To create overall control parameters which provide for a basic minimum service standard and prevent the proliferation of petrol outlets and unnecessary duplication.

The basis of the RATPLAN is to limit the number of service stations and by controlling petrol outlets other than service stations which can have a detrimental effect on the sale of petrol through service stations.

2.2.7.2 Retail Price Maintenance (RPM)

Retail price maintenance is only applicable to petrol sold at retail level. All prices at wholesale level are maximum prices only, and may be discounted. The Department of Minerals and Energy enforces the retail price maintenance on petrol in terms of the Petroleum Products Act.

2.2.8 *Fuel transport*

Fuel is transported in four ways, namely coastal shipping (by oil industry owned coastal tankers), road, rail and pipeline.

Some companies in the oil industry own and operate a single buoy mooring facility outside Durban harbour. Crude oil can be discharged from tankers without the necessity of entering the port. Portnet, the state port parastatal handles petroleum products at its harbours.

The transportation of crude oil from the coast to the only inland refinery, Natref, as well as from bulk-storage facilities to the refineries, and of petroleum products from the refineries and storage facilities to inland depots is mostly carried out by Transnet, the state-owned transportation company. All crude oil and petroleum-product pipelines in South Africa is owned and controlled by Transnet through its subsidiary, Petronet. The transportation of fuel by rail and road are done by other Transnet subsidiaries, Spoornet and Autonet respectively, as well as the road tankers of the oil companies (Trollip, 1996:4-37).

Oil industry-owned road tankers distribute petroleum products from the refineries or coastal supply points to the inland fuel depots and from the depots to the service stations, in the most economical mode or combination of modes available. The transport cost element in the retail price of fuel is dependent on the area in which the fuel is sold, increasing with distance from the coast. South Africa is divided into pricing zones by using the cheapest combination of modes (using Transnet tariffs) of transport from the nearest port where oil companies distribute petroleum products. This system ensures that petroleum products are nationally available including rural areas. The published tariffs of the different modes of transport in Transnet are used to determine the cheapest transport cost from coast to inland sources. Some zones use the rail tariffs (where there are no pipelines), some road tariffs (where there is no rail or pipeline transport available), and there are the zones that use the pipeline and a combination of pipeline and rail (so-called onrailing) tariff to determine the associated transport cost (Trollip, 1996:4-37).

2.3 REGULATION IN THE LIQUID FUELS SECTOR

2.3.1 Legislation

The main acts that are applicable on the liquid fuels sector are the following:

Central Energy Fund Act no. 38 of 1977. This act provide for the payment of certain moneys into the Central Energy Fund and for the utilisation and investment thereof; for the imposition of a levy on fuel and for the utilisation and investment thereof; for the control of the affairs of CEF (Proprietary) Limited by a board of directors; for the keeping of records of all transactions entered into for account of the Central Energy Fund or the Equalisation Fund and of certain other transactions; for the investigation, examination and auditing of the books, accounts and statements kept and prepared in connection with the said transactions; and for the submission to Parliament of a report relating to the said investigation, examination and auditing; and to provide for matters connected therewith (Central Energy Fund Act 38/1977)

Customs and Excise Act of 1964. This act provides for the levying of customs and excise duties and a surcharge; for a fuel levy, the prohibition and control of the importation, export or manufacture of certain goods; and for matters incidental thereto (Customs and Excise Act 91/1964).

The Petroleum Products Act no. 120 of 1977. This act provides measures for the saving of petroleum products and an economy in the cost of the distribution thereof, and for the maintenance and control of a price therefor; for control of the furnishing of certain information regarding petroleum products; and for the rendering of services of a particular kind, or services of a particular standard, in connection with motor vehicles; and to provide for matters incidental thereto (Petroleum Products Act 120/1977).

2.3.2 Regulatory measures applied

- **Acquisition of crude oil**

  The Strategic Fuel Fund was since the early eighties responsible for the co-ordination of the acquisition of crude oil. The crude oil purchased by the Strategic Fuel Fund Association is sold to the crude oil refiners at international market prices determined by

the Department of Minerals and Energy in close collaboration with the Strategic Fuel Fund Association and the oil companies.

The crude oil purchased for the Durban and Sasolburg refineries is imported through the Single Buoy Mooring near Durban. The Single Buoy Mooring is a privately owned facility operated by a consortium of oil companies. Since not all oil companies are members of the consortium the Department of Minerals and Energy controls the charges levied by the Single Buoy Mooring to its members, Strategic Fuel Fund and other oil companies (Department of Mineral and Energy Affairs, 1993:58).

- **Refining**

The refining industry, was deregulated in 1991 with In-Bond-Landed-Cost maintained as the ex-refinery price. The In-Bond-Landed-Cost (IBLC) is used to ensure import parity pricing and is the price paid to oil refiners for their refined product and to Sasol for its synfuels (Ensor, 1993:8).

Crude oil refineries had to reduce throughputs of crude oil in their facilities to accommodate the production of the synthetic fuel plants. Government compensates the refining industry for loss of refinery income by means of a synthetic levy (see page 6), until the refineries could attain their previous output levels as a result of market growth. The Government afford tariff protection to the synthetic fuels industry, so as to enable it to compete with imported fuel products.

Imports of refined products are controlled in order to promote local refinery throughputs, especially in view of the oil industry's upliftment of the synthetic fuel products (Department of Mineral and Energy Affairs, 1993:59).

- **Wholesale**

In determining the wholesale price, the freight, insurance and leakages as well as landing charges levied by Portnet are added to obtain the In-Bond-Landed-Cost. Government imposts such as taxation are determined by the Department of Finance. The Equalisation Fund levy, the Strategic Fuel Fund, the Multilateral Motor Vehicle Accidents Fund as well as the wholesale margin are determined by the Department of Minerals and Energy.

The wholesale margin is determined through a formula based on a return on depreciated assets at historical values plus additional depreciation (Petroleum Activities Return on Marketing - MPAR). Transport cost to the depots, and from the depots to the points of sale, are then added to determine the wholesale price at the end destination.

Transport cost to the depots are based on tariffs set by Petronet and Spoornet as well as road transport cost, while the transport cost from the depots to the points of sale are determined by the Department of Minerals and Energy on audited figures from the oil industry, and are averaged out for the country as a whole. The country has been divided into pricing zones based on magisterial districts, because transport tariffs to different destinations are different.

Sasol has been limited with regard to its market share of the national market.

- **Retail**

  The retail price is determined by adding the retail margin to the wholesale price in the various pricing zones. This margin reflects the average cost of operation of a sample of service stations. It is determined by the Department of Minerals an Energy on a basis of a cost and financial analysis of their profitability. Petrol prices are fixed at retail level in terms of the Petroleum Products Act No 120 of 1977 (Retail Price Maintenance) and it may not be discounted.

  In order to improve the viability of service stations, the RATPLAN is administered by the Department of Minerals and Energy. This plan has the aim of rationalising the number of service stations so as to enable them to reap the benefits of increased throughputs and the unit cost advantages flowing therefrom. This also reduces the level of retail margins required. The Ratplan also prohibits the oil industry from integrating vertically from refinery to the retail industry, thereby promoting the interest of the small entrepreneur. The Department has also prescribed a cost saving measure by the prohibition on the sale of fuel on credit. In terms of the Ratplan competition to promote sales on driveways, whether run by the service stations or the wholesale marketers, are also curtailed, because experience has clearly shown that this just adds to the overall cost of both the retailers and the oil companies (Department of Mineral and Energy Affairs, 1993:61).

2.4 AN OVERVIEW OF THE PETROL PRICE COMPOSITION

Since June 1994 the retail petrol price in South Africa is adjusted on the first Wednesday of every month. The reason why this is done is the following:

Petrol is refined from crude oil and in South Africa it is also manufactured from coal and natural gas. To produce petrol in South Africa, oil has to be bought on international markets and imported. The international price of oil and petroleum products are fixed in US dollars, and fluctuates a great deal. A rise in the international oil price will increase the cost of producing petrol and will lead to a higher retail petrol price in South Africa. The fact that oil is bought with US dollars means that the value of the Rand in terms of dollars also influences the cost of petrol. A weak Rand (that is when more Rands are needed to buy one US dollar) makes it more expensive to produce petrol. As the value of the Rand and the price of oil and petroleum products fluctuate on a daily basis, the retail petrol price should actually be adjusted on a daily basis. This is impractical, and the Government decided that the adjustment should be done on a monthly basis, taking the fluctuations of the preceding month into account.

The retail price of petrol in South Africa comprises two main elements, that is, the international element (external factors) and the domestic element (internal factors).

2.4.1 International dimension (In-Bond-Landed-Cost and the Rand / Dollar exchange rate)

Cabinet, on 28 September 1994, approved that fuel prices in South Africa be determined as follows:

a) **Free-on-Board value (product postings)**

Free-on-Board value means the value of the product when it boards the ship, without any additional costs, like insurance.

An average of the "free-on-board" (FOB) petrol prices "posted" (listed) by four international export refineries is used to calculate the FOB portion of the landed cost. These refineries are Esso, Mobil and Singapore Petroleum Company (SPC) in Singapore and Caltex in Bahrain.

Posted prices are an assessment of the prices at which term or contract prices are set. This is based on the prices at which large volume contractual deals are negotiated and where there are security of supply and an assurance of quality of product. There is a built-in premium for such assurances. Spot prices are the prices of products which are surplus to the contractual refinery agreements and sold ad hoc into the market.

In the case of liquid fuels in South Africa, prices are controlled, and therefore transparency of the base on which the prices are determined, is of importance. The Singapore / Bahrain IBLC basis that is used to price South African controlled fuels, fully complies with the requirement of transparency since it is kept at arm's length, cannot be manipulated and has consistently delivered internationally competitive prices. Singapore refineries also serve the developing South East market which is more comparable with the South African market than the mature European market. That is why Singapore, with its major export refineries, was regarded the best choice. Bahrain was included as a balance to avoid using prices from only one refinery centre. The value of these "Product Postings" reflects the purchase price for petroleum products, should South Africa be required to import significant volumes of these products. The basket of average prices is further adjusted to reflect 80 per cent posted prices and 20 per cent spot prices.

b) **Freight**

The base for this is standard international tariffs from the "Worldscale" publication for voyages from Bahrain and Singapore to South African ports. Each month, factors reflecting the latest market trends for different types of vessels are incorporated into a market rate, which is then applied to the standard tariff or "Worldscale" to determine the freight cost.

c) **Insurance**

This is determined by Lloyds of London for different voyages according to prevailing risks to and from different areas in the world (for cargo insurance purposes) for different product types. The 0,1009 per cent of cost and freight applied in the South African situation represents a low risk tariff for petroleum product shipments.

d) **Ocean Leakage**

A loss of 0,5 per cent for crude oil and 0,3 per cent for products has been accepted as a normal leakage, clingage and evaporation in international crude oil and petroleum products trading, shipping and insurance. The "normal" loss has to be borne by the buyer. Payment is made on Bill-of-Lading volumes (B/L), that is when the product is put on board of the ship, yet actual landed volumes are "normally" 0,5 per cent or 0,3 per cent less than Bill-of-Lading volumes. The buyer therefore has a financial loss of 0,5 per cent on crude oil and 0,3 per cent on imported petroleum products.

The sum of the above elements represents the CIF (cost, insurance and freight) cost for products landed in South Africa.

e) **Landing and wharfage**

Landing and wharfage charges of 1,78 per cent of Free-On-Board product value of the shipment are added to get the In-Bond-Landed-Cost.

The In-Bond-Landed-Cost, in US c/gallon, as determined above, is converted to cents/litre by applying the applicable Rand/Dollar exchange rate (four banks daily mean quoted at 11:00 averaged over the calendar month applicable) and a constant litre/gallon factor (3,8038 for petrol).

The In-Bond-Landed-Cost represents the transfer price from refineries to the marketing division of oil companies. The difference between the In-Bond-Landed-Cost income and the crude oil import costs and operational costs for the refineries represents the gross refining margin for the refinery.

2.4.2 Transport costs

Transport costs differ among the different pricing zones. South Africa is divided into A, B and C zones according to the dominant mode of transport (Trollip, 1996:4-37). Bulk rail transport is used in the A-zones, road transport in the B-zones and pipelines are used in the C-zones. Transport costs are determined by using the transport tariffs of Transnet (Petronet, Spoornet and Autonet) for transporting the product from the coastal refineries to inland depots serving the area or zone. The Department of Minerals and Energy and Caltex, as

Secretary Company to the oil industry for pricing zones determination, ensure that the most economical cost of transporting fuel is recovered from fuel consumers.

Natref refinery in Sasolburg is the only refinery that is established inland. Crude oil is transported by pipeline to this refinery. Regardless of that, Sasol's synfuel products are priced as if it were transported from the coast. Although there is criticism, two economic principles are important here, namely:

- Sasol can claim the location advantage which is a phenomenon well known in the pricing of other commodities; and
- it is practically impossible to have a double barrel pricing structure in the same area for synthetic fuels and fuels refined from crude oil.

2.4.3 Delivery cost (Service differential)

Marketers are compensated by this element for depot related costs and distribution costs from the depot to the end user. It is calculated on actual historic costs (1 year previously) averaged over the country and industry.

2.4.4 Wholesale (marketing) margin

The Marketing Petroleum Activities Return (MPAR) is the mechanism used to calculate the wholesale margin in the retail petrol price. This mechanism is based on the results of a cost and financial investigation by a firm of chartered accountants (Deloitte & Touché) into the profitability of the wholesale marketers. The level of the margin is calculated on an industry basis and aim to grant marketers a benchmark return of 15% on depreciated book values of assets, with allowance for additional depreciation, but before tax and payment of interest.

2.4.5 Retail margin

The retail margin is fixed by the Department of Minerals and Energy and is determined on the basis of the actual costs incurred by the service station operator in distributing petrol. This costs take into account all proportionate driveway related costs such as rental, interest, labour, overheads and entrepreneurial compensation.

In the calculation of these costs a detailed investigation have been undertaken at approximately 80 service stations, where the average monthly volume was just above the country's average of 153 000 litres per month (Trollip, 1996:4-34). Petrol service stations that sell higher volumes may achieve a certain advantage as they function at the same retail margin, but in many cases higher fixed costs may offset such an advantage. The manner in which the margin is determined creates an incentive to service station dealers to become more efficient, in that way they can increase their profits proportionate to their efficiency.

2.4.6 Equalisation Fund

The Minister of Minerals and Energy in concurrence with the Minister of Finance determine the Equalisation Fund, which is a fixed monetary levy. It was necessary to establish the Equalisation Fund, because of the fact that during 1979 the Republic of South Africa found itself in a situation where it could not obtain crude oil without paying a price premium. The Equalisation Fund was established to manage the collection of levies and financing of the crude oil price differential. A levy based on retail sales of petroleum products was imposed from January 1979. These levies were collected on behalf of the Equalisation Fund by the companies marketing petroleum products (so called Schedule C Companies).

The In-Bond-Landed-Cost is a function of daily changing postings and rand dollar exchange rate movements. The actual In-Bond-Landed-Cost for an applicable month is determined by the monthly average of the net effect of these daily changings, and other domestic elements that may also change from time to time. Since it will be impractical to change pump prices at approximately 4 900 filling stations nation wide on a continuous basis, an account is kept between the Department of Minerals and Energy and the oil industry to take account of these monthly movements.

Underrecoveries (that is when the sum of the elements constituting the price is more than that recovered at the pump) are debited against the unit slate overrecoveries (that is when the sum of the elements is less than the pump price). The unit over- and underrecoveries times the volume sold for a specific month accumulate to form a positive or negative slate balance and are carried by the oil companies.

Underrecoveries (or overrecoveries) can be corrected by implementing a price change to take account of the unit situation or by delaying a price change and temporarily financing underrecoveries from the Equalisation Fund.

2.4.7 Fuel tax and the Customs and Excise levy

Liquid fuels taxes are a good source of revenue for Government because such products are widely used, evading payment is very difficult and collection costs are low. South Africa's fuel tax are at a relatively low level to countries in Europe and elsewhere (European Commission, 1997).

2.4.8 Road Accidents Fund (RAF)

The Road Accident Fund levy income is utilised to compensate third party victims of motor vehicle accidents.

2.5 COMPETITION IN THE LIQUID FUELS SECTOR

The following may be used to determine whether the South African petroleum market is competitive:

- The level of retail prices (excluding tax) compared with world prices.
- The oil industry's profitability.
- The extent of barriers to entry into and exit from the market.
- Evidence of fluctuations in market shares and prices.
- The Herfindahl-index.

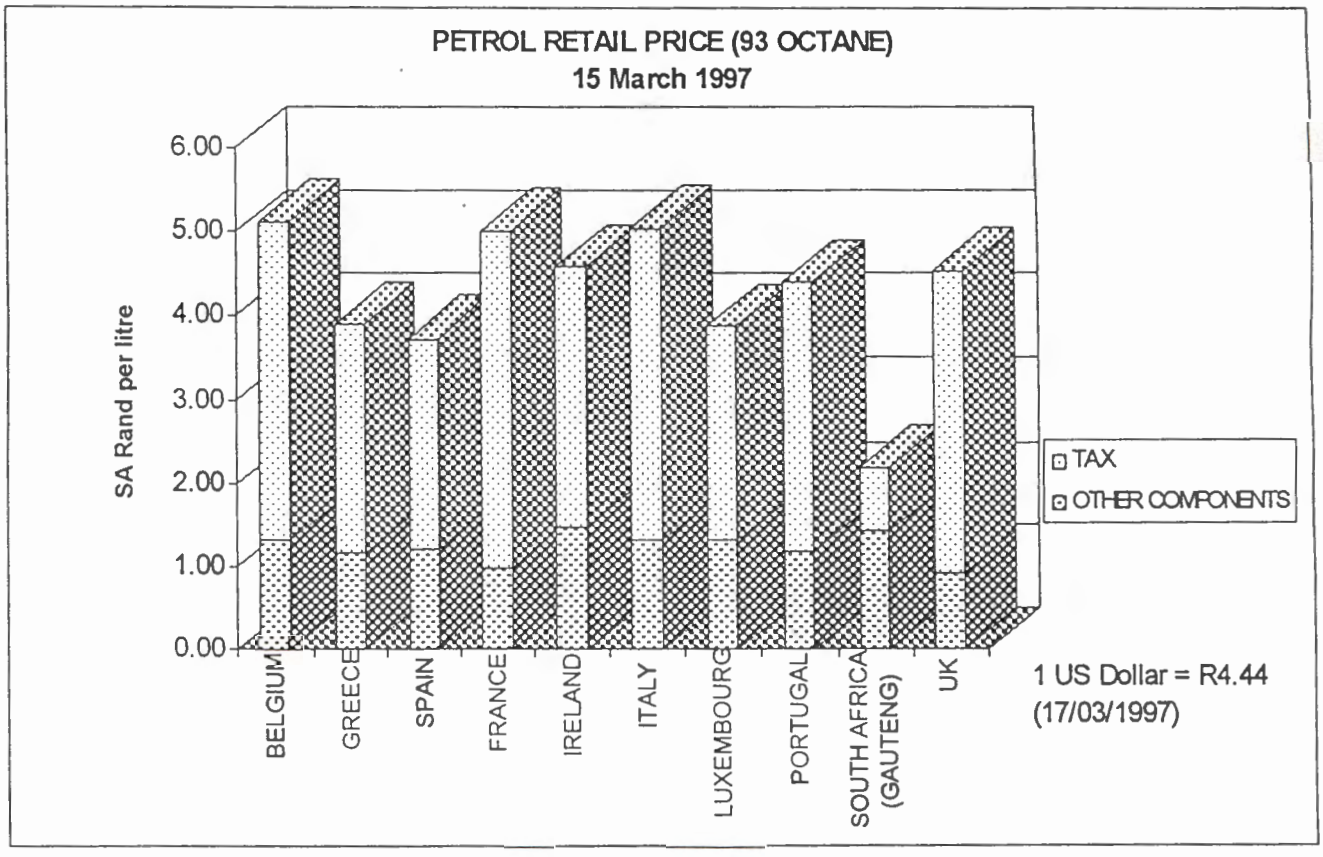
In order to evaluate South Africa's competitiveness with regard to the liquid fuels sector, a discussion will follow on each of these factors. This will be done for the situation which prevailed in 1996.

2.5.1 The level of South African petrol retail prices (excluding tax) compared with world prices

By excluding Government imposed taxes and taking the differences in retail petrol prices between countries, the industry cost structures and the competitive forces in the nations

concerned will be reflected. The following graph shows South African retail petrol prices compared to European developed countries:

Figure 1: Petrol retail price (93 octane)



Source: Oil Bulletin Petrolier, 1997

The conclusion out of the graph can be made that South African petrol retail prices (tax excluded) are average compared to other deregulated European countries.

2.5.2 The oil industry's profitability

Returns on assets and cents per litre profits have fallen since 1993. A reason for this can be the impact of depressed international refining margins and delays in the implementation of the existing regulatory mechanism (South African Petroleum Industry Association, 1996:6).

2.5.3 Entry and exit cost

The competitiveness of markets in which there are relatively few firms is influenced by the ease of entry and exit.

The greater the freedom to enter a market, the greater is the pressure on companies in that market to minimise cost and price their products efficiently. If they do not do so it would create profit opportunities which new entrants would seek to exploit. In markets where there are low barriers to entry and exit, even a sole producer may have little market power.

Exit costs are important because it influence decisions about entry. If the cost to leaving an industry is very high (for example losses incurred on asset sales), then the risk associated with entry is higher.

In South Africa there are no regulation that prohibits the entry or exit of companies in the market.

2.5.4 *Evidence of fluctuations in market shares and prices*

In a market where market shares and prices are both stable it could signify a non-competitive market in which the major players accept existing market shares, and competitive forces are therefore weak.

In South Africa, retail petrol prices have changed a lot especially since the beginning of 1996. The primary reason for this was the fall in the rand dollar exchange rate which is reflected in South Africa's regulated petrol pricing mechanism (Doppegieter *et al*, 1996:15). Shares of major oil companies have been stable. There is no evidence of fluctuations in market shares and prices due to market forces.

From the above, one may conclude that the South African liquid fuels sector is competitive when measured against the above criteria and with regard to petrol prices. This was not necessarily true for periods before 1996. In the current situation there is collusion between oil companies, because of the regulated environment. If deregulation takes place, collusion will be against the law, but there still is concern that collusion will take place as can be seen from the Herfindahl index.

2.5.5 *The Herfindahl index (HHI)*

Economic concentration is the extent to which an industry is dominated by a few companies, to which wealth is held by few individuals and to which oil reserves are located in a few

countries (Slesser, 1982:55). The Herfindahl index can be used to measure economic concentration.

The Herfindahl index:

$$H = \sum_{i=1}^{n} Si^2$$

S_i denote the market share of company i, where i runs from 1 through to n. Squares are determined to accentuate the situation where there is only a few companies with big market shares that operate in the sector.

Table 3: The Herfindahl Index

South African oil companies	Petrol market share (%)	S_i^2
BP	15.9	252.81
Caltex	18.5	342.25
Engen	25.8	665.64
Sasol	7.5	56.25
Shell	17.6	309.76
Total	12.1	164.41
Zenex	2.6	6.76
Total	**100.0**	**H = 1 797.88**

(Only the companies with a market share were used, the other three that were left out do not have a significant market share at this stage).

When H = less than 1000:	no concern with regard to market concentration
When H > 1000, but < 1800:	some concern with regard to market concentration
When H > 1800:	potential for collusion with regard to market concentration

One may conclude that in the light of the above criteria and the fact that H = 1 797,88 that there is a potential for collusion. Although three new companies were formed, they do not have any market share at this stage. There are only seven companies in the market currently,

therefore one may assume that the more companies there are and the more even their market share is, the less potential for collusion there will be.

2.6 CONCLUSION

This chapter gave an overview of the liquid fuels sector in South Africa. The reason for the overview of the historic situation was to realise the extent of Government involvement in the industry and to see where regulation comes from. It started with the raw material resources that is available in South Africa and those that are obtained from other countries. The structure of the liquid fuels sector was then described, starting with the refining industry. The refining industry consists of four refineries. The synthetic fuels industry was then described with reference to the establishment of Sasol and Mossgas. This was followed by a description of the Central Energy Fund (Pty) Ltd, the Strategic Fuel Fund Association (SFF) and Soekor. The wholesale and retail industry followed as well as the modes of fuel transport.

The regulation in the liquid fuels sector was next with a look at all the different acts that is applicable. A section was dedicated to the regulatory measures applied in the liquid fuels sector. An overview of the retail petrol price mechanism was then given. This was followed by a short section on competition in the liquid fuels sector. The conclusion can be made that although there really is no competition (because of strict regulations) in South Africa's liquid fuels sector, it compares well with other deregulated European countries.

The aim of this chapter was to give an insight to the South African liquid fuels sector with regard to the degree of regulatory powers. In order to decide whether Australia may be a benchmark country for South Africa there will be an overview of the Australian liquid fuels sector in the next chapter. The reason for benchmarking is because the aim of the study is to compare South Africa with a country that has been deregulated or partly deregulated. This comparison will then lead to a conclusion as to what the possible consequences of partial deregulation in South Africa may be.

CHAPTER THREE

AN OVERVIEW OF THE LIQUID FUELS SECTOR IN AUSTRALIA

The previous chapter gave an overview of the liquid fuels sector in South Africa. This chapter endeavours to determine whether it is possible to use Australia as a benchmark country for South Africa, if one has to draw conclusions with regard to the effects of deregulation of the liquid fuels sector in South Africa with regard to retail petrol prices. Hence, an overview of the Australian liquid fuels sector follows. At first, there will be an overview of the raw material resources in Australia. A description of the liquid fuels sector will follow. This description will cover the refining, wholesale and retail industries. A look at the extent of competition, the regulation that exists and the composition of the wholesale price in Australia will follow. This will provide an insight into the liquid fuels sector in Australia after some deregulation has taken place. It will give a background for comparison with the South African situation later.

3.1 RAW MATERIAL RESOURCES

The first commercial oil field was established in Australia at the Surat Basin in Queensland in 1961. Exploration started and reserves were discovered in the late 1960's (Victorian Automobile Chamber of Commerce, 1996:2). In 1969 the largest and most productive field off the Gippsland coast in Victoria, was discovered. Australia is currently operating three major oil and gas fields in Bass Strait, North West Shelf and Northern Australia. Australia also has coal and gas reserves.

3.2 THE LIQUID FUELS INDUSTRY

3.2.1 The refining industry

There has been rapid growth in the Australian liquid fuels sector since the mid 1950's. New refineries were erected and existing ones expanded. There were regulations in place that required the use of local crude oil. The demand for petrol was increasing in the 1950's and 1960's as car ownership spread, highways were developed and the economy grew. Large additions were made to Australian refining capacity in the 1960's and 1970's. Since then the surplus refining capacity, distribution facilities and retail sites were reduced.

There are four major oil companies operating refineries in Australia. The four oil companies are Australian Petroleum Pty Ltd, BP Australia Holdings Limited, Mobil Oil Australia Limited and Shell Australia Limited (Victorian Automobile Chamber of Commerce, 1996:10). Each refinery is located near a major capital city, close to port facilities and demand centres. Refining activities are highly capital intensive, therefore unit costs can be minimised by, amongst other things maximising refinery throughput. Refineries cannot operate at 100 per cent of capacity all year round because of the need to undertake routine maintenance. National refining capacity is around 730 000 barrels per day (Industry Commission, 1994:8).

3.2.2 Wholesale industry

The oil companies also act as wholesalers providing petrol directly or indirectly (via distributors or jobbers) to retail outlets and end users. A jobber is a distributor who is independently branded and who will access multiple supply sources, use independent storage and sells widely, including to other wholesalers (Australian Institute for Petroleum, 1993:14). Distributors that act as wholesalers are either tied to or are independent of the oil companies. Distributors usually run independent businesses that may be franchised to an oil company brand, and occupy a company depot. There are about 400 distributors in Australia (Victorian Automobile Chamber of Commerce, 1996:10).

Around one-third of petrol sales go through distributors, about 2% are commercial sales to end users and the balance is distributed directly from the oil companies to retail outlets (Australian Institute of Petroleum, 1993:14).

The wholesale role of distributors is important in the sense that distribution is being carried out more efficiently than a large oil company would have been able to do it. It provides a value added function, especially in rural areas where multiple small deliveries are required. The number of distributors in both rural and metropolitan areas has declined. As the number of urban retail outlets declines, direct deliveries by oil companies to higher throughput sites become more economic and result in better utilisation of company truck fleets with possible implications for the role of distributors (Australian Institute of Petroleum, 1993:14).

3.2.3 *The retail industry*

Australia's retail industry consists of 8 000 service station outlets, mainly concentrated on the eastern seaboard (Queensland, New South Wales and Victoria). When comparing this 8 000 service station outlets with the number of vehicles of 10 941 747 in 1996, it shows that there are on average approximately 1 368 cars per service station outlet. About 54 000 people are employed, and there is an average of six persons employed at each fuel retailing site. In South Africa there are approximately 4 900 service station outlets currently with about 45 000 forecourt workers (International Energy Agency, 1996:193). When comparing this 4 900 service station outlets with the estimated number of vehicles (by Naamsa) of 6 280 000 in 1996, it shows that there are on average approximately 1 282 cars per service station outlet compared to Australia's 1 368. This shows that the Service Station Rationalisation Plan in South Africa has had the consequence that South Africa's number of service station outlets compares well with a partly deregulated country. The number of service station outlets in Australia has decreased by about 50% (see the next paragraph for the reasons why the decrease has taken place) from the mid 1970's (Victorian Automobile Chamber of Commerce, 1996:11). The nature of activities undertaken by retail sites has also changed. Outlets selling petroleum products range from the sites for which fuel accounts for the biggest share of turnover, to convenience stores for which petrol sales are secondary to shop sales.

The reasons for the decrease in service station outlets since the 1970's include (Industry Commission, 1994:17):

- An increase in independent retail sites in the mid 1960's accompanied by greater price competition;
- Better technology that permitted self-service with resulting increases in economies of scale;
- Engine maintenance became specialised with increasingly complex cars;
- Decreasing need for frequent oil changes and other motor vehicle servicing;
- New cars are more reliable;
- Consumer acceptance of the greater range of products that are on offer; and
- the operation of service stations incorporating convenience stores.

Retail sites in Australia are divided into five major categories:

- **Company Operated**

  Company-operated outlets are service stations where the operator is either paid a fixed commission in sales by an oil company or is a company employee. The Petroleum Retail Marketing Sites Act 1980 restricts the number of company operated sites.

  The following table shows the limit that is imposed on sites:

Table 4: Quotas of Australian petroleum companies

Company	Quota
Australian Petroleum Pty Ltd	136
BP Australia Holdings Limited	87
Mobil Oil Australia Limited	87
Shell Australia Limited	114
TOTAL	**424**

(Victorian Automobile Chamber of Commerce, 1996:10).

- **Franchise**

  Franchisees lease from an oil company and sell the majority of fuel consumed in Australia. The franchise agreements are regulated by the Petroleum Retail Marketing Franchise Act 1980 that sets minimum terms of leases. Recently multi-franchise operations have become more common.

- **Branded Independent**

  An independent operator owns these type of retail outlet and has an agreement to carry the brand name of a major oil company.

- **Unbranded Independent**

  These can be owned by individuals or companies with a limited network who display their own brand of petrol, as distinct from one of the four major oil companies.

- **Distributor Owned / Supplied Sites**

  Distributors own and supply these sites and it shows the brand that the distributor is affiliated with. There are approximately 400 distributor sites, predominantly in country areas. Distributors usually use a fleet of trucks to collect and deliver fuel, they also manage their own country depots. Many distributors are partly or wholly owned by an oil company (Victorian Automobile Chamber of Commerce, 1996:10).

3.2.4 Vertical arrangements

Four main vertical supply arrangements exist between the four major oil companies, wholesalers and retailers:

- Vertically integrated: The reseller site is owned and operated by the oil company;
- Partly integrated: The reseller site is owned by the oil company, but the business operating that site is only partially owned by the oil company;
- Franchised: The reseller site is owned by the oil company, but it franchises the site to a business in which the oil company has no equity;
- Contractual arrangement: A term supply contract governs the relationship between the oil company and the reseller. The oil company does not own the reseller site nor does it have equity in the business operating the site.

A reseller site does not have to be owned or operated by an oil company, it can be brought close to vertical integration by:

- oil company ownership of the reseller site's capital assets, such as pumps and tanks;
- tying the use of capital assets owned by the oil company to the supply of petroleum products; and
- the development of an exclusive supply arrangement with an independent reseller.

Vertical arrangements define the terms and conditions of the trading relationships between the oil companies and resellers. There can be arrangements for short periods that allow the parties to remain independent or restrictions can be incorporated that make one party totally dependent on the direction of the other (this can include an agreement to source products only from the other party).

Vertical arrangements are used to reduce costs and transfer risk and responsibility. An agreement to source products only from one party can open the reseller's profit to the risk that prices will become non-competitive and that the reseller will not be able to get products from other sources.

3.2.5 Transport

Crude oil and petroleum products are transported by road, rail, ship, pipeline and combinations of these modes to various locations.

3.3 COMPETITION IN THE LIQUID FUELS SECTOR

A perfect competitive market is rare in practise. A large number of buyers and sellers, a standardised product, low entry and exit barriers, mobile resources, constant or decreasing returns to scale, full knowledge and no regulation are required for a purely competitive market (Australian Institute of Petroleum, 1993:25).

The following can be used to determine whether the Australian petroleum market is competitive:

- The level of retail prices (excluding tax) compared with world prices.
- The oil industry's profitability.
- The extent of barriers to entry into and exit from the market.
- Evidence of fluctuations in market shares and prices.

3.3.1 The level of Australian retail prices

After allowing for transport cost, crude oil is an internationally traded commodity with broadly similar prices for the same types of crude oil in different places. By excluding Government imposed taxes and taking the differences in retail petrol prices between countries, the industry cost structures and the competitive forces in the nations concerned will be reflected. By comparing Sydney retail petrol prices with those in other developed countries, Sydney prices were low by international standards (Australian Institute of Petroleum, 1993:25).

In Australia there is the believe under many people in the rural areas that there is collusion to keep rural prices unreasonably higher than those in the city. There was confirmation that the wholesale and retail prices of petrol in metropolitan areas are generally lower than the prices charged in non-metropolitan areas and that metropolitan retail prices are generally more volatile. Two factors are relevant in addressing the concerns of rural motorists:

- Evidence exists that maximum wholesale price regulation has led the oil companies to serve some rural markets through more costly distribution networks that are not subject to price regulation. Rural prices are administered by the Price Surveillance Authority (PSA) in different ways to city prices.
- Before reaching the conclusion that competition in rural markets is inadequate, it is necessary to determine whether price differences can be explained by underlying market fundamentals. Transport costs alone account for observed differences in some rural cities and towns. Another market fundamental may be that rural towns are a less attractive proposition for refiners when it comes to discounting petrol, because rural towns are further away from refineries. Many rural towns are characterised by lower volume depots and retail sites, and larger distances between them.

3.3.2 Industry profitability

There is no evidence that the Australian liquid fuels sector is exploiting monopoly power to earn excess profits. It appears that the liquid fuels sector has been so competitive that its rate of return has been driven below the all-industry norm for long periods (Australian Institute of Petroleum, 1993:32).

These low rates of return have partly reflected excess refining capacity, this does not necessarily cause competition for market share in many industries. The competitive pressures in the liquid fuels sector as a result of excess capacity are increased by its structural characteristics:

- Refineries have high fixed cost and low variable cost. This creates an incentive to keep output as high as possible provided the prices received exceed variable cost.

- The structure of petrol retailing means that there are a number of small low profit outlets that have an incentive to try to increase sales through price discounting, with the ability to obtain cheap petrol from alternative suppliers.
- Competition for market share is encouraged by low barriers to entry and exit in retailing, and by the ability to import product from offshore.

Given the capital intensity of oil refining, there is an incentive for refiners to operate refineries at high utilisation rates. Individual refiners can increase market share, as demand for an individual brand is highly price elastic. Discounting of prices is likely to be focused in areas with high volumes of sales and a variety of competitors, as small reductions in price can gain significant market share depending on competitors' reactions. This will lead to a decreasing rate of return and prices will tend to fall towards variable cost for periods, as individual marketers try to boost market share. Low rates of return will lead to exits from the industry, closure of spare capacity and limited investment in new capacity. The exception is if this is necessary to protect existing investment, or is a way to force higher cost competitors out of business (Australian Institute of Petroleum, 1993:33).

Downward pressure on domestic prices can also occur from competition between retailers and between distributors, as a result of individual dealers trying to increase their profitability, as well as through the oil companies competing over market share. In Australia service station sites have been rationalised and the number of distributors has fallen. At the retail level, a large proportion of profits result from non-petroleum sales, including car repairs, general merchandise and car washes (Australian Institute of Petroleum, 1993:34).

3.3.3 Entry and exit cost

At the refiner level, there has been no new entrant for over two decades. However, this is not evidence of significant barriers to entry since market conditions have not warranted an expansion in capacity (Industry Commission, 1994:53).

The competitiveness of markets in which there are relatively few firms is influenced by the ease of entry and exit.

The greater the freedom to enter a market, the greater is the pressure on companies in that market to minimise cost and price their products efficiently. If they do not do so it would create profit opportunities which new entrants would seek to exploit. In markets where there are low barriers to entry and exit, even a sole producer may have little market power.

Exit costs are important because it influence decisions about entry. If the cost to leaving an industry is very high (for example losses incurred on asset sales), the risk associated with entry is higher.

Barriers to entry can be described as factors that give companies in a market an advantage over new or potential competitors which permit them to earn higher than normal profits over the medium to long term.

In the case of the liquid fuels sector in Australia claims have been made that there are some barriers to entry and exit at the wholesale and retail levels. This is said to have happened where the oil companies paid subsidies to retailers to remain in the industry. The number of wholesalers has fallen from 7 000 to 600 and retail numbers have dropped from approximately 20 000 to around 8 000. This indicates that restrictions are not severe.

At the refiner level there has been no new entrant for over two decades, although some firms have left the industry. There is a suggestion that there are significant barriers to entry in this sector of the industry.

The following are of the important factors which are perceived to be barriers to entry and exit:

- **Regulatory and institutional factors**

  There are relatively few regulatory or institutional barriers to the entry of new refiners, but environmental regulation and development approval processes are potential entry barriers. Government is concerned about the impact of industries generally on the environment, and also about specific aspects of the liquid fuels sector, like the difficulties associated with the containment of emissions and reducing the risk of accidents at the plant which could threaten the safety of residents in adjacent suburbs.

- **Refinery exchange agreements**

  These agreements are commercial arrangements where the oil companies are permitted to avoid the transport cost they would incur if they wish to compete in markets in which they have no refining capacity. A new entrant to the refining sector could be at a disadvantage if the agreements were not open to that entrant. In the past however, newcomers have been permitted to participate in exchange agreements (Industry Commission, 1994:54). The refinery exchange agreements have facilitated competition between all the oil companies in most of Australia's larger markets. In the absence of these agreements, some oil companies would choose not to compete in those markets which are most distant from their refinery. In a market such as Adelaide, which has only one refinery, there might only be two or three oil companies competing, as compared with five at present.

- **Economies of scale**

  There are considerable scale economies in refining (Industry Commission, 1994:56). A new refinery would represent a significant increment in capacity. Unless export sales were secured, the additional supply capacity would be likely to depress prices generally. The expected profitability of the new refinery would be reduced to the point where entry would be deferred, unless demand was expected to grow rapidly. When there are periods of low demand growth, incremental expansion by existing refiners could be the most viable form of increasing refining capacity.

  The distribution of the product is also important. To justify entry a certain volume of output needs to be sold. A new domestic refiner would need to develop a sizeable customer base. This could take time, if taken the equity links and the long term exclusive supply arrangements already established by existing refiners.

  Although both abovementioned factors appear to be obstacles to the entry of a new refiner, the establishment of refineries by Ampol and Total in Australia suggests that they are surmountable. The new entrant initially focused on developing its distribution network, relying on existing refineries or imports for the supply of product. Entry into refining only occurred after the companies had established a distribution network which

could dispose of sufficient volume to warrant the investment (Industry Commission, 1994:56).

- **Capital requirements**

  Established firms associated with refineries are perceived to have lower costs because their original investments have been written off or were acquired long ago when costs and interest rates were lower. The Australian capital market is now closely integrated with international markets and is more flexible than it was a decade or so earlier. The potential for an Australian firm to raise the capital required to enter refining is unlikely to be limited significantly by shortcomings in the capital market.

- **Product differentiation**

  Product differentiation can allow producers to increase their profitability. Bain (as quoted by the Industry Commission, 1994:57) concluded that it is the most important determinant of the ability of firms to earn above-normal profits. In the liquid fuels sector firms have attempted to differentiate their product in a number of ways. There is nothing that prevent a new entrant to adopt a similar strategy. The ability of firms to benefit from product differentiation is limited by the homogeneous nature of the core products, and for the majority of consumers petrol is petrol (Industry Commission, 1994:57).

- **Barriers to importing**

  Imports of petroleum products are relatively low, and most imports are by the oil companies. This low level of imports does not preclude the possibility of future imports by independents. Possible barriers to imports include Government restrictions such as tariffs and natural protection to the industry arising from transport cost. There are no protective tariffs or quantitative barriers to the entry of petroleum products (a tariff equivalent of the excise on domestic production is levied).

  Insufficient infrastructure (wharf and storage facilities) is sometimes said to inhibit importation. Provided that environmental requirements can be satisfied, there is the option of importers to establish their own facilities.

- **Sunk cost**

  Sunk cost cannot be recouped after they have been incurred. If this cost is high it raises the risk associated with entry. The specialised nature of a refinery plant suggests that sunk cost could be high. However, to the extent that refinery facilities can be sold to other producers sunk cost may not be a major obstacle to entry.

3.3.4 Evidence of fluctuations in market shares and prices

In a market where market shares and prices are both stable it could signify a non-competitive market in which the major players accept existing market shares, and competitive forces are therefore weak.

The fact that market shares are stable is not always a sign of non-competition. An example is that there could be periodic outbreaks of price competition as one firm attempts to expand market share, but if competitors react quickly and effectively by cutting prices, then market shares could still remain relatively stable for extended periods. There have been significant changes in the market shares of the major refiners in Australia over the last few years (Australian Institute of Petroleum, 1993:37). The maintenance of high prices in any industry will only work if entry and exit barriers are high and all firms accept current market shares. The volatility in Australian retail petrol prices shows that price competition is a vital part of the battle for market share. The short-term fluctuations in market shares that have occurred in Australia are consistent with periodic price discounting that has occurred, these are quick price responses by the oil companies to protect their market shares.

The retail price volatility and fluctuations in market shares suggest that the oil companies do compete over market share. The fact that Australian retail petroleum prices (excluding tax) compare with prices in competitive markets overseas confirms this conclusion (Australian Institute of Petroleum, 1993:37). If major oil companies should cease to compete for market share and raise wholesale prices, this would stimulate current and new retail entrants to use imports. So far it has simply not been very profitable to rely on imports, given the current Australian wholesale and retail prices, but the option of importing provides a guarantee that competitive pressures will continue to operate in the liquid fuels sector. Australian retail petrol prices cannot rise for long above import parity, without an increase in imports that would compete prices down again.

3.3.5 Conclusion

The evidence shows that on all four points the Australian market is competitive. Retail prices (excluding tax) are comparable with competitive markets offshore, profitability is low, barriers to entry and exit are effectively low and market shares and prices fluctuate. When compared to the South African situation, similarities can be seen. The regulatory frameworks in the countries differ, because of the fact that Australia's liquid fuels sector with regard to retail petrol prices is only regulated at the wholesale level whereas in South Africa it is regulated at the retail level.

3.4 REGULATION OF THE LIQUID FUELS SECTOR

To get an idea what kind of legislation and regulations exist in Australia, the following can be seen:

3.4.1 Government legislation and regulations

A number of Government regulations exist which relate to the liquid fuels sector:

- The Petroleum Retail Marketing Franchise Act 1980 sets out the regulation of franchise agreements between companies and lessee dealers.
- The Petroleum Retail Marketing Sites Act 1980 regulates the nature of service stations that can be operated directly by the oil companies.

The following acts are also relevant to the industry, but not specifically towards petrol:

- The Trade Practices Act 1974 prohibits corporate anti-competitive behaviour, collusion and price discrimination.
- The Prices Surveillance Act 1983 established the Prices Surveillance Authority (PSA) which is responsible for determining maximum wholesale prices.

Except for the abovementioned Acts, industry self-regulation exists in the form of an Oil Code. This voluntary code of practice was established in 1989 by oil refiners and resellers to provide principles of fairness and reasonableness within the industry (Victorian Automobile Chamber of Commerce, 1996:5).

3.4.2 *Price control in petroleum product markets*

The maximum wholesale price of petrol is regulated by the Commonwealth Government, through the Prices Surveillance Authority.

3.4.3 *Surveillance of petroleum products by the Prices Surveillance Authority (PSA)*

The Prices Surveillance Authority sets a common capital city maximum wholesale price each day. The maximum wholesale price is termed the intervention price for petrol. This maximum wholesale price applies to all petrol sold by the declared oil companies (BP, Ampol-Caltex, Mobil and Shell) except for petrol sold by advertised tender and on fuel cards. The Prices Surveillance Authority maximum wholesale prices are based on a formula related to a moving average of Singapore petrol product prices plus transport cost and it includes an allowance for domestic distribution and marketing cost and profits. Federal customs and excise duty and State franchise fees are added where relevant (Australian Institute of Petroleum, 1993:43). In setting maximum wholesale prices the Prices Surveillance Authority is required under its Act to have regard for the need to maintain investment and employment in an industry, including the influence of profitability on investment and employment (Australian Institute of Petroleum, 1993:43).

Petrol price regulation by the Prices Surveillance Authority covers a high proportion of petrol sales, but in rural areas account for approximately 20 per cent of petrol sales (Industry Commission, 1994:110). Only a small proportion of sales to rural retailers appear to be directly subject to Prices Surveillance Authority price regulation. The maximum wholesale price regulation only applies to sales by declared companies, which effectively limits the regulation to the big oil companies. Therefore, sales by the oil companies to distributors are covered by the regulation, but wholesale sales by these distributors are not covered. Between 50 and 70 per cent of petrol sales in rural areas are made on distributor invoices (Industry Commission, 1994:G.2).

The following is a description of the different components that the Prices Surveillance Authority use to determine the maximum wholesale price:

- The Singapore price (quoted in Australian dollars) of Mogas is determined. This is determined by a 7 day moving average of spot and posted prices.

- Freight (updated monthly). This is determined by a weighted average for six mainland coastal capital cities of the cost of freight for deliveries from Singapore by a 30 000 - 40 000 tonne product tanker.
- Insurance and loss. This is 0.5668 per cent of the free on board (f.o.b.) plus freight - the rate is based on information supplied by companies in the oil and other industries.
- Wharfage. The cost of unloading only, not storage, and based on information supplied annually by the port authorities.
- All the above elements make up the Import Parity Price.
- Then a local component is added.
- Federal Excise is then added.
- All the above elements added up are the maximum wholesale price.

  Source: Industry Commission, 1994, p. 111.

The Prices Surveillance Authority has two objectives in mind:

- To place a cap on prices charged by the oil companies.
- To ensure lower rural fuel prices at the expense of capital city consumers.

3.4.4 The impact of price regulation

Despite the Prices Surveillance Authority' involvement in regulating wholesale petrol prices, there are community concerns regarding the level and sometimes the volatility (or lack of volatility) of retail prices. Most concerns relating to price discounting, however, are expressed by rural consumers who do not share in the lower prices. In many rural towns prices are relatively high and experience little variation. Prices in the major Australian cities exhibit cyclical variations with prices in both peaks and troughs often lower than the lowest rural prices (Industry Commission, 1994:116).

3.4.4.1 Price volatility

Different people view price volatility differently. Some people are concerned because of the wide swings in price offered at retail outlets, often the same outlet, on different days. There is concern about the number of changes in retail prices, as prices change considerably over a number of days or even during a single day. There are also the differences in volatility between different retail outlets at the same time.

In many instances the volatility of city prices is not a reflection of changes in the import parity price of fuel or changes in taxation arrangements. Increases and decreases in fuel franchise fees have been identified as part of the retail price variations (Industry Commission, 1994:117). One reason for price volatility in cities can be related to their proximity to refineries and to the potential for demand in those cities to consume any excess stock, because demand is large in those cities. When there are periods in which there is a build-up in stocks, refiners can be expected to act to reduce stock levels as quickly as possible to minimise storage cost. An effective method of reducing stocks at lowest cost is to offer lower prices in areas of high demand. Capital cities are close to the refineries and can absorb additional petrol quickly and cheaply. Smaller cities and country towns, however, consume relatively low volumes of petrol and have a much smaller capacity to quickly absorb a significant increase in supply. Supplying these locations can also involve significant transportation and storage cost.

Search cost may also be a reason for price volatility. Prices will vary most at those outlets that serve well-informed buyers. The low search cost arises because people going to work can choose along the route that they take to work, which outlet is the cheapest.

The Prices Surveillance Authority is of the opinion that price regulation reduces volatility and reduces the disparity between city and rural prices. It is not evident, however, that the Prices Surveillance Authority maximum wholesale prices dampen the peak or lift the floor of the price cycle, or that it minimise rural and city price differentials.

3.4.4.2 City-rural price differentials

Significant differentials often occur between city and rural prices, and even between city prices. Differentials are particularly apparent at times of city price discounting.

The gap between retail prices and the maximum wholesale prices of the Prices Surveillance Authority is considerably higher in rural towns than in cities, especially capital cities (Industry Commission, 1994:121). This gap is at least in part due to the lower throughput in some rural retail outlets (compared to capital cities) which require a higher retail margin in order to meet cost. This of course is where the wholesale price paid equals the maximum wholesale

price. If a lower wholesale price is paid in rural towns and cities then it could be that retailers are taking even higher margins.

Possible explanations for differences in rural prices

The argument could be used that each city and town has a different market with a different range of factors contributing to the local retail prices. A number of factors which could contribute to the price differences are:

- Lower throughput.
- The need for a higher retail margin.
- State Government regulation of the transport of fuel.
- Brand / dealer loyalty in close-knit rural towns.
- A lack of competition in rural areas. This may explain the large gaps between retail prices and maximum wholesale prices. This is supported by the low volatility of prices in rural areas compared with the densely populated cities.
- Two other factors could also help explain the relatively high rural retail prices. First, retailers could be purchasing petrol on distributor paper - sales on distributor paper are not subject to Prices Surveillance Authority price regulation. If the maximum wholesale price regulation leads to the oil companies servicing rural areas indirectly through distributors it is likely that the cost of supplying rural consumers are not being minimised. If the oil companies use this last method to overcome price control it is likely that this will lead to higher costs and therefore higher wholesale prices. Second, there could be a high actual retail margin, with the retailers capturing the margin. For vertically integrated companies, this can imply that any cost not recovered at the wholesale level can be recovered at the retail level.

3.5 CONCLUSION

This chapter gave an overview of the Australian oil industry, the competition that exists and the regulation that is executed, and the impact of price regulation. One can see that with regard to raw material resources Australia is much more independent from outside sources than South Africa. As can be seen in chapter two South Africa mostly import crude oil to produce petrol and uses an amount of local gas and coal to produce petrol. Australia, like in South Africa has only a few major oil companies operating refineries. The refineries in both

countries are located near major capital cities, close to port facilities, except for Natref in South Africa. The refining capacity in Australia is around 730 000 barrels per day, whereas in South Africa it is around 645 000 barrels per day. Australia's petrol prices are regulated on a wholesale level, whereas South Africa's petrol prices are regulated on retail level. South Africa has eight wholesale marketers of petrol currently, where in Australia the four major oil companies also act as wholesalers providing petrol directly or indirectly (via distributors or jobbers) to retail outlets and end users. Australia has 8 000 service stations, where 54 000 people are employed. Referring to paragraph 3.2.3. there are on average approximately 1 368 vehicles per service station outlet in Australia whereas in South Africa there are on average approximately 1 282 vehicles per service station outlet. In South Africa there are 4 900 service stations where 45 000 people are employed. When looking at the structure of both Australia and South Africa's liquid fuels industries, there is a similarity. Also when looking at the composition of the retail petrol prices, especially the import parity price, there is also a similarity. This similarities led to the comparison of South Africa with Australia. This chapter is important in the sense that it gave an understanding as to what happens when retail prices are not regulated and the industry as a whole is not heavily regulated. The next chapter will investigate the opinions of different stakeholders in the liquid fuels sector in South Africa (business, labour and Government) to see what their views are on deregulation or regulation of the liquid fuels sector. These views will then be compared to the theoretical findings of this chapter (next paragraph) on the possible deregulation of retail petrol prices on the same basis as Australia to see how the views differ or correlate with possible outcomes of deregulation.

3.5.1 Theoretical findings

The following is theoretical findings (derived from this chapter) as to what may be the outcome of deregulation on the wholesale level in South Africa, compared to what has happened in Australia:

- The number of service station outlets can decrease to up to 50% of the current total.
- Self-service at service station outlets can occur to increase economies of scale.
- Vertical arrangements can differ between vertical integration, partial integration, franchises and contractual arrangements (page 37, second paragraph refers).

- Prices of petrol in rural areas may become more expensive than in cities, not only because of transport costs, but because it will be characterised by lower volume depots and retail sites and larger distances between them. It may be that refiners won't see these areas as an attractive proposition compared to city areas where there are high volumes of sale and prices can be discounted to gain market share.
- In Australia at the retail level, a large proportion of profits at service station outlets result from non-petroleum sales, including car repairs, general merchandise and car washes. This may also increase in South Africa.
- Free importation of petrol or the option thereof may provide a guarantee that competitive pressures will continue to operate in a free market liquid fuels sector. If major oil companies should cease to compete for market share and raise wholesale prices, this would stimulate current and new retail entrants to use imports.
- Petrol prices may become volatile, because as can be seen from the Australian example, price competition is a vital part of the battle for market share by oil companies especially in urban areas. In rural areas there will probably be a lack of competition and as can be seen from the Australian situation the volatility of prices in rural areas will be lower compared with the densely populated cities.

CHAPTER FOUR

VIEWS OF DIFFERENT STAKEHOLDERS IN THE LIQUID FUELS SECTOR IN SOUTH AFRICA AND AUSTRALIA

The Australian liquid fuels sector was reviewed in the previous chapter. In this chapter a summary of the opinions with regard to deregulation of different stakeholders in the liquid fuels sector in South Africa will first be given to compare it with the theoretical conclusions with regard to deregulation in the previous chapter. This chapter is important to see how the different stakeholders in the liquid fuels sector view possible change in the industry. After discussing the liquid fuels sectors' of both South Africa and Australia, it is important to see what the different stakeholders' viewpoints are with regard to deregulation or regulation.

The following are goals that are required to assure stability and order in the liquid fuels sector (Motor Industries' Federation, 1993:2):

- Quality petrol products must be provided nationally at a reasonable price at all times.
- Security of supply should be enhanced.
- Essential service station facilities should be available at viable petrol outlets for the cost benefit and convenience of the public.
- Small business entrepreneurship and investment should be promoted generally in the liquid fuels sector.
- Jobs should be retained in the marketplace and the creation of new job opportunities should be a priority.

4.1 A SUMMARY OF THE VIEWS OF THE DIFFERENT STAKEHOLDERS IN THE LIQUID FUELS SECTOR IN SOUTH AFRICA

The views of the different stakeholders in the liquid fuels sector with regard to possible deregulation were mostly obtained from a study done by professor LJ Lamprechts during 1996. This study of professor Lamprechts was commissioned by the Liquid fuels sector Task Force (LFITF). The purpose was to facilitate a transparent process of consultation to develop a Draft White Paper on energy policy.

4.1.1 Business and individual members of the business delegation

4.1.1.1 Business

Business is in favour of a free market environment where competition determines the retail price of petrol and Government involvement does not exist. It is in favour of total deregulation and believes that from the point where the decision is made in favour of total deregulation government's involvement should be scaled down over two years (Lamprechts, 1996:9).

4.1.1.2 The South African Petroleum Industry Association (SAPIA)

SAPIA believes that there should be a transitionary period of about three and a half years, whereafter free price setting should be introduced and whereafter the liquid fuels sector should be totally deregulated.

4.1.1.3 Sasol

Sasol agrees in general with the above visions (see 4.1.1.1 and 4.1.1.2) but believes that the transition period should be at least five years. It also submits that vertical integration should be prohibited and it suggests that a minimum or maximum price band be introduced during the transition period until Retail Price Maintenance is lifted. Only after this should the moratorium on self-service be lifted.

4.1.1.4 The Fuel Retailers Task Group (FRTG)

The FRTG, although part of Business, holds an opposing view and believes that present Government involvement should be retained and even be amended by improved measures (that is re-regulation). It believes that a reduction in Government involvement would lead to an increase in the oil companies' involvement in the field of retailing and to job losses, but that a reduction of Government involvement is a possibility over the longer term (Lamprechts, 1996:11).

4.1.1.5 Petronet

Petronet believes in deregulation and submits that Government should formulate a liquid fuels policy with specific objectives and aims in terms of which transition can take place. It is not in favour of a regulatory body or vertical integration (Lamprechts, 1996:11).

4.1.1.6 South African Agricultural Union (SAAU)

The SAAU believes in a free market and submits that the transition to such a market should be based on research and continuous evaluation. The SAAU gives no specific indication of the length of the transitionary period but it states clearly that competition should be the long-term objective of the restructuring of the liquid fuels sector. It is also of the opinion that transport costs to rural areas may ultimately have to be subsidised.

4.1.1.7 Afrikaanse Handelsinstituut (AHI)

In the longer term the AHI submits that there should be less Government involvement in the liquid fuels sector of South Africa. It does not support vertical integration.

4.1.1.8 South African Chamber of Business (SACOB)

SACOB basically believes in deregulation of the liquid fuels sector. It does not view the liquid fuels sector as a strategic industry and is not in favour of a regulator for the industry. SACOB views self-service and vertical integration as negotiable items over the medium to longer term.

4.1.2 Labour (unions)

Labour believes that some form or another of Government involvement and regulation will always be necessary in view of the strategic nature and cartelisation in the liquid fuels sector. It does, however, see competition over the longer term and the lifting of Retail Price Maintenance if the economy is experiencing real growth, if there is significantly lower unemployment and a rapidly expanding black small business sector. It also states that it may be increasingly difficult to prevent the discounting of petrol sales. Labour supports margin determination and is against self-service. It agrees with the lifting of import and export control in the longer term and with controls over the quality of the product. In the longer term it believes that synfuels should enter the market with the rest. They also believe that the liquid fuels sector requires appropriate labour market institutions that could deal with the management of job losses, skills' recognition, grading, health, safety and affirmative action and the improvement of franchise laws.

Labour is basically in favour of the continuation of Government involvement but foresees a relaxation of certain aspects under certain conditions.

4.1.3 Government

Government views the liquid fuels sector as of strategic importance from an economical viewpoint, but it recommends the reduction of its involvement over the longer term (about five years). After Retail Price Maintenance is lifted eventually free market principles should reign but with a ban on self-service and vertical integration. Franchising agreements should be equitable and import and export control as well as fuel standards should be retained. Government also states that the review of its involvement in the liquid fuels sector should be managed carefully to minimise the impact on employment. Appropriate retrenchment and retraining programmes should be facilitated and the liquid fuels sector should remain subject to all applicable legislation on the environment, health and safety (Lamprechts, 1996:15).

4.1.4 Institute of Policy and Social Research (IPSR)

The IPSR expressed itself against less Government involvement in the liquid fuels sector to avoid job losses as well as against the present levels of protection to Sasol and Mossgas. It is in favour of Retail Price Maintenance as well as a uniform pricing system for the country. The IPSR believes that prohibition on vertical integration and self-service as well as import and export control should remain (Lamprechts, 1996:15).

4.1.5 Summary of the viewpoints of the stakeholders

The Business delegation and almost all of the respondents support the idea of deregulation whereas Labour is in favour of the continuation of some Government involvement and the possibility of competition in the future. Government supports the idea of diminishing its involvement over the longer term, but with a properly managed and monitored transition in two phases (Lamprechts, 1996:16).

Having regard to the views expressed by the stakeholders in connection with the various issues the conclusion can be made that there is broad consensus on the overall goals for the industry but a difference in the timescale.

4.1.6 *Comparison of theoretical findings (p. 50) with the general views of the stakeholders*

Australia's liquid fuels sector has not been deregulated totally. It is still regulated on the wholesale level. The theoretical findings were the consequence of the assumption that South Africa is deregulated in the same way as Australia.

In table 5 possible consequences of partial deregulation of the liquid fuels sector of South Africa are given, taken into account what has happened in Australia. In the second column the possible viewpoints of the different stakeholders in South Africa with regard to the consequences in column one are given. These viewpoints were discussed from page 47 to page 51.

Table 5: Comparison of theoretical findings (p. 50) with the views of the stakeholders

	Theoretical findings (Australia)	Views of Stakeholders
1	The number of service station outlets may decrease to up to 50% of the current total.	The Business delegation and respondents believe in the power of market forces to set this problem right by creating other opportunities. The Fuels Retailers Task Group (FRTG) (part of business) believes that a reduction in Government involvement would lead to exactly this problem and they are against such a reduction, so they would react negatively to this. Labour would not react positively to this, because thousands of petrol pump attendants and their families will be affected by this. Government will also try to prevent this from happening as in South Africa there is a very large unemployment rate and this could negatively influence the economy. The Institute of Policy and Social Research (IPSR) is against less Government involvement because of possible job losses,

	Theoretical findings (Australia)	Views of Stakeholders
		hence they would not be in favour of this happening.
2	Self-service at service station outlets may occur to increase economies of scale.	The Business delegation will be in favour of this. The Fuel Retailers Task Group will not be in favour of this because they are against any job loss as a result of some deregulation and consequent less Government involvement (FRTG). Labour is against self-service. The Institute of Policy and Social Research is against self-service (IPSR). Government is not in favour of self-service.
3	Vertical arrangements may differ between vertical integration, partial integrated, franchises and contractual arrangements (page 37, second paragraph refers).	Vertical arrangements are not favourable to all of the business delegation and respondents. Sasol, the FRTG, Petronet and the AHI are against this kind of arrangements. SACOB is of the opinion that it may be negotiable over the longer term. Labour did not express itself against vertical integration over the longer term and if the economy is experiencing real growth. Labour also supports the improvement of franchise laws. The IPSR is against vertical integration. Government is also against vertical integration and believes that franchising agreements should be equitable.

	Theoretical findings (Australia)	Views of Stakeholders
4	Prices of petrol in rural areas may become more expensive than in cities, not only because of transport costs, but because it will be characterised by lower volume depots and retail sites and larger distances between them. It may be that refiners will not see these areas as an attractive proposition compared to city areas where there are high volumes of sale and prices can be discounted to gain market share.	Although this has happened in Australia it is only a possibility in South Africa. The respondents did not express their views on how to react to this scenario. By looking at their views, one can derive that business would see this as a realistic occurrence in a free market environment, labour would react negatively to this as well as Government, the FRTG and the IPSR.
5	In Australia at the retail level, a large proportion of profits at service station outlets results from non-petroleum sales, including car repairs, general merchandise and car washes. Although this is in certain circumstances already happening it may increase in South Africa.	In a free market environment with competition it may be that some service station outlets would make their profits from other services. It does not seem that any of the respondents would be against this kind of services or the making of profits from it.
6	Free importation of petrol or the option thereof may provide a guarantee that competitive pressures will continue to operate in a free market liquid fuels sector. If major oil companies should cease to compete for market share and raise wholesale prices, this would stimulate current and new retail entrants to use imports.	The Business delegation, except for the FRTG is in favour of free importation and exportation. Labour is also in favour (over the longer term) of free importation and exportation. The IPSR is against the lifting of import and export control. Government believes that import and export control should be retained.
7	Petrol prices may become volatile, because as can be seen from the Australian example, price competition is a vital part of the battle for market share by oil companies especially	Although this may also happen in South Africa it is only a possibility and the respondents did not react to this kind of statement. By deriving from the views of

	Theoretical findings (Australia)	Views of Stakeholders
	in urban areas. In rural areas there will probably be a lack of competition and as can be seen from the Australian situation the volatility of prices in rural areas will be lower compared with the densely populated cities.	the above stakeholders, business except for the FRTG would accept this as part of a free market environment. Labour and the IPSR would react against this and Government will also not be in favour of this occurring.

4.2 A SUMMARY OF THE VIEWS OF THE DIFFERENT STAKEHOLDERS IN THE LIQUID FUELS SECTOR IN AUSTRALIA

The Department of Industry, Technology & Science (DIST) (which has departmental responsibility for petroleum products marketing) favours a less regulated regime. DIST has reasoned though that arguments supporting deregulation, on the one hand, and the status quo, on the other, have so far made it indifferent to initiating change (Industry Commission, 1994:2).

The oil majors favour deregulation to allow them more commercial freedom in pricing and marketing. They seek greater flexibility to deal with what they see as intense price competition and low profitability at a time when additional investment is required to meet environmental standards and to adapt refineries to a heavier feedstock. With minor variations, they called for:

- repeal of the Sites Act;
- repeal of the Franchise Act;
- greater reliance on self regulation;
- the Prices Surveillance Authority (PSA) to cease setting a maximum intervention price;
- withdrawal of the Ministerial Directions;
- removal of State and Territory Government regulations on service station trading and (in Victoria) regulations requiring the use of rail for the freight of petroleum product;
- the opening of coastal shipping to international vessels and to company employment of crew members; and

- harmonisation of franchise fee rates and more uniform regulation between States (Industry Commission, 1994:2).

Distributors and retailers favour some deregulation, but with certain safeguards. Their concern is their commercial vulnerability in the face of the market power of the oil (Industry Commission, 1994:2).

Consumers were generally critical of petrol pricing. The discounting of prices in capital cities were at the heart of most complaints. The country motorists are concerned about the difference between retail petrol prices in capital cities and rural towns. City motorists are concerned about the low retail petrol prices during price wars and then the high retail petrol prices after the price wars (Energy Commission, 1994:3).

4.3 CONCLUSION

This chapter gave a summary of the viewpoints of stakeholders in the liquid fuels sector in South Africa and Australia. It linked to the previous chapters as comparisons could be made as to how the views of stakeholders in South Africa compare to the possibility of South Africa's liquid fuels sector deregulating in the same way as Australia's. The viewpoints of stakeholders in Australia were given to illustrate that their system is not perfect to all their stakeholders and to see how and what they want to change further on.

In the next chapter the elasticities of the determinants of the petrol price in both countries are compared over a certain period. Two major cities that are comparable will be chosen in each country. This comparison will be made to see how deregulation influences elasticities. The fact that there has been change in the South African liquid fuels sector and the composition of the retail petrol price, has lead to the comparison of elasticities in South Africa between two different periods. The aim of this comparison is to see if there actually was a change in the elasticities.

CHAPTER FIVE

EMPIRICAL RESULTS

The previous chapters gave a background of the liquid fuels sectors in both South Africa and Australia and a summary of views of stakeholders in these sectors. In this chapter regression models are used to determine what the major determinants of the prices of petrol in South Africa (Gauteng) and Australia (Canberra) is. Conclusions are drawn as to what the differences are between the elasticities of determinants of retail petrol prices in a country where the liquid fuels sector is regulated and one where it is partly deregulated.

5.1 EMPIRICAL STUDY

The purpose of this study is to make a comparison between the determinants of the retail petrol price in South Africa (Gauteng) and the determinants of the retail petrol price in Australia (Canberra). To do this, two major provinces in each country were chosen that have similar characteristics (with exception of the degree of regulation of the liquid fuels sector) to one another. Both are also located inland. Canberra in Australia was chosen and Gauteng in South Africa.

The following variables are important in the South African (Gauteng) situation (all of them are described in chapter one): In-Bond-Landed Cost, a one period lagged retail petrol price and then a group of variables namely: Wholesale margin, retail margin, delivery cost and fuel tax. These variables are important because they constitute 90% of the retail petrol price in South Africa (Gauteng).

The following variables are important in the Australian (Canberra) situation: Oil producer and oil marketer, product excise (an impost levied by the Commonwealth Government on the sale of the product), royalties and resource rent tax (tax that is paid to the Commonwealth and State Governments as designated by legislation) and the state franchise fee. These variables are important because they constitute 90% of the retail price of petrol in Australia (Canberra). In order to compare South Africa (Gauteng) and Australia (Canberra) it was necessary to group certain variables in Australia (Canberra) in such a way that they are comparable to the variables in South Africa (Gauteng).

An empirical study has been done to determine the elasticity of the retail petrol price with regard to certain factors. Firstly the elasticities of Australia (Canberra) whose liquid fuels sector is much less regulated, and the elasticities of South Africa (Gauteng) are calculated over the same time period. In this way one tries to compare the elasticities between a regulated province with that of a partly deregulated province. The Wald test will be applied to determine whether the elasticities, between the two provinces, differ in a statistical sense. Thereafter the elasticities for South Africa (Gauteng) are calculated for two different time periods. The reason for this is to decide whether the elasticities have become different in a statistical sense over time. The Wald test will be also be applied for this.

5.2 REGRESSION RESULTS OF THE SOUTH AFRICAN (GAUTENG) EQUATION

The retail petrol price equation in South Africa (Gauteng):

LPP = a + b (LCOST) + c (LPP1) + d (LGROUP) + e

Where:

a	= Constant term
PP	= Retail petrol price
COST	= In-Bond-Landed cost
PP1	= Retail petrol price lagged by one month
GROUP	= Retail margin + Delivery cost + Wholesale margin + Fuel tax
e	= Residual term

In order to calculate the elasticities the natural logarithmic form of the variables are used in the equation. The "L" symbol indicates the use of a logarithmic transformation.

The regression coefficients for the equation are contained in the table 6. In order to compare the elasticities of South Africa (Gauteng) with that of Australia (Canberra) the time period January 1988 to December 1996 is used.

Table 6: Regression coefficients for the retail petrol price spread in South Africa (Gauteng)

(See Appendix 1 for a graph on the fitted and real values).

Dependent variable is LPP

Sample range: January 1988 to December 1996

Number of observations: 108

Ordinary Least Square Estimation

Regressor	Coefficient	Standard Error	T-Statistic	Probability> |T|
a	0.29260	0.079097	3.6992	0.000
LCOST	0.15556	0.026560	5.8568	0.000
LPP1	0.66138	0.052921	12.4974	0.000
LGROUP	0.18553	0.035914	5.1661	0.000

R-squared	0.98663	F-statistic F(3,139)	2558.5 (0.000)
R-Bar-Squared	0.98625	S.E. of Regression	0.33996
Residual Sum of Squares	0.12019	Mean of Dependent Variable	4.9702
S.D. of Dependent Variable	0.28987	Maximum of Log-likelihood	213.9969
DW-statistic	1.8782		

5.2.1 Interpretation of Regression Results

According to table 6:

- the coefficient (elasticity) of the In-Bond-Landed cost is 0.15556. This elasticity has a t-statistic of 5.8568 and therefore the elasticity is statistically significant on a 5% level (probability < 0.05).
- the coefficient (elasticity) of the retail petrol price lagged by one month is 0.66138. This elasticity has a t-statistic of 12.4974 and therefore the elasticity is statistically significant on a 5% level (probability < 0.05).
- the coefficient (elasticity) of (retail margin + delivery cost + wholesale margin + fuel tax) is 0.18553. This elasticity has a t-statistic of 5.1661 and therefore the elasticity is statistically significant on a 5% level (probability < 0.05).

Note that the signs of each independent variable in the estimated regression equation correspond with the theory.

$R^2 = 0.98663$ which implies that 98.663% of the total variance in the retail petrol price is explained by the independent variables. This favourable result is accentuated by the fact that a small error of 0.68% ((0.33996/4.9702)) x 100) is present.

The Durbin-Watson lower and upper values are $D_l = 1{,}61$ and $D_u = 1{,}74$ so that DW = $1.8782 > D_u$. This implies that there is no auto-correlation on a 5% level of significance. This proves that the assumption of the independence between the error terms, which is a condition for the good qualities of the estimation procedure, is fulfilled.

Interpretation: If the In-Bond-Landed cost increases by 1% the retail price of petrol will increase by 0.16%. If the lagged retail petrol price increase by 1% the retail petrol price will increase by 0.66%. This result may be interpreted as that the pressures on the retail petrol price will take one month before it is released in full. If there is a rise of 1% in the netto effect of all the variables that are included in the group-variable, the retail petrol price will increase by 0.19%.

5.3 REGRESSION RESULTS OF THE AUSTRALIAN (CANBERRA) EQUATION

The retail petrol price equation in Australia (Canberra) is as follows:

LPP = a + b (LCOST) + c (LPP1) + d (LGROUP) + e

Where:

a	= Constant term
PP	= Retail petrol price
COST	= Oil producer + Oil marketer
PP1	= Retail petrol price lagged by one month
GROUP	= Service station margin + Royalties and resource rent tax + Product excise + State franchise fee
e	= residual term

The notation "L" has the same meaning as in paragraph 5.2 (p. 57).

The regression coefficients for the equation are contained in the table 7. The time period corresponds with the time period that was used for the regression with respect to South Africa (Gauteng): January 1988 to December 1996.

Table 7: Regression coefficients for the retail petrol price spread in Australia (Canberra)

(See Appendix 2 for a graph on the fitted and real values).

Dependent variable is LPP

Sample range: January 1988 to December 1996

Number of observations: 108

Ordinary Least Square Estimation

Regressor	Coefficient	Standard Error	T-Statistic	Probability> |T|
a	0.68973	0.045932	15.0163	0.000
LCOST	0.33387	0.013635	24.4868	0.000
LPP1	0.096982	0.033306	02.9118	0.004
LGROUP	0.54485	0.022913	23.7789	0.000

R-squared	0.99023	F-statistic F(3,139)	3513.8 (0.000)
R-Bar-Squared	0.98995	S.E. of Regression	0.0097411
Residual Sum of Squares	0.0098684	Mean of Dependent Variable	4.2444
S.D. of Dependent Variable	0.097162	Maximum of Log-likelihood	348.9844
DW-statistic	1.9623		

5.3.1 *Interpretation of Regression Results*

According to table 7:

- the coefficient (elasticity) of the (oil producer + oil marketer) is 0.33387. This elasticity has a t-statistic of 24.4868 and therefore the elasticity is statistically significant on a 5% level (probability < 0.05).
- the coefficient (elasticity) of the retail petrol price lagged by one month is 0.096982. This elasticity has a t-statistic of 2.9118 and therefore the elasticity is statistically significant on a 5% level (probability < 0.05).
- the coefficient (elasticity) of (service station margin + royalties and resource rent tax + product excise + state franchise fee) is 0.54485. This elasticity has a t-statistic of 23.7789 and therefore the elasticity is statistically significant on a 5% level (probability < 0.05).

$R^2 = 0.99023$ which implies that 99.023% of the total variance in the retail petrol price can be explained by the independent variables. As in the case of South Africa (Gauteng) a small error of 0.23% ((0.0097411/4.2444) x 100)) error occurs.

The Durbin-Watson lower and upper values are $D_l = 1{,}61$ and $D_u = 1{,}74$ so that DW = $1.9623 > D_u$. This implies that there is no auto-correlation on a 5% level of significance. See paragraph 5.2.1 (p. 59) for the detailed interpretation on this favourable Durbin-Watson statistic.

Note that the signs of the coefficients again correspond with what the theory suggests.

Interpretation: If the oil marketer and oil producer cost increase by 1% the retail price of petrol will increase by 0.33%. In the case of Australia (Canberra) it is also the case that the pressure on the retail petrol price takes a month before it has no further effect. This follows from the fact that the elasticity of the retail petrol price with regard to one month's lagged retail petrol price is 0,10%. If there is an increase of 1% in the netto result of the movement in the variables included under the group-variable, the retail petrol price will increase by 0.54%.

5.4 WALD TEST OF RESTRICTION IMPOSED ON PARAMETERS

5.4.1 Wald test on the regression coefficient of South Africa (Gauteng) and Australia (Canberra)

The following table shows the Wald test on some of the regression coefficients of South Africa (Gauteng) and Australia (Canberra) for the period January 1988 to December 1996. This test is performed on a 5% level of significance to determine whether the elasticities with regard to South Africa (Gauteng) can be statistically regarded as equal or different with the specific corresponding elasticities of Australia (Canberra).

Table 8: Wald test between the elasticities of the COST in South Africa (Gauteng) and Australia (Canberra)

Based on Ordinary Least Square regression of LPP1 on:			
A	LCOST	LPP1	LGROUP
108 observations used for estimation from January 1988 to December 1996			
Coefficients A1 to A4 are assigned to the above regressors respectively.			
List of imposed restriction(s) on parameter(s):			
a2 = 0.15556 (Parameter of LCOST)			
Wald Statistic		CHI-SQ(1) = 171,0229 (0,000)	

Australia's (Canberra) elasticity with regard to COST differs on a 5% level of significance (LCOST = 0.33387) from South Africa's (Gauteng) elasticity (LCOST = 0.15556). By inspection, the other remaining coefficients differ significantly between the two countries.

The conclusion can be made that Australia's (Canberra) elasticities differ significantly from the elasticities in South Africa's (Gauteng) situation. The elasticities in Australia (Canberra) with regard to the cost- and group-variables are higher than that of South Africa (Gauteng). This may implicate that the price elasticity in a partly deregulated country is higher for market related variables than in a regulated country. One may conclude that the pressure to change retail petrol prices quicker are higher in a partly deregulated country (because of market forces), because the elasticity of the lagged retail petrol price (0.096982) is less than that of a regulated country (0.66138). In a regulated country there may be a sensitivity towards a

change in retail petrol prices. Keep in mind that Australia (Canberra) has a higher degree of deregulation in their liquid fuels sector than South Africa (Gauteng). From this, one may suggest that there may be a difference between the specific elasticities of a country which liquid fuels sector is regulated and a country which liquid fuels sector is partly deregulated

5.4.2 Wald test on the regression coefficients of South Africa's (Gauteng) regressions for two periods

To decide whether South Africa (Gauteng) has become more market sensitive over a period, a regression from January 1985 to December 1987 is performed by using the data applicable to South Africa (Gauteng) and the elasticities are compared with those which were estimated for the period January 1988 to December 1996. The Wald test is then performed to test whether the elasticities between the two periods differ on a 5% level of significance.

Table 9: Regression coefficients for the retail petrol price spread in South Africa (Gauteng)

(See Appendix 3 for graphs on the fitted and real values).

Dependent variable is LPP

Sample range: February 1985 to December 1987

Number of observations: 35

Ordinary Least Square Estimation

Regressor	Coefficient	Standard Error	T-Statistic	Probability> |T|
A	1.113300	0.211040	5.2751	0.000
LCOST	0.15733	0.018453	8.5262	0.000
LPP1	0.596000	0.055673	10.7054	0.000
LGROUP	0.023614	0.013667	1.7277	0.094

R-squared	0.95721	F-statistic F(3,139)	231.1493 (0.000)
R-Bar-Squared	0.95307	S.E. of Regression	0.018555
Residual Sum of Squares	0.010673	Mean of Dependent Variable	4.3667
S.D. of Dependent Variable	0.085650	Maximum of Log-likelihood	92.0064
DW-statistic	2.1272		

5.4.3 *Interpretation of Regression Results*

According to table 9:

- the coefficient (elasticity) of the In-Bond-Landed cost is 0.15733. This elasticity has a t-statistic of 8.5262 and therefore the elasticity is statistically significant on a 5% level (probability < 0.05).
- the coefficient (elasticity) of the retail petrol price lagged by one month is 0.596. This elasticity has a t-statistic of 10.7054 and therefore the elasticity is statistically significant on a 5% level (probability < 0.05).
- the coefficient (elasticity) of (retail margin + delivery cost + wholesale margin + fuel tax) is 0.023614. This elasticity has a t-statistic of 1.7277 and therefore the elasticity is not statistically significant on a 5% level (probability > 0.05).

$R^2 = 0.95721$ which implies that 95.721% of the total variance in the retail petrol price can be explained by the independent variables. A small error of 0.42% ((0.018555/4.3667) x 100)) occurs.

The Durbin-Watson lower and upper values are $D_l = 1{,}61$ and $D_u = 1{,}74$ so that DW = $2.1272 > D_u$. This implies that there is no auto-correlation on a 5% level of significance. See paragraph 5.2.1 (p. 59) for the detailed interpretation on this favourable Durbin-Watson statistic.

Note that the signs of the coefficients again correspond with what the theory suggests.

Interpretation: If the In-Bond-Landed cost increases by 1% the retail price of petrol will increase by 0.20%. If the lagged retail petrol price increase by 1% the retail petrol price will increase by 0.60%. If there is a rise of 1% in the netto effect of all the variables that are included in the group-variable, the retail petrol price will increase by 0.02%.

The following table shows the Wald test that was done on South Africa's (Gauteng) data to see how the elasticities of LCOST differ from the period January 1985 to December 1987 to the period January 1988 to December 1996.

Table 10: Wald test for South Africa (Gauteng) between the first period (January 1985 to December 1987) and the second period (January 1988 to December 1996) with regard to the COST variable

Based on Ordinary Least Square regression of LPP			
A	LCOST	LPP1	LGROUP
35 observations used for estimation from February 1985 to December 1987			
Coefficients A1 to A4 are assigned to the above regressors respectively.			
List of imposed restriction(s) on parameter(s):			
a2 = 0.15556 (parameter of LCOST)			
Wald Statistic		CHI-SQ(1) = 0.0092436 (0,923)	

South Africa's (Gauteng) elasticity of the In-Bond-Landed Cost does not differ from the first part of the period (January 1985 to December 1987) to the second part of the period (January 1988 to December 1996) on a 5% level of significance. This suggests that the elasticities of the retail petrol price for the two periods do not differ statistically, therefore Gauteng's retail petrol price has not become more sensitive with regard to cost.

The following table shows the Wald test that was done on South Africa's (Gauteng) data to see how the elasticities of PP1 differ from the period January 1985 to December 1987 to the period January 1988 to January 1996.

Table 11: Wald test for South Africa (Gauteng) between the first period (January 1985 to December 1987) and the second period (January 1988 to December 1996) with regard to the PP1 variable

Based on Ordinary Least Square regression of LPP			
A	LCOST	LPP1	LGROUP
35 observations used for estimation from February 1985 to December 1987			
Coefficients A1 to A4 are assigned to the above regressors respectively.			
List of imposed restriction(s) on parameter(s):			
a3 = 0.0.66138 (Parameter of LPP1)			
Wald Statistic		CHI-SQ(1) = 1.3792 (0,240)	

South Africa's (Gauteng) elasticity of the PP1 variable does not differ significantly from the first part of the period (January 1985 to December 1987) to the second part of the period (January 1988 to December 1996) on a 5% level of significance, but in comparison with table 10 there is a bigger difference. This implies that the retail petrol price has become more sensitive to the retail petrol price lagged by one month, than to the In-Bond-Landed cost ((CHI-SQ (LPP1) = 1.3792 (0.24) and CHI-SQ (LCOST) = 0.0092436 (0.923)).

The following table shows the Wald test that was done on South Africa's (Gauteng) data to see how the elasticities of the GROUP variable differ from the period January 1985 to December 1987 to the period January 1988 to December 1996.

Table 12: Wald test for South Africa (Gauteng) between the first period (January 1985 to December 1987) and the second period (January 1988 to December 1996) with regard to the GROUP variable

Based on Ordinary Least Square regression of LPP			
A	LCOST	LPP1	LGROUP
35 observations used for estimation from February 1985 to December 1987			
Coefficients A1 to A4 are assigned to the above regressors respectively.			
List of imposed restriction(s) on parameter(s):			
a4 = 0.18553 (Parameter of LGROUP)			
Wald Statistic		CHI-SQ(1) = 140.3469 (0,000)	

South Africa's (Gauteng) elasticity of the GROUP variable differs significantly from the first part of the period (January 1985 to December 1987) to the second part of the period (January 1988 to December 1996) on a 5% level of significance. The conclusion may be made that market forces played a bigger role (liquid fuels sector in South Afarica was more deregulated in this period) in the second part of the period because variables included in the GROUP variable represent those variables which are more market related.

5.4 CONCLUSIONS

When comparing the elasticities of the variables of Australia (Canberra) with those of South Africa (Gauteng), it follows that there are statistical differences between the elasticities for a country that is regulated and that of a country that is partly deregulated.

From table 6 the conclusion may be drawn that the retail petrol price in South Africa (Gauteng) is more sensitive to the retail petrol price lagged by one month than the In-Bond-Landed cost or the GROUP (margins and taxes) variable. It is also more sensitive to the GROUP (margins and taxes) variable than the In-Bond-Landed cost. This may imply that South Africa (Gauteng) is spreading the pressure on the retail petrol price over a period.

From table 7 the conclusion may be drawn that the retail petrol price in Australia (Canberra) is more sensitive to the GROUP (taxes and margins) variable than the retail price lagged by one month or the COST (oil producer + oil marketer cost) variable. This retail petrol price is also more sensitive to the COST (oil producer + oil marketer cost) variable than the retail price lagged by one month.

By comparing tables 6 and 7 one may conclude that there are differences between the elasticities of determinants of retail petrol prices in a country where the liquid fuels sector is regulated and one where it is partially deregulated. In a country which is partly deregulated like Australia (Canberra) it seems that the variables with high elasticities are those that are market related. Should South Africa (Gauteng) deregulate in the same way it may happen that the elasticities of cost, margins and taxes will increase and the elasticity of the lagged retail price by one month will decrease. There will be competition when a sector deregulates and retail petrol prices will be volatile, because of retailers trying to capture more of a market than their competitors. This empirical study has shown that there will be volatility in such a deregulated sector and the question one may ask is if the South African market is ready for such a volatile sector.

In paragraph 5.3.2 where the Wald test on South Africa's (Gauteng) data for two different periods were done, one may conclude that although the South African retail petrol price is regulated there has been a gradual change in the sensitivity of the retail price of petrol with

regard to market forces. It seems as though market forces have begun to play a role. The reason for this may be that South Africa has gradually started to become more deregulated.

CHAPTER SIX

SUMMARY

The main aim of this study was to determine what the possible consequences of partial deregulation may be if the liquid fuels sector in South Africa with regard to the retail petrol price, should be deregulated on the same basis as in Australia. The motivation for this study is the relevance of this issue of deregulation of the liquid fuels sector in South Africa, which is currently regulated. There are different opinions as to what may the best option be, regarding deregulation or re-regulation, but whatever is decided, should deliver the best deal for the country and its people, especially since the unemployment rate is particularly high.

The study started with an overview of the South African liquid fuels sector, the different bodies which are involved in this sector, the regulation that is prevalent and also a view on the issue of competition. There is also a description of how the retail petrol price is comprised as well as a graph that shows the comparison between South African retail petrol prices and deregulated European countries' retail petrol prices. The reason for this overview of the South African liquid fuels sector was so that one can realise the extent of Government involvement in this sector and the kind of regulation that is prevalent. Another motivation for this overview was to provide a background for the comparisons which were made later on in the study.

The next part of the study was an overview of the liquid fuels sector in Australia, the different bodies which are involved in their sector, the regulation that is prevalent as well as a description of the competition. There is also a part that shows how the wholesale petrol price is comprised. The reason why Australia was chosen as a benchmark country was because the structure of its liquid fuels sector is similar to that of South Africa. This overview was done to provide a background of the Australian liquid fuels sector after partial deregulation and to compare it with the South African situation. This chapter lead to some findings on what may be theoretically possible consequences, should South Africa be partially deregulated on the same basis as Australia. The following could be effects of partial deregulation:

- A decrease in the number of service station outlets.

- Self-service at service stations may occur.
- Vertical arrangements.
- Retail prices of petrol in rural areas may become higher than in cities.
- Non-petroleum sales may increase at service station outlets in South Africa.
- Free importation of petrol or the option thereof may provide a guarantee that competitive pressures will continue to operate in a free market liquid fuels sector.
- Retail petrol prices may become volatile.

A chapter was dedicated to a summary of the views of different stakeholders in the liquid fuels sectors of both South Africa and Australia. This was done to get an understanding regarding the different views of stakeholders in South Africa with regard to a possible change of the liquid fuels sector. The views of stakeholders in Australia were important because one realises now that their system is still not viewed as perfect by all their people. One may also conclude that one will never be able to satisfy all, but the important factor is for everyone to come to an agreement as to what is the best for a country. The views of the different stakeholders in South Africa were compared to the theoretical findings in chapter three. Business, except for the Fuels Retailers Task Group, is in favour of deregulation whereas labour is not in favour of total deregulation, but over the longer term the lifting of some regulations may be considered. Government feels that total deregulation is not possible over the short term, but that their involvement can decrease over the longer term. The Institute of Policy and Social Research also expressed itself against less government involvement in the liquid fuels sector.

When looking at the goals at the start of chapter four, one realises that deregulation should be carefully considered when the theoretical findings of paragraph 4.1.6 are compared with these goals. If total deregulation should happen overnight, it may lead to questions such as:

- Quality of the products?
- Security of supply?
- Essential service station facilities available at viable petrol outlets?
- Promotion of small business entrepreneurship and investment?
- Security of jobs and creation of job opportunities?

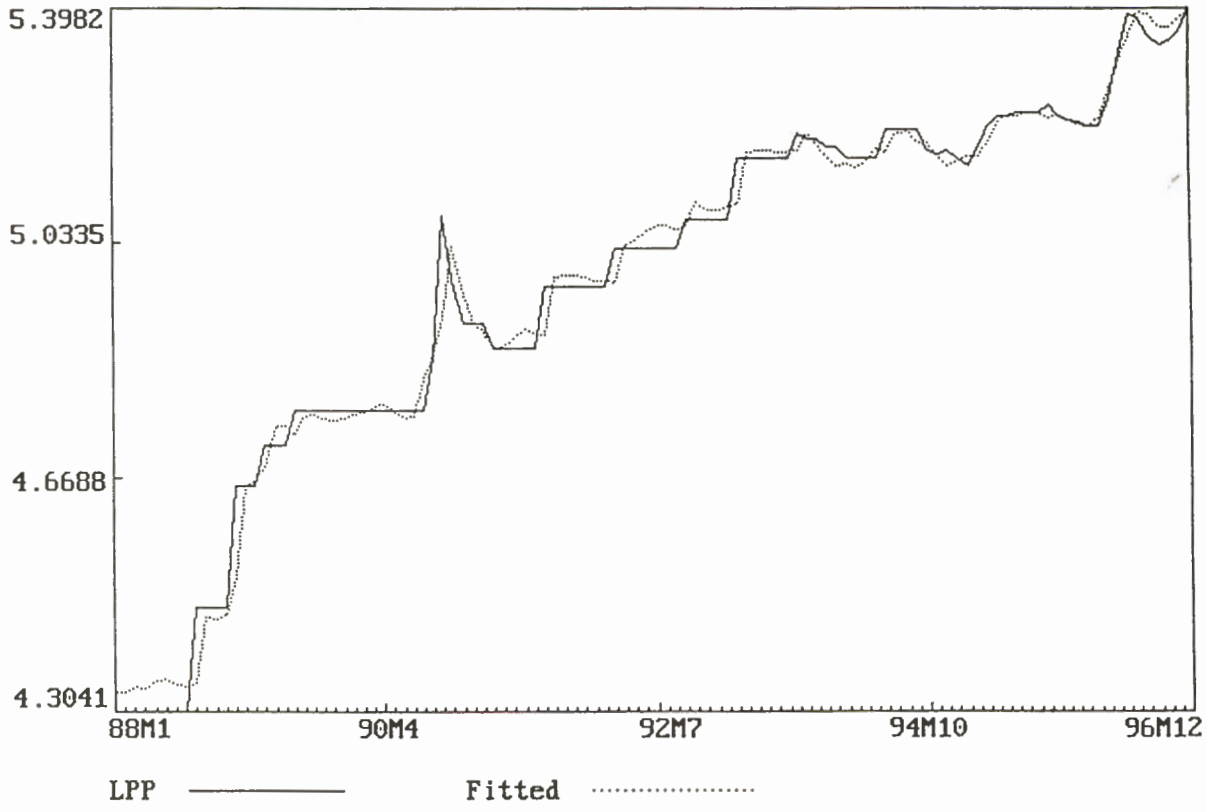
A chapter was dedicated to an empirical study to determine whether there are statistical differences between the elasticities of variables of the retail petrol price in a country where the liquid fuels sector is regulated and one where it is partially deregulated. The conclusion was that there are statistical differences between the elasticities of the variables of the retail petrol price in South Africa (Gauteng) and that of Australia (Canberra). In a partially deregulated liquid fuels sector there are more sensitivity towards cost, margins and taxes whereas in the regulated liquid fuels sector of South Africa it seems that the most sensitivity was towards the previous month's retail petrol price. It was also interesting to see that there was some change in South Africa's (Gauteng) liquid fuels sector when comparing two periods (January 1985 to December 1987 and January 1988 December 1996), it seems that although still regulated there was a tendency that the elasticity of the retail petrol price increases over time toward market forces. This chapter was important in a statistical sense to prove that there is a difference between the elasticities of determinants of the retail petrol price in a regulated liquid fuels sector and the elasticities of determinants of the retail petrol price in a partially deregulated liquid fuels sector.

The conclusion of this study is that the possible outcome of deregulation of the liquid fuels sector in South Africa on the same basis as in Australia, with regard to retail petrol prices, may be that retail petrol prices will become volatile. Taking the South African economy into account and the high unemployment rate one may conclude that South Africa may not be ready to deal with the consequences of a higher volatility of the retail petrol price.

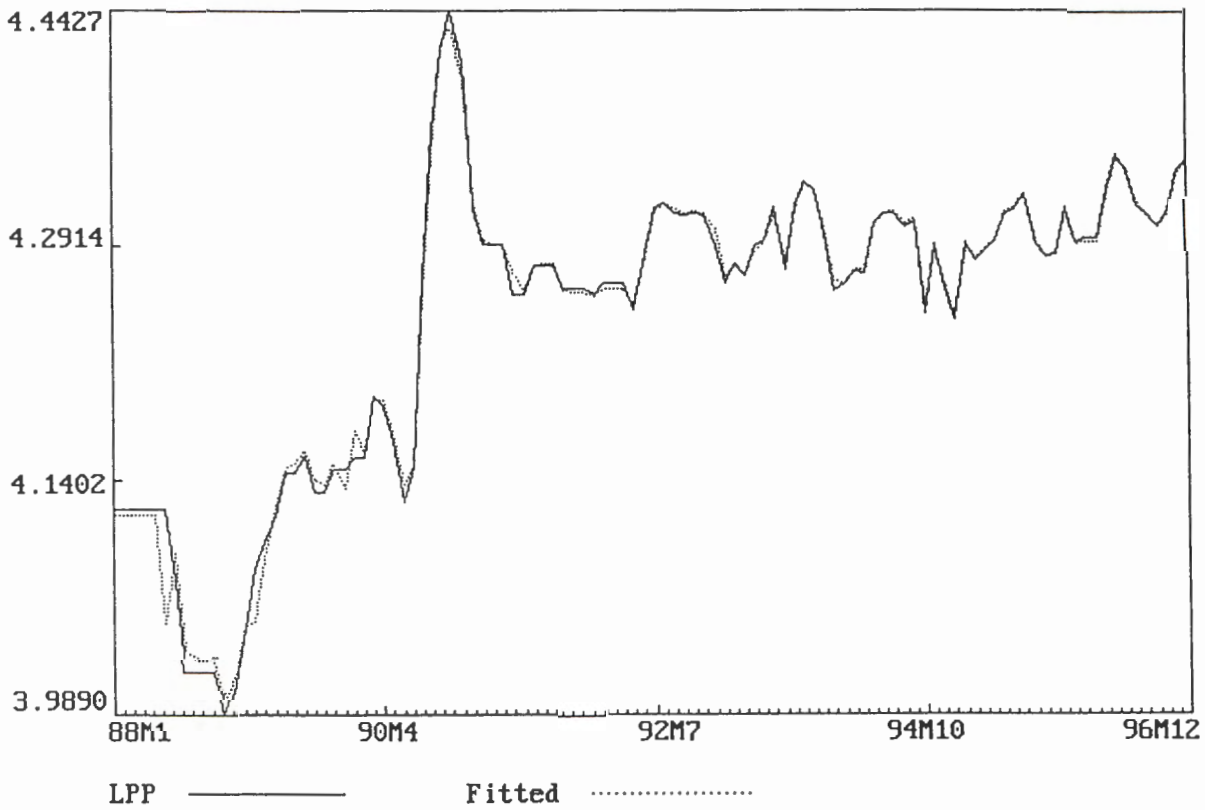
One may suggest that further research is necessary to discover methods on how to prevent or at least lessen the effect of those unwanted results which may occur once the liquid fuels sector with regard to retail petrol prices in South Africa is less regulated.

APPENDICES 1 TO 3

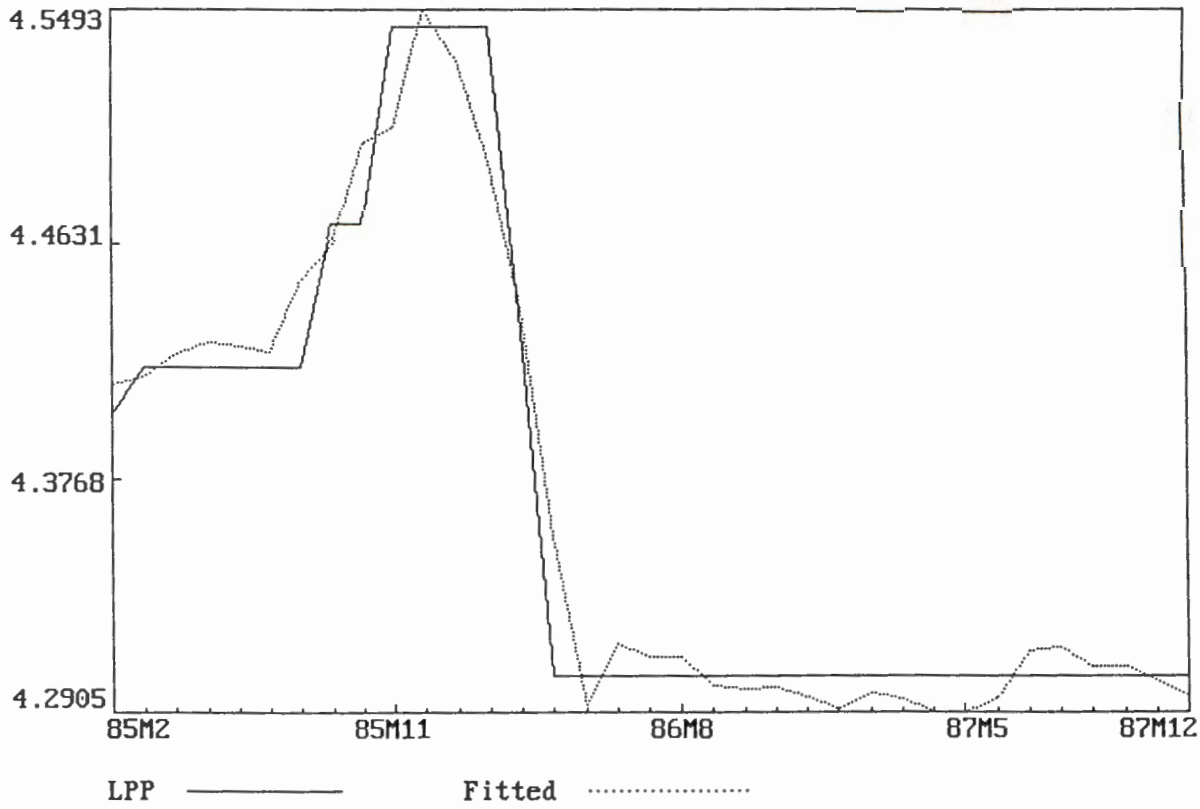
Appendix 1: Fitted and real values of retail petrol prices in South Africa (Gauteng) from January 1988 to December 1996



Appendix 2: Fitted and real values of retail petrol prices in Australia (Canberra) from January 1988 to December 1996



Appendix 3: Fitted and real values of retail petrol prices in South Africa (Gauteng) from January 1985 to December 1987



OPSOMMING

OPSOMMING

Die doel van hierdie studie was om te bepaal wat die moontlike gevolge van gedeeltelike deregulering sal wees, indien die vloeibare brandstofsektor met betrekking tot kleinhandelpryse van petrol in Suid-Afrika gedeeltelik sou dereguleer op dieselfde grondslag as Australië. Die motivering vir die studie was die relevantheid van deregulering in die vloeibare brandstofsektor in Suid-Afrika (wat tans gereguleer word). Daar bestaan verskillende menings oor wat die beste vir Suid-Afrika sal wees, betreffende regulering of deregulering, maar wat ookal besluit word moet die beste wees vir die land en sy mense, veral omdat werkloosheid hoog is.

Die studie begin met 'n oorsig van die Suid-Afrikaanse vloeibare brandstofsektor, die verskillende liggame wat betrokke is in hierdie sektor, die regulering wat tans toegepas word asook 'n oorsig oor die aspek van mededinging. Daar is ook 'n verduideliking ten opsigte van hoe die kleinhandelprys van petrol saamgestel word sowel as 'n grafiek wat die vergelyking toon tussen Suid-Afrikaanse petrol kleinhandelpryse en gedereguleerde Europese petrol kleinhandelpryse. Die rede vir hierdie oorsig van die Suid-Afrikaanse vloeibare brandstofsektor is om aan te toon wat die mate van regeringsbetrokkenheid is in hierdie sektor asook die tipe van regulering wat toegepas word. Nog 'n motivering vir hierdie oorsig is dat daar 'n agtergrond moet bestaan sodat die vergelykings wat later in die studie gemaak word beter gevolg kan word.

Die volgende deel van die studie was 'n oorsig van die vloeibare brandstofsektor in Australië, die verskillende liggame wat betrokke is in hulle sektor, die regulering wat toegepas word asook 'n beskrywing van die mededinging wat bestaan. 'n Gedeelte word ook afgestaan om aan te toon hoe die groothandelprys van petrol saamgestel word. Die rede waarom Australië gekies is as 'n basis, was omdat die struktuur van die vloeibare brandstofsektor ooreenkom met die van Suid-Afrika. Hierdie oorsig is gedoen om 'n agtergrond te verskaf van hoe Australië se vloeibare brandstofsektor lyk na gedeeltelike deregulering en om dit dan te vergelyk met die Suid-Afrikaanse situasie. Hierdie hoofstuk het tot sekere bevindinge gelei wat aantoon wat moontlike teoretiese gevolge kan wees indien Suid-Afrika gedeeltelik sou dereguleer op dieselfde grondslag as Australië. Opsommenderwys is die volgende gevind:

- 'n Afname in die aantal vulstasies.
- Selfbediening mag ontstaan by vulstasies.

- Vertikale ooreenkomste.
- Kleinhandelpryse van petrol in landelike gebiede mag hoër wees as in stede.
- Verkope van ander produkte (uitsluitend petrol) mag toeneem by vulstasies in Suid-Afrika.
- Vrye invoer van petrol of die keuse om dit te mag doen, mag 'n waarborg verskaf dat mededingende druk aanhou toegepas sal word in 'n vrye mark vloeibare brandstofsektor.
- Kleinhandelpryse van petrol mag onbestendig raak.

'n Hoofstuk is afgestaan aan 'n opsomming van die menings van verskillende belanghebbendes in die vloeibare brandstofsektore van beide Suid-Afrika en Australië. Die rede waarom dit gedoen is was om insig te verkry in die menings van die verskillende belanghebbendes ten opsigte van 'n moontlike verandering in die vloeibare brandstofsektor. Die sienswyses van belanghebbendes in Australië was belangrik omdat dit getoon het dat hulle vloeibare brandstofsektor steeds nie perfek is vir almal nie. Die gevolgtrekking kan gemaak word dat almal nooit ten volle tevrede sal wees nie, maar dat die belangrike faktor is dat ooreenstemming bereik moet word oor wat die beste vir die land is. Die sienswyses van die verskillende belangegroepe in Suid-Afrika is vergelyk met die teoretiese bevindinge in hoofstuk drie. Besigheid, behalwe vir die "Fuels Retailers Task Group", is ten gunste van deregulering terwyl arbeid nie ten gunste is van totale deregulering nie, maar tog oor die langer termyn die opheffing van sekere regulasies sal oorweeg. . Die regering voel dat totale deregulering nie moontik is oor die korttermyn nie, maar dat hulle betrokkenheid wel verminder kan word oor die langer termyn. Die "Institute of Policy and Social Research" het hulleself ook uitgedruk teen minder regeringsbetrokkenheid in die vloeibare brandstofsektor.

Wanneer daar gekyk word na die doelwitte aan die begin van hoofstuk vier, dan kom mens tot die besef dat deregulering baie versigtig oorweeg sal moet word wanneer die teoretiese bevindinge van paragraaf 4.1.6 vergelyk word met hierdie doelwitte. Indien deregulering oornag sou plaasvind mag dit aanleiding gee tot die volgende kwessies:

- Kwaliteit van produkte?
- Die veiligheid van verskaffing?
- Is daar essensiële vulstasie fasiliteite beskikbaar by lewensvatbare petrol afsetgebiede?
- Promosie van klein onderneming entrepreneurskap en belegging?
- Veiligheid van werk en skepping van werksgeleenthede?

'n Hoofstuk is afgestaan aan 'n empiriese studie om te bepaal of daar statistiese verskille bestaan tussen die elastisiteite van die veranderlikes van die kleinhandel petrolprys in 'n land waar die vloeibare brandstofsektor gereguleer word en 'n land waar dit gedeeltelik gedereguleer is. Die gevolgtrekking was dat daar wel statistiese verskille, tussen die elastisiteite van die veranderlikes van die kleinhandel petrolprys in Suid-Afrika (Gauteng) en die van Australië (Canberra) is. In 'n gedeeltelik gedereguleerde vloeibare brandstofsektor is daar meer sensitiwiteit teenoor koste, marges en belastings, waar in die gereguleerde vloeibare brandstofsektor van Suid-Afrika dit lyk asof die meeste sensitiwiteit teenoor die vorige maand se kleinhandel petrolprys is. Dit was ook interessant om te sien dat daar wel verandering in Suid-Afrika se vloeibare brandstofsektor was toe twee verskillende periodes (Januarie 1985 tot Desember 1987 en Januarie 1988 tot Desember 1996) met mekaar vergelyk is. Dit blyk dat alhoewel die sektor gereguleer word daar tog wel 'n neiging was dat die elastisiteit van die kleinhandel petrolprys verhoog het teenoor markkragte. Hierdie hoofstuk was belangrik in 'n statistiese opsig om te bewys dat daar 'n verskil is tussen die elastisteite van veranderlikes van die kleinhandel petrolprys in 'n gereguleerde vloeibare brandstofsektor en die elastisiteite van veranderlikes van die kleinhandel petrolprys in 'n gedeeltelik gedereguleerde vloeibare brandstofsektor.

Die gevolgtrekking van hierdie studie is dat die moontlike resultaat van deregulering in die vloeibare brandstofsektor in Suid-Afrika op dieselfde grondslag as Australië, met betrekking tot kleinhandel petrolpryse, mag wees dat kleinhandel petrolpryse onbestendig sal word. Deur die Suid-Afrikaanse ekonomie in ag te neem asook die hoë werkloosheidsyfer, mag 'n mens aflei dat Suid-Afrika miskien nie gereed is om die gevolge van 'n hoër onbestendigheid in kleinhandel petrolpryse te hanteer nie.

Dit blyk dat verdere navorsing nodig is om metodes te onthul oor hoe om die effek van ongewenste resultate te verminder of te voorkom, wat mag ontstaan sodra die vloeibare brandstofsektor in Suid-Afrika minder gereguleerd is.

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