



# SAMPLE B

Diploma Programme subject in which this extended essay is registered: ECONOMICS

(For an extended essay in the area of languages, state the language and whether it is group 1 or group 2.)

Title of the extended essay: MARKET FORM OF THE  
RETAIL PETROLEUM SUPPLY INDUSTRY  
IN PARRLANDS.

## Candidate's declaration

*If this declaration is not signed by the candidate the extended essay will not be assessed.*

The extended essay I am submitting is my own work (apart from guidance allowed by the International Baccalaureate).

I have acknowledged each use of the words, graphics or ideas of another person, whether written, oral or visual.

I am aware that the word limit for all extended essays is 4000 words and that examiners are not required to read beyond this limit.

This is the final version of my extended essay.

Candidate's signature: \_\_\_\_\_

Date: 3 MARCH 09

IB Cardiff use only:

A: 44737 B: \_\_\_\_\_

## Supervisor's report

The supervisor must complete the report below and then give the final version of the extended essay, with this cover attached, to the Diploma Programme coordinator. The supervisor must sign this report; otherwise the extended essay will not be assessed and may be returned to the school.

Name of supervisor (CAPITAL letters) \_\_\_\_\_

## Comments

Please comment, as appropriate, on the candidate's performance, the context in which the candidate undertook the research for the extended essay, any difficulties encountered and how these were overcome (see page 13 of the extended essay guide). The concluding interview (viva voce) may provide useful information. These comments can help the examiner award a level for criterion K (holistic judgment). Do not comment on any adverse personal circumstances that may have affected the candidate. If the amount of time spent with the candidate was zero, you must explain this, in particular how it was then possible to authenticate the essay as the candidate's own work. You may attach an additional sheet if there is insufficient space here.

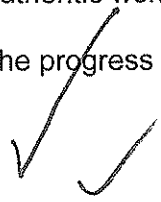
Rikesh chose his topic and case study plan on his own. I would have liked to have been involved in the process more from the beginning, but overall I am happy with Rikesh's final product. There are few items I would have liked to see included in his study, but his use of economic theory was very good. Since HL extension for unit two is the last item we cover here at ISK, Rikesh learned almost all the theories used in his essay on his own. Upon reading his first draft, there were only one or two items I suggested to him for further research. Overall the final essay is very close to 100% the student's own ideas, research and outline.



I have read the final version of the extended essay that will be submitted to the examiner.

To the best of my knowledge, the extended essay is the authentic work of the candidate.

I spent  hours with the candidate discussing the progress of the extended essay.



Supervisor's signature: \_\_\_\_\_

Date: 3 MARCH 09

Extended Essay in Economics

# Market Form of the retail petroleum supply industry in Parklands

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2/14/2009

Word Count: 3980



RQ

**Abstract:** This essay discusses the market form of the petroleum industry in Parklands, Nairobi. Specifically, this paper investigates the research question what market form characterizes the petroleum retail supply industry in the Parklands residential suburb of Nairobi? ✓

How

The petroleum service stations within Parklands were chosen using a geographical clustering technique, and identified using a map. Primary data on daily pump prices for diesel and petrol and data on auxiliary services offered, product brand names, and offers and promotions was collected between November 24th 2008 and February 1st 2009. In addition, secondary data on the respective market shares of all Kenyan petroleum companies was obtained from the internet database of the Petroleum Institute of East Africa. ✓

Conclusion

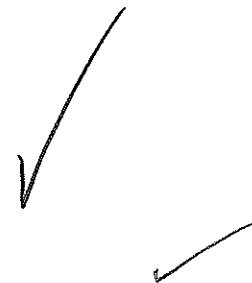
Processing and analysis of the data revealed that there are only a few service stations in the Parklands industry which belong to a small number of companies. Assuming that the petroleum products sold at all service stations are homogenous and that all consumers and competitors in the market have perfect information, it was seen that all brands of service stations priced their products differently than their competitors. Furthermore, Shell appears to be the price leader, because it is the first to execute any major price changes. But the data collected also exposes the petroleum companies' attempts to differentiate their products and engage in non-price competition. Even though Shell dominates in terms of the number of service stations, it doesn't seem to be exercising monopoly power over its competitors. Also, the relatively small number of firms and product price differences counter the presence of perfect competition. ✓

In effect the evidence collected supports the conclusion that the Parklands retail petroleum supply industry is an oligopoly, more specifically, a competitive oligopoly in which there is insignificant evidence to suggest the presence of a tacit collusion. [Word count: 296] ✓

Acc 3 VERY CLEAR PRESENTS

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CRITERIA B

setting?

## Introduction

The current global economic recession was accompanied with a free-fall in crude oil futures. However, this price decrease was not reflected in the local retail petroleum supply industry, sparking a controversial battle between consumers, the government and the petroleum suppliers. The consumers were disappointed that the petroleum suppliers were not willing to pass on the benefit of low crude prices in terms of lower retail petroleum prices. The government moved by asserting that the petroleum suppliers were colluding to sustain high prices and exploit consumers, and promised to regulate the prices in the industry.

To evaluate one aspect of the behavior of the petroleum industry in my small suburb of Parklands, the research question "what market form characterizes the petroleum retail supply industry in the Parklands residential suburb of Nairobi?" was formed.

## Hypothesis

It was hypothesized that the petroleum retail supply industry in Parklands residential suburb is an oligopoly. An oligopoly is a market form in which a market or industry is dominated by a small number of sellers. The proposition was based primarily on the fact that there are a very limited number of petrol service stations in Parklands.

## Method of Data collection

To investigate the research question thoroughly, a geographical cluster sampling technique was adopted where all sampling elements – petrol service stations – were no further than a three kilometer radius away from my home. The service stations that conformed to this condition were chosen using personal geographical knowledge with the aid of an online street map to measure radial distances (Appendix 1). Service stations that did not satisfy this condition were not considered since they did not belong to the population of service stations within Parklands.

Using a tabular data collection sheet, the retail prices of petroleum and diesel were recorded from their roadside sign-boards at each of the 10 service stations every day for 5 weeks from the 24<sup>th</sup> of November 2008 till the 28<sup>th</sup> of December 2008 (Appendix 2). All prices were recorded between 22:00 and 23:00 East African time. Even though the price of petrol was very unlikely to fluctuate on a daily basis, I chose to collect daily data to monitor responses of competing firms to price changes of one firm. Less frequent data collection could potentially overlook responsive time lag and step-by-step price changes.

Since each petroleum company had their own special name for petrol and sometimes diesel, these "brand names" were recorded. A list of the ancillary services that each petrol station offered was also created.

Meanwhile, secondary data was collected from the internet database of the Petroleum Institute of East Africa. This data mainly consisted of a list of oil retail companies and their relative market share.

## Data and Analysis

The research revealed that there were only 10 petrol service stations in the Parklands. In fact, those service stations belong to only five companies: Shell, Oilibya, Kenol/Kobil, Total and Caltex.

CONTEXT

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&  
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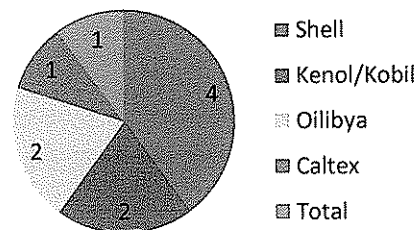
CRITERIA B  
BRIEF  
BUT  
EFFECTIVE  
B.O.D

GOOD  
EFFORT

Table 1 - Number of service stations per company in Parklands

| Company     | Number of service stations |
|-------------|----------------------------|
| Shell       | 4                          |
| Kenol/Kobil | 2                          |
| Oilibya     | 2                          |
| Caltex      | 1                          |
| Total       | 1                          |

Chart 1- Parklands service station distribution

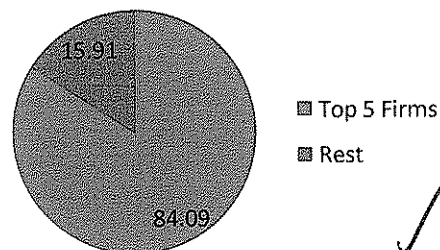


According to industry data collected from the Petroleum Institute of East Africa, these five companies control the largest market share in terms of volume of petroleum products sold in Kenya.

Table 2 – Kenyan Petroleum Industry Market shares

| Company          | MarketShare % |
|------------------|---------------|
| KENOL/KOBIL      | 24.41         |
| SHELL            | 20.57         |
| TOTAL            | 19.65         |
| CHEVRON (CALTEX) | 11.25         |
| OILIBYA          | 8.21          |
| NATIONAL         | 3.34          |
| GAPCO            | 2.48          |
| BAKRI            | 2.01          |
| ENGEN            | 1.65          |
| HASS             | 1.32          |
| GALANA           | 1.27          |
| OILCOM           | 0.63          |
| PETRO            | 0.54          |
| TRITON           | 0.39          |
| DALBIT           | 0.37          |
| MULOIL           | 0.29          |
| MGS              | 0.27          |
| INTOIL           | 0.25          |
| HASHI EMPEX      | 0.20          |
| ADDAX            | 0.18          |
| FOSSIL           | 0.18          |
| GULF             | 0.16          |
| RIVA OIL         | 0.15          |
| RIVAPET          | 0.07          |
| JADE             | 0.06          |
| PENTOIL          | 0.05          |
| METRO            | 0.02          |
| GLOBAL           | 0.02          |
| AL-LEYL          | 0.01          |
|                  | <b>100.00</b> |

Chart 2 - Kenyan petroleum industry market share, %



Petroleum Institute of East Africa

The domination of the small number of petrol firms in Parklands supports the idea that the industry is an oligopoly – a market structure characterized by a few dominant firms and high barriers to entry. Furthermore, the five-firm concentration ratio is often used to distinguish oligopolies from other market

forms. This gauge is the percentage of total market share of the five largest firms in an industry. Using table 2, this ratio (Kenol/Kobil, Shell, Total, Chevron-Caltex and Oilibya) is equal to 84.09% (Chart 2). Similarly, the five-firm concentration ratio of the Parklands petrol industry is equal to 100%. Such a high concentration implies that the market has an oligopolistic feature.

In economic terminology, there are two types of monopolies: a pure monopoly, when the market share of one firm approaches 100 percent with effectively blockaded entry, and dominant monopoly when the market share of the largest firm is over 50 percent with no close rival (Sawyer 45). Kenol/Kobil, the industry leader does not control more than 24.41% of the Kenyan market share, and thus cannot be a pure or dominant monopoly. However, in Parklands, making the crude assumption that the number of service stations is proportional to the volume of petroleum products sold, Shell controls 40% of the market share. Even though Shell may not have a high enough market share to be classified as a monopoly, in reality a monopoly is defined by how much monopoly power the firm has, that is to what extent it is able to set its own prices without worrying about competition from other firms. Prematurely, Shell's apparent domination of service station ownership may support the notion that it has monopoly power.

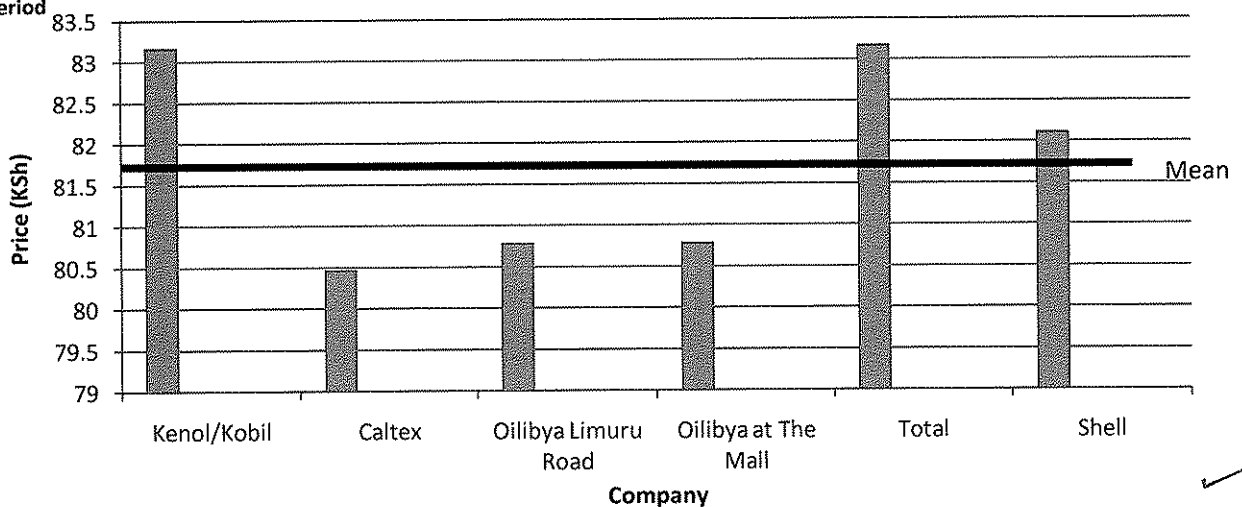
For further analysis, table 3 presents the mean weekly prices of the 10 service stations, where

$$\text{Mean} = \mu = \frac{\sum p}{7}, \text{ where } p \text{ is the price of petrol or diesel on each of the seven days of the week}^1.$$

Table 3 - Mean weekly pump prices (Ksh)

| Week | Kenol/Kobil Ojijo Road |       | Kenol/Kobil Limuru Road |       | Caltex Limuru Road |       | Oilibya Limuru Road |       | Oilibya at The Mall |       | Total Parklands Road |       | Shell Parklands Road |       | Shell Forest Road |       | Shell at The Mall |       | Shell Masaba Road |       |
|------|------------------------|-------|-------------------------|-------|--------------------|-------|---------------------|-------|---------------------|-------|----------------------|-------|----------------------|-------|-------------------|-------|-------------------|-------|-------------------|-------|
|      | Pet.                   | Dies. | Pet.                    | Dies. | Pet.               | Dies. | Pet.                | Dies. | Pet.                | Dies. | Pet.                 | Dies. | Pet.                 | Dies. | Pet.              | Dies. | Pet.              | Dies. | Pet.              | Dies. |
| 1    | 95.67                  | 88.90 | 95.54                   | 88.90 | 93.19              | 87.61 | 92.33               | 90.33 | 92.33               | 87.19 | 93.30                | 88.80 | 94.37                | 88.80 | 94.37             | 88.80 | 94.37             | 88.80 | 94.37             | 88.80 |
| 2    | 88.64                  | 84.07 | 88.64                   | 84.07 | 82.33              | 78.47 | 84.47               | 82.47 | 84.47               | 79.47 | 85.01                | 80.23 | 80.94                | 75.09 | 80.94             | 75.09 | 80.94             | 75.09 | 80.94             | 75.09 |
| 3    | 78.50                  | 74.74 | 78.10                   | 74.74 | 75.90              | 72.90 | 75.90               | 73.90 | 75.90               | 70.90 | 78.80                | 73.80 | 78.80                | 72.80 | 78.80             | 72.80 | 78.80             | 72.80 | 78.80             | 72.80 |
| 4    | 75.70                  | 72.90 | 75.70                   | 72.90 | 75.04              | 70.33 | 74.90               | 73.90 | 74.90               | 70.19 | 78.80                | 73.80 | 77.37                | 72.80 | 77.37             | 72.80 | 77.37             | 72.80 | 77.37             | 72.80 |
| 5    | 77.30                  | 72.19 | 77.30                   | 72.19 | 75.90              | 70.90 | 76.33               | 74.47 | 76.33               | 71.33 | 79.94                | 73.91 | 79.09                | 73.31 | 79.09             | 73.31 | 79.09             | 73.31 | 79.09             | 73.31 |

Chart 3 - Mean prices of petrol at different petrol stations compared with mean at all petrol stations for the entire 5 week period

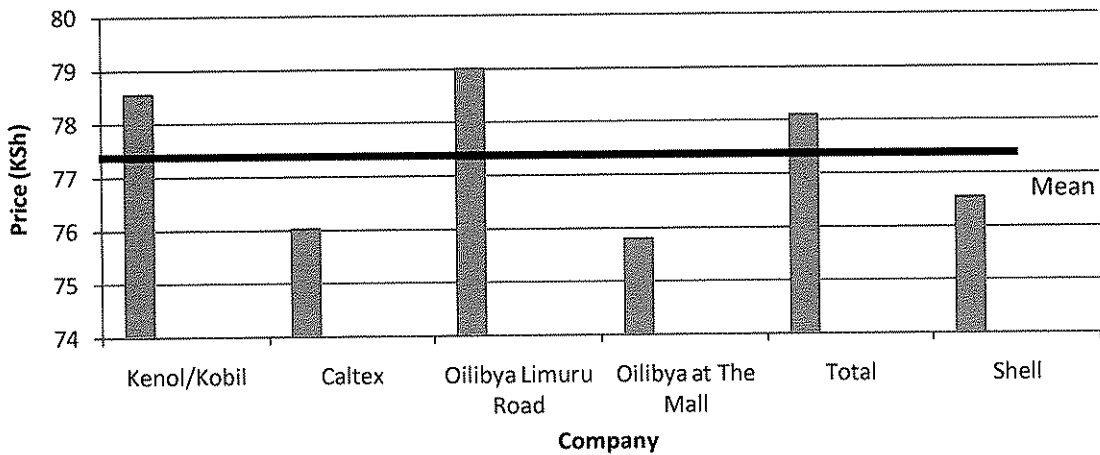


<sup>1</sup> The prices of petrol and diesel were on a downward trend throughout the study because of the decreasing price of international crude oil around this period.

*Good data  
clear used  
so far very good*



Chart 4 - Mean prices of diesel at different service stations compared with mean at all service stations for the entire 5 week period



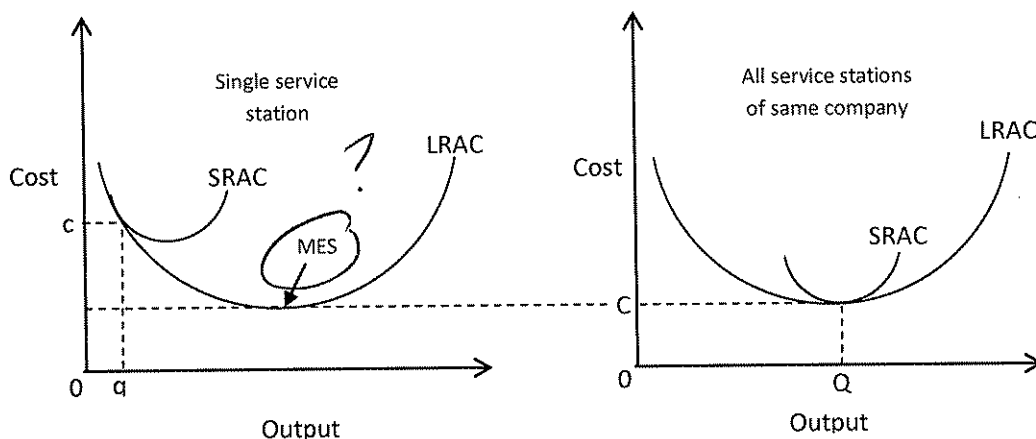
The price of the petroleum products are displayed on large road-side signboards at all times at all petrol stations, and the analysis outlined henceforth in the essay will assume that all consumers and producers have perfect information about the prices of the petroleum products offered by all firms in the industry.

An interesting observation from the table 3 is that the mean pump prices for petroleum and diesel are the same at all four Shell branded service stations throughout the investigation. This is also true for the pump prices at Kenol/Kobil's two service stations in the investigation. On the other hand, the prices for diesel at the two Oilibya service stations are not equal, with the Oilibya on Limuru Road having higher mean prices for diesel. This observation could be explained if Oilibya has different franchise rules than the other companies and that the price for diesel is higher at Oilibya on Limuru Road, because demand for diesel at Oilibya on Limuru road is higher than that at Oilibya at the Mall. Alternative explanations include the possibility that Oilibya is a price discriminator since it charges higher prices to consumers on Limuru Road than at the Mall for the same product, diesel, or that the cost of production (such as land rent) is higher on Limuru road than at the Mall so that there is price differentiation (Glanville 148).

*Good Discussion / Comment*

Moreover, it is highly unlikely that all the service stations owned by the same company have the same costs of production because of the differences in size of station (i.e. rent), number of employees and level of output, just to state a few. But since the prices are uniform across all stations of the same brand (except for diesel at Oilibya), an important inference can be made: the price of the products sold is determined by the total costs and total output of all service stations of a company rather than by the cost and output of that service station. As a result, economies of scale – long run productive efficiency attained by increasing scale of production – can be realized by those companies whose total output is sufficient such that it operates on, or closer to the minimum efficient scale (MES) (figure 1).

Figure 1 - Comparative long run average cost of production

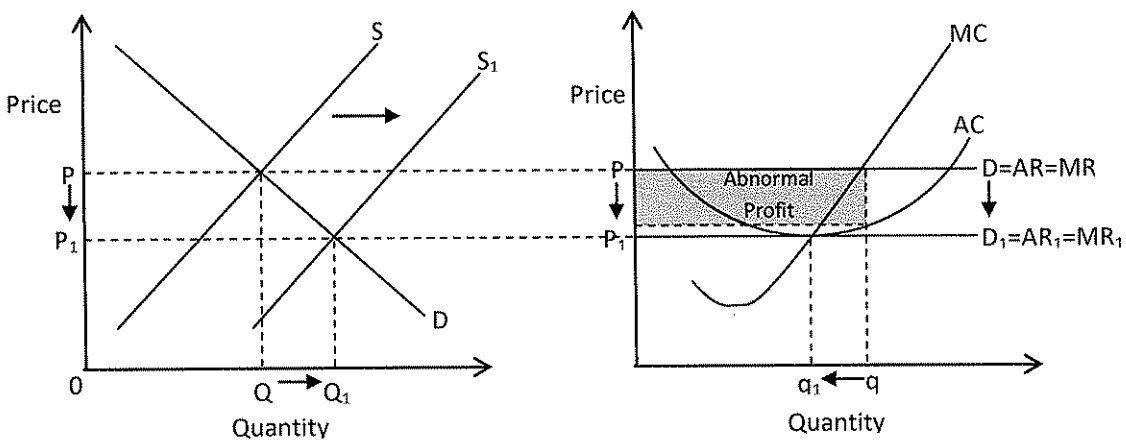


*yes explain*

*being not necessary to go through perfect competition's supply*

Assuming that all firms have a goal of maximizing profits in the short run, an industry with perfect competition would be characterized by market equilibrium prices at which the average cost of production equals the marginal cost of production. This is because if perfect competition exists, there would be a large number of firms and no barriers to entry or exit the market. This means that the firms in the industry do not have the capacity to prevent new firms from entering or old ones from exiting the industry. If the prevailing market price is such that the firms make abnormal profits (returns in excess of what is required to keep firms in production), other firms will also enter the industry in the long run, attracted by the opportunity to make abnormal profits. In effect, the added production from these new producers would increase the supply in the market, and this outcome would repeat until equilibrium price reduces to  $P_1$  in the long run and abnormal profits are eliminated (Barron and Perlick 47):

Figure 2 - Long run changes in supply, price and profit in a perfectly competitive market



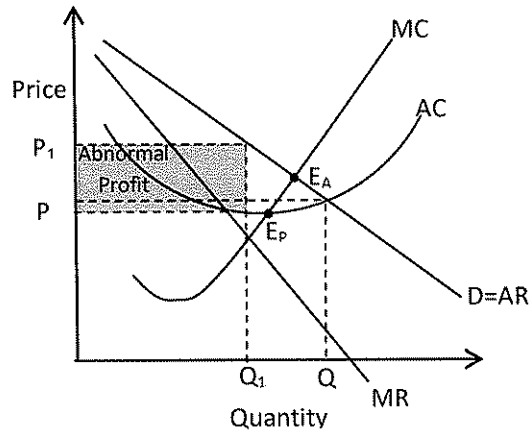
But the absence of a universal price between all market competitors, or the difference between mean weekly prices of petrol and diesel at different service stations suggests that the firms are not "price-takers" and that perfect competition is absent. There also seems to be a high barrier to entry in the market, partly because of the lack of unused prime land for setup, which reinforces the absence of free competition.

Another market structure is monopolistic competition, which shares many characteristics of a perfectly competitive market, especially extremely competitive prices, very low barriers to entry, and quick erosion of supernormal profits. Even though firms that compete monopolistically attempt to distinguish their products from competitors (such as the firms in the Parklands petroleum industry), there are typically a large number of firms in the market. Hence, together with the reasoning outlined in the previous paragraph, we can also eliminate the presence of monopolistic competition.

As aforementioned, Shell's dominance in the number of service stations in Parklands could potentially mean it is a monopoly. A monopoly has a large market share and is a significant part of the industry, thus the demand curve for its goods is effectively downward sloping. As a result, a monopoly firm can control the price of the goods or services it sells (or control the quantity, but not both simultaneously). Because of the downward sloping demand curve it faces, its marginal revenue curve is below the demand curve. But since profit per unit sold is defined as the average revenue (AR) minus the average cost of production (AC), the firm would make abnormal profits as long as quantity sold is lower than  $Q$ :

*Good connection of theory to the area of study.*

Figure 3 - Monopoly costs, revenues and profit



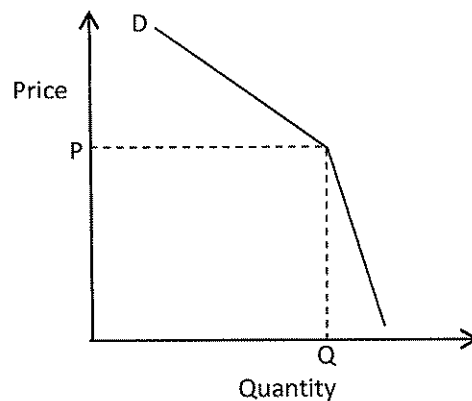
As long as the monopoly firm maintains effective barriers to entry in the industry, it can sustain abnormal profits, and afford to avoid allocative efficiency  $E_A$  (when no resources are wasted) and productive efficiency  $E_P$  (when a firm produces output with minimum input). However, Shell doesn't seem to have erected a barrier to entry in the Parklands petrol industry since other firms are also present. At the same time, when mean weekly prices of petrol and diesel at Shell are compared with those at other service stations, they are not at any time during the investigation significantly higher than those at other service stations. This may imply that Shell does not have enough monopoly power to set its own prices without worrying about competition from other firms. Hence we can eliminate the possibility that the industry is characterized by a monopoly.

On the other hand, there is evidence that the industry is an oligopoly, with the existence of only five dominant firms.

Now that, through the process of elimination, it has been established that an oligopoly market form characterizes the industry, we can analyze the collected data to determine if it is one of the two types of oligopolies: competitive oligopoly, or cooperative oligopoly. It is crucial to note that the small number of firms in an oligopoly makes them highly interdependent.

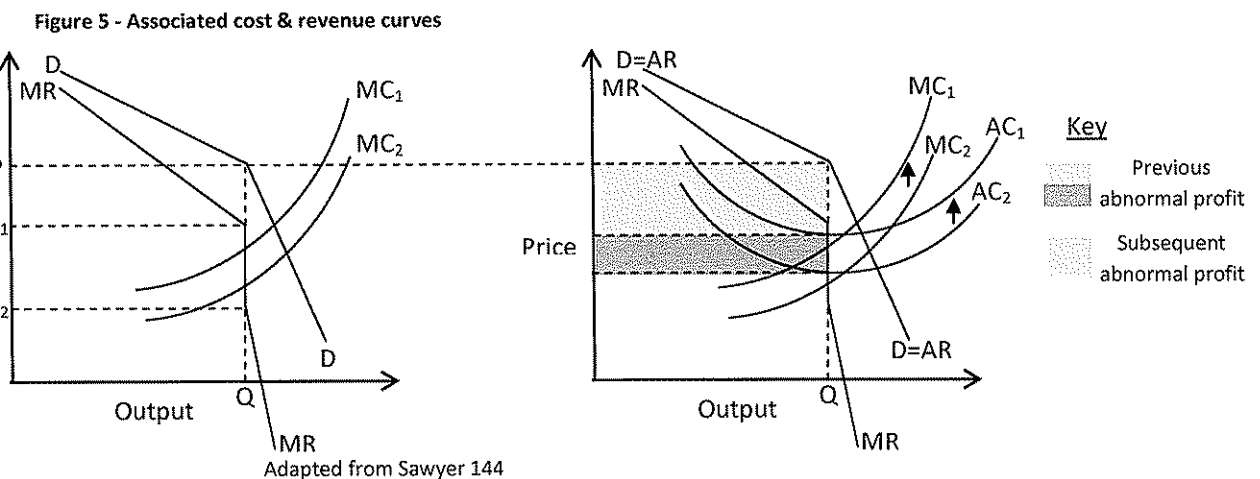
The kinked-demand theory explains the behavior of competitive oligopolies. The law of demand governs the downward sloping nature of the demand curves. For the extreme market forms of perfect competition and monopoly, the demand curve is a continuous function. However, according to one economic model, the demand curve in an oligopoly market is kinked:

Figure 4 - Oligopoly kinked demand curve



We can safely assume that the petroleum products are homogenous. Then, if one of the few firms of an oligopoly, firm Z, decides to increase prices for its product above  $P$  in an attempt to increase revenues, it will face an elastic demand. This is because the other firms will not increase their prices, and thus consumers reduce their demand for the products offered by firm Z, and instead opt to consume the substitutes offered by the competing firms. In effect, firm Z will lose revenue. On the other hand, if firm Z decides to reduce prices for its product below  $P$  in an attempt to increase revenues, it will face an inelastic demand. This is because the other firms will fear losing market share to firm Z, and as a consequence they will also reduce their prices. If all firms reduce prices, firm Z will gain little extra demand from its initiative. As a result, the demand below price  $P$  is inelastic and firm Z would lose revenue if it were to reduce the price of its product. In both cases, the firm's perceived notion of its rival's responses makes it reluctant to change prices for the fear of making it worse off. Since the reaction to the change in price by firm Z is asymmetric, the demand curve is kinked (figure 4). This provides a brief insight into why the firms in an oligopoly have no economic incentive to increase or decrease prices, and thus why the prices are more rigid and seem to change far less than in perfectly competitive markets.

Still, an advanced analysis of the price rigidity and disinclination to reduce (or increase) prices is seen when one considers the marginal costs and revenues associated with a kinked demand curve:



Since the demand curve is kinked at output  $P$ , the marginal revenue curve is vertical at this level of output due to the mathematical relationship between demand and marginal revenue (strictly speaking, it is discontinuous at this output). Once again, if we assume that the goal of the firm is to maximize profit in the short run, profit maximization occurs when marginal cost is equal to marginal revenue, and the firm would produce  $Q$  units when the price is  $P$ . Hence the marginal cost curve must cut the marginal revenue curve at output  $Q$ , at a corresponding price between  $P_1$  and  $P_2$ . Mathematically, this means that there could be an infinite number of possible marginal cost curves which would produce a price of  $P$  at an output of  $Q$ . For instance, it could be  $MC_1$  or even  $MC_2$ . If the marginal cost curve is  $MC_2$ , then a rise in costs to  $MC_1$  would not result in any change in price. As a result, the oligopolist firm would have to bear the full incidence of the increase in production costs by reducing its abnormal profits (shown in Fig. 5). Conversely, a fall in marginal costs from  $MC_1$  to  $MC_2$  will not cause a change in price, and the oligopolist firm will benefit entirely from the cost decrease by increasing its abnormal profit (Clarke 52). This explains why a change in the underlying cost of production does not lead to a change in price in an oligopoly, unless of course if the change in the marginal cost of production is so significant such that it does not cut the marginal revenue curve at output  $Q$ . It seems that the rapidly falling prices

Mainly  
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with  
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price

TDD pennebral

of crude oil in the international market during the time period of the investigation significantly lowered the marginal cost of production of the oligopoly firms in the investigation, as a result of which the prices of petroleum did not stay rigid but decreased. The theory of contestable markets – an argument that the threat of competition determines price – would explain that the price falls are a result of the threat of new firms entering the industry to share the abnormal profits (George, Joll and Lynk 276). But the condition that there be easy entry and especially exit to and from the market is not adequately satisfied, so the market is not highly contestable, and the price falls are a result of actual competition between industry incumbents.

A collusive oligopoly can further be subdivided into one with a tacit (covert) collusion or one with an overt collusion. (Collusion is a situation where two or more firms agree to cooperate with each other on a certain strategy for reciprocal benefit).

*WHAT ABOUT COVERT COLLUSION?*

When cooperation among firms in an industry is overt, it is called a cartel. Such an arrangement is illegal in Kenya, ruling out the possibility that this type of market form characterizes the Parklands petroleum industry. ~~However, a tacit collusion may exist.~~

Closer inspection of the daily collected data reveals that Shell is usually the first industry player to reduce prices, after which other companies follow suit. This behavior in which one company sets the price which other competitors adjust to, is known as price leadership, and is one of the principle characteristics of a tacit collusion. Since we are working under the assumption that all consumers and suppliers have perfect information about the market, Shell's leading price cuts allows it to earn more revenue. Due to the homogenous nature of petroleum products, consumers could immediately substitute their demands by consuming Shell products (in the time period during which prices at other petrol stations have not yet decreased), and Shell would benefit from increased revenue.

The tendency for firms to collude tacitly can be explained by game theory – a branch of applied mathematics that analyses strategic situations – more specifically a non-zero sum game (Glazer and Hirshleifer 296). A non-zero sum game is when the outcomes do not sum to zero that is one game player's benefit is not equal to the other player's loss. We can consider the case of a perfect duopoly (an oligopoly with only two firms that have equal market share) between firms 1 and 2 who both play a price game. Either firm can choose to sell its product at either Ksh 70 or Ksh 80. If either firm chooses to charge Ksh 80 while the other chooses to charge Ksh 70, the firm that chooses Ksh 80 will suffer a loss in market share while the other will encounter a gain. However, if both choose to charge Ksh 70, then neither firm will gain any market share over the other, but both firms will experience decreased average revenues and thus lower profits. Nevertheless, if they both choose to charge Ksh 80, then neither firm will have any market share advantage over the other and both will earn higher profits. Choosing arbitrary (but realistic) values for the profits that the firms make in each scenario, this game can be expressed as a matrix:

Table 4 - Game theory: strategy-outcome matrix

|                 | Firm 1 – Ksh 70   | Firm 1 – Ksh 80   |
|-----------------|---|---|
| Firm 2 – Ksh 70 | Each firm earns Ksh 20 profit                               | Firm 1 earns Ksh 10 profit while Firm 2 earns Ksh 40 profit |
| Firm 2 – Ksh 80 | Firm 1 earns Ksh 40 profit while Firm 2 earns Ksh 10 profit | Each firm earns Ksh 70 profit                               |

In game theory, the Nash Equilibrium is a situation where each player is making the best strategic decision while taking the other players decisions into account. For the example outlined above, the Nash equilibrium is the situation where each firm is making the best sales decision given the possible reactions of the other firm, and it is set at both firms choosing to charge Ksh 70 for their product. Each firm is afraid of losing revenue if it decides to charge Ksh 80 while the other firm starts charging Ksh 70. This means that even though both firms receive greater returns when they both charge Ksh 80, this would be an unstable arrangement because each firm would be tempted to lower their price to increase returns. Hence in the long run, the equilibrium price would be set at Ksh 70 for both firms.

However, since the firms suffer reduced profits by playing at the Nash Equilibrium, they could possibly choose to cooperate by colluding tacitly to charge Ksh 80, so as to increase payoffs.

If such a game were played between five players, reminiscent of the Parklands industry, it would be much more complex with  $2^5$  outcomes. In reality, each of the five firms can have numerous strategic options. Yet all players would benefit most from cooperation through a tacit collusion, and would be tempted to make one.

However, a significant part of the data collected shows that the service stations actually compete against each other for customers, by using non-price competition. Non-price competition is a marketing approach in which one firm tries to distinguish its product or service from competing products on the basis of attributes like design and workmanship. It is a way of competing against other firms by distinguishing its products rather than competing with other firms centering on low price (Brue and McConnell 437).

Table 5 - Retail product names

| Company     | Petrol Retail Name | Diesel Retail Name |
|-------------|--------------------|--------------------|
| Shell       | V-Power            | Diesel extra       |
| Oilibya     | Unleaded super     | Diesel             |
| Kenol/Kobil | Unleaded premium   | Low-sulfur diesel  |
| Total       | Unleaded Premium   | Low-sulfur diesel  |
| Caltex      | Premium unleaded   | Diesel             |

Each company's service station has their own special retail name for their petroleum products. Since all refined petroleum products are supplied to Nairobi as homogenous products using the same pipeline, this is a product differentiation technique designed to attract more demand by convincing consumers that their product is different and more attractive than that of other companies. Shell has the "most different" names for its products, which helps it to lure demand by instilling the concept of brand loyalty to its consumers.

In addition, the service stations offer several other services besides retail petroleum supply.

Table 6 - Supplementary services offered

| Company     | Restaurant/<br>Fast food chain | Free engine<br>oil<br>inspection | Free<br>windscreen<br>wash | 24<br>hour<br>"Quick" shop | Supply<br>of<br>LPG<br>cylinders | Car Wash |
|-------------|--------------------------------|----------------------------------|----------------------------|----------------------------|----------------------------------|----------|
| Shell       | ✓                              | ✓                                | ✓                          | ✓                          | ✓                                |          |
| Oilibva     | ✓                              | ✓                                | ✓                          | ✓                          | ✓                                | ✓        |
| Kenol/Kobil |                                | ✓                                | ✓                          | ✓                          |                                  | ✓        |
| Total       |                                | ✓                                | ✓                          | ✓                          | ✓                                |          |
| Caltex      |                                | ✓                                | ✓                          | ✓                          |                                  |          |

*Good evidence*

These additional services provide added convenience to most consumers. When the service stations offer a wider range of services, a consumer's travel costs are cut since they can now satisfy many of their demands at one place. It seems that service stations like Oilibya attempt to attract consumers by offering a wider range of services for this purpose, so that the demand for its petroleum products rises. Furthermore, most petrol stations are located on the main roads surrounding Parklands (appendix 1) which makes gives them the advantage of proximity to heavy traffic. In fact, the service stations which are in direct line of sight with each other such as the Kenol/Kobil and Caltex on Limuru Road, and the Shell and Oilibya at the Mall offer their products for different prices, and rely solely on these non-price tactics to compete against each other.

## Conclusion

The retail petroleum supply industry in Parklands is characterized by a small number of service stations owned by a small number of petrol companies. The prices of petrol and diesel collected at the service stations over the time period showed that all companies offer their products at different prices. Furthermore, attempts at product differentiation and the rigid market equilibrium prices are evident. These factors provide significant evidence to conclude that the hypothesis that was formulated at the beginning of this essay is correct, and that the market is indeed characterized by an oligopoly.

However, the data showed that even though the mean prices for the products is similar, and that Shell was the first to implement major changes in price – after which other companies closely complied. This evidence could lead to the notion that the firms in the oligopoly are operating under a tacit collusion and are not engaged in price wars.

But closer analysis uncovers that even though all the petroleum prices do not vary significantly from the mean, the prices are not the same, and the time lag between the price changes of one company and the other strongly hint that tacit collusion may not be present. In fact, the extensive non-price competition and the rigid prices (kinked-demand curve theory) reinforce the conclusion that the oligopoly is competitive.

Thus the evidence of competition between the oligopolists is greater than the evidence for collusion among them, and it can be concluded with support, that the retail petroleum supply industry in Parklands is characterized by a competitive oligopoly market form.

The investigation had some limitations. Interviews with service station staff who are familiar with pricing strategy could have been conducted as a simple way of recognizing or dismissing tacit collusion. Moreover, if access to data on sales volumes and production costs had been granted, industry specific data such as elasticity of demand (responsiveness of quantity demanded to change in price) could be calculated. This would help an advanced analysis of the kinked demand curve theory, barriers to entry and also contestability.

Finally, the essay was based on the underlying assumption that the petroleum market operates under perfect information. Surveys of drivers at different petrol stations would reveal the true extent of consumer knowledge of prices at other service stations (and also other details such as the degree to which extra services influence their choice of service station), which could open up the possibility for further evaluation of the oligopoly.

— CLEARLY WRITTEN, GOOD USE OF [Word count – 3980] ✓

— INTEGRATED + THOROUGH

— NOT PERFECT BUT A VERY GOOD PIECE OF WORK ✓

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# Appendices

## Appendix 1

Map of Parklands showing sampling units



Source: Europa Technologies

Appendix 2

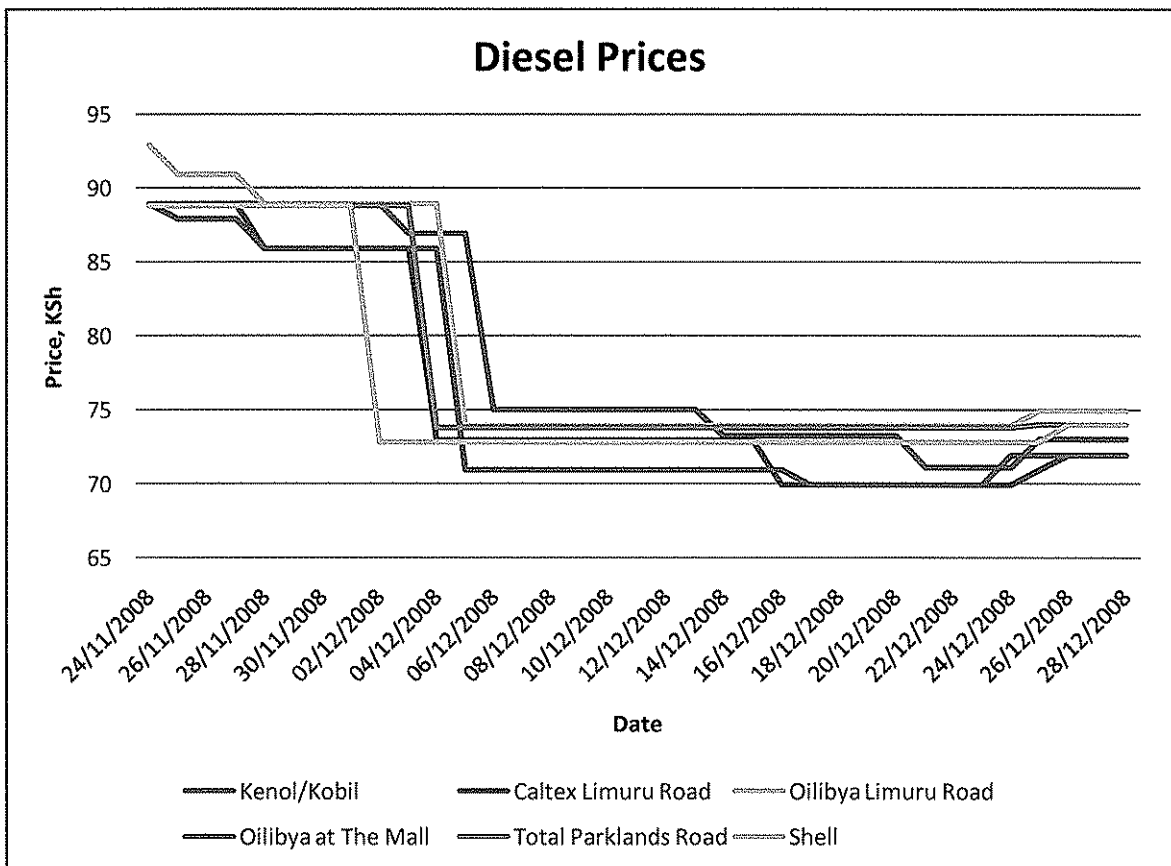
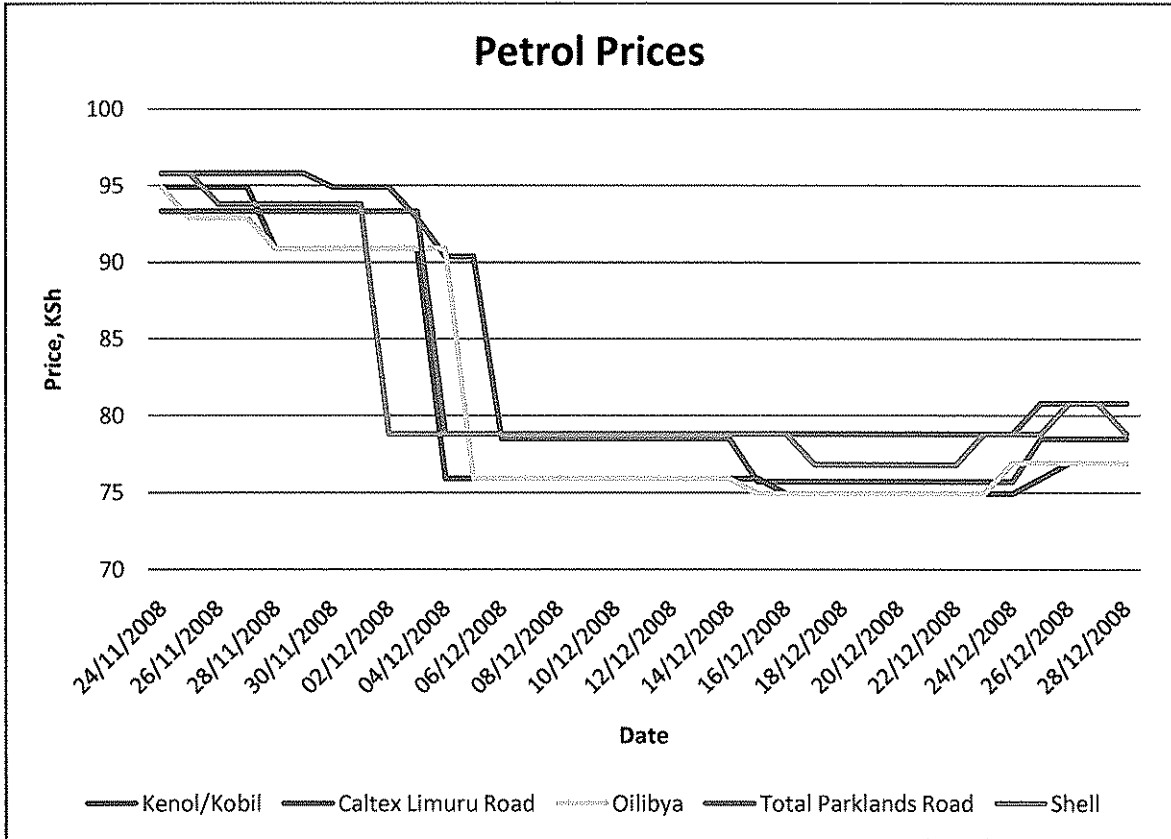
Raw data: Petrol & diesel prices in Ksh at service stations between 24<sup>th</sup> November and 28<sup>th</sup> December 2008

| Service station | Kenol/ Kobil Ojjo Road |         | Kenol/ Kobil Limuru Road |         | Caltex Limuru Road |         | Oilibya Limuru Road |         | Oilibya at The Mall |         | Total Parklands Road |         | Shell Parklands Road |         | Shell Forest Road |         | Shell at The Mall |         | Shell Masaba Road |         |
|-----------------|------------------------|---------|--------------------------|---------|--------------------|---------|---------------------|---------|---------------------|---------|----------------------|---------|----------------------|---------|-------------------|---------|-------------------|---------|-------------------|---------|
|                 | Petr ol                | Die sel | Petr ol                  | Die sel | Petr ol            | Die sel | Petr ol             | Die sel | Petr ol             | Die sel | Petr ol              | Die sel | Petr ol              | Die sel | Petr ol           | Die sel | Petr ol           | Die sel | Petr ol           | Die sel |
| 24/11/08        | 95.80                  | 88.90   | 95.80                    | 88.90   | 94.90              | 88.90   | 94.90               | 92.90   | 94.90               | 88.90   | 93.30                | 88.80   | 95.80                | 88.80   | 95.80             | 88.80   | 95.80             | 88.80   | 95.80             | 88.80   |
| 25/11/08        | 95.80                  | 88.90   | 95.80                    | 88.90   | 94.90              | 88.90   | 92.90               | 90.90   | 92.90               | 87.90   | 93.30                | 88.80   | 95.80                | 88.80   | 95.80             | 88.80   | 95.80             | 88.80   | 95.80             | 88.80   |
| 26/11/08        | 95.80                  | 88.90   | 95.80                    | 88.90   | 94.90              | 88.90   | 92.90               | 90.90   | 92.90               | 87.90   | 93.30                | 88.80   | 93.80                | 88.80   | 93.80             | 88.80   | 93.80             | 88.80   | 93.80             | 88.80   |
| 27/11/08        | 95.80                  | 88.90   | 95.80                    | 88.90   | 94.90              | 88.90   | 92.90               | 90.90   | 92.90               | 87.90   | 93.30                | 88.80   | 93.80                | 88.80   | 93.80             | 88.80   | 93.80             | 88.80   | 93.80             | 88.80   |
| 28/11/08        | 95.80                  | 88.90   | 95.80                    | 88.90   | 90.90              | 85.90   | 90.90               | 88.90   | 90.90               | 85.90   | 93.30                | 88.80   | 93.80                | 88.80   | 93.80             | 88.80   | 93.80             | 88.80   | 93.80             | 88.80   |
| 29/11/08        | 95.80                  | 88.90   | 94.90                    | 88.90   | 90.90              | 85.90   | 90.90               | 88.90   | 90.90               | 85.90   | 93.30                | 88.80   | 93.80                | 88.80   | 93.80             | 88.80   | 93.80             | 88.80   | 93.80             | 88.80   |
| 30/11/08        | 94.90                  | 88.90   | 94.90                    | 88.90   | 90.90              | 85.90   | 90.90               | 88.90   | 90.90               | 85.90   | 93.30                | 88.80   | 93.80                | 88.80   | 93.80             | 88.80   | 93.80             | 88.80   | 93.80             | 88.80   |
| 1/12/08         | 94.90                  | 88.90   | 94.90                    | 88.90   | 90.90              | 85.90   | 90.90               | 88.90   | 90.90               | 85.90   | 93.30                | 88.80   | 93.80                | 88.80   | 93.80             | 88.80   | 93.80             | 88.80   | 93.80             | 88.80   |
| 2/12/08         | 94.90                  | 88.90   | 94.90                    | 88.90   | 90.90              | 85.90   | 90.90               | 88.90   | 90.90               | 85.90   | 93.30                | 88.80   | 78.80                | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   |
| 3/12/08         | 92.90                  | 86.90   | 92.90                    | 86.90   | 90.90              | 85.90   | 90.90               | 88.90   | 90.90               | 85.90   | 93.30                | 88.80   | 78.80                | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   |
| 4/12/08         | 90.40                  | 86.90   | 90.40                    | 86.90   | 75.90              | 72.90   | 90.90               | 88.90   | 90.90               | 85.90   | 78.80                | 73.80   | 78.80                | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   |
| 5/12/08         | 90.40                  | 86.90   | 90.40                    | 86.90   | 75.90              | 72.90   | 75.90               | 73.90   | 75.90               | 70.90   | 78.80                | 73.80   | 78.80                | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   |
| 6/12/08         | 78.50                  | 75.00   | 78.50                    | 75.00   | 75.90              | 72.90   | 75.90               | 73.90   | 75.90               | 70.90   | 78.80                | 73.80   | 78.80                | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   |
| 7/12/08         | 78.50                  | 75.00   | 78.50                    | 75.00   | 75.90              | 72.90   | 75.90               | 73.90   | 75.90               | 70.90   | 78.80                | 73.80   | 78.80                | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   |
| 8/12/08         | 78.50                  | 75.00   | 78.50                    | 75.00   | 75.90              | 72.90   | 75.90               | 73.90   | 75.90               | 70.90   | 78.80                | 73.80   | 78.80                | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   |
| 9/12/08         | 78.50                  | 75.00   | 78.50                    | 75.00   | 75.90              | 72.90   | 75.90               | 73.90   | 75.90               | 70.90   | 78.80                | 73.80   | 78.80                | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   |
| 10/12/08        | 78.50                  | 75.00   | 78.50                    | 75.00   | 75.90              | 72.90   | 75.90               | 73.90   | 75.90               | 70.90   | 78.80                | 73.80   | 78.80                | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   |
| 11/12/08        | 78.50                  | 75.00   | 78.50                    | 75.00   | 75.90              | 72.90   | 75.90               | 73.90   | 75.90               | 70.90   | 78.80                | 73.80   | 78.80                | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   |
| 12/12/08        | 78.50                  | 75.00   | 78.50                    | 75.00   | 75.90              | 72.90   | 75.90               | 73.90   | 75.90               | 70.90   | 78.80                | 73.80   | 78.80                | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   |
| 13/12/08        | 78.50                  | 75.00   | 78.50                    | 75.00   | 75.90              | 72.90   | 75.90               | 73.90   | 75.90               | 70.90   | 78.80                | 73.80   | 78.80                | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   |
| 14/12/08        | 78.50                  | 73.20   | 75.70                    | 73.20   | 75.90              | 72.90   | 75.90               | 73.90   | 75.90               | 70.90   | 78.80                | 73.80   | 78.80                | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   |
| 15/12/08        | 75.70                  | 73.20   | 75.70                    | 73.20   | 75.90              | 72.90   | 74.90               | 73.90   | 74.90               | 70.90   | 78.80                | 73.80   | 78.80                | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   |
| 16/12/08        | 75.70                  | 73.20   | 75.70                    | 73.20   | 74.90              | 69.90   | 74.90               | 73.90   | 74.90               | 70.90   | 78.80                | 73.80   | 78.80                | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   |
| 17/12/08        | 75.70                  | 73.20   | 75.70                    | 73.20   | 74.90              | 69.90   | 74.90               | 73.90   | 74.90               | 69.90   | 78.80                | 73.80   | 76.80                | 72.80   | 76.80             | 72.80   | 76.80             | 72.80   | 76.80             | 72.80   |
| 18/12/08        | 75.70                  | 73.20   | 75.70                    | 73.20   | 74.90              | 69.90   | 74.90               | 73.90   | 74.90               | 69.90   | 78.80                | 73.80   | 76.80                | 72.80   | 76.80             | 72.80   | 76.80             | 72.80   | 76.80             | 72.80   |
| 19/12/08        | 75.70                  | 73.20   | 75.70                    | 73.20   | 74.90              | 69.90   | 74.90               | 73.90   | 74.90               | 69.90   | 78.80                | 73.80   | 76.80                | 72.80   | 76.80             | 72.80   | 76.80             | 72.80   | 76.80             | 72.80   |
| 20/12/08        | 75.70                  | 73.20   | 75.70                    | 73.20   | 74.90              | 69.90   | 74.90               | 73.90   | 74.90               | 69.90   | 78.80                | 73.80   | 76.80                | 72.80   | 76.80             | 72.80   | 76.80             | 72.80   | 76.80             | 72.80   |
| 21/12/08        | 75.70                  | 71.10   | 75.70                    | 71.10   | 74.90              | 69.90   | 74.90               | 73.90   | 74.90               | 69.90   | 78.80                | 73.80   | 76.80                | 72.80   | 76.80             | 72.80   | 76.80             | 72.80   | 76.80             | 72.80   |
| 22/12/08        | 75.70                  | 71.10   | 75.70                    | 71.10   | 74.90              | 69.90   | 74.90               | 73.90   | 74.90               | 69.90   | 78.80                | 73.80   | 76.80                | 72.80   | 76.80             | 72.80   | 76.80             | 72.80   | 76.80             | 72.80   |
| 23/12/08        | 75.70                  | 71.10   | 75.70                    | 71.10   | 74.90              | 69.90   | 74.90               | 73.90   | 74.90               | 69.90   | 78.80                | 73.80   | 78.80                | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   |
| 24/12/08        | 75.70                  | 71.10   | 75.70                    | 71.10   | 74.90              | 69.90   | 76.90               | 73.90   | 76.90               | 71.90   | 78.80                | 73.80   | 78.80                | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   | 78.80             | 72.80   |
| 25/12/08        | 78.50                  | 73.00   | 78.50                    | 73.00   | 75.90              | 70.90   | 76.90               | 74.90   | 76.90               | 71.90   | 80.80                | 74.00   | 80.80                | 74.00   | 80.80             | 74.00   | 80.80             | 74.00   | 80.80             | 74.00   |
| 26/12/08        | 78.50                  | 73.00   | 78.50                    | 73.00   | 76.90              | 71.90   | 76.90               | 74.90   | 76.90               | 71.90   | 80.80                | 74.00   | 80.80                | 74.00   | 80.80             | 74.00   | 80.80             | 74.00   | 80.80             | 74.00   |
| 27/12/08        | 78.50                  | 73.00   | 78.50                    | 73.00   | 76.90              | 71.90   | 76.90               | 74.90   | 76.90               | 71.90   | 80.80                | 74.00   | 80.80                | 74.00   | 80.80             | 74.00   | 80.80             | 74.00   | 80.80             | 74.00   |
| 28/12/08        | 78.50                  | 73.00   | 78.50                    | 73.00   | 76.90              | 71.90   | 76.90               | 74.90   | 76.90               | 71.90   | 80.80                | 74.00   | 80.80                | 74.00   | 80.80             | 74.00   | 80.80             | 74.00   | 80.80             | 74.00   |

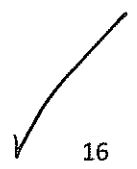


**Appendix 3**

Line Graphs: Petrol & diesel prices in Ksh at service stations between 24<sup>th</sup> November and 28<sup>th</sup> December 2008



*WHY NOT USE SAME KEY COLOURS ON BOARD DIAGRAM?*



**Assessment form (for examiner use only)**

|                          |   |   |  |
|--------------------------|---|---|--|
| Candidate session number | 0 | 0 |  |
|--------------------------|---|---|--|

| Assessment criteria |   | Achievement level                       |         |  |
|---------------------|---|---|---------|--|
|                     |   | First examiner                          | maximum | Second examiner                              |
| A                   | research question   | 2 ✓                                     | 2       | 2 ✓  |
| B                   | introduction  | 2 ✓                                     | 2       | 2 ✓  |
| C                   | investigation<br><i>P.O.O</i>                                   | 4 ✓                                     | 4       | 3 ✓ <i>- A but too much separate things!</i> |
| D                   | knowledge and understanding<br><i>Research v. food products</i> | 4 ✓                                     | 4       | 4 ✓  |
| E                   | reasoned argument   | 4 <input checked="" type="checkbox"/> ✓ | 4       | 4 ✓  |
| F                   | analysis and evaluation   | 3 <input checked="" type="checkbox"/> ✓ | 4       | 3 ✓  |
| G                   | use of subject language   | 4 ✓                                     | 4       | 4 ✓  |
| H                   | conclusion  | 2 ✓                                     | 2       | 2 ✓  |
| I                   | formal presentation   | 4 ✓                                     | 4       | 4 ✓  |
| J                   | abstract  | 2 ✓                                     | 2       | 2 ✓  |
| K                   | holistic judgment   | 3 ✓                                     | 4       | 3 ✓  |
| Total out of 36     |   | 34 ✓                                    |         | 33 ✓   |

Name of first examiner: \_\_\_\_\_  
(CAPITAL letters)

Examiner number: \_\_\_\_\_

Name of second examiner: \_\_\_\_\_  
(CAPITAL letters)

Examiner number: \_\_\_\_\_