DECOMPOSITIONS OF DRIVERS OF INFLATION BEFORE AND AFTER OIL PRICE CONTROLS IN KENYA

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ABSTRACT

This research work sought for an empirical assessment to the policy that by regulating and dictating market prices for oil products in Kenya, the ERC will help reduce and stabilize the CPI inflation in the Country. Inflation has and still remains a major concern in the country with the authorities consistently unable to bring it under the 5% target set by the National Treasury. However, little empirical studies have conclusively been undertake to back the validity, viability and stability of the claim that oil prices are most responsible for inflationary pressures and that by fixing retail and wholesale prices, the ERC will stabilize the CPI inflation. Beside this, other objectives of the research included examination of other variables affecting inflation, and the extent to which they affect inflation and an evaluation for the need of price controls in Kenya's energy sector. The research adopted 4 exogenous variables, namely, oil prices, dollar exchange rate, 1 period-lagged interest rates and foreign remittances, while inflation will be the endogenous variable. Spanning the monthly data from October 2008 to February 2010 for period one and March 2013 to February 2014, the proposal used a single equation regression model using OLS estimation. Data used was secondary data from KNBS and CBK publications as well as data from ERC.

The finding of this policy analysis show that the policy only managed to reduce volatility in CPI Inflation and prices for oil, but has not significantly lowered the CPI inflation. The mean inflation rate in the two time periods is found not to be statistically different. It was also found that effects of oil prices on CPI inflation are statistically significant in period one, while insignificant in period two. The research also show that individual and joint effects of other independent variables like Dollar Exchange rate and Foreign Remittances on CPI inflation are insignificant in both time periods.

1. INTRODUCTION

1.1 Inflation Environment Background/Global Inflation Targeting

Romer(2012) defines inflation as increase in average prices of goods and services in terms of money. Globally, inflation management is a reserve of monetary policy and monetary policy is a reserve of Central Banks. Friedman (1963) famously noted that inflation is a monetary phenomenon, and so it has remained. Laws that govern most Central Banks define their core mandate as maintaining stable price levels and establishment of monetary system of transaction. Besides other subsidiary role like growth and employment, the Bank of England like Bank of Canada, has its core functions defined as monetary stability and financial stability. Interest rate decisions are made by its Monetary Policy Committee (MPC) while Chancellor of Exchequer sets and confirms the inflation targets. It is up to the Bank to meet the inflation target as it conducts its monetary policy. Currently the inflation target is two per cent (Bank of England, 2013.

In Kenya, the Central Bank is established under Sections 4 and 4A of the Central Bank of Kenya (CBK) Act which sets out the Bank's core objectives and mandate as formulation and implementation of monetary policy directed to achieving and maintaining stability in the general levels of prices and fostering liquidity, solvency and proper functioning of a stable market-based financial system. Subject to these two broad objectives, the CBK is mandated to support the economic policy of the Government, including its objectives for growth and employment through (CBK 2013).

The mandate of calculation of official statistics on all levels of inflation in Kenya is vested with KNBS, while the law gives mandate to Treasury Secretary to specify to the Governor, CBK, the price stability target for every succeeding 12 months and the economic policies to be undertaken in the period under review. As has been in the last six years, the price stability target for CBK has been five per cent as measured by the 12-month Consumer Price Index, published by KNBS (Republic of Kenya, 2010). This is the target that the CBK is accountable to the general public. Whenever actual inflation deviates from target by twopercentage point, the CBK is expected to notify the Treasury Secretary the reasons for deviation, the policy actions CBK is undertaking to deal with the deviation, the period within which the Bank expects inflation rate to move within the target and how this new approach meets the Government's monetary policy objectives (Republic of Kenya, 2010).

The 4th APR on the implementation of Kenya's 1[st]MTP of V2030 notes that economic slowdown in the MTP period was mainly attributed to drought, inflation and global economic activities. Failure to attain MTP growth target of 9.7% was attributed to depressed state of economy associated with inflationary pressures, with inflation skyrocketing from 6.9% in 2010/2011 to 16% in 2011/2012. The high oil prices also continued to exert pressure on productivity and national competitiveness.

The CBK has maintained a modest inflation target of 5% in the short to medium term. First introduced during the 1st MTP(2008-2012) of Vision 2030, the same target has been put in the 2[nd]MTP(2013-2017). While this target seem modest compared to the Canadian or British targets, it has consistently proved insurmountable in the period under target with double-digit annual inflation being registered. Annual inflation rate increased from 9.8% in 2007/08 to 16.2% in 2008/09 before easing to 10.2 % in 2009/10 (Republic of Kenya, 2012, 2013).

Table 1.1: Rate of inflation, GDP growth and CBR from 2004-2011

Year	2004	2005	2006	2007	2008	2009	2010	2011
Π	11.6	10.3	14.5	9.8	16.2	10.2	14	14.0
Δ GDP	5.1	5.8	6.4	7.1	1.5	2.7	5.8	4.4
CBK R			10	8.75	8.5	7.0	6.0	18

1.1.1 Inflation, Money Growth and Interest Rates

Inflation, as studied in the AD-IA Model (Romer, 2000) is constant in the short run mainly due to standard wage setting behaviors in the economy and expectations of steady inflation in the economy. While in the intermediate to long term, changes to inflation rate may be gradual or sudden. Gradual changes in inflation will depend on position of actual GDP as compared to potential GDP. In cases of excess demand (overheating economy), firms raises prices irrespective of prevailing rates of inflation. These new prices are set higher than the prevailing inflation rate to promote production. If all firms in market raise their prices, inflation gradually rises. Inflation that arises is Demand Pull inflation, which comes from strengths and weaknesses of the economy (Friedman, 1968, also Phelps, 1967).

Sudden changes in the levels of inflation are due to occurrence of unforeseen events. These events are mainly attributed to, first, drastic changes in prices or supply of key inputs to production like oil. The rationale being that the key inputs to production have no instantaneous substitution and no backstop technology exists to cover for their shortfall. Supply will be constrained as long as changes occur. Inflation from such constraints on the supply side is cost push inflation, which captures all shocks due to inflation that are unrelated to expectations and labour markets in the economy (Phelps 1968). Secondly, changes in inflation expectations will cause sudden adjustment in the inflation adjustment schedule. If major players in the economy believe that future inflation will differ substantially from the current experience, then the expected inflation will be built in negotiated wages and prices. Thus if more and more economic decisions are based on expected inflation levels, then actual inflation in the short run will suddenly change to reflect these expected changes. These changes will occur assuming agents in economy have rational expectations (Thomas and Neil, 1975).

1.1.2 Oil Price Regulations in Kenya

Because price controls cannot effortlessly set prices as free market would, there is always chance that such market intervention will create artificial support levels not matched by true fundamentals. This mismatch will mostly, where no empirical studies exist, be hard to detect. The challenge posed by such artificial price support initiates is that it perpetuates a feedback loop that can be devastating to the economy when a new policy to eliminate the price controls is enacted or enforced. Attempts by the government to suddenly terminate the price controls could lead to bankruptcy to various economic agents, depending on their position of exposure. In Nigeria, the attempts by the Federal government to end the oil price subsidy program in 2012 were met with massive street protests as inflation rapidly rose.

 In economies with no shock therapy, oil prices are deemed to contribute highest to the shocks that aggregate the cost push inflation while monetary policy influences demand pull inflation. In bid to reduce the cost push inflation aggregating from fluctuations in oil price, the ERC instituted price control on oil

pump prices in Kenya. Established under the Energy Act, 2006, the ERC has several objectives among them to "regulate the electrical energy, petroleum and related products, renewable energy and other forms of energy"(ERC, 2014). Through the legal notice no.196, The Energy (Petroleum Pricing) Regulations, 2010 were gazetted that set the maximum wholesale and the retail prices of petroleum products at a wholesale depot or retail dispensing site. The prices are usually set for a month, running from 15th to 14th of the next month. The sole objective of these regulations was to stabilize the general price levels, with assumption that the headline inflation was spiraling due to economic profiteering by oil marketers.

1.2 Statement of the Problem

The cost structure of maintaining a full-time price control regime and the associated economic efficiency loss of both consumer and producer surpluses makes justification of the review of the policy of price controls, in as much as costs and benefits are concerned. Whether price controlpolicy in the energy sector is the best reaction to perceived market failure or the price control is the end result of government failure will constitute the dilemma that is at the core of the research problem. Thus whether these price controls have helped stabilize inflation in the country no study has been undertaken on the same, leaving the policy makers in dilemma, thus the urgent need for study.

A secondary problem lies in the fact that it hasn't been determined how much of the variations in inflation are explained by the changes in money supply or interest rate, foreign remittances, or shocks in oil prices and dollar exchange rate. Lack of such decomposition makes the policy response function uncoordinated and ineffective. This is quite necessary if policy makers are to effectively use both fiscal and monetary policies to bring inflation to target.

For successfully meeting its objective of internal equilibrium via stable price levels, the CBK needs to know the true drivers and their magnitude plus direction. This failure to bring inflation to target has prompted the problem sustained high rates of interest in the medium to long term. This in effects stifles growth in an economy as ambitious as Kenya's.

1.3 Objectives of Study

1.3.1 General Objectives

The broad objective of this study is to establish whether oil price controls in Kenya helped stabilize the country's rate of inflation as measured by CPI.

1.3.2 Specific Objectives

Specifically, the study seeks to:

1. Establish if the country has registered a lower inflation rate as a result of oil price control
2. Examine whether other factors under study influences the rate of inflation in Kenya and the extent to which they influence.
3. Examine if oil price controls are a necessity in meeting objective of Price stability.

1.4 Research Questions and Hypotheses

1.4.1 Research Questions

The study seeks to find answers to the following questions:

1. Has the country registered a lower inflation rate as a result of oil price controls in Kenya?
2. What are the other factors affecting the rate of inflation in Kenya?

3.   Are oil price controls a necessary requirement in Kenya's Free Market Economy?

1.4.2 Research Hypotheses

The research hypotheses will determine the parameters of the research questions and the methods to be employed in testing the hypotheses.

This study will adopt the following research hypotheses:

H0: oil price controls have helped reduce the country's rate of inflation

H1: oil price regulations have not helped reduce the country's inflation

H0: Oil prices, foreign remittances, interest rates and dollar exchange rate do explain much of the inflation source

H1: Oil prices, foreign remittances, interest rates and dollar exchange rates do not explain much of the inflation sources

H0: Oil price Controls area necessary requirement in Kenya

H1: Oil price controls are not a necessary requirement in Kenya

1.5 Justification of the Study

This research will provide an interim scorecard of the effects of oil price regulations and their level of significance in signaling inflation direction. This is useful to the consumers and investors in the energy sector as stability and uncertainty in the market will be reduced since it is expected that relevant policy measures will be recommended. Speculators who have been hoarding vast oil stocks on the week preceding the price announcement will be eliminated if policy recommendation is abolishment of the price controls. Likewise, as in every Price mechanism not dictated by market fundamentals, the welfares losses by both Consumers and Suppliers will be reduced, if present, when relevant recommendations are adopted. Also this study will help the ERC determine the cost and benefit of having oil price controls in Kenya depending on research output and results.

1.6 Scope of the Study

The study concentrates on two time horizon, modeling inflation before and after introduction of oil price caps by the Energy Regulatory Commission. The first period will be period between October 2008 and February 2010, while period two range from March 2013 to February 2014. Also, in modeling inflation, only four variables that are endogenized, i.e, Foreign Remittances, Oil prices, dollar exchange rate and interest rate. Since oil pump price are set for every town and city, pump prices for Nairobi will be used as it has the highest percentage of industrial output and motor vehicles, which is a representative of the aggregate value of the country. The research is confined to the Kenyan aggregate Macroeconomic context.

1.7 Limitations of the Study

The study relied heavily on secondary data sources and thus the findings are as good as the data sources. Inconsistency and inaccuracy in secondary data used would significantly affect the entire research process. Effort has been made to confirm these secondary data from other multiple sources.

2. REVIEW OF LITERATURE

2.1Theoretical Review and Conceptual Framework

2.1.1 Theoretical Review

Various theories that give both the normative and positive analysis of the primary role of the government in free market economies have long been formulated. The primary concern of these theories is whether the mechanism of demand-supply equilibrium is stable with or without government intervention through regulations and price controls. The classical economists were the first adherent of free market values. The Keynesians Economists thought that government intervention in free market was vital in the face of pervasiveness of the market. Weimer and Vinning (2011) note that there is need to exercise caution in Government intervention in free market equilibrium. While market failure through traditional channels like Provision of public good, existence of externality, asymmetric information and natural monopoly are the major avenues of government intervention, the authors stress that market failure is a necessary but not sufficient condition for government intervention. The sufficient condition requires that the anticipated benefits should be greater than the costs.

These government costs through market interference constitute government failure as compared to market failure. This could either be Passive Government failure, where failure of government to intervene in market to bring upon result in a socially preferred mix of output or the active government failure, which occurs when government intervention causes a more inefficient allocation of goods and services than would occur in free market setting (Weimar and vining, 2011). These societal costs of government intervention is normally manifested through rent seeking, where interest groups exert effort to use government machinery to restrict competition and capture monopoly profits. These rent seeking occurs through means like lobbying for favorable tariffs, regulations and direct fixation of prices by government of price ceiling, like the current situation in Kenya's oil market.

Stiglitz (1986), a key architect of the Theory of Market with Asymmetric information, strongly advocates for government intervention in free market, and has shown that that it is under limited circumstances that markets are efficient. The basis of this theory is that whenever asymmetric information exists and markets are incomplete, the outcomes of a complete competitive market allocation cannot be Pareto constrained optimal. The theory calls for balance between government and free market.

Viscusi et al (2005) describes the major theories that underpin government regulations of free market activities. Public interest theory assumes that government is a benevolent force that intervenes in market to maximize public interest. Capture Theory (Stigler,1971) highlights that regulatory agencies set up to advance public good, normally end up serving the commercial interests of interest group that they are charged with regulating. Stigler argues that regulations are used to keep out competitions for firms to earn super normal profits. This theory is closely related to the Economic theory of Regulation, which emphasizes that though regulations are mainly set up for public good, firms are better organized to lobby for their interests than other economic agents.

The theoretical models and theories that drive most of the literature on inflation are as diverse as they come. The starting point for such analyses on inflation is always monetary policy theories like the Quantity Theory of Money, which emphasizes that inflation is fundamentally influenced by growth rate of money supply, decrease in output, decrease in interest rates and decrease in demand for money (for given level of interest rates and output) (Romer 2012). Assuming prices are fully flexible (like in the

longrun), the implication is that changes in money supply does not affect real variables like real output and real interest rate (Sargent and Wallace, 1975).Romer shows that changes in inflation resulting from changes in money growth is reflected one for one in the nominal interest rates(fisher effect) and secondly, these changes in nominal money stock reduces real money stock through positive changes in inflation expectations resulting in increase in opportunity cost of holding money. The net effect is reduction in quantities of real balances that individuals want to hold. Under this assumption of complete price adjustment, equilibrium entails situation of periods where rate of inflation is higher than rate of growth of money stock.

Under incomplete price adjustment and flexibility model, monetary expansion reduces both the nominal and real interest rates, since this increase in money supply will raise output, with equilibrium condition requiring decline in real interest rates (liquidity effect) (Romer, 2012). The traditional practice of conducting monetary policy by police makers was based on variations of money supply in response to changing inflation rates. Friedman (1960) argued that Central Banks should follow the K-per cent rule of growing money supply at annual rate of 2-3 per cent. Most economists have argued against this procedure of conducting monetary policy. Romer (2012) shows that it would be imprudent for Central Bankers to follow the K-per cent rule since measure of stock of money that Central Banks can hold tightly, like stock of High-Powered Money are not closely linked to AD. Thus the theoretical practice is variation of interest rates as a policy in lieu of rising inflation. This calls for active Central Banks, ready to intervene in varying economic environment.

 Taylor (1993), argued that conduct of monetary policy should be based on rules for changing short-term nominal interest rates. To this Romer adds that Central Banks should neither be thought of fixing nominal interest rates that is out of synch with economic conditions(which leads to instabilities) nor should central bank be seen as adjusting the interest rate on ad hoc basis(which gives no room for studying economic agents behaviours and expectations)(2012).

The Taylor rule (Taylor, 1993) provides basis for adjustment of the nominal CBR based on two elements. First, is raising nominal interest rate more than one for one with inflation, so that real interest rate increases when inflation falls. Secondly, interest rate should rise when output is above normal and fall when output if below full potential.

This prescription of conduction of monetary policy via adjustment of interest rates becomes ineffective in an environment of zero-bound nominal interest rates coupled with falling prices. The experience of Japan in the late 1990 after burst of the Dot Com bubble and also in Europe (especially Britain) and USA after the financial crisis of the 2007-2008 showed how ineffective and incapacitated the Central Bank that relies on this rule will be in the face of deflation and zero-bound nominal interest rates.

Bernanke and Reinhart (2004) shows that the apt solution to this quagmire is open market operations that involve buying assets other than short-term government debts (quantitative easing) and shaping expectations (forward guidance) Joyce et al (2011)of The Bank of England in Q3 bulletin observes that after 2007-8 crisis Over the period March 2009 to January 2010, £200 billion of assets were purchased, overwhelmingly made up of government securities, representing around14% of annual GDP. They define QE as policy of expanding the Central Bank's balance sheet through asset purchases, financed by Central Bank money.

The authors' note that the sole purpose of QE is to do what interest rate rule cannot do: "to stimulate nominal spending and thereby domestically generated inflation, so as to meet the MPC's 2% inflation target in the medium term" (Joyce et al 2011). The desired end result of transmission mechanism of QE is increase broad money holdings, increase in asset prices and expenditure by lowering borrowing costs. The empirical evidence by BoE on macro effects of the QE's Asset Purchase Facility suggests that QE may have raised the level of real GDP by 1.5 to 2/% to and increased inflation by between 0.75 to 1.5 percentage points.

Helmut (2008) identifies economic shock as an unexpected event that affects the economy positively or negatively. This event thus is unpredictable changes in exogenous factors having impact on endogenous variables. The understanding being that these changes in exogenous factors are unexplained by economics. Blinder and Rudd (1998) defines supply shocks as events that, on impact, move the price level and real output in opposite directions while Demand shocks are events that, on impact, move the price level and real output in the same direction. Thus when negative shocks hits the economy causing AS to contract, economy tries to restore itself to a new, lower equilibrium. In the process of readjustment to the reality, output falls, employment falls and inflation rises rapidly. This stagnation of growth together with high levels of unemployment and inflation (stagflation) occurs mainly due to sudden reduction of productive capacity of economy by unfavorable supply shock (DeLong, 1998) e. g the stagflation of the 1970s after the oil shock crisis. However stagflation can also be caused by inappropriate and loose monetary policies of the central bank that allows for excessive money supply and also inappropriate macro policies like too much regulation of goods and labour markets (Blanchard 2000).

Oil prices hugely drive the inflation pressure in most developing countries. Thus instability in supply and pricing will precipitate cost push inflation that gives huge variations between headline inflation and core inflation. The problem faced by an inflation targeting Central Bank is containing inflation due to cost structures of the economy. Volatility in supply of key ingredient to production process like oil, will mean that inflation remains volatile, leaving little chance to the meeting of the inflation target. In such an environment of huge discrepancy between headline and core inflation, the cause of such is always apportioned on oil prices, without much empirical studies to prove extend of the effect.

The quick fix solution to such problem perception is imposition of state supported subsidies on oil prices (like Nigeria) or establishment of oil price controls at the pump, (like Kenya). In Nigeria, attempts by state to eliminate subsidies on oil were met with public riots as general price level escalated. Weimer and Vining (2011) notes that such price supports only provides temporal benefits and any attempt to regain efficiency and cut government spending through elimination of price support will precipitate bankruptcy of many firms.

While the effects oil prices and interest rates on inflation are rather direct, this is not so when it comes to exchange rates. Various empirical studies have given varied results and thus the Jury is still out there. However the concerns of these empirical works in modeling effects of exchange rate volatility on CPI inflation have been based on whether the exchange rate regime is floating or fixed. The Kenyan exchange rate regime is fully flexible with psychological bands which when crossed, there is always public outcry forcing active intervention by the CBK.

The CBK however notes that while foreign exchange reserves are also an indirect instrument of monetary policy, its involvement in the Forex Market does not target a particular level or direction of change of the

Exchange rate other than stemming excessive volatility in the Exchange rate. Since exchange rate is price of Kenyan Currency in terms of other Currency, this intervention by CBK falls within its statutory objective of price stability (CBK, 2013). It also emphasizes that Inflation seriously harms the value of the Kenya Shilling (exchange rate), causing exports to lose competitiveness and consequently decreasing earnings of foreign exchange.
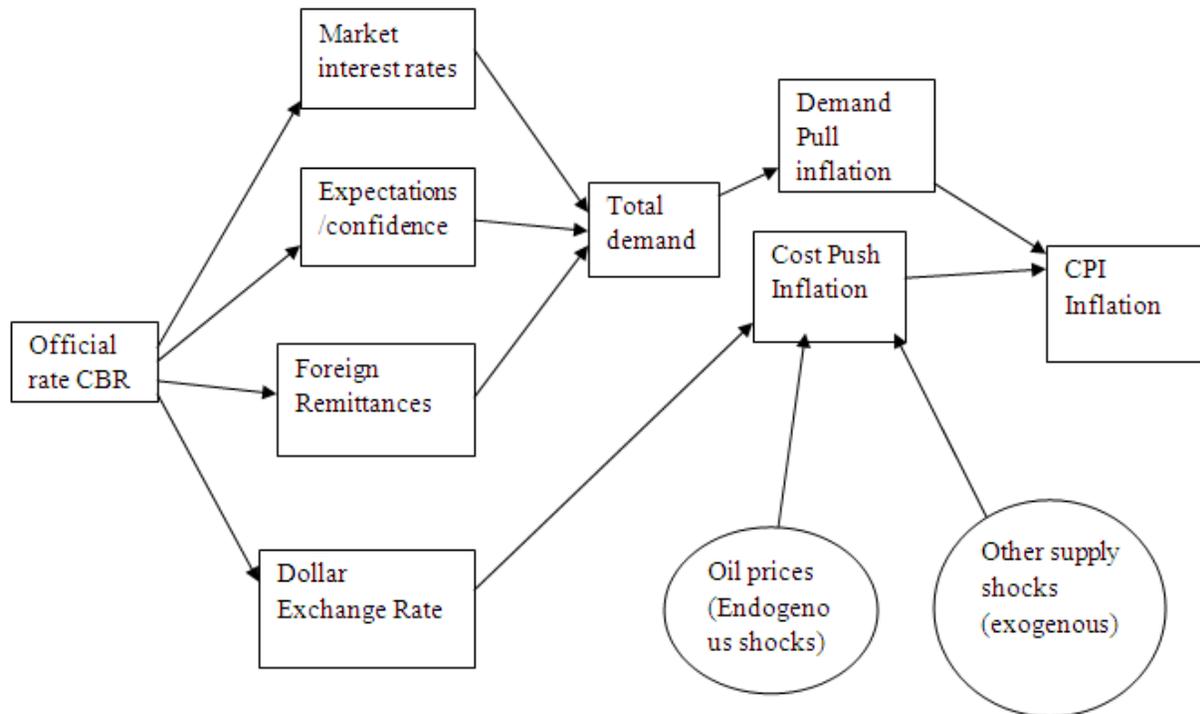
2.1.2 Conceptual Framework

The conceptual framework developed from the traditional monetary policy transmission mechanism and exogenous shocks which explains much of the Demand Pull Inflation and Cost Push inflation. As one of the variables under study, shocks due to oil prices will be endogenous in this framework. Taylor (1995) identifies nominal interest rates, exchange rates, the credit channel and channel determining prices of assets in the economy as the principal transmission channels of monetary policy.

These channels are mostly effective for developed economies. However for developing countries that rely mostly on crude oil as source of energy, transmission mechanism is heavily impaired in times of supply shocks that precipitates cost push inflation. Effects of such shocks tend to be severe and prolonged in developing countries than in developed countries with other energy solutions. This cost-push inflation may run counter to the prevailing monetary policy stand making achievement of policy targets hard. Bernanke et al (1997), notes that such shocks always leads to fall in output, rising inflation and monetary tightening Sommer, (2002) attributes supply shocks effect on inflation in the short run only. He notes that knowing whether these shocks are permanent or transitory is significant in the formulation of the reaction function.

Tober and Zimmermann, shows that with such a shock, oil becomes expensive and real wages falls with return on capital increasing. In the long run, capital is substituted for oil as energy efficient techniques and new energy technologies increase. Labour productivity starts to increase as potential output returns to previous highs. Due to existence of friction in the economy, the fast and smooth return of the economy to its equilibrium will depend on various monetary policy choices adopted. Their conclusion is that during such shocks, conductors of monetary policies should focus on core inflation and react accordingly. Absence of real wage rigidity will mean that the rising inflation will be temporal, whether the shocks are temporal or permanent. While the central bank can influence inflation due to monetary policy, there isn't anything the central bank can do to control cost-push inflation. Thus an inflation targeting Central Bank should hardly react to the price shock at all.

Likewise, the CKB has acknowledged the inflationary pressure that Foreign Remittances generates. This foreign remittance component, like the international oil prices shocks, are beyond the control of a Central Bank operating in a liberalized economy where capital is fully mobile and dollar remittance comprises a significant source of foreign currency.

(Figure 2.1- Conceptual Framework)

2.2 Empirical Literature

Bleaney and Fielding (1999) Using a model of the Barro-Gordon (1983) type, in which policy-makers have two objectives (output and inflation), and using a sample of 80 developing countries with different exchange rate regimes, the authors tests the hypothesis that countries with managed exchange rates achieve lower inflation and suffer higher output and inflation variability than those with floating rates, their findings were unambiguous; The 52 countries with pegged exchange rates averaged inflation of 9.5%, far lower than the 23.9% experienced by the 28 flexible-rate countries.

Nguyen and Fujita (2007) observes The channel of effect of real devaluation on inflation is via positive change in money supply and increasing trade balance through the economy's AD and AS. Using a VAR model, the authors decompose impulse response functions and variance decomposition for output and price levels and how the output and price levels respond to a shock in real devaluation and what proportions of output and price levels can be explained by variations in real exchange rates. Their empirical finding is that a real devaluation affects inflation positively.

Albuquerque and Portugal (2005) seeks to establish the relation between exchange rate and inflation volatilities by adopting a bivariate GARCH model that deals directly with conditional volatilities of the variables. They find a semi-concave relation between exchange rate and inflation variances. This position is reinforced by Edwards (2006) who tests the relationship between exchange rates and Inflation Targeting. The author tries to answer three questions; first the stability of relationship between the relationship between the pass-through and the effectiveness of nominal exchange rates in IT regimes, second, the effects of IT on exchange rate volatility and lastly, the potential role of exchange rate changes on the monetary rule in IT countries. The findings were consistent with the established literature. First,

Countries that have adopted IT have experienced a decline in the pas-through from exchange rate changes to inflation; second, the adoption of IT monetary policy procedures has not resulted in an increase in nominal or real exchange rate volatility. Third, on role of exchange rate on IT, the author opines that there is some evidence that IT countries with a history of high unstable inflation tend to take into account explicitly developments in the nominal exchange rate when conducting monetary policy.

Using the Granger Non-Causality Test based on Kenyan Data during the period of 1970-1993,Ndungu' (1997) showed that the level of domestic inflation and exchange rate changes affect each other, though the magnitude of this relationship is not certain. Ghosh*et al* (1996) in an IMF Paper sought to find out how various exchange rate regimes influenced inflation and output. Using more comprehensive data from all IMF members from 1960–90, they find a strong link between fixed exchange rate and low inflation. Countries with pegged exchange rates had an average annual inflation rate of 8 percent, compared with 14 percent for intermediate regimes, and 16 percent for floating regimes. This causality, they explain, is due to, first a *discipline* effect, which they define as the political costs of abandoning the peg induce tighter policies and a *confidence* effect (greater confidence leads to a greater willingness to hold domestic currency rather than goods or foreign currencies (Ghosh*et al*, 1996).

Economic effects of remittance to the recipient countries have long been known to be positive. Most significantly, remittances improve living conditions of the individual recipients. These when aggregated, could mean a significant percentage of the poor (if it is assumed that the poor are the recipient) are driven from abject poverty afflicting most developing countries. The World Bank estimates that Global remittances, including those to high-income countries, are estimated to have reached $529 billion in 2012, compared to $132 billion in 2000. Out of these, $401 billion went to developing countries, with forecast for $ 515 billion in 2015. India ($69 billion), China ($60 billion), the Philippines ($24 billion) are the top recipient among developing countries with Nigeria and Egypt ($21 billion each) being the top recipient in Africa (World Bank 2013).

In Kenya, CBK monitors statistics on Remittances and acknowledges that they are important contributor to the country's growth and development, and thus conducts monthly surveys of inflows in Kenya through the formal channels that include commercial banks and other authorized international remittances service providers in Kenya. As of the first ten months of 2013, the country had received $ 1.063941 billion in remittance inflows, with North America accounting for 45% of total remittances while Europe and the rest of the World accounted for 28% & 27%, respectively (CBK,2013).

Despite this huge potential that remittances have, little empirical studies have been dedicated on the macro-economical effects that remittance could have on the economy. Like effects of remittance on exchange rate under both fixed and floating exchange rates regimes, also, effects of remittance on inflation in the recipient country. Possible explanation could be that since remittance is mainly an issue of developing countries, the effects could seem insignificant when observed in the most developed countries.

Khathlan (2012) attempts to find the link between remittances and economic growth in Pakistan using Autoregressive Distributed Lag (ARDL) test and the Error Correction Model (ECM) techniques for the period 1976-2010. Although the author finds the relationship positive and significant, the result does not show effect on variables like inflation. Ball et al (2012) uses panel vector auto regression techniques to understand the effect of remittances on GDP, inflation, real exchange rate and money supply, depending on the exchange rate regimes. Under a fixed exchange rate regime model predicts that remittances should

temporarily increase inflation, GDP, the domestic money supply and appreciate the real exchange rate but decrease inflation, increase GDP, appreciate the real exchange rate and generate no change in the money supply when studied under flexible exchange rate regime.

2.3 Research Gaps

Most of the contemporary literature on relationship between inflations and the independent variables are limited to two variable models or in other cases, multivariable models but not under policy guidelines as this proposal tries to model. These existing researches mainly have concentrated on only establishing the magnitude of the relationship and not the effect of the existing policy, like price controls, on the relationship of the variables. This is a vital omission, and as the Lukas Critique goes, conclusions from such econometric measures will give misleading forecasts when used practically during times of policy change since parameters of these models are not structural and time-invariant (Lukas, 1976).

3. RESEARCH METHODOLOGY

3.1 Introduction

This chapter provides the empirical model which establishes the econometric model specified and a description of the variables used and the estimation procedure. Thereafter, we provide a brief discussion of the study area, the data types and sources.

3.2 Research Design

The research process adopted experimental survey method. The functional form will be a Single Equation Linear Regression model involving the variables under study, at periods before and after domestic oil price controls. Therefore, in this model, two regression models of the same variables at different time periods were adopted and results compared. This method satisfies the objectives of this research paper; which is to test how effective has the oil price control helped in stabilization of the country's rate of inflation. The research adopted quantitative, secondary time series data.

3.3 Model Specification

In formulation of this research model, the basis has been trying as much as possible to come up with a model that reflects the transmission mechanism of the monetary policy plus the Supply Shocks. Thus as stated, the independent variables are interest rates (CBK rate), the Dollar exchange rates, foreign remittances and Domestic Diesel oil prices. The expectations, which are also major transmission mechanism, will be captured by the constant variable in the Regression Model. Inflation is the dependent variable.

The model itself will borrow heavily from the model of Expectations Augmented Phillips Curve, 1968, as developed by Milton Friedman and Edmund Phelps. Thus:

Inflation today = f (oil prices, exchange rate, Foreign Remittances and Interest rates)

The interest rate effect on inflation is lagged by one period, the model can thus be specified as,

$$\Pi_t = \Pi_{t+1}^e + \beta_1 OP_t + \beta_2 Ex_t + \beta_3 FR_t + \beta_4 IR_{t-1} + \epsilon_t$$

Where Π_t, Is the actual inflation rate observed in the economy today, Π_{t+1}^e is the constant in the regression model, and could be defined as the expected inflation in the economy tomorrow, which is inflation that can exist even if the economy is in full employment. OP_t Is current month oil price growth rate, Ex_t is the current monthly dollar exchange rate against the shilling, FR_t is the current month Foreign Remittances growth, IR_{t-1} is the previous month's rate of interest and lastly, $\in_t$ is the disturbance term that measures all others factors influencing inflation not captured by the model. It captures all other unspecified shocks in the economy that is unrelated to expectations, oil price and labour market. These shocks could be drought, political violence, or acts of war. It could be either positive or negative.

The coefficients, $\beta_1, \beta_2, \beta_3, \beta_4$ attached to each respective explanatory variable, and their utility are found in explaining marginal effects for each variable to the current rate of inflation. $\beta_1 OP_t$ and $\in_t$ is the sum of the Cost-Push inflation while $\beta_2 Ex_t + \beta_3 FR_t + \beta_4 IR_{t-1}$ is the sum of demand pull inflation. Interest rates are lagged by one time period, because, as the Bank of England Confirms, transmission mechanism via interest rates take time before their peak effects on demand, production and inflation are felt. These nominal rigidities could be attributed to adjustment Costs (menu costs), imperfect information, or contracts (Romer 2000).

3.4 Description of the Study Area

Nairobi is the capital city of the republic of Kenya, with over 50% of the country's GDP and center of the country's manufacturing and transport sector.

3.5 Data Sources and Data Types

The research process used secondary time series, monthly data on all the variables under study. Data on inflation and oil prices was retrieved from KNBS publications like Leading Economic Indicators, Statistical Abstract and Economic Survey while data on mean monthly exchange rates, Monthly Foreign Remittances and Interest Rates was extracted from publications of CBK and KNBS. The sample size will constitute data collected spanning the period from October 2008 to February 2010 and March 2013 to February 2014

3.6 Data Analysis

The research used Linear Regression Analysis method of OLS, instead of Maximum likelihood method because OLS estimates are BLUE. The data was tested to ensure it fits in the assumptions of OLS. Research process used *Eviews* for all its descriptive statistics analysis and econometric analysis. The output was tested and evaluated on economic, statistical and econometric criterion. Evaluation of model estimates on economic criteria involved test whether the parameters satisfy economic theory in as far as the size and magnitude are concerned. Statistical criteria involved tests for statistical reliability of the estimates using measures like correlation coefficients, degree of correlation between variables and coefficient of determination. Econometric criterion evaluated whether econometric assumptions of the model are satisfied. These tests includes, test for autocorrelation, heteroskedasticity and multi-collinearity. Finally, the model will be tested on its forecasting power.

4. RESEARCH FINDINGS AND DISCUSSION

4.1 Introduction

This chapter presents the summary statistics and regression results for various analyses required to meet the specific objectives of this research process. First though, a diagnostic test is conducted to evaluate whether the data at hand fits into the requirement and assumptions of OLS. These diagnostic criteria tests include econometric criteria (tests for autocorrelation, heteroskedasticity, multi-collinearity) that determined whether the estimates have minimum variances. Statistical evaluation criteria evaluated statistical reliability of the estimates using measures like correlation coefficient, coefficient of determination. Last criterion was the economic criterion that reviewed whether our parameters satisfy economic theory as far as size and magnitude are concerned. This formed the basis of accepting or rejecting the null hypotheses.

Because of the experimental nature of this study, it was implemented over two different time horizon, the first period ranging from October 2008 to February 2010, while the second phase involved conducting the study from March 2013 to February 2014. These two time horizons respectively correspond to time without oil price controls and time of oil price controls.

4.2 Descriptive Statistics

This section presents summary statistics for the two time horizons and discussion thereon. From the tables 4.1A and 4.1B below, mean of variable, monthly inflation (INR) can be observed to have marginally dropped from 0.595 (before oil price regulation and control) to 0.567 (after oil price regulation and control). At 5% significance level, this difference of means is not statistically significant (see table 4.2). This drop in mean inflation is reinforced by a lower standard deviation of monthly inflation rate after oil price control (from 0.866 to 0.533). Thus it can be argued that monthly inflation rates under oil price regulation and control regime have been less volatile compared to period under no price control, under the relevant sample size and space.

The normality test of the variables is done using the Jarque-Bera statistic, which will test the null hypothesis that the variables are normally distributed against the alternative hypothesis that the variables are not normally distributed. The high P-values indicate acceptance of the null hypothesis, and conclude that the variables under study are normally distributed, a necessary condition.

Table 4.1A descriptive statistics before oil price control (October 2008-Feb 2010)

Variable	Unit of measure	Mean	Median	Maximum value	Minimum value	Std. deviation	Jarque-Bera
Inflation rate	%	0.5958	0.4	2.5	-0.7	0.8662	1.2338 (0.5396)
Foreign exchange depreciation	%	0.4435	-0.01	7.35	-2.22	2.083	32.85 (0.00)
Foreign remittances	%	0.8165	-0.58	34.95	-28.05	15.6211	0.3701

growth						(0.8310)
Oil prices growth	%	-1.4518	0.09	7.33	-16.97	5.7783	5.623 (0.063)
Central Bank Rate	%	7.9411	8	9	7	0.6645	0.6860 (0.709)

Table 4.1B descriptive statistics after oil price control (Mar 2013Feb 2014)

Variable	Unit of measure	Mean	median	Maximum value	Minimum value	Std. deviation	Jarque-Bera
Inflation rate	%	0.567	0.35	1.8	-0.05	0.5384	2.11 (0.3476)
Foreign exchange depreciation	%	-0.103	0.015	1.6	-2.4	1.344	0.888 (0.6412)
Foreign remittances growth	%	0.77	0.41	13.05	-9.39	5.52	0.6249 (0.7316)
Oil prices growth	%	-0.009	0.61	3.73	-5.05	2.20	1.1307 (0.5681)
Central Bank Rate	%	8.5	8.5	8.5	8.5	0.0	NA (NA)

Table 4.2 test for equality of means for INR before and after oil price regulations controls

```
Hypothesis Testing for INR
Date: 06/11/14  Time: 19:35
Sample: 2008M10 2010M02
Included observations: 17
Test of Hypothesis: Mean =  0.567500
Assuming Std. Dev. =  0.538400

Sample Mean =  0.595882
Sample Std. Dev. =  0.866250

Method                           Value      Probability
Z-statistic                      0.217354       0.8279
t-statistic                      0.135092       0.8942
```

We also examine the volatility in percentage changes in prices of oil before and after the oil price regulations and control. From table 4.1A, it can be seen that on average, oil prices had bigger dispersion

and volatility before introduction of price regulations and control (5.77%) compared to the period under price regulations and control (2.20 %). Ceteris Peribus, regulations of oil prices has narrowed the dispersion in movement of average month prices

Tables 4.2A and 4.2B shows the summary correlation statistics for the variables under study for the two time period under study. As it is observed, inflation (INR) rate is negatively (weakly) correlated with changes in oil price (OILP) under period 1 of no price controls. This is compared to period 2 under price controls, when it is observed that the two variables, inflation and oil prices have weak positive correlation. This observation in period 1 is countercyclical to most market expectations.

When compared to CBKR (Central Bank Rate), it is seen that in period 1, the two variables have strong positive correlation (0.615). The correlation coefficient in period 2 between variables is indeterminate because of the co-linearity problem attributable to the variable CBKR in that period. Compared to the variable FEX(growth in Dollar Exchange Rate) the relationship between INR and FEX shows mixed results under the two time periods, with period 1 showing weak positive correlation coefficient (0.385) while period 2 gives a weak negative correlation (-0.284).The last variable, FR(growth in foreign remittance) has very weak positive correlation with INR in period 1 (0.098), as compared to weak negative relationship between the two variables in period 2 (-0.108)

Table 4.2A covariance-correlation table for period 1(October 2008-february 2010)

Covariance	FEX	FR	OILP	CBKR	INR
FEX	4.0855				
FR	9.27728	229.6658			
OILP	-1.7556	20.4838	31.4255		
CBKR	0.561	0.7817	-1.8224	0.4156	
INR	0.655	1.2490	-2.6055	0.3333	0.7062
Correlation					
FEX	1				
FR	0.3028	1			
OILP	-0.1549	0.2411	1		
CBKR	0.4305	0.0800	-0.5042	1	
INR	0.3856	0.0980	-0.5530	0.6151	1

Table 4.2B covariance-correlation table for period 2(March 2008-february 2014)

Covariance	CBKR	FEX	FR	INR	OILP

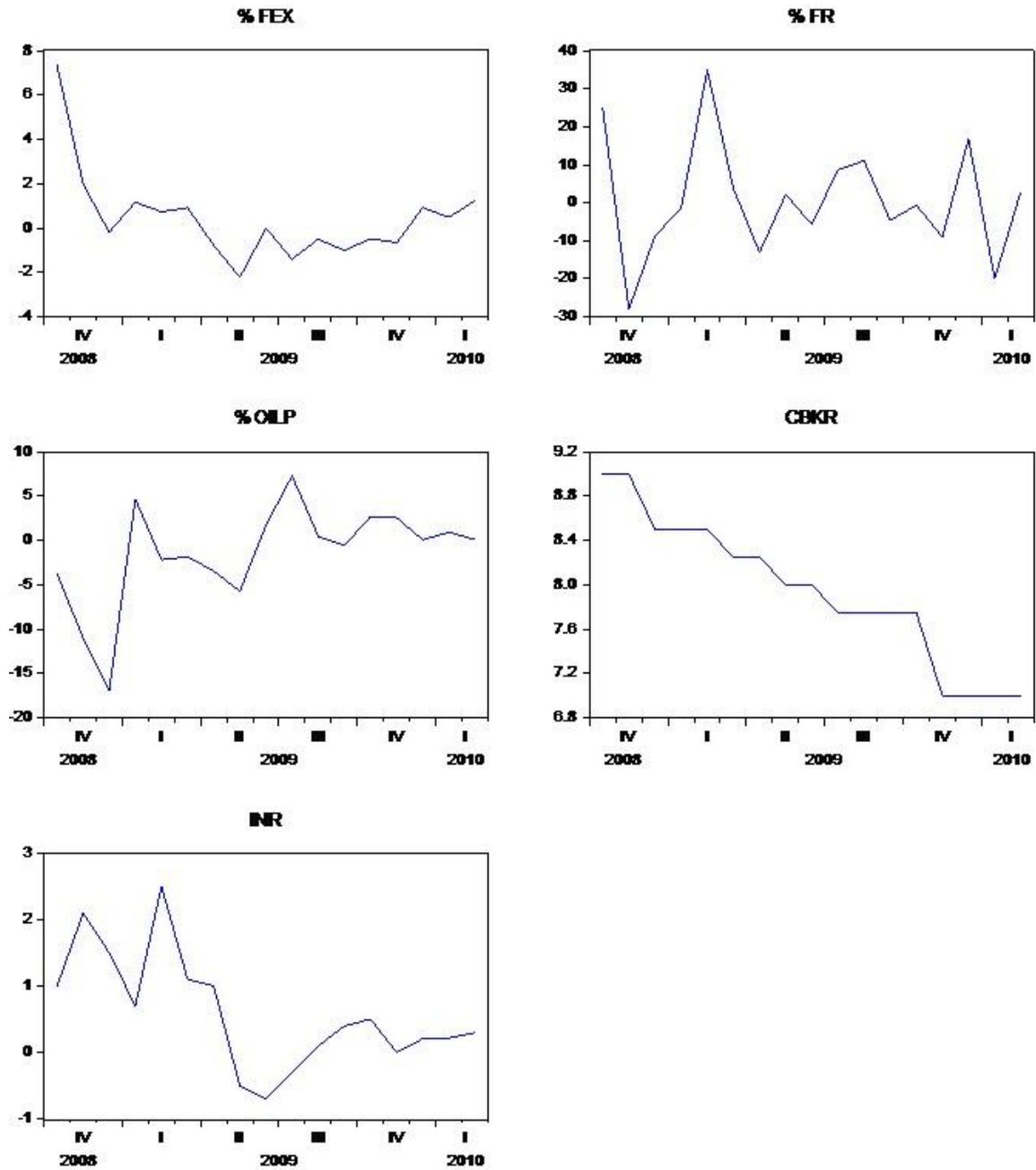| CBKR	0				
FEX	0	1.6561			
FR	0	-1.0714	27.9672		
INR	0	-0.1886	-0.2962	0.2657	
OILP	0	0.4985	2.2531	0.2656	4.4511
Correlation					
BKR	NA				
FEX	NA	1			
FR	NA	-0.1574	1		
INR	NA	-0.2844	-0.1086	1	
OILP	NA	0.1836	0.2019	0.2442	1

Figure 4.1A graph of the variables in period 1 (October 2008-february 2010)
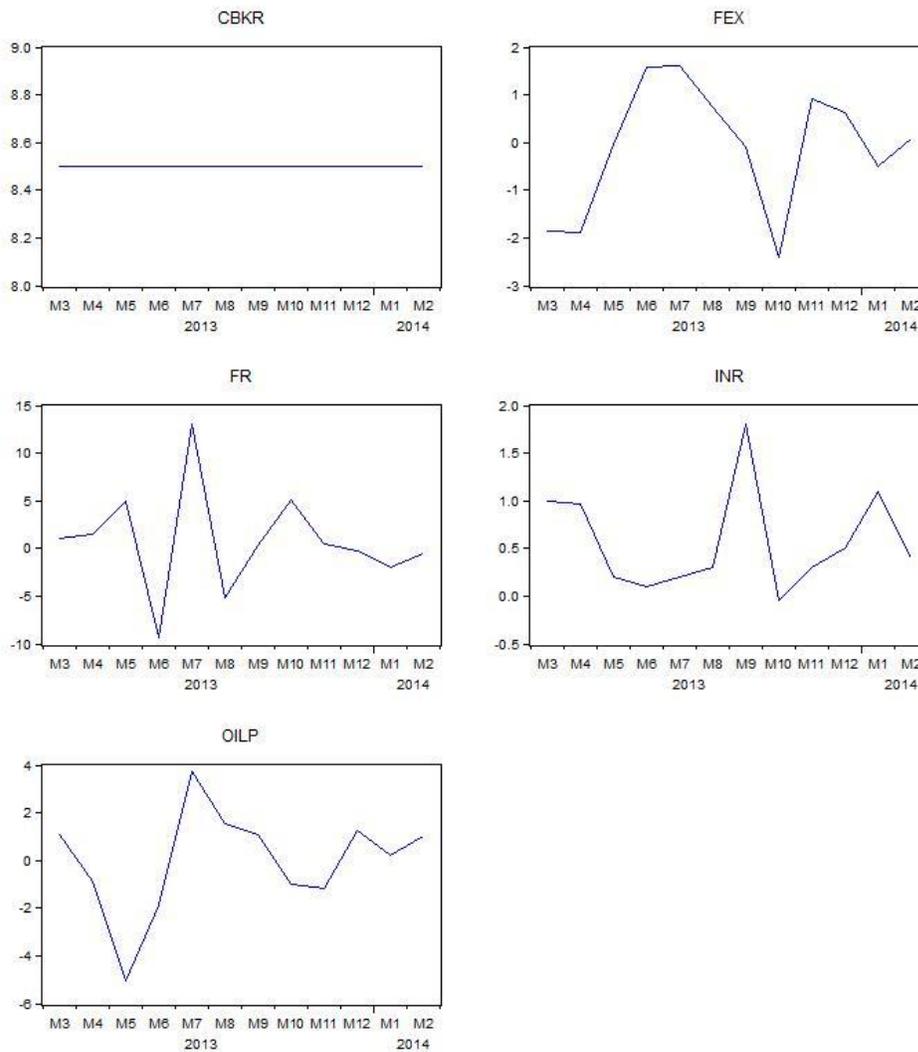
Figure4.1B.Graph of variables in period 2

4.3 Diagnostic Tests

Due to the problem of perfect collinearity between the Independent variable CBKR and other variables in period 2 due to stagnation of values for CBKR, (the CBKR was kept at 8.5% for the entire period two) the variable was dropped from our model. Other tests conducted included tests for heteroskedasticity, auto-correlation and unit root test for stationary.

Tests for heteroskedasticity used the White heteroskedasticity test, with the null hypothesis stating residuals are heteroskedastic and the alternative hypothesis that residuals are homoskedastic . Tables 4.3A and 4.3B shows test summary statistics for the two time periods.

Table 4.3 Heteroskedasticity Test

WHITE HETEROSKEDASTICITY TEST			
Period 1(October 2008-february 2010)			
F-statistic	2.6783	Prob. F(9,7)	0.1038
Obs*R-squared	13.1742	Prob. Chi-Square(9)	0.1549
Scaled explained SS	8.1754	Prob. Chi- Square (9)	0.5166
Period1 (march 2013-february 2014)			
F-statistic	0.3063	Prob. F(9,2)	0.91441
Obs*R-squared	6.9546	Prob. Chi-Square(9)	0.6418
Scaled explained SS	4.7704	Prob. Chi- Square (9)	0.8538

At 5% confidence interval, the P-values for the test statistic at both time periods are very high, thus we reject the null hypothesis and accept that variances of our error terms are constant.

Unit Root Test

To ensure that all our series are stationary, ADF unit root test was conducted for each time series with the null hypothesis that each series has a unit-root (hence therefore non-stationary) with the alternative hypothesis that each series has no unit root (therefore stationary)

Table 4.4:Unit Root Tests

Method	Augmented Dickey-Fuller Unit Root Test			
Variables	Level	t-statistic	P-value	Conclusion
OILP	1%	-4.9922		
	5%	-3.8753		
	10%	-3.3883		
ADF Test Statistic		-4.5249	0.0195	Stationary at 10 % and 5%
INR	1%	-4.9922		
	5%	-3.8753		
	10%	-3.3883		
ADF Test Statistic		-6.7452	0.0010	Stationery at all levels
FR	1%	-4.0044		
	5%	-3.0988		
	10%	-2.6904		

ADF Test Statistic		-4.9132	0.0020	Stationery at all levels
FEX 1%		-3.9203		
5%		-3.0655		
10%		-2.6734		
ADF Test Statistic		-6.1066	0.0002	Stationery at all levels

The p-values for our unit root test for OILP is 0.0195, this negates the null hypothesis of presence of a unit root in our series. That at 5% critical levels, the series' mean, variance and auto-covariance is time invariant. For other series, it is observed from respective tables that they are all stationary at 5% level.

4.4 Regression Results

Table 4.7A and 4.7B present the regression result for the variables at the two time periods. From this regression results, research questions will be answered, research hypotheses rejected or accepted and the general and specific objectives achieved.

Table 4.7A regression analysis period 1(Oct 2008-feb 2010)

INR=c(1)+c(2)*FEX+c(3)*FR+c(4)*OIP

	Coefficient	Std. Error	t-statistic	prob
c(1)	0.4222	0.1868	2.2597	0.0417
c(2)	0.1054	0.0952	1.1069	0.2884
c(3)	0.0085	0.0129	0.6605	0.5204
c(4)	-0.0825	0.0337	-2.4482	0.0293
Statistics				
R-Squared	0.4176	Mean dependent var.		0.5958
Ad. R Sqd	0.2832	S. D. Dependent Var.		0.8662
S.E Regression	0.7333	Akaike Information criterion		2.4199
F-Statistics	3.1077	Schwarz criterion		2.6160
Prob(F-statistics)	0.0635	Durbin-Watson statistic		1.532

This output gives the result of our regression of monthly CPI inflation (INR) against monthly growth rate in Dollar Exchange Rate vis-à-vis the Kenyan shilling(FEX), monthly growth rate in Foreign Remittance into the country (FR) and growth rate of price of Diesel per liter (OILP).

Table 4.7B Regression Analysis period 2 (Mar 20013-Feb 2014)

INR=c(1)+c(2)*FEX+c(3)*FR+c(4)*OIP

	Coefficient	Std. Error	t-statistic	prob
c(1)	0.5704	0.1623	3.5149	0.0079
c(2)	-0.1561	0.1293	-1.2068	0.2619
c(3)	-0.0237	0.0316	-0.7518	0.4737
c(4)	0.0892	0.0795	1.1209	0.2948
Statistics				
R-Squared	0.2265	Mean dependent var.		0.5675
Ad. R Sqd	-0.0635	S. D. Dependent Var.		0.5384
S.E Regression	0.5553	Akaike Information criterion		1.9226
F-Statistics	0.7809	Schwarz criterion		2.0842
Prob(F-statistics)	0.5370	Durbin-Watson statistic		3.0889

Comparing the intercepts (C1)A and (C1)B, which by definition from our expectations augmented model, are the expected inflation in the economy tomorrow, which is inflation that can exist even if the economy is in full employment. Thus in period 1, (C1)A equals 0.422% while in period 2, (C1)B equals 0.57%. It could be argued that economic agents' perception of future inflation rate is more pessimistic in period 2 compared to period 1, meaning expectations that inflation will be higher than current experience are more pronounced in period 2 than period 1. This is despite period 2 being the time when the ERC instituted measure to combat inflation rate through oil price controls. Thus it appears that confidence by economic agents on these measures' ability to reduce inflation eroded as skepticism increased. This reaction by agents could be attributed to changes in their individual demand which could shift their expenditure from oil-indexed expenditures to relevant substitutes, not indexed on changes in prices of oil.

Likewise, this pessimistic overview of future inflation by economic agents, counter to 'remedial measures' by ERC, could as well be interpreted that agents had negative perception about the assumption that oil prices were most responsible for changes in CPI inflation. In period 1, this expectation component is almost equal to the mean inflation rate in the relevant period under study. (C(1)A= 0.422, while mean inflation = 0.59%) . This is consistent with the rational expectations theory that holds that agents' expectations equal the true expected value and errors are random and their mean equal to zero. In period 2, C(1)B= 0.57 while mean inflation equals 0.56%.

The coefficient C(2) A and C(2) B measures the marginal effect of depreciation of the shilling against the dollar on the inflation rate in Kenya in period 1 and period 2 respectively. In period 1, C(2) equals 0.105, meaning a 1% depreciation of the shilling against the dollar is associated with increase in monthly CPI inflation by 0.105% while in period 2, C(2) equal -0.156. Thus in period 2, 1% depreciation of the shilling against the dollar will decrease CPI inflation by 0.156%. It is to be noted that these coefficients though, are not statistically significant at 5% confidence level.

Coefficients C(3) measures the marginal effect of percentage growth of foreign remittance (FR) on the CPI inflation in the country, with C(3)A, being at period 1 and C(3)B for period 2. For period 1, this coefficient is positive and explained as; a 1% increase foreign remittance flows will increase CPI inflation by 0.08%. This is statistically insignificant at 5% level. For period 2, C(3) equals -0.023, thus under regime of oil price regulations and control, there is negative relationship between inflation and foreign remittance growth, with projections that a 1% increase in foreign remittances will marginally reduce the CPI inflation by 0.023%.

The above quantitative relationship between the two independent variables, FR and FEX helps answer our research question 2 on what other variables under study affect the CPI inflation. As explained, the effect is mild and not statistically significant at both time periods.

This mild, statistically insignificant causal relationship between FEX, FR and dependent variable inflation also helps us to reject the second null hypothesis and accept the alternative hypothesis that these two independent variables do not explain much of the sources and direction of the CPI inflation.The last coefficient C(4)A and C(4)B measures the impact of control of oil price and its deemed marginal effect on CPI inflation. This will help answer the research question one, whether the country registered a lower inflation rate as a result of oil price controls in Kenya and research question three, whether oil price controls a necessary requirement in Kenya's Free Market Economy.

Checking C(4)A, which captures the effect of free market-oil price changes on the rate of inflation, it is found that there is a negative relationship between increase in free-market oil prices and inflation, such that 1% increase in price of 1 liter of Diesel will reduce CPI inflation by 0.08%. This small marginal effect is statistically significant at 5% confidence level.

For C(4)B, which measures period 2's effect of introducing oil price controls on inflation rate, it is found that this policy shift had the opposite result to its intended purpose. A 1 % upward variation of the oil price will increase CPI inflation by 0.089% though. From this last pair of coefficients, it means that the economy did not register a low rate of CPI inflation as a result of introduction of oil price controls through active price setting regime. Thus this puts in doubt the necessity of having an active price setting regime in the energy sector.

For period one, the R-squared is 0.417, meaning the variables under study explain on less than 50% of the variations in the dependent variable. This could be translated into a corollary that Explained Sum of Squares is less than residual sum of squares, meaning that the disturbance term explains much of the variations in the dependent variable. From our model, the disturbance term was associated with droughts, political instabilities and other unmeasured supply shocks.

The impact of the above revelation is that effects of cost-push inflation in the Domestic Economy are greater than the effects of demand-pull inflation. Thus for effective management and stabilization of CPI Inflation, greater emphasis should be laid on Supply side constraints to our economy.

5. SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This section gives summary of the research plans highlighting the key inputs into the research process and the output statistics. Conclusions drawn from the research output are emphasized and necessary policy recommendations, resulting from the research finding are given.

5.2 Summary

The main objective of this research was to study whether introduction of price setting regime on oil products in Kenya led to reduction or stabilization of the CPI inflation in the country. The study was conducted over two time periods, with period 1 ranging from October 2008 to February 2010. Period 2 is the time when the policy of regulations and setting regime for oil products was in place. This period, stretched from March 2013 to February 2014.

The second objective was to examine how other factors, like Dollar exchange rate and foreign remittances affect the CPI inflation, and the extent to which they affect. From the findings, it was shown that monthly inflation rates under oil price regulation and control regime have been less volatile compared to period under no price control, under the relevant sample size and space. This slowdown in volatility howeveris not equal to the objective of the policy of price controls. This is compared to the fact that under period of price control, it is found that this policy shift had the opposite result to its intended purpose. A 1 % upward variation of the oil price will increase CPI inflation by 0.089% though.

Thus it is evident that the policy did not obtain its desired effect of reducing CPI inflation in the period under review. On the question whether dollar exchange rate and foreign remittance affect inflation rate, it was found that the effect is mild and not statistically significant at 5% confidence level.The low R squared in both time periods indicate that much of the stock and flow of CPI inflation is much a result of other supply shocks, and less by demand pull inflation. Supply shocks include unspecified shocks in the economy that is unrelated to expectations, oil price and labour market. These shocks could be drought, political violence, or acts of war.

In summary, the leading drivers of CPI inflations are long-term perception and expectation of higher future inflation rate, and secondly other supply shocks not related to expectations in the economy, oil prices and labour market.

5.3 Conclusion

From our summary, the results of the research can be concluded by the following inferences:

Under period 2, inflation has showed less volatility compared to the dispersion shown in period one, as measured by the standard deviation. It is also observed that in period 1, inflation and oil price have weak negative relationship while in period 2, the relationship is positive though weak. The other variables, dollar exchange rate and foreign remittances exhibit weak relationship with inflation, in the two time periods. It is also observed that much of the variations in inflation are explained by supply shocks and expectations in the economy.

5.4 Recommendations

Policy recommendations can be deduced from this research output, including the following;

- The objective of reducing levels of inflation through introduction of price control on oil products has not been effective, with the opposite result being the result. It could thus call for policy review through additional research to evaluate the cost-benefit trade-off. Thus additional research over a longer time period during the implementation of this policy.

- Policy makers could also try to shape future inflation trends and expectations through firm commitment of fiscal and monetary policy. This could be setting up long-term inflation targets through forward guidance based on economic growth rate, unemployment rate and other leading economic indicators.

- While it is not possible to effectively deal with supply shocks, there is need to reduce dependence on rain fed agriculture that continue to distort supply of foodstuff in the local markets. Cushioning from such shocks will ensure that inflation becomes more 0predictable than the current experience.

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ABBREVIATIONS

AD……………………………. Aggregate Demand

AD-IA…………………………Aggregate Demand- Inflation Adjustment Model

APR-……………………………Annual Progress Report

ARDL…………………………..Auto-Regressive Distributed Lag

AS…………………………………. Aggregate Supply

BoC………………………………...Bank of Canada

BoE………………………………... Bank of England

BLUE……………………………. Best Linear Unbiased Estimate

CBK……………………………... Central Bank of Kenya

CBR……………………………... Central Bank Rate

CPI………………………………. Consumer Price Index

ECM……………………………… Error Correction Model

ERC……………………………… Energy Regulatory Commission

GARCH………………………….General Auto-Regressive Conditional Heteroskedasticity

GDP……………………………… Gross Domestic Product

IMF……………………………… International Monetary Fund

IT…………………………………Inflation Targeting

KNBS…………………………….. Kenya National Bureau of Statistics

MPC……………………………. Monetary Policy Committee

MTP……………………………...Medium Term Plan

OLS………………………………Ordinary Least Square

Q3…………………………………. Quarter 3

QE………………………………… Quantitative Easing

USA……………………………...United States of America

VAR……………………………….. Vector Auto-Regressive