SENSITIVITY OF KENYA BANKS' STOCK RETURNS TO INTEREST RATE AND EXCHANGE RATE CHANGES

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.

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DEDICATION:

This research project is dedicated to my father Peter Mwaniki for constantly reminding me that ambition is priceless. It is also dedicated to my mother Julia Mwaniki who taught me that the greatest task can be accomplished if it's done a step at a time

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ABSTRACT

This paper seeks to establish the effect of interest rates and foreign exchange changes on bank stock returns. There are various reasons why the stock returns of banks can be responsive to interest rate and FX rate changes. The objective of the study was to determine the sensitivity of Kenya banks' stock returns to interest rate and exchange rate changes. To determine the sensitivity of Kenya banks' stock returns to interest rate and exchange rate changes, regression of stock returns on exchange rates and event study methodology was used.

The event is what the researcher would like to study. The event date is the date of announcement of change in interest rate by CBK and change in Foreign exchange by the sample firm. The study only sampled commercial banks listed in the NSE as the study is focusing on the analysis of the sensitivity of Kenya banks' stock returns to interest rate and exchange rate changes with reference to listed banks in Kenya. The study covered a period of 18 months start from January 2011 to June 2012. The period has been selected since it has been characterized with changes in foreign exchange and interest rate. Secondary method of data collection was used. Data was analyzed using ordinary least square (OLS) market model which measured the estimation of abnormal return on stock prices.

The study found that changes in the interest rate had both positive and negative effects on the stock price of commercial banks listed in the NSE. The study further found that share price of commercial banks listed in the NSE was sensitive to changes in interest rate. The study also established that 73.2 % changes stock price of commercial banks listed in the NSE could be accounted for by changes in foreign exchange an indication that changes in stock price of commercial banks listed in the NSE could be attributed to changes in foreign exchange rate. There is need for the central bank of Kenya to control the interest rate as changes in interest rate were found to have both positive and negative effects on the performance of stocks of commercial banks listed in the NSE.

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LIST OF ABBREVIATIONS

APT	Arbitrage Pricing Theory
CBK	Central Bank of Kenya
DGP	Data Generating Process
FX	Foreign Exchange
KBA	Kenya Bankers Association
MNCs	Multi National Corporation
NSE	Nairobi Security Exchange
PPP	Purchasing Power Parity
US	United States

DEFINITION OF TERMS

Foreign exchange rate; the price for which one currency is exchanged for another.

Interest rate; an interest rate is the rate at which interest is paid by a borrower for the use of money that they borrow from a lender. Specifically, the interest rate (I/m) is a percent of principal (I) paid at some rate (m).

Share prices; the cost of purchasing a security on an exchange. *Stock prices* can be affected by a number of things including volatility in the market. Market value of a share of common stock on the date shown. Highs and lows are based on the highest and lowest intra-day trading price.

CHAPTER ONE:

INTRODUCTION

1.1 Background of the Study

Foreign exchange (FX) rate and interest rate risks are important financial and economic factors affecting the value of common stocks. There are important reasons why the stock returns of banks can be responsive to interest rate and FX rate changes. The volatility transfer hypothesis suggests that random shocks can induce higher volatility in financial markets and because of contagion effects which are highest in more volatile markets (King and Wadhwani, 1990), investors as well as banks may look abroad to invest in alternative financial assets. If international portfolio diversification also results in an increase in the volatility of those returns (Eun and Resnick, 1988), then greater exposure to interest rate and FX rate risks is like to affect the stock returns of banks if indeed such information is impounded into their stock prices. So the implications of the arbitrage pricing theory (APT) will apply if indeed interest rates and FX rates are priced factors that constitute important elements in the equilibrium price of stocks. In equilibrium, the stock price of financial institutions (FIs) including banks would differ according to their sensitivity to interest rate (Yourougou, 1990) and FX rate changes. Choi *et al.* (1992) provide empirical evidence that both interest rates and FX rates are priced in the stock market for banks.

Interest rate and FX rate changes have been shown to directly affect the revenues and costs of financial institutions (Edmister and Merriken, 1989; Saunders and Yourougou, 1990). Largest banks have a significant proportion of their operations in foreign countries (Madura and Zarruk, 1995), interest rate and FX rate changes are likely to substantially impact on their revenue and cost streams beyond the protection that is afforded by hedging. Banks can affect their exposure to interest rate and FX rate changes when they act as financial intermediaries for their clients. As such, their role as financial intermediaries can affect the sensitivity of their assets and liabilities to interest rate (Deshmukh *et al.*, 1983) and FX rate changes. Indeed, an exposure would arise from a mismatch of the bank's assets and liabilities given in relation to their maturities (Song, 1984). This mismatch gets more difficult to accurately hedge, the more distant the investment horizon.

The nominal contracting hypothesis (Kessel, 1956) has also been used to explain the interest rate sensitivity of banks (Kwan, 1991), given also the composition of their balance sheets (Flannery and James, 1984). Since the internationalization of financial and banking markets is incomplete (Hirtle, 1991), it is likely that both interest rate and exchange rate sensitivity would vary among FIs and the extent of that variation would depend on both the nationality and financial operations of those institutions. Those risks occur whenever banks' assets and liabilities are mismatched and interest rate and FX rate change unexpectedly. Financial institutions can hedge to mitigate some of those risks but hedging tends to be partial or incomplete (Grammatikos *et al.*, 1986).

Firms in any industry are exposed to a certain level of interest rate risk because their investments and/or debts are sensitive to changes in interest rates. The more interest sensitive assets and liabilities held by a firm, the more interest rate sensitive a firm's assets and liabilities. Interest rate changes may not affect the value of a firm's equity as much as the values of the firms' assets and liabilities due to the offsetting effect between interest rate sensitive assets and liabilities. In addition, taking interest rate risk provides an opportunity for firms, especially financial institutions whose assets and liabilities are interest rate sensitive, to earn a higher return, and to increase the market value of its net worth, or shareholders' wealth.

The values of financial institutions' assets and liabilities are very sensitive to interest rate changes due to the nature of assets and liabilities held by financial institutions, but the interest rate sensitivity of one financial institution is not the same as that of others. Depending on the capital structure, a financial institution can be more sensitive to short-term interest rate changes, while other financial institutions can be more sensitive to changes in long-term interest rates. In addition to the interest rate changes, the degree of interest rate changes known as volatilities, also have an impact on the financial institutions' equity value and profitability. Volatile interest rate fluctuations during the late 1970s and early 1980s were one of the major culprits for the savings and loans crisis (Kaufman, 1990). Thus, managing interest rate risk for financial institutions is a critical matter.

Event studies document that there are strong historical relationship between interest rate changes and stock returns. Attempts to understand the impact of interest rate changes in the value of financial institutions have resulted in numerous studies in finance literature. Stone's (1974) model has been directly adopted or augmented (Chen *et al.*, 2001), while others have used other multi-index stock return processing models (Isimbabi and Tucker, 1997). Elyasiani and Mansur (1998) use the generalized autoregressive conditionally heteroskedastic in the mean (GARCH-M) model to test sensitivity of bank stock returns. Carson *et al.* (2008) study market and interest rate risk of stock returns of three categories of insurers – accident and health, life and property and liability insurers – using a system-GARCH framework.

1.1.1 Commercial Banking in Kenya

The commercial banks and non-banking financial institutions offer corporate and retail banking services but a small number, mainly comprising the larger banks, offer other services including investment banking, (Dikken & Hoeksema, 2001). In Kenya, The Companies Act, the Banking Act, the Central Bank of Kenya Act and the various prudential guidelines issued by the Central Bank of Kenya (CBK), governs the Banking industry in Kenya. The banking sector was liberalised in 1995 and exchange controls lifted. The CBK, which falls under the Minister for Finance's docket, is responsible for formulating and implementing monetary policy and fostering the liquidity, solvency and proper functioning of the financial system. The CBK publishes information on Kenya's commercial banks and non-banking financial institutions, interest rates and other publications and guidelines. The banks have come together under the Kenya Bankers Association (KBA), which serves as a lobby for the banks' interests and addresses issues affecting its members. (Kenya Bankers Association annual Report, 2008)

There are forty-six banks and non-bank financial institutions, fifteen micro finance institutions and forty-eight foreign exchange bureaus in Kenya. Thirty-five of the banks, most of which are small to medium sized, are locally owned. The industry is dominated by a few large banks most of which are foreign-owned, though some are partially owned locally. (Central Bank of Kenya annual report, 2010). Six of the major banks are listed on the Nairobi Stock Exchange. The banks have come together under the Kenya Bankers Association

(KBA), which serves as a lobby for the banks' interests and addresses issues affecting member institutions.

1.2 Statement of the Problem

A better understanding of the sensitivity of firm values to exchange rate movements is critical to suppliers of investment capital. To identify the reaction of individual stock returns to exchange rate changes, one should consider the economic characteristics of a firm that would link operating profitability and expected future cash flows to unexpected exchange rate changes. According to Kogut (1983), firms can reduce their exposure to uncertain environmental conditions through direct investment in international markets. The argument for risk reduction from having a presence in more than one country turns on the flexibility created by foreign direct investment. Having subsidiaries operating outside the home market may provide unique options unavailable to purely domestic firms for sourcing inputs and locating production, marketing, or other value chain activities (Miller and Reuer, 1998).

Event studies document that there are strong historical relationship between interest rate changes and stock returns. Attempts to understand the impact of interest rate changes in the value of financial institutions have resulted in numerous studies in finance literature. Stone's (1974) model has been directly adopted or augmented (Chen *et al.*, 2001), while others have used other multi-index stock return processing models (Isimbabi and Tucker, 1997). Elyasiani and Mansur (1998) use the generalized autoregressive conditionally heteroskedastic in the mean (GARCH-M) model to test sensitivity of bank stock returns. Carson *et al.* (2008) study market and interest rate risk of stock returns of three categories of insurers – accident and health, life and property and liability insurers – using a system-GARCH framework.

Much of the studies done on the sensitivity of banks' stock returns to interest rate and exchange rate changes, have been conducted in the developed, to the researcher knowledge no known local study has ever been conducted on sensitivity of Kenya banks' stock returns to interest rate and exchange rate changes , it's against this backdrop in the research that this study seeks to fill the existing research gap by conducting a study on to determine the sensitivity of Kenya banks' stock returns to interest rate and exchange rate changes, a case

study of listed banks in Kenya. This study sought to answer the following question; to what extent are the banks stock returns sensitive to change in interest rate and foreign exchange?

1.3 Objective of the Study

The objective of the study was to determine the sensitivity of Kenya banks' stock returns to interest rate and exchange rate changes.

1.4 Value of the Study

The study will be of invaluable information to the managers of commercial in Kenya as they will understand the sensitivity of Kenya banks' stock returns to interest rate and exchange rate changes. The study will also helped the relevant government agencies dealing with commercial banks as they will be able to design policies that will help to determine the sensitivity of Kenya banks' stock returns to interest rate and exchange rate changes, a case study of listed banks in Kenya. This study will help future scholars as it will form basis of future studies to the sensitivity of Kenya banks' stock returns to interest rate and exchange rate changes, a case study of listed banks in Kenya

CHAPTER TWO:

LITERATURE REVIEW

2.1 introduction

This chapter summarizes the information from other researchers who have carried out their research in the same field of study. The specific areas covered here are theoretical review and empirical review.

2.2 Theoretical Review

In trying to explain the fluctuations in exchange rates, several theories have been advanced that link between domestic and foreign inflation, interest rate and exchange rates. These are: the law of one price, the relative version of purchasing power parity, uncovered interest parity theory and covered interest parity theory.

2.2.1 Relative Version of Purchasing Power Parity Theory

The purchasing power parity hypothesis traces its origin to the writings of the Swedish economist Gustav Cassel (1918). The original theory states that equal goods in different countries cost the same in the very same countries when measured in terms of the same currency. Cassel declares that deviations from PPP imply that a country's currency is incorrectly valued.

Even if the contemporarily examined forms of PPP are weaker than the original version of PPP, it is still based on the simple hypothesis of arbitrage. If two homogeneous goods are traded at different prices in different countries, this arbitrage opportunity will be utilized, which leads to convergence of the deviations from PPP towards zero (in the absence of arbitrage costs). "Half-life" is the generally applied PPP convergence measure. Rogoff (1996) describes a consensus view in PPP research of three to five year half-lives, which is definitely too slow to be compatible with arbitrage opportunities. Therefore, an intense hunt for empirical half-life evidence, that supports this idea of arbitrage, has accelerated over the last few years.

Different versions of PPP have been examined over the years. The absolute form of PPP has very weak support in empirical studies. In the attempts to find evidence in favour of PPP, weaker and weaker forms of PPP have been specified, sometimes with questionable policy relevance (Horne, 2004). Currently, in the research community, the main focus is on long-run (relative) PPP, (henceforth termed long-run PPP, or just PPP). Given the large variation in the nominal spot rate relative to the variation in inflation rates, international inflation differentials are unlikely to explain changes in the short run exchange rates. This explains the development of the concept of long-run PPP. However, due to the specification of various test methods, there has been an implicit development of different empirical versions of long-run PPP (despite that all these studies claim that they test the very same theory of long-run PPP). It is difficult to quantify how strong different versions of long-run PPP are, but some tests are definitely weaker than others. For instance, if a time-varying equilibrium is allowed, this generally leads to some limitations in the policy implications and its relevance.

Over the years, conclusions regarding the validity of PPP have been under constant debate. In some periods the research community has concluded that PPP holds, and in other periods that PPP is not valid. PPP was put forward as a long-run equilibrium condition in the post-war period, but after the breakdown of the Bretton Woods system in the early 1970s it was even advocated as a short-run equilibrium (Taylor and Taylor, 2004). During the late 1970s and early 1980s most research concluded that the theory was not valid (Krugman, 1978). Essentially, at this time, only tests for hyperinflation economies indicated support for PPP (Frenkel, 1978). However, a fundamental flaw in the econometrics of the so-called stage-one tests was the failure to take explicitly into account the possible non-stationarity of the relative prices and exchange rates. PPP increasingly came under attack on both theoretical and empirical grounds from the late 1970s to the mid-1990s (Taylor and Taylor, 2004). PPP was tested using real exchange rates with a random walk as the null hypothesis. The alternative hypothesis was that PPP holds in the long run, see, e.g. Huizinga (1987), and Meese and Rogoff (1988). In small samples, it is difficult to distinguish between slow mean reversion and a random walk real exchange rate, and this causes a power problem when only post-Bretton Woods data is used.

An obvious solution to increase power is to rely on long time spans such as in Abuaf and Jorion (1990), Lothian and Taylor (1996) and Taylor (2002), whose finding are in favour of the PPP theory. However, a problem with long-horizon tests is the risk of sample selection bias since countries with long-horizon data tend to be the wealthiest nations in the world. There is usually no available data for third world countries, countries that grew very fast from a low level, or countries that once were rich but are no longer so. Furthermore, it is a well-known fact that increasing the estimation period can cause problems associated with structural breaks and regime changes (fixed versus floating exchange rate data). It is well documented that unit root tests are misleading in the presence of structural breaks.

2.2.2 Uncovered Interest Parity Theory

While the purchasing power parity condition applies to the cross border pricing of goods and services, uncovered interest rate parity theory looks into the cross border pricing of financial investments. According to Reid and Joshua (2004), this theory states that, lacking frictions in financial markets, the price of otherwise less financial investments or the rate of return received on them, should be identical across borders. The frictions present in the international financial markets are slightly different from those in goods markets. While there are likely to e few frictions in the form of costs to transferring capital across borders, markets for investment capital still have the frictions, causing the imperfect capital mobility such as multiple currencies. Uncovered interest parity requires that overseas returns be expected to equal domestic returns when converted at spot rates. The theory established that in international financial markets, when looking at the domestic currency return in an investment that pays interest in foreign currency, exchange rate changes must be added to own currency return

2.2.3 Interest Rate Parity Theory

Concept that any disparity in the interest rates of two countries is equalized by the movement in their currency exchange rates (Huang 1984). This theory states that the interest rate differential between two countries is equal to the differential between the forward exchange rate and the spot exchange rate. Interest rate parity plays an essential role in foreign exchange

markets, connecting interest rates, spot exchange rates and foreign exchange rates (Roll and Yan, 2000).

Exchange rate changes can impact the level of competitiveness of firms that are exposed to exchange rate risk, or affect the value of net assets denominated in foreign currencies. This may indirectly affect the portfolio value of banks or financial institutions that finance or insure these firms. An additional source of risk is the exchange rate risk associated with currency activities, predominantly to the unhedged positions held by these institutions in investment and financing activities on international capital markets. Wetmore and Brick (1994) empirically test the theoretical model of Choi *et al.* (1992), and confirm that US commercial banks are exposed to exchange rate risk resulting from their increasingly uncovered foreign loans. Chamberlain *et al.* (1997) find that one-third of US large banks are sensitive to exchange rate risk, while such is the case for only a few Japanese banks.

2.2.4 Arbitrage Pricing Theory

The underlying principle of the pricing theory involves the recognition that the anticipated return on any asset may be charted as a linear calculation of relevant macro-economic factors in conjunction with market indices (Stephen Ross, 1976). It is expected that there will be some rate of change in most if not all of the relevant factors. Running scenarios using this model helps to arrive at a price that is equitable to the anticipated performance of the asset (Roll and Yan, 2000). The desired result is that the asset price will equal to the anticipated price for the end of the period cited, with the end price discounted at the rate implied by the Capital Asset Pricing Model. It is understood that if the asset price gets off course, that arbitrage will help to bring the price back into reasonable perimeters (Stephen Ross, 1976).

This model was in the study to determine the sensitivity of Kenya banks' stock returns to interest rate and exchange rate changes. Although it is well-known that unexpected changes in interest rates induce risk, market and interest rate risks are not the only risks faced by banks. They may also be affected by exchange rate risk, which increases as their international activities, and those of their clients, increase. Notwithstanding the increasing volume of banks' international activities, few studies have attempted to consider the exchange rate as a determinant of banks' stock returns (1994; Chamberlain *et al.*, 1997).

2.3 Interest Rate Sensitivity

Empirical studies of interest rate sensitivity of financial institutions' stock returns date back to Stone (1974), who argues that the "introduction of the multi-period aspect of investment forces one to recognize the existence of debt instruments" and postulates a two-index model, which includes both the market returns and returns on debt instruments. The study of Martin and Keown (1977) and Sweeney and Warga (1986) support Stone's model by showing that stock returns of some companies are highly interest rate sensitive. Exploring the effect of interest rate changes in commercial banks stock returns, Lloyd and Shick (1977) also support Stone's model by noting that the inclusion of an interest rate index in the model improves the explanatory power. Other studies have modified Stone's model to devise multi-index models, such as models with different interest rate indices (Lynge and Zumwalt, 1980), models with changes in foreign exchange rate (Choi *et al.*, 1992) and models with interest rate volatility (Saunders and Yourougou, 1990).

One variant of Stone's model is to use different interest rate indices in the model to investigate how stock returns react to changes in different interest rates. Flannery and James (1984a, b), Bae (1990) and Saunders and Yourougou (1990) report that stock returns are inversely related to interest rate changes, but the sensitivity of stock returns to long-term interest rate changes is substantially larger than that to short-term interest rate changes. Similar findings are also reported by Wolff and Benink (2000). Yourougou (1990) finds the same negative association between mid-term interest rate changes and stock returns. Although, Akella and Chen (1990) are in accord with others on the negative relationship between stock returns and long-term interest rate changes, they find a positive association between the returns and short-term interest rate changes. Contrary to the findings of aforementioned studies, no impact of short-term interest rate changes on stock returns is also reported (Isimbabi and Tucker, 1997).

Unanticipated interest rate changes in lieu of actual interest changes are often incorporated in a return generating model. The market efficiency theory postulates that expected values of factors interest rates should be already reflected in the values. According to the theory, stock returns should not be affected by anticipated changes in those factors, but by unanticipated

changes. To generate the proxy for an unanticipated interest rates, extant studies use various techniques such as an autoregressive model (Unal and Kane, 1988), an autoregressive integrated moving average (ARIMA) model (Saunders and Yourougou, 1990) and the difference between the actual treasury bill rate at time t and the forward treasury bill rate at time $t-1$ (Brewer and Lee, 1986). Findings of these studies provide little evidence to support the market efficiency theory (Bae, 1990).

Studies investigating the sensitivity of a financial institution's stock returns to interest rate changes utilize different interest rate indexes. Lloyd and Shick (1977) use Solomon Brother Index, while most studies choose various treasury security rates as a proxy for an interest rate index. Some studies utilize rates of return in excess of risk-free rate of interest (Isimbabi and Tucker, 1997), while most studies use actual returns. In other cases, both short- and long-term interest rate indexes are simultaneously included so the model becomes a multi-index model (Isimbabi and Tucker, 1997). Other studies also use multi-index models by including foreign exchange rate risk (Choi *et al.*, 1992) or interest rate volatility (Saunders and Yourougou, 1990) in addition to an interest rate index.

2.4 Exchange Rate Exposure

Although foreign exchange risk is one of the many business risks faced by modern corporations, it has not been subject of much empirical research, even though exchange rates are several times more volatile than inflation or interest rates (Jorion, 1990). More puzzling is that the fundamental question regarding the impact of foreign exchange rate movements and contemporaneous changes in firm value remains unanswered (Faff and Marshall, 2002). As Jorion (1990) points out, the sources of exchange rate exposure are complex and not well understood. Previous studies of exchange rate exposure have found, at best, mixed evidence of exchange rate exposure. Some studies find a significant effect of exchange rate changes while others do not. While some studies have so far documented a weak link between contemporaneous exchange rate fluctuations and the stock returns, other studies establish a lagged relation claiming that there is mispricing by investors.

Furthermore, the majority of the studies in the area focus on the valuation consequences of exposure to exchange rate changes. Such studies focus on the US and other developed

countries. A number of empirical studies in the UK have examined the approach of corporate treasurers in managing foreign exchange rate exposure (Dhanani, 2003; El-Masry, 2006a). Few studies have investigated the relationship between exchange rate changes and the value of UK companies (Joseph, 2002). Therefore, the current study seeks to fill the gap by providing empirical evidence on the impact of exchange rate changes on the monthly stock returns of UK firms from January 1981 to December 2001.

As the exchange risk sensitivity of firms will depend on their operating, financial and hedging strategies and other firm-specific variables (Allayannis and Ofek, 2001), a firm-level study is necessary to understand whether, and why, individual firms display varying sensitivity to exchange risk. This approach is distinct from previous research, which focuses on industries or portfolios of firms from various industries (Donnelly and Sheehy, 1996). A potential shortcoming of studies examining the exchange rate exposure of industries or multi-industry portfolios is that such aggregations of firms may mask differences in firm-specific factors affecting foreign exchange rate exposure. Not only may some firms have significant exposure while others do not, the signs of the significant exposure may vary, even within an industry.

Jorion's (1990) study is the first empirical attempt in the US to empirically examine the relationship between exchange rate changes and stock returns of 287 multinational companies to changes in exchange rate. His results suggest that only a small proportion of his sample firms only (5 per cent) exhibit a significant contemporaneous exchange rate exposure. Amihud (1994) examines the relationship between stock returns of 32 of the US largest exporting companies to changes in the trade-weighted exchange rates of the US dollar, conditional on the overall stock market using monthly and quarterly intervals for the period January 1979 to December 1988. The results show there is no significant contemporaneous relationship between monthly changes in nominal and real exchange rates and monthly equity returns for these 32 firms. The results also show a weak significant relationship between lagged exchange rate changes and companies' stock returns. Walsh (1994) examines the relationship between operating income and exchange rate, and contemporaneous and lagged relationships between exchange rate and stock returns of 391 firms for the period April 1982 to January 1993. He demonstrates that operating income will only exhibit a

lagged relationship to exchange rate movements in the presence of a competitive foreign exchange rate exposure. His results show that more than 10 per cent of firms are significantly exposed to contemporaneous exchange rate changes. Bartov and Bodnar (1994) examine the relationship between exchange rate changes and abnormal returns of 208 US companies. Choi and Prasad (1995) examine the exchange risk sensitivity of 409 US multinational firms.

Chow *et al.* (1997a) examine the existence of exchange rate exposure using stock returns on four US diversified equity portfolios and a sample of 213 US multinational firms. The study finds that the changes in real exchange rates are important in explaining the temporal variation in expected returns on bonds and stocks, and that all assets are exposed to exchange rate risk. Chow *et al.* (1997b) examine the exchange rate exposure of US stock and bond returns of multinational firms. They find that the statistical significance of exchange rate exposure increases with the length of the return horizon and that large (small) firms are, on average, positively (negatively) exposed to exchange rate changes across all horizons. They argue that the cross-sectional differences in the magnitude of exposure are significantly related to firm size and weakly related to foreign sales ratio. Bodnar and Wong (2003) find that the percentage of firms with statistically positive and negative exchange rate exposure varies noticeably over different horizons. On the other hand, the significantly negative coefficient on firm size indicates that larger firms have exposures that are more negative, independent of their foreign sales ratio.

Williamson (2001) investigates the effect of real exchange rate changes on the value of a small sample of firms in the automotive industry from the United States and Japan during the period 1973-1995. However, the results show that the exposure of US firms to the yen and Japanese firms to the dollar are due to the Japanese sales in the US market. His findings also indicate that exchange rate exposure in the automotive industry changes through time, mostly because of the changing structure of the industry over the sample period. Chan *et al.* (2002) investigate the effect of foreign exchange risk on the valuation of the two main groups of US pharmaceutical firms: proprietary drugs and generic drug firms during the period 1990 to 1999. The major result of this research is that the proprietary drug producers exhibit exchange rate sensitivities that reversed from negative during 1990-1994 to positive during

1995-1999. They argue that, in the period 1990-1994, the proprietary drug producers' stock returns were adversely affected by an appreciating US dollar.

Choi and Kim (2003) examine the Asian currency exposure of US firms with regard to their international operational and risk management strategies. Their sample firms are US firms with Asian sales, income and assets during the period from January 1992 to December 1997. The study finds that contemporaneous and lagged changes in real exchange rates have significant impacts on firm value for 29 per cent of the US firms with Asian operations at the 10 per cent level of significance. Of the firms that show significant exposure, about half of them have significant positive exposures. Chen and So (2002) study the relationship between the variability of exchange rates and weekly stock returns of 129 US multinationals with sales in the Asia-Pacific region over the period from January 1996 to December 1998. Empirical results show that the volatility of the common stock return for the multinational firms increased significantly with the exchange rate variability increase. The results also indicate that the volatility of weekly stock returns of firms is higher after the Asian financial crisis than before it. Kiymaz (2003) investigates the foreign exchange exposure of 109 Turkish firms traded on the Istanbul Stock Exchange during the period of 1991-1998. He finds that Turkish firms are highly exposed to foreign exchange risks and the most exposed industries are textile, machinery, chemical and financial industries. The sign of foreign exchange exposure is negative, indicating an adverse impact of foreign exchange rate on firm value. The findings also show significant foreign exchange exposure for domestic firms.

Chow and Chen (1998) confirm this result using a sample of Japanese firms. They find that Japanese firms with higher import ratios are adversely affected by yen depreciation and less detrimentally affected if they are in industries with higher exports, since real exchange rate changes may affect a firm's value in the long run. He and Ng (1998) also examine the exchange rate exposure for a sample of 171 Japanese firms. They find that about 25 percent of the firms in their sample experience economically significant positive exposure effects for the period January 1979 to December 1993. Khoo (1994) measures the foreign exchange rate exposure of mining firms in Australia. The sensitivity of stock returns to exchange rate movements and the proportion of stock returns explained by exchange rate movements are found to be small.

2.5 Determinants Of Exchange Rate Exposure

A better understanding of the sensitivity of firm values to exchange rate movements is critical to suppliers of investment capital. To identify the reaction of individual stock returns to exchange rate changes, one should consider the economic characteristics of a firm that would link operating profitability and expected future cash flows to unexpected exchange rate changes. According to Kogut (1983), firms can reduce their exposure to uncertain environmental conditions through direct investment in international markets. The argument for risk reduction from having a presence in more than one country turns on the flexibility created by foreign direct investment. Having subsidiaries operating outside the home market may provide unique options unavailable to purely domestic firms for sourcing inputs and locating production, marketing, or other value chain activities (Miller and Reuer, 1998).

Kogut and Kulatilaka (1994) offer a model in which multinational operational flexibility, under conditions of real exchange rate movements, gives option value. To the extent that a firm concentrates its overseas assets in a particular foreign market, the firm could have significant currency exposure. This suggests that beyond some level of foreign assets, the relation of these assets to exchange rate exposure may become positive. Jorion (1990) presents some empirical evidence on the extent to which cross-sectional variations in foreign exchange rate exposure coefficients of US MNCs are explained by differences in the proportion of sales revenues earned from abroad. His results show that exchange rate exposure is positively correlated to the foreign sales to total sales ratio. Choi and Prasad (1995) confirm that foreign sales and foreign assets are significantly related to exchange rate exposure during the total sample period of 1985 to 1989. Although foreign profits are not significant for the entire sample period, they are significant for the first three individual years. Overall, the firm-specific variables support the hypothesis of a positive relationship between foreign operations and exchange rate exposure.

Booth and Rotenberg (1990) have used foreign sales, foreign assets and foreign debt ratios as measures of the degree of foreignness to determine the sensitivity of Canadian stock returns to the Canadian dollar against the US dollar exchange rate changes. Consistent with Jorion (1990), firms with a higher fraction of foreign sales are found to have more positive

exchange rate exposure. However, firms with a higher fraction of foreign debts have more negative foreign exchange rate exposure, though this result is statistically insignificant. Harris *et al.* (1991) suggest that stock returns and dollar exchange rates are negatively correlated and that the degree of correlation between these two variables depends upon the degree of foreign operations of the individual firms. They also provide evidence suggesting that the sensitivity of stock prices to changes in exchange rates varies with the degree of foreign operations.

Shin and Soenen (1999) also argue a smaller but significant negative effect for large firms with foreign operations. This is evidence that the hedging activities of large firms have a limited effect on exchange rate exposure. For small firms, a significant, positive foreign exchange exposure is found. Chowdhry and Howe (1999) claim that corporations will engage in operational hedging only when both exchange rate uncertainty and demand uncertainty are present. The study also shows that firms are likely to use financial instruments to a greater extent to hedge short-term exposure and rely on operational hedging more heavily to hedge long-term exposure. Doidge *et al.* (2002) find that firms' foreign activities are broadly and significantly related to exchange rate exposure and that, after controlling for these activities, large firms are more sensitive to currency movements than small firms. They also find that firms with high international sales outperform those with no international sales during periods of large currency depreciation, whereas they underperform during periods of large currency appreciation. Doukas *et al.* (2003) find that the exposure effect on multinationals and high-exporting firms, however, is found to be greater in comparison to low-exporting and domestic firms. Solakoglu (2005) finds that the size of the firm and the share of export revenue in total revenue have a negative effect on the exposure level. The study does not find *hedge* variable as a significant factor in influencing exposure level. De Jong *et al.* (2006) find that firm size and the foreign sales ratio are significantly and positively related to exchange rate exposure.

2.6 Empirical Review

A number of empirical studies have sought to estimate the sensitivity of FIs' stock returns to interest rate changes. The research methodologies tend to vary and this variation in turn,

gives rise to different empirical results. Flannery (1981) employed a cash flow approach to show that interest rate changes have no significant effects on the costs and profits of the banks, thereby implying the banks are not exposed to interest rate risk (Flannery, 1983). Based on the augmented market model, Flannery and James (1984) find evidence of interest rate sensitivity for FIs stock returns which they explain by means of the duration gap between their assets and liabilities.

Most of the earlier empirical studies focused on the interest rate sensitivity of FIs stock returns (Kwan, 1991) without much regard for possible that FX rate changes might also affect those stock returns. Those empirical results tend to show strong evidence of interest rate sensitivity (Flannery and James, 1984; Akalla and Chen, 1990). The results are often based on the orthogonalization of the explanatory variables prior to estimation. Orthogonalization seeks to ensure that the *iid* condition is satisfied and that the estimated parameters capture effects that are specific to the dependent variable. Giliberto (1985) shows that these estimation procedures can bias the estimated parameters and in turn, affect statistical inferences (Akella and Chen, 1990). If a model is mis-specified or the estimation method is inappropriate for the data generating process (DGP), orthogonalisation is unlikely to ensure estimation consistency.

A few empirical studies have also examined the sensitivity of FIs' stock returns to FX rate changes while others have jointly estimated the impact of FX rate and interest rate changes. Take first the empirical work that focus only on FX rate sensitivity. Chamberlain *et al.* (1997) report weak evidence of FX rate sensitivity for US banks. Their cross-section regression results show that accounting measures can in fact explain the degree of FX rate sensitivity. Japanese banks do not appear to be exposed to FX rate changes and the degree of sensitivity also appears to vary over time (Harris, *et al.*, 1991). Other empirical studies that jointly estimated interest rate and FX rate sensitivity provide mixed results. Choi *et al.* (1992) report much stronger evidence of interest rate sensitivity than FX rate sensitivity although the degree of sensitivity varies by bank groups. Choi and Elyasiani (1997) report much stronger evidence of FX rate sensitivity than interest rate sensitivity for US banks. Most of the banks in their study exhibited FX rate sensitivity. Wetmore and Brick (1994) found similar results

for US banks. They also report that the extent of FX rate sensitivity has increased over time while interest rate sensitivity has decreased.

Empirical results show that FIs' stock returns exhibit strong variation on the degree of interest rate and exchange rate sensitivity. The different empirical results can reflect differences in estimation methods, the time period of the study, the frequency of the data and cross-sectional variation in the degree of exposure of FIs according to their activities and groupings. It is also clear that the extent of exposure varies over time and that the use of estimation methods that assume constant parameter estimate will be inappropriate in this setting. OLS estimation methods are unlikely to perform well with daily data since such data contains a lot more volatility clustering.

Model for sensitivity of banks' stock returns to interest rate and exchange rate changes

Following Choi *et al.* (1992) and Wetmore and Brick (1994), the multi-factor market model was used in our study.

$$Rit = \alpha + \beta m\, R_{mt} + \beta_r R_{rt} + \beta_f R_{ft} + \varepsilon_{it}$$

Where R_{it} is the return on bank i equity or on portfolio i at time t; R_{mt} is the return on the market index at time t; R_{rt} is the return on the interest rate index at time t; R_{ft} is the return on the exchange rate index at time t; and ε_{it} is an error term. Coefficients β_m , β_r and β_f are market, interest rate and exchange rate risks, respectively. The sign and the magnitude of β_f is the primary focus of our analysis. A positive and significant coefficient for β_f indicates that an increase in the US dollar relative to the Canadian dollar or in the basket of G10 countries' currencies relative to the Canadian dollar positively affect Canadian banks' stock returns.

Estimating equation (1) may induce some econometric problems such as collinearity. To solve it, many authors use the "orthogonalization" technique. For instance, testing the two-factor model, Flannery and James (1984) and Chance and Lane (1980) "orthogonalize" interest rates by regressing them on market rates, or by regressing market rates on interest rates. However, "orthogonalization" does not necessarily provide better results. On the one hand, it is difficult to identify which of the market rate or the interest rate determines the

other (Kane and Unal, 1988). On the other hand, "orthogonalization" may result in biased student *t* statistics (Gilberto, 1985). Furthermore, the correlation between market and interest rate returns is not likely to induce an important econometric problem (Kwan, 1991). Following Kane and Unal (1988) for the two-factor model, or Wetmore and Brick (1994) for the three-factor model, we do not orthogonalize indices.

2.7 Summary of Literature Review

A major contribution of this study is to investigate the interest rate sensitivity of P/L insurer stock returns in different time periods to examine whether the sensitivity is portfolio specific (Brewer *et al.*, 2007) and time varying as is documented in banking literature (Kwan, 1991; Maher, 1997). Consistent with extant studies of financial institution's interest rate sensitivity, we also report that the interest rate sensitivity of insurer stock returns is time varying. Although generalization is difficult and the conclusion is not as convincing as it could be because only one underwriting cycle is sampled, it is still noteworthy to recognize that the insurers' interest rate sensitivity is closely related to the insurance industry's underwriting cycle or performance. The interest rate sensitivity becomes negative during the period when the industry's underwriting profit increases, indicating that the firm's value declines as interest rates rise. On the other hand, the sensitivity becomes positive, i.e. insurers' stock prices rise as interest rates move up, when the underwriting profit is eroded. In addition, when the underwriting profit increases, insurer stock returns are more sensitive to changes in long-term interest rate, but when the underwriting profit decreases the stock returns are more sensitive to changes in short-term interest rate. This suggests that the market factors both the industry's underwriting performance and the direction of interest rate change in the insurer stock prices.

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 to determine the sensitivity of Kenya banks' stock returns to interest rate and exchange rate changes. It further discusses how the data was processed and tools to be used in analyzing and presentation

3.2 Research Design

To determine the sensitivity of Kenya banks' stock returns to interest rate and exchange rate changes 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 are the announcements of change in interest rate and change in Foreign exchange by the Central Bank of Kenya. The event date is the date of announcement of change in interest rate and change in Foreign exchange by the sample firm. It can be expressed as t_o. The event window comprised some period before & after the event day. The event window in this study was 30 days before & 30 days after change in interest rate and foreign exchange rate. It can be expressed as -30 to +30. The estimation period is the period prior to the occurrence of the event. This method clearly shows the sensitivity of Kenya banks' stock returns to interest rate and exchange rate changes before and after the announcement.

3.3 Target Population

The population under study comprised of all commercial banks quoted in the Nairobi Securities Exchange Market.

3.4 Sample and Sampling Procedure

The study only sampled commercial banks listed in the NSE as the study is focusing on the analysis of the sensitivity of Kenya banks' stock returns to interest rate and exchange rate

changes with reference to listed banks in Kenya. The study covered a period of 18 moths start from January 2011 to June 2012. The period has been selected since it has been characterized with changes in foreign exchange and interest rate.

3.5 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 Nairobi Securities Exchange Market will be adopted.

3.6 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 security j on day t

Rjt = Actual return on security j on day t

ERjt = Expected return on security j on day t

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

$$Rjt = \frac{Pjt - P\,jt\,-1}{P\,jt\,-1}$$

Where

Pjt = Price of security j on day t

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

Expected return on security j in period t will be 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 securities the average abnormal returns (AARs) will be computed during event period (-30 to +30). AARs will be computed as follows:

$$AARt = \frac{1}{N} \sum_{j=1}^{N} ARjt$$

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 will done. After this cumulative average abnormal return (CAARs) will be computed. The formula for CAARt:

$$CAARt = \sum_{t-k}^{t} AARi$$

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 securities was computed. Individual company's pre- event standard deviation i.e. (from -90

to -31) will be computed & then aggregation done. The formula for estimation of pre- event standard deviation of daily abnormal returns is as follows:

$$s_{i,pre} = \sqrt{\frac{\sum_{-30}^{2} (ARit - AARjt\ pre)}{n}}$$

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

AAR pre = Average of abnormal return of security i estimated from pre- event measurement period

Aggregate pre- event standard deviation will be computed as follows:-

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

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

$$\text{AARt t stat} = \frac{AAR_t}{s_{N,pre}}$$

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

$$\text{CAARt t stat} = \frac{CAAR_t}{s_{N,pre}\sqrt{N_t}}$$

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

In order to determine the relationship between stock return and foreign exchange rate, regression analysis was applied. The regression model was as follows:

$\mathbf{Y = \beta_0 + \beta_1 X_1 + \varepsilon_i}$

Where :

Y= Stock return

β_0= the constant

X_1= Foreign Exchange Rate

CHAPTER FOUR:

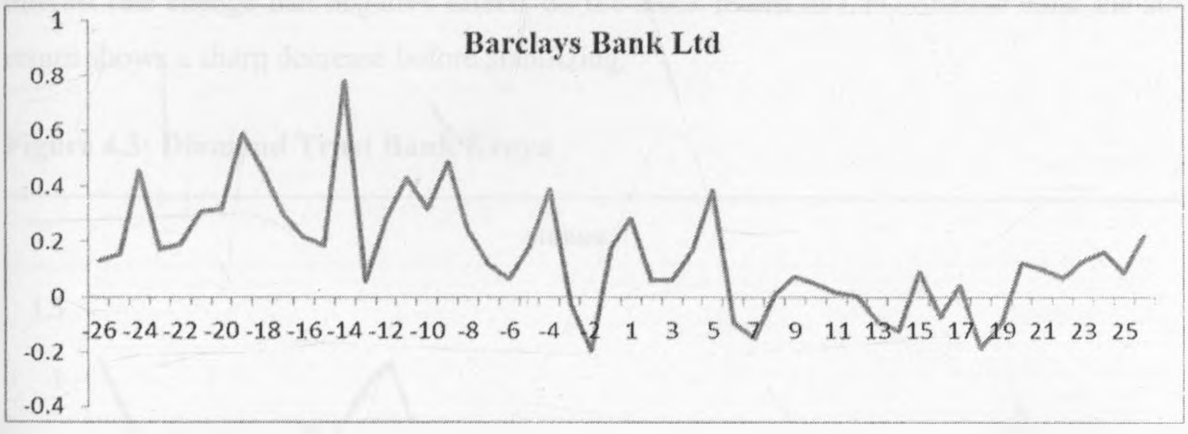
DATA PRESENTATION AND ANALYSIS

4.1 Introduction

This chapter presents information to determine the sensitivity of Kenya banks' stock returns to interest rate and exchange rate changes. Data collected from NSE was analyzed using the event study model. For each day, t-statistics and test of significance was done using SPSS statistical package for social science, the difference between the two period will be computed to establish whether there are excess return around the changes in interest rate window period.

4.2 Market performance during the event period

Figure 4.1: Barclays Bank Ltd



The study presented the stock return performance of Barclays banks share performance before and after change in interest rate. From the figure above, stock return, represented on the y axis increased day before interest change, which was followed by a sharp reduction stock return on approaching the interest change date. This depict a reduction in stock price immediately after interest rate change, this is an indication that Barclays Bank stock was very sensitive to change in interest rates. However this is just a cosmetic reduction as is shown by a sharp increase in stock return which stabilized with time but still above the market performance of post-interest rate change.

Figure 4.2: CFC Stanbic Holdings

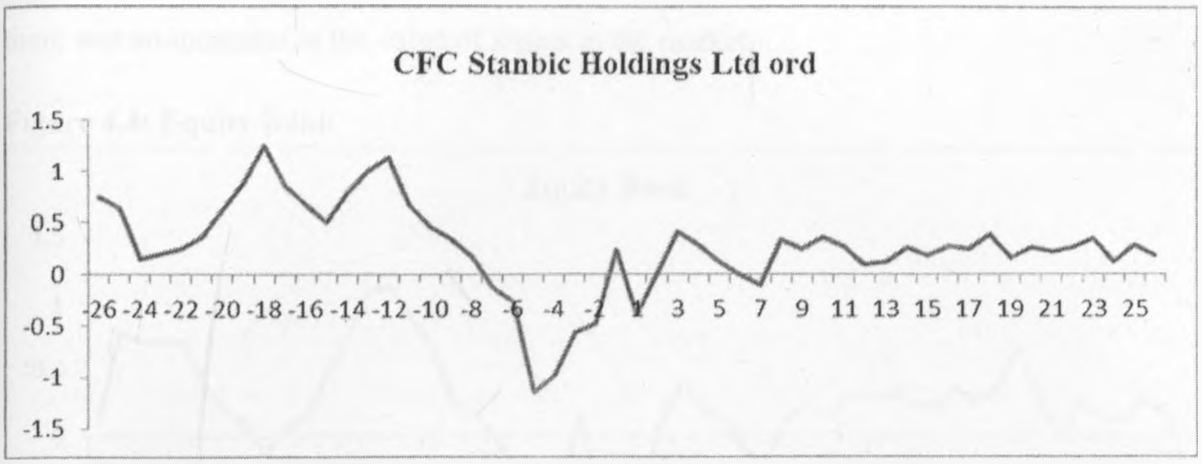


Figure above presents CFC Stanbic bank stock market performance before and after change in interest. The study found that the stock return were increasing day away from the announcement of change in interest rate, there were sharp decrease few days before the interest rate change and then stabilized after the interest rate change . This indicates that interest rate change had negative effects on the stock return of CFC Stanbic bank the stock return shows a sharp decrease before stabilizing.

Figure 4.3: Diamond Trust Bank Kenya

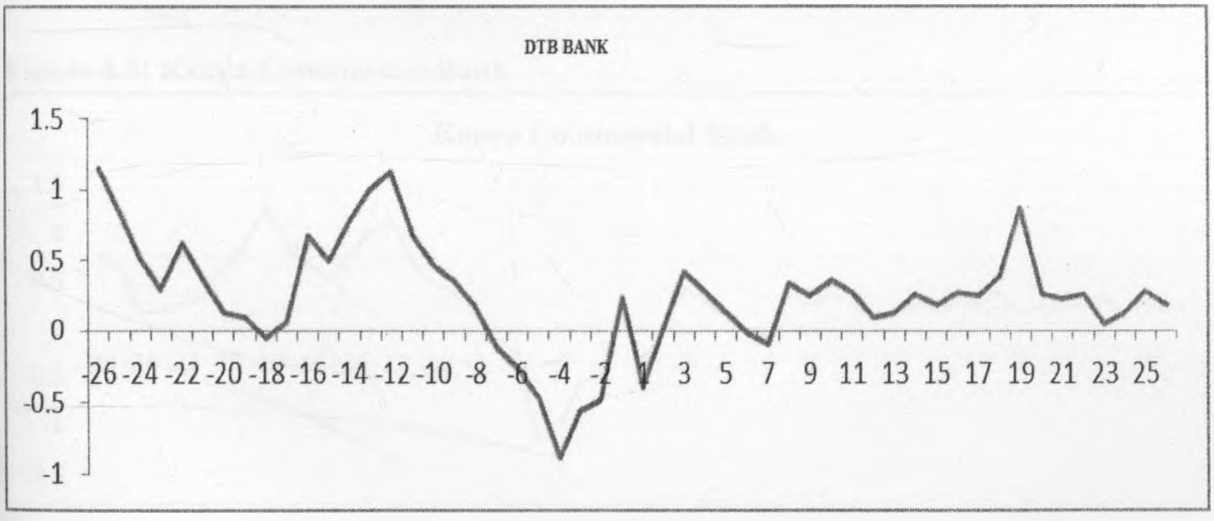
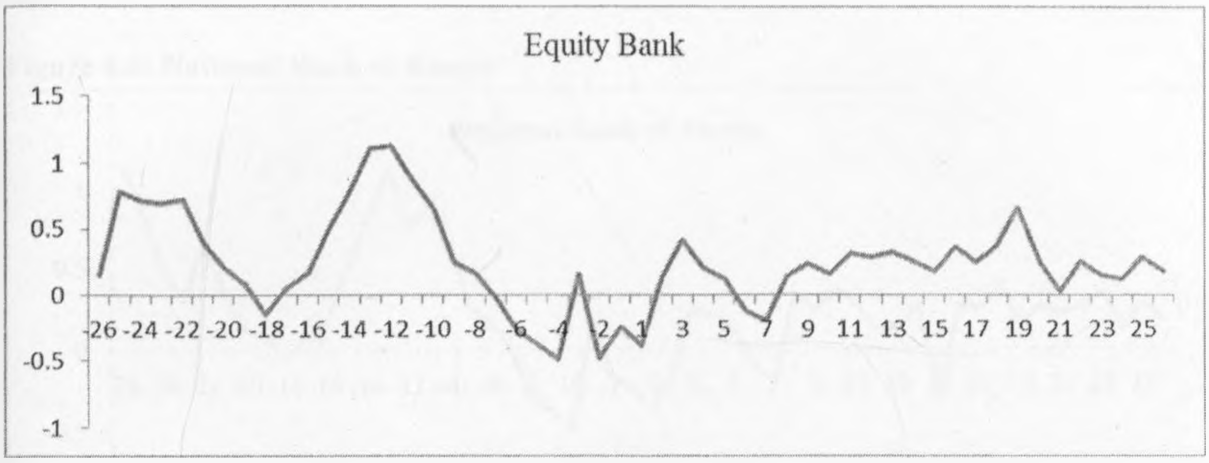


Figure above presents Diamond Trust Bank market performance before and after interest change announcement. Share prices were declining prior to interest rate change; the share price started to rise and stabilized after the interest rate change though the increase was not

high. This indicates that stock return positively increased after interest rate change this shows there was an increases in the value of shares in the market.

Figure 4.4: Equity Bank



Equity Bank stock performance shows an decrease in stock prices before interest rate change, which is followed by a reduction in stock return. Equity Bank stock return shows a reduction in stock performance, after some days before and after interest rate change there was notable increase in the stock return which was an indication of positive market performance of Equity Bank due to changes in the interest rate.

Figure 4.5: Kenya Commercial Bank

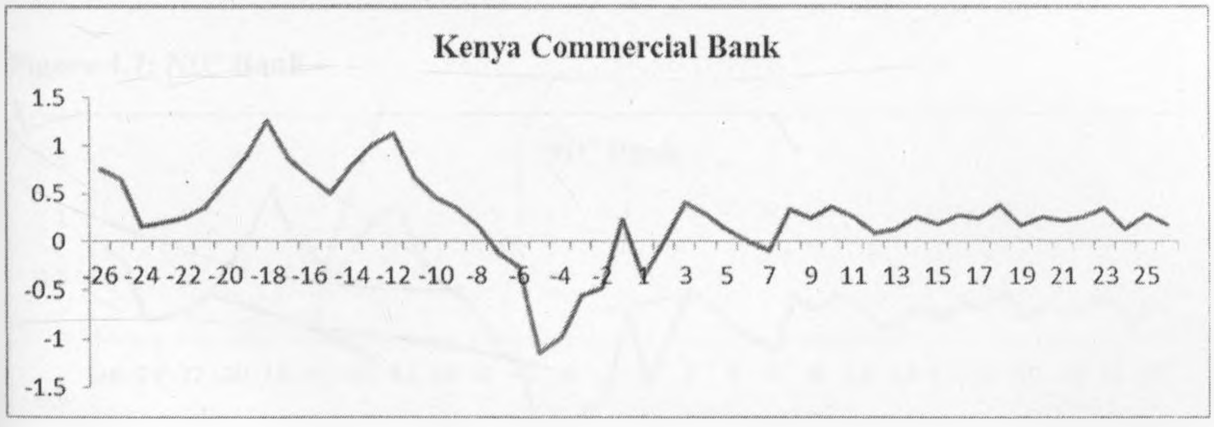
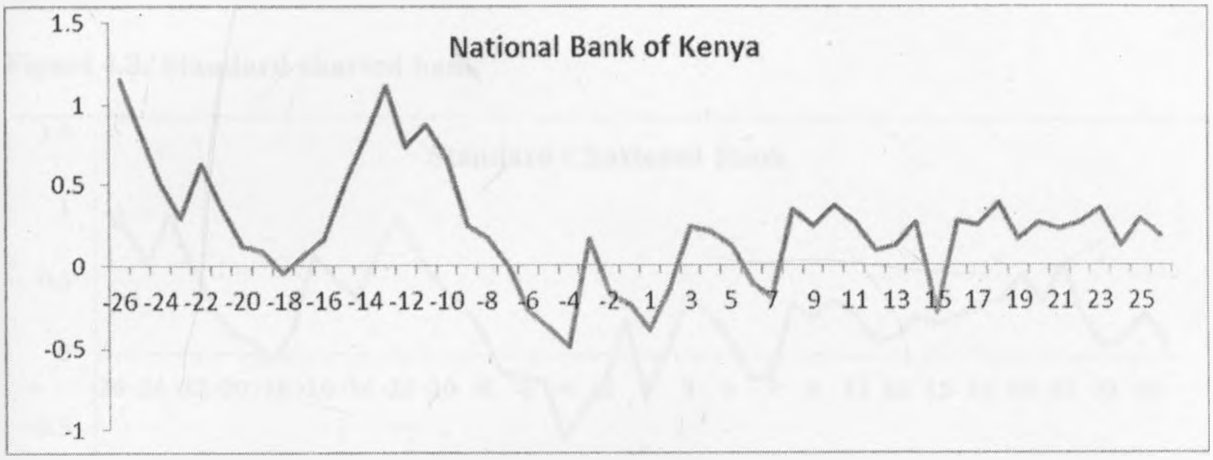


Figure shows the market performance of Kenya Commercial Bank before and after interest rate changes from the figure it is evident that before interest rate change there was a decrease in market performance and indication that Kenya Commercial Bank stocks were sensitive to interest rate change , after the change in interest rate the stock performance decreased

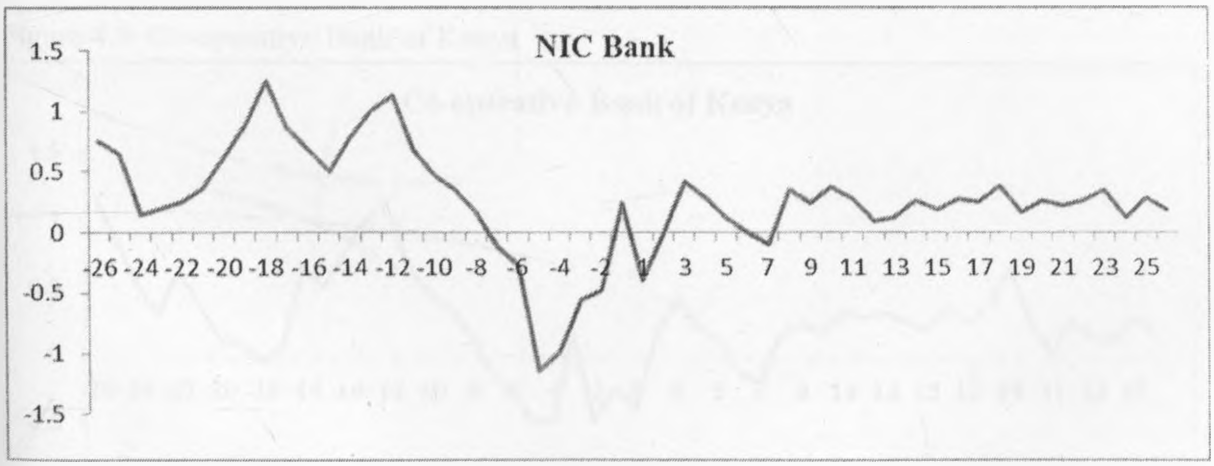
drastically a strong indication of the end of speculation which then stabilized later after some day , this was a clear indication that Kenya Commercial Bank stock were sensitive to interest rate change.

Figure 4.6: National Bank of Kenya



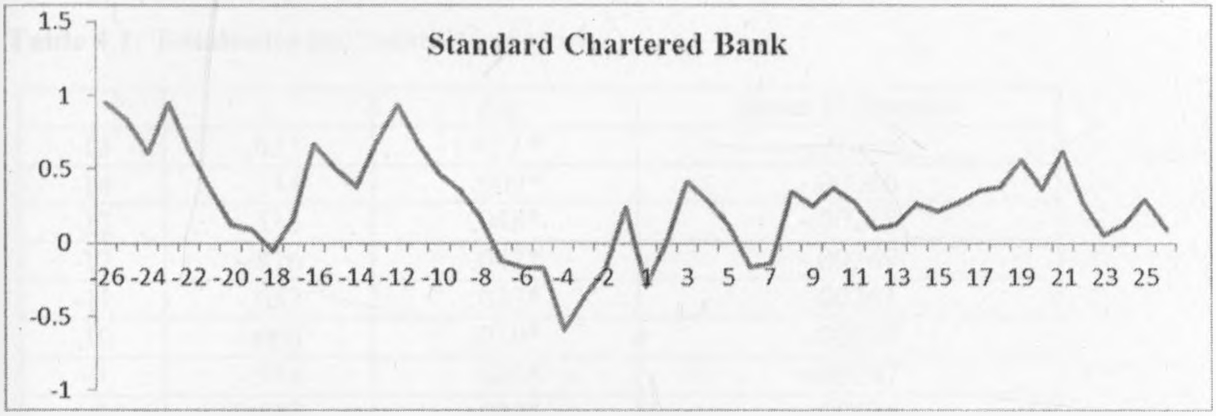
The figure of shows the market performance of National Bank of Kenya before and after interest rate changes, there was decrease in market performance of National Bank of Kenya which was an indication that there were speculation on the National Bank of Kenya stock the is an indication that stock of National Bank of Kenya were sensitive to interest rate.

Figure 4.7: NIC Bank



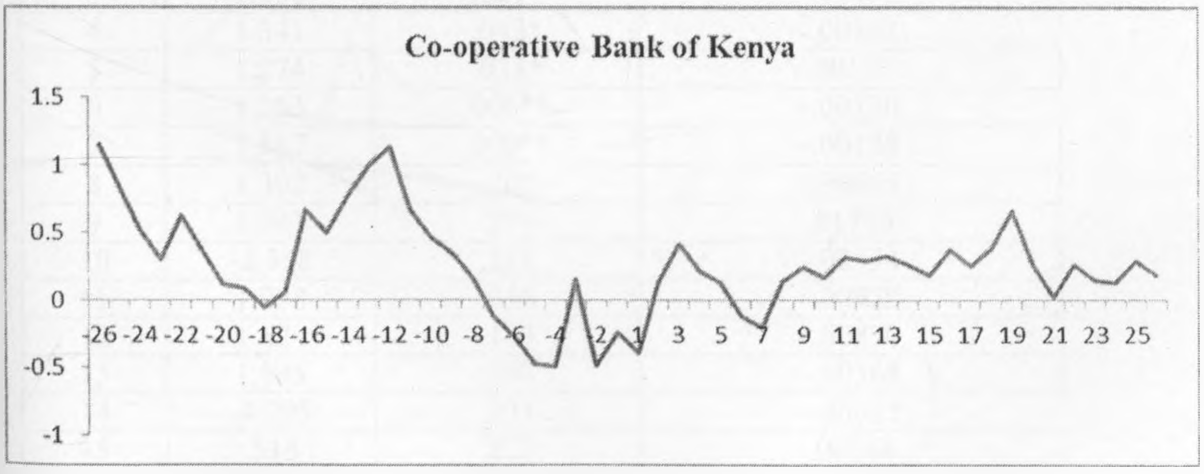
From the figure above NIC Bank market performance before and after interest rate changes, there was an indication that before interest rate changes there was a speculative motive which lead to increase in the stock return days before and after the interest rate changes the stock return for NIC Bank started to decrease an indication that interest rate changes had negative effects on the market performance of NIC Bank.

Figure 4.8: Standard charted bank



From the figure above standard chartered bank market performance before and after interest rate changes, there was an indication that before interest rate changes there was a speculative motive which lead to increase in the stock return, days before and after the interest rate changes the stock return for standard chartered bank started to decrease an indication that interest rate changes had negative effects on the market performance of standard chartered bank.

Figure 4.9: Co-operative Bank of Kenya



From figure, the study revealed that there was an increase in price for Co-operative Bank of Kenya stock for period before and after change in the interest rate, the market performance reached its maximum days before interest rate changes, day before and after the interest rate changes there was a decrease in the share price an indication that interest rate changes had negative effect on the market performance of Co-operative Bank of Kenya.

4.3 T –statistics for 30 days surrounding interest rate changes

Table 4.1: T-statistics for Volatility of stock

	t	Sig.	Mean Difference
-15	-.651	.027 *	-.01016
-14	-.144	.009*	-.00086
-13	-.333	.048*	-.00218
-12	-.876	.047*	-.00269
-11	-.652	.033*	-.00251
-10	-.026	.010*	-.00010
-9	-.958	.036*	-.00237
-8	1.283	.025*	-.00496
-7	1.422	.025*	-.00343
-6	1.451	.024*	-.00451
-5	1.919	.011*	-.00626
-4	1.989	.022*	-.00498
-3	1.518	.017*	-.00657
-2	2.711	.034*	-.00470
-1	2.641	.040*	-.00305
0	2.367	.023*	-.00295
1	2.538	.005*	-.00307
2	2.358	.029*	-.00201
3	1.688	.021*	-.00492
4	1.341	.042*	-.00142
5	1.274	.031*	.00117
6	1.253	.006**	-.00120
7	1.317	.009**	-.00158
8	1.392	.202	-.00665
9	1.931	.379	.01756
10	-1.358	.211	-.02334
11	1.228	.056	-.00929
12	1.624	.143	-.00870
13	1.895	.397	-.00368
14	-1.295	.231	-.00615
15	.515	.621	.00244

** Significance at 0.01 level of significance

* Significance at 0.05 level of significance

In order to determine the sensitivity of the stock price to interest rate changes, the researcher calculated the T-statistics for the 15 days before, interest rate changes and 15 day after interest rate changes , if the T – value was close to 2 this was an indication that the share were sensitive to interest rate changes, from the finding shown in the above table, it was found that on 15 date before interest rate changes the T- statistics was negative an indication that the share price were insensitive to interest rate changes on approaching the 8th date before interest rate changes, there was a rise in and it was positive on reaching the 5th day before interest rate changes the market was found to be sensitive to interest rate changes an indication that there were some speculation by investor , on reaching the event date it was found that the share price were so sensitive to interest rate changes 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 interest rate changes and after interest rate changes the share price were very sensitive to interest rate change . This shows that share price are sensitive to interest rate changes.

Table 4.2: Market Reaction across the Event Period

Estimation Period	t	Sig.	Mean	STDEV
From day -15 to day +15	.816	.451	0.002	1.567
From day -15 to day -1	2.180	.041*	0.010	1.379
From day +1 to day +15	1.342	.027*	-0.008	0.873
From day 0 to day +15	2.000	.033*	-0.006	1.192
Day 0	2.267	.000**	0.030	0
From day 0 to day +1	2.951	.035*	0.000	2.719
From day -1 to day 1	1.410	.018*	0.013	0.0382
Form day -3 to day +3	.866	.026*	0.008	1.888
From day -7 to day +7	-.635	.054	0.004	1.489

** Significance at 0.01 level of significance

* Significance at 0.05 level of significance

The study further analyzed the data with regards to time intervals within the event window. As illustrated by the table above, stock return for t_{-15} to t_{+15} was 0.002 indicating that on average, the stock return did not exhibit a wide above stock return within 15 days pre and post- interest rate changes. While the average stock return for t_{-15} to t_{-1} 0.010, the average stock return for t_{+1} to t_{+15} time period was -0.008 signifying that investors did not benefit

from trading on stock return during post- interest rate changes as they did during after interest rate changes. The average stock return for t_0 to t_{+1} was 0.000, t_{-1} to t_{+1} was 0.013 and t_{-3} to t_{+3} was 0.008. This indicates that the uncertainties about interest rate changes are quickly absorbed into the market prices. The cancelling effect of returns was also great between the third day's pre-and post- interest rate changes than was in the first day pre and post- interest rate changes. Table above shows that t_{+0} and t_{15} had an average stock return value of -0.006.

4.4 Effects of Forex exchange on stock return

In order to determine the effects of foreign exchange on stock return data on foreign exchange rate and share price was regressed

Regression analysis

Table 4.3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.874[a]	.764	.731	.12225

Adjusted R squared is coefficient of determination which tells us the variation in the dependent variable due to changes in the independent variable, from the findings in the above table the value of adjusted R squared was 0.731 an indication that there was variation of 73.1% on stock price of comeracail banks due to chnages in foreign exchange at 95% confidence interval . This shows that 73.2 % changes stock price of commercail banks listed in the NSE could be accounted for by changes in foreign exchange. R is the correlation coefficient which shows the relationship between foreign exchnage and stock price of commercail banks listed in the NSE, from the findings shown in the table above there was a strong positive relationship between the study variables as shown by 0.874.

Table 4.4: Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.878	.357		2.459	.016
	Foreign exchange rate	.305	.097	.402	3.145	.002

Y = share prices

X_1= Foreign Exchange Rate

The established regression equation was

$Y = 0.878 + 0.305 X_1$

From the above regression equation it was revealed that holding foreign exchange rate to a constant zero to a constant zero , stock prices of commercial banks listed in the NSE would stand at would stand at 0.878 , a unit increase in foreign exchange rate would lead to increase in , stock prices of commercial banks listed in the NSE by a factors of 0.305, this is a clear indication that stock prices of commercial banks listed in the NSE had positive association with foreign exchange rate , the study further established that the p-value were less than 0.05 which is an indication that foreign exchange rate was statistically significant to influence stock prices of commercial banks listed in the NSE .

4.5 Interpretation Of Findings

From the findings on the sensitivity of the stock price to interest rate changes, the study found that the share price were so sensitive to interest rate changes , the study further revealed that during few day before interest rate changes and after interest rate changes the share price were very sensitive to interest rate change . This shows that share price are sensitive to interest rate changes. The stduy also found that changes in the stock price of commeracaial banks could be attriuted to changes in foreign exchange , the stduy also found that there was a strong relationship between stock prices and foreign exchnage rate. The interest rate sensitivity of insurer stock returns is time varying. Although generalization is

difficult and the conclusion is not as convincing as it could be because only one underwriting cycle is sampled, it is still noteworthy to recognize that the insurers' interest rate sensitivity is closely related to the insurance industry's underwriting cycle or performance. The interest rate sensitivity becomes negative during the period when the industry's underwriting profit increases, indicating that the firm's value declines as interest rates rise. The sensitivity becomes positive, i.e. insurers' stock prices rise as interest rates move up, when the underwriting profit is eroded. In addition, when the underwriting profit increases, insurer stock returns are more sensitive to changes in long-term interest rate, but when the underwriting profit decreases the stock returns are more sensitive to changes in short-term interest rate. This suggests that the market factors both the industry's underwriting performance and the direction of interest rate change in the insurer stock prices.

CHAPTER FIVE:

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter presents discussions of the key findings presented in chapter four, conclusions drawn based on such findings and recommendations there-to, the researcher had intended to determine the sensitivity of Kenya banks' stock returns to interest rate and exchange rate changes. This chapter will thus be structured into summary, conclusion, recommendations and areas for further research.

5.2 Summary

The study established that the market was very sensitive to changes in interest rate , from the findings T-statistics for the 15 days before, changes in interest rate and after changes in interest rate, the study found that on 15 date before changes in interest rate the T- statistics was negative an indication that the share price were insensitive to changes in interest rate on approaching the 8^{th} date before changes in interest rate, there was a rise in and it was positive on reaching the 5^{th} day before changes in interest rate the market was found to be sensitive to changes in interest rate an indication that there were some speculation by investor, on reaching the event date it was found that the share price were so sensitive to changes in interest rate 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 changes in interest rate and after changes in interest rate the share price were very sensitive to changes in interest rate. This shows that share price are sensitive to changes in interest rate. From the regression analysis, adjusted R squared is coefficient of determination which tells us the variation in the dependent variable due to changes in the independent variable, from the findings in the above table the value of adjusted R squared was 0.731 an indication that there was variation of 73.1% on stock price of comeracail banks due to chnages in foreign exchange at 95% confidence interval . This shows that 73.2 % changes stock price of commercail banks listed in the NSE could be accounted for by changes in foreign exchange. R is the correlation coefficient which shows the relationship between foreign exchnage and stock price of commercail abnsk listed in the NSE, from the findings shown in the table

above there was a strong positive relationship between the study variables as shown by 0.874. The established regression equation was

$Y = 0.878 + 0.305 X_1$

It was revealed that holding foreign exchange rate to a constant zero to a constant zero , stock prices of commercial banks listed in the NSE would stand at would stand at 0.878 , a unit increase in foreign exchange rate would lead to increase in , stock prices of commercial banks listed in the NSE by a factors of 0.305, this is a clear indication that stock prices of commercial banks listed in the NSE had positive association with foreign exchange rate , the study further established that the p-value were less than 0.05 which is an indication that foreign exchange rate was statistically significant to influence stock prices of commercial banks listed in the NSE .

5.3 Conclusions

From the findings the study found that changes in the interest rate had both positive and negative effects on the stock price of commercial banks listed in the NSE. The study further found that share price of commercial banks listed in the NSE was sensitive to changes in interest rate. The study also established that 73.2 % changes stock price of commercail banks listed in the NSE could be accounted for by changes in foreign exchange an indication that changes in stock price of commercial banks listed in the NSE could be attributed to changes in foreign exchange rate.

5.4 Policy Recommendations

From the finding the study recommends that there is need for the central bank of Kenya to control the interest rate as changes in interest rate were found to have both positive and negative effects on the performance of stocks of commercial banks listed in the NSE. There is need for the government to control the inflation rate in the country as this will affect the foreign exchange which will have effects on the stock prices of commercial banks.

5.5 Limitation of the Study

The study was limited to study was to determine the sensitivity of Kenya banks' stock returns to interest rate and exchange rate changes for 18 months from January 2011 and June 2012. Secondary data was collected from the forex market and data published by Central Bank and also from the NSE.

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 a 18 months period, 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.

5.6 Areas for Further Research

This study sought to determine the sensitivity of Kenya banks' stock returns to interest rate and exchange rate changes, there is need for an in-depth study to be done on the relationship between financial performance of commercial banks and exchange rate.

Exchange rate and interest rate are controlled by the Central bank of Kenya, there is need for a study to be done on the effects of Central Banks intervention of the performance of commercial banks stock prices.

There is need for an in-depth study to be carried out on the factors influencing foreign exchange changes in the country.

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