THE IMPACT OF CENTRAL BANK INTERVENTION IN THE SPOT FOREIGN EXCHANGE MARKET IN KENYA

By

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DECLARATION

I declare that this is my own original work and to the best of my knowledge it has not been submitted for a degree award in any other University or institution of higher learning.

Signature.....................................   Date...07 Nov 2012.........

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This research project has been submitted for moderation with my approval as University Supervisor

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DEDICATION

This work is dedicated to my dear Husband Peter Wanjau, my darling Daughter Natasha Wambui Wanjau and to Mum and Dad.

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ABSTRACT

Intervention is a very crucial policy tool that central banks uses to correct any short term exchange rate misalignments and to dampen excessive short-term volatility in the exchange rate and other disorderly market conditions. However, it could put the banks credibility and the scarce foreign exchange reserves at risk if poorly adopted. Despite the prevalence of intervention in developing markets, empirical research on its impact is limited. In spite of the importance and frequency of intervention in the foreign exchange markets of Kenya and other developing countries with floating exchange rate regimes who have experienced very rapid and sharp short-term volatility of their domestic currency, relatively little empirical work has measured its effectiveness and also there has been very little research on factors that determine the magnitude of intervention.

The general objective of the study was to investigate the impact of central bank intervention in the spot foreign exchange market in Kenya. The event is what the researcher studied. The population under study comprised the number of years that CBK has at least been in the market intervening in the spot foreign exchange market since Kenya adopted the floating foreign exchange regime i.e. 1993 to 2012.

The study found that the Forex Markets Reacts both positively and negatively to Central Bank Intervention announcement. It was found that there was an increase in volumes of Forex traded before Central Bank Intervention announcement which reduced after Central Bank Intervention announcement as compared to those before the Central Bank Intervention announcement. This study found that there were positive mean returns with respect to Central Bank Intervention announcement; this was in agreement with the signaling hypothesis.

The study found that direct currency intervention by central bank is conducted by the monetary authority which aims at influencing exchange rate. Indirect currency intervention is a policy that influences the exchange rate indirectly these includes capital controls (taxes or restrictions on international transactions in assets), and exchange controls (the restriction of trade in currencies, these policies lead to inefficiencies or reduce market confidence, but can be used as an emergency damage control.

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LIST OF ABBREVIATIONS

DEM   Deutsche mark

FX   Foreign Exchange

IMF's   International Monetary Fund

KES/Ksh   Kenya shilling

PPP   Purchasing Power Parity

SPSS   Statistical Package for Social Science

US   United States

USD   United States Dollar

SEK   Swedish Krona

GARCH   Generalized Auto-Regressive Conditional Heteroskedacity

CBK   Central Bank Of Kenya

USDKES   The exchange rate of 1 United states Dollar to the Kenya Shilling

CHAPTER ONE:

INTRODUCTION

1.1 Background of the study

A foreign exchange spot market is a market for trading one currency against another in such a way that the delivery takes place within few days of the execution of the trade. It usually takes two days to transfer cash from one bank to the other. The price is based on the ongoing exchange rate i.e. the current value of one country's currency relative to another. Currency risk is one of the major risks that investors in emerging markets (www.securities.com) may undertake; however, these markets often have few financial instruments for creating common hedges for such financial exposure. Emerging markets' portfolio investments have the potential of high returns, however, the associated risk, including currency risk, can be significant. Many of the standard tools used to hedge currency risk, such as futures, swaps and options contracts, are either not available in emerging markets or, where available, are traded in illiquid and inefficient markets, making the overall process of hedging and unwinding of a hedge a difficult task.

Intervention is basically a process through which Central Banks or monetary authorities buys or sells foreign currency against the domestic currency in the market based on the prevailing market conditions. This bridges the gap between and demand to ensure equilibrium at the predetermined exchange rate supply. To weaken the currency, intervention will be through selling their reserves of the currency on the open market and to strengthen the currency, they buy the currency by exchanging their domestic currency for the foreign currency (Schwartz, 2000).

The currency used to intervene in the exchange market is drawn either from the holdings of the Reserve or from the Exchange Stabilization Fund. Central Bank Intervention is one of the tools that central banks will use to implement their monetary policy (Monetary policy is defined as the process by which the Central Bank influences the level of money supply credit in the economy in order to minimize excessive price fluctuations, and promote economic growth. It guards against inflation and ensures stability of prices, interest rates and exchange rates) intervention can either be sterilized or unsterilized (Baillie *et al*, 2000).

Intervention is usually conducted with the intention to influence the future path of the exchange rate (Baillie et al. 2000 and Schwartz, 2000), correct any short term exchange rate misalignments and to dampen excessive short-term volatility in the exchange rate and other disorderly market conditions, accumulate foreign exchange reserves and supply foreign exchange to the market It usually seeks to ensure stability of the exchange rates or to moderate exchange rate volatility. Disorderly market conditions include developments such as large changes in bid-ask spreads relative to tranquil periods and steep declines in market turnover sharp ex fluctuation high exchange rate volatility.

Correcting exchange rate misalignments is a high priority for central banks. Real exchange rate overvaluation can undermine export competitiveness and weaken a country's external liquidity position; while an undervalued exchange rate may create inflationary pressures. Owing to the fact that interventions affect the domestic money market conditions, most of the interventions are sterilized (Dominguez and Frankel, 1998).Interventions on the other hand if unsuccessful can be very costly.

Intervention is a very crucial policy tool that central banks use to correct any short term exchange rate misalignments and to dampen excessive short-term volatility in the exchange rate and other disorderly market conditions however, it could put the banks credibility and the scarce foreign exchange reserves at risk if poorly adopted. The issues and factors determining effective intervention including the timing,frequency,amounts and modalities of intervention are very important decisions that central banks taken.

According to the signaling channel theory, the effectiveness of intervention through signaling relies on influencing market expectations by transmitting information on fundamentals or future policy actions. Interventions must be perceived as credible signals (or threats) of future monetary policies to influence expectations hence institutional and policy credibility of the central bank becomes a very critical determinant of central bank intervention efficacy. The signaling channel is most effective when interventions are publicly announced, which enhances the visibility of intervention, thus strengthening the central bank's policy signal. It is expected that the central bank should have a record of prudent macroeconomic management that does not underpin the strong credibility of monetary authorities.

On the other hand According to the microstructure approach, central banks are uniquely positioned to affect the transmission of fundamentals to the exchange rate through order flow. Aggregate order flow is the balance of buyer-initiated and seller initiated orders; as such, it is a measure of net buying pressure in the foreign exchange market. The microstructure channel emphasizes that the size of intervention relative to market turnover determines the effectiveness of that intervention. In principle, the larger the intervention relative to market turnover, the higher its effectiveness on the foreign exchange market.

1.1.1 Central Bank of Kenya as the Intervention Authority

The Central Bank of Kenya is by law responsible for managing the official foreign exchange reserves. The reserves are denominated in the major currencies, namely US Dollars, Sterling Pounds and the Euro. Among the uses for these reserves is to maintain foreign currency liquidity to absorb shocks in time of crisis and Intervention to support the local currency in periods of volatility. Exchange rates in Kenya were liberalized in October 1993 and since then have largely been determined by demand and supply of the Kenya shilling vis-à-vis other currencies. A weak shilling makes Kenyan goods and services cheaper in the international market but makes imports more expensive. So exporters benefit while importers lose (they import less goods from abroad). Conversely, a strong shilling makes our goods and services expensive in the international market and makes our imports more affordable. In this case, importers gain while the exporters lose.

The exchange rate is determined by the interaction of supply and demand for foreign currency in the interbank market for foreign exchange. The Central Bank participates in the foreign exchange market only to build reserves to a desired level and will occasionally come into the market to intervene by smoothening out any short-term fluctuations occasioned by speculative behavior of market players.

1.1.2 Spot Foreign Exchange Market

Spot market transaction is an agreement to buy or sell currency at the current exchange rate. The delivery time is usually two days or less. Forward market on the other hand is an agreement to buy or sell currencies for settlement at least three days later, at predetermined exchange rates. The forward market transaction has the advantage of not requiring immediate cash outlay and is often used to reduce the exchange rate risk. If a

central bank expects that the need for intervention will be short-lived and reversed in the future, then a forward market intervention may be conducted discreetly - with no observable effect on foreign exchange reserves.

A point worth mentioning, the economic effects of forward market intervention are fully equivalent with the net effect of a sterilized intervention Exchange rate changes have important implications for key macroeconomic variables that include domestic output, unemployment, inflation, and balance of payments. Nominal exchange rate changes are fully reflected in domestic price changes, if Purchasing Power Parity (PPP) holds. This implies that a rise in the exchange rate (or domestic currency depreciation) increases domestic price of tradable goods in the consumer basket. Even if PPP does not hold, we could still expect some pass through from exchange rate changes to domestic prices. A nominal exchange rate plays an important role in price-setting behaviour in high inflation countries (Taylor, 2000). In a high inflation environment, firms pass on to customers the increase in cost that results from exchange rate changes.

This further increases the domestic price level. Furthermore, the depreciation of one country currency results in the collapse of exchange rate regime of the second country; for example, in East Asian currency crises. Gerlach and Smets (1995) argue that a depreciation of one country's currency increases its competitiveness against its trading partners. This increases the trade deficit of the second country, reduces the foreign exchange reserves of the Central Bank and thus puts pressure on its exchange rate regime to collapse. Second, currency depreciation for one country makes its exports cheaper in a second country. This reduces the overall price level and thus decreases demand for real money balances in the second country. Given that money supply is fixed, this leaves the second country's residents with excess monetary balances which they swap for foreign currency. This depletes the foreign exchange reserve of a second country's Central Bank and thus moves it from having no speculative attack equilibrium to one where it is profitable for speculators to launch speculative attacks (Eichengreen et al. 1996).

Nominal exchange rate changes are associated with movements in the real exchange rate when Purchasing Power Parity does not hold. The real exchange rate determines both internal and external equilibrium and resource allocation in the economy. Furthermore, changes in the real exchange rate determine a country's external competitiveness and thus

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the country's trade balance through its effect on import and export prices. Exchange rate changes have an important effect on the balance sheet of domestic agents particularly firms and financial institutions, (Krugman, 1999). Exchange rate shocks do not turn into a recession in economies with sound firm, household and financial sector balance sheets (Mishkin, 1998). Economies with weak balance sheets are more vulnerable to a speculative attack which translates into a severe recession. Foreign currency denominated debt of firms and financial institutions play an important role in the transmission of exchange rate shocks. Negative exchange rate shocks increase foreign currency liabilities and debt servicing of firms and financial institutions. This deteriorates their balance sheet and results in the collapse of financial institutions and firms. This leads to output loss and an increase in the unemployment rate.

The Kenya shilling had been stable for nearly a decade, hardly breaching Ksh. 80 to the US dollar since 2003. However, the shilling depreciated sharply in 2011 to levels seen in the 1990's. By mid-October 2011, the Kenyan shilling had depreciated sharply against major currencies, hitting a historic low of Ksh.107 against the US dollar the interventions by the Monetary Policy Committee, and the interventions by Treasury had not borne fruit in addition, the IMF's Principles for the Guidance of Members' Exchange Rate Policies describes that a member should intervene in the exchange market if necessary to counter disorderly conditions which may be characterized inter alia by disruptive short-term movements in the exchange value of its currency.

1.2 Statement of the problem

Intervention is a very crucial policy tool that central banks use to correct any short term exchange rate misalignments and to dampen excessive short-term volatility in the exchange rate and other disorderly market conditions however, it could put the banks credibility and the scarce foreign exchange reserves at risk if poorly adopted. The depletion of reserves by Mexico in 1994 and by Thailand in 1997 while defending their currencies was an important factor in their respective financial crises. The issues and factors determining effective intervention including the timing,frequency,amounts and modalities of intervention are very important decisions that central banks taken.

Exchange rate misalignments and disorderly markets which are the most common justifications for intervention are extremely difficult to detect. There is no consensus on a methodology to estimate the equilibrium exchange rate. On the other hand determining

the timing and amount of intervention is a highly judgmental exercise, and the two depend heavily on such factors as changing market conditions, the nature of economic shocks, and available reserves. Lastly, empirical evidence on the effectiveness of intervention in influencing the exchange rate is mixed, and even where favorable evidence is found, the impact of intervention on the exchange rate level is short lived. Similarly, empirical studies find that intervention tends to increase exchange rate volatility under flexible exchange rate regimes. All these factors leave a knowledge gap in the determination of central bank intervention efficacy.

Despite the prevalence of intervention in developing markets, empirical research on its impact is limited. In spite of the importance and frequency of intervention in the foreign exchange markets of Kenya and other developing countries with floating exchange rate regimes who have experienced very rapid and sharp short-term volatility of their domestic currency, relatively little empirical work has measured its effectiveness and also there has been very little research on factors that determine the magnitude of intervention Evidence on the effectiveness of intervention is generally mixed (Sarno and Taylor, 2001) but clearly, unsuccessful intervention is costly. The existing literature seems to pay proportionately less attention to possibility of an endogeneity bias and nonlinearity in the effects of intervention and this perhaps explains the failure to resolve the debate on the impact of intervention.

The impact of central banks' foreign exchange (FX) interventions has given rise to an important debate and hence. This paper attempts to fill this knowledge gap by investigating so as to contribute to the understanding of the factors determining the effectiveness of central bank of Kenya intervention on the spot foreign exchange market in its bid to use its monetary policy in the open market operations of intervention in an effort to correct short term misalignments or to dampen excessive short-term volatility in the exchange rate and other disorderly market conditions. It seeks to establish if it matters for central bank to intervene or it should adopt a laissez faire policy towards foreign exchange markets, it seeks to get answers as to what is the impact of intervention on the spot foreign exchange rate, does it smoothen exchange rate misalignment and dampen excessive volatility or it only serves to exert an incorrectly signed effect on the levels of exchange rates and tend to increase their volatility in the short run and if so why.

1.3 Objectives of the study

To investigate the impact of central bank intervention in the spot foreign exchange market in Kenya.

1.4 Value of the study

The study would offer valuable contributions from both a theoretical and practical standpoint. From a theoretical standpoint, it would contribute to the general understanding of impact of central bank intervention in the spot foreign exchange market. Hence very useful to the monetary policy committee. In identifying the processes of effectively intervene in the spot foreign exchange market. This would enlighten its ministries on the possible approaches towards solving the problems associated to spot foreign exchange market. Policy makers would benefit from the issues and insights raised in the study that are important in developing spot foreign exchange market frameworks to effectively intervene.

The study would add to the existing body of knowledge on the concept of effective central bank intervention in the spot foreign exchange market to benefit academicians and aid further research on the concept. It would form a fundamental base upon which further researches into the field would be based as it would act as both reading and secondary source material in such cases.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter review the existing literature on the subject under the study, the chapter is organized into four main areas: first review of the theories that explores central bank intervention. The second section reviews empirical evidence from both local and international front, third it covers the general literature and finally the fourth chapter concludes with the summary of how this proposed research will contribute to the body of knowledge.

2.1.1 Types of intervention

Sterilized versus unsterilized intervention

Sterilization is achieved by taking measures which help to neutralize the expansionary or contractionary effects of interventions. There are two types of intervention, sterilized and unsterilized intervention. Unsterilized affects the monetary base while sterilized does not. When a monetary authority buys (sells) foreign exchange, its own monetary base increases (decreases) by the amount of the purchase (sale). By itself, this type of transaction would influence exchange rates in the same way as domestic open market purchases (sales) of domestic securities; however, many central banks routinely sterilize foreign exchange operations that is, they reverse the effect of the foreign exchange operation on the domestic monetary base by buying and selling domestic bonds (Edison, 1993). The crucial distinction between sterilized and unsterilized intervention is that the former constitutes a potentially useful independent policy tool while the latter is simply another way of conducting monetary policy.

Direct and indirect intervention

Direct currency intervention is generally defined as foreign exchange transactions that are conducted by the monetary authority and aimed at influencing exchange rate. Indirect currency intervention is a policy that influences the exchange rate indirectly. Some examples are capital controls (taxes or restrictions on international transactions in assets), and exchange controls (the restriction of trade in currencies, Neely (1999) Those policies

may lead to inefficiencies or reduce market confidence, but can be used as an emergency damage control.

Coordinated versus Unilateral intervention

Coordinated interventions are interventions conducted by two (or more) central banks the same day on the same market and in the same direction as opposed to unilateral operations where only one single bank is involved in the transaction. Examples of coordinated support of the ECB, the Federal Reserve, the BoJ, the Bank of Canada, the BoJ of the Euro against the dollar on the 22nd of September 2000.

Spot and forward markets intervention

According to the time used to settle the transaction, currency intervention could be labeled as either spot market intervention (intervention within two or lesser days) or forward market intervention (intervention after two days of settlement).If simultaneously used then it becomes currency swap interventions.

2.2 Theoretical Review

In academic literature, the main theories that have been suggested to explain the channels through which sterilized central bank interventions may adopt to influence the foreign exchange rates are the signaling channel, the portfolio, balance channel, the microstructure theory and the noise trader channel.

2.2.1 The Signaling Channel Theory

The signaling approach is based on the assumption that the exchange rate is an asset price, foreign-exchange markets are competitive and all information relevant for the pricing of foreign exchange is instantaneously included in the pricing of the spot rate as its publicly available In such an environment, sterilized interventions can affect exchange rates if a central bank succeeds in influencing foreign exchange participants' expectations regarding the future evolution of these fundamentals (Mussa,1981). Thus sterilized intervention will affect the exchange rate only if the central bank has an informational advantage over the other parties involved in the trading process. Such an asymmetric distribution of information implies that central banks have access to information which is

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not publicly available or have information advantage over the market hence Central banks can reveal this information by intervening in the foreign-exchange market to influence pricing. Market participants can then collect the new information and adjust their expectations regarding the future direction of the market fundamentals, this, leads to a change in exchange rate This signaling channel signifies that there is asymmetry of information between the central bank and the market participants on future fundamentals of the exchange rate, perceived as a credible signal on the future stance of monetary policy.

Therefore, the current sterilized intervention alters market perception about the future course of monetary policy according to which exchange rate will move even though sterilized intervention currently offsets the monetary effects. Mussa (1981) suggested that if the central bank uses foreign exchange interventions to credibly indicate intended changes in monetary policy, the resulting revaluing of the exchange rate can be described as the signaling channel. The impact of intervention through the signaling channel has often been found to be substantially stronger than through the portfolio balance channel (Dominguez and Frankel, 1993)

2.2.2 The Portfolio Balance Model

The portfolio balance model on the other hand is based on the strategic presumption underlying this theoretical framework is that market participants regard assets denominated in domestic currency and assets denominated in foreign currency as imperfect substitutes .This assumption implies that sterilized interventions can affect the exchange rate because such policy action alters the relative supply of domestic and foreign bonds and, thus, requires an adjustment of the risk premium to balance demand and supply in international asset markets. Sterilized intervention alters the relative supply of domestic versus foreign currency bonds, leading agents to rebalance their portfolios to equalize risk-adjusted returns, which causes a change in the exchange rate.

2.2.3 The Microstructure Channel

The microstructure channel provides a new window into the functioning of foreign exchange markets and the effectiveness of intervention (Lyons, 2001). Microstructure

finance analyzes the impact of order flow on exchange rates. Aggregate order flow is the balance of buyer-initiated and seller initiated orders; as such, it is a measure of net buying pressure in the foreign exchange market (Evans and Lyons, 2005). In this framework, analyses of the effectiveness of interventions focus on the extent to which central bank trades affect aggregate order flow. According to the microstructure approach, central banks are uniquely positioned to affect the transmission of fundamentals to the exchange rate through order flow. Central bank intervention can cause market participants to change their expectations on the future path of the exchange rate and lead them to modify their net open foreign exchange positions, triggering a change in aggregate order flow well in excess of the central bank's contribution. The impact of official intervention on order flow and exchange rates can be greater in the presence of noise traders, which follow past trends, and often trade, in a correlated fashion (Hung, 1997).

Central bank intervention, even in small amounts, can trigger a tide of buy or sell orders by trend-chasing traders. Interventions need not be announced and should be timed to maximize the exchange rate impact. Intervention in this context may also lead to higher volatility, which can help promote a sense of two-way risk in the market. The impact of official intervention on market expectations can be even greater if the central bank trades aggregate or disseminate information (Popper and Montgomery, 2001). When central banks are perceived to be more knowledgeable about future monetary and exchange rate policies or better equipped to monitor and interpret fundamentals, such as balance of payments trends, market participants may try to learn from central bank trades.

2.2.4 The Noise Trading Theory

Lastly, sterilized central bank interventions may affect exchange rates through the noise trading theory of exchange rate determination. Noise traders are financial market participants whose demand for financial security is not influenced by economic fundamentals alone (Black, 1986). Instead, noise traders employ, for example, techniques provided by technical chart analysis to extract buy and sell signals from historical exchange rate path. In noise trader models of exchange-rate determination it is assumed that, at least in the short and medium run, the group of technicians influences the dynamics of the spot rate so that the price of this asset can depart from its fundamental value. In a market in which noise traders participate in the trading process, central banks

can try to influence the position taking of these agents by utilizing interventions to establish or to break short-run price trends. If the central bank succeeds in affecting the exchange rate and noise traders respond to these changes, the price impact of the orders submitted by noise traders might then account for persistent exchange rate effects of sterilized foreign exchange market interventions (Hung, 1997).

2.3 Empirical evidence

There is no specifically documented literature on central bank intervention in Kenya but a number of studies have been conducted internationally mainly in the US and other G7 countries. The literature on the impact of foreign-exchange-market interventions discusses the issue as to whether such operations tend to stabilize or destabilize exchange rates or even have no effect at all. No generally accepted conclusions have been generated so far. Most papers on this topic analyze the effectiveness of interventions in terms of either their effect on the level of the spot rate or their impact on the volatility of exchange rate returns. The intervention of central bank in foreign exchange market and its impact on exchange rate has been the focus of theoretical and empirical research ever since the introduction of floating exchange rate system.

To date, there have been only a few empirical studies of foreign exchange intervention covering a broad cross section of emerging market economies. The most extensive study is Canales-Kriljenko (2003), based on the IMF's 2001 Survey on Foreign Exchange Market Organisation. One of the main hypotheses advanced in this paper is that central banks in many emerging markets may be able to conduct foreign exchange intervention more effectively than the central banks of countries issuing the major international currencies. This hypothesis is supported by evidence indicating the large size of intervention by emerging economy central banks relative to their foreign exchange market turnover. Moreover, evidence is presented that central banks in emerging markets issue a large volume of regulations and conduct their foreign exchange operations in a way that increases the central bank's information advantage over private sector participants. However, the study does not demonstrate decisively that official intervention in the emerging market economies is indeed more effective because of these characteristics of their foreign exchange markets.

Most studies suggest that intervention did not have a statistically permanent impact on exchange rate (Aguilar and Nydahi, 1998) and (Neely, 2001), who examined the practice of foreign exchange intervention in a sample of 22 countries. This study addressed directly to central banks several questions on the effectiveness of foreign exchange intervention. It will therefore be used to compare some responses to this proposed research. Studies that find some evidence in favor of effectiveness in this context are Dominguez and Frankel (1993). Another line of research has sought to assess the ability of intervention to curb volatility. Evidence in support comes from Murray et al (1996); Beattie and Fillion (1999) whereas Rogers and Siklos (2001) suggest no effect and Dominguez (1998) suggest that intervention increases volatility.

Empirical studies, and statements by central banks, suggest that central banks intervene in foreign exchange markets to slow or correct excessive trends in the exchange rate, i.e. they "lean against the wind", and to calm disorderly markets Lewis (1995b) and (Baillie and Osterberg , 1997). The survey response of central banks in Neely (2001) in his study; The Practice of Central Bank Intervention, Looking under the Hood suggests the factors that continue to drive the decision to intervene. He presents evidence from 22 responses to a survey on intervention practices sent to monetary authorities in order to explore intervention mechanics. He outlines the factors that determine the efficacy as instruments, counterparties, timing and amounts as well as related issues like secret intervention, motivation, and the perceived efficacy of such transactions. His survey of monetary authorities' intervention practices reveals that a number of monetary authorities do intervene with some frequency in foreign exchange (mostly spot) markets. The desire to check short-run trends or correct longer-term misalignments often motivates intervention, whereas the size of intervention often depends on market reaction to initial trades. Although intervention typically takes place during business hours, most monetary authorities will also intervene outside of these hours, if necessary and while there is unanimous agreement that intervention does influence exchange rates, there is much disagreement about the horizon over which the full effect of this influence is felt, with estimates ranging from a few minutes to more than a few days.

Dominguez and Frankel (1993) estimate the effect of intervention on contemporaneous exchange rate movements and on forecasts of future exchange rates. Using survey data to measure exchange rate expectations, they find a significant effect of intervention on market expectations, especially if interventions are announced and coordinated. They also

show that secret interventions are largely ineffective was one of the first empirical investigations in which daily data on public interventions were used to assess the effectiveness of foreign exchange-market interventions of central banks. The authors apply a univariate regression approach to analyze the effectiveness of the foreign-exchange-market operations conducted by the U.S. Federal Open Market Committee and by the Deutsche Bundes Bank. The study is concerned with testing the portfolio balance channel through which sterilized interventions might affect exchange rates. This approach relies on the assumption that domestic and foreign assets are imperfect substitutes and that investors construct globally diversified portfolios on the basis of expected market returns.

Additional evidence on the impact of interventions by the U.S. Fed and the Bundes bank is provided by Eijffinger and Gruijters (1992). Utilizing daily data covering the period from February 1985 to August 1988 to assess the impact of foreign-exchange-market interventions on the level of the exchange rate, it is demonstrated that central bank interventions were rather ineffective in this respect. Furthermore, the authors report some evidence that the coordination of interventions tended to influence positively the effectiveness of this policy instrument. As interventions frequently occur over a series of days, the authors also analyze whether the first intervention in such a series was more effective than subsequent foreign-exchange-market operations. While some evidence for this hypothesis is found for Bundes bank interventions, a similar result cannot be derived with respect to the interventions conducted by the U.S. central bank.

Hisali, (2008) studies the efficacy of the central bank intervention modeling the fact that intervention actions usually do not target the exchange rate itself but rather its orderly movement. The author employs conditional probabilities generated from a homogenous two-state Markov chain to obtain maximum likelihood estimates of possible factors that may govern a shift from one exchange rate state space to another Is it possible that central bank intervention is one of these factors, that is to say, is central bank intervention effective? In other words, if for some reason it happens that large and disruptive movements arise in the spot exchange rate process, what is the likelihood that central bank intervention will succeed in returning it to a more tranquil regime? What would happen on the other hand, if for any reason the bank intervened when the exchange rate was in a tranquil regime.

Humpage (1999) suggests that interventions conducted by the U.S. central bank during the Louvre period effectively smoothed the U.S. dollar/deutsche mark (USD/DEM) and the U.S. dollar/Yen (USD/KES) spot rates. Using a binary dependent variable model, Humpage reports that the probability of a successful U.S. intervention was higher whenever the Federal Open Market Committee coordinated foreign-exchange-market operations with other major central banks. According to the binary success criterion used in this study, foreign-exchange-market interventions are identified as effective if a sale (a purchase) of foreign currency is either followed by an appreciation (a depreciation) of the domestic currency or a in slowdown of the rate of appreciation (depreciation) of the home currency.

An event study technique is used in a recent study by Fatum (2000) and Hutchison (2003). The authors find strong evidence in favor of intervention. In the analyis of both the US dollar-deutsche mark and U.S. dollar-Japanese yen bilateral exchange rates, they find that sterilized intervention systematically affects the exchange rate level, regardless of whether it is secret or announced. The probability of success is much higher, however, when interventions are coordinated among central banks and when they are conducted on a large scale (greater than $1 billion) who analyzes the effectiveness of foreign-exchange-market interventions by the U.S. central bank and by the Bundes bank. The researcher used intervention data for the period September 1985 to December 1995 and event windows of 2, 5, 10, and 15 days which were defined to include one or more intervention episodes (interspersed with nonintervention days), during which exchange rate changes are analyzed compared with the pre-event window. An intervention is rated as effective if a central bank succeeds either in moving the exchange rate in the direction intended by the foreign exchange-market operation or in weakening an exchange rate trend prevailing before the intervention. The results reported in the study suggest that the interventions conducted by the U.S. Fed and by the Bundes bank in the DEM/USD market during the sample period analyzed in the study was indeed effective. In particular, it is found that a coordination of the central banks FX market operations tended to influence the effectiveness of interventions positively

Kaminsky and Lewis (1996) also report that interventions affected exchange rates. They studied the impact of the interventions conducted by the U.S. central bank in the

USD/DEM and the USD/KES market during a period beginning in 1985 and ending in 1990.The empirical approach adopted by these authors is particularly suited to test the hypothesis that sterilized interventions mainly affect the exchange rate through the signaling channel. The signaling model implies that interventions allow economic agents to gain information regarding the future stance of monetary policy. In contrast to the predictions of the theoretical framework, the authors emphasize that U.S. interventions convey information that future monetary policy moves in the opposite direction suggested by the sign of the intervention.

Consequently, interventions are also found to induce an exchange rate movement inconsistent with the interventions. Taking a noise trader approach, Hung (1997) points out that the impact of interventions on exchange rate volatility might change over time. Hung (1997) argues that central banks should employ interventions to raise exchange rate volatility if they intend to break exchange rate trends used by noise traders to extract buy or sell signals. The author finds that the interventions carried out during the mid-1980 tended to decrease volatility. The interventions undertaken in the aftermath of the Louvre summit were intended to weaken the strong dollar. In contrast, interventions mainly motivated by the goal of stabilizing rates around prevailing levels in the aftermath of the Louvre Accord are found to have raised exchange rate volatility.

Aguilar and Nydahl (2000) studies the impact of interventions by the Swedish central bank on the level and the volatility of the krona/U.S. dollar (SEK/USD) and the krona/deutsche mark (SEK/DEM) exchange rates. The authors set up a multivariate GARCH framework that allows modeling the impact of interventions on the level and the conditional volatility of the SEK/USD and the SEK/DEM exchange rate within a unified framework. The results obtained from estimating this model as well as the findings of supplementary exercises relying on options implied volatilities to trace the effect of central bank interventions on anticipated exchange rate volatility indicate that interventions exerted only a rather weak influence on exchange rate volatility. When the model is re-estimated for certain sub periods, it is found that interventions tended to dampen (increase) the volatility of the SEK/USD in 1995. In addition, weak empirical evidence for a destabilizing impact of interventions on SEK/DEM spot rate volatility is found for the year 1994. In their empirical analysis of intervention in Mexico and Turkey, Domac and Mendoza (2002) conclude that central bank foreign exchange sales (but not

purchases) were highly effective in influencing the exchange rate and in reducing volatility in both countries.

There has been growing pessimism about the effectiveness of intervention, especially in developed economies (Schwartz, 2000). In the case of developing countries, some authors have argued that because of the variety of regulations that restrict the size of the market, the information advantage of the central bank and the fact that intervention volumes are larger relative to total market volume, intervention is more effective. In addition, central banks in some countries may be the main conduit of foreign exchange to the market, since the government is one of the main recipients of foreign currency flows (Canales-Kriljenko, Guimaraes and Karacadag, 2003). Given these differences between developed and developing countries, it has proven difficult to achieve consensus on the modalities and the effectiveness of intervention,(Rigobon, 2002); This no doubt is related in part to the disparate objectives, policies and procedures and economic environments in which different central banks operate. Notwithstanding these challenges, intervention to restrict exchange rate volatility brought on by temporary shocks remains an important policy objective of central banks.

In his study Rigobon,(2002) found that that central bank interventions exert an incorrectly signed effect on the levels of exchange rates and tend to increase their volatility in the short run. In general, our results also show that the traditional GARCH estimations tend to underestimate the effects in terms of volatility (Sarno and Taylor, 2001). This implies that intervention that leans against the wind is not sustainable in the long term Currency crisesin Mexico in 1994, Thailand in 1997 and Brazilin 1999 highlight the limits of intervention, wherein the first two cases the intervention activities of the central bank virtually depleted these countries' foreign exchange reserves because intervention was based on a targeted rate, which was inconsistent with fundamentals and the policy mix

2.4 Summary of Literature Review

Intervention is a very crucial policy tool that central banks use to correct any short term exchange rate misalignments and to dampen excessive short-term volatility in the exchange rate and other disorderly market conditions however, it could put the banks credibility and the scarce foreign exchange reserves at risk if poorly adopted. Central banks have probably improved their intervention techniques in recent years. They now

devote greater resources to "reading" the market than in the past. But it is unclear whether central banks have become more effective as a result, because the sophistication of market participants has also risen and because the knowledge of what drives the exchange rate is still very imperfect, the outcome of various intervention tactics depends on the situation, and tactics evolve as part of an ongoing trial-and-error process reflecting uncertainty about what works.

Central banks can use market dynamics (eg entering the market when it is known to be illiquid) to leverage the influence of interventions, Most have an aversion to volatility, and would not like to add to it. Some would not like to be visible in the market at all, and the central bank's presence is harder to hide when operating in thin markets. Others feel that having a large effect in a peripheral part of the market would be unlikely to generate useful results in the main (spot, wholesale, onshore) market. In any case, if a central bank wants to be effective in the main market, it should intervene in that market for reasons of credibility. The immediate goals of intervention include dampening volatility symmetrically, countering excessive exchange rate movements or overshooting, reducing the rate of change in the exchange rate "leaning against the wind" and supplying liquidity to the market.

Policymakers are typically concerned not just with how much the exchange rate might deviate from equilibrium but with how quickly it does so. Intervention will often attempt to slow the rate of change in the exchange rate without preventing trend changes, a policy that is known as leaning against the wind. While intervention of this kind typically occurs when the exchange rate is moving away from equilibrium, it can sometimes occur if the exchange rate is moving back to equilibrium, but "too quickly". Slowing the rate of change in the exchange rate can stop herding behaviour by acting as a circuit breaker. By reducing uncertainty, this type of intervention may facilitate foreign exchange market development and enhances the availability of hedging instruments. On the other hand, by acting as a provider of "insurance." against rapid exchange rate movements.

Despite a vesture on the effectiveness of intervention, few sources offer guidance on how central bank of Kenya intervention impacts on the USDKES exchange rate, a knowledge gap that this proposed research endeavors to fill.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

The chapter outlines the methods, tools and sources of research data, targeted groups and sample from which data was collected in order to attain the objective of the study, which was used to investigate the impact of central bank intervention in the spot foreign exchange market in Kenya. It further discusses how the data was processed and tools used in analyzing and presentation

3.2 Research Design

To examine the impact of central Bank intervention on spot exchange on forex prices event study methodology was used. The event is what the researcher would like to study. To construct an event study the event, event date, event window, estimation window & estimation model was determined. The events defined for this study was the announcements of Central Bank Interventions. The event date is the date of announcement of intervention by Central Banks. It can be expressed as t_0. The event window comprised some period before & after the event day. The event window in this study was 30 days before & 30 days in intervention by central Banks. It can be expressed as -30 to +30. The estimation period is the period prior to the occurrence of the event. This method clearly showed the impact of Central Bank Intervention on forex prices before and after the announcement.

3.3 Target Population

The population under study comprised the number of years that CBK has at least been in the market intervening in the spot foreign exchange market since Kenya adopted the floating foreign exchange regime i.e. 1993 to 2012.

3.4 Data Collection

Secondary method of data collection was used. Through an event-study approach, patterns of price changes for the periods proceeding public announcements could yield interesting evidence about market efficiency. The study utilized the event-study approach where the transaction date, report date, and publication date as reported in the Forex Market were adopted.

3.5 Data Analysis

Data was analyzed using ordinary least square (OLS) market model which measured the estimation of abnormal return on stock prices. Following is the formula for OLS market model to compute abnormal returns:-

$ARjt = Rjt - ERjt$

Where

$ARjt$ = Abnormal return of forex j on day t

Rjt = Actual return on forex j on day t

$ERjt$ = Expected return on forex j on day t

Actual return on security j in period t will be computed as follows:-

$Rjt = \dfrac{Pjt - P_{jt-1}}{P_{jt-1}}$

Where

Pjt = Price of forex j on day t

$Pjt-1$ = Price of forex j on day prior to day t

Expected return on forex j in period t was computed as follows:-

$ERjt = aj + bj\ Rmt$

Where

aj = Risk free rate of return

bj = Relative riskiness of the security to market index

Rmt = The rate of return on market index on the day t

After computation of abnormal returns of all the forex the average abnormal returns (AARs) was computed during event period (-30 to +30). AARs were computed as follows:

20

$$N$$

$$AARt = \underline{1} \sum ARjt$$

$$N \quad j=1$$

Where

AARt = Average of abnormal return for day t

N = Number of securities in the sample

The abnormal returns are aggregated trading day –wise & then divided by number of securities. Thus cross-sectional & time- series aggregation was done. After this cumulative average abnormal return (CAARs) was computed. The formula for CAARt:

$$t$$

$$CAARt = \sum AARi$$

$$t\text{-}k$$

Where

k = Number of event days before day t

T test was used to determine the statistical significance of CAARt & AARt. For computation of t statistics the aggregate pre- event standard deviation of abnormal returns of all the forex was be computed. Individual company's pre- event standard deviation i.e. (from -90 to -31) was computed & then aggregation done. The formula for estimation of pre- event standard deviation of daily abnormal returns is as follows:

$$-30 \qquad\qquad 2$$

$$s\, i, pre = \sqrt{\sum} \underline{(ARjt - AARjt\ pre)}$$

$$n$$

Where

i, pre s = Standard deviation of abnormal returns of security i estimated from pre- event measurement period.

n = Number of days in pre- measurement period

AARpre = Average of abnormal return of security i estimated from pre- event measurement period . Aggregate pre- event standard deviation will be computed as follows:-

$$s\,N,pre = \sqrt{\sum_{I=1}^{N} \partial^2 I\,pre)}$$

$$N^2$$

i, pre s was applied on AAR of each day. The t- test for AARs was as follows:-

AARt t stat = $\dfrac{AAR_t}{sN, pre}$

For testing CAARs, The t –test formula is:-

CAARt t stat = $\dfrac{CAAR_t}{sN, pre\sqrt{N_t}}$

Where Nt = the absolute value of event day t plus 1 (e.g. for event day -30, the absolute value will be 30 and Nt = 31)

A testable hypothesis was set. H1: The null hypothesis being tested was that abnormal returns on & around intervention are less than or equal to zero. If AARt or CAARt are greater than zero and statistically significant it indicates that the forex prices on an average reacted positively to bonus issue. If the t-test statistic was larger in absolute value than 1.96 or 2.58, the relevant abnormal return was statistically non zero at 5% or 1% significance level respectively.

CHAPTER FOUR:

DATA ANALYSIS AND PRESENTATION OF FINDINGS

4.1 Introduction

This chapter presents the data findings on foreign exchange market reaction to Central bank intervention on spot exchange by analyzing the forex prices and market return around central bank intervention. These data were collected from the Central Banks. Analysis involved evaluation of abnormal return and forex variability around Central bank intervention. The study covered a period of 18 months surrounding the CBK October 21 2011 intervention.

4.2 Data Presentation

Table 4.1: T –statistics for 30 days surrounding event date

	t	Sig.	Mean Difference	95% Confidence Interval of the Difference	
				Lower	Upper
-15	-.651	.027	-.01016	-.0188	-.0015
-14	-.144	.009	-.00086	-.0146	.0129
-13	-.333	.048	-.00218	-.0173	.0129
-12	-.876	.047	-.00269	-.0098	.0044
-11	-.652	.033	-.00251	-.0114	.0064
-10	-.026	.010	-.00010	-.0086	.0084
-9	-.958	.036	-.00237	-.0081	.0033
-8	1.283	.025	-.00496	-.0139	.0040
-7	1.422	.025	-.00343	-.0099	.0030
-6	1.451	.024	-.00451	-.0144	.0054
-5	1.919	.011	-.00626	-.0138	.0013
-4	1.989	.022	-.00498	-.0108	.0008
-3	1.518	.017	-.00657	-.0166	.0034
-2	2.711	.034	-.00470	-.0214	.0120
-1	2.641	.040	-.00305	-.0140	.0079
0	2.367	.023	-.00295	-.0215	.0156
1	2.538	.005	-.00307	-.0162	.0101
2	2.358	.029	-.00201	-.0150	.0109
3	1.688	.021	-.00492	-.0137	.0039
4	1.341	.042	-.00142	-.0110	.0082
5	1.274	.031	.00117	-.0087	.0111
6	1.253	.006	-.00120	-.0121	.0097
7	1.317	.009	-.00158	-.0131	.0099
8	1.392	.202	-.00665	-.0177	.0044
9	1.931	.379	.01756	-.0259	.0610
10	-1.358	.211	-.02334	-.0630	.0163
11	1.228	.056	-.00929	-.0189	.0003
12	1.624	.143	-.00870	-.0210	.0037

13	1.895	.397	-.00368	-.0131	.0058
14	-1.295	.231	-.00615	-.0171	.0048
15	.515	.621	.00244	-.0085	.0134

In order to determine the sensitivity of the foreign exchange prices to central bank intervention on spot exchange, the researcher calculated the T-statistics for the 15 days before, during intervention and after intervention announcement, if the T – value was close to 2 this was an indication that the foreign exchange price were sensitive to central Banks intervention announcement, from the finding shown in the above table, it was found that on 15 date before Central Banks intervention the T- statistics was negative an indication that the forex price were insensitive to CBK intervention announcement on approaching the 8th date before CBK intervention announcement, there was a rise in and it was positive on reaching the 5th day before CBK intervention announcement the forex market was found to be sensitive to CBK intervention announcement an indication that there were some speculation by investor, on reaching the event date it was found that the forex price were so sensitive to CBK intervention announcement as shown by t-value of 2.367, this continued up to second day after the announcement, this an indication that during few day before and during the CBK intervention announcement and after CBK intervention announcement forex price were very sensitive to CBK intervention announcement. This shows those forex prices are sensitive to CBK intervention announcement.

4.2.1 Market performance during Central bank's intervention

Table 4.2: Average Abnormal Returns

kDays	AAR	t	Sig. (2-tailed)
-30	1.158	.816	.451
-29	1.842	2.180	.081
-28	1.279	1.342	.237
-27	-0.924	-1.000	.363
-26	-0.756	-.267	.800
-25	0.703	.951	.385
-24	1.266	1.410	.218
-23	1.369	.866	.426
-22	0.073	-.635	.554
-21	0.030	-1.230	.273
-20	1.793	.361	.733
-19	1.465	-.523	.623
-18	3.386	2.191	.080

-17	1.285	1.210	.280
-16	0.092	.735	.495
-15	0.745	.261	.805
-14	0.774	.565	.596
-13	0.266	1.066	.335
-12	0.686	4.912	.004
-11	0.607	2.378	.063
-10	0.597	2.938	.032
-9	0.705	3.022	.029
-8	0.095	1.120	.314
-7	0.317	2.515	.053
-6	0.326	.059	.955
-5	0.627	.262	.804
-4	0.814	1.926	.112
-3	0.864	1.390	.223
-2	3.596	2.629	.047
-1	2.527	1.967	.106
0	8.969	1.834	.126
1	3.787	-1.841	.125
2	-2.303	-2.758	.040
3	-1.853	-1.660	.158
4	-0.390	-1.346	.236
5	-2.005	.656	.541
6	-1.316	-1.318	.245
7	-0.801	.365	.730
8	-1.089	-1.637	.163
9	-0.705	-1.380	.226
10	-0.799	-.131	.901
11	-1.424	.993	.366
12	-1.359	.171	.871
13	1.691	.974	.375
14	-0.087	-.869	.424
15	-0.755	-1.404	.219
16	0.303	-.104	.921
17	-1.194	-1.196	.285
18	-0.055	-.537	.614
19	0.866	.756	.483
20	0.561	1.020	.355
21	0.036	.438	.680
22	-0.784	-1.897	.116
23	-1.141	-1.144	.304
24	0.212	.081	.939
25	-0.495	-.167	.874
26	0.374	-.024	.981
27	-0.287	-.217	.837
28	0.686	1.869	.121
29	6.073	.716	.506
30	-0.461	-.280	.790

Table above which presents the abnormal returns for the forex market following the CBK intervention announcement shows that t-2 to t1 had a positive abnormal returns of values greater than 1; 3.596, 2.527, 8.969and 3.787respectively. The period between t2 to t12 had average abnormal return of less than 1 which means that no investor benefitted from above normal returns pointing at market adjusting to the CBK intervention announcement. This implies that the market do not react fast to CBK intervention announcement which could point to efficiency, but not perfectly efficient. However, period between between t-15 to t1 had above normal returns meaning that the investors enjoyed above normal returns. This could point at insider trading just before the CBK intervention announcement.

4.2.2 Forex Returns Variability (FRV)

Table 4.3: Average Forex Returns Variability

Day	Mean (AFRV)	STDEV	T-stat	Sig
-30	0.4375	0.5234	2.047	.451
-29	1.3938	1.8582	1.837	.081
-28	0.5875	0.6349	2.267	.237
-27	0.7102	0.5702	3.051	.363
-26	1.0529	1.1117	2.320	.800
-25	0.3839	0.4850	1.939	.385
-24	0.2612	0.2629	2.434	.218
-23	0.4774	0.4699	2.488	.426
-22	0.3698	0.3010	3.009	.554
-21	0.3845	0.5874	1.603	.273
-20	0.6196	0.7380	2.057	.733
-19	0.4158	0.5269	1.933	.623
-18	0.3621	0.5936	1.494	.080
-17	0.4290	0.5200	2.021	.280
-16	0.2057	0.1282	3.932	.495
-15	0.1673	0.1663	2.465	.805
-14	1.0176	1.2111	2.058	.596
-13	1.7646	3.4017	1.271	.335
-12	1.2849	2.0187	1.559	.004
-11	0.3819	0.6810	1.374	.063
-10	2.6129	3.4394	1.861	.032
-9	0.5799	0.5939	2.392	.029
-8	1.4308	1.4331	2.446	.314
-7	0.5264	0.5191	2.484	.053
-6	1.2743	1.7801	1.754	.955
-5	0.3490	0.3457	2.473	.804
-4	0.2696	0.4164	1.586	.112
-3	0.8296	0.7799	2.605	.223

-2	1.0894	0.8281	3.222	.047
-1	2.3329	2.7111	2.108	.106
0	4.5166	3.9164	2.825	.126
1	3.2318	4.1131	1.925	.125
2	0.8559	0.5396	3.886	.040
3	0.2945	0.1820	3.962	.158
4	0.2251	0.2760	1.997	.236
5	0.1447	0.2029	1.747	.541
6	0.0607	0.0271	5.491	.245
7	0.1299	0.0981	3.244	.730
8	0.0411	0.0397	2.540	.163
9	0.0692	0.1027	1.651	.226
10	0.1885	0.1639	2.817	.901
11	43.0224	85.8135	1.228	.366
12	1.5179	2.3342	1.593	.871
13	0.1160	0.1066	2.666	.375
14	0.2478	0.3888	1.561	.424
15	1.1385	1.5994	1.744	.219
16	2.3328	4.4154	1.294	.921
17	0.7888	0.6696	2.886	.285
18	0.2792	0.3248	2.105	.614
19	0.2432	0.2181	2.732	.483
20	0.3464	0.5638	1.505	.355
21	0.2046	0.0673	7.444	.680
22	0.7916	1.0715	1.810	.116
23	0.1092	0.0663	4.038	.304
24	0.8801	1.5974	1.350	.939
25	0.0676	0.0470	3.521	.874
26	0.9100	1.5537	1.435	.981
27	0.4095	0.4468	2.245	.837
28	1.2688	1.3201	2.354	.121
29	17.2388	33.5374	1.259	.506
30	0.2198	0.2115	2.546	.790

The study sought to establish the variability of the forex return following CBK intervention announcement thus determine the forex market reaction to CBK intervention announcement. The information presented in the above table show that that the variability in forex prices does increase erratically with time though there is more variability in the days preceding and after CBK intervention announcement. However, the t-significance shows 15 of the statistics were significant; 10 of which were in the post-announcement period. 6 out of the 10 were between t0 and t15. The announcement day had an average ASRV of 3.9164 at 95% confidence level. Apart from day t1, t11, t15, t12, t15, t16, t22, t24, t26, t28 and t29, other periods had ASVR of less than 1. Results support the semi-strong form efficient market hypothesis since forex prices adjust so fast to public

information that no investor can earn an above normal return by trading on the announcement day and period thereafter.

Table 4.4: Average Value of AFRV for CBK intervention announcement

Estimation Period	Forex Return Variability
From day -15 to day +15	4.3362
From day -15 to day -1	1.0607
From day 0 to day +15	3.4875
From day 0 to day +1	3.8742
From day -1 to day 1	3.3604
Form day -3 to day +3	1.8787
From day -7 to day +7	1.0753

To analyze the speed at which the forex market absorbs the CBK intervention announcement in the forex prices, the study presented the average security return variability across the announcement periods. As indicated by the table, forex variability was more in post-announcement period than pre-announcement period; while t-15 to t-1 had AFRV of 1.0607, t0 to t15 had AFRV of 3.4875. Between t0 and t1 the AFRV was 3.8742, t-1 to t1 had a variability of 3.3604. Day t-3 to t3 had AFRV of 1.8787 and t-7 to t7 had AFRV of 1.0753. Therefore, the forex market positively absorbed CBK intervention announcement contained information positively.

Table 4.5: CAR Across the Event Windows

Days	Mean of CAR	Variance
t-30 to t-21	3.200135	2.698851
t-20 to t-1	11.606	54.117
t0 to t1	30.50557	16.91172
t-1 to t1	29.065	26.12547
t+2 to t+20	22.383	1.745567
t+20 to t+30	29.035	57.56523
t-30 to t+	16.28562	98.38799

To track abnormal returns over a number of trading days, cumulative abnormal return (CAR) is computed through out the event period for the CBK intervention announcement as presented in table above from the table, it can be noted that CAAR for the forex market are positive during entire event window. From the results shown in table above the mean

CAAR was found to be positive in the period after CBK intervention announcement that trading volume reacted positively towards the CBK intervention announcement in the period before CBK intervention announcement the mean CAAR was found to have both negative value and indication the market was not sensitive to CBK intervention announcement, in the results on t- value the study found that period surrounding the event date the value of t was close to 2 an indication that trade volume were very sensitive to CBK intervention announcement.

4.3 Summary and Interpretation of Findings.

From the findings on the sensitivity of the Forex price to Central Bank Intervention announcement, the study found that during CBK intervention announcement and after Central Bank Intervention announcement, T – value was close to 2 this was an indication that the forex price were sensitive to Central Bank Intervention announcement, on nearing the announcement date the forex market was very sensitive to Central Bank Intervention announcement which could be attributed to speculation by investor. From the findings on the abnormal returns for the entire forex market following the Central Bank Intervention announcement, the stduy found that t-2 to t1 had a positive abnormal returns of values greater than 1; 3.596, 2.527, 8.969and 3.787 respectively. The period between t2 to t12 had average abnormal return of less than 1 which means that no investor benefitted from above normal returns pointing at market adjusting to Central Bank Intervention announcement. This implies that the market do not react fast to Central Bank Intervention announcement which could point to efficiency, but not perfectly efficient. The period between between t-15 to t1 had above normal returns meaning that the investors enjoyed above normal returns. This could point at insider trading just before the Central Bank Intervention announcement. On the variability of the forex return following Central Bank Intervention announcement thus determine the market reaction to Central Bank Intervention announcement. The study found that the variability in forex prices does increase erratically with time though there is more variability in the days preceding and after CBK intervention announcement. The t-significance shows 15 of the statistics were significant; 10 of which were in the post-announcement period. 6 out of the 10 were between t0 and t15. The announcement day had an average AFRV of 3.9164 at 95% confidence level. The results support the semi-strong form efficient market hypothesis since Forex prices adjust so fast to public information that no investor can earn an above normal return by trading on the announcement day and period thereafter. On the speed at

which the forex market absorbs the Central Bank Intervention announcement in its prices, the study found that forex variability was more in post-announcement period than pre-announcement period. The Forex market positively absorbed Central Bank Intervention announcement information positively.

From the findings, the study concludes that the Forex Markets Reacts both positively and negatively to Central Bank Intervention announcement, it was found that there was an increase in volumes of Forex traded before Central Bank Intervention announcement which reduced after Central Bank Intervention announcement as compared to those before the Central Bank Intervention announcement. This study found that that there were positive mean returns with respect to Central Bank Intervention announcement, this was in agreement with the signaling hypothesis. These finding concur with the findings of Mussa (1981) who suggested that if the central bank uses foreign exchange interventions to credibly indicate intended changes in monetary policy, the resulting revaluing of the exchange rate can be described as the signaling channel.

The impact of intervention through the signaling channel has often been found to be substantially stronger than through the portfolio balance channel (Dominguez and Frankel, 1993). Sterilized intervention will affect the exchange rate only if the central bank has an informational advantage over the other parties involved in the trading process, this implies that central banks have access to information which is not publicly available or have information advantage over the market hence Central banks can reveal this information by intervening in the foreign-exchange market to influence pricing. Market participants can then collect the new information and adjust their expectations regarding the future direction of the market fundamentals, this, leads to a change in exchange rate This signaling channel signifies that there is asymmetry of information between the central bank and the market participants on future fundamentals of the exchange rate, perceived as a credible signal on the future stance of monetary policy.

Central bank intervention, even in small amounts, can trigger a tide of buy or sell orders by trend-chasing traders. Interventions need not be announced and should be timed to maximize the exchange rate impact. Intervention in this context may also lead to higher volatility, which can help promote a sense of two-way risk in the market. The impact of official intervention on market expectations can be even greater if the central bank trades aggregate or disseminate information (Popper and Montgomery, 2001). When central

banks are perceived to be more knowledgeable about future monetary and exchange rate policies or better equipped to monitor and interpret fundamentals, such as balance of payments trends, market participants may try to learn from central bank trades.

Most studies suggest that intervention did not have a statistically permanent impact on exchange rate (Aguilar and Nydahi, 1998) and (Neely, 2001), found some evidence in favor of effectiveness in this context are Dominguez and Frankel (1993). Evidence in support comes from Murray et al (1996); Beattie and Fillion (1999) whereas Rogers and Siklos (2001) suggest no effect and Dominguez (1998) suggest that intervention increases volatility. Neely (2001) in his study suggests the factors that continue to drive the decision to intervene. He presents evidence from 22 responses to a survey on intervention practices sent to monetary authorities in order to explore intervention mechanics. Factors that determine the efficacy as instruments, counterparties, timing and amounts as well as related issues like secret intervention, motivation, and the perceived efficacy of such transactions.

Dominguez and Frankel (1993) estimate the effect of intervention on contemporaneous exchange rate movements and on forecasts of future exchange rates. Using survey data to measure exchange rate expectations, they find a significant effect of intervention on market expectations, especially if interventions are announced and coordinated. They also show that secret interventions are largely ineffective was one of the first empirical investigations in which daily data on public interventions were used to assess the effectiveness of foreign exchange-market interventions of central banks.

Edison, (1993) indicates that sterilization is achieved by taking measures which help to neutralize the expansionary or contractionary effects of interventions. There are two types of intervention, sterilized and unsterilized intervention. Unsterilized affects the monetary base while sterilized does not. Neely (1999) states that direct currency intervention is generally defined as foreign exchange transactions that are conducted by the monetary authority and aimed at influencing exchange rate. Indirect currency intervention is a policy that influences the exchange rate indirectly. Some examples are capital controls (taxes or restrictions on international transactions in assets), and exchange controls (the restriction of trade in currencies, those policies may lead to inefficiencies or reduce market confidence, but can be used as an emergency damage control. Coordinated

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interventions are interventions conducted by two (or more) central banks the same day on the same market and in the same direction as opposed to unilateral operations where only one single bank is involved in the transaction. According to the time used to settle the transaction, currency intervention could be labeled as either spot market intervention (intervention within two or lesser days) or forward market intervention (intervention after two days of settlement).If simultaneously used then it becomes currency swap interventions.

The microstructure channel provides a new window into the functioning of foreign exchange markets and the effectiveness of intervention (Lyons, 2001). Microstructure finance analyzes the impact of order flow on exchange rates. Aggregate order flow is the balance of buyer-initiated and seller initiated orders; as such, it is a measure of net buying pressure in the foreign exchange market (Evans and Lyons, 2005). Central bank intervention can cause market participants to change their expectations on the future path of the exchange rate and lead them to modify their net open foreign exchange positions, triggering a change in aggregate order flow well in excess of the central bank's contribution. The impact of official intervention on order flow and exchange rates can be greater in the presence of noise traders, which follow past trends, and often trade, in a correlated fashion (Hung, 1997).

Popper and Montgomery, (2001) found that central bank intervention, even in small amounts, can trigger a tide of buy or sell orders by trend-chasing traders. Interventions need not be announced and should be timed to maximize the exchange rate impact. Intervention in this context may also lead to higher volatility, which can help promote a sense of two-way risk in the market. The impact of official intervention on market expectations can be even greater if the central bank trades aggregate or disseminate information. The literature on the impact of foreign-exchange-market interventions discusses the issue as to whether such operations tend to stabilize or destabilize exchange rates or even have no effect at all. The intervention of central bank in foreign exchange market and its impact on exchange rate has been the focus of theoretical and empirical research ever since the introduction of floating exchange rate system.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

The general objective of the study was to investigate the impact of central bank intervention in the spot foreign exchange market in Kenya. The researcher analyzed this using the event study methodology. The event is what the researcher studied. The population under study comprised the number of years that CBK has at least been in the market intervening in the spot foreign exchange market since Kenya adopted the floating foreign exchange regime i.e. 1993 to 2012.

The study found that the Forex Markets Reacts both positively and negatively to Central Bank Intervention announcement. It was found that there was an increase in volumes of Forex traded before Central Bank Intervention announcement which reduced after Central Bank Intervention announcement as compared to those before the Central Bank Intervention announcement. This study found that there were positive mean returns with respect to Central Bank Intervention announcement; this was in agreement with the signaling hypothesis. This implies that the market do not react fast to Central Bank Intervention announcement which could point to efficiency, but not perfectly efficient.

The study found that direct currency intervention by central bank is conducted by the monetary authority which aims at influencing exchange rate. Indirect currency intervention is a policy that influences the exchange rate indirectly these includes capital controls (taxes or restrictions on international transactions in assets), and exchange controls (the restriction of trade in currencies, these policies lead to inefficiencies or reduce market confidence, but can be used as an emergency damage control.

5.2 Conclusions

From the findings the study concludes that the Forex Markets Reacts both positively and negatively to Central Bank Intervention announcement, it was found that there was an increase in volumes of forex traded before Central Bank Intervention announcement which reduced after Central Bank Intervention announcement as compared to those before the Central Bank Intervention announcement. This study found that that there were

positive mean returns with respect to Central Bank Intervention announcement, this was in agreement with the signaling hypothesis.

The study found that direct currency intervention by central bank is conducted by the monetary authority which aims at influencing exchange rate. Indirect currency intervention is a policy that influences the exchange rate indirectly these includes capital controls (taxes or restrictions on international transactions in assets), and exchange controls (the restriction of trade in currencies, these policies lead to inefficiencies or reduce market confidence, but can be used as an emergency damage control.

The study revealed that coordinated interventions are interventions conducted by central banks on the same day on the same market and in the same direction as opposed to unilateral operations where only one single bank is involved in the transaction. The study found that the microstructure channel provides a new window into the functioning of foreign exchange markets and the effectiveness of intervention. Microstructure finance analyzes the impact of order flow on exchange rates. Aggregate order flow is the balance of buyer-initiated and seller initiated orders; as such, it is a measure of net buying pressure in the foreign exchange market

Microstructure framework, analyses of the effectiveness of interventions focus on the extent to which central bank trades affect aggregate order flow. The central banks are uniquely positioned to affect the transmission of fundamentals to the exchange rate through order flow. Central bank intervention can cause market participants to change their expectations on the future path of the exchange rate and lead them to modify their net open foreign exchange positions, triggering a change in aggregate order flow well in excess of the central bank's contribution.

5.3 Policy Recommendation and implication

Central bank can uses foreign exchange interventions to credibly indicate intended changes in monetary policy, the resulting revaluing of the exchange rate can be described as the signaling channel.

The impact of intervention through the signaling channel has often been found to be substantially stronger than through the portfolio balance channel. The key assumption of the event study method was the ability to identify the event date. In this case of Central Bank Intervention announcement, two key event dates did occur; the announcement date and the effective date.

The data of announcement date was not complete so the effective Central Bank Intervention announcement date was defined as the event date. The comparisons done were based purely on forex price trends and did not account for changes in the overall market conditions. Other market conditions could have arisen, which had effects on the general activity of shares in the market and on the returns, hence there was need to make use of the market model.

There is need for central bank to adopt direct currency intervention which are the foreign exchange transactions that are conducted by the monetary authority and it aims at influencing exchange rate, this will influence influences the exchange rate indirectly, this can be achieved through capital controls taxes or restrictions on international transactions in assets, and exchange controls the restriction of trade in currencies, these policies lead to inefficiencies or reduce market confidence and also can be used as an emergency damage control.

Central banks should adopt coordinated interventions which should be conducted the same day on the same market and in the same direction as opposed to unilateral operations where only one single bank is involved in the transaction.

5.4 Limitation of the study

The study was limited to investigate the impact of central bank intervention in the spot foreign exchange market in Kenya for 18 months surrounding October 21st 2011. Secondary data was collected from the forex market and data published by Central Bank.

The study was also limited to the degree of precision of the data obtained from the secondary source. While the data was verifiable since it came from the Central Banks publication, it nonetheless could still be prone to these shortcomings.

The study was based on an 18 months period surrounding October 21st 2011. A longer duration of the study will have captured periods of various economic significances such as booms and recessions. This may have probably given a longer time focus hence given a broader dimension to the problem.

5.5 Areas of Further Research

The study sought to determine the impact of central bank intervention in the spot foreign exchange market in Kenya. There is need for a study to be conducted to determine the market reaction to central bank intervention in the spot foreign exchange market in Kenya.

There is need for a study to be conducted to determine the various type of intervention used by central bank to control spots exchange.

There is also need for a study on the impact of central bank intervention in other markets for example the forward exchange and derivatives market.

From the findings the study recommends that an in-depth study should be conducted to determine the effects of central bank intervention on the market performance.

There is need for a study to be conducted on the determinants of central bank intervention in the spot foreign exchange market in Kenya.

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