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**An international review of the impacts of
liberalisation of the petroleum sector: lessons
for South Africa**

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**Submitted in partial fulfilment of the requirements for
the degree of Master of Philosophy (Energy and
Development Studies)**

UNIVERSITY OF CAPE TOWN

Declaration

I, Zoleka C. Xabendlini, submit this dissertation to the University of Cape Town in partial fulfilment of the requirements for the degree of the Master of Philosophy. I declare that, unless otherwise acknowledged, this is my original work and that it has not been submitted in this or similar form for a degree at any University.

Signed by candidate

Z. C. Xabendlini

...*29th*...day of *August*...2000

In loving memory of my father.

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1. BACKGROUND

1.1 Introduction

The purpose of this Master's (Energy and Development) half thesis is the undertaking of a comparative international review of the experience and impact of deregulation of the liquid fuels industries of a number of countries in order to draw lessons for the South African case. The South African Energy Policy White Paper states that it is government's intention to deregulate the downstream liquid fuels industry. It is not clear what the consequences will be. Hence a comparative analysis with countries already past this stage will be made.

1.2 Importance of liquid fuels industry

Consumption of liquid fuels globally is concentrated in the transport sector. Liquid fuels are strategically important for the modern transport systems of all countries. The reason for this is that there are no close substitutes yet. Therefore the sector remains almost totally dependent on liquid fuels.

The contribution of liquid fuels to the economy is also valued as source of employment, especially in the retail sub sector. Also, there is value added in the production of liquid fuels. There is value added to local natural resources in the production of liquid fuels, usually crude, but in South Africa also to coal and natural gas.

Liquid fuels can contribute significantly towards foreign earnings for the government. As a result governments have traditionally treated liquid fuels as strategic commodities whose price and distribution need to be regulated.

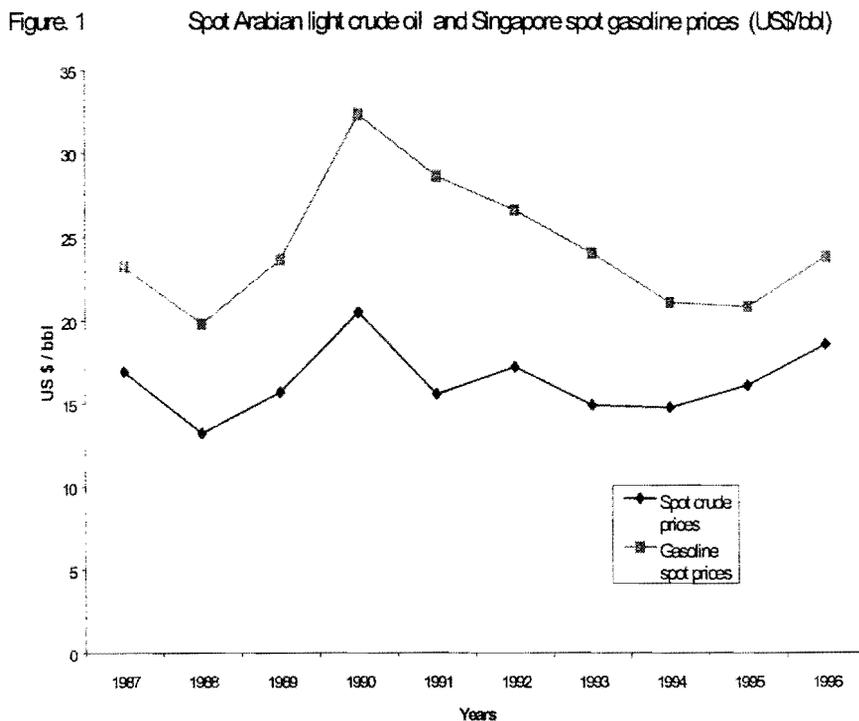
1.3 Crude oil markets

Just about all liquid fuels are manufactured from crude oil. However, two countries¹, namely Germany and South Africa, manufacture liquid fuels from coal and natural gas, (IEA Energy Balances 1997). Many countries, both producers and importers of liquid fuels, depend largely on crude oil. The fact that crude oil is only found in certain

¹ Production of liquid fuels from natural gas in New Zealand ceased in 1994. Discussed further in Chapter 4.

parts of the world means that some countries have to import it for domestic refinery or import refined products.

Because liquid fuels across the world are produced from crude oil, the price of most liquid fuels is therefore highly affected by changes in price and availability of crude oil. It should be noted that prices of gasoline² and crude oil follow the same trend (see figure 1). The world crude oil price hike of 1990 for example is shown by the break in figure 1, also translated into increased prices of gasoline. The volatility of crude oil prices therefore has a profound effect on the movement of liquid fuels prices.



Source: BP Statistical Review of World Energy, 1997 and IEA Energy Statistics, 1997

² Price of gasoline is used with the assumption that it is the major liquid fuel and can be expected to provide good representation of other products, diesel, jet fuel, paraffin, LPG, and fuel oil.

An analysis of the liquid fuels industry would therefore be incomplete without first looking at the crude oil industry and the developments and changes experienced over the past decades. A look at some properties (strategic commodity, reliability of supply) that characterise the oil industry and the development phases of this industry helps form a background against which a picture of the liquid fuels industry can be drawn. This is important because the changes experienced in the oil industry impact directly on the liquid fuels industry as shown above.

Extremely large oil companies who have operations in exploration and production, refining and marketing have historically dominated the crude oil market. These vertically integrated companies thus have a strong influence on crude markets and they have shifted profits and investments between exploration and production, refining and marketing. Thus an understanding of the operation of crude markets is important.

1.3.1 Importance of oil

The fact that large commercially exploitable oil deposits are concentrated at particular geographic points in the world means that these oil deposits are of strategic importance to every country in the world. Areas with significant proven reserves include the Middle East, parts of America, the Former Soviet Union, Asia, the North Sea and Africa. Elsewhere oil has to be imported either in its crude form or as refined petroleum products.

The geographic distribution of oil reserves also has important economic implications for most oil-importing countries. Generally if the local market is big enough it is preferable for non-oil producers, on economic grounds, to import in the form of crude oil and refine domestically. This is because transport costs of crude oil are lower than costs of transporting refined products. However, it should be noted that not all refineries are competitive. Indeed some are uneconomical.

Domestic refining can be chosen for various other reasons including multiplier effects on other activities in the economy. Among these reasons is the attractiveness of profits that can be earned in the downstream activity. So domestic refining is also chosen for value adding reasons. It is also valued for savings through import substitution. Huge amounts of foreign currency that would be spent on imported products can be saved.

In some countries oil is also important as a source of heat and power, making it an economically important commodity. For example, in many countries across the world oil is used in the production of electricity (although that is changing significantly), that is an important input in other sectors. Thus oil has indirect links with other sectors of the economy. Therefore its continued supply is vital for the stable functioning of such sectors.

The importance of oil, according to Deagle (1983) is different for most exporting countries than it is to importers. For these exporting nations oil is a feature of national pride and a source of wealth. They are dependent on it for the development of their economies. Thus oil is valued for what it can earn host nations. They have to exchange it for goods with which they are relatively less endowed to ensure the growth and sustainability of their economies.

1.3.2 Reliability of crude oil supply

A reliable supply of oil is of paramount importance for the healthy functioning of economies. It becomes a crucial factor for energy security in countries highly dependent on imported oil. This raises the issue of the vulnerability of these countries to supply disruptions. Energy security can be defined as ensuring reliable and affordable supplies of energy at all times. Vulnerability refers to the potential for expected damage that can result from a disruption in supply. Thus the status of an importing country with respect to the above factors can potentially be seriously threatened if oil is a major source of energy.

Measures to guard against vulnerability or reduce its effects can be devised, and keeping emergency stocks of oil can be one of them in the short-term measure. Lieber (1983) adds that even though a country may not be heavily dependent on oil imports, it may be vulnerable to supply shocks if protective measures are not in place. Energy diversification is another measure that is commonly being utilised to improve energy security and reduce vulnerability.

1.3.3 Volatility of crude oil prices

The international oil industry is generally characterised by volatile prices both of crude oil and liquid fuel products. Oil markets are highly exposed to political and economic changes that can have serious effects on the trading relationships between countries. Relatively small changes in the supply of oil can result in major shocks as happened in

the 1973-74 crisis. A cutback of less than 7% in exports from OPEC countries that resulted in prices rising to levels more than three times higher than what they originally were. The next crisis in 1978-1979 was caused by less than a 4% reduction in supply resulting in prices increasing by 170% (Lieber, 1983:83).

Political uncertainties concerning the supply of crude oil and the increasing demand for oil, in non-oil producing countries makes the problem even worse (although this is slowly changing). As Lieber (1983) notes, the source of supply disruption can be technical, economical or political. The political situation is one that is largely unpredictable. This is of particular concern to small importing countries who cannot have any influence on the world price of oil. South Africa (SA), a price taker in the world oil market, is one such country.

1.3.4 Development phases of the oil industry

It is also important also to look at the different structural changes in response to which the industry has evolved. These developments shed light on the events indicating the growth of awareness of oil as an economically and strategic commodity, and the involvement of governments in the industry. It is to those changes that we now turn.

It is useful to consider the development of the international oil industry in the following phases:

- The period before the first oil price shock
- Phase I: The first price shock and consequences
- Phase II: Second price shock and consequences
- Phase III: Third price shock and consequences
- Period until now

(1) The period before the first price shock

Since 1859, when oil was discovered, the industry has been characterised by boom and bust cycles. Periods of shortage would be followed by periods of surplus. In general, however, by the end of the first half of the 20th century, oil reserves and production far

exceeded demand on an aggregate global basis. Despite the surplus the market was still subject to volatility. This was largely caused by a conflict between the desire of the producing countries on the one hand, concentrated on limited geographical regions, to maximise government revenue and the desire of oil majors, on the other hand, to maximise their profits.

The period in the late 1950's was characterised by relatively stable crude oil prices. This was the time when largely the major international oil companies controlled the production and pricing of oil, and therefore liquid fuels, in a number of ways. They controlled profit-sharing agreements between themselves and producing states, and maximised total margins as far as possible.

Governments of oil-producing nations were by then actively involved in this industry. Towards the end of the 1960's prices of oil were slowly moving downwards. Host governments were slowly getting a lower share of revenue per barrel of oil sold, causing dissatisfaction. The cause of dropping prices was a combination of factors, the most apparent being the large discoveries of new oil reserves. These discoveries led to overproduction despite the growing demand for crude oil and its products that was experienced throughout the world. This pushed prices down (Adelman *et. al.* 1977 and Heal *et. al.* 1991).

On the other hand there were efficiency gains from the fact that major oil companies were able to enjoy the benefits associated with scale economies through vertical integration. This contributed to increased efficiency and thus reduction in production costs that were passed to the consumer in the form of reduced prices. Although it could be argued that the major oil companies restricted competition because they were vertically integrated and needed any competitor to enter the industry on the same footing, this would have been outweighed by the gains in efficiency.

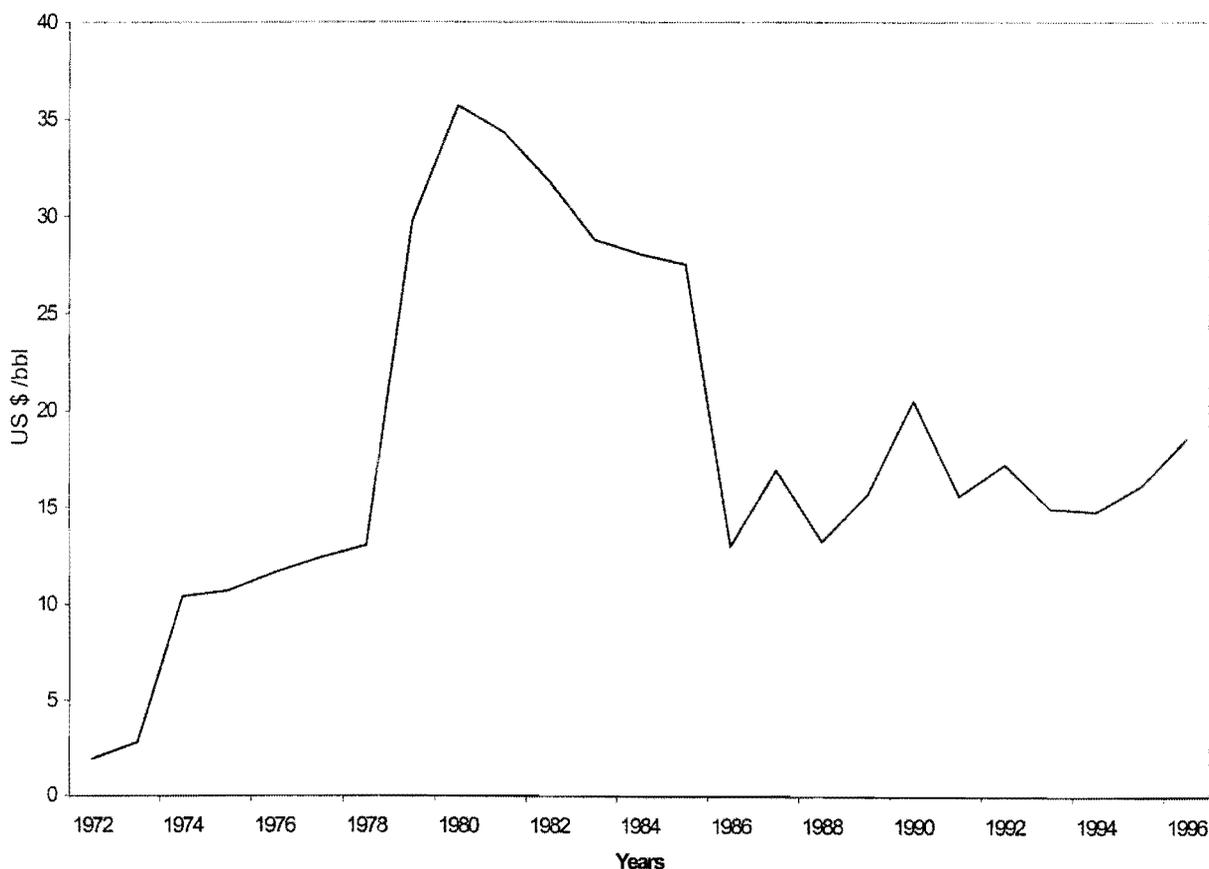
(2) The first price shock and consequences

The beginning of 1973-1974 marked Phase I (as defined above) of development of the oil industry. The increased awareness of the role of the oil industry and the need for economic and political independence of Middle Eastern countries led to profound changes in control and ownership. The Libyan government, followed by governments of other OPEC members, emphasised the need to control the deposits of oil within their country's boundaries, and to control a higher proportion of revenue from sales.

These governments responded to the awareness by nationalising oil assets. This changed expectations of buyers and sellers.

The outbreak of the Yom Kippur war in 1973 led to a reduction in the supply to oil markets. OPEC members controlled levels of production in their territories. They were anxious to maintain prices at reasonable levels by reducing production. The control was largely triggered, however, by the fact that governments of oil-producing countries were more conscious about sustaining production than the oil majors were. Heal, et. al. (1991) assert that, oil companies were producing at very high rates just before being driven away. They were doing so to maximise profits whilst they could, as they may have expected the government take-over. The price increased from \$2.8 to over \$10.

Figure.2 Spot crude oil prices



Source: BP Statistical Review of World Energy, 1997

It should be noted that up to 1973 there was a generally strong economic growth, coupled with high demand for energy in OECD countries. Oil represented about 46% of total energy consumption, of which a significant proportion was imported from the Middle East.

The price rise of 1973 did not immediately lead to the adoption of strategies by consumers to ameliorate the effects. It took time before measures could be implemented to lower prices. So before any measures to reduce prices could be implemented, prices continued to rise steadily.

(3) The second price shock and consequences

Phase II between the late 1970's and early 1980's (depicted in figure 2) was characterised by the steep rise in prices in 1979-1981. An OPEC cartel had fully emerged at that period. By this time demand was growing and new oil finds were not large. This meant that non-OPEC producers had to increase production in order to be able to replace the reduced supply. However, levels of growth of production in the United States (USA), the largest oil consumer, were low despite the large growth of its economy, which had contributed to increasing reliance of supply on oil imports. This made counteraction by non-OPEC producers difficult, since USA was largely reliant on imports from OPEC countries. Concerns from consuming nations therefore about the depletion of oil resources grew, and oil producers, mainly OPEC members, decided to cut down on production through the introduction of quotas.

By the end of 1981 governments of importing countries were active participants in the industry. Various methods of intervention induced by the two price hikes came into effect, ranging from state monopoly of oil industries to regulation of activities and the price of crude oil. Other countries outside the OPEC were stimulated to increase production so reducing dependence on imported oil from the Middle East. This in turn led to lowering of prices in 1982.

Some of the measures that the importing governments took in response to price shocks included promoting the development and use of other energy sources produced domestically so reducing over-reliance on imports of oil. Some other actions taken were energy conservation and protection of domestic industries from international market pressures. Oil-producing nations, as important earners of the most part of government revenue were striving to make the best economic use of their resources. It

is in this environment that the International Energy Agency (IEA) was formed, enforcing oil stocks of up to 90 days consumption to be kept by member countries.

(4) The third price shock and consequences

The late 1980's to early 1990's was the third phase. It was triggered by production cuts in Kuwait and Iraq during the time of war in that region. As a result, production was reduced by about 4.3 million bpd, a 7.6% of world oil production. Price increases in phase III were less severe than during the 1973 shock. The response by Saudi Arabia, according to Greene (1997), of increasing its production level by 3 million bpd played a significant role in reducing this effect and led to a real production cut of 1.3 million bpd. In addition, the measures taken after the 1979 shock were fully in place causing little disruption to supply.

(5) The period until now

Oil-consuming countries are no longer as dependent on Middle Eastern oil as was the case in the 1970's. Since then there have been discoveries of oil in other parts of the world and other energy sources have been utilised. One of the important developments is the fading away of the cold war that prevailed between the various oil producing, and consuming nations, improving trade relations.

Crude oil prices were relatively stable from 1992 to 1997, ranging between \$14 and \$19 per barrel. Prices in 1998 dropped to around \$10 before rising to high levels, around \$23 per barrel in 1999.

It is interesting to note the impact of the manipulation of production levels by OPEC members in the second quarter of 1999 on the world oil prices. In an attempt to raise the crude prices, OPEC called on its members to reduce the supply of oil to the world markets by 1.7 million bpd (Business Day: 18/05/99). Whether this turns out to be another phase is yet to be seen.

1.4 Development of SA liquid fuels industry

The developments in the oil industry highlighted above affected energy economies and liquid fuels industries of various countries in different ways. How the economy is exposed to international markets, liquid fuels industry regulatory framework, and whether the economy is highly dependent on imported products are expected to have

been the determining factors to the extent of disruptions. The situation in South Africa was also partly shaped by these changes and will be discussed within this framework as follows.

The SA government became involved in the liquid fuels industry in 1931. The intention was to prevent the formation of cartels and to ensure the continued supply of fuels and stability of this important industry. Until 1954 SA imported all liquid fuel consumed in the country in refined form. The only marketers and distributors operating in the country were Caltex, BP, Shell and Mobil.

With the growth of demand for liquid fuels, it proved viable to establish a local refinery, and Genref (Durban) was established by Mobil company in 1954 (DMEA, 1993). Sapref (Durban) was the second refinery opened in 1964 by Shell and BP, followed by Calref (Cape Town) of Caltex in 1966 and then Natref (Sasolburg) by Sasol and Total in 1971/72.

The current SA crude-refining capacity, taking account of recent de-mothballing³, is 455 000 barrels per day. A breakdown according to refinery capacity before (1992) and after de-mothballing (1997) is shown in Table.1. There was an overall increase of refineries' capacity of 137 000 bpd by 1997, with Calref having doubled its capacity.

³ SA refineries were required to mothball their capacities during the years of apartheid to fully accommodate synthetic fuels production.

Table. 1 Refinery capacity ('000 bpd⁴)

Refinery	1992 (⁰⁰⁰)	1997 (⁰⁰⁰)
Sapref	120	165
Genref	70	105
Calref	50	100
Natref	78	85
Total	318	455

Source: SAPIA, 1998

Currently there are nine companies involved in the marketing and distribution of liquid fuels around the country, namely; Afric Oil, BP, Caltex, Engen, Exel, Shell, Tepco, Total and Zenex. The import ports and production facilities are unevenly distributed across the country. This requires co-operative arrangements to be made among different companies in order to be able to distribute products around the country in the most efficient way. Companies therefore exchange products in the various regions where they are not physically represented to avoid duplication of facilities and functions. Transport and depot facilities are shared among all companies.

1.4.1 Supply of crude oil and refined products

SA does not have significant commercially exploitable reserves (current production is 18 000 bpd crude). Almost all crude oil is imported. The Strategic Fuel Fund, a subsidiary of the state owned Central Energy Fund, was responsible for the procurement of crude oil for resale to SA refineries when the UN oil embargo against apartheid SA was intensified.

Crude oil refineries are situated at the Cape Town and Durban ports, and in Gauteng, pipelines from Durban connect to the Natref refinery. The oil companies are responsible now for negotiating and arranging with their suppliers to import crude oil. These refineries import mainly crude oil since the importation of refined products is only allowed on permit.

⁴ barrels per day

1.4.2 Synthetic fuels industry

A synthetic fuels industry was established in South Africa in 1954. This was done for political, strategic, and economic reasons. When it was largely believed that world oil reserves were being depleted, together with threats of oil sanctions towards SA, the government embarked on a synthetic fuel programme with the first Fischer–Tropsch equipment, producing oil from indigenous coal tested at Sasol I in 1955.

When the international oil crisis of 1973 set in, resulting in oil prices rising from US \$2.80 to US \$10.41 per barrel (BP Statistics, 1997), the government took the decision to expand local production of synfuels. As a result of that Sasol II was commissioned in 1980. By then pressure of UN sanctions against SA was mounting, with Iranian government cutting its supplies of oil to SA.

The third phase of the oil industry development as discussed in section 1.3.2, when oil prices rose from US \$13.03 to US \$29.75 per barrel resulted in yet another decision to expand Sasol, and the third plant Sasol III started operating in 1982. The government of the day realised the need to make up for the loss of Iranian supplies, reinforcing the expansion of Sasol. The establishment of Sasol III enabled the government to attain the target level of self-sufficiency in liquid fuels (in particular petrol and diesel) of 40%.

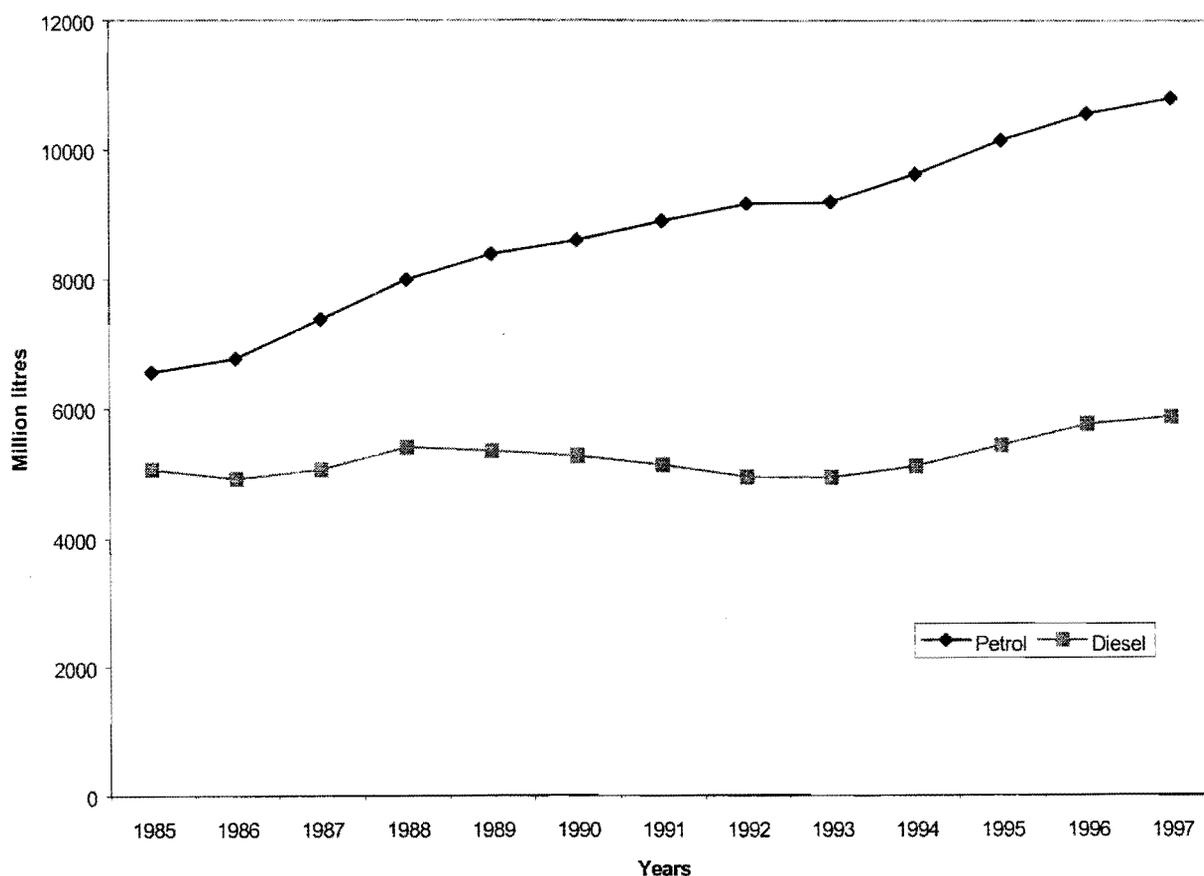
The overall Sasol synthetic fuels capacity is currently 150 000 bpd of crude oil equivalent. Its products include petrol, diesel, paraffin, LPG and chemical feed stocks. Trollip (1996) notes that Sasol produces a higher proportion of the light fuels than the conventional refineries. Sasol, being previously state owned until 1979, enjoyed preferential treatment. It still qualifies for a subsidy from the government and oil companies are obliged to distribute its output.

In 1991 Mossgas, converting natural gas to oil was established to increase the supply of synthetic fuels. The demand for liquid fuels was increasing and it was estimated that by the mid 1990's the level of self-sufficiency would have dropped to 30%. To retain the self-sufficiency ratio at the desired level therefore meant that ways of increasing the supply of local production of synthetic fuels had to be devised, and hence, Mossgas was established. It meets about 8% (45 000 bpd of crude oil equivalent) of total liquid fuels demand. Thus about 38% of local demand for refined products is currently met by synfuels with Sasol contributing 30%. The remaining 62% is met through imports of crude oil. This makes SA the world's leading producer of synfuels (DMEA, 1993).

1.4.3 Demand for products

South Africa consumes about 20 billion litres of liquid fuels per year. Major products are petrol, diesel, paraffin, jet fuel, and LPG. Petrol represents a dominant share in terms of demand (Sapia, 1998). Petrol versus diesel consumption is shown in figure 3. Petrol, as noted, has the highest level of consumption and growth in all the years considered. Despite this, diesel is priced relatively high through the SA pricing formula. This is unusual and, in fact, contrary to what one would have expected. That is, one would expect a higher price for petrol due to its high demand, in order to balance supply and demand.

Figure 3 Inland consumption of petrol and diesel



Source: SAPIA, 1998

Many countries price diesel lower than petrol in trying to promote the use of diesel. The technological advances offered by diesel engines for various applications have been some of the aspects taken into consideration by these governments in their attempts to encourage increased use of diesel (Trollip, 1996). However, South Africa

has chosen to be an exception to this rule. As a result consumption of diesel has been relatively constant and lower than that of petrol.

The predominance of high growth in petrol demand can be traced back to growth of the minibus taxi industry using largely petrol as its fuel. A slight increase in diesel consumption is observed just after 1994. Overall demand for liquid fuels is noted to have increased in 1997 by 2.2%. It is the use of jet fuel that has shown significant increase since mid 1990's. Sapia (1998) attribute this to re incorporation of SA into the international community, with 11% growth in 1997.

1.4.4 Oil industry regulation in SA

The main regulatory measures involve import control of refined products, price control of petroleum products, upliftment of Sasol and Mossgas products and restricted entry to retailing (Rationalisation Plan). Each of these will be discussed below.

SA was not immune to international events. The oil industry in SA has since 1931 been characterised by a high level of state intervention and complex regulations: from procurement of crude oil (although that is now left in the hands of the oil companies), to refining and marketing. The Strategic Fuel Fund was established to acquire and maintain strategic fuel crude oil stockpiles for resale to refineries. In 1994 the government approved a strategic level equivalent to four months of petroleum requirement (Trollip, 1996).

Oil companies were forced to contribute towards the costs arising from the build-up of reserves, in return for a franchise afforded to them to build or expand their refineries. So the government had to use compulsion and incentive to force oil companies to comply. Hengeveld, *et. al.* (1995) note that threats of nationalisation of shareholdings in refineries, so that parent oil companies could guarantee their continued supply of oil to the country were used.

It is interesting to note that even before crude oil sourcing was deregulated in 1991, when SFF was largely thought to be the only body importing crude, Shell and Total (SA) were exceptions. They obtained their crude from the parent companies (Hengeveld, *et. al.*, 1995: 21). This sheds light on the secrecy that prevailed in the industry during oil sanctions. The secrecy was made possible by secrecy legislation, which governed the industry during the years of oil sanctions.

1.4.4.1 Import and Export control

Importation of refined products is only allowed by special permit in order to ensure full utilisation of crude refineries. This had the added function of being an incentive to keep the major oil companies in the country during apartheid years. Also, it was done to promote and protect the government's investments in synthetic fuels.

In addition, the government could not afford losing the added value component provided by refineries. The refineries are valued for their significant contribution to the country's Gross Domestic Product, estimated at R 1.4 billion on an annual R 10.46 billion turnover (Sapia, 1999). Refineries also had to be kept in the country in order to reduce foreign exchange requirement and provide jobs.

The conviction that should imports be allowed, other non- industry groups (like hypermarkets) would enter the market, reinforced the decision on import control. It was felt, that allowing imports of products would disadvantage consumers and the industry in the long run and result in sporadic dumping into the local market (DME, 1993). Export is permitted provided SA and other South African Customs Union members' needs are met and permits are required for that (Trollip, 1996).

1.4.4.2 Price control

The wholesale and retail price of petrol is controlled by the government. The final price of the product is based on import parity plus other charges including tax and transport costs. Import parity pricing is thought to be a way of forcing domestic refineries to operate to internationally efficient and cost-effective standards. (This pricing principle is based on the idea that prices in SA should be influenced by supply of and demand for liquid fuels in the international markets in particular, those from which SA would have to get its supplies). These controls, as the Competition Board notes, guarantee the oil companies a fixed return (1994). The control of the retail price of petrol is one of the cornerstones of the regulatory system in the liquid fuels industry (DME, 1998).

The import parity price, sometimes called the In Bond Landed Cost (IBCL) comprises the basis of petroleum products price. It is formed by adding the average *free on board (fob)* petrol price listed by a proportion of 80:20 refineries in Singapore and Bahrain, plus freight, insurance and ocean leakage costs. The freight costs are determined by standard international tariffs for transport journeys on a monthly basis, from Singapore to SA ports. Landing and wharfage charges are then added and thus the

IBLC is arrived at. Singapore is chosen as the basis for this calculation because it is thought to be the most relevant site to consider. It is considered as such because it gets its crude oil from the same area as SA. It is also situated at more or less the same distance from SA as the Gulf refineries from which SA would have to get supplies of liquid fuels. Bahrian prices are also used for comparison purposes (DME, 1993). Added to the IBLC are transport costs (determined by the notional and actual cost of transporting products from coasts to inland) and service differential, (calculated as previous years' real historic costs for the whole industry and averaged country- wide).

1.4.4.3 Service Station Rationalisation plan

The Service Station Rationalisation Plan (RATPLAN) is an agreement between the government and oil companies to control the number of service stations, and prevents self-service at filling stations to safeguard the jobs of petrol attendants. Wholesalers are not allowed to operate service stations except for training purposes. Reasons for this include promotion of small business development and prevention of vertical integration.

Through the RATPLAN agreement, supermarkets and hypermarkets are not allowed to sell petrol at prices below the controlled price. This makes dealers the largest owners of national networks (58%) where wholesalers contract with dealers to sell their products. On the other hand oil companies can lease a service station and about 29% of them fall under this category (Kotze, 1995). The RATPLAN determines the maximum number of closures of service stations by a company.

1.4.4.4 Upliftment of synfuels

This situation is unique to SA. With the construction of Sasol, an agreement was formed with the oil companies in which they had to uplift all Sasol's products. Sasol would not have dedicated service stations, but, was allowed a sales pump in each service station within a particular area (Trollip, 1996). Sasol has now given notice, effective from 01-01-1999 to 31-12-2003, that it intends entering the retail market (Business Day, 17/02/99). Mossgas receives compensation from the government for the difference in the price of its products and the import parity price.

From 1989 to 1991 some of the country's refining capacity was mothballed to accommodate synthetic fuels production. This was done through an agreement to compensate companies for the loss of under-utilised capacity. Companies were forced

to mothball refineries because it proved more difficult for synthetic fuel plants to adjust their proportions of output in response to changes in market demand (Hengeveld, *et. al.*, 1995). This shows how the government's desire to be secure in oil supplies led to the objective of energy security overriding even economic considerations.

The arrangements for oil supply in the face of the embargo cost the government more than R22b than it would normally have spent in the absence of an embargo (Hengeveld, *et. al.*, 1995). Sasol and Mossgas contribute 190 bpd of crude equivalents to the country's refining capacity. Their contribution had been stable at this level, testimony to the commitment of the government to fully utilise their output, which warranted mothballing of conventional refineries noted before.

1.5 Deregulation

The changed political and economic situation in SA, with the lifting of the oil embargo and our re- integration into the world economy, has led to consideration of institutional and regulatory reforms in the petroleum industry. Deregulation of the petroleum sector is the envisaged policy, to effect this change, and will be the concern of this study. It can be defined as the process of altering the set of rules that structure economic activity, and changing or removing institutions that implement them (Frischtek, 1992). The new government is committed to see this process through, provided some milestones are achieved (as detailed in the SA Energy Policy White Paper (1998)). Among these is the attainment of a 25% Black Economic Empowerment within this sector.

The implementation of deregulation is intended to take place in a series of three steps: firstly, arrangements are to be put in place to ensure that job - losses are minimised during the implementation process, and to give the government a chance to restructure its assets in the industry. Secondly, prices are to be allowed to be set by the market and, finally any distortions that arise with deregulation are to be monitored and corrected (SA Energy Policy White Paper, 1998). It is worth mentioning that SA does not have experience regarding the issue of deregulation. Reliance will be placed on international lessons to provide a solid foundation on which SA can draw its deregulation policy. Therefore the steps taken in implementing deregulation in other countries and what was involved will be closely studied.

1.6 Problem statement

The SA industry was largely shaped by the policies of the apartheid government; self-sufficiency in the face of the UN embargo against SA. A complicated set of regulations and agreements were made possible by the secrecy that governed the industry. The economic and political environment, however, have changed. The government has recognised this and set a path for changing the existing regulatory framework, as detailed in the Energy Policy White Paper.

The envisaged policy is one of minimum government intervention with the ultimate goal of deregulating the industry. The possible effects that deregulation could have on the economy (for example, price, jobs, and economic participation) will be investigated.

1.7 Research questions

This study intends to investigate what the pattern of deregulation was in other countries and to what extent this is applicable to SA with regard to:

- Impact on prices

Deregulation is supposed to bring about lower prices. It should however be pointed out that this may not always be the case. An analysis of the possible effects will then be made. Whether the intended recipients reap the benefits will be an important question this study will attempt to answer.

- Jobs

Deregulation will possibly have a related effect of leading to the phasing out of the RATPLAN (which forbids vertical integration by refusing oil companies operation of service stations). The concern here is whether deregulation with the subsequent phasing out of the RATPLAN will not result in labour layoffs.

- Economic participation in the industry by different participants

When deregulation happens, will the result be increased competition or collusion by oil companies already in the industry such a result would make it even more difficult for new companies to enter the market.

Where the idea of redistribution of wealth is so sensitive and important as in SA, deregulation might not accelerate the process of wealth-transfer to historically

disadvantaged groups. Frishtek (1992) warns that deregulation does not necessarily provide equitable distribution. The likely effects of deregulation with regard to redistribution of wealth will be in SA will be examined.

This review will also try to determine the extent to which deregulation will enable the development of small local business. It will examine what the impact on marginal and rural service stations might be, and what measures could be employed to ameliorate these.

1.8 Thesis outline

In chapter two, an analysis of some theoretical underpinnings of regulation and deregulation is made, followed in chapter three by a review of the experiences of the different countries who have liberalised their petroleum sectors. Chapter four is an in-depth discussion of the Australian and New Zealand case studies from which lessons for South Africa can be learnt.

2. REGULATION AND DE-REGULATION: SOME THEORETICAL UNDERPINNINGS

This chapter briefly examines the theoretical ideal of the free market. It should deliver optimum allocation and distribution in the economy. However, it is pointed out that the free market is an “ideal” that is not achieved in practice. However, the liberalised market, achieved via deregulation and imposition of other regulations, can achieve some of the goals of a free market. Having looked at some properties characterising the international oil industry and the background of the SA industry, a review of some regulatory measures applied by the state in the oil sector will follow. Here I will try to shed some light on the various forms of and motives driving regulation and or deregulation.

2.1 The market

The forms of ownership and control over oil companies have developed differently over time. Presently the trend seems to be towards market competition where there is a minimum government intervention. As noted, this is not a new phenomenon in economic history. What follows is a review of some of the underlying theory justifying this trend.

The preference for an open market involving competing private enterprises stems from the belief that this type of organisation will lead to an efficient allocation of resources. The reasoning is that private individuals would, in trying to satisfy their interests, satisfy the public interest and objectives (Stiglitz, 1988). Here public interests are served when individuals seek to satisfy their individual interest. This is also justified on the premise that members of the society are ready to pay for anything they desire, so that there can be no likelihood of goods being overproduced or under-produced. Sellers act on signals sent by consumers, and produce just what is needed in the market. Producers are in search for better opportunities to increase profits. This search for profits ends up being a search for better, more efficient means of production, that also benefit the consumer, driving out of business inefficient producers. The belief that competition will induce efficiency and spur innovation is central to this ideology.

The above argument is based on the fundamental theory of Pareto efficient allocation of resources. This states that in a Pareto optimal situation there can be no re-allocation

of resources where someone is made better off without making someone else worse off. Secondly, that re-allocation can only be achieved if the right allocation of resources was made from the beginning. This means that, if the initial allocation is found to be unsatisfactory, redistribution is all that is needed to let market force adjust to changes. The main principle of these theorems is that consumers, in deciding whether to buy a commodity and how much, search for a quantity at which the price they have to pay just equals the extra benefit derived from consuming an extra unit.

That is, they equate the additional benefit of consuming an extra unit with the marginal cost. The same applies to the producer. Production will continue until the marginal cost of producing an additional unit is equal to the extra benefit derived. Threat of competition forces producers to remain efficient by continuing the search for profitable opportunities in order to protect their market shares.

However, the theoretical ideal is seldom achieved. In practice markets are imperfect and governments have often been impelled to intervene.

2.2 Justification for government involvement

The justification for government involvement in industry affairs arises out of the failure of market forces to address imbalances in the market place. The reasons cited for this may be economic, political, social or a combination of these. Some of the common justifications are failure of the market to deal with monopoly, supply of public goods, externalities, paternalism/ merit goods, insufficient information, links to other industries and socio-economic goals, development of local natural resources, strategic and security reasons. Each of these will be discussed below.

2.2.1 Monopoly/oligopoly

The term monopoly refers to a single supplier serving the market. A natural monopoly occurs where only one supplier in a market can efficiently provide the goods/ services because of its increasing returns to scale (that is, the marginal costs of production decline as output increases). A monopoly is regarded as problematic because a monopolist can restrict output and charge a higher price than would be the case in a competitive market. For a monopolist the marginal revenue is lower than the selling price. In other words for sales to increase, prices must rise. Thus the market power enjoyed by a monopolist may lead to the monopolist producing at a higher price than is economically optimal.

Although in the case of a natural monopolist the primary objective is the one already mentioned, closely associated are concerns about the distribution of income (Jaccard, 1995). Thus it is often felt that a natural monopoly usually should be government owned or regulated. One of the reasons for that is that the government is thought to promote the interests of its citizens. Secondly, regulation of a public monopoly is expected to be less costly in terms of access to information than regulating a private monopoly company. In the SA case for example there is public monopoly of ownership of the oil pipelines by Transnet subsidiary.

Major oil producers, by virtue of their near monopolistic power over the oil markets or their ability to collude over production decisions, can reap very high rewards by exploiting consuming nations. The OPEC cartel has proved capable of that practice in the 1970's and there is no guarantee that it cannot be repeated. Thus collusion is another practice which concerns governments, because it can yield similar effects to those of monopolies. In fact, Greene (1997: 7) identifies OPEC as an imperfect monopolistic cartel of the von Stackelberg type.

The price that maximises profit for this type of cartel is determined by the price elasticity of demand, the cartel's share of the market and the supply response of other producers outside of the cartel. If the other producers respond to the cartel's production cuts by increasing their production with equal amounts, the price does not change. The situation of the OPEC cartel in the 1970's appears to conform very closely to the classic characteristics of producer cartels. Five objective conditions have been identified as the most important for a successful cartel: high concentration of production, high barriers to entry, small number of significant outside producers, non-substitutability, and non-differentiation (Spar, 1994). The situation, however, has now changed.

The oil companies dominating the international oil and products markets are vertically integrated. That is, they are involved in all the stages of the supply chain, from exploration to distribution and retailing. They are in a position to exercise market power and cause all the disadvantages associated with this. With such conditions in the market then, government involvement may be warranted to ensure that necessary precautions are taken to safeguard the economy against market power. In various countries, vertical integration is prohibited to avoid the abuse of power by these companies. Government interference can be justified on these grounds.

2.2.2 Public goods

A public good is characterised by two characteristics: one is non-exclusivity (it is difficult or impossible to exclude certain individuals from enjoying a public commodity). The second characteristic is non-rivalry (an extra individual enjoying the benefits of a good does not cause price of a commodity to increase, or does not diminish the quantity available for others) (Stiglitz, 1988). Because of these properties, public goods will either be supplied in insufficient quantities or not supplied by the market. A private investor, when undertaking a decision to invest in the production of goods and/or services expects a reward in the form of enough profit, to cover the costs of production. If the market does not allow full appropriation of the rewards, such goods will not be provided, as the producer may simply withdraw from the market.

Judging from the definition given in section 1.2.2.2, oil on its own is not a public commodity. This may be confusing when a deeper look is taken at the role of the oil industry in economies. Since it is of significance to certain sectors that largely contribute to the supply of public goods, one is tempted to treat it as a public good. Proponents of public theory would insist that government interference is warranted. That is not the case. Provision of public goods should not be confused with social equity arguments.

2.2.3 Externalities

These are actions of firms or individuals imposing costs on or bestowing benefits on others, but not compensating those affected. An externality may either be positive or negative. A positive externality is when a firm/individual confers a benefit on others but does not receive compensation for that. A negative one is imposing costs on others, and not compensating them for that. In the petroleum industry, refining imposes a cost on communities nearby by polluting the air and not compensating those communities for the loss of clean, fresh air. In that case, a refiner imposes a negative externality on communities.

Negative externality-causing activities, related to petroleum product production and usage, are enormous because the use of oil is highly associated with environmental degradation and subsequent health problems. The combustion of oil results in the emission of sulphur dioxide, nitrogen oxide, carbon monoxide and carbon dioxide, all of which can be harmful. Sources of these emissions are mainly power stations burning oil for electricity generation, the refineries, and the transport sector from its use of

petroleum to fuel vehicles. Also, production, transport and storage of crude and its products can cause huge damage to the environment.

Continued exposure to polluted air has been associated with bronchial problems in human beings. The greenhouse effect, a result of carbon dioxide emissions building up in the air, has become a major concern in many parts of the world.

The petroleum industry produces negative externalities from production to final consumption. There are steps being taken to force the industry to take account of the externalities. For example, setting of pollution standards to control production of externalities, compensation and disincentives aimed at reducing negative externalities are some measures taken in this regard. Therefore, on these grounds the government should intervene. Transferring this function to the private sector or to an independent body cannot be expected to do justice as regulators are subject to capture and, among other reasons, are not expected as the government is to be concerned with the interests of citizens.

Those involved in positive externality activities, on the other hand, may be discouraged from producing more of the externality-generating services since they are not fully rewarded. The result can be a shortage of those goods. In the presence of externalities therefore, Stiglitz (1988) also contends, the allocation of resources provided by markets may not be efficient and governments may need to intervene.

2.2.4 Inadequate information

Inadequate information provided to consumers about conditions and products available in the market can cause markets to be ineffective. Sufficient information is necessary to allow proper evaluation by market participants of competing products. It is also important to potential market entrants to assess the conditions of the market in respect to opportunities available and other dynamics of the market. Public sector supporters will argue that the private sector will not provide enough of that information.

An important point to be considered about this kind of information is that it is not readily available and therefore is costly to obtain. Information cannot to be considered a free commodity, it has to be paid for and can be very expensive if supplied by the private sector. Added to this, it exhibits public commodity characteristics of non-rivalry and non-exclusivity. The private sector can deliberately hide important

information from the public about market conditions and the costs of production in order to charge very high prices. The goods may in the end be under-produced. Since the government has the power to compel, private companies can be forced to disclose the necessary information. This can also be an argument reinforcing the role of the government.

2.2.5 Paternalism/Patronage

The idea that the government knows best about what is good for individuals is used as justification for government involvement. According to the proponents of this idea, even if adequate information is available to facilitate informed decisions, notes Stiglitz (1988), consumers may not be in a position to analyse it correctly. For example, the government can enforce oil companies to supply products conforming to certain standards of quality deemed necessary by the government to protect consumers.

2.2.6 Protection of domestic industry

The intention for the government to interfere may also be to protect the domestic industry from dumping by foreign countries. This may squeeze out local business by increasing the supply of lower priced, poor quality products, which have been rejected in their domestic markets. The government of SA, for instance supported a policy of self-sufficiency until the 1980's that in some ways supported this goal. This may also seem to support the objective of providing adequate information to the market, and paternalism.

2.2.7 Rent from natural resources

There is also a goal of receiving rent from natural resources, some of which could not be fully realised without government intervention. This is also to prevent exploitation by other companies from making use of the country's resources without adequately compensating the host country.

2.2.8 Links to other industries

The provision of certain goods is essential for the continued survival of certain industries within the economy. In order therefore to maintain the link between the relevant industries the government may need to be involved. For example, petrochemicals and liquid fuels can be a case in this regard.

2.2.9 Socio-economic development

Governments have various objectives to be achieved by using different policy instruments. In trying to do that co-operation between government sectors becomes relevant. In the case of supplying liquid fuels, the broader objective is provision of fuels across the country at affordable prices. What is likely to happen in most cases is that fuel can be supplied throughout the country but that prices may not be uniform if commercial prices are charged. A higher price would be charged for consumers far from production / supply centres, (usually rural areas) in order to reflect distribution and transport costs. On social grounds it may be felt that those consumers should be subsidised by their counterparts in urban centres. (See also fiscal measures 2.3.3).

2.3 Forms of intervention

The government has various forms at its disposal that it can use for intervention in the market. Among them are producing those goods or services identified to be unattractive to the private sector, to oversee and regulate activities of the private sector, and encouraging or prohibiting production and trade. These will be analysed below.

2.3.1 Ownership

Active participation of government through this form has been widely used in the petroleum sector. Governments in some countries have been, and in others still continue to be, responsible for production of this form of energy or ensuring continued supply to consumers. This has been experienced through ownership of oil companies integrated throughout the supply chain and separate activities of industry where the companies are not integrated. The fact that oil was viewed as a strategic commodity that cannot be traded like any other common commodity and that it is significant to most countries' industries were the underlying reasons for government ownership of petroleum industries.

2.3.2 Regulation

Various regulatory measures that governments impose range from control of prices, regulation of monopoly/oligopoly, access to the market, protection of industry, regulation of relationships between refineries, wholesalers and retailers, to public service obligations, quotas, import / export control technical, health, environment and safety. Each of these types of regulation will be discussed below:

Price controls

With price controls, prices of crude and products are in this case not set by the market. The government may set limits in terms of the floor price and ceiling within which prices are allowed to vary. Various components of the build-up of the final price may thus have nothing to do with the costs of production, as will be seen under taxation below. Controls can be set at any component of the activity of the supply chain, be it the refinery gate price, the wholesale price or retail.

The purpose of this is to protect consumers from monopoly / oligopoly abuse. These are some of the market failures noted as reasons for government intervention in the industry. The fear is that a monopoly/oligopoly will abuse its market power leading to inefficient use of resources. Another objective of regulating these types of market structure is to introduce free and fair competition. This involves encouraging participation by a number of parties including small businesses.

In SA an additional reason for this was to keep international companies in the country during the apartheid era. When the UN embargo was effected international companies disinvested from SA, and the government had to use incentive measures, by way of guaranteed margins, to keep some in the country.

Trade restrictions

Restriction of trade is a form of regulation that can be used to protect an industry. It may be necessary for the development of local industry. The need to protect a local industry could arise from the fact that it may not have reached full development, making its competition with already established companies unfair. Another reason for this could be that the industry is promoted in order to utilise a local natural resource to reduce over-reliance on imported materials. Commercial competitiveness with the imported product may take a long time to achieve, as it may be the first time the technology required for operation is used.

The production of liquid fuels from synthetics can be viewed as an industry that needs government protection. The technology for their production is not widely used. Synthetic liquid fuels have to compete or supplement liquid fuels from crude oil which are traded internationally. This can pose a threat to a local industry that may not have reached commercially competitive stages.

The economic consideration of local industry's contribution to the economy is another reason for protection. Although this does raise a lot of questions regarding the cost of protecting the industry, it is a factor that could support government intervention.

Operating relationships

The major purpose of this is to promote free and fair competition in the industry. For example it can ensure that there is no discrimination by a supplier among different customers. Also the government may choose to regulate the operating relationships between refiners, wholesalers and retailers in order to limit vertical integration in the liquid fuels industry. For example, government may oversee contractual agreements giving refiners or wholesalers some form of control over activities downstream. This could also be a way of guarding against unfair competition because, if vertical integration is allowed, independent small business may not be able to participate in the industry. Any potential competitor will be required to enter in a vertically integrated manner to make any meaningful contribution (discussed further in 2.6.3).

Standards of operation

Operating standards may be regulated to ensure that a number of objectives are satisfied. Such operation standards usually relate to safety. Government may set uniform standards regarding the construction and operation of service stations in terms of size, location and materials used. This will ensure the safety of motorists, and the general public from dangerous operations service station operators might engage in.

Labour regulation

An economic factor can also be a point under consideration. Prevention of self-service in order to safeguard jobs of petrol attendants can be enforced through this form of regulation.

General mergers and acquisitions regulation

This is supportive of the general principle of promoting free and fair competition in the industry. It regulates formation of mergers and acquisitions by setting guidelines regarding acceptable conditions of mergers that will not lead to violation of general competition principles. Acquisitions that, for example, result in the acquiring company

gaining a certain share of the market that is regarded big enough to exercise unfair market power can be prevented through this form of regulation.

2.3.3 Fiscal measures

These include taxes, grants and subsidies. The stage of production at which any of these is applied can vary depending on the objective they are intended to achieve. Taxes can, for example, be used to reduce demand for a certain product, in order to promote consumption of another product or as a way of promoting energy efficiency in production and use. Currently some countries are taxing leaded and unleaded petrol differently, with leaded priced higher to promote the use of unleaded petrol. Also there might be a differential between diesel and petrol to encourage increased use of diesel.

Taxes are also used to force users of oil and its products to take responsibility for their externality-causing activities, as noted above. Taxes are mostly, however, designed to earn governments revenue (IEA, 1996).

Subsidies are to a large extent used to equate prices charged to consumers at different localities. The main target is mainly consumers in the rural parts of the country who, because of low demand or poor infrastructure, are not profitable to supply.

2.3.4 Trade instruments

Falling under this category are tariffs, quotas, exports / imports embargoes. Quota (regulating quantity) systems have been used in to regulate major petroleum products for a long time.

Tariffs may be used to discourage imports with the aim of promoting local business or, alternatively together with quotas, to encourage trade, respectively.

Trade embargoes are used for political reasons mainly (as was the case with the embargo by the US against Iraq, and the UN embargo against the apartheid South Africa).

2.3.5 Research and Development

The emphasis on Research and Development (R&D) funded by the government varies across different energy sources and countries. The IEA (1996) notes that the amount spent on R&D for oil and coal issues together constituted 11% of total government

R&D expenditure in IEA countries. Support for dissemination of new technology is the common form of intervention. This is done to create public awareness about a new technology in the market thus assisting suppliers to make it commercially viable.

R&D are in some way a public commodity. Knowledge gained through R&D does not diminish by sharing it with others. That is, there is the characteristic of non-rivalry. Also once a technology is in the market, other producers can imitate it if not under patent. The support for R&D can thus be direct or indirect through the use of subsidies and tax incentives.

The effectiveness of these measures is very difficult to assess as different results have been achieved in different situations. Rather what can be done is to look at the rationales for government intervention and see whether they really apply to the petroleum markets, first, and then analyse whether the appropriate measures have been used.

The justifications for government intervention discussed above may appear conclusive and well thought out, but an analysis of actual experience raises some doubts about this. These rationales are put forward with the assumption that the government has proper knowledge of the market and has the best interest of its citizens. This may not always be the case as will be shown below. The government also has limitations. We turn to those.

2.4 Government failures

Governments are thought to be better representatives of their citizens than private companies, so that what is desired by the government will satisfy all the citizens. This had been the underlying reason for advocating high government involvement in certain industries, including the liquid fuels industries of various countries. This view is however slowly changing towards minimum government involvement. Some of the reasons for this are highlighted below.

Governments have budgetary constraints within which to operate in pursuit of their goals. Objectives of the government are many and often contradictory. This makes attainment of the stated objectives very difficult for a number of reasons.

Government employees are individuals who have different objectives. These individual objectives may be in conflict with those of the government. Corruption may result and this in turn results in an inefficient use of resources.

Many services supplied by the government are supplied in a manner that does not show the true costs to the consumer, and are often under-priced. Because of that individuals tend to demand provision of that particular service more than they would if individual consumption was tied to the price.

In view of the above the role of government is increasingly being limited to those services in which there is consensus that the private sector cannot supply adequately. This can give the government opportunity to operate effectively without being a player and a referee in business.

2.5 Drivers for liberalisation

It was stated earlier that some of the objectives of the free market ideal can be achieved through liberalisation of the markets. Different situations are experienced in different countries that lead to the desire to liberalise the markets. The general performance of petroleum sectors under heavy ownership of governments has had mixed results. Of the bad ones, mention can be made of investment decisions that have been made haphazardly without any due concern for long term implications. Some have largely been politically driven. The result has been misallocation of resources that could have been used efficiently within the sector.

2.5.1 Inefficiency and lack of commercial objectives

One of the main reasons for the poor performance of public companies is the result of lack of incentives on the part of managers to operate efficiently. One of these is the lack of accountability and easy access to public funds. Because of this and the fact that they are often not guided by business principles, the result is inefficiency in use of resources. The problem of a concise definition among governments of what constitutes public goods and how these should be priced is also often to blame for this.

Governments in certain cases have been too industrious in providing energy for citizens at all costs without due consideration of the impacts. In trying to fight other pressures the government allocates funds to other projects away from petroleum sub sectors, for example promoting development of other domestic energy industries to

reduce reliance on oil. In the end there are not enough funds aimed at improving petroleum sector services and/or products by way of upgrading and expanding facilities to meet the growing demand of petroleum products.

In spite of this, it should be noted that there are or have been public companies that are efficient.

2.5.2 Pressure from international lending agencies

Countries facing poor growth or struggling to improve economic performances are the most vulnerable to this kind of pressure. They are characterised by high foreign debt levels. Dependence on donor organisations for rescue packages therefore forces them to comply with the rules laid down to them by their donors.

One of the conditions is often that in order for them to be able to raise funds and promote private sector investment, they are obliged to consider opening the industry to competitive forces.

2.5.3 Lack of private investment

Lack of finance to develop the petroleum sector's infrastructure meant that the government had to look to the private sector to provide new investments. In those instances, the recognition of the importance of the private sector for the development of the petroleum sector was the driving force.

Also private investment means the government avoids straining the central budget and frees the government to perform other functions which the private sector cannot be trusted to do adequately.

2.6 Forms of liberalisation

Liberalisation of the industry can take a number of forms depending on the objectives underlying the decision to open up the market. In some cases it will be noticed that a combination of methods rather than one single way is followed. Country specifics play an important role in the determination of which method is applied. These involve privatisation, deregulation, promotion of competition, capitalisation, foreign investment, and trade liberalisation. A look at each one of the methods follows.

2.6.1 Privatisation

Various forms have been used to reduce the hand of the state in business activities in the petroleum industry. One common way among previously state-owned monopoly companies is the privatising of those companies. Liberalisation often involves privatisation although this does not mean to suggest that it is a pre-condition for liberalisation to take place. As much as this method is followed, most of the times to earn revenue for the state, that is not always the reason. Transfer of ownership through sale of assets achieves this objective, but there are other methods of privatising without selling all the assets.

A look at such different privatisation measures in a number of countries is considered later. The study will only be limited to the relevant types as pursued in petroleum industries, the motivations and what was achieved afterwards.

Cognisance should be taken of the fact that change of ownership in these petroleum markets is not the ultimate goal sought by the various governments but a step towards the final objective of introducing competition and improving efficiency, by liberalising and deregulating the industry. Of utmost importance to private ownership are the potential benefits expected through efficiency gains accruing as a result of better set of incentives and constraints. Some of these potential benefits relate to providing consumers better service and a wider choice.

Private companies are thought to be more sensitive and responsive to changing market conditions and customer needs than publicly owned ones. The benefits associated with a private company can largely be realised if the relevant companies operate in a competitive set up, otherwise they can also be inefficient.

Competition is thought to foster innovation among companies thus promoting introduction of new products as a way to enhance individual company image and to restore and protect market share. Threat of take-over and bankruptcy drive private firms to be efficient.

Privatising is also done to reduce political interference in business. It provides incentives to achieve both allocative (keeping prices close to marginal costs) and productive (achieving higher profits as a result of reducing costs and improving products or service) efficiency. It is worth noting, however, that the efficiency gains accorded to the private business are not universally agreed upon (Head, *et. al.*, 1991).

2.6.1.1 *Methods of privatisation*

Privatisation can be defined as transfer of ownership, operation and development from the state to private hands. The type of privatisation chosen will to a large extent be determined by the underlying objectives for privatisation. A range of objectives for privatisation include increasing economic efficiency by promoting and introducing competition, reducing public debt, freeing public funds for financing other demands, especially for social development. Included are methods of increasing both local and international private investment, and reducing the fiscal burden of running a public company.

The crucial co-ordination of the method chosen with the goal, can be shown as follows: where the driving force for privatisation is mainly to generate cash for the government, transfer of ownership by direct sale of assets or business unit is the preferred type. Other considerations like protecting national interests however may lead to another choice being made. One or a combination of these measures may be chosen depending on the nature of the privatisation method preferred.

Before the actual privatisation of the company takes place, restructuring the company is often necessary to adjust the company to commercial principles. Restructuring is a process of effecting changes in the operational, financial, labour and administrative structure of the organisation. The main purpose is to prepare the company commercially for the discipline of the market and put it on a par with potential competitors.

In financial restructuring, functions the enterprise was performing and financing have to be divided into separate business units. This can facilitate the breaking down of big corporations that used to be diversified for other functions.

Hence functions of the enterprise which can be commercially viable are separated from purely social functions. Debts incurred whilst in public hands may have to be written off. This is to make valuation of the enterprise simpler especially if it is considered for sale.

As part of the restructuring, the company's infrastructure may need upgrading or expansion. This may in many cases have been the reason for restructuring. It is a worthwhile exercise if the government has intentions of selling it off, otherwise the buyer may prefer to do the changes. The UN (1995) emphasise the point that should

the government effect changes that are not in line with the potential investors' interests, this can result in big losses. Potential investors may be driven away, or the enterprise may be undervalued. Once the restructuring process is complete, privatisation may proceed.

Commercialisation and corporatisation are also considered before the decision to privatise is implemented. Commercialisation is the process of bringing commercial objectives into the management and operation of the enterprise. It requires the enterprise to do away with subsidies it used to receive from the government and henceforth operate within a tight budget. This phase can also involve setting of performance goals in terms of production or quality of products. Corporatisation also means exposing the company to commercial principles and goes further into transforming the enterprise into a legal corporation, governed by the country's corporate act. The section under consideration or the whole enterprise becomes independent of the government (although the government retains ownership). This is a way of placing public managers on a par with private sector managers, all striving for the maximisation of their shareholders wealth.

The various methods that can be followed are joint venture, direct sale, capitalisation, public shares, and management / employee buyout. Each of these methods will be looked at below.

- **Joint venture**

This is a form of working together between the government and a private partner (usually international) to share benefits and risks of running the enterprise. Here the government retains ownership. This is mostly preferred where the enterprise in question has to be upgraded and requires a lot of investment. A joint venture can be in the form of a contract. The advantage of choosing this method of privatisation is that both partners stand to benefit. The government will get the needed investment and special know-how in management. In addition, this can provide access to networks that can open the way to new technology and export markets. The partner, on the other hand, gets access to domestic markets. In countries where foreign ownership is not allowed, this can be the only way to enter the domestic market for an international partner.

- **Direct sale**

This means direct transfer of ownership from the public to the private sector through sale of the public enterprise. The sale may involve the whole or part of the enterprise and can be effected through sale to an already identified buyer or through competitive bidding. The first option has many disadvantages, which can lead to the dissatisfaction of the public rendering the whole process unacceptable. One of the reasons for this is the lack of transparency and competition. The UN (1995) suggests that this method should be carried out only when a limited number of potential buyers with enough financial and managerial resources are available. This, however also raises some questions as to the commitment and honesty of the individuals carrying out the exercise and whether they can be trusted to perform that duty without prejudice in the selection of the buyer. Criteria used may not be clear and easy to challenge.

Competitive bidding on the other hand introduces competition among bidders, offering the state a wider choice. The bidder who offers the highest price, while at the same time satisfying the other requirements and objectives of privatisation, can be selected, publicly and transparently.

The disadvantages with bidding are that it is time consuming and involves the high costs of administering the bidding process. Acceptability and trust that privatisation is done in the public interest becomes very important. That is because privatisation of one enterprise can set precedence (for being accepted or rejected) for others yet to follow. This consideration can therefore outweigh cost- saving considerations and will result in an unsatisfactory outcome.

- **Public shares**

This method is used to transfer ownership of the enterprise and also to raise capital. In addition to that there may be the goal of increasing share ownership by allocating a percentage of shares to small investors. Shares of the public enterprise are offered on the stock market. Transparency in this method is even greater than with a direct sale. With this type of transaction the company is required to disclose its financial information and is advertised. Certain groups of the population can be targeted to encourage wider participation by offering shares in small units to make them affordable to the targeted group.

- **Employee/management buy out**

This plan gives the management and employees of a public enterprise an opportunity to gain share ownership in the enterprises they work for. The advantage is a potential increase in productive efficiency. Since employees and management are allowed to buy shares, they feel they are part of the company and are motivated to find ways of reducing costs. Privatisation is in many situations rejected by employees who risk losing their jobs.

On that basis, buy-outs can help win the support of such reluctant parties. A serious factor, which is likely to cancel out this opportunity for employees, is a lack of sufficient resources. This, needs to be evaluated before-hand to avoid reselling of the company once employees fail to meet payment for the shares allocated to them.

2.6.2 Deregulation

Liberalisation and/or deregulation of the industry are the important elements that have been used to introduce competition in markets. The World Development Report (1994) asserts that entry into activities with no technological barriers promotes competition in the industry. The downstream oil industry exhibits such characteristics. The general nature, entry barriers and structure of the oil industry indicate that it is an industry that can be workably competitive.

Liberalisation and deregulation are so closely related that sometimes use of the two words can be confusing. In trying to clear up that confusion, liberalisation is defined as abolishing measures that prohibit entry into certain areas of the market, normally served by a monopoly firm (Waterson, 1988). Deregulation is the release from regulatory supervision of prices and entry into the industry. The regulatory controls can be on prices or measures such as restraining imports or exports of products. These definitions show that it is possible for a market to be liberalised without being deregulated.

2.6.3 Promotion of competition by allowing new entrants

This is largely concerned with liberalising the market where potential competitors were initially prohibited from participating. This still has to be followed by the elimination of other restraining regulations. Allowing new suppliers in a market can be misleading, though, as it does not necessarily ensure competition. The mere fact that a large number of firms are allowed to participate in the industry, does not imply a

competitive market. Of particular importance is the potential for other members being able to enter. Price or output, for example, can be determined by the government by limiting the actions of firms or profit margins, thus rendering the market non-competitive regardless of the number of firms. A good example in the petroleum industry is that of limiting imports of refined products. That way, local firms are shielded from international competition.

At the initial stages of freeing markets, benefits of competitive entry come largely from reaction of the firms already in the industry and less from new entrants themselves, because they do not cover a big share of the market right away. Waterson (1988) asserts that new firms gain sales from new customers and partly by attracting former customers of the old firms. The entrant will strive for further attraction of customers by improving its service and engaging in cost-reducing practices. This will give both old and new firms incentives to introduce new varieties. At this stage regulation that will prevent restraining actions from old firms driving out the new entrants may still be needed. This will allow new entrants to fully establish themselves in the industry (South Centre, 1996) in terms of experience, markets, information and all other characteristics surrounding the established companies. It is very important that a definite period, regarded to be long enough for adjustment, regarding protection of new entrants be agreed upon. Otherwise the whole process can end up being a change from supporting one group to another.

Initial protection of entrants is suggested because the incumbent firm has an advantage over the new entrant for reasons mentioned above. Considering an example of an integrated refiner a new-comer needs to enter the industry also by vertically integrating which is not always possible for some. Without that the integrated firm can withhold its supply to the new-comer, if the new entrant operates downstream and has to compete with the same supplier.

2.6.4 Foreign investment and trade liberalisation

Lack of funds to invest in expansion and upgrading of refineries and other petroleum sector infrastructure has been mentioned as one of the reasons for the decision to liberalise the petroleum sector. In an attempt to rescue host countries' situations, the industries were opened to domestic and international investors. International investments in developing countries is being sought to accelerate the upgrading with the hope of gaining from the expertise such investors bring along. As a result

petroleum sectors consist of multinational companies (MNCs) operating in various supply segments.

The same international companies have been accused of cheating host countries to the benefit of their home countries. Arguments that they give a false picture of growth in that they highly develop the small sub-sector in which they operate with little contribution to other sectors of the economy.

It has been alleged that they invest in highly capital-intensive technology and therefore contribute very little to employment creation. It is on these grounds that the South Centre (1996) warns that not all foreign investments are of benefit, as it is not necessarily the amount of investment which matters, but the form of it. Of importance is the kind of links with the rest of the economy that will result from the investment. In the petroleum sector, the MNCs often acquire oil supplies from their mother companies or affiliates. It has also been alleged that they use transfer prices and technology agreements and send all earnings back home. In that case, argues Roland (1998), it is the home country that benefits. This is viewed as exploitation of the countries they were expected to develop.

Developing countries are trying to attract the attention of the international companies to invest in the petroleum industry. The high debt and lack of expertise has forced a change of perception about the large oil companies, perhaps also in ways of dealing with them. The widespread use of licenses and joint ventures can be thought to be some of the strategies to guard against the old "abuse" by internationals. We now turn to look at different countries' experiences of liberalising the petroleum sector.

3. COUNTRY EXPERIENCES GENERALLY

3.1 Liberalisation as a general economic phenomenon

From after the second worldwar until the 1970's there was general growth and prosperity in most economies except the many developing countries in the Sub-Saharan region. Per capita incomes and growth levels of labour productivity were at their highest levels in history in almost all developed nations.

A disastrous change in the 1970's reversed many of the benefits that had been gained after the war. High unemployment together with high inflation rates emerged. Almost every country experienced a change in economic performance, with the extent and severity of the economic downturn differing according to individual countries' situations and characteristics. This was alarming and forced nations to review their economic policies in adjustment to the crippling situations they found themselves in (Roper, *et. al.*, 1987). These were changes affecting economies in large and specific sectors. The oil sector was not an exception to this.

The major oil crises of 1973-4 associated with the OPEC-manipulated rise in oil prices contributed significantly to the decline of economic growth. The trade balances of oil-importing countries deteriorated and seriously affected investors' confidence. Consequently governments had to devise policy reforms thought to be capable of withstanding such crises without detrimental effects to economic performance.

The changes happened at a time when governments in most countries were highly involved in industries. However, these events led to a review of such policies, with the growing belief that excessive government interference and regulation in markets were directly responsible for the deterioration in growth rates. Calls for minimum state intervention became a characteristic of political statements in the 1980's. The desirability of government involvement in commercial areas of the economy began to be questioned.

The perception that the growth of government has had harmful effects on the performance of industries grew, and many countries started planning and implementing ways of reducing public control. The process is not without difficulties

and obstacles. In the downstream petroleum sector most efforts were geared toward reducing the government's role in business by introducing competition through liberalisation and deregulation of petroleum markets. Changes have been proceeding at a very slow pace in developing countries compared with industrialised countries.

Some of the factors seemingly driving developing countries towards liberalisation, are the policies of international finance institutions, the World Bank and the International Monetary Fund (IMF). So the liberalisation policies adopted are often not of their own initiative. Continued deterioration in the performance of their oil sectors though, has also been one of the pressures.

Most developing countries are still contemplating or just beginning implementing reforms in petroleum industries. The economic performances of many developing countries have not been satisfactory. Because of this, one would expect these economies to be taking an initiating role in reforming their petroleum sectors as they are highly affected by the poor performance of their petroleum industries. The economic and political characteristics of these countries, however, seem to be holding them back.

Progress has been slow. Nevertheless a few developing economies are about to reach their advanced stages of liberalising their petroleum industries. These stages may be described as advanced in the sense that they have implemented their reform plans fully and are in a position to review the outcomes and fully determine whether their policies have been successful.

On the whole, the past two decades have brought profound changes to economies world-wide. The oil shocks and the resulting economic shocks reduced the perception of independence and striving for self-sufficiency in energy supply and promoted development of international trade. Developing countries are also slowly being forced to integrate themselves into this trend. Participation in international competition requires them to attract private capital to be able to upgrade and modernise to international standards.

3.2 Specific country experiences

In the petroleum industry these changes are impacting on the involvement of governments by way of ownership of oil companies and industry regulation. Both the levels and forms of intervention differ from country to country. In some countries, the

government is involved through the ownership and operation of the oil companies throughout the supply chain. From procurement of crude (in the case of oil importers) to storage, refining, distributing, through to wholesaling and retailing. In others, governments own and/or operate certain elements of the chain, and regulate most other activities in the industry. The main interest of this paper is in the downstream sub-sector. With the wave of liberalisation and deregulation, governments are trying different ways of freeing industries to establish competitive markets.

The different strategies pursued range from corporatisation and privatisation, to liberalisation and deregulation. The procedures followed differ according to whether before the reforms the government had a monopoly throughout the chain, or only in certain activities. There were different situations in different countries and so the nature of the reforms followed are expected to differ according to the country's situation. Also, in some countries there was a mixture of public and private participation accompanied by state regulations. Others had the government only playing a regulatory role over the enterprises.

Another aspect that is important in the analysis of the process of liberalisation is whether the process was a once off or a gradual step-by-step process with the underlying reasoning behind each step. Some countries experienced an overall reform from the structure (e.g. public monopoly) to the set of regulations governing the industry. In other countries where both public and private companies were functioning under strict oversight by the government, only the set of regulations had to be altered to be in line with the new liberalised order.

A deeper look at each of the strategies of a number of countries follows below. The situation that prevailed before the reforms will briefly be laid out. Having done that, various motivations behind liberalisation and deregulation of these markets will be analysed. This will help in drawing a picture of the effects each government had in the industry.

3.2.1 Bolivia

All oil produced in the country is consumed domestically and has been enough to cover the country's products supply. Bolivia has for the period 1985–1992 been self-sufficient in production of products as indicated by the absence of products' imports in Table 3.2.1. Small amounts of products were imported in 1992–1995.

Table 3.2.1 Supply of and demand for crude and products (m t)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Crude production	1.19	1.16	1.19	1.14	1.2	1.31	1.38	1.33	1.37	1.56	1.75
Net product exports	0.02	0.01	0.01	0.01	0.00	0.01	0.02	-0.05	-0.12	-0.10	-0.09
Product demand	0.99	1.01	1.05	1.04	1.09	1.13	1.16	1.16	1.21	1.28	1.34

Source: Prepared from IEA Energy Balances, 1997.

Status before liberalisation

In Bolivia, the government had a monopoly over all activities, and set prices and petroleum product supply. The state-company was responsible for the production of over 81% of liquid fuels consumed in the country and owned all the oil pipelines and the refining facilities. There were two main objectives in this; firstly to maximise revenues collected from the petroleum industry. The second aim was the social responsibility to ensure continued subsidies on liquid petroleum gas (LPG). Petroleum products were priced uniformly throughout the country. This caused a distortion of prices in terms of output/price ratios of gasoline to diesel and kerosene and LPG ratios.

The state-company, YPF, had limited incentives to improve its standards of services such that there was a need to improve service, and quality of products to customers. Bolivia is suitably situated for production and transportation of petroleum products to its surrounding neighbours (Pacheco, 1998). The failure of the state monopoly to expand and make the necessary investment to take advantage of the country's regional position is testimony to its poor performance.

Capitalisation

A somewhat unusual reform compared to that of the other countries examined in this paper was implemented in Bolivia. This is called capitalisation. It can be said to be another version of privatisation, not conducted in the common manner of transferring a public company to private hands just to earn revenue directly for the treasury. In Bolivia capitalisation involved doubling the capital investment in the company. The would-be proceeds did not go to the government. Rather, the private owner agrees to re invest within an agreed period of time into the company. The new investor then

took administrative control of the company. The rest of the shares were used to boost a pension plan for the Bolivian citizens, administered by a private sector pension fund.

The new method was focused on building the relevant sector's infrastructure and promoting social security by creating the pension scheme. This would increase the potential growth of the economy. This was applied in the upstream oil sector. Its unique nature sheds light on the different procedures followed in countries in addressing their problems. Some countries might decide to follow the same strategy but extend it to downstream.

Firstly, for the process to be initiated, relevant regulatory laws were passed. This preceded any capitalisation. A separate department was formed to oversee and drive the process, as there was no other suitable department within the state. A new department was necessary because the capitalisation program not only affected the oil sector but other sectors as well. Once all legal provisions were in place, implementation was started in 1995.

The process of capitalisation was undertaken in a series of steps involving consultations conducted in a transparent manner. The net current valuation of the company concerned was determined in accordance with internationally accepted auditing and accounting principles. In allocating the 50% share to the private owner, interested parties were allowed to bid. The best financial offer got the shares. It was after this process that the state shares were transferred to the fund.

The state monopoly was broken into three separate entities because of the relative importance accorded to the oil sector, and the strong sentiments of the desire to protect national and economic interests. For this reason, the refined products pipeline and wholesale marketing remained under state ownership.

The government of Bolivia was cautious about liberalisation of the downstream sub sector. There were fears that opening it can lead to substantial problems. These problems would concern especially the refineries, because of the small size of the market (Pacheco, 1998:104). However, an agreement was reached in 1999 to privatise the downstream sector. Consultations were held with the employees of YPF and it was understood that the process would result in about 1600 employees losing their jobs (Energy International Administration, 1999). The process still continues.

3.2.2 Argentina

Argentina has considerable reserves of oil, but for the period 1985–1995 has been importing crude oil. In the same period there were exports of products while small amounts were imported except in 1987-1988.

Table: 3.2.2 Supply of and demand for crude and products (m t)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Crude production	24.8	23.5	23.2	23.5	24.3	25.6	25.8	30	32.1	36	38.8
Net crude exports	-26.5	-29.7	-30.5	-31.2	-28.6	-27.5	-25	-23.4	-21.3	-17.5	-11.4
Net product exports	3.37	1.14	-1.07	-0.31	2.45	3.94	3.43	3.67	2.50	1.65	0.85
Product demand	20.39	21.37	23.02	21.89	20.46	18.98	20.06	20.71	22.12	21.66	21.49

Source: IEA, 1997.

Status before liberalisation

Before regulatory reforms in Argentina, Yacimientos Petroliferos Fiscales (YPF) was a state-owned monopoly company operating both upstream and downstream. To safeguard the country from international oil disruptions the government adopted policies aimed at self-sufficiency. A few private companies were allowed to supply crude and products on a quota basis when there were shortages in local production. Over-staffing was high and labour unions were strong. Labour unions interfered with the management of the company, to the extent that the company was used in many instances for political rather than commercial objectives. This led to operational inefficiencies (Vielvoye, 1991).

Privatisation and deregulation

In 1985 the government of Argentina tried to open the oil industry to private participation. The intention was to attract foreign funds while the control of partnerships would remain in the hands of YPF. This attempt failed. The plans to privatise YPF were revived and modified in 1989 when the new government took over.

The opening of the oil industry to competition was accomplished by reducing YPF's control of over the nation's oil. The main objectives were to allow companies to sell oil at world market prices while keeping domestic petroleum prices at levels very much

lower than internationally competitive market prices. The price per barrel of oil was approximately \$8 compared to the \$20 world market price (Hillman, 1995).

The strategy was aimed at developing an export-oriented domestic market. This was done by increasing consumption of heavier crude for local refining thus making available lighter, higher value oil for export. YPF's monopoly was removed, allowing other companies entry into the market. Supply quotas were also removed in order to promote competition. Privatisation followed after trying to upgrade YPF to international standards, leaving the new company (YPFBA). The state held a 50% share in YPBA.

The process of deregulation started in 1991 with the formulation of a program of action for deregulation. The program had three important elements:

The first one is related to the reform of the state itself. This has very important implications for the success of any development initiative. Changes limited to the petroleum sector cannot be fully effective while the rest of the economy is still bound to the old ways of doing business. The various sectors of the economy are interdependent. Therefore to be able to effect improvements or failures, the rest of the economic environment has to be supportive of individual sector policies.

The second step was the deregulation of the oil industry and the fostering of competition. Ensuring an environment conducive to competition, with the continued participation of YPF as a state company, was not an easy task. In fact the manager of YPF confessed that it was the biggest challenge they had to face (Aalund, 1995:47). All prospective participants in the industry, both local and international, needed to be ensured of a level playing field before they would consider investing in such a high-risk industry. The main issue that had to be dealt with first was fear that YPF could take advantage of its big share. This meant YPF had to operate on a commercial basis, guided by business principles.

Impacts of liberalisation

YPF's legal monopoly was removed after the privatisation and deregulation of the petroleum market in Argentina. Currently, YPF shares the market with private companies through joint ventures to produce, refine, transport and market products. Privatisation has led to the development of an economic environment receptive to new

foreign business. There is fierce competition in the industry from international and domestic companies.

Argentina's refining capacity is in the region of 635 000 barrels per day. Esso, YPF and Shell are the major refiners with 17%, 47.5% and 22% market share respectively. The other small refiners are Isaura with a 9.3% market share and the only one among these with a catalytic converter. Others are Refisan and Refinor (together with 4.2% market share) in which YPF still maintains a 30 % interest. (Aalund, 1995). YPF still remains the largest company, refining over 52% (taking also into consideration the fact that it holds interest in Refisan and Refinor). YPF also controls more than 54% of the retail distribution network.

On this note it can be argued that market power is not a completely undesirable characteristic. For, a large firm may have attained its position through its operational efficiency thus out-competing its rivals. In this case, as YPF is competing with other firms, efficiency is the key to retaining its share. The size of the company need not be an issue. In fact, market power may even be desirable if it or the need to attain it, realises the highly desirable aim of giving consumers better quality products at reasonable prices.

Since privatisation of YPF, Hillman (1995) notes that the petroleum industry has contributed significantly to reducing the inflation rate from 4.9% in 1989 to just over 15% in 1994. The loss of 22% of jobs in YPF has had great social impacts.

3.2.3 Brazil

Significant quantities of crude oil in Brazil are produced domestically. However crude imports during 1985–1995 constituted more than half the domestic production. The quantities of products exported were slowly decreasing until 1991, when products' imports grew significantly, outstripping the quantity of products exported. The oil supply/demand situation is shown in Table 3.2.3.

Table. 3.2.3 Supply of and demand for crude and product (m t)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Crude production	37.4	38.5	38.7	37.4	39.6	41.4	42.2	41.6	42.6	44.8	46.1
Net crude exports	-27	-29.8	-30.6	-31.4	-29.2	-28.4	-26.2	-26.4	-25.7	-28	-25.1
Net product exports	3.83	1.97	2.51	1.48	1.16	0.26	-1.57	-2.09	-7.76	-5.65	-8.11
Product demand	56.79	63.42	64.40	64.15	65.30	64.88	65.63	67.28	70.31	74.51	77.71

Source: IEA, 1997.

Status before liberalisation

Energy consumption was largely characterised by domestically produced oil. With the increased growth in demand for oil as a result of high industrialisation that was taking place, oil imports grew. The fear that this would limit the growth of the economy and exert pressure on the balance of payments became a serious concern. Means of reducing the dependence on energy imports (as coal was also mainly imported) had to be sought.

It was on this basis that the state monopoly oil company, Petrobras was formed in 1954 (de Oliveira, 1998). It was formed as a vertically integrated company, aimed at reducing market and political risks, and ensuring the efficient running of the oil industry at large. It had a monopoly almost throughout the supply chain, except at retailing where a number of private companies were operating. Only two small refineries were private.

Petrobras was regarded as one of the state oil companies that was functioning satisfactorily. The efficient and competent operation of this company can predominantly be attributed to large economies of scale. The company had ten refineries and owned all terminals and oil pipelines.

The international oil disruptions of 1973 and 1979 increased the pressure to reduce imports of oil as they had a large effect on Brazil's economy. The government therefore intensified its efforts to promote domestic production of energy substitutes for imported fuel. The main instruments in this campaign were the use of incentives and subsidies. This resulted in a decrease in the net imports of crude oil and petroleum products from 85% dependency in 1979 to about 48% in 1995 (<http://www.ibp.org.br>).

Despite this, Petrobras' profitability was slowly being reduced, until it became difficult to finance new projects, impacting on the company's performance.

Towards the end of the 1980's, a review of macro economic policies took place. It resulted in a steady removal of protection measures for domestic producers and removal of policies directed at substituting imports. The respective energy industry authorities reiterated the idea that private investors be accorded significant recognition in Brazilian markets (de Oliveira, 1998 and <http://www.ibp.org.br>). This meant the introduction of a series of reforms among which, was the privatisation of public companies including Petrobras. It also meant introducing competition wherever it was found feasible. The National Petroleum Agency, an independent body was charged with implementing these new energy policies (<http://www.gasandoil.com>). Hence Petrobras' monopoly ceased towards the end of 1997 when the petroleum law, deregulating the sector, was announced.

Regarding the use of terminals and pipelines that belonged to Petrobras, after deregulation, the new entrants were allowed fair access to those facilities, with Petrobras still keeping control. It has also retained ownership of refineries, but has to get the approval of the regulatory agency if considering expansion of the production capacity. Similarly, new investors have to apply for approval to construct new refineries.

Impacts of deregulation and privatisation

Brazil just started announcing the deregulation of its petroleum sector in 1997 and it is therefore too early to comment on its experience. Also, complete privatisation of Petrobras is not expected, as some still believe that the government must retain a large interest. As a result of this, according to the national survey conducted towards the end of 1999 (dos Santos, 2000), there is no consensus regarding further deregulation of the downstream industry. This is going to create problems for competition in the industry as private investors may doubt the fairness of the game if they are to compete with Petrobras.

3.2.4 Peru

Peru's petroleum supply and demand situation over the 1985 –1995 period is depicted in Table 3.2.4. Production of crude declined by about 3 million tons in 1995 from 1985.

This resulted in an increase of products imports over the years while the consumption of products has been relatively stable.

Table. 3.2.4 Supply of and demand for crude and products (m t)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Crude production	9.55	9	8.16	7.07	6.49	6.39	5.72	5.76	6.3	6.43	6.15
Net crude exports	1.26	0.65	-0.12	-0.94	-0.88	-0.72	-1.62	-1.52	-1.26	-1.08	-0.99
Net product exports	2.68	2.35	2	1.4	1.67	1.44	1.91	1.66	1.84	1.11	-0.31
Product consumption	5.56	6.01	6.56	6.5	5.9	5.87	5.63	5.54	5.77	6.39	6.88

Source: Compiled from IEA, 1997.

Status before liberalisation

The Peruvian oil industry had for decades been a state-controlled industry. Its general economic policies and the institutional framework were not conducive to private investment. Corruption and the high incidence of terrorism were acting as strong barriers to investment in the economy as a whole. Petroperu was an integrated state-owned company, responsible for the production of about 49% of the national crude output.

The company almost had a monopoly in the downstream industry. It operated six refineries with an overall capacity of 180 thousand barrels per day. Of these, Talara and La Pampilla were the two largest. The integration ensured that petroleum products were made available across the country at uniform prices. There were 83 service stations owned by the company and only 23 in private hands. With time the petroleum industry started showing signs of deterioration.

Petroperu was operating at sub-optimal levels and was unable to maintain and invest in necessary upgrades. This resulted in an increase in the import of crude and products. The company's personnel were convinced that the poor performance of the company could be reversed by a withdrawal of government from business affairs in this industry. They were committed to continue running the business and serving the industry continuously, without any disruptions in supply (Mayorga Alba, *et. al.*, 1997). With the situation further worsening towards end of the 1980's, various options to save the company had to be considered.

After 1990, change in the Peruvian economy was inevitable. The petroleum sector also planned policy reforms as part of the overall change that was taking place in the economy. A redefinition of the role of the government was called for. In this new thinking, the state was entrusted with the role of providing social services and letting the private sector play a greater role in productive and commercial activities. A competitive market was considered most suitable to achieve better outcomes.

Privatisation of Petroperu was the chosen option, but the first step was to restructure. The process involved correcting for price distortions so as to allow the company to regain financial viability. Of major concern was the path to be followed in deciding the new structure of Petroperu. Two ideas were the cause of bitter debate among relevant stakeholders. One was privatising Petroperu as an integrated company⁵, the other was privatising it as an unbundled company in which separate units would be privatised independently.

With the first option what was envisaged was that the likelihood of disrupting supply would be lower and that there would be no risk of failing to find buyers for certain units of business and assets. Advantages such as efficiency associated with an integrated company would be maintained. In addition, there was the understanding that the proceeds to be earned were expected to be higher than if the company was disintegrated.

There were, however, also disadvantages that would come with the choice of this option. These included the risk of failing to secure a buyer for the entire company. If a buyer were available there would be difficulties in introducing competition into the industry. This would entail transforming a public monopoly company to private monopoly. The company would still retain all of its market share. In that case also, the government would in a way still have to be involved as it would be felt that the private monopoly company would need to be regulated so as not to abuse its market power.

It is important to bear in mind that what prompted the change in the first place was the need to reduce government interference in the industry, promote competition in provision of services and encourage private sector involvement. The choice of this first option would not fulfil these basic objectives. A long time would have to pass before everything could be ready for complete privatisation.

The choice of an unbundled company on the other hand, meant that the company would be divided or broken down into separate business units and privatised separately. The industry would then later be deregulated. It was expected that this would increase the chances of having different players in the industry. Small investors who could not afford buying the entire unit would also be given an opportunity to participate. This way competition could be expected to increase. The disadvantage of remaining with some unattractive units unsold, however, was recognised.

The existence of these unsold units could lead to the use of unfavourable methods or terms of privatisation to get rid of such units. Also, co-ordination throughout the supply chain could not be guaranteed once units were broken into separate entities and disruptions could be expected. This demanded a well-calculated plan to try and minimise disruptions as far as possible.

Privatisation and deregulation

After careful consideration and heated debates, the latter option was taken. The ultimate goal after privatisation was full deregulation of industry prices. The process began during 1991/92. During this same time, the industry's institutional and regulatory framework were also under review. This was reaffirmed in 1993 with the passing of the new law that ended Petroperu's monopoly and allowed entrance of private investors to any activity of the supply chain. Closing the operations that were making financial losses was part of the process. Also, personnel had to be reduced from 10 000 to 6000 by 1994 (Mayorga Alba, *et. al.*, 1997).

Peru has a small market, which creates a natural monopoly in storage and transport facilities. That is, because of the small size of the market it is difficult to introduce competition for such a market, as it would mean duplication of services and a waste of resources. The best way therefore was to leave these activities as they were and to start privatising those in which competition could be workable.

Retail margins were deregulated. This made possible the privatisation of retail service stations, and ended the uniform pricing of gasoline across the country. The process began with the sale of 90% of Petroperu's retail stations. After 3 years of privatisation, price differences among service stations started being noticed, according to whether

⁵ Petroperu would be privatised retaining all the core activities and business units after restructuring.

the oil-company, franchisee or smaller independent retailers own the station. Restrictions to the number and locations of service stations were removed.

Deregulation removed previous price regulations and thus supply and demand forces set prices of petroleum products. As a transitional measure, prices were set by use of a formula, determining the opportunity cost that would be paid in international markets after making adjustments for transport, quality standards. The US Gulf of Mexico was used as reference.

As a further step towards deregulation, subsidy and taxation policy for kerosene and LPG were reviewed, resulting in the removal of subsidies for kerosene and bringing the excise taxes of the two products to the same levels thus also encouraging the use of LPG that was previously highly taxed.

Impacts of deregulation

The sector saw a build up of investments around US\$ 250M. Service improvement and infrastructure were associated with the entrance of new investors into the industry. There were 810 retail stations by 1996 of which about 500 were owned by the international companies operating in Peru. The gas business contributed by attracting private investment that was seen with the construction of larger LPG reception facilities. The number of gas filling stations has more than doubled.

Petroleum product taxes earn the government revenue of US\$ 1000 million per year. This represents a significant contribution to Peru's economy. The tax structure encourages the use of the more abundant and environmentally benign domestic energy, that contribute positively to sustainable development and growth of the economy. A notable attribute of the tax structure was its use as a tool for the redistribution of income and the improvement of economic growth.

The smooth transfer and absorption of most Petroperu staff was another important fact in the privatisation process. The company's management contributed very much to seeing the process through.

Problems encountered

The privatisation of refineries has been slow. It was a political move to give the government control over its electoral agenda. The main challenge was that of

privatising La Pampilla, one of the largest refineries. Up to 60% of its shares were released and put up for bids. This allowed participation and brought in competition by Repsol Spain, YPF Argentina, Mobil, El Banco Wiese and Fondo de Privatizacion Peru. There are still refineries and wholesale terminals to be privatised. This would allow full deregulation of the downstream sector.

3.2.5 Nicaragua

Nicaragua does not have oil resources and has to depend on imports for this source of energy. Before 1989, the Soviet Union and Eastern Europe were the major suppliers of oil, but with the political instability that was experienced, the supplies decreased significantly. Currently, (USAID, 1998) oil is imported from Venezuela and Mexico. About a third of petroleum products demand is satisfied by imports. The size of crude imports in 1995 and products consumption by sector is shown in Table 3.2.5.

Table 3.2.5 Crude imports and product consumption by sector, 1995 ('000 toe)

	Crude	Products
Imports	768	855
Exports	0	-11
Industry (%)	0	19
Transport (%)	0	65
Other sectors (%)	0	16

Source: Prepared from IEA, 1997.

There are three international oil companies operating in the country's downstream sub sector, and a state-owned company. The government has been involved in the industry through regulations and active participation.

Phased liberalisation

In 1995 a hydrocarbons decree relaxing the restrictions on prices of various petroleum products and import of hydrocarbons was passed. Consumer price caps on some products were set, otherwise allowing participants in the sector to determine margins among themselves (USAID, 1998). This form of regulation was intended to give firms an incentive to innovate, since any reductions in cost benefits the firm. It also promotes production efficiency. The pricing system was intended to be only transitional until the

industry has adjusted to the market system. Thereafter demand and supply would determine prices of petroleum products. The process is still in progress.

3.2.6 El Salvador

El Salvador does not have any proven reserves of oil, therefore all oil consumed in the country is imported. Petroleum constitutes 30% of the primary energy demand. Consumption by sector is shown in Table 3.2.6. This sub-sector consists of private international companies, Exxon, Shell and Texaco responsible for refining and distribution of products. The government regulated all the activities of the industry. The major aim was the attraction of private investment to develop the sector.

Table 3.2.6 Products consumption by sector, 1995 ('000 toe).

	Consumption (%)
Industry	26
Transport	64
Other	10

Source: Compiled from IEA, 1997

Phased liberalisation

With the wave of liberalisation and deregulation sweeping across countries, the government of El Salvador also decided slowly to open the petroleum industry to market forces. An import parity pricing formula was adopted. This was a step toward opening prices to market forces in 1994. Instead of rushing straight into deregulation, it was a way of allowing companies to prepare for the fierce competition they would find themselves in once deregulation was complete. It helped determine the price of imported oil by reflecting the international price after adjusting for quality and handling costs (USAID, 1998). It was regarded as fairly efficient as it was cost-reflective.

The changes to pricing systems reflective of costs of acquiring crude oil and/or the products appeared already to have the effect of increasing private investment, notes USAID (1998). New companies are encouraged to enter the market at different levels of the supply chain. The reforms are still in their infant stages or halfway through their implementation. As the industry is still in transition it would therefore be premature to come up with impacts.

3.2.7 Kenya

Petroleum products represent about 24% of primary energy needs of the Kenyan population (Okech, *et. al.*, 1999). Petroleum is a significant source of energy in all sectors, with the transport sector showing complete dependence on petroleum fuels. A breakdown of petroleum fuels usage by sector shows that, after transport, the commercial sector is the largest consumer, followed by manufacturing, agriculture and household respectively. This is shown in Table 3.2.7.

Table 3.2.7.

SECTOR	Petroleum as a (%) of sector energy use
Transport	100
Commercial	66
Manufacturing	38
Agriculture	19
Household	4

Source: Okech, *et. al.*, 1999

Status before liberalisation

The state-owned the national corporation of Kenya (NCOK) a crude importer not involved in refining and handling of refined products was established to ensure undisrupted supply of oil for all Kenyans. Reliable supply is a concern since Kenya does not have any proven reserves of its own.

Kenya imported all its crude needs and there were no restrictions on importation of crude except that, thirty-percent of all imports made by oil companies had to be purchased from the NCOK. Product imports were not allowed. Although the state did not have a monopoly in operating the industry, there was a host of regulations preventing competition.

Deregulation

The government removed price controls on petroleum in 1993 but was not convinced that full deregulation was the right move, despite the sector's sub-optimal performance. The sole refinery, for example, built in the 1960's and upgraded in the 1970's, was inefficient, leaving the country with a high diesel percentage to dispose of.

The state, according to List (1994), owned a 50% share of the refinery, with the international oil companies, Shell and BP, Esso, Caltex holding the rest.

Removal of price controls was seen as sufficient deregulation. Other regulations that were still remaining in the petroleum sector were:

- Enforced refining of all the country's white product needs in the single Kenya's refinery in Mombasa.
- Import of white product was forbidden
- Use of road transport of fuel on certain routes was prohibited by enforcing the use of state-owned oil pipelines between Mombasa and Nairobi and to other three larger towns on the Western part of the country (List, 1994). Pipelines were owned and run by the parastatal, Kenya Pipeline Company (KPC).

Impacts of deregulation

Regulatory framework

Liberalisation of the market was implemented without adequate regulatory measures in place. The abuse of consumer rights as a result of price leadership is one example of this. The government does not have intervention measures to protect consumers against such practices. The Restrictive Trade Practices; Monopoly and Prices Control Act, Chapter 504 of the Laws of Kenya are supposed to empower the government to deal with issues like these. They are, however, inadequate. The legal process needed to prove that a firm committed a restrictive offence and the light penalties awarded are not supportive of the Act (Okech, *et. al.*, 1999: 49). The Petroleum Act that is under review will hopefully encompass intervention measures where necessary to protect consumers.

Market structure

As before liberalisation there are seven companies operating in the downstream market. These are Shell/BP (24%), Caltex (22%), Total (15%), Agip (13%), Esso (13%), Kobil (9%) and Kenol (4%). The market structure is defined as an oligopoly.

There are a few firms, (Shell/BP, Caltex and Total) holding more than half of the entire market share, and the concentration ratio, used, the Herfindal Hirshman Index, points towards an oligopoly structure.

This market structure and the conditions resulting from its existence tend to create barriers to entry into the market. The established companies are found to deter potential entrants in that existing companies are not willing to share facilities with would-be-entrants. Also, the Kenya Petroleum Refinery Limited (KPRL) has an agreement with the oil companies to process their crude at a fee. The fact that KPRL also controls storage facilities for refined products means that a new operator cannot be guaranteed a fair deal by KPRL. There will be a conflict of interests. This situation favours existing companies who already have a reputation of working with KPRL.

Existing firms insist that potential entrants be required to refine some of their products domestically to contribute to the production of LPG for domestic consumption (Okech, *et. al.*, 1999). This shows the influence that these companies exert on the petroleum industry.

As regards the pricing of products, price leadership, has developed following deregulation. This is in accordance with the prevailing oligopoly structure, contrary to the competitive market operation that was intended. The structure of the market rather than collusive behaviour is responsible for this pricing behaviour (Okech, *et. al.* 1999). Product prices, as a result, are very high.

Taxes

The underlying objective of taxes is to generate revenue for the state, to promote equitable distribution and the conservation of energy. Taxes account for a relatively high proportion of product cost / price. This can be seen to be in line with the objective of raising revenue.

The taxes applicable include customs duty, excise duty, Value Added Tax (VAT), Petroleum Development Levy (PDL), and Road Maintenance Levy (RML). Taxes discriminate between different products.

Table 3.2.7.1 Product taxation

Product	Customs duty	Excise duty	VAT	PDL	RML
Jet Fuel	N/A	N/A	N/A	N/A	N/A
Petrol	A	A	N/A	A	A
Automotive diesel	A	A	N/A	A	A
Illuminating Paraffin	N/A	N/A	N/A	A	N/A
LPG	A	N/A	A	A	A

Source: Prepared from Okech, et. al., 1999.

*Abbreviations, A – Applicable; N/A – Not applicable

It should be noted that illuminating paraffin is only subject to PDL, representing 1% of the final price in the period 1990 - 1996. In the case of petrol, Okech, *et. al.*, (1999), highlight the fact that the tax component in the final price ranged between 30% and 50% in the same period.

Taxation of products is implemented in a manner that is not satisfactory. The discriminatory nature of taxes introduces price distortions in the market. Also, discriminatory tax policy seems to contradict government's objective of conservation for those products carrying relatively low taxes.

Product quality

Shortages of products became a common problem. There are also common instances of imported products that do not meet domestic consumer specifications (Mbendi, 1995). The quality of products and service to consumers thus deteriorated even further after deregulation.

3.2.8 Portugal

Portugal does not have energy resources other than hydroelectricity, biomass and some wind power. For other energy sources therefore, it has to depend on imports of about 90% of all its primary energy. Oil represents 70% of that and constitutes 80% of overall consumption (IEA, 1997). Table 3.2.8 shows the situation of the energy economy of Portugal.

The energy industry in general has until recently been under strict regulation by the government. The oil sector has thus been functioning under various laws affecting the industry from refining to the formulation of retail prices.

Table. 3.2.8 Breakdown of energy primary demand by type and crude imports ('000 tep)

	1980	1985	1990	1995
Primary energy demand	10020	11420	16410	19165
Coal	422	759	2760	3604
Oil	8009	8564	11730	13649
Electricity	851	1126	804	811
Other	738	971	1115	1102
Oil imports	9346	8656	12507	14351

Source: DGE in WEC (1998)

The government and the refiners came to an agreement regarding the installation and operation of refineries. The major oil products, namely gasoline, diesel, kerosene and fuel oil, were distributed under a quota system. This mechanism guaranteed the refining sub-sector a good operation in the local market. The number of companies functional in product distribution had been constant at seven companies between 1939/40 (when the refining business started) and 1985 (Nunez, 1998).

In addition, an administrative price-fixing system was used in which most product prices included a supply differential in the form of compensation by the state. Liquid petroleum gas, aviation fuel and products that were intended for international fishing were exempt from this pricing policy.

Although efforts aimed at increasing domestic production of other energy sources were made, the consumption of oil has not shown any decline, as indicated by the continued increase of imports. The discovery of natural gas expected to supply around 10% of the primary demand, is the result of efforts to diversify energy use.

The central government forces private companies who have the right to import to finance reserves of petroleum products. The main products, which the government insists have to be permanently in stock, are automotive gasoline, kerosene, jet fuel, aviation jet kerosene, diesel, and fuel oils. The minimum reserves of these products vary, with those for aviation jet kerosene and fuel oil at 90 days import. For fuel oil,

compulsory financing of reserves applies to those importers whose major business is electricity production. As for the rest of the products, the requirement is 120 days reserves.

Privatisation and Deregulation

The need to conform to the European Community directive is seen to have been the driving force towards liberalisation. The process was carried out in a phased manner to allow smooth adjustment to the changes.

The first step was implemented in 1991 with the removal of the quota system at distribution, allowing the market share of each company to be determined by its competitive ability.

The pricing policy originally designed to protect the domestic refining industry was abolished, together with the Tax on Oil Products charged on products according to place of origin. The tax was instituted specifically to discourage participants from resorting to foreign markets for their supplies. Regulation of the pricing of premium leaded gasoline, diesel and fuel oil with sulphur content above 1%, however, remained.

Alongside liberalisation of the oil market, the government proceeded with the privatisation of the state refinery Petrogal, which was the only refinery. At first, it was exposed to commercial principles where it faced competition in the form of imported products. In 1992, 25% of the share capital was sold, and the state interest was further reduced by 20% in 1995, leaving it with a 55% holding.

The IEA (1997) notes that the further deregulation that took place in 1997 ended the remaining price ceiling on heavy fuel oil. The difference between the price of leaded and unleaded gasoline was still maintained to encourage the fast penetration of unleaded gasoline into the market.

Problems encountered

The question of reserves financed by private companies remains an issue that has to be resolved. It causes a competitive disadvantage for Portuguese companies over their European counterparts (Nunez, 1998) who are not faced with such a requirement.

3.2.9 Italy

Italy is highly dependent on imports for its primary energy demand, and oil accounts for 59% of that (IEA, 1997). The country's oil situation is shown in table below. There is a high level of importation, both of crude and products, and there are no exports of crude. Energy security becomes an important consideration for the government.

Table. 3.2.9 Crude and products supply and demand (m t)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Crude production	2.41	2.56	3.94	4.84	4.6	4.67	4.33	4.5	4.64	4.9	5.24
Crude imports	63.55	71.88	67.44	65.11	68.54	74.73	73.06	77.99	77.21	75.23	73.52
Product imports	19.89	17.14	24.82	22.12	24.58	23.61	21.42	23.36	23.95	23.03	24.95
Product exports	12.10	16.80	14.37	15.17	14.39	16.97	18.57	21.21	22.60	19.50	16.91

Source: Prepared from IEA Energy Balances, 1997.

Diversification was identified as the possible means to ensure energy security, by reducing the heavy reliance on imported oil. The import of oil impacts significantly on the operation of the whole economy, particularly because, as the IEA (1997) indicates, over half of electricity generation is through oil-fired plants. This makes the country highly vulnerable to supply disruptions that can result in the social and economic status of the economy being undermined.

Status before liberalisation

Historically the oil industry had been regulated. The government had control over the pricing of products. To open a service station a special grant from local authorities was required. Opening and closing hours for business were based on a pre-determined timetable government, with fewer hours of business over the weekends being granted. On Saturdays, only half the number of stations were allowed to operate, with the number reduced to a quarter on Sundays (Grassini, 1998).

ENI had monopoly control of storage facilities. Of the total service stations, oil companies owned about 62% and, the rest belonged to small independent owners. Of those owned by independents, 80% were leased to oil companies. Self-service was only applicable to less than 10% of the stations.

The government, however, announced its intentions to liberalise the industry in 1996. ENI started privatising in accordance with the plan of government to liberalise the industry (IEA, 1997).

Problems encountered

In areas where regulation has caused cross-subsidies, deregulation is not welcomed by the general public since it is understood that those subsidies will have to be removed. Tax constitutes about 80% of the price of petrol in Italy. The fear is that, should the subsidies be removed, the customers who were subsidised will remain without the services as few can afford the market prices. No supplier will be willing to supply an area that does not allow recovery of the costs. In essence, this means that many service stations in those areas would have to close down in order to increase throughput. This would further complicate the case of poor communities.

A reduction of service stations means that rural consumers have to travel long distances to obtain service. Proponents of continued regulation contend that this is socially unacceptable. It is understood that liberalisation will result in higher prices for these customers as there are few big consumers and high distribution costs.

On this issue, Grassini (1998) warns that, in some instances, cross-subsidies may be politically unavoidable, even after deregulation or liberalisation. Of importance in such cases is the transparency in the manner in which subsidies are funded and administered.

Fear of job losses is an additional reason for rejecting liberalisation in the Italian industry. The public is convinced that liberalisation will benefit the oil companies at the expense of the public, through job losses. The process has not proceeded because of these problems.

3.2.10 Hungary

Hungary has for a long time had a command economy; that is, one in which decisions to produce, how much to invest and ownership control of most industries was in government hands. In the energy sector, the economy is largely dependent on imports for oil, with all imported crude coming from Russia (Brendow, *et. al.*, 1998). Small quantities of crude are produced domestically. Production and consumption volumes over the 1985–1995 period are shown in Table 3.2.10. Crude imports far exceed the

domestic production volumes, indicating the dependence on imported oil. Small quantities of products are imported.

Table 3.2.10 Crude production and product trade, 1985 – 1995

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Crude production	2.52	2.48	2.42	2.38	2.38	2.3	2.21	2.15	2.04	1.96	2.06
Crude imports	6.43	6.78	6.47	6.92	6.32	6.42	5.28	5.7	6.03	5.52	5.87
Net product imports	0.70	0.17	0.17	-0.71	-0.17	0.13	-0.50	-0.05	0.08	0.06	-0.39

Source: Energy Balances of Non-OECD countries, 1997.

The fact that a significant amount of the oil consumed in the country has to be imported was seen to increase the vulnerability of the country to supply shocks and disruptions. Hence high government involvement, to ensure security of supply to all its citizens, was advocated.

Increased supply security, with less negative impacts on the budget are quoted as the main objectives of the Hungarian petroleum industry, according to the Brendow, *et. al.*, (1998). This was based on the belief that liberalisation would attract private capital investments, thus relieving the budget of the need to finance imported energy. It was also identified as one of the most effective ways that could promote supply diversification to reduce import reliance on oil.

Status before liberalisation

Negotiations regarding importation and prices of crude and products were the responsibility of the state-owned company, Mineralimpex. Up until 1991, the fully integrated oil company, Hungarian Oil and Gas (OKGT), was the sole supplier of petroleum products. OKGT had a monopoly in production, storage, refining, but not retailing. Its subsidiary company, AFOR, was the operator at the oil product wholesale and retail levels.

Commercialisation

The liberalisation process involved commercialisation of the institutions operative in the industry and the development of a legal framework within which liberalisation could run effectively.

In 1991, the OKGT was commercialised and changed into a joint stock company called MOL. The internal structure changed significantly and MOL was exposed to competitive means of doing business. In 1995 Mineralimpex became a fully owned subsidiary of MOL. Under the new setting, the state still controls the emergency stock reserves. Emergency reserves of over 115 days of oil imports are held. This figure also includes the operational and emergency stocks held by oil companies of about 25 days of imports. The difference is made up by MOL reserves.

All imported oil still comes from Russia, Brendow, *et. al.* (1998) note, despite the opening up of the pipeline between the sea terminal on Adria and the major refinery in Hungary that was closed during the war in the region from 1991. The pipeline business for oil is a monopoly of MOL.

Just at the beginning of the liberalisation process, threats of oil shortages increased and the government decided to sell well over one hundred filling stations to multinational oil companies. The stations sold off were the ones performing well in terms of profitability and turnover, asserts Brendow, *et. al.* (1998). This reduced the market share of MOL from 80% to 30%.

Oil prices were liberalised in 1991. Mineralimpex no longer had a monopoly over imports of crude and products. The competitive pressure created by imports from refineries in neighbouring countries is thought to be enough to guard against the potential abuse of the dominant position by MOL. However, importers are forced to contribute to the emergency reserves of up to 90 days demand.

There are no serious problems encountered in the process that are known.

Impacts

That the process has been smooth can be attributed to the extensive consultation by the government with all the stakeholders in the industry. Before the implementation, the public was fully aware of what was happening and had welcomed the proposed changes. Privatisation was chosen to facilitate liberalisation because it was regarded as an immediate way of separating the usually contradictory functions of investment, operation and regulation by the government among the relevant players. Over 300 small private enterprises were established following liberalisation of the industry.

3.2.11 Thailand

This country does not produce enough crude to satisfy domestic demand. This demand has to be satisfied by imports. In the last decade, the country had strong economic growth that increased living standards leading to an increase in overall energy consumption.

The transport sector has been the major contributor to the increased growth of energy consumption. It represents the biggest proportion of total final energy demand at 54%. The sector utilises 60% of oil products mainly through the use of gasoline and diesel. The levels of production and consumption are indicated in table 3.2.11.

In the light of its dependence on imported oil, the government promoted diversification of energy use through development of natural gas and coal to substitute for oil. Also significant was the encouragement of energy efficiency in energy production and use.

Table 3.2.11 Oil production and demand (m t)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Crude production	2.17	2.22	2.07	2.38	2.4	2.83	3.27	3.66	3.49	3.54	3.48
Crude imports	6.75	7.18	7.87	7.51	10.61	10.88	11.01	13.83	16.12	18.64	22.88
Net product imports	2.32	2.06	3.15	4.27	5.14	7.67	7.90	7.86	8.52	8.18	8.75
Product demand	10.61	11.23	12.18	13.91	16.49	20.25	21.18	23.39	26.38	28.96	32.87

Source: Prepared from IEA Energy Balances, 1997.

Status before deregulation

The downstream oil sub-sector was dominated by an integrated state-owned company, the Petroleum Authority of Thailand (PTT). Entry into the industry was by way of licences issued by the government. This allowed control of the number of entrants into the industry.

PTT was considered an efficient state-owned company that ensured undisrupted product supply in the country. However, there were no service stations in rural areas. Consumers relied on informal suppliers who sold their petrol at more than double the price paid at the pumps (NEPO, 1995). PTT had a market share of 30% in distribution and marketing of oil. PTT shared the retail market with Shell, Esso and Caltex.

Imports of oil were regulated through a quota system to protect domestic refiners from international competition. The companies' margins were regulated and were generally kept constant. Retail prices of petroleum products were also regulated and linked to Singapore prices until 1991.

Deregulation

The government embarked on a program of deregulation of the sector in 1991. The objectives of deregulation were to increase competition in the sector and to relieve the government of the duty of determining prices. The first phase of deregulation was effected in May 1991. Import control was removed. Issuing of operating permits was reviewed, with the purpose of encouraging new entrants into the oil business.

Import parity pricing was maintained. Margins were flexible and the oil companies were expected to change wholesale prices in accordance with changes in margins. Service station operators reported monthly price changes at the pump to the government.

The second phase of deregulation was put in place on 19 August 1991, liberalising prices (NEPO, 1995). Regulation of imports is maintained. An import levy is required to ensure the survival of domestic refineries. The refineries pay the government 2% of gross revenue in return for the protection afforded. For PTT the "protection fee" is 35% of gross revenues.

Impacts

Following deregulation there has been a significant increase in the number of participants and the number of service stations. Growth in the number of service stations in rural areas is largely by new small operators rather than by the big oil companies. The overall quality of service has improved.

Further changes are expected in the sector as the government speeds up the privatisation of its enterprises following the East Asian financial crisis of 1998. There was an understanding that sectors that are not controlled could cope with crises. This means that the different business units of PTT will be sold to private owners, injecting a new wave of competition and causing an increase in the number of participants in the industry (NEPO, 29/03/1999).

3.2.12 Philippines

Status before deregulation

The Philippines has limited production of crude oil, which meets around 10% of the country's total primary energy supply. The Philippines is dependent on imports for a large part of the oil demand. The country's situation is depicted in table 3.2.12.

Table. 3.2.12 Crude and product production and demand ('000 bpd)

	1985	1986	1987	1988	1989	1990	1991	1992	1993	1994	1995
Crude production	8	7	5.4	6	5.2	4.8	3.2	8	10	6	3.8
Crude imports	133.4	137.8	167	194	194.4	219.8	210.4	244.2	257	266.4	358.8
Net product imports	9.5	8.1	21.3	13.3	22.7	12.2	22.2	31.6	33.0	36.1	37.7
Product demand	165.9	174.8	182.6	193.2	221.9	224.4	226.4	259.8	271.0	279.1	334.5

Source: Prepared from IEA Energy Balances of Non-OECD Countries, 1997.

The history of government control over the downstream petroleum industry in the Philippines dates as far back as the first international oil crisis in 1973. The aim was to ensure the continued supply of products throughout the country. Government involvement was through the regulation of prices and oil companies' margins. The imports and/or exports of products were controlled. In recent years, however, the industry's profitability deteriorated. Investment in the industry infrastructure's dropped.

Before deregulation, the downstream industry was characterised by an oligopoly structure, in which few firms controlled the supply of products and services to the market. The oil companies operating in the industry were Caltex, Petron, and Shell. Each company's current refinery capacity in bpd, and the date of commissioning were as follows: 260 000 (1954), 155 000 (1961) and 3000 bpd respectively (Oil and Gas, 1994).

By 1994, in line with the overall regulatory reforms of the economy, discussions about deregulating the petroleum industry began. The government planned a two - year transition period. This was meant to give an opportunity to adjust to the new business principles and to allow new players a level playing field with the existing participants.

Deregulation

In March 1996, the downstream Oil Industry Deregulation Act of 1996 was put in place. The main aims of deregulation were to encourage competition and private investment in the industry. This was expected to ensure the supply of quality products and services at fair prices.

The other objective was to attract private investment both from local and international companies (Tiffany, 1996). This would contribute to alleviating the poor infrastructure that was slowly deteriorating. During the same year, however, the deregulation act was nullified by the high court, on the grounds that it lacked in enforcement of competition, and also, that it was unconstitutional (Oilgram News, 1998).

After lengthy deliberations, the new deregulation law was passed in 1998. With the new law, a transitional period of five months was established before full deregulation was allowed. It gave the president powers to shorten the length of the transition, in consultation with the industry participants.

The new law specifically includes guidelines to prevent the formation of cartels and predatory pricing in the industry. It also requires the companies involved in refining to be listed on a stock exchange three years after operation for new refiners, and three years after the law takes effect for existing refiners (Oilgram News, 11/02/99).

In addition, tax incentives for new entrants into the industry include five - year tax holiday and reduced tariff of 3% on imported capital equipment. The incentives are not available to existing players even if for expansion or improvement of infrastructure.

During the transitional period, exports and imports of oil, refining, marketing and distribution were deregulated. Pricing was done through a formula related to Singapore posted prices. In support of the new pricing mechanism, an Oil Price Stabilisation Fund of about \$ 7.5 million was set up to absorb price swings during the transitional period. Premium gasoline was not included in the cover. The oil company margins were still regulated by the government.

Three months following the implementation of the transitional period, full deregulation was announced, and this allowed prices to be set by market forces. It also meant the removal of the Oil Price Stabilisation Fund that was already creating

problems for the government. It had become too cumbersome to administer, and the shortage of funds required the government to come to the rescue.

Impacts of deregulation

It is now (October 1999) about 18 months since full deregulation of the industry. There are already mixed opinions about the appropriate timing of deregulation. There are lobbies for the reversal of the decision, claiming that the short transitional period was meaningless. It is claimed that the law did not give new entrants enough time to establish themselves in the industry. As a result there are no signs of the cartel being dismantled (Cruz, 1999). This comes after two price increases, following deregulation. The continued existence of the cartel is thought to be the major reason behind the price increases.

The new entrants on the other hand are opposed to the reversal of the law, and are urging the critics to be patient and give deregulation enough time to work. Among members of this group, it is understood that it is still too early to expect the full realisation of the benefits of deregulation (Philippines Business, 19/05/1999). They are, therefore, calling upon the government to be firm in its decision, and to give consideration to the fact that stability and precision of policies are strong determinants of the attractiveness of the sector to private investors. They warn that if the law is scrapped, that will be for the second time, and that is bound to wipe out investors' confidence. Among the new entrants are Coastal Petroleum Philippines, total Petroleum Philippines Inc., Thailand Petroleum Authority, Flying V, Eastern Petroleum, Liquigaz, Pryce Gases, Total LPG, Unioil, and Seoil (Philippine Daily Inquirer, June/26/1999)

4. AUSTRALIA CASE STUDY

Production of oil for export started in 1983, with a volume approximating 160 000 barrels per day. Since most of Australia's crude is of the light sweet quality, it has a very low sulphur content and is, therefore, highly suitable for the production of light fuels, especially for transport, like petrol, kerosene and diesel. This characteristic causes this type of crude to be highly priced because of high demand (Petroleum Topics, 1994).

In 1991, domestic production had been sufficient to cover demand. Consumption has been growing faster than production, resulting in increase in imports. Although domestic production accounted for most of the oil refined in the country, the scenario has been changing with the increased growth of demand for petroleum products. Presently Australia has become both a producer and importer of crude oil.

The Australian Institute of Petroleum (1997) recorded a growth of 26% in demand during the period 1985 -1995. Demand for petrol over the same period grew by 13%, and that for automotive diesel by 39%. A large portion of the total consumption is concentrated in New South Wales, Victoria and Queensland.

The major products are petrol, automotive diesel fuel and aviation fuel, each constituting 46%, 27% and 11% respectively. Over 80% of the demand for petroleum products is from the transport sector. Table 2 gives an indication of product demand, as indicated by the local refineries' configurations.

Table 2. Refinery output; import and exports, 1992 – 1993

Product	Ref. Output (ML)	%	Imports (ML)	Exports (ML)
LPG	960	2.5	115	1480
Petrol	17708	46.0	387	678
Aviation gasoline	176	0.5	0	0
AVTUR	4164	11.0	0	390
Kerosene	93	0.2	0	0
Heating oil	212	0.4	0	0
Diesel	10471	27.0	671	585
Industrial & marine diesel	89	0.2	0	0
Fuel oil	2484	6.3	1053	0
Lubricating oil	682	2.0	0	0
Bitumen	626	1.5	0	0
Other	959	2.4	1413	1005
TOTAL		100		

Source: ABARE Quarterly Statistics, in Industry Commission (1994)

With refined petroleum products, Australia is relatively self sufficient, and imports only account for 8% of demand. This, however, has increased compared to the percentage of imports throughout 1970 – 1980.

The downstream oil industry consists of integrated refining and marketing companies, and independents with no direct links with major oil companies. Independents are involved in different activities ranging from importing, distributing, and independent retailing. There are nine refineries with an overall capacity of 804 000 bpd. The four oil companies, Ampol, BP, Mobil and Shell operate eight of these. The refineries are each situated close to a port facility, near large demand centres. Refinery capacities are shown below.

Table 3 Refinery capacity and dates of operation

COMPANY	REFINING CAPACITY ('000b/sd)	OPERATION DATE
Ampol refinery LTD	100	1965
Ampol ref. (NSW) LTD	115	1956
BP ref. (Kwinana) PTY LTD	138.5	1955
BP ref. (Bulwer Island) (PTY) LTD	73	1965
Mobil ref. (Australia) PTY LTD	108	1949
Mobil ref. (Australia) PTY LTD	72	1963
Shell ref. (Australia) PTY LTD	110	1954
Shell ref. (Australia) PTY LTD	86	1928
Inland oil refinery (Queensland) PTY LTD	1.5	

Source: Australian Institute of Petroleum (1996) in ACIL (1997)

Australia is a big country with a dispersed population that accounts for the geographic positioning of refineries, in order to utilise economies of scale associated with refining. Because of the geographic location of refineries, there are exchange agreements between companies to supply parts of the country where a company does not have a refinery. Exchanges are made on the basis of exchange for equal volume of products in order to reduce costs of transporting products to distant markets.

Refining is highly capital-intensive and maximum throughput can help reduce unit costs. It should be noted that refineries cannot operate at full (100%) capacity because of, among other things, routine maintenance. However, the highest achievable utilisation capacity is being sought. Thus in 1995 over 90% of utilisation was achieved (ACIL, 1997) following the closure of BP and Caltex refineries to improve operational efficiency. This reduced overall capacity from 830 000 bpd in 1983 to current levels.

The major oil companies control most of the product bulk storage and distribution facilities. This ensures the efficient distribution of petroleum products throughout the country. The oil companies operate 87% of the storage infrastructure, and the distributors operate the rest. Crude oil and refined products are moved around the coast and to overseas markets using tankers of different sizes for large volume movements as a means of reducing transport costs. Deliveries to customers are mainly through the use of rail trucks and road tankers.

Products are either distributed directly by marketers or independent distributors. Direct supply by refiners accounts for around 55% of total deliveries and distributors account for 45%. Approximately 65% of distributors are in a way associated with refiners through joint equity or lease agreements. They distribute branded products in their own tankers. Vertical integration is thus allowed through this arrangement, since refiners are also represented in the subsequent stages of production. The other 35% of distributors are independent of refiner/marketers and make their own opportunistic supply arrangements.

Independent marketers include a wide range of participants ranging from chain stores to individual actors. This group sources its own fuel from either domestic refiners or imports depending on what it regards to be advantageous. Previously, when competition from independent actors was minimal, they had to negotiate with the refining companies. Currently, independents often operate in competition with the oil companies. They use their own distribution facilities to supply their retail sites and do not sell fuel on credit. This group is believed to have low overheads because they contract most of the activities (Industry Commission, 1994). They have an opportunity to distribute with or without the brand of the supplier depending, on the agreement.

Service stations during the 1950s sold more than one brand. When demand for petroleum products grew, it became apparent that this form of trading could not be maintained. This came as a result of the increase in demand that made it easier to achieve economies in distribution by carrying only one brand. It allowed bigger storage tanks to be used cutting down on number of times retail sites could be supplied. This was called "solus trading".

Solus trading resulted in a growth in the number of retail sites. The reason for this was that the two major oil companies, Shell and Mobil, controlled most of the existing retail sites through leasing. To introduce competition, other interested parties had to build new stations. If Shell/ Mobil were to give up some of the stations, it was expected that they would release the old, low-profit ones. Thus new entrants found it more attractive to build new sites than to take over the existing ones.

Competition was on the basis of service and trading hours. With time, competition became so fierce because of the large number of service stations and high prices caused by the world oil price shock of 1973-74. The strategy changed from a service-oriented

to price-oriented one. This forced a reduction in further growth of retail stations. In fact, a number of some existing ones had to be closed. Since that period, Industry Commission (1994) notes that by 1993 the number has fallen by half.

At retail level, a number of arrangements with refiners are in place. ACIL (1997) notes that, the refiners have contributed largely in terms of investing in efficient retail infrastructure country-wide. This may account for the continued existence of refiner-marketers even at this level. The relationships among retailers and marketers can be classified into four categories:

Company / agent operated sites. The company, that is refiner or marketer, owns the site and the operator receives a fixed commission on sales from the marketer. The retailer cannot change the supplier before the end of the lease term. The fact that the company owns the capital assets and land is a binding element on the side of the retailer. The refiner-marketers do not realise the full benefits of vertical integration, as the marketer does not set the final price. In other cases the operator is an employee of the company who is expected to run the business on commercial principles, responsible for day-to-day operations. Retail sites operated in this manner represent 4% of the total outlets.

Franchised sites. The franchisee operates the outlet owned by a marketer. The site itself, installation of buildings, tanks and other equipment are the responsibility of the marketer. The operator leases from the marketer and operates according to franchise standards. All fuel sold is supplied by the marketer with the franchisee setting the price. 32% of retail outlets are operated under this agreement.

Dealer owned/ operated sites. The dealer acquires the land and makes the necessary capital investments. The dealer then enters into contractual agreement with the marketer to carry the symbols and sell its products exclusively. If the dealer owns more than one site, those sites can be contracted to different companies. This provides the marketers with the opportunity to conduct business in areas they would otherwise not be permitted to operate in without regulation. These comprise 33% of outlets.

Independent outlets. In this category, a number of operators agree to buy products together and show a common brand throughout the chain. In other cases distributors operate displaying own brand names. Within this group are those who are supplied by independent distributors or distributors linked to a refiner. The distributor may either

own the site, or the site belongs to a dealer or independent. This accounts for 22% of outlets (ACIL, 1997).

Independent-unbranded sites. These are independently owned and operated by retailers. They are not linked to wholesalers, and obtain supplies from refineries or independent wholesalers. This group accounts for 9% of retail sites.

It is noted that even in retailing there are economies of scale in which costs are reduced with throughput. This comes as a result of the spread of capital costs over larger sales volumes and scale economies in operation. Retail sites in which there are high volumes of sales are commercially viable at lower retail margins than sites with low volumes. On average, ACIL (1997) note, that metropolitan sites sell around 200 000 litres per month and the average throughput for sites in the rural areas is lower than this.

The retail activity has attracted the entry of supermarkets, and this is expected to significantly increase the number of retail sites operated under the independent arrangements.

4.1 Regulation of the industry

The regulation of the industry has a long history in Australia. Regulations were developed in order to encourage the domestic industry, and to protect it from the pressure of world markets. Since the beginning of regulation, all crude oil produced domestically was marketed under the crude allocation scheme. The scheme was a voluntary agreement between producers and refiners, seen by the Commonwealth government (Hoffman, 1989). It assured producers a market for their product by providing a mechanism that ensured equal allocation of domestic crude oil to the refiners.

The situation changed slightly in 1985, following a technical surplus of crude oil that was understood would last for a few years. Also, the realisation that production was bound to decline contributed to the changed situation. Together these led to a replacement of the crude allocation scheme by a partial allocation system that it was hoped would be a transitional method to a deregulated market.

The partial allocation system was characterised by the sale of crude oil from small fields at the import parity price of light crude oil imported from Saudi Arabia. That is, the price charged for domestic crude was equivalent to the price that would be paid if

that crude had to be imported from Saudi Arabia, taking account of the import charges. Secondly, between 1985 – 1987 the refiners were allocated 350 000 b/d of Bass-strait crude oil. Any production in excess of this was exported or sold to refiners who had already purchased their share (designed to uplift the local industry). During the same period world oil prices were volatile, and that led to the Import Parity Price being reviewed every two months to adjust for any price changes of A\$ 1 or more.

Of the eight Australian states, six have legislation with respect to regulation of petroleum products' prices. These are:

- Price Regulation Act (1948) in New South Wales. This could be used only in emergency situations to prevent prices rising to very high levels during supply shortages.
- Fuels Price Regulation Act (1981) in Victoria
- Prices Act (1975), South Australia

The above two involved the monitoring of retail petrol prices, and the setting of maximum retail prices for petrol, were removed in 1993

- Petroleum Products Pricing Act (1983), West Australia
- Fair Trading (Fuel Prices) Act (1993), Australian Capital Territory. Since this regulation was passed, it has not been applied.
- Price Regulation Act (1949) Northern Territory (Industry Commission, 1994)

In addition to these state regulations there is a Prices Surveillance Authority (PSA) that started functioning in 1994. It regulates prices by surveillance, which, the Industry Commission (1994) stresses, is different from monitoring. Surveillance is meant to prevent excessive prices before they arise, while monitoring involves finding out whether prices continue persistently to be above the expected levels that would prevail in a competitive market. It was put in place, firstly, in order to address concerns about the effectiveness of competition in the industry. Secondly, it is a way of guarding against duplication of regulation by state, commonwealth and Territory governments. The strategic importance of petroleum products and the sensitivity of the public to its prices were other reasons.

4.1.1 Wholesale pricing

The PSA sets a common capital city maximum wholesale price for petrol and diesel. The price is determined by summing up the import parity price of Singapore, petroleum products, local component and federal excise. Products under PSA are petrol, diesel, AVTUR and LPG. Surveillance on aviation fuel stopped in 1990, and on LPG changed to price monitoring in 1991. The regulated price applies to petrol and diesel sold by the major oil companies, with the exception of fuel sold on fuel cards and by advertised tender. These companies have to submit their prices to the PSA for approval.

Such prices are approved on condition that they are below or at the prevailing maximum wholesale price. The relevant parties, therefore, are not forced but comply with surveillance procedures by persuasion. It is the sales by the oil majors to distributors that are under regulation. Sales by the distributors are not covered, regardless of whether they have an agreement with the oil majors. Thus only a small fraction of sales in the rural areas are subject to direct price regulation, because the majors do not supply a number of these sites.

The main objectives of the PSA are to place a cap on prices charged by the oil majors and to ensure lower country fuel prices at the expense of capital city consumers (Industry Commission, 1994:112). This appears to be cross-subsidisation of country by city consumers, but the Commission contends that cross-subsidisation is not likely. This is because of the high level of competition between oil majors in metropolitan areas, forcing prices below the maximum wholesale price. The argument continues that this can be shown by the difference between country and city petrol prices.

Prices in most country towns are said to be relatively high and stable, whereas in major cities prices vary but are usually lower than the "lowest" country prices. The volatility here refers to the changes in prices offered at the retail outlets on different days, the number of changes in prices over a number of days or on the same day and, also, in differences between retail stations over the same period.

In the case of capital city prices, one explanation for these changes and lower price can be found in the fact that, they are close to refineries and have a high potential for

demand⁶ to reduce any stock build-up. When stocks build up, refiners are expected to reduce stock levels to cut down storage costs. One quick method is to offer lower prices in areas of high demand where the extra product can be absorbed more quickly. Country and smaller towns generally have low demand, and their capacity to absorb extra volumes is low and involves high costs of transportation.

4.1.2 Other regulations

The Sites Act and Franchise Act passed in 1980 was aimed at changing the institutional framework in which the industry operated, while ensuring minimum intervention by the government at the firm level. The purpose of this was to reduce the number of petroleum product retailers. It was expected to rationalise service stations, and put a stop to the unnecessary development of stations at every major intersection resulting in lower prices to consumers. It was hoped that higher throughput would be achieved by the remaining stations which would lower the distribution costs. Despite that, the target number of outlets was never determined.

The South Australian state went for a more active approach, by setting a Motor Fuel Distribution Act (1973) in which petrol is treated as a unique product by requiring interested parties to get licences or permits to sell petrol. Licenses could be given to those selling petrol as their main business. Those selling it as a secondary product to their businesses (for example, where the major business is grocery shop, motor repairs) can be granted permits.

Other criteria used include: suitability of the premise; the number of licensed premises within a 3 km radius or 10 km radius of the premises in question, possibility of transferring an existing license (permit) to the proposed site, extent to which fair and reasonable competition within the industry of retailing will be affected (Industry Commission, 1994: 178).

Various reviews of the Act suggested major changes with the 1991 review even proposing a repeal of the Act on the grounds that the Act was causing extra burden to the usual town planning procedure and increased the source of risk for retailers. Two important factors in this regard are that, new smaller retailers are disadvantaged, because the increase in resources needed to be able to acquire a licence/permit. Sometimes legal representation is needed to prove their capability, since they are

⁶ Bear in mind that it was stated earlier that refineries are mostly located in areas of high demand.

inexperienced in the industry. For the oil companies this is not the case, as their costs may be spread by making regular applications and/or lodging complaints. The issued licenses cannot be traded, because they are awarded to individuals to operate at a particular site. They can only be transferred to new owners if ownership of the site changes.

In Australian Capital Territory, the number and location of service stations are restricted. As a result of that, the Industry Commission (1994) notes that prices in that region are higher than prices elsewhere, and that this shows the benefits accruing to the lessees on those sites. The level of price competition has been reduced and, in addition to that, advertising of prices on major roads is also forbidden.

The Western Australia government restricts trading hours and the range of products sold by petroleum retailers. By so doing convenience stores development is being retarded. The Retail Trading Hour Act (1987) was put in place for this purpose. It is noted that this reduces the retailers' ability to make full use of the assets and can contribute to the reduction of competition, consumer choice and convenience.

4.2 Levels of competition in the industry

Concerns about the level of competition in the petroleum sector in general led to the investigation into whether such concerns were founded. It has become widely accepted that competition can be an incentive to improve efficiency and economic growth (Industry Commission, 1994) by forcing firms to be more responsive to changing market conditions.

Some of the concerns stem from the realisation that the supply of petroleum products in the Australian markets is concentrated in the hands of a few large companies, who are vertically integrated in one way or another. The degree of competition can be determined by a number of factors: barriers to entry and exit, import competition, seller concentration and level of vertical integration. These are discussed below.

4.2.1 Barriers to entry

This refers to the ease with which firms can enter or exit the market. If firms are free to enter and exit the market as they wish, incumbent firms would be under pressure to become more efficient so as to deny new entrants profitable opportunities that might induce them to seek entry into the industry. On the other hand, if it is expected that

high losses can be incurred (like losing an investment completely: associated with sunk costs discussed later) on exiting the industry, entry could also be discouraged.

A definition of the barriers to entry will be discussed in order to gain a better understanding of the issue. The same definition as used by the Industry Commission (1994) will be adopted; that barriers to entry are factors giving incumbent firms advantage over new or potential entrants that would allow them to earn super-normal profits over the medium to long term. Thus some regulations can be regarded as barriers to entry, together with some other factors, as will be discussed below. These include economies of scale, product differentiation, and capital requirements.

- Regulatory barriers: The government of Australia is strict on environmental regulation. New entrants into the industry need approval to construct refineries and/or service stations. In the case of refineries, even the existing refiners have to get approval for expansion. Although such regulations apply equally to both incumbents and potential or new entrants, some participants see these as barriers to entry. Regulations that can be regarded as conforming to the definition are those restricting free and fair competition.

On the other hand denying approval for a new construction restricts competition. In that way the incumbent companies are advantaged, as there are no arrangements to reduce their numbers in order to accommodate new applicants.

Other regulations that can be regarded as conforming to the definition of barriers to entry are the Sites and Franchise Acts. The Sites Act controls the number of sites oil majors are allowed to own and operate. The Franchise Act is aimed at balancing bargaining powers between franchisees and franchisers. This is to be achieved by putting in place minimum terms and conditions for franchise agreements. These can be seen to be restricting free business operation in the industry. Also, the fact that it does not apply to all participants (for instance, independents are not included in its terms) means that fair competition is not allowed.

- Economies of scale: It was noted that there are significant scale economies in refining. The size of the market is relatively small in relation to the large minimum efficient scale of the plants, making it uneconomical to have more than two refineries in the major capital cities. As a result, a new entrant in refining would

significantly increase the supply, driving down domestic prices of petroleum products.

One way of avoiding a drastic fall of prices can be securing export sales. This, however, cannot be guaranteed, especially where such exports would have to compete with other Asia Pacific markets (like, Korea, Indonesia) that have more developed and larger refineries enabling them to capture economies of scale more effectively than their Australian counterparts. The expected profitability of the new entrant will therefore be reduced, posing a threat of loss of investment if the only option remaining is to exit the industry.

This point brings the discussion to a closely related issue of sunk costs, prevailing in the refining business. The reason being that a refinery plant is specialist in nature and cannot easily be converted to or used for something else. The risk can only be reduced if other actors in the industry are willing to buy the equipment.

This can only be expected if other refiners have intentions of upgrading or expansion (which does not seem to be possible at present in Australia). Without that, huge losses can be incurred, as it may imply that facilities are given away at unfavourably low prices for the seller.

There are also scale economies in storage, the bulk of which is owned by the oil companies. New entrants, therefore, have to make arrangements to utilise the facilities of the competitors. This does not result in a meaningful competition. This also applies to the distribution infrastructure.

- Capital requirements: Again, refining is the sub-sector most relevant to this matter, in which high capital is needed. With regard to entry barriers, the established firms are often confused as having lower costs than those facing new entry, because their investments were made when interest rates were lower, or their debts had been written off, it would be argued. If costs were lower than at present when the incumbent entered the industry, this does not constitute a barrier to entry. Only if the associated costs were to be incurred by the new entrant in protection of the incumbent would there be a barrier. They just reflect the advantage incumbents enjoy or the benefits of being first movers.

However, the fact that a new entrant has to enter into an agreement with the refiner cannot constitute free competition. A refiner can set unfavourable terms for the new entrant, and in so doing restrict competition. There is no evidence pointing towards such incidents. Also, there are no policy restrictions on imports of refined products and no regulatory barriers to wholesaling and retailing.

Independent terminal operators are currently emerging (ACIL, 1997). Only when significant progress has been made in building independent storage facilities can independents be in a position to compete on a level playing field with refiners. This does not suggest a barrier to entry.

4.2.2 Seller concentration

Of importance to market competition is the degree to which sellers can collude, explicitly or tacitly. The assumption is that when there are few sellers, the probability of colluding against consumers is high. It follows from this that, as the number increases, it becomes difficult to monitor members of the collusion, some of whom may be tempted to cheat. The fear or suspicion is that, since there are few refiner marketers in the Australian industry, producing products (some of which have few close substitutes) incentives to collude may be high. Especially because refiners are to a certain degree vertically integrated. However, before discussing this, the issue of scale economies must be touched on.

Demographic factors and therefore transport costs contribute in determining the structure of the market. Also, the fact that there are imports into the market continues to be a threat to any agreement to collude, as the importers may seize the control of the market at any opportunity (Industry Commission, 1994).

The argument that importers can guard against collusive behaviour raises some doubts. The first point to consider in this case is that the importer has to utilise the competitors' storage infrastructure to present meaningful competition to domestic refiners. The refiners are in a position to monitor the levels of imports and detect when imports rise to levels that threaten their position, and squeeze the competitor out of business.

The big companies have control in one way or another of over 70% of the retail outlets. The ability of independents, not owning a single refinery, and controlling less than half

of the storage infrastructure, to exert competitive pressure seems to be limited. These facts point towards a lack of free and fair competition.

4.2.3 Vertical integration

The petroleum industry is characterised by vertical integration of one form or another. This may appear to raise the entry costs of the industry. The general argument against vertical integration is that for a new entrant to compete against a vertically integrated firm it has to enter in the same way or will be disadvantaged by the incumbent. To the extent that there are independents operating in the industry, this may seem to create a false picture that there are no barriers.

These arguments also need to be checked against the potential benefits of integrating vertically. Vertical integration may be chosen to increase efficiency by cutting down costs through for example reduction in transaction costs. The advantages that come with economies of scale and scope can be increased. Whether those benefits are passed on to the consumer is another question. So, not all vertical integration is aimed at reducing competition.

A fact that should be remembered about refiner/marketers is that they are vertically integrated but, Industry Commission (1994) argues that they do not get all the benefits of that, as sellers set the final price.

Very few retail sites are owned and operated by independents to be able to exert profound pressure on a vertically integrated competitor. It is not clear how this group is realistically able to set the final products prices without being coerced by the major refiners, who are their suppliers.

The structure of the industry allows vertical integration, which places the competitor in a difficult position of competing with a refiner. The structure does not allow fair competition. A marketer who is not integrated into the refinery is forced to consider the option of importing products. If one considers the fact that the integrated companies also own 87% of the storage infrastructure, the competitor can still be squeezed out of business. The existing structure is seen as inhibiting free competition in the industry.

4.3 Regulatory reforms

Following complaints from different industry stakeholders about lack of free competition and some investigations, various proposals had been tabled for the government to take the necessary steps. Of the main regulations that had been regarded as prohibiting competition and full development of the industry were the Sites and Franchise Acts of 1980 and also the PSA. The Sites Act was found irrelevant in the face of changes experienced in the industry. Since its aim was to control oil majors owning a certain proportion of the sites, the majors were thought to have found ways of by passing the act, making it ineffective. On these grounds, it was felt that it should be repealed.

The Franchise Act (1980) was thought to be impractical in that it could not be legally enforced (Bill Digest, 1998) and, therefore, unable to address the problems it was designed for. It was also repealed.

The Prices Surveillance failed to achieve the objectives for which it was designed. It has instead served as a price floor for country prices and as a target to which prices return after a discount cycle (Bills Digest, 1998).

The "Strengthened Oilcode" was meant to cover the areas that were supposed to be under these Acts. This would (if accepted, as it was still a proposal) be part of the Trade Practices Act (1974) introduced as a section of the small business statement by the government. It is more flexible, and is relatively easy to amend if it loses effectiveness due to the dynamics of the industry, unlike legislation.

The Oilcode entails provision for the code of conduct for a petroleum retail sector that can be enforced legally. It comprises the introduction of new procedures for settling disputes between firms, including independent retail operators. It also makes provision for new competitors to have access to the existing major oil refineries and to product exchange arrangements. The cornerstones of the "Strengthened" Oilcode are:

- 1) Pre-contractual disclosure, designed to deal with problems of information asymmetries, so that decisions are taken with full knowledge of prevailing conditions.

- 2) Alternative dispute-resolution aimed at maintaining commercial relationships in a manner that is mutually acceptable to solving any disputes that may arise. This also allows the "Strengthened" Oilcode to be legally enforceable.

The reform policy of the petroleum retail sector was passed in July 1998. The main objectives of the reforms are to encourage competition; protect consumers; and protect small business (Bills digest, 1998).

Removal of the prices' surveillance on 1 August 1998 marked the first phase of the reforms. An independent price monitoring system was established, being co-operation between the oil companies and the Australian Automobile Association. This is intended to provide a continuous check on petroleum prices. In addition, the Australian Competition and Consumer Commission will perform an oversight duty on petroleum prices to make sure that the benefits of liberalising the industry are passed on to the consumer.

The second phase involved Repealing the Sites and Franchise Acts, and the introduction of the "Strengthened" Oilcode. These, however, were rejected in the August 1999 negotiations in the industry (Caltex, 1998: <http://www.caltex.com.au>). This was disappointing to stakeholders who would like free and fair competition in the industry.

5. NEW ZEALAND CASE STUDY

A number of regulations governed the New Zealand petroleum industry until deregulation in 1988. These had a number of effects in the way business was conducted in the industry and how decisions were made. This discussion begins with a review of the situation before deregulation, and continues to the current situation.

5.1 Previous regulations

The oil companies paid the refinery for processing their crude oil, and the government set the rate charged. It was determined in a manner that allowed the New Zealand Refining Company shareholders to recover costs and provide a reasonable (12.5%) return on investment. In this way the refiners were under no pressure to improve their services and operational efficiency, as their returns were guaranteed.

The government also set the wholesale price in such a way as to allow wholesalers to recover costs and a certain percentage return on investments made in wholesaling. This was in line with what was happening in the refining activity. Refiners had limited incentives to improve on their operations. Wholesalers were also not pressing them to reduce the charged fees for processing their oil, since they could recover costs from the market anyway.

Wholesalers and retailers got licenses from the government to operate in the industry. Company margins were also controlled, and so were prices. The Motor Spirit Licensing Authority was responsible for issuing licenses for the development of retail sites. A number of factors were considered in the process. These included determining whether there was a requirement for a retail outlet in a particular area, and the viability, size and position of the outlet (ACIL, 1997). Thus a potential entrant's application could be rejected on the basis of one or more of these conditions. This made entry into the industry difficult. Retail operators also had to obtain licenses for upgrading or expanding the existing stations.

On the question of ownership of sites, the Motor Spirits Distribution Act, 1953 forbade ownership of retail sites by wholesalers. There was no limit to the number of sites that could be owned by individuals. This was introduced at the time of solus trading when retailers contracted with individual oil companies to sell only the particular company's brand at the retail station. This discouraged any price competition and rationalisation.

The government intended to provide low prices to consumers but also ensure a fair return to the industry.

Deregulation

The New Zealand government started the process of liberalising its economy in 1987 as a way of withdrawing its active participation in business and a way of allowing crowding in of private investment. Different sectors considered ways of opening to market forces in response to the government's calls. The energy sector was no exception, and the petroleum sector was deregulated in May 1988 in line with reforms that were implemented throughout the economy. This put an end to the tight regulations in the petroleum industry.

Under the new arrangements, oil companies were not forced to process their crude at the New Zealand Refinery. The New Zealand Refining Company then needed to become efficient in order to compete with world refineries. Because deregulation of the industry happened at the time when the New Zealand Refining Company was being expanded, the government took responsibility for the payment of loans taken for that purpose. The refinery was also compensated for breached contractual agreements, entered into when the expansion started, before deregulation. It was guaranteed a floor income, and the oil companies committed themselves to utilising the refinery's capacity. Wholesale and retail licensing was abandoned. Wholesalers were no longer prohibited from owning retail sites, and controls on prices were discontinued.

The industry operations came under normal legislation governing the competitiveness of industries generally, namely, the Commerce Act of 1986. The main objective of this act is to promote competition in New Zealand markets. Other general legislation to which the industry is subjected includes the Resources Management Act 1991, the Dangerous Goods Act, 1974 and the Petroleum Products Specification Regulation, 1995.

In addition, the oil companies, in conjunction with the department of labour, developed an Oil Industry Code of Practice. This, however, was not a formal regulation. It was a voluntary agreement, meant to ensure that companies conform to design, installation and operation of petroleum storage system specifications (ACIL, 1997).

5.2 Current structure of industry after deregulation

Petroleum production and trade

New Zealand produces crude, but not enough to cover demand. Significant quantities of crude are imported. Imported crude comes mainly from Saudi Arabia, the United Arab Emirates and Australia.

Petroleum supply

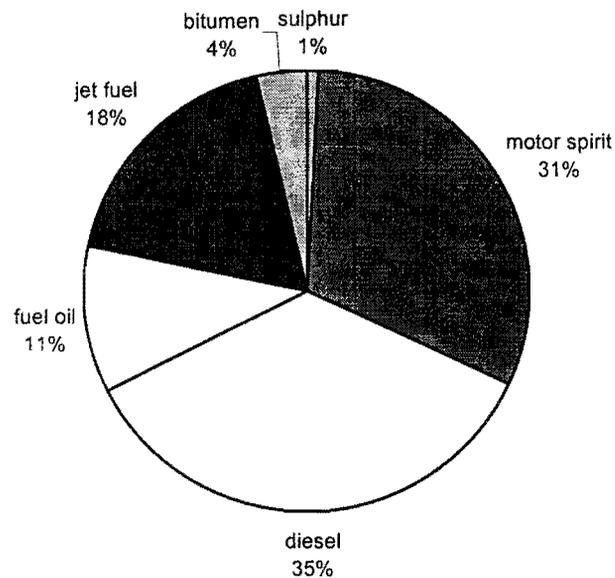
The industry consists of four major oil companies, transport companies, independent operators, and service station owners and operators. The Marsden Point Refinery is the main domestic refinery. Products from the refinery are shipped to seaboard terminals or piped to the terminals in South Auckland. Products are then transported to service stations and independent consumers by rail, road tankers and trucks. Petroleum product sources include the refinery, imports and, until recently, a synthetic gasoline plant.

New Zealand Refining Company (Ltd) (NZRC) at Marsden Point, which started operation in 1964, supplies about 75% of New Zealand's petroleum product demand. Its main shareholders are BP Oil NZ Ltd (23.7%); Mobil Oil NZ Ltd (19.2%); Shell NZ Holding Company Ltd (17.2%); Fletcher Challenge Petroleum Ltd (14.2%) and Caltex NZ Ltd (11.4%). The general public and institutional investors have a 14.4% holding.

The oil companies own the crude oil and the NZRC charges them a fee for refining their oil. When the Marsden refinery started operation, it had a refining capacity of 75 000 bpd, but was expanded to 95 000 bpd at a cost of \$1.8 billion in 1986. According to ACIL the major investment was in the construction of a hydro-cracker unit to increase production of diesel fuel and jet fuel. The refineries' product composition as at 1996 is depicted in figure 4.1⁷.

⁷ Percentages are own calculations from ACIL (1997) production figures.

Fig. 4.1 Refinery's product composition



The establishment of a synthetic gasoline plant in 1986 also contributed to the increased production of products. Before the expansion, a significant amount of products was imported. Following the expansion, NZ became a net exporter of petroleum products in 1988-89 (ACIL, 1997). However, the closure of the synthetic gasoline plant (noted below) and the increased petroleum product demand in the domestic market led to an end of exports in 1994. Again NZ became a net importer of petroleum products, especially motor spirits.

As from 1995, it was arranged for the refinery to receive 70% of the Gross Refining Margin (that is, the difference between the landed price at New Zealand ports of all products produced by the refinery and the landed price of crude oil at the refinery). Both the crude and product prices are based on quoted Singapore prices.

Synthetic production

The government and Mobil jointly owned the synthetic gasoline plant that started operation in October 1985, each with a 75% and 25% share respectively. New Zealand

Synthetic Fuels Corporation operated the plant. It converted natural gas to synthetic gasoline. Its plant capacity increased from 10 000 to 15 000 barrels per day.

The products from the plant were shipped to the Marsden Point Refinery for blending, and sold directly to the domestic market in different regions, with the remainder being exported. Exports of synthetic gasoline stopped in 1994, while the domestic consumption declined from close to 30% of motor spirit demand in 1992, finally dropping to zero.

The closure of the synthetic gasoline section was the result of a shift in emphasis from producing synthetic gasoline producing export quality methanol, following strong demand for this in Asia.

Petroleum demand

The major products are unleaded motor spirit, dual-purpose kerosene, diesel fuel, jet fuel, fuel oil, bitumen and sulphur. Motor spirit and diesel represent the largest demand. Between 1985 and 1995, the demand for diesel increased more than that for petrol, as a result of lower taxation on diesel. ACIL (1997) states that motor spirit consumption increased towards the end of the 1980's due to a decrease in the use of compressed natural gas following the abandonment of financial incentives by the government for using it, however the growth rate was still lower than that for diesel.

Since January 1996, two grades of motor spirit have been in use, namely unleaded regular and unleaded premium. The production and importation of leaded motor spirit ceased in January 1996 and the sale for use on the road was prohibited in October of the same year (Scott, 1997). Unleaded regular motor spirit was introduced in 1987 and accounts for 70% of motor spirit demand. 75% of that demand is concentrated in the North Island. According to ACIL (1997), half of the total consumption of motor spirits is accounted for by the three largest cities.

Transportation

The Wiri terminal south of Auckland has the largest throughput of 2 billion litres per year. It is owned by NZRC and leased to Wiri Oil Services Ltd owned by the oil companies. It is connected to the Marsden Point Refinery by a 170km pipeline owned and operated by NZRC. Oil companies own another 7km pipeline from Wiri to the jet fuel tanks in Auckland airport.

The cost of shipping fuel around the country is divided among oil companies according to usage and market share, averaging the cost of products at coastal terminals. This accounts for the almost uniform prices between main ports. Consumers in areas away from the refinery benefit since they are cross- subsidised. ACIL (1997) estimates each company's market share to be around 27%, with only Caltex having a lower share just below 20%.

Products are transported from terminals to inland depots and service stations by road and rail transport. Oil companies use their own fleets, or contract out transport companies to deliver fuel to their customers. The use of rail, previously the dominant method of transporting petroleum products, declined after the rationalisation of the transport sector. This meant doing away with the maximum limit on truck distances. Trucks became the preferred means to transport petroleum.

Marketing

The major oil companies provide products to various customers in the NZ market. Motor spirit sales account for 65% of the sales at retail outlets while inland diesel represents only 33%. The total number of service stations in 1997 was estimated at about 1900 compared to 2814 that existed in 1986. This shows that the rationalisation of service stations, which is said to have been happening since the 1970's, resulted in a significant reduction of service stations in NZ.

The effect of deregulation has been seen with regard to ownership, size and services offered at service stations. Since deregulation, the number of stations that are independently owned has declined, following the sale of most independent businesses to oil companies. The various ownership types currently existing can be classified as follows:

Dealer owned/ operated. The dealer owns the station, or leases it from an independent company. Supplies are obtained from the oil companies. These are independents, although some may display brands of major oil companies. Largely, they own sites that have low volumes and are in rural areas. The approximately 60% that fall in this category are in the South Island.

Lessee operated. A service station is leased from an oil company, and displays the brand of the particular company. These represent 20% of stations.

Company /agent operated. The oil-company owns or leases the site. An agent who receives commission for each litre of fuel sold, manages it on behalf of the company. These represent 20% of the stations. The retail sites owned by oil companies tend to be those situated along major roads, selling large volumes, or show a potential to be developed into larger volume stations.

The change in ownership made possible by the deregulation of the industry by allowing oil companies to own sites has promoted investment in high volume service stations (ACIL, 1997). Many sites have become multi-service sites, providing a range of services to consumers. These range from convenience stores, car washes, multi lane courts and payment at the pumps. Such services have increased to the extent that they represent a significant proportion of petrol site revenue. A feature that is still prevalent is full attendance at the service stations. This is viewed as increasing the costs by around two cents per litre.

Petrol pricing

The final price of petrol consists of a number of components, of which taxes constitute over 40% of the price. The typical price of unleaded motor spirit is made up of government duties (excise, comprised of Consolidated Fund and Land Transport Fund used on road infrastructure), petroleum fuel monitoring levy, the local authorities petroleum tax and the accident compensation corporation levy to which product costs are added. For diesel, the composition is different. For example according to ACIL there are no excise duties for diesel, since diesel vehicles are all subjected to road user charges that vary according to type of the vehicle. Note that the excise from which diesel is exempted makes up 70% of the tax component of motor spirit price. Thus diesel users pay for instance only around 10 c/l road user charge for a 3 ton vehicle, plus a lesser percentage of the government taxes (Goods and Services Tax and Local Authorities Petroleum Tax) compared to a motor spirit user.⁸ Thus there is an incentive for using diesel.

5.3 Competition in the industry

The situation in the industry can be discussed through the analysis of the current situation to determine whether it encourages competition in the industry or whether

⁸ Details of motor spirit & diesel pricing example in ACIL, 1997:29.

there are high barriers to entry. Barriers to entry could be in the form of absolute cost advantage, economies of scale and regulatory barriers. Each of these is discussed below.

Access to infrastructure: This refers to the fact that incumbents may face potential cost advantage against potential new entrants. This could be due to various reasons. The incumbent could own an important input needed by the entrant to be able to compete in the industry. In that case, if the incumbent is the only supplier of that superior input, it can withhold the input from the potential competitor as a way of forcing the competitor to use an inferior input and/or completely discouraging entry into the industry.

In the petroleum industry, that input could be crude oil especially in a situation where imports of petroleum products are not allowed. This, however, is not the case in the New Zealand industry. The oil industry is deregulated, crude can be imported and the potential entrant can also source its products from international markets. Incumbents cannot be said to have cost advantages in that regard.

The incumbent oil companies own the 7 km pipeline from the Wiri terminal to the airport, and lease the 170 km pipeline, but even the whole terminal capacity is not enough to cover the market demand. There are also other terminals where the major companies have no control. Secondly, the transport sector is also deregulated; meaning the use of road transport is another option.

The oil companies enjoy benefits that the new entrants are not in a position to share. The fact that there are other terminals, not under control of the oil companies, can be used as an argument that there are opportunities available to new entrants. In reality, these are not as attractive as the terminals under the incumbents' control. The pipeline from Wiri terminal is the shortest, and connects to a major refinery. The other pipelines connecting to the same refinery need to be longer than this. The longer the pipeline, the higher are the costs which the entrants have to incur.

As regards the deregulated road transport system, the amount that can efficiently be transported by road is minimal compared to pipeline transportation. Forcing a competitor to use this form of transport is effectively forcing the competitor to use an inferior input.

Economies of scale: As pointed out earlier, this refers to a situation where the costs are reduced as output increases. That is, the minimum efficient scale is large in relation to the size of the market, so that there are gains in utilising only one or few plants, and is associated with large capital investments. Some argue that scale economies form a barrier to entry. Refinery is the point in question under this category. The NZ industry is small (consuming 90 000 bpd) relative to the efficient scale of a modern refinery. Scherer (1996) estimates the minimum efficient scale to be around two times larger than the size of the NZRC. The size of the refinery, it should be noted, depends on the level of demand and transportation. Constructing a refinery presently therefore may not be efficient, considering that New Zealand is situated relatively far from major markets in Asia and elsewhere.

Another point to be considered is that entry does not have to occur at all levels of the production chain. So, even if entry at refining seems unprofitable, it can still be possible at wholesaling or retailing. Also, refined products can be imported. A disadvantage to the potential entrant could be if the only way to source the product was by utilising the refinery's output. However, this argument applies in a situation where the refiners are not also marketers and retailers. With deregulation, wholesalers are allowed to participate in retailing. This could place small independents at a competitive disadvantage if there is no open access to infrastructure.

Regulatory and institutional barriers: The deregulation of the industry in 1988 was expected to bring competition and remove any barriers deterring entry into the industry. There had to be some general regulations though, even after that, to which the industry is subjected. These are the Commerce Act 1986, Resources Management Act, Petroleum product specifications Act and Dangerous Goods Act.

The Commerce Act, 1986 is to encourage competition in New Zealand markets by ensuring that, among other things, the behaviour of incumbents does not deter entry. It does not protect one group at the expense of another. A barrier would be created if it protected incumbents from competition of imported products. There are no barriers in the form of quotas or tariffs. Specifications laid out in the other regulations regarding sale of petroleum products, setting up of storage equipment and service stations, and environment are the same for all industry participants.

There may be costs associated with complying with some of the regulations, but this is not to say that these are barriers. They apply to everyone doing business in the industry, and should not be regarded as barriers.

The costs of shipping products around the country are divided among companies according to market share. The terms governing a new entrant's access to infrastructure are not clear. The new entrant, would have to compete with the majors on a commercial basis since the industry is deregulated. The fact that there is no regulation ensuring that all willing participants have fair access to infrastructure is a barrier to entry. If there was open access to infrastructure this would not be a barrier.

6. DISCUSSION AND LESSONS FOR SA

6.1 History of intervention

The oil industry is economically and strategically important to all countries. The development phases of the international oil industry led to increased-government intervention throughout the world. The aim was to put in place mechanisms to reduce heavy reliance on imported oil. This meant diversification to other energy sources and tight regulation of petroleum industries for importers of oil. For producers, it meant increased government involvement through ownership, to maximise the share of government revenues from the natural resource. This situation, is however, changing. The trend now is towards the liberalisation of markets, to improve efficiency and to allow private investment in the industry.

The idea of liberalisation is that minimum government intervention and an industry open to market forces would improve efficiency. Pareto-optimal allocation of resources, in which no one can be made better off without making some else worse off, guided the thinking. This, however, is a theoretical ideal that is seldom achieved. Liberalisation was thought to be a way to achieve some of the objectives of the ideal.

6.2 Motivations for intervention

There are important rationales for involving governments in the sector. There are natural monopoly characteristics in some parts of the supply chain that require the intervention of the government on the grounds of protecting consumers from monopoly abuse.

Other motivations for government intervention include the development of the domestic industry, socio-economic development, the generation of cash for government and inadequate information regarding the markets. The government retains the provision of social services in most cases (although this is slowly changing). This function is closely related to that of regulating the domestic industry, for example, ensuring supplies throughout the country. Parts of the local industry, particularly manufacturing, may still be in its infancy, and opening it to international competition may hinder further developments. Governments, in such cases, decide to protect certain industries for strategic and political reasons, even though, economically, the protection could not be justified.

The choice of the intervention tool depends both on the goals the government wants to achieve and the structure of the existing industry. The different tools include ownership, regulation, fiscal measures, trade instruments as well as research and development. After the second oil price shock, the ownership of industry and regulation including upstream and fiscal, were the most widely used instruments.

6.3 Reasons for liberalisation

During the 1980's, liberalisation of markets gained renewed importance. Various forces were pertinent both to driving economies to open their markets and to the procedures used as well. The most outstanding were inefficiency, lack of private investment and pressure from international lending agencies.

In some countries lack of investment is one of the driving forces. Poor infrastructure that required upgrading and expansion, that governments could not finance was characteristic in some countries. This made governments realise that the private sector could play an important role in that regard.

State-owned oil-companies performed poorly, because of lack of incentives on the part of managers to operate efficiently. Lack of accountability and easy access to public funds were largely to blame. Governments started realising that the private sector can play an important role in the provision of commercial services. Nevertheless it should be recognised that some state-owned companies were efficient.

International lending agencies play a role in forcing countries to open their markets. Countries who depend on these agencies to rescue their poorly performing economies are forced to comply by the rules of the lenders. This group of countries does not initiate liberalisation of their own petroleum sectors.

6.4 Methods of liberalisation

Different methods of liberalisation include privatisation, deregulation, foreign investment and liberalisation of trade. Where the government was involved in the industry through ownership, the first step towards liberalisation is usually the privatisation of the state oil-company. It is important to bear in mind that privatisation is used as a means towards achieving the overall objective of liberalising the sector. It is not the end in itself.

There are different methods of privatisation. The method chosen depends on the underlying objective and the structure and status of the industry. The various methods of privatisation include preparations such as restructuring, commercialisation and corporatisation. The actual privatisation might be by way of joint venture, direct sale, public shares and employee/management buyout. If, for example, the main objective of privatisation were to generate cash for the government, the sale of assets would be the method followed.

6.5 Overall lessons from case studies

The various cases considered are state-owned companies that were privatised before the industry could be liberalised, and regulated petroleum industries. This will help give a picture of the situations that can be expected from the experiences of these different categories of countries.

6.5.1 State owned oil companies

There are two categories of state-owned monopoly oil-companies, namely those in which poor performance and lack of commercial objectives, were the main drivers for liberalising the industry, namely Argentina, Bolivia, and Peru; and those where the state oil-companies performed satisfactorily, namely Brazil, and Thailand, but the need for private investment was the driver for liberalisation.

In both circumstances there were difficulties in deciding whether the government should give up ownership of the company completely or only reduce its share. This raised concerns on the part of private investors about the sincerity of the government regarding its attitude to free and fair competition.

Consultations that enabled informed planning, and defined the objectives and direction that the process would follow, were important in driving the process forward. Also, transparency of the whole process was one important factor that allowed progress in all the cases considered. All the stakeholders felt they should be part of important changes in their industry. In successful cases, possible problems were discussed before hand with those that would be affected.

6.5.2 The previously regulated petroleum industries

In these countries, the petroleum industries were regulated and different motivations that led to partial or full liberalisation of the industries were observed. These included

lack of competition, compliance with the demands of international lending agencies, lack of incentives to be efficient, overall change in economic and industry policy.

Among the countries considered in this paper, New Zealand is the only country that can be said to have fully deregulated the industry. Despite this, there are stakeholders that are still concerned about the presence of free and fair competition in the industry, pointing towards the existence of barriers to entry even after the industry is deregulated. There is no fair access to infrastructure, and therefore competition is not fair. The fact that there is an arrangement among existing companies to have access and pay costs according to market share may disadvantage a new entrant.

The rest of the countries partially deregulated their industries for a number of reasons. Some were characterised by a lack of consensus as to whether the industry should be liberalised. This created problems for further steps towards fully liberalising the industry. The dissatisfaction of certain stakeholders with the process, as a result, led to rising tensions between the different stakeholders and governments, and delays in completion of the process. This shows the importance of a transparent process where all the parties concerned understand the problem and understand what liberalisation will entail.

In the cases of Kenya and Philippines, one group of stakeholders, the major oil companies, have ended up being the only group that benefits from the unsatisfactorily liberalised industry. Unfortunately this is the same group that benefited from a regulated industry.

The case of the Philippines, of a previously regulated industry where the deregulation law was reversed, and passed again, was an exceptional case among the cases reviewed in this paper. It is not clear what the outcomes of the current law will be, but already there are once again calls for scrapping the law from the dissatisfied stakeholders. Consultations, a better analysis of the situation and clear objectives and direction, could be better if held before the decision is made for the well being of the whole industry. The situation points towards a lack of consensus and understanding of what liberalisation should entail.

6.6 Lessons for SA

6.6.1 The need for change

International relations largely shaped the development of the SA petroleum industry during the apartheid era. Driven by the desire for energy security in the face of the UN embargo against the apartheid government, liquid fuel policies centred on self-sufficiency. Decisions regarding investments and regulation of the petroleum industry were determined by such international developments. As a result of this, a culture of secrecy and complicated negotiations between the government itself and the industry characterised the industry itself.

The Petroleum Products Act 1977 made effective the secrecy that governed the industry. It forbade "*publication, releasing, announcement, disclosure or conveyance to any person of information or the making of comment regarding the source, manufacture, transportation, destination, storage, consumption, quantity or stock level of any petroleum product acquired or manufactured or being acquired or manufactured for or in the Republic*" (DME, 1998:9).

The new government inherited these policies that are now in the process of being reviewed. The apartheid era is over. A policy of self-sufficiency in liquid fuels is no longer relevant, hence regulations that were designed to meet this objective are inappropriate.

6.6.2 Competition in the industry

The industry operates under a set of complicated regulations, not conducive to free and fair competition. The main regulations as discussed in Chapter 1 will be analysed with respect to their implications for competition in the industry.

The retail price of petrol is determined through a complicated formula that takes into account the prices of four refineries from which SA would typically import product, plus wharfage, insurance and other charges. Price control through the use of import parity pricing is thought to be the best possible system in the current regulated industry. There are many components in the final price of fuel that do not account for the actual cost of supplying fuel to the consumer, other than government taxes.

These components are a result of negotiations and agreements entered into during the apartheid era. The oil companies were, and are, guaranteed a margin for refining crude in return for uplifting the locally produced synthetic fuels.

The control of imports shields the local refineries from competition, and guarantees utilisation of their products in addition to the guaranteed a certain import parity selling price for the refinery output and a certain margin for marketing both crude derived and synthetic products. This is a disadvantage to new entrants who do not own a refinery. Although there are product exchanges among the refiners, new entrants who rely on product supply from local refiners are not on a level playing field with their competitors, who are also their suppliers. It is understood that the government currently gives new entrants priority regarding import permits. Control of imports is also against the World Trade Agreements (Burger, 1999).

Imported products are shipped through pipelines and transported inland using Petronet's tariffs. Petronet is an unregulated natural monopoly who can abuse customers by charging high price and impacting on the final price of fuel.

The promotion of synfuels has a reinforcing effect on import controls. It is not possible to support the production of synfuels without import controls, in the light of existing agreements. However, Sasol gave notice to end the industry agreement, which is expected to lead to a new set of regulations.

The ratplan controls the number, location, ownership and operation of service stations and prohibits self-service at petrol stations. This is said to promote development of small businesses and protect the jobs of petrol attendants. While it is noted that the ratplan made possible the allocation of new rosters to new entrants, it is anti-competitive. The study conducted by the Competition Board (1994) in which it found certain clauses of the agreement to be against the principles of the competition act supports this. In a free and fair competitive environment, market conditions determine the opening or closure of a business.

6.6.3 Current context

The UN embargo against SA, that shaped the policies around regulation of the petroleum industry, was lifted in 1993. The economic and political situation changed with the re-acceptance of SA into the international community.

There are also significant changes taking place in the petroleum industries around the world, following the period of oil crises. An important realisation is that there is a shift from the need to achieve energy security through self-sufficiency to achieving energy security through increasing energy supply options, by cross-country trade and diversification.

There is, therefore, a need for policies more appropriate to the new environment. The domestic petroleum industry policy has to integrate international trends by adopting relevant examples into the local environment.

6.6.4 Main objectives

As SA embraces the international community, sensitivity to domestic conditions and problems is very important. There is a trend towards market-oriented petroleum sectors around the world. SA faces the challenge of transforming the petroleum sector from the secretive, regulated industry to a market oriented one, while making sure that stated government objectives are met.

Each country implements the reforms in a manner that suits the country's situation and circumstances. The general underlying goal is to open the industry to market forces. How far the process continues is a matter that should be monitored and determined by the government.

SA is in a critical stage of development, and building investors' confidence is crucial. The government articulated its intentions to de/re-regulate the liquid fuels sector after some specified milestones are achieved.

- Availability of fuel in rural areas at affordable prices
- 25% Black economic empowerment (BEE) through ownership or control in all levels of the industry
- Maintenance of full service at the petrol stations
- Promotion of small business
- Protect jobs
- Guard against abuse of market power

- Protect investments in synfuels industry
- Optimise the use of existing investments

Impacts

SA should learn from all the cases reviewed in this paper, as there were different outcomes. An important observation to be made is whether the intended results were achieved in each. In a country like SA, that is still trying to build its economy, and is eager to attract private investment, consistency and precision in policy objectives is of the utmost importance. This creates a good picture for investors one where the government is committed to favourable business environment and long term goals. This in turn will contribute to building a stable economic environment, and build investors' confidence.

The impacts of liberalising the petroleum sector in other countries will be assessed in terms of prices, rural-urban price differences, closure of service stations and entry of new players.

- Prices

The majority of poor South Africans live in rural areas where the price of fuel is likely to be high should the industry be deregulated. The experiences of Kenya and the Philippines shed light in this regard. When the industries opened to competition, prices of petroleum products rose to levels even higher than during the pre-liberalisation period. This is contrary to what the liberalisation was intended for.

The structure of the market in Kenya did not change after liberalisation, which may account for the high prices paid for fuel. The few, big oil companies, that operated in the industry before, manipulate prices as they wish. The levels of competition did not change either. The major oil companies practice price leadership.

In the Philippines where new entrants into the industry could be expected to bring competition, the big oil companies are the price-setters. The entry of new players with about 8.7% market share in the retail sector has not brought any meaningful competition.

The multi-national oil companies dominated the petroleum sector in these two countries before liberalisation, a characteristic existing in South Africa. It must be pointed out though that in the Kenyan case there are two factors that could be responsible for failure to realise the expected benefits of liberalisation. Firstly, that there were no proper regulatory measures in place to carry the process through. Secondly the remaining regulations could be working against liberalisation.

- Rural –urban price differences

Urban-rural price differences are observed following liberalisation of the sector. The tendency is for prices to be higher in rural areas than in urban areas. This is the case in Australia. It is because prices are cost-reflective. Consumers in rural areas are far away from the refineries, and those areas are characterised by low demand and high distribution costs.

How rural consumers are ensured affordable fuel without resorting to subsidies is an issue that requires careful consideration. It is important to note that in instances where subsidies are “unavoidable”, the government welcomes transparent administration (DME, 1998:31).

The Prices Surveillance Authority in Australia placed a cap on prices charged by the oil companies, to ensure lower country prices at the expense of capital city consumers. This allowed minimum government intervention while protecting the interests of rural consumers and encouraging the development of small business. Despite this, rural consumers pay a higher price for fuel than consumers in urban areas do reflecting high distribution costs of supplying those areas. Price capping allowed commercial principles to be retained.

- Closure of service stations

The liberalisation of the petroleum sector resulted in the closure of more than half the service stations that existed in New Zealand before liberalisation. The majority of the closed stations were the low volume sites. These are likely to be in the rural areas of SA.

The impact of the closure of service stations is threefold. It means the loss of jobs for petrol attendants. It is the aim of the government to protect jobs of petrol attendants by securing full service. Jobs lost through rationalisation of this nature may not be

avoidable. Secondly, access to fuel in rural communities would be difficult, as it is stations in these areas, with low throughput that are more likely to close. Thirdly, new small retail level entrants may be easily driven out of business through the closure of stations. Other service businesses such as general retailers, mechanics operating in the service stations will close. The development of small business can be threatened in a deregulated industry.

The objective of the government of making fuel available throughout the country at affordable prices may then be compromised in a deregulated environment. Also, the closures would be contrary to promoting small business. Re-regulation, therefore, is needed to achieve this objective.

It is worth mentioning that in only one country in this review, Thailand, was there an increase in the number of service stations and small businesses in the industry following the liberalisation of the sector.

- Entry of new players

One of the reasons for liberalising the sector is to encourage the entry of new and small businesses into the industry. The extent to which this objective was realised, for example, in New Zealand, is cause for concern about the fairness of competition in that industry. Significant numbers of new entrants in the industry were only seen from 1997, a decade after the industry was deregulated. Although it is not clear what the reasons for that were, it is cause for concern in SA, if there are lessons to be learned.

In Kenya, the industry was deregulated in 1994, but the number of players has not changed. A number of factors can be said to be responsible for this. Among these is the unwillingness of the existing players to share the facilities with new entrants.

Philippines saw entry of new players both local and international. This is one of the expected results of liberalisation. The new players are expected to contribute significantly to increase investment and development of infrastructure in the country. However, the new entrants have not been in a position to exact significant changes with regard to prices. This could mean that effective competition in the industry has not started.

If SA is to realise the objective of 25% BEE, cases like these need to be investigated. For meaningful BEE to be achieved, a lot has to be done to ensure a level playing field for

all players in the industry. The multinational companies operating in SA control most of the existing infrastructure. How previously disadvantaged groups, at which the BEE is directed, obtain ownership and fair access to infrastructure can better be managed in a regulated environment.

The review of the deregulation experiences of other countries shows a trend but not much on what can be a lesson to SA. There is a need to draw on specific areas that can be adapted to the SA case, in a manner that will allow flexibility when a need arises for regulation to be reviewed.

Therefore, re-regulation of the sector until such time as the industry has adjusted to market principles is appropriate. Re-regulation will mean a review of the mainly inappropriate regulations, namely the ratplan, and promotion of synfuels and pricing. Certain sections of the ratplan can still be incorporated into the reviewed regulations to see to it that new entrants are accommodated, as is currently the case. It may be necessary also to retain some sections of the ratplan, for example, prohibiting vertical integration, to protect small businesses.

With regard to uplifting synfuels, Sasol has already given a notice to terminate the agreement with the industry by 2003. This should be the starting point for the government in its attempts to re-regulate the industry. Negotiations over the future of Mossgas need to be finalised.

Import control should remain until the review of the other regulations is complete. This would allow an appropriate regulatory framework to be developed. Only after that time could the debates about whether the industry should be deregulated resumed, if still necessary. Presently, all SA needs are regulations appropriate to the current environment. For example, it is not clear how products' imports can be allowed while the companies currently operating in the industry have to uplift synfuel production. The removal of import control is expected to attract new entrants who will compete with the existing companies. If competition in the industry is to be meaningful, promoting the local industry's products needs to be dealt with first, or the existing companies will be at a competitive disadvantage.

There is a strong international trend towards liberalisation, however, there are no guaranteed results. Hence re-regulation of the industry is justified. Some instruments that can be applied are price-capping, and the review of the ratplan.

Price-capping allows minimum government intervention, while also allowing some degree of competition in the industry. It would protect consumers from the potential danger of big oil companies colluding over prices. Also rural-urban price differences are allowed as a means of retaining commercial principles.

SA needs to alter its system to achieve specific objectives; that is, re-regulation must be seen as a means rather than an end in itself, and needs to be competitively planned and implemented.

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