

Determinants of Consumer Oil Prices in Kenya

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Abstract: It has been argued variously that the retail petroleum prices in Kenya don't closely reflect the true costs of product supply. In particular, petroleum prices do not seem to change in tandem with shocks in the international crude oil prices. The general objective of this study was to investigate the determinants of consumer oil prices in Kenya. Specifically, the study sought; to determine the effect of crude oil cost on consumer oil prices in Kenya; to examine the effect of oil distribution costs on consumer oil prices in Kenya; and to establish the effect of oil taxes on consumer oil prices in Kenya. The study was anchored on the cost push theory and demand pull theory, based on secondary data and applied a descriptive research design. Data was collected from 2007 to 2016 on monthly basis. The data was analyzed using Eviews statistical software. The study tested for unit root and cointegration. The study used the Vector Autoregressive (VAR) and Vector Error correction (VECM) models to correct the cointegration error. The short run VECM model found a positive and significant relationship between oil distribution costs and consumer oil prices with a one period lag. However, crude oil costs and oil taxes were found to be insignificant. In the long run, the study concluded that oil import prices have a significant pass-through effect into consumer oil prices. The study recommends the need to allow for competitive oil market where forces of demand and supply determine the oil prices without government intervention.

Keywords: Consumer Price Index (CPI), Crude Oil Costs, Oil Distribution Costs, Oil Taxes, Pass-Through Effect.

I. INTRODUCTION

1.1 Background of the Study:

Oil is said to be one of the most important commodities used in any modern industrial economy. A number of studies support this notion as they emphasize that oil has many economic uses around the world. These include amongst others studies such as Duma, (2008); Bendi, (2008); Chris, (2010) and Sukati, (2013). These studies concede that oil is crucial for the global economy as it can be used as a major input in producing petroleum products such as petrol, diesel, paraffin and fuelling transportation. However, a common view amongst these studies is that if the cost of intermediate input (oil) rise, so should the cost of the end output. This implies that producers are likely to respond to a rise in oil prices by increasing the prices of the final product.

Oil was initially traded for its fundamental purposes, but over time gained a permanent place in the investment portfolio. Oil and its derivatives are specific with high liquidity, volatility and relatively high profit opportunities for investors. Price formation is an important factor influencing the oil market. Determining the price of this commodity is derived from the market mechanism (the relationship of the global and regional supply and demand). According to Baláz (2002), the oil market is differentiated from other commodity market by certain specifics. Oil market shows considerable deviation from the perfect market, where the price range is just above marginal costs. There are many reasons, but mainly it is caused by an attempt of the dominant producers to control the sale prices. Quoting price of oil affects the pricing of all major oil producers and they regulate the supply of oil in order to achieve price targets. This market is also largely determined by political factors and internal situations in major producing and consuming countries, as well as international conflicts and tensions.

Efficient, reliable and competitively priced energy supplies are prerequisites for accelerating economic growth. For any developing country, the strategy to obtain and meet the energy requirements and energy developments are the integral part

of the overall economic strategy. Efficient use of resources and long-term sustainability in its utilization is of prime importance for economic development.

Sustainability would take into account not only available natural resources but also to take care of the related ecological and social aspects to meet the priority needs of the economy. Simultaneous and concurrent action is, therefore, necessary to ensure that the short-term concerns do not detract the economy away from the long-term goals (Mohaddes & Mehdi, 2011).

Changes in crude oil price are the global phenomena that felt by each country in the world. The oil price impact is in particular influential in determining the economies of emerging countries as these economies are not financially stable and are weak to the influences of external shocks. One of the main impacts from oil price changes is on inflation rate/changes on prices. Fluctuation in inflation or price levels may further lead to economic changes which will affect the economic performance in overall. Due to this reason, inflation rate is seen as the main economic indicator to imply the economic condition/ performance. Hence, price stability and low inflation are also the main policy objectives that are targeted by policymakers (Kilian, 2014).

The analysis on the pass-through effect of oil price changes on domestic consumer prices is originated from the concept of exchange rate pass-through. We modify the exchange rate pass-through (ERPT) equation to include the oil price variable so that our analyses permit interpretation on the effect of oil price changes on domestic inflation/ price changes. The oil price pass-through rate measures the percentage changed in domestic consumer prices led by a one percentage changed in the oil price (Kilian, 2014).

India, for example, meets nearly 35 per cent of its total energy requirements through imports. With the increase in share of hydrocarbons in the energy supply/use, this share of imported energy is expected to increase. The challenge, therefore, is to secure adequate energy supplies at the least possible cost. Although growth of the energy sector is moderate and has, to some extent, served the country's social needs, it has put tremendous pressure on the Government's budget (Schwartz, 2004). Energy is essential for living and vital for development. Affordable energy directly contributes to reducing poverty, increasing productivity and improving quality of life. In the UK, households that spend less than 10% of their income on heating their homes are officially stated to suffer from fuel poverty.

In the case of India, there is no such identification; as a result, some poor do not have access to minimum energy resources and its utilization for the quality life. Likewise lack of access to reliable energy is a severe impediment to sustainable social development and economic growth.

High oil prices have prompted increased investments in the Exploration and Production (E&P) sector, posing new challenges for the sector in the form of increased cost of operations due to high service costs, exposure to logistically difficult terrain and shortage of technical manpower. Global refining scenario indicates very little to negligible addition in capacities in major developed consuming markets like the USA and the European countries. Developing countries like the Middle East, China and India are fast emerging as refining hubs. Needless to say that capacity augmentation in these regions would also result into possible integration of both the refining and petrochemicals business (Schwartz, 2004).

McCarthy (2010) emphasizes that a rise in oil prices lead to a rise in the production costs in firms that uses oil as a major input in their production processes and this will results in a rise in prices of the end products. Similarly, Kojima (2011) emphasizes that an increase in oil prices has a negative effect on oil-importing countries making their input costs greater. Kojima (2011) studied the vulnerability of oil importing countries in selected African countries and found that the vulnerability increased to 82% over a five year period ending in 2008. Africa had the highest share of countries in which rising oil prices worsened the vulnerability of oil price shocks.

The Department of Minerals and Energy (DME) (2010) shows that the rise in oil demand as an energy source has resulted in South Africa's growing dependence on external sources for its domestic crude oil needs, within a substantial increase in world oil prices. In its 2014 annual survey, the Energy Information Agency (EIA) shows that in South Africa, over 96% of the crude oil requirements was imported, the bulk of which were supplied by Saudi Arabia (45.8%), Iran (33.7%), and Nigeria (16.6%), (EIA, 2014). From the survey, it is evident that South Africa is almost entirely dependent on imported oil and that makes the country's economy to be more vulnerable to changes in oil prices.

Kenya solely relies on oil imports to satisfy its oil energy needs. According to Kojima, Matthews, Sexsmith (2010), Kenya has an Open Tender System, whereby crude or petroleum products are purchased by a single company for the entire market on the basis of a public tender and shared among all marketing companies in proportion to their share of the

market. Questions have been raised about the cost-effectiveness of this system. The GoK (2003) in its Vision 2030 recognizes that Kenya's energy costs are higher than those of her competitors and that Kenya must, therefore, generate more energy at a lower cost and increase efficiency in energy consumption. The Kenya Government is, therefore, encouraging foreign interest in oil exploration thus there is a modest upstream oil industry, currently limited to exploration in various parts of Kenya.

In Kenya, petroleum retail prices are controlled through price capping by ERC which is reviewed monthly. The ERC sets maximum retail pump prices for selected products on a monthly basis and become effective and remain in force from the 15th of the calendar month until the 14th of the following calendar month (www.erc.go.ke). The situation may vary across different jurisdiction (Omagwa & Reardon, 2017).

1.2 Statement of the Problem:

It has been argued variously that the retail petroleum prices in Kenya do not closely reflect the true costs of product supply. In particular, petroleum prices do not seem to change in tandem with shocks in the international crude oil prices. Proponents of this argument, such as the Ministry of Energy, Energy Regulatory Commission and the public, indicate that firms in the petroleum industry are quick to increase retail prices immediately upon a spike in international crude oil price but are reluctant to lower the same and pass the benefits to oil consumers when the reverse happens (Wepukhulu, 2011).

Oil companies, especially the Multinational Corporations, on the other hand argue that petroleum prices just reflect crude oil prices; supply adjustment costs and the normal interaction of supply and demand. Many consumers and politicians have interpreted these petroleum price movements as an attempt by the oil companies to exploit their market power for financial gain (Mecheo and Omiti, 2013). Consequently, organized stakeholders in Kenya like Parliament, Central Organization of Trade Unions (COTU), Kenya Association of Manufacturers (KAM) and the general public have strongly agitated for re-introduction of price controls ostensibly to tame a seemingly predatory petroleum industry.

Empirical researches have analyzed the effect that oil prices have on consumer prices. Celik and Akgul (2011) examined the relationship between the consumer price index and the fuel oil price index in Turkey. Ansar and Asghar (2013), analyzed the impact of oil prices on the Consumer Price Index (CPI) and Stock market in Pakistan. Hilda (2013), established the relationship between Crude oil prices and the Consumer Price Index in Kenya. However, none of the existing studies have focused on the effect of oil import prices components on consumer oil prices. This study, thus, sought to fill the existing research gaps by investigating the relationship between components of oil import prices and consumer oil prices in Kenya.

II. METHODOLOGY

2.1 Research Design:

The study adopted a descriptive study design which was conducted to describe the present situation, what people currently believe, what people are doing at the moment and so forth (Baumgartner, Strong & Hensley, 2002). The major purpose of descriptive research design is description of the state of affairs as it exists at present (Kothari, 2004). The current situation in Kenya is existence of rising oil prices. A descriptive research design answers the 'what', 'which' and 'when' research questions. Therefore, the research design guided the study in answering the 'what' question of the relationship between oil import prices and consumer prices in Kenya.

2.2. Model specification:

The study objectives were achieved using the pass-through general model equation presented below.

$$CP = \alpha + \beta_1 COC + \beta_2 ODC + \beta_3 OT + e$$

Where:

CP = consumer oil prices measured in terms of consumer price index (CPI) on monthly basis.

COC = cost of crude oil measured in US dollars per barrel on monthly basis.

ODC = oil distribution cost measured in Kenya shillings per litre on monthly basis.

OT = oil taxes to be measured in Kenya shillings on monthly basis.

e = error term.

III. RESEARCH RESULTS

3.1 Trend Analysis:

Figure 3.1.1 indicates that the general trend of cost of crude oil has been declining throughout the estimated period. This could be attributed to improved international trade relations between Kenya and other countries. The decrease in the cost of crude oil is expected to pass the impact to the consumer oil prices. Therefore, with such a trend, the consumer oil prices are also expected to show a downward trend.

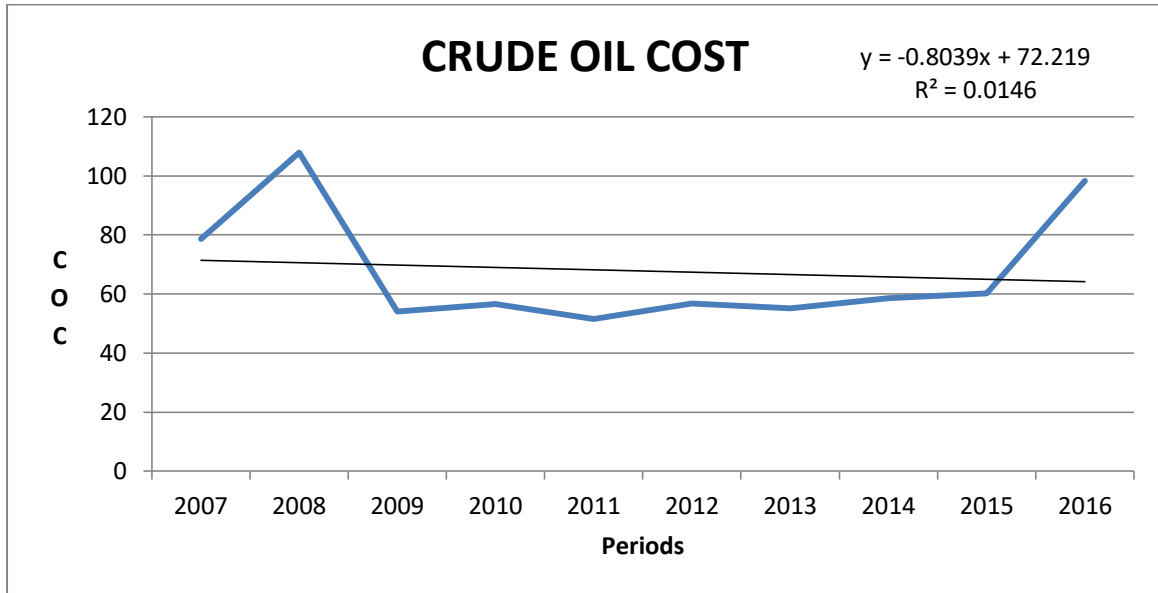


Figure 3.1.1: Monthly trend for COC from 2007 to 2016

Figure 3.1.2 indicates the general trend of oil distribution costs. The trend shows a general decline in the oil distribution costs over the estimated period. The fall in the oil distribution costs could be attributed to improvement in the transportation infrastructure. A decline in the oil distribution costs is expected to result to a fall in the consumer oil prices.

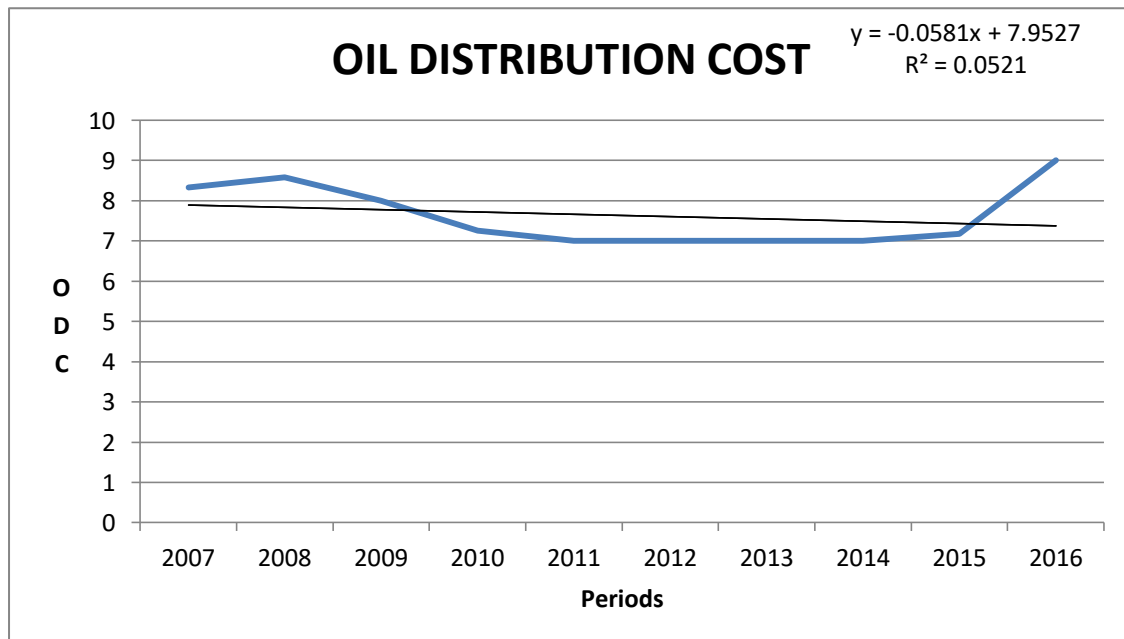


Figure 3.1.2: Monthly trend for ODC from 2007 to 2016

Figure 3.1.3 indicates the general trend of oil taxes. The trend shows a general increase in the oil taxes over the estimated period. The rise in the oil taxes could be as a result of increased oil tariffs. An increase in oil taxes is expected to result to an increase in the consumer oil prices.

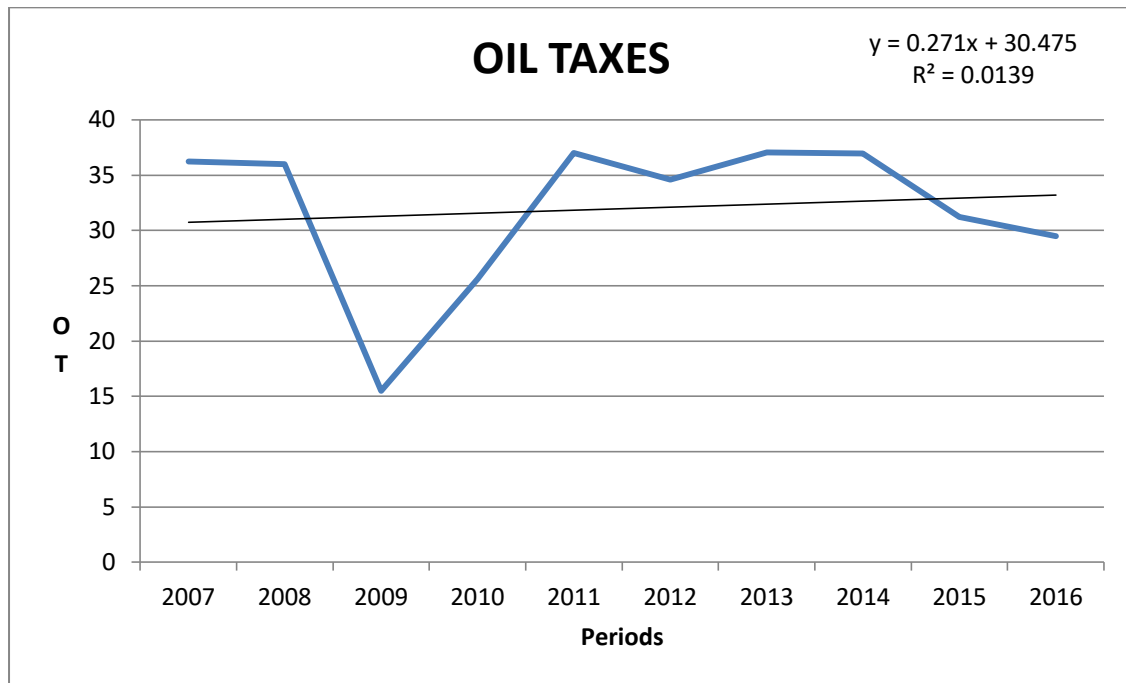


Figure 3.1.3: Monthly trend for OT from 2007 to 2016

Figure 3.1.4 indicates the general trend of consumer price index. The trend shows a steady decrease in the consumer oil prices throughout the estimated period. The fall in the consumer oil prices is attributable to several factors including favorable economic conditions.

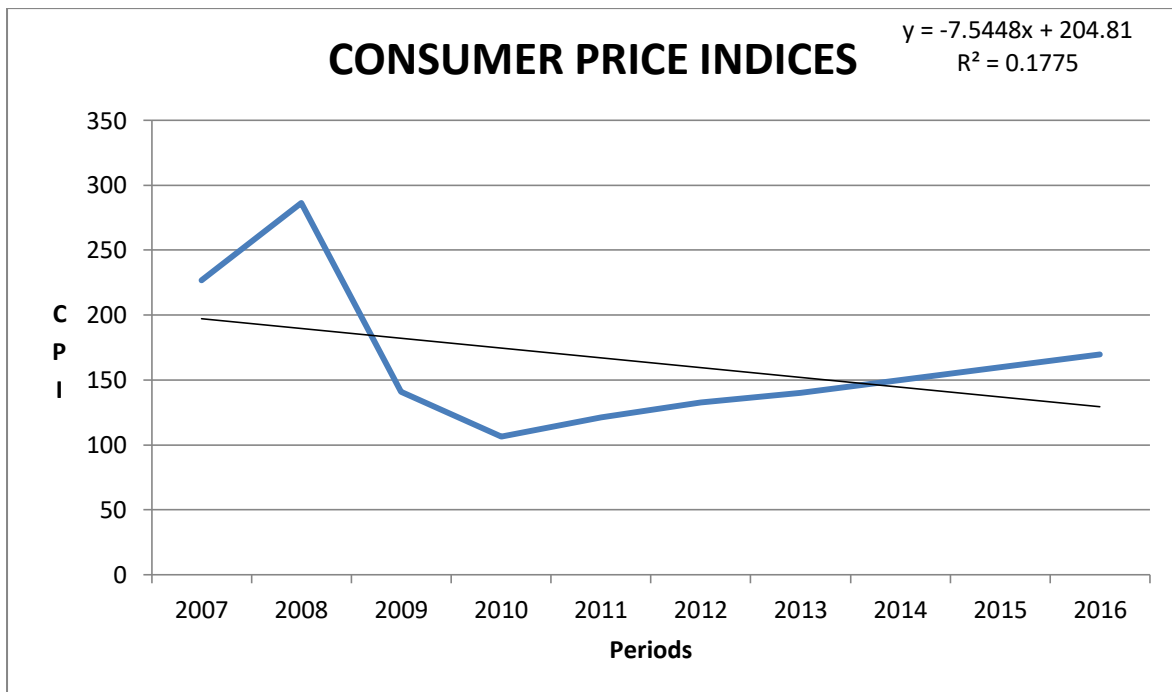


Figure 3.1.4: Monthly trend for CPI from 2007 to 2016

3.2 Correlation Analysis:

Table 1 below presents the results of the correlation analysis. The results revealed that cost of crude oil and consumer oil prices are positively and significantly associated ($r=0.579723$, $p=0.000$). The results also revealed that oil distribution costs and consumer oil prices are positively and significantly associated ($r=0.584353$, $p=0.000$). Lastly, the results revealed that oil taxes and consumer oil prices are positively and significantly associated ($r=0.299380$, $p=0.000$). The results imply that crude oil cost, oil distribution costs, oil taxes and consumer oil prices change in the same direction.

TABLE I: CORRELATION MATRIX

Correlation				
Probability	CPI	COC	ODC	OT
CPI	1.000000			

COC	0.579723	1.000000		
	0.0000	-----		
ODC	0.584353	0.612831	1.000000	
	0.0000	0.0000	-----	
OT	0.299380	0.173539	-0.132477	1.000000
	0.0009	0.0580	0.1492	-----

3.3 Long Run Regression Model:

Results in table 2 present the long run regression model. The results indicated that the goodness of fit (r squared) for the long run model was 51.34%. This implies that the independent variables (Crude oil cost, oil distribution cost and oil taxes) explain 51.34% of total variations in the dependent variable (consumer oil prices). The relationship between COC and CPI was found to be positive and significant ($r=0.466861$, $p=0.0117$). Further, the relationship between ODC and CPI was found to be positive and significant ($r=30.04136$, $p=0.000$). In addition, the relationship between OT and CPI was found to be positive and significant ($r=2.179218$, $p=0.0.000$). The results implied that an increase in COC, ODC and OT by one unit, results to a corresponding increase in consumer oil prices by 0.466861, 30.04136 and 2.179218 units respectively.

TABLE II: LONG RUN REGRESSION MODEL

Variable	Coefficient	Std. Error	t-Statistic	Prob.
COC	0.466861	0.182321	2.560646	0.0117
ODC	30.04136	5.262836	5.708209	0.0000
OT	2.179218	0.461896	4.717982	0.0000
C	-167.9020	39.91026	-4.206989	0.0001
R-squared	0.513478	Mean dependent var		163.3164
Adjusted R-squared	0.500896	S.D. dependent var		51.91610
S.E. of regression	36.67733	Akaike info criterion		10.07496
Sum squared resid	156046.3	Schwarz criterion		10.16788
Log likelihood	-600.4976	Hannan-Quinn criter.		10.11269
F-statistic	40.80906	Durbin-Watson stat		0.569590
Prob(F-statistic)	0.000000			

3.4. Summary of Findings:

The first objective of the study was to determine the effect of crude oil cost on consumer oil prices in Kenya. The regression results revealed a positive and significant relationship between crude oil costs and consumer oil prices in the long run. This implies that an increase in the cost of crude oil would lead to an increase in the consumer oil prices and vice versa. However, in the VECM short run model, the relationship between crude oil costs and consumer oil prices was insignificant.

The second objective of the study was to examine the effect of oil distribution cost on consumer oil prices in Kenya. The regression results revealed a positive and significant relationship between oil distribution cost and consumer oil prices both in the short run and in the long run. This implies that an increase in the oil distribution cost would lead to an increase in the consumer oil prices and vice versa.

The third objective of the study was to establish the effect of oil taxes on consumer oil prices in Kenya. The regression results revealed a positive and significant relationship between oil taxes and consumer oil prices in the long run. This

implies that an increase in the oil taxes would lead to an increase in the consumer oil prices and vice versa. However, in the VECM short run model, the relationship between oil taxes and consumer oil prices was insignificant.

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3.4.2. Appendix 1:

TABLE III: DATA COLLECTION TEMPLATE

Year	Monthly	Consumer Oil Prices (CPI)	Crude oil Cost (USD)	Oil Distribution Costs (Kes)	Oil Taxes (Kes)
2007	January				
	December				
2016					

IV. CONCLUSION

4.1 Conclusions:

Based on the findings, the study concluded that crude oil cost, oil distribution costs and oil taxes have a significant influence on consumer oil prices in the long run. The study concluded that there was positive and significant relationship between oil import price components (crude oil cost, oil distribution costs and oil taxes) and consumer oil prices. Based on the findings, the study concluded that oil import prices have a significant pass-through effect into consumer oil prices in Kenya.

However, the short run results indicated by the VECM revealed that the VAR model was not significant. The goodness of fit (r squared) for the 1st short run model was 2.1%, compared to the r squared for the long run model which was 51.34%.

4.2 Recommendations:

Based on the study findings, it is evident that oil import prices influence the consumer oil prices in Kenya, especially in the long run. The government should therefore formulate policies aimed at curbing the negative impact of oil import prices fluctuations on consumer oil prices. There is need to ensure that producers and suppliers of crude oil do not exploit consumers by setting unreasonable prices. There is also need to allow for a competitive oil market, where the prices are determined by demand and supply forces and not government intervention.

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