

# **Impact of Oil Price, Exchange Rate and Capital Structure on Firm Performance: Evidence from Nairobi Securities Exchange**

*David Onguka*

University of Nairobi, Nairobi, Kenya

Doi:10.19044/esj.2019.v15n4p263

[URL:http://dx.doi.org/10.19044/esj.2019.v15n4p263](http://dx.doi.org/10.19044/esj.2019.v15n4p263)

---

## **Abstract**

This study aimed at determining the impact of oil prices, exchange rate and capital structure on the Performance of NSE listed firms. Annual data include oil prices, exchange rates, debt-equity ratio and firm performance are modeled into a linear regression model. The annual average international prices of the three oil products prices of Diesel oil, Premium and Kerosene were used as these are the major consumed products in Kenya. Hypothesis were formulated and tested on a population of sixty four listed firms at the NSE. The study used petroleum prices obtained from Energy Regulatory commission website, global prices obtained from plats, exchange rates from CBK, leverage and return on Assets (ROA) from audited financials obtained from NSE year books. The study applied census survey due to the small size of the population of firms listed at the NSE. The findings show there is significant relationship between oil price changes, exchange rate, capital structure and company performance.

---

**Keywords:** Oil Prices, exchange rate, capital structure and firm performance.

## **Introduction**

Oil Prices changes, particularly increment, has always attracted social and political pressure on both the government and the oil marketing companies (OMCs). Oil sector is one of major pivotal sectors for country's economic growth as the product is used in transportation, power generation and is raw material to a number of products like paints, plastics etc. There has been wide spread concern that the oil companies have been inflating prices to make super profit and that they are quick to increase prices whenever global prices goes up and very slow in effecting the same when international prices reduces. This concern has capitalized on by consumer protection association and politicians to push government and parliament to establish a price control system for most petroleum products sold in Kenya including diesel Oil, kerosene and supper

petrol which are the most highly consumed in the country. This pressure for price control reached a tipping point when international crude price peaked between 2007 and 2008 which resulted in the highest price increments in Kenya. The subsequent decline in prices appeared not to have been fully passed on to the final consumers resulting in hue and cry by the consumers and politicians. This agitation got some research support from the works of Johnson (2002) who justified the control of prices on the basis that oil industry is generally characterized by unstable prices and that some control is needed to provide same level of stability and predictability. The government finally yielded to the pressure and introduce price controls in Kenya at pump price level in 2007.

Taylor and Weerapana (2011) define price controls as government regulation of prices of products which can be a price ceiling, price floor or minimum price at which goods can be bought or sold. In the Kenyan case, it was a price ceiling – which set a maximum price that may be charged but do not prevent goods from being sold at lower prices, below the ceiling price (Tucker, 2010). The directive was effected by creating an Energy Regulatory Commission (ERC) in July 2007 (ERC, 2008) charged with setting prices monthly basis. The new prices announced every 14<sup>th</sup> of the month to be effective from the 15<sup>th</sup> of the month. OMCs are then allowed to sale only at the announced prices or below. The price is set for every region, with the difference being the additional transportation costs. The prices in local currency are based on the weighted average of the last three months landed costs prices where the landed costs is the unit cost of each product i.e. global prices plus all costs and duties incurred by the shipments offloaded at Mombasa terminals with dollar denominated costs converted at the average dollar exchange rate for the month. However, according to Taylor (2006) price controls are only effective for a short term basis and when they take place over a long period, they may lead to rationing, long queues and black market. The fact that despite this awareness, the government of Kenya instituted and allowed the price control to stay this long underscores the importance attached to the oil sector and impact on the economy. A lot of research has been done on this subject matter despite the existence of unresolved matters touching on theory and practice (Gitahi, 2015). According to petroleum Insight (2009), when crude oil reached its most recent peak towards the end of 2008 of \$147 per barrel, there was a sharp rise in retail prices with petrol prices touching Ksh.100. per litre but suddenly dropped to \$45 per barrel at the end of the 2008 resulting in huge losses to the OMCs in Kenya. According to the findings of Kilian (2008), almost all economies in the world are affected by increase in global prices which translates into their local retail prices changes.

Gatuhi and Macharia (2013) study concluded that oil prices and market interest has significant impact on share prices of listed firms at NSE. Total oil

consumption and exchange rates are positively related to firm performance, though the impact is insignificant. Rao (2016) focused on five firms listed at NSE dealing with energy and petroleum using arbitrage pricing model. The study found a significant relationship between macroeconomic variables and firms performance. The oil price and interest rates have a significant effect on the financial performance. Henderson and Newell (2010) studied accelerating energy innovation with an insight from multiple sectors and concluded that to reduce demand on petroleum products in the public, government intervention to provide subsidies on alternative products is inevitable. Sakib and marsiliani (2015) studied oil price shocks using Dynamic Stochastic General Equilibrium (DSGE) model. They found that technology was driving force in oil price fluctuations in Bangladesh. The study objective is to determine the impact of oil price changes, exchange rates and capital structure on performance of NSE firms. High petroleum products prices tend to impact positively the stock market performance of petroleum producing countries, the opposite effect is expected for an oil importing country. This is because increase in oil prices increases government revenues for oil exporting country, such high oil prices reduces consumer's available income to spend in other goods and services thereby affecting the performance of other companies as well.

### **Stock Market Performance**

Stock performance refers to the returns on capital employed by a firm. It's measured by return on investment, assets and equity, Tobin Q, dividend shares among other measurements (Hamilton, 1983). Past studies have mostly confined themselves with macroeconomic factors in their study on firm's performance in financial markets. (Gatuhi & Macharia, 2013; Omagwa et al., 2017 and Rao 2016). Capital markets are different from other markets and require different approach in regulation and control to be efficient and geared towards economic growth. (Githui, 2015) study and theories point to the stock exchange performance as key determinant of financial health of a developing economy like Kenya hence the need to a study on the strength and direction of stock performance and key macroeconomics factors such as price changes, exchange rates changes and capital structure which underscores the need for this study.

### **Exchange rates**

Exchange rate is the relative purchasing power of currencies (Kutty, 2010). Bahmani-Oskooee and Sohrabian (1992), using Granger Casualty Test concluded that stock prices and exchange rate have positive and significant relationship on short run. Desislava Dimitrova (2005) argued that; in the short period, capital prices are indirectly related to exchange rate in financial markets and may lead to depreciation of currency. According to the National

Energy Policy (2012) exchange rate is also important in influencing retail prices as purchases are done in US dollar but sales are done in Kenya shillings. Based on the law of one price, as US dollar strengthens relative to Kenya shillings, the local traders are forced to use more shillings to get the US dollars for importing the product (Golub, 1983; Bloomberg & Harris, 1995). This implies that changes in exchange rates influences oil prices.

### **Capital Structure**

Abor (2007) defines it as a blend of debt and equity which company uses to fund its activities and notes that companies generally employ different mix ratios in their financing activities. A trend of continues oil price upward escalation result in an increase in inflation. This is because oil products forms one of the key consumable in the country either directly through transportation fuel or indirectly as raw material or energy source for finance products production. The central bank and other banks will respond to increased inflation by raising the interest rate of debt. This implies that the cost of debt financing will be higher which will pushed companies into lower profits and the need to review their capital structure (Akram, 2009). They may then opt to finance with more of internally generated funds resulting in lower leverage and less dividend payment to shareholders. Reduce return to shareholders may result in reduce demand or increase sale of shares which leads to reduced company value. The increased financing costs when applied in calculating company value based on perpetual discounted cash flow stream also gives a lower company value. The reduction in capitalization eventually reduces economic performance of the country resulting in negative growth (Pindyck & Rotemberg, 1991)

The pecking order theory postulates that, management plays a crucial role in the way the company monetary resources are utilized, starting with profits, then debt and finally share capital. According to this hypothesis, there is no best possible capital organization hence the resulting capital structure is just a combination of decisions made earlier (Hansmann, 2000). Optimal debt ratio for all firms may not be generalised but it can be a decisive point for a company's debt policy (Stiglbauer, 2011). A continues growing price changes can result in higher demand for working capital as the same quantity imported or purchased will require a higher amount of money to finance it while a reducing prices will result in excess liquidity in the short run. However, the company may use the excess working capital to increase their stock size resulting in improved profitability or even use the extra cash released from working capital to pay off part of the debt thereby reducing financing costs in long run. A fluctuating oil product prices may make it very difficult for finance managers to plan for an optimal capital structure due to uncertainties of the future requirement and may even be more costly in the long run.

Capital structure variable measurement to be used is leverage. It involves borrowing money to invest in company's capital expansion or working capital, over and above what has been contributed by shareholders (Denis, 2001). It weighs the capability of a company to deal with trade downturns, meaning that a company with high leverage is more susceptible to trade shocks because it has little ability to service debt (Jensen, 1986). Leverage comes up as a result of using debt to finance activities. This leverage decision can impact firm performance (Mauwa et al., 2016). The sensitivity of leverage measurement to trade downturns makes it more suitable to measure the impact of oil price changes on firm performance. Leverage measures the proportion of capital financed through debt / total funding. I.e.

$$\text{Leverage} = \frac{\text{Total BVD}}{\text{Total BVD} + \text{MVE}}$$

This method was also applied by Solomon et al., (2013) and Githira and Nasieku (2015).

### **Research Problem**

Research has been done on relationship between oil price changes and firm performance but did not factor in capital structure and exchange rates. This study has therefore recognized and incorporated the influence of capital structure and exchange rate on oil price changes and firm performance. Investors are more concerned with the returns generated from investments and factors that could affect the expected returns. Even those who are already in the sector are interested to know these factors to mitigate any inappropriate conditions while optimizing on the factors with positive effects. These impacting factors are also known to vary between time and geographical regions thereby affecting the performance of different countries in different ways. Although oil business is a key gear towards economic growth, empirical evidence points out that it has been neglected in research. There is therefore a scholarly gap on the impact of changes in various microeconomic variables – particularly on price changes and foreign exchange on performance of firm's listed at the NSE as well as the role of capital structure on this relationship.

High petroleum products prices have a positive impact on stock market performance of oil producing country but importing countries face negative effects in capital markets. The reason behind the scenario is; oil price increase will generate foreign exchange for home countries and put spending and investing constrains to the investors in importing countries. For industries using petroleum products as fuel or raw materials, the cost per unit of such items will be higher resulting in reduced profitability and reduced demand. Higher oil prices would also increase inflation, which central bank may try to control by increasing interest rate. Since the value of a firm is a discounted value of perpetual cash flows, such value is then affected by increased interest

rate resulting in lower share prices and lower economic growth (Huang, Masulis & Stoll, 1996).

This underscores the importance attached to changes in oil prices as the effect is transmitted to changes in macroeconomic variables that influence the liquidity and the market capitalization. The resulting slowdown of economic growth reduces the attractiveness of the market to foreign investors who may react by withholding new investment or drawing down on their current investments resulting in economic shock in the long run. Few studies that have attempted to evaluate this relationship reported mixed results (Anoruo & Mustafa, 2007; Papapetrou, 2001 and Sadorsky, 2000). Oil price fluctuation poses a huge impact on economic growth and this call for government through its agencies to mitigate unexpected price change and create confidence in the economy. High oil prices leads to high cost of imports hence affect exchange rates and capital structure of the companies as they attempt to ensure stability in working capital and long term capital requirement stability. The induced increased interest rates also affect the costs of financing which again affect decision on capital structure and the resulting firm performance (Omai, Njeru & Memba, 2018). The CBK has consistent claim that the increasing oil prices in the world is putting pressure on the exchange rate hence the need for an empirical study to back up this claim. This theory was backed up by Bernanke, Gertler & Watson (1997) argument that it is not the oil prices that causes recession but the common response of the Central Bank to increase interest rate in their effort to control inflation. Could this CBK response be the cause of apparent unproportioned impact of oil prices? Oil sector plays an important role in economic growth hence company's financial performance (Huang, Masulis & Stoll, 1996). Politicians and other social workers have been very quick to attribute the high cost of living to increase in oil prices without a proper backing from the research. The study seeks to put to such speculations to rest. The study seeks to establish the impact of oil price, exchange rate and capital structure on performance of Nairobi Securities Exchange listed firms.

## **Literature Review**

### **Relationships of price changes, exchange rates and capital structure with firm performance**

Changes in oil prices affects performance of corporation in a number of ways: Increasing oil prices shifts substantial income from oil importing countries to oil producing countries. The reduced disposable income in oil consuming countries causes reduced demand for other goods and services causing a downward trend in the economy of that country as general performance is impacted. Central banks tend to react to such price inflation by increasing interest rates further worsening the situation in such countries. The increased cost of capital results in a change of capital structure as companies

tries to reduce borrowing, withhold dividend and push for more equity injection to service already incurred debts financing. The reduced activities leads to reduction in cash flow generated from profits resulting to general liquidity squeeze in the country. Omagwa, Kihooto and Reardon (2017) studied oil retail pricing and controls and found that monthly international crude oil prices and exchange rates have a significant effect on monthly retail prices for petroleum products.

Omai, Njeru and Member (2018) investigated the effect of commercial debt finance on profitability of petroleum marketing companies in Kenya and found a positive effect of debt on performance. They adopted a cross-sectional survey design in their methodology. The current share value can be said to be the expected value of discounted cash flows stream (Huang, Masulis, & Stoll, 1996). This means that the price of oil effect on stock value can be direct through discounted cash flow or indirect through the application of discount rate when calculating the discounted cash flow value. The exchange rate also has an impact on oil prices and firm performance. Amin and Marsiliani (2015) studied energy price shocks in dynamic stochastic general equilibrium in Bangladesh and found that quantitative temporary energy price shocks and technology shocks produce similar impulse response function and autocorrelations in aggregate quantities. Hamilton, (1988) explored a neoclassical model of unemployment and the business cycle and found that impact-full price changes can results in wages reduction and unemployment which forces those losing jobs to remain unemployed - instead of shifting to other industries – until situation improves in the oil industry. Sadorsky (1999) investigated oil price shocks and stock market activity and found price volatilities and shifts have a significant effect on corporate value. He also found a significant positive relationship between industrial production and interest rate changes with oil products price changes. Bjørnland (2009) reviewed oil price shocks and stock market booms in an oil-exporting country. She opined that such increase in oil prices represent an income gain to these countries. She found that the impact of such positive income growth depends on how the government of the country utilizes such funds. In cases where the same is used to finance omega projects with long term economic positive growth, the economies of such countries expanded with sustained long term income growth across the sectors. Where such windfalls were used for social welfare or distributed to citizens in one way or the other, the impact was immediate but short lived.

Omagwa et.al (2017) found a significant effect on retail prices by global prices and exchange rates. Gatuhi (2015) argues that exchange rate influences capital market performance significantly. Rao (2016) argues that energy firm's performance in financial markets depends on prevailing market prices of oil. Globalization and integration of international market economies

resulting in increased capital flows especially to developing countries like Kenya has made external investors exposed to oil price effect on local stock markets (Chittedi & Reddy, 2010, 2011). Other studies have found that developed economies are more energy efficient when it comes to oil consumption compared to developing countries like Kenya due to technological diversification of energy sources. Although demand for oil products is growing rapidly in developing countries like China, India and others, oil consumption in developed countries are hardly growing. Alternative energy sources are not only economic friendly but also improve efficiency in operation for firms (Henriques & Sadorsky, 2008). However, Huang et.al (1996) argues oil prices fluctuation in the market do not affect the stock market performance and only way to contain inflation in the market is by managing interest rates.

Maghyereh (2004) examined oil price shock and emerging stock markets using generalized VAR approach. He found a weak but positive evidence that oil price changes affect firm performance. He however, noted that the impact of price shock depends on the intensity of a country's energy usage based on efficient market hypothesis. The transmission of such market information is comparatively much slower in developing economies than in developed economies which accounts for the intensity and timeframe of the impacted noted in different countries.

There is both strong theoretical and empirical evidence on the relationship between these variables, although the results of past studies are mixed and were mainly carried out in developed countries. This study was therefore intended to resolve the relationship between these variables i.e oil price changes, exchange rates, capital structure and firm performance through empirical analysis. The theories that are anchoring this research study are; the arbitrage pricing theory, the Capital Asset Pricing Model (CAPM) theory and Efficient Market Hypothesis (EMH).

### **Arbitrage Pricing Theory**

This theory was originally applied by Ross (1976) to explain stock return by examining seven macroeconomic variables including terms structure, inflation, oil price, industrial production, market return, risk premium and consumption. The pricing model defines the variation of expected return on an investment and the underlying factors causing the changes. The basis of the model is that absence of arbitrage by extension implies a near linear relationship between expected returns and the betas of various factors (Shanken, 1992). APT Model is stated as follows:

$$r_s = r_f + \beta_1 r_1 + \beta_2 r_2 + \dots \dots \beta_n r_n + \varepsilon$$

The symbols represent the following variables;  $r_s$  is return on specific investment,  $r_f$  is risk free rate of return,  $\beta$  is the proportional movement in



dependent variable as a result of movement in independent variable,  $\mathbf{r}$  is variables determining rate of output resulting from input,  $\boldsymbol{\varepsilon}$  error term capturing unpredictable and short lived changes in the market and  $\mathbf{n}$  is the final value in the sequence of terms in the equation.

The assumption of APT include all securities have a finite expected range of values and variances, some agents have the ability to form portfolios that are well diversified, there are no transaction costs no taxes levied.

### **Capital Asset Pricing Theory**

CAPM is applied when determining the prices of risky securities by applying time value of money and T-bill returns. (Sharpe, 1964). Risk is measured by beta by comparing the expected and actual returns yield of a particular investment over a single period. The product of beta and market premium results in an additional risk component. This model assumes that all investors are rational and their portfolios have an efficient mean variance within a single period; all investors have similar expectations on portfolio yields; an efficient flow of information in the market and divisibility of investments is perfect.

The model is represented as below:-

$$\mathbf{R}_a = \mathbf{R}_F + \beta_a (\mathbf{R}_m - \mathbf{R}_F)$$

Where  $\mathbf{R}_F$  represents risk free rate of return;  $\beta_a$  is Security Risk;  $\mathbf{R}_m$  is Anticipated Return of the market and

$\mathbf{R}_a$  is Expected Return of the Security.

In summary, both of these models have factored in the systematic risk of an investment. CAPM is often seen as a unique case of APT. The differentiating fact is that CAPM considers single risk factors as sensitivity to the market price changes; APT considers many risk factors which make it appropriate in evaluating the multiple factors affecting firm performance hence the reason for adopting the same in this study.

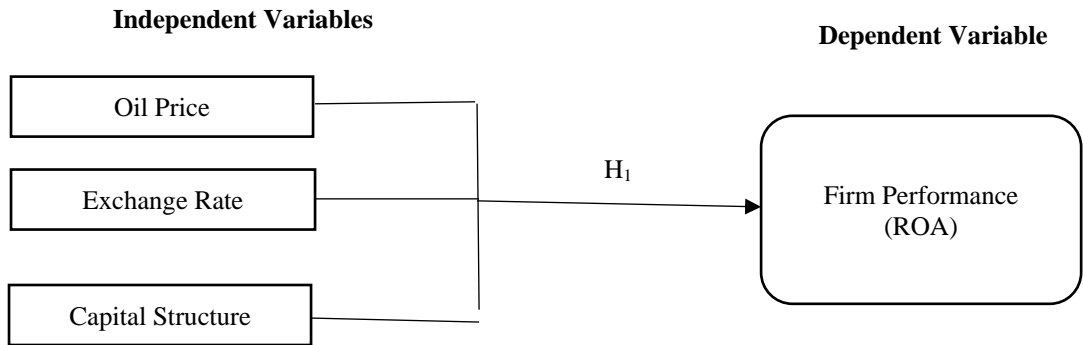
### **Efficient Market hypothesis (EMH)**

The EMH postulates that all information in market is reflected in asset pricing. (Fama 1965, 1970). There are three level of market efficiencies based on level of information circulation in the market; Weak, medium and strong form. Under weak market efficiency, market is assumed to incorporate all past information including past asset prices, dividend pay-outs and quantity traded. Semi strong market efficiency comprise of all public available information. Strong market efficiency states that asset prices reflect all past, present and private information such that regardless of the information one cannot generate abnormal profits. Investors value securities based on discounted cash flows it will generate for definite period. Efficient stock market leads to efficient allocation of economic resources. Private information is costly to

obtain hence past studies have confined themselves with weak and semi strong market efficiencies. (Timmermann & Granger, 2004).

**The Conceptual Model**

The conceptual model is a model indicating the linkage between the variables identified for the research. H<sub>1</sub> indicates the link between independent variables (Oil price, Exchange rate and capital structure) and response variable (Firm Performance). The dependent variables are expected to have a significant effect on company value as measured by return on assets (ROA).



**Figure 1. The Conceptual Model**  
**Source: Author (2018)**

**Research Methodology**

**Research Philosophy**

Solomon et al. (2013) defined research philosophy as a conviction about the way and method in which data about a phenomenon should be gathered, analyzed and used. Positivist research philosophy has its foundation on existing theory and formulates quantitative hypotheses to be tested. The approach also relies on taking large samples, therefore the entire population of the research was considered. Positivists’ use quantitative tools and techniques that emphasize on counting and measuring while naturalists prefer the qualitative tools like observation, interrogation, and description of research (Mugenda & Mugenda, 2003). The study is based on positivism research philosophy because it formulates quantitative hypothesis and uses existing theories to frame the ideas. Positivism philosophy emphasis on use of quantitative measures to measure properties of phenomena.

**Research design**

Research design is a scheme used to guide a research study to enable the study to address the research problem. It is a design of inquiry into a phenomenon which has been thought of as to enable the research to get

answers to research inquiries (Dooley, 2007). Rajput and Bharti (2015) defined a research design as a procedural blueprint embraced by a researcher to respond to questions objectively, validly, economically and accurately. The significance of research design is anchored on its ability to determine the success of research envisaged.

Three kinds of research design exist; exploratory, descriptive and causal. The study adopted descriptive cross-sectional design which involves description of existing features associated with a subject population (who, what, when, where, and how of a topic). It allows approximation of the proportions of a population that has these characteristics. The finding of associations among different variables is possible, in order to determine if the variables are independent and if they are not, then to determine the strength or magnitude of the relationship. Cross-sectional studies are carried out once and represent a snapshot at one point in time (Okiro et al., 2015).

Study seeks to establish the impact of oil price, exchange rate and capital structure on firm performance. This research design involved the gathering of information in order to evaluate the hypothesized connection underlying the variables. As per Mugenda and Mugenda (2003), descriptive form is useful in answering questions relating to the current status of the subjects under study while cross-sectional survey allows for the elements to be measured at a single point in time enabling the application correlational descriptive approach. This provided a logical and systematic process that guides the gathering and examination of data in order to achieve the defined research objectives. The research considered the whole population in lieu of a sample. A cross-sectional descriptive survey was applied to describe characteristics or features and to analyze their frequency, their distribution and observable phenomena. This helped in finding whether notable association is part of variables exists at a moment (Pandey, 2004). A descriptive cross-sectional design enabled the researcher to discover any association between oil price, exchange rate, capital structure and value of companies listed at the NSE. The design was used to consider the data and the analysis required. Similar design were previously adopted by Aduda and Musyoka (2011).

### **Population and Sampling.**

All the quoted companies at the NSE as at December 2018 formed the population of the study which numbered 64 as on this date. The list of companies were obtained from NSE listings. An individual company formed the unit of analysis in this study. The research adopted a census to achieve efficiency, representativeness and reliability of data (Dominic & Member, 2015). The company performance was measured by ROA as companies try to maximize this return so as to optimize return to shareholders.

## Data Collection

Secondary data was collected and presented in a data collection sheet for a five year period (2014 to 2018). Monthly and annual average international oil prices were obtained from Platts International. Monthly and average annual local oil prices were obtained from petroleum Institute of East Africa (PIEA) website. Average yearly and monthly exchange rates for US dollar against Kenya Shillings were obtained from Central Bank of Kenya (CBK) website, and annual return on assets (ROA) and leverage were calculated from profitability, asset values, debts amounts obtained from audited financial statements from NSE year book and websites of individual companies and of NSE. Fifty nine firms were selected as a sample forming 90% of the population (Bloom and Van Reena, 2001).

## Reliability and Validity of the Measurement Instruments

To test for normality, Jarque-Bera test and Shapiro-Wiki test were applied. Jarque-bera is variation from normality, based on the sample's kurtosis and skewness (Jarque and Bera, 1980). Least Absolute Deviation (LAD) regression and Huber's M examine presence of outliers in the data. Huber regression is a robust technique used to reduce the effects of outliers through minimization approach (Huber, 1981). Validity and reliability test was also carried out. Validity is obtained when there is no variation between results and phenomena under study. Reliability refers to stability, accuracy and the precision of measurement (Mugenda and Mugenda, 2003). Both of these were achieved by use of audited financial reports from the NSE.

## Data Analysis

Descriptive and inferential frameworks were used with correlational and panel analysis. The incorporation of panel data was done at the data analysis stage. These were aided by SPSS version 24. R Square and p-value were used to determine the effect of predictors on the outcome of the variables at a significant level of 0.05. Prior to above analysis, we did a preliminary diagnosis test of normality, multicollinearity and homoscedasticity, which were well within the acceptable limits. Direction and strength of relationship between independent and dependent variables was examined using correlation coefficient. Statistical significance of variables was examined by analyzing variance. Using APT to perform the analysis, variables were analyzed as follows:-

$$Y_{it} = \beta_1 X_{it} + \beta_2 X_{it} + \beta_3 X_{it} + \varepsilon_{it}$$

The symbols represent the following variables;  $Y_{it}$  is financial performance of a listed firms .i at time t,  $X_{it}$  is value for the corresponding independent variable at the point in time,  $\beta_1$  is International (Platts) Oil Price

coefficient,  $\beta_2$  is exchange rate coefficient,  $\beta_3$  is capital structure coefficient,  $\epsilon_{it}$  is error term and  $Y$  is the market value growth.

$Y$  = the market performance of listed firms at the NSE. The performance measure chosen for this research was the Return on Asset (ROA) to measure return realized on company assets. This measurement method was also applied by Berger and Bonaccorsi di Patti (1997). ROA is measured as a ratio of Net profit and Total Assets as presented below:-

$$ROA = NP / TA$$

### Descriptive Statistics

The table 1 below provides descriptive measurements of the variables:

Table 1 - Descriptive statistics

Variables	Observation	Average	Std. Dev.	Minimum	Maximum
Int. Oil Prices (\$)	5	1.38	0.18	0.94	1.46
Local Oil Prices (\$)	5	1.97	0.12	1.24	1.64
US Dollar Exchange Rate	5	101	8.08	92	105
Capital Structure – Leverage (%)	5	41%	4.67	5%	63%
Return on Asset (ROA) (%)	295	9%	-29%	-76%	24%

Source: Author 2018

The performance is measured by return on assets (ROA). Companies registered an average drop in performance of 29% of industry earning over the 5 years period. This can be attributed to increase competition in the industry as well as improved infrastructure like storage facilities and pipeline capacity and reach which has reduced the entry barriers. It also indicates a general maturing trend of the industry. Of the five variables, local oil prices had the lowest volatility at 0.12 while exchange rate had the highest at 8.08. This could be attributed to the fact that almost 45% of the local price is made up of taxes and duties which are fixed on unit quantity and therefore does not vary with global price fluctuations, exchange rates or any other variables. Exchange rate high volatility can be attributed to high and fluctuating balance of payments occasion by major importation to implement government led mega projects like SGR as well as international dollar instability.

### Correlation Analysis

Levine et al. (1999) defined correlation analysis as a measure direction and strength of relationship between two variables. A strong relationship between the variables of the study is not desirable. Any value above 0.7 is considered too strong and is therefore not desirable.

Table 2: Correlation Analysis Results

	Firm performance	International Oil Prices	Local Oil Price	Exchange rate	Capital Structure
Firm performance	1.00				
International Oil Prices	-0.21	1.00			
Local Oil Prices	-0.14	0.78	1.00		
Exchange rates	-0.29	-0.03	0.16	1.00	
Capital Structure	0.17	0.28	0.08	0.19	1.00

The table above shows that International and local oil prices are negatively and weakly correlated with firm performance while local prices is also positively and strongly correlated with international oil prices at above 0.7 which is undesirable showing that are measuring the same thing. Local price was therefore dropped in subsequent analysis due to this. Exchange rate is negatively but weakly correlated with both firm performance and International oil prices but positively but weakly correlated with local prices. Capital structure is positively but weakly correlated with firm performance, International prices, local oil prices and exchange rate. All the correlations except local price with international prices are below the maximum 0.7. It can also be inferred from the study that low oil prices results in a positive firm performance since oil is considered a major costs of a number of firms as well as a trigger to reduce demand for other unrelated firms due to reduced disposable income available to buy other products. The high exchange rate also causes the Central bank to increase interest rates which reduces firm performance as discounted perpetual cash flow value is reduced by higher borrowing costs. Beside high exchange rate result in higher costs of product for the Oil Marketing companies which results in reduced profitability.

### Regression Analysis

APT model in form of regression model is captured as below to test the hypothesis:

$$Y_{it} = \beta_1 X_{it} + \beta_2 X_{it} + \beta_3 X_{it} + \varepsilon_{it}$$

The symbols represent the following variables;  $Y_{it}$  is financial performance of a listed energy firm .i at time t,  $X_{it}$  is value for the corresponding independent variable at the point in time,  $\beta_1$  is International (Plats) Oil Price coefficient,  $\beta_2$  is exchange rate coefficient,  $\beta_3$  is capital structure coefficient and  $\varepsilon_{it}$  is error term.

## Hypothesis Testing

Based on objective of study, the null hypothesis can be stated that there is no significant impact of oil price, exchange rate and capital structure on performance of firms listed at the NSE. Firm performance was measured by return on Asset (ROA) for each firm. Multiple regression analysis was used to examine if oil prices, exchange rate and debt-equity structure significantly predict NSE firm performance. This was the test of the first null hypothesis as shown below:

***Hypothesis H<sub>01</sub>: There is no significant impact of oil price, exchange rate and capital structure on performance of firms listed at the NSE.***

The prediction equation as shown above was  $Y_{it} = \beta_1 X_{it} + \beta_2 X_{it} + \beta_3 X_{it} + \epsilon_{it}$

Three steps were used in carrying out the hierarchical multiple regressions with the first step involving oil prices against firm performance, the second involving regressing exchange rate against firm performance and capital structure against firm performance while the third step involved oil prices, exchange rates and capital structure against firm performance. The results of these regressions are indicated below.

**Table 3: Regression results of the oil price, exchange rate and capital structure variable on ROA**

Dependents	Coefficients		
	M.1	M.2	M.3
Oil Prices	.785	.598	.663
Exchange Rate	-	.243	.221(.032)
OP * XR * CS	-	-	-.87(.032)
R Square	.615	.632	.649
Adjusted R Square	.622	.628	.643
F Statistics	452.479	285.863	182.527
Significance	0	0	0
Df1	1	2	3
Df2	294	293	292

Results show that the combined effect of oil price, exchange rate and capital structure, accounts for 64.9% (R<sup>2</sup>=.649) of the variation in ROA. In the 1st model, the variation is explained by 61.5% (R<sup>2</sup>=.615), in the second model, the variation is explained by 63.2% (R<sup>2</sup>=.632) and in the third model, the variation is explained by 64.9% (R<sup>2</sup>=.649). This means that as capital structure is added to regression equation the variation increases from 61.5% to 64.9%. The output indicates that the combined effect of the study variables are statistically significant at  $\beta = -0.87$  with a p-value of 0.032. The implication is that study variables jointly predict firm performance as measured by ROA for the NSE listed firms.

Based on the study findings it can be concluded that; firm performance in stock market is indirectly related to oil prices, exchange rates and debt-equity of the NSE firms resulting in the rejection of hypothesis one ( $H_1$ ).

### **Conclusion and Recommendations**

The findings demonstrates that firm performance has a negative substantive and measurable relationship with oil prices, exchange rates and capital structure of NSE listed firms; thus null hypothesis is rejected. This implies that increasing all prices results in reduced firm performance as the cost per unit will be higher thereby reducing gross profits and its ability to cover fixed costs. Oil products are purchased in US dollars which are then converted into local currency when doing the costing. This means that; the higher the exchange rates, the higher the unit cost of imported products. Also after making the sales in local currency, part of the sale is converted back to US dollar to finance the next import. The higher rate again results in less US dollar resulting in a second foreign exchange cost which reduces the bottom line. Exchange rate therefore has double fold effect on firm performance. Increase in oil prices will force firms to take more debt as working capital hence high cost of operation reducing the share price in stock market.

The variables influencing firm performance of the industry are important consideration for any investor interesting in making further investment or retain their investment in the country. Some of these factors may contribute to non-diversifiable risks but which may dictate the timing of market entry or expansion. Such prediction on the relationship on impact of these variables on performance may enable one to foster better relationship and proper positioning to harness the opportunities that come with such knowledge like timing of supply, holding stock and making pricing decisions. The findings show that the effect of oil prices is influential in market performance like variables such as interest rates and exchange rates; major economic variables. Increasing oil prices result in increase in import value of oil products which results in unfavorable terms of trade / balance of payments thereby imposing welfare losses. When CBK increases interest rates to control resulting inflation from the increased petroleum products prices, the bond market become more attractive thereby reducing demand on stock market. We also notice some level of speculative factors that operate over a short period within the market which may re-enforce or act against price changes. This may also result in a speculatively strong but fundamentally weak market in the short run (Ravichandran, 2010). Jones & Kaul (1996) study concludes that oil prices fluctuations affect to a greater extend performance of stock market in US, Canadian, UK and Japanese.

Policy makers will find in-depth knowledge and ideas in the study in bid to manage oil prices for sustainable economic growth. Further research



should be done on other petroleum products like LPG (Liquefied Petroleum Gas) which is becoming a major commodity following the tax reduction and its government promotion. Research should also be done on how global and local prices affect debt levels of listed companies. Also future research will look at how global and local oil prices relate to exchange rates given that despite price controls being in place, majority of people don't understand how global prices can be reducing while local prices are increasing or not affected much by the global changes.

The recommendations from the study are that both international oil price changes and changes in exchange rates have significant influence on the NSE listed firms and therefore should continue with the current price controls which assist in smoothening out the impact to avoid sudden price shocks on the economy. The Central Bank Should continue playing a key role in monitoring and influencing foreign exchange through fiscal instruments and currency reserves to shield the economy and firm performance from high fluctuations. The use of interest rates to control inflation should also be moderated to avoid sudden high increase which may adversely affect the cost and availability of finance to the economy and to ensure better firm performance, information on projected interest rate growth should also be availed to the companies in time for adequate planning.

Limitation of the study were that it considered only three variables affecting firm performance but there could be other variables like inflation, interest rates circulation of currency in the economy, foreign exchange trade and politics etc. which could have some impact on the firm performance. The study also should have covered a wider period which has a better explanatory power than the five years and probably also covered the period before price controls which were introduced toward the end of 2010 to see the impact of global prices before and after the price controls.

### **References:**

1. Abor, J. (2005). Effect of capital structure on Performance of Firms. *Journal of Risk Finance*, 6(4), 38-47.
2. Aduda, J., & Musyoka, L. (2011). The relationship between executive compensation and firm performance in Kenyan banking industry. *Journal of Accountancy*, 3(6), 130-139.
3. Amin, S. B., & Marsiliani, L. (2015). Energy Price Shocks in Dynamic Stochastic General Equilibrium: The case of Bangladesh. *Review of Business and Economic Studies*, 3(4), 12-21.
4. Amram, M., & Kulatilaka, N. (1999). Disciplined decisions: aligning strategy with the financial markets. *Harvard business review* 1(3), 95–104.

5. Anoruo, E., Mustafa, M. (2007). Relationship between oil prices and stock market prices. *North American Journal of Finance and Banking Research*,1(1), 22-36.
6. Aydemir O. & Demirhan, E. (2009). The relationship between stock prices exchange rates evidence from Turkey. *International Research Journal of Finance and Economics*, 23(2), 207-215.
7. Bahmani-Oskooee, M., & Sohrabian, A. (1992). Stock prices and the effective exchange rate of the dollar. *Applied economics*, 24(4), 459-464.
8. Bernanke, B.S., Gertler, M. & Watson, M.W. (1997). *Systematic monetary policy and the effects of oil price shocks*. (with discussion) Brookings Papers on Economic Activity 1, 91-148, 1997.
9. Bjørnland, H.C. (2009). Oil price shocks and stock market booms in an oil-exporting country. *Scottish Journal of Political Economy* 56, 232-254.
10. Bloom N., Bond S. & John Van, J. R (2001). *Uncertainty and Investment Dynamics*, Stanford University, Centre for Economic Performance and Institute of Fiscal Studies, University of Oxford.
11. Bloomberg, S.B. and Harris, E.S. (1995). The commodity-consumer price connection: Fact or fable? Federal Reserve Board of New York. *Economic Policy Review*, 21-38.
12. Chittedi, Krishna Reddy. (2010). Global Stock Markets Development and Integration: with Special Reference to BRIC Countries. *International Review of Applied Financial issues and Economics*, 2(1).
13. Chittedi, Krishna Reddy. (2011). Integration of International Stock Markets: With Special Reference to India, *GITAM Journal of Management*, 9(3).
14. Collis, J. & Hussey, R. (2003). *Business research – a practical guide for undergraduate and postgraduate Students* (2nded.). Palgrave Macmillan: Great Britain.
15. Denis K., (2001). Twenty-five years of corporate governance research and counting. *Journal of Review of Financial Economics*, 10, 191-212.
16. Dimitrova, D. (2005). The relationship between exchange rates and stock prices: Studied in a multivariate model. *Issues in Political Economy*, 14(1), 3-9.
17. Dooley, D. (2007). *Social Research Methods*. London: Oxford university press.
18. Dominic, O. O., & Memba, F. (2015). Effect of corporate governance practices on financial performance of public limited companies in Kenya. *International Journal of Management and Commerce Innovations*, 3(1), 122-132.

19. Fama, E. (1965), The Behavior of Stock Market Prices. *Journal of Business*, 38, 34-105.
20. Fama, E.F., (1970), Stock Performance, real activity, inflation and money, *American Economic Review*, 71, 545-65
21. Gatuhi, S. K. & Macharia, P. I. (2013). Influence of Oil Prices on Stock Market Performance in Kenya. *IJMBS* 3(4), 59-65.
22. Gatuhi, S. K. (2015). *Macroeconomic factors and stock market performance in Kenya*. (PhD Thesis), JKUAT.
23. Githira, W. C. & Nasieku, T. (2015). Capital structure determinants among companies quoted in Securities Exchange in East Africa. *International Journal of Education and Research*, 3 (5), 483 – 496.
24. Golub, S. (1983). Oil prices and exchange rates. *Economic Journal*, 93, 576-593.
25. Huang, R.D., Masulis, R.W., Stoll, H.R. (1996). Energy shocks and financial markets. *Journal of Futures Markets* 16, 1–27.
26. Jensen, M. C. (1986). Agency costs of free cash flow, corporate finance, and takeovers, *American Economic Review* 76, 323–329.
27. Jarque, C. M. and Bera, A. K. (1980) Efficient Tests for Normality, Homoscedasticity and Serial Independence of Regression Residuals. *Econometric Letters*, 6, 255–259.
28. Jones, C., Kaul, G. (1996). Oil and the Stock Market, *Journal of Finance*, 51, 463-491.
29. Johnson, R. N. (2002). Search costs, lags, and prices at pump. *Review of Industrial Organization*, 30, 33-50.
30. Hamilton, J.D., (1988). A Neoclassical Model of Unemployment and the Business Cycle. *Journal of Political Economy* 96, 593-617.
31. Henderson, R. & Newell, R. G. (2011). *Accelerating Energy Innovation: Insight from multiple sectors*. Harvard Business School, Working Paper 10-067.
32. Hansmann H., (2000). *The Ownership of Enterprise*. The belknap press of Harvard University press. England. 11-12.
33. Henriques, I. Sadorsky, P. (2008). Oil prices and the stock prices of alternative energy companies, *Energy Economics*, 30, 998-1010.
34. Huang, R.D., Masulis, R.W. & Stoll, H.R.. (1996). Energy shocks and financial markets. *Journal of Futures Markets* 16, 1–27.
35. Hussain, Z., Rao, H., Akram, B., & Fayyaz, M. (2015). Effect of Financial Leverage on Performance of the Firms: Empirical Evidence from Pakistan. *SPOUDAI Journal of Economics and Business*, 65(1–2), 87–95.
36. Kilian, L. (2008). The economic effects of energy price shocks. *Journal of Economic Literature*, 46(4), 871-909.

37. Kutty, G. (2010). Effect of Exchange Rates on Stock Prices. *Journal of Finance and Banking Research*, 24(3) 43 – 59.
38. Maghyereh, A. (2004). Oil price shock and emerging stock markets: A Generalized VAR Approach. *International Journal of Applied Econometrics and Quantitative Studies*, 1(2), 27-40.
39. Mauwa, J., Namusonge, G.S. & Onyango, S. (2016). Effect of capital structure on financial performance of firms listed on the Rwanda Stock Exchange. *European Journal of Business, Economics and Accountancy*, 4(4), 1-11.
40. Ministry of Energy. (2012). National Energy Policy. *Sessional Paper*.
41. Mugenda, O., & Mugenda, A.G. (2003). *Research Methods: Qualitative and Quantitative approaches*. African center for technology studies, Nairobi. Kenya.
42. Okiro, K., Aduda, J., Omoro, N. (2015). Effect of corporate governance and capital structure of performance of firms listed at the East African community securities exchange. *European Scientific Journal*, 11(7), 504-533.
43. Omagwa, J; Kihoto, E. & Reardon, G. (2017). Oil Retail Pricing and Price Controls: A Case of Oil Marketing Sector in Kenya. *Journal of Economics and Sustainable Development*. 8(2), 114 – 120.
44. Omai, M. D., Njeru, A. G. & Momba, F. S. (2018). Commercial Debt Effect on Petroleum Marketing Companies Profits in Kenya. *International Journal of Economics, Commerce and Management* 6(1), 125 – 138.
45. Pandey, I.M. (2004). *Financial Management*. Ninth revised edition, Vikas, India.
46. Petroleum Insight. (2009, October-December). *Kenya petroleum sales market shares 2009*. Nairobi: Kenya Petroleum Institute of East Africa.
47. Rajput, N. & Bharti (2015). Shareholder types, corporate governance and firm performance: An anecdote from Indian corporate Sector. *Asian Journal of Finance & Accounting*, 7 (1), 45-63.
48. Rao, D.T. (2016). *The relationship of macroeconomic factors and financial performance of the five firms listed in the energy and petroleum sector of the NSE* (Thesis). Strathmore University. Retrieved from <http://su-plus.strathmore.edu/handle/11071/4752>
49. Ravichandran K. (2010). Impact of Oil Prices on GCC Stock Market. *Research in Applied Economics*. 2(1) 56-78.
50. Ross, S. A. (1976). The arbitrage theory of capital asset pricing. *Journal of economic theory*, 13(3), 341-360.
51. Sadorsky, P. (1999). Oil price shocks and stock market activity, *Energy Economics*, 21, 449-469.

52. Sakib B. A., & Marsiliani, L. (2015). Energy Price Shocks in Dynamic Stochastic General Equilibrium: The Case of Bangladesh. *Review of Business and Economics Studies*, 3(4), 12-21.
53. Shanken, J. (1992). The current state of the arbitrage pricing theory. *The Journal of Finance*, 47(4), 1569-1574.
54. Shapiro, S. S. and Wilk, M. B. (1965) An Analysis of Variance Test for Normality (Complete Samples). *Biometrika*, 52, 591–611.
55. Sharpe, W. F. (1964). Capital Asset Prices: A Theory of Market Equilibrium under Conditions of Risk. *Journal of Finance*, 425-42.
56. Solomon, M.C., Gerald, M.M., Alala, O.B., Douglass, M. & Maokomba, O. C. (2013). Capital structure and corporate governance practices. Evidence from listed non-financial firms on Nairobi security exchange. *Journal of Business Management*. 10(2), 8-16.
57. Stiglbauer, M. (2011). Impact of capital and ownership structure on corporate governance and performance: evidence from an insider system. *Journal of Problems and Perspective in Management*, 9(1), 16-23.
58. Taylor, J., & Weerapana, A. (2011). *Principles of microeconomics (7th ed.)*. New Jersey, NY: South-Western, Cengage Learning.
59. Taylor, B. (2006). *Price ceilings*. Retrieved January 5, 2013 from <http://economics.fundamentalfinance.com/price-ceiling.php>
60. Timmermann, A. & Granger, C. W. J. (2004) Efficient Market Hypothesis and Forecasting, *International Journal of Forecasting*, 20, 15-27.
61. Tucker, I. B. (2010). *Economics for today (7th ed.)*. Mason: South-Western Cengage Learning.
62. Zhu, B. (2012). The effect of macroeconomics Factors on Stock Return of Energy Sector in Shanghai Stock Market. *International Journal of Scientific and Research Publications*, 2(11), 1-4.