

**THE EFFECT OF FOREIGN EXCHANGE RISK MANAGEMENT ON THE
FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN KENYA**

BY

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THE REQUIREMENTS FOR THE AWARD OF A MASTER OF SCIENCE IN
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DECLARATION

STUDENT'S DECLARATION

I declare that this Research Project is my original work and has never been submitted for a degree in any other university or college for examination/academic purposes.

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SUPERVISOR'S DECLARATION

This Research Project has been submitted for examination with my approval as the University Supervisor.

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DEDICATION

I dedicate this work to my family for their moral support, encouragement and understanding.

To the Almighty God for His unceasing blessings without which it is impossible to accomplish anything.

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I would like to extend my appreciation and gratitude to all those that contributed tremendous inputs towards completion of this research project.

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ABSTRACT

Foreign exchange risk management is complex and requires a thorough understanding of the banks business needs, its internal and external environment and exposures to the financial markets. Challenges abound as banking institutions commit themselves to improving risk management practices. The banking industry in Kenya is characterized by numerous teething problems. These emanate from their calibre of target customers and the seemingly liberal and/or informal system of operations. 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 range of products available extremely limited. This has put an extra burden on corporate treasurers to be able to find adequate hedge to their exposures in exotic currencies. The objective of the study was to establish the effect of foreign exchange risk management on the financial performance of commercial banks in Kenya.

The research used a descriptive research design. The target population comprised of the forty three (43) commercial banks in Kenya. The study used census approach to pick all the 43 commercial banks in Kenya since the population is not large. The study made use of secondary data. The multiple linear regression analysis was applied to examine the extent of influence of the independent variable on the dependent variables.

The regression analysis established that $ROA = 1.627 + 13.491*Options + 3.113*Forward\ Contracts + 4.820*Cross\ Currency\ Swaps + 0.720*Leading\ and\ Lagging - 0.071*Price\ Adjustments + 0.044*Netting$. The study further found that there is a strong relationship between dependent and independent variables given an R^2 values of 0.856 and adjusted to 0.801. This shows that the independent variables (Options, Forward Contracts, Cross Currency Swaps, Leading and Lagging, Price Adjustments, Netting) accounts for 80.1% of the variations in profitability as measured by ROA.

TABLE OF CONTENTS

DECLARATION.....	ii
DEDICATION.....	iii
ACKNOWLEDGEMENTS	iv
ABSTRACT	v
LIST OF TABLES	ix
LIST OF ABBREVIATIONS	x
CHAPTER ONE	1
INTRODUCTION.....	1
1.1 Background of the Study	1
1.1.1 Foreign Exchange Risk Management	2
1.1.2 Financial Performance	3
1.1.3 Effect of Foreign Exchange Risk Management on Financial Performance...	5
1.1.4 Commercial Banks in Kenya	6
1.2 Research Problem	7
1.3 Objectives of the study.....	9
1.3.1 General Objective	9
1.3.2 Specific Objectives	9
1.4 Value of the Study	9
CHAPTER TWO	11
LITRATURE REVIEW	11
2.1 Introduction.....	11
2.2 Theoretical Review	11
2.2.1 International Fisher Effect Theory	11
2.2.2 Purchasing Power Parity	12

2.2.3 Foreign Exchange Exposure Theory	14
2.2.4 Interest Rate Parity Theory	14
2.2.5 Arbitrage Pricing Theory	15
2.3 Determinants of Financial Performance of Commercial Banks	15
2.3.1 Bank Specific Factors/Internal Factors	16
2.3.2 External Factors/ Macroeconomic Factors	19
2.4 Empirical Review.....	19
2.5 Foreign Exchange Risk Management Strategies	26
2.6 Financial Performance	30
2.7 Summary of the Chapter	31
CHAPTER THREE	33
RESEARCH METHODOLOGY	33
3.1 Introduction.....	33
3.2 Research Design.....	33
3.3 Target Population.....	33
3.4 Data collection	34
3.5 Data Analysis	34
3.5.1 Analytical Model	35
CHAPTER FOUR.....	38
DATA ANALYSIS AND PRESENTATION OF FINDINGS.....	38
4.1 Introduction.....	38
4.2 Data Presentation	38
4.2.1 Correlation	39
4.2.2 Regression Analysis.....	40
4.3 Summary and Interpretation of Findings	44
CHAPTER FIVE	47
SUMMARY, CONCLUSION AND RECOMMENDATIONS	47

5.1 Summary	47
5.2 Conclusions.....	48
5.3 Policy Recommendations.....	48
5.4 Limitations of the Study.....	50
5.5 Suggestions for Further Study	50
REFERENCES.....	52
Appendix I: Raw Data	56

LIST OF TABLES

Table 4.1: Descriptive Statistics	39
Table 4.2: Correlation Matrix	65
Table 4.3: Model Goodness of Fit	41
Table 4.4: Analysis Of Variance.....	42
Table 4.5: Regression Model	43
Table 4.6: Multicollinearity Statistics.....	44

LIST OF ABBREVIATIONS

CAR	Capital Adequacy Ratio
CBK	Central Bank of Kenya
FERM	Foreign Exchange Risk Management
GDP	Gross Domestic Product
IFE	International Fisher Effect
IIF	Institute of International Finance
MFC	Mortgage Finance Company
MFI's	Microfinance Institutions
PPP	Purchasing Power Parity
ROA	Return on Assets
ROE	Return on Equity

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Foreign exchange rate risk management is an integral part in every banks decision about foreign currency exposure (Allayannis, Ihrig, and Weston, 2001). Currency risk hedging strategies entail eliminating or reducing this risk, and require understanding of both the ways that the exchange rate risk could affect the operations of economic agents and techniques to deal with the consequent risk implications (Barton, Shenkir, and Walker, 2002). Selecting the appropriate hedging strategy is often a daunting task due to the complexities involved in measuring accurately current risk exposure and deciding on the appropriate degree of risk exposure that ought to be covered. The need for currency risk management started to arise after the break down of the Bretton Woods system and the end of the U.S. dollar peg to gold in 1973 (Papaioannou, 2001).

The issue of currency risk management for non-financial and financial firms is independent from their core business and is usually dealt by their corporate treasuries. Most multinational firms have also risk committees to oversee the treasury's strategy in managing the exchange rate (and interest rate) risk (Lam, 2003). This shows the importance that firms put on risk management issues and techniques. Conversely, international investors usually, but not always, manage their foreign exchange rate risk independently from the underlying assets and/or liabilities. Since their currency exposure is related to translation risks on assets and liabilities denominated in foreign currencies, they tend to consider currencies as a separate asset class requiring a currency overlay mandate (Allen, 2003).

Exchange rate volatility creates a risky business environment in which there are uncertainties about future profits and payments. These are especially exacerbated in countries where financial instruments for hedging against foreign exchange risk are not developed, which is the case in many developing countries including Kenya (World Bank & MTTI, 2006).

1.1.1 Foreign Exchange Risk Management

Butler (2008) refers foreign exchange risk as the risk related with the unexpected changes in exchange rates and foreign exchange exposure as the extent to which unexpected changes in exchange rates affect the value of a firm's assets or liabilities. Taggart and McDermott (2000) assert that forex related firms are subject to foreign exchange risk on the payables and receipts in foreign currencies. Evan et al (1985) defines foreign exchange risk management as a program of assessment (identification and quantification) and counterstrategies to mitigate exchange rate risk and saves firm's economic value. Kirt further adds foreign exchange risk is a financial risk to manage value creation and loss prevention in a firm by internal and external financial tools. Piet and Raman (2012) say spot rate changes are offset by changes inflation though small firms may depend on unstable currency rates for profits.

According to Featherson, Littlefield and Mwangi (2006), foreign exchange risk arises when fluctuation in the relative values of currencies affects the competitive position or viability of an organization. Firms are exposed to foreign exchange risk if the results of their projects depend on future exchange rates and if exchange rate changes cannot be fully anticipated. Generally, companies are exposed to, Transaction exposure, Economic exposure and Translation exposure (El-Masry, 2006; Salifu et al, 2007).

Transaction risk occurs where the value of the existing obligations are worsened by movements in the foreign exchange rates. Transactional exposure arises from future cash flows such as trade contracts and also occurs where the value of existing obligations are affected by changes in foreign exchange rates. Economic risk relates to adverse impact on entity /income for both domestic and foreign operations because of sharp, unexpected change in exchange rate. Operational exposure occurs where the market position of a firm changes as a result of the effect of exchange rate changes on competition, prices and demand (El-Masry, 2006). Translation risk is also related to assets or income derived from offshore enterprise. Translation exposure occurs through currency mismatch and it is related to assets or income derived from offshore enterprise (Madura, 2003).

Foreign Exchange risk comes about as a disparity between the assets held by a bank and the loans that fund its balance sheet. An unexpected depreciation of the local currency against the USD can dramatically increase the cost of servicing debt relative to revenues. It can also negatively affect the creditworthiness of the bank (hence the ability to raise new funds) and even generate a negative net income, with serious consequences for the long-term financial stability of the bank (Moles, 2002). Banks are particularly vulnerable to foreign exchange rate risk, since they operate in developing countries where the risk of currency depreciation is high.

1.1.2 Financial Performance

The firm's debt ratio is the proportion of the firm's debt in relation to the total equity finance in the company's capital structure (McMenamin, 2009). This key ratio is famously known as an indicator of the company's long term solvency position and also indicator of the financial risk position of the company. It's obtained by dividing the total company debt with the total shareholders' funds. Gross profit is the

difference between revenue and cost of goods sold. Gross Margin is the ratio of gross profit to revenue. Depends on situation or decision analyzed both or one of these two performance indicators can be more suitable. For merchandising decisions in company with large assortment of products gross profit expressed in money terms needs to be used when measuring financial result on the level of all product assortments or on the level of big product group. This allows seeing what the overall financial result without digging into details is.

Gross profits are the cleanest accounting measure of true economic profitability. The farther down the income statement one goes, the more polluted profitability measures become, and the less related they are to true economic profitability. For example, a firm that has both lower production costs and higher sales than its competitors is unambiguously more profitable. Even so, it can easily have lower earnings than its competitors (Abor, 2005).

The Return on Assets ratio (ROA), also called return on investment, is an important profitability ratio because it measures the efficiency with which the company is managing its investment in assets and using them to generate profit. It measures the amount of profit earned relative to the firm's level of investment in total assets. The return on assets ratio is related to the asset management category of financial ratios. The calculation for the return on assets ratio is: $\text{Net Income} / \text{Total Assets}$ (Brealey et al, 2008). In MIX definition the return on asset ratio is: $(\text{Net Operating Income Taxes}) / \text{Average Assets}$. The higher the percentage, the better, as a high percentage means that the company is succeeding in using its assets to generate sales.

1.1.3 Effect of Foreign Exchange Risk Management on Financial Performance

Although there is a growing literature linking foreign exchange risk management to company performance there is, equally, a growing diversity of results. The diversity of results can be partly explained by differences in the theoretical perspectives applied, selected research methodologies, measurement of performance and conflicting views on general employee involvement in decision making and, in part, to the contextual nature of the individual firm (Carter et al, 2003).

Even studies based on the integrative models of employee involvement; incorporating different theoretical perspectives and various employee attributes, provide inconclusive results, suggesting that currency risk management has, at least, an indirect effect on company performance (Adler and Dumas, 2010).

Previous research studies have provided a link between currency risk management and firm performance (Ankrom, 2007) with very little conclusive results. Others (Lee, 2010) have shown that firms that have robust currency risk management frameworks have higher firm performance. The main characteristics of good risk management identified in these studies include; leadership of the risk team, adequate compensation of the risk team and compliance with laws & best practice. There is a view that companies with risk management departments are better corporate performers. In recent times on the contrary, emphasis has geared towards general employee training in currency risk management. Dufey (2005) contend that risk management departments without well trained personnel to man the departments are less effective and the company will many a time be prone to such currency risks.

The use of foreign exchange management strategies results in reduced foreign exchange exposure hence minimal losses. According to Carter et al (2003) changes in

exchange rate can influence a firm's current and future expected cash flows and ultimately, stock prices. The direction and magnitude of changes in exchange rate on firm's value are a function of a firm's corporate hedging policy which indicates whether the firm utilizes operational hedges and financial hedges to manage currency exposure and the structure of its foreign currency cash flows. Stacy and Williamson (2010) examine risk management and performance in a sample of firms in 14 companies listed on the Johannesburg stock exchange. They find that better risk management is associated with better performance in the form of Tobin's q and ROA.

1.1.4 Commercial Banks in Kenya

Commercial banks are financial intermediary institutions that take deposits and give credit amongst other financial services. In Kenya, the banking sector plays a dominant role in the financial sector, particularly with respect to mobilization of savings and provision of credit. As per Bank Supervision Annual Report (2012) the banking sector consisted of the Central Bank of Kenya, as the regulatory authority, 44 banking institutions (43 commercial banks and 1 mortgage finance company -MFC). Out of the 44 banking institutions, 31 locally owned banks comprise 3 with public shareholding and 28 privately owned while 13 are foreign owned. The foreign owned financial institutions comprise of 9 locally incorporated foreign banks and 4 branches of foreign incorporated banks. During the period 2008-2012, the Kenyan banking system showed resilience, which was attributed in part to the low financial integration in the global financial market and the intensive supervision and sound regulatory reforms (Bank Supervision Annual Report, 2009).

The performance of commercial banks in Kenya is highly financial in nature. It is hence affected through low net cash flows, low sales turnover and uncertain profits

due to financial exchange rate volatility in the era of globalization. The Kenyan shilling per US Dollar is undervalued and depreciation proves to be counterproductive. While exchange rate fluctuation is a recurrent event, it is a challenge to acknowledge foreign exchange risk after realizing financial distress by dismal profits or loss performance.

1.2 Research Problem

Foreign exchange risk management is complex and requires a thorough understanding of the banks business needs, its internal and external environment and exposures to the financial markets. Foreign exchange risk hedging needs to be tailored around the banks mission and vision statements, operational infrastructure, risk exposure and risk appetite. Consequently, there are no ‘one size fits all’ solutions (Piet and Raman, 2012). Challenges abound as banking institutions commit themselves to improving risk management practices (Institute of International Finance – IIF). The large percentage of the unbanked economically active people in Kenya has triggered the proliferation of both officially and non-officially recognized banking institutions providing financial services such as savings, loans and remittances as well as other social intermediation services to millions of Kenyans all over the country. However essential these institutions are -giving their quest to liberate people from financial insecurity- its clientele is so massive that a collapse or mismanagement of these institutions can deal a hefty economic shock to millions of people in the country.

The banking industry in Kenya is characterized by numerous teething problems. These emanate from their calibre of target customers and the seemingly liberal and/or informal system of operations. The rapid increase in private sector, international investment in microfinance, plus a dose of common sense, makes foreign currency

risk management an important topic for commercial banks. Seventy percent of cross-border, fixed-income investments are denominated in foreign currencies (meaning currencies other than the currencies in which the banks are operating), leaving banks with significant foreign exchange exposure. During the most recent global financial crisis, some banks that depend on foreign currency-denominated debt have suffered heavy foreign exchange losses that threaten their overall viability (Littlefield and Kneiding, 2009). 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 range of products available extremely limited. This has put an extra burden on corporate treasurers to be able to find adequate hedge to their exposures in exotic currencies.

Locally, Njunge (2012) conducted a survey of the foreign exchange rate risk management practices adopted by MFI's in Kenya; Oduori (2012) did a study focusing on the strategies used by banks in combating emerging operational, strategic and credit risks while Mutua (2013) did a survey of foreign exchange risk management practices by foreign owned commercial banks in Kenya. These previous studies have focused on the practices adopted by microfinance institutions and selected banks in managing foreign exchange risk without relating these management practices to a banks financial performance. With increased transactions using foreign currency, the fluctuations in exchange rates tend to pose significant foreign exchange risk. Hence the management of the foreign exchange risk ultimately affects the financial performance of the bank. The study seeks to fill the knowledge gap by analyzing the effect of foreign exchange risk management on the financial performance of commercial banks in Kenya. The following research questions will therefore guide this study: What are the different methods of foreign exchange risk

management used by commercial banks in Kenya? What is the effect of foreign exchange risk management on financial performance of commercial banks in Kenya?

1.3 Objectives of the study

1.3.1 General Objective

The objective of the study was to establish the effect of foreign exchange risk management on the financial performance of commercial banks in Kenya.

1.3.2 Specific Objectives

- i. To establish the different modes of foreign exchange risk management used by commercial banks in Kenya.
- ii. To assess the effect of foreign exchange risk management on financial performance of commercial banks in Kenya.

1.4 Value of the Study

The study will enrich Treasury/Risk managers with knowledge on risk management especially techniques associated with foreign exchange risk management within the Kenyan banking industry. Most Treasury Managers of banks, insurance companies and other financial institutions will use the findings in the enforcement of such foreign exchange risk management policies in such organizations. The literature, study findings and recommendations will supplement the existing body of knowledge on bank foreign exchange risk management.

This study is important to various stakeholders in the financial sector because it will provide an insight into the effects of financial risk management on financial performance of banks. Banks are the most reliable savings and credit facilities available in Kenya. The study will be valuable to investors because it will provide

information on the foreign exchange risks which will help them make sound decisions.

The information that will be obtained will be useful to the Government and research institutions that may want to advance the knowledge and literature on intellectual capital. It will also add to literature on the subject as reference material and stimulate further research in the area. This study will be very valuable to the area of study of intellectual capital and financial performance of commercial banks in Kenya.

The study will be useful to academicians as it will provide information that can be used as a basis for further research. The study will also propose areas for further research which will be very important to researchers who will easily get to know what needs to be done in the area of study.

CHAPTER TWO

LITRATURE REVIEW

2.1 Introduction

This chapter highlights the importance of foreign exchange risk management, various categories of currency risks and various techniques used to manage foreign exchange risks as advanced by a number of scholars. The chapter also focuses on review of empirical studies, general literature review, and theoretical framework and finally the conclusions from literature review are presented.

2.2 Theoretical Review

There are various theories that suggest the irrelevance of managing the risk of change in exchange rates. These theories suggest that changes in exchange rates are evened out in some form or the other.

2.2.1 International Fisher Effect Theory

This model was developed by Irving Fisher in his book *The Theory of Interest* (1930). It uses market interest rates rather than inflation rates to explain why exchange rates change over time. The International Fisher effect states that exchange rates changes are balance out by interest rate changes. The Fisher theory simply argues that real interest rates across countries was equal due to the possibility of arbitrage opportunities between financial markets which generally occurs in the form of capital flows. Real interest rate equality implies that the country with the higher interest rate should also have a higher inflation rate which, in turn, makes the real value of the country's currency decrease over time. The relationship between relative interest rates and foreign exchange rates is explained within the interest rate theory of exchange

rate expectations. Nominal interest rate differentials between two countries tend to reflect exchange rate fluctuations. Giddy (1977) called this the international Fisher effect, a close relationship to the Fisher effect, a phenomenon observed by Irving Fisher (1896). If the international Fisher effect holds, interest rates in appreciating currencies tend to be low enough, and in depreciating currencies high enough, to offset expected currency gains and losses.

The International Fisher Effect (IFE) theory suggests that foreign currencies with relatively high interest rates will tend to depreciate because the high nominal interest rates reflect expected rate of inflation (Madura, 2010). Does the interest rate differential actually help predict future currency movement? Available evidence is mixed as in the case of PPP theory. In the long-run, a relationship between interest rate differentials and subsequent changes in spot exchange rate seems to exist but with considerable deviations in the short run (Hill, 2004). The international Fisher effect is known not to be a good predictor of short-run changes in spot exchange rates (Cumby and Obstfeld, 1981).

2.2.2 Purchasing Power Parity

The Purchasing Power Parity (PPP) was first developed by the Swedish economist Gustav Cassel in 1920s to examine the relationship between the exchange rates of different countries. The PPP holds if and when exchange rates move to offset the inflation rate differentials between two countries. The PPP is also defined as the basis of the “law of one price” which asserts that the exchange rate between two currencies should be equal to the ratio of the price level of identical goods and services in the two countries. The Purchasing Power Parity (PPP) theorem explains the relationship between relative prices of goods and exchange rates. The PPP theorem propounds that under a floating exchange regime, a relative change in purchasing power parity for

any pair of currency calculated as a price ratio of traded goods would tend to be approximated by a change in the equilibrium rate of exchange between these two currencies (Shapiro and Rutenberg, 1976).

According to the PPP, increase in the price level of a country will cause depreciation of its exchange rate relative to other countries, thereby keeping the relative price of identical goods the same across countries. This theory suggests that exchange rate changes were offset by relative price indices/inflation since the Law of One Price should hold. PPP follows from the law of one price, which states that in competitive markets, identical goods will sell for identical prices when valued in the same currency. It relates to an individual product and its generalization is the absolute version of PPP. Relative PPP relates to changes in prices and exchange rates, rather than on absolute price levels. It states that change in exchange rates is proportional to the change in the ratio of the two nations' price levels, structural relationships remaining unchanged.

The assumptions for PPP to hold are that goods are identical, all goods are tradable, there are no transportation costs, information gaps, taxes, tariffs, or restrictions of trade, and exchange rates are influenced only by relative inflation rates. Due to these restrictive assumptions and empirical violation of the law of one price which is the building block of PPP, monetary models of exchange rate determination was adopted. Since currencies are considered assets, exchange rates are asset prices that adjust to equilibrate international trade in financial assets. Like other asset prices, exchange rates are determined by expectations about the future. Since currencies are treated as assets this approach is called the asset approach.

2.2.3 Foreign Exchange Exposure Theory

Contemporary foreign exchange exposure theory (Buckley, 2000; Levi, 1996; Shapiro, 2003) is of the opinion that exchange rate fluctuations should affect the value of a multinational company mainly via foreign sales and foreign (net) assets, which have to be denominated in the domestic currency of the parent company. Despite that, the earliest empirical studies on the topic (Levi, 2009; Amihud, 2009; Jorion, 2010.), although focusing on companies with considerable operations abroad, fail to show a significant impact of fluctuations in exchange rates on the stock price of multinational companies.

More recent studies (Jongen et al., 2006; Gao, 2000; Bartov et al. 1996; Bodnar & Gentry, 1993), however, are more consistent with financial theory and find that exchange rate movements, through their effect on sales and net assets values, are an important factor in determining firm value.

2.2.4 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, 2009). 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).

Most importantly to our purpose, Bilson and Hsieh (1983), Huang (2009), have shown that the economic theory relating interest-rate differences among countries to subsequent exchange rate changes (uncovered interest-rate parity) seems to have broken down during the recent float. As a consequence, exchange-rate changes are no

longer governed by international interest differentials. Hacche and Townsend (1981) and Meese and Rogoff (1983) have demonstrated that other plausible economic theories, such as purchasing power parity and the monetary model, also add little to random walk forecasts of exchange rates, at least at horizons of less than a year. These studies all reported strong rejections of uncovered interest-rate parity. Subsequent studies have confirmed these results. There is also an active theoretical literature, which attempts to determine if the failure of uncovered interest parity is due to risk aversion or market segmentation rather than market inefficiency. In contrast, Roll and Yan (2000) suggest that forward exchange rates are unbiased predictors of subsequent spot rates and there is really no forward premium puzzle.

2.2.5 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 (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 (Ross, 1976).

2.3 Determinants of Financial Performance of Commercial Banks

The determinants of bank performances can be classified into bank specific (internal) and macroeconomic (external) factors (Al-Tamimi, 2010; Aburime, 2005). These are

stochastic variables that determine the output. Internal factors are individual bank characteristics which affect the banks performance. These factors are basically influenced by internal decisions of management and the board. The external factors are sector-wide or country-wide factors which are beyond the control of the company and affect the profitability of banks. The overall financial performance of banks in Kenya in the last two decade has been improving. However, this doesn't mean that all banks are profitable, there are banks declaring losses (Oloo, 2010). Studies have shown that bank specific and macroeconomic factors affect the performance of commercial banks (Flamini et al. 2009). In this regard, the study of Olweny and Shipho (2011) in Kenya focused on sector-specific factors that affect the performance of commercial banks. Yet, the effect of macroeconomic variables was not included.

2.3.1 Bank Specific Factors/Internal Factors

The internal factors are bank specific variables which influence the profitability of specific bank. These factors are within the scope of the bank to manipulate them and that they differ from bank to bank. These include capital size, size of deposit liabilities, size and composition of credit portfolio, interest rate policy, labour productivity, and state of information technology, risk level, management quality, bank size, ownership and the like. CAMEL framework often used by scholars to proxy the bank specific factors (Dang, 2011). CAMEL stands for Capital Adequacy, Asset Quality, Management Efficiency, Earnings Ability and Liquidity. Each of these indicators are further discussed below.

2.3.1.1 Capital Adequacy

Capital is one of the bank specific factors that influence the level of bank profitability. Capital is the amount of own fund available to support the bank's business and act as a buffer in case of adverse situation (Athanasoglou et al. 2005). Banks capital creates

liquidity for the bank due to the fact that deposits are most fragile and prone to bank runs. Moreover, greater bank capital reduces the chance of distress (Diamond, 2000). However, it is not without drawbacks that it induce weak demand for liability, the cheapest sources of fund Capital adequacy is the level of capital required by the banks to enable them withstand the risks such as credit, market and operational risks they are exposed to in order to absorb the potential losses and protect the bank's debtors. According to Dang (2011), the adequacy of capital is judged on the basis of capital adequacy ratio (CAR). Capital adequacy ratio shows the internal strength of the bank to withstand losses during crisis. Capital adequacy ratio is directly proportional to the resilience of the bank to crisis situations. It has also a direct effect on the profitability of banks by determining its expansion to risky but profitable ventures or areas (Sangmi and Nazir, 2010).

2.3.1.2 Asset Quality

The bank's asset is another bank specific variable that affects the profitability of a bank. The bank asset includes among others current asset, credit portfolio, fixed asset, and other investments. Often a growing asset (size) related to the age of the bank (Athanasoglou et al., 2005). More often than not the loan of a bank is the major asset that generates the major share of the banks income. Loan is the major asset of commercial banks from which they generate income. The quality of loan portfolio determines the profitability of banks. The loan portfolio quality has a direct bearing on bank profitability. The highest risk facing a bank is the losses derived from delinquent loans (Dang, 2011). Thus, nonperforming loan ratios are the best proxies for asset quality. Different types of financial ratios used to study the performances of banks by different scholars. It is the major concern of all commercial banks to keep the amount of nonperforming loans to low level. This is so because high

nonperforming loan affects the profitability of the bank. Thus, low nonperforming loans to total loans shows that the good health of the portfolio a bank. The lower the ratio the better the bank performing (Sangmi and Nazir, 2010).

2.3.1.3 Management Efficiency

Management Efficiency is one of the key internal factors that determine the bank profitability. It is represented by different financial ratios like total asset growth, loan growth rate and earnings growth rate. Yet, it is one of the complexes subject to capture with financial ratios. Moreover, operational efficiency in managing the operating expenses is another dimension for management quality. The performance of management is often expressed qualitatively through subjective evaluation of management systems, organizational discipline, control systems, quality of staff, and others. Yet, some financial ratios of the financial statements act as a proxy for management efficiency. The capability of the management to deploy its resources efficiently, income maximization, reducing operating costs can be measured by financial ratios. One of this ratios used to measure management quality is operating profit to income ratio (Rahman et al. in Ilhomovich, 2009; Sangmi and Nazir, 2010). The higher the operating profits to total income (revenue) the more the efficient management is in terms of operational efficiency and income generation. The other important ratio is that proxy management quality is expense to asset ratio. The ratio of operating expenses to total asset is expected to be negatively associated with profitability. Management quality in this regard, determines the level of operating expenses and in turn affects profitability (Athanasoglou et al. 2005).

2.3.1.4 Liquidity Management

Liquidity is another factor that determines the level of bank performance. Liquidity refers to the ability of the bank to fulfill its obligations, mainly of depositors.

According to Dang (2011) adequate level of liquidity is positively related with bank profitability. The most common financial ratios that reflect the liquidity position of a bank according to the above author are customer deposit to total asset and total loan to customer deposits. Other scholars use different financial ratio to measure liquidity. For instance Ilhomovich (2009) used cash to deposit ratio to measure the liquidity level of banks in Malaysia. However, the study conducted in China and Malaysia found that liquidity level of banks has no relationship with the performances of banks (Said and Tumin, 2011).

2.3.2 External Factors/ Macroeconomic Factors

The macroeconomic policy stability, Gross Domestic Product, Inflation, Interest Rate and Political instability are also other macroeconomic variables that affect the performances of banks. For instance, the trend of GDP affects the demand for banks asset. During the declining GDP growth the demand for credit falls which in turn negatively affect the profitability of banks. On the contrary, in a growing economy as expressed by positive GDP growth, the demand for credit is high due to the nature of business cycle. During boom the demand for credit is high compared to recession (Athanasoglou et al., 2005). The same authors state in relation to the Greek situation that the relationship between inflation level and banks profitability is remained to be debatable. The direction of the relationship is not clear (Vong and Chan, 2009).

2.4 Empirical Review

Griffin and Stulz (2001) find the effect of exchange rate shocks is minimal in explaining relative US industry financial performance and is even smaller in other countries that are more open to trade finding that industry effects are more significant than exchange rate effects. While there may be some differences in empirical

findings, as Marston (2001) shows, foreign exchange exposure most likely depends on the competitive structure in an industry.

It is widely believed that changes in exchange rates have important implications for financial decision-making and for the profitability of firms. One of the central motivations for the creation of the euro was to eliminate exchange rate risk to enable European firms to operate free from the uncertainties of changes in relative prices resulting from exchange rate movements. At the macro level, there is evidence that the creation of such currency unions results in a dramatic increase in bilateral trade (Frankel and Rose, 2002). But do changes in exchange rates have measurable effects on firms? The existing literature on the relationship between international stock prices (at the industry or firm level) and exchange rates finds only weak evidence of systematic exchange rate exposure (Doidge et al., 2003; Griffin and Stulz, 2001, two recent studies). This is particularly true in studies of US firm share values and exchange rates.

Bhatia (2004) made research on mitigating currency risk for investing in microfinance institutions in developing countries found that there is a clear trade-off for investors mitigating currency risk in least developed countries in the form of contract fees for the benefit of protection against currency fluctuations. The best financial instrument for investors interested in MFI's is currency options.

Hudon (2006) in his study of subsidies and financial performances of the microfinance institutions stated that financial institutions including MFI's still exhibit better management ratings. The technical, organizational and communication competencies of the top managers are the most important management dimensions to explain all financial results. Under this dimension of management, the professional

skills of top managers must be emphasized. Therefore the institutions were effective in risk management performance.

Ahmed (2007) in the study of microfinance: realizing the social role of Islamic finance examined that the bank has to create various reserves to cover various risks arising due to the nature of its assets and liabilities since it positively contributes to risk management in microfinance. Some observations and suggestions stated that risk management has become more important now and its importance will continue to grow in the future. Factors such as the increasing competition in markets and the integration of new technology into the industry further reinforce the importance of risk management in banks. However, it is disturbing to note that systematic risk management is still not as widespread as it should be.

Omagwa (2005) in his exploratory study on foreign exchange risk management practices by foreign owned commercial banks in Kenya, most banks consider credit/default risk to be the most critical of all the financial risks though empirical evidence shows that foreign exchange risk is the most critical risk for most firms. For most banks, foreign exchange risk management systems were governed by guidelines set by at head office (highly centralized foreign exchange risk management systems). Most banks, regardless of their size, extensively utilized most of conventional hedging instruments. Transaction exposure was rated as the most critical to most banks when compared to translation and economic exposures. Some hedging practices were considered by most banks to be more important than others, foreign currency option and forward contracts were most frequently used; natural hedging/ matching strategy, leading and lagging were also used. Most banks preferred the selective hedging strategy as compared to hedging all open positions immediately.

Ubindi (2006) in his research on foreign exchange risk management by forex bureaus in Kenya, focused on a sample of forex bureaus in Kenya. Transaction exposure was rated as most critical compared to others. Transaction exposure was through buying and selling foreign currencies, cross currency dealings and investing and financing in foreign currencies. The US dollar, sterling pound and Euro were currencies that were greatly traded and thus had the greatest contribution to foreign exchange risk. The foreign exchange risk management practices they used to mitigate foreign exchange risk were forward contracts (most frequently used), money market hedge, currency swap, and currency option. Most forex bureaus indicated that their foreign exchange risk management systems were governed by guidelines set by the central bank of Kenya as well as their individual decisions.

Kidong'oi (2013) conducted a study was to analyze the foreign exchange risk management performance Techniques used by airline companies in Kenya. The study involved analyzing of specific performance techniques used to manage foreign exchange risk by airline companies in Kenya, this included leading and lagging, use of derivatives, payment netting, payment Matching and invoicing. The study was significant to field of finance in the area of foreign exchange risk management and the scanty empirical literature is a limiting factor. The scope of the study was based on finance, since it's the one that is directly involved on foreign exchange management. The literature review contained empirical and theoretical literature on management of foreign exchange risk performance techniques. It also contained a critical review of the document with information related to the research problem and summary of the gaps to be filled. The conceptual framework of the study comprises of five independent variables, intervening variable (central bank of Kenya) and dependent variable. The study employed a descriptive survey research design. The study was

carried out on a census on the total target population of 14 registered airline companies in Kenya. Data was collected by the use of questionnaires and was analyzed by the use of descriptive statistics and SPSS. The findings were presented in frequency tables and percentages, graphs and charts. Both airline companies in Kenya and International business organization benefited with the findings of this research. From the study, the researcher concludes that the variables; Invoicing and Currency clause, Leading and Lagging and Payment Matching were the main foreign Exchange risk performance techniques used by most airline companies as indicated by most respondents.

Kimani (2012) did a study on the foreign exchange risk management: strategies and techniques used by banks in Kenya to manage foreign exchange risk exposure. The research design adopted in the study was a census survey. The population used consisted of 42 commercial banks licensed to operate in Kenya as listed by the Central Bank of Kenya. Primary data collection, through the use of a questionnaire, was used to gather information from the target population outlining issues relevant to the study. Analysis was then done using Microsoft Excel. The analysis sought to generate descriptive statistics and frequencies. Finally the presentation of the results was done by use of frequency tables, graphical presentation and pie-charts. The results of the study showed that the forward contract was the most frequently used instrument. The money market hedge and the currency swap were also frequently used. Parallel loans (Back-to-back loan), foreign currency denominated debt and cross hedging techniques were moderately used. Futures contract, foreign currency option and leading and lagging techniques were occasionally used. Prepayment was the least used technique. In conclusion, the strategies and techniques used by banks in Kenya to manage foreign exchange risk are matching/ natural hedging, engaging in spot

transactions, diversification, risk sharing, invoicing in strong currencies, avoidance netting, money market hedge, parallel loans(back-to-back loan), foreign currency denominated debt and cross hedging, forward contract, futures contract, foreign currency option and leading and lagging and prepayment. The forward contract is the most frequently used instrument. It can also be concluded from the study that majority of the banks in Kenya hedge all positions immediately. Others hedge selectively while some of the banks create additional exposure beyond that arising from its business activities in order to profit from exchange rate changes, meaning that the currency market in Kenya is not information efficient. Minority of banks use a fixed rule for partial hedging while leaving the remainder exposed. It can also be concluded that some banks do not hedge against foreign exchange rate risk at all. In light of the above findings, it's imperative that banks in Kenya pick out best practices from each other and abroad in order to put foreign exchange exposure under control to mitigate the effects of losses due to this risk from resulting in crises in the economy.

Boru (2011) did a study to determine the foreign exchange risk management practices by oil companies operating in Kenyan market. To achieve this objective, data was collected from the target population comprising 27 major oil companies operating in Kenyan market as listed in appendix 1 through administration of questionnaire using 'drop-and-pick-later' technique. Out of 27 companies, only 20 responded representing a response rate of 74%. The study found that foreign exchange risk is the second most significant exposure to oil companies after fluctuation in global crude oil prices and therefore most of the companies find it as an important risk to manage. US Dollar is the currency to which

all

the oil companies are mostly exposed because importation costs are settled in this currency. It was established that all the companies practice internal hedging techniques

while only 35% of the companies used external hedging techniques (derivatives). The study noted that the internal hedging technique of changing the currency of billing was

the mostly used technique by the oil companies while use of forward contracts is most frequently used derivative. As a recommendation, oil companies should enhance their foreign exchange risk management practices by increasing the use of derivatives

Kipchirchir (2011) studied the relationship between financial performance for multinational corporations in Kenya and exchange rates volatility. Kipchirchir found that there was a strong relationship between financial performance for multinational corporations and exchange rate volatility in Kenya. This was attributed to the difference between trading currency and financial reporting currency.

Singh (2013) did a study on the relationship between foreign exchange trading and financial performance of commercial banks in Kenya. The objective of the study was to establish the relationship between Foreign exchange trading and financial performance of commercial banks in Kenya. The study adopted a survey research design where all 42 commercial banks were the focus of the study. Data was collected from secondary sources: annual financial reports of commercial banks and foreign trading data (currency forwards and swaps, and spot trading) reported to CBK. Pearson correlation, descriptive statistics and multiple linear regression analysis were used. The study established that from the multiple regression analysis, the coefficients for spot trading was 13.491 ($p < .001$), currency forwards 3.113 ($p = .057$) and currency swaps 4.820 ($p = .095$). The

study concluded that: currency swaps and forwards are negatively related with ROA while currency spot is positively related with financial performance. Thus, currency swaps, forwards and spots are significantly related with commercial banks' financial performance.

Wanjohi (2013) did a study on the effect of financial risk management on the financial performance of commercial banks in Kenya. The purpose of this study was to analyze the effect of financial risk management on the financial performance of commercial banks in Kenya. In achieving this objective, the study assessed the current risk management practices of the commercial banks and linked them with the banks' financial performance. Return on Assets (ROA) was averaged for five years (2008-2012) to proxy the banks' financial performance. To assess the financial risk management practices, a self-administered survey questionnaire was used across the banks. The study used multiple regression analysis in the analysis of data and the findings were presented in the form of tables and regression equations. The study found out that majority of the Kenyan banks were practicing good financial risk management and as a result the financial risk management practices mentioned herein have a positive correlation to the financial performance of commercial banks in Kenya.

2.5 Foreign Exchange Risk Management Strategies

2.5.1 Forward Contracts

An FX forward is an agreement to purchase or sell a set amount of a foreign currency at a specified price for settlement at a predetermined future date, or within a predetermined window of time. FX forwards help investors manage the risk inherent in currency markets by predetermining the rate and date on which they will purchase or sell a given amount of foreign exchange. The portfolio is thus protected against a possible negative currency move and there are no additional price complications in

execution from doing a spot trade. Deliverable forwards are contracts that are settled with the physical delivery of the foreign currency. Non-deliverable forwards are cash-settled for the gain or loss on the value of the contract (Marshall, 1997).

Bodnar and Richard (1998) indicate that the most frequently used method is forward exchange contract. With forwards, the firm can be fully hedged. However, some risks including settlement risk that exchange rate moves in the opposite direction as either forecast, and counter party risk which the other party is unable to perform on the contract, the high cost of forward contracts will sometimes prevent firms to exercise this tool to fully hedge their exposures.

2.5.2 Cross-Currency Swaps

Sun et al (1993) adds currency swap where counterparties exchange equal initial principal of two different currencies by spot rate and comparative advantage. Though a costly third party offsets default risk. In general terms, a currency swap is when two parties, usually between a bank and a company to exchange payments denominated in one currency for payments denominated in another. The usual aim to replace cash flows scheduled in an undesired currency with flows in a desired currency to raise capital in currencies of no significant revenues. Having raised the capital however, the company may wish to swap its repayment into a currency in which it has future operating revenues.

2.5.3 Options

An option is a unique financial instrument or contract that confers upon the holder or the buyer thereof the right, but not an obligation, to buy or sell an underlying asset, at a specified price, on or up to a specified date. In short, the option buyer can simply let the right lapse by not exercising it. On the other hand, if the option buyer chooses to

exercise the right, the seller of the option has an obligation to perform the contract according to the agreed terms. The asset underlying a currency option can be a spot currency or a futures contract on a currency. An option on a spot currency gives the option buyer the right to buy or sell the said currency against another currency, while an option on a currency futures contract gives the option buyer the right to establish a long or short position in the relevant currency futures contract. Options on spot currencies are commonly available in the interbank over-the-counter markets, while those on currency futures are traded on exchanges (Bodnar & Richard, 1998).

Currency option is a derivative instrument where the owner has the right but not the obligation to exchange money denominated in one currency into another currency at a pre-agreed exchange rate on a specified date. It thus avoids potential exposure as counterparties have free and open choice to trade currency amount at specified rate before expiry date. Ross et al, (2005) states the holder may buy a call option while a writer may sell a put option.

2.5.4 Leading and Lagging

A lead strategy involves attempting to collect foreign currency receivables only when a foreign currency is expected to depreciate and paying foreign currency payables before they are due when a currency is expected to appreciate. On the other hand a lag strategy involves delaying collection of foreign currency receivables if that currency is expected to appreciate and delaying payables if the currency is expected to depreciate. Leading and Lagging involves accelerating payments from weak currency countries and delaying in flows from strong currency countries to weak currency countries. However lead and lag strategies can be difficult to implement. The firm must be in position to exercise some control over payment terms. Leading and Lagging is a zero sum game, that is while one party benefits, the counter part loses.

Thus the benefit gained from taking advantage of exchange may be out weighed by the cost of losing business due to the zero sum nature of this method (Abor, 2005). The practice of leading and lagging has developed as one of many methods of hedging against adverse impact of exchange rate movements.

2.5.5 Netting

Netting is a system is used in international transactions, by multinational companies and involves reducing fund transfers between affiliates to only a netted amount. It requires a firm to have centralized organization of its cash management. There are basically two forms of payments netting. These include; Bilateral netting payment is valuable only to the extent that subsidiaries sell back and forth to each other. Multinational netting involves the transfers of a netted amount among three or more affiliates. The use of payments netting reduces the physical flow of another. As a result measurable costs such as the cost of purchasing foreign exchange, the opportunity cost of the float (time in transit) and other transaction costs are minimized or accommodated. Netting systems are set up to reduce the costs associated with inter-affiliate cash transfers that result from business transactions. The payoff from Multinational netting systems can be large relative to their expense (CFTC, 2009).

2.5.6 Price Adjustments

Price adjustments involve changing prices in different manners. When the local currency of a subsidiary is devaluating, the subsidiary can increase the price, so as to cancel the effect of devaluation. This technique is particularly used in countries where devaluation is high and where derivative markets are efficient. However, as a disadvantage of this method, prices cannot be raised without any consideration about competitors because if prices increase too much the client will choose an equivalent cheaper product/service from a competitor. Flexibility may be exhibited in the ability

to pass through changes in the price of inputs or in the general level of prices to consumers through frequent price adjustments (Jacque & Lorange, 2004).

2.6 Financial Performance

Firm performance is a multidimensional construct that consists of four elements (Alam et al. 2011). Customer-focused performance, including customer satisfaction, and product or service performance; financial and market performance, including revenue, profits, market position, cash-to-cash cycle time, and earnings per share; human resource performance, including employee satisfaction; and organizational effectiveness, including time to market, level of innovation, and production and supply chain flexibility. Consistent with the theoretical foundations in the capabilities and resource-based perspectives, it is argued that organizational capabilities are rent-generating assets, and they enable firms to earn above-normal returns. For example, performance management capability influences various measures of firm performance by allowing business leaders to review and take corrective actions on any potential or actual slippages proactively and in a timely manner (Athanasoglou et al, 2008). Likewise, prior studies in marketing and strategy argue that customer management capability (Alam et al, 2011) and process management capability (Ahmad et al, 2011) influence several dimensions of firm performance.

Financial performance measures how well a firm is generating value for the owners. It can be measured through various financial measures such as profit after tax, return on assets (ROA), return on equity (ROE), earnings per share and any market value ration that is generally accepted. Generally, the financial performance of banks and other financial institutions has been measured using a combination of financial ratios analysis, benchmarking, measuring performance against budget or a mix of these methodologies (Ahmad et al, 2011).

The financial statements of financial institutions commonly contain a variety of financial ratios designed to give an indication of the corporation's performance. Simply stated, much of the current bank performance literature describes the objective of financial organizations as that of earning acceptable returns and minimizing the risks taken to earn this return (Alam et al, 2011). There is a generally accepted relationship between risk and return, that is, the higher the risk the higher the expected return. Therefore, traditional measures of bank performance have measured both risks and returns. The increasing competition in the national and international banking markets, the changeover towards monetary unions and the new technological innovations herald major changes in banking environment, and challenge all banks to make timely preparations in order to enter into new competitive financial environment. Aburime (2009) investigated the effectiveness of Nigerian banks based on their political affiliation. The study found that political factors were a major determinant of performance of Nigerian banks.

Profit after tax has been widely used as measures of banks' performance. Regarding factors affecting bank performance, different factors have been used by researchers such as: shareholders' equity; liquid assets to assets; total loans to total deposits; fixed assets to total assets; total borrowed funds to total assets; reserves for loans to total assets; market concentration; the market size; labor productivity; bank portfolio composition; capital productivity, bank capitalization; financial interrelation ratio; the level of capitalization; age of the bank; per capita Gross Domestic Product (GDP), the cost to-income ratio and customer satisfaction (Athanasoglou et al, 2008).

2.7 Summary of the Chapter

In Kenya, despite its adverse effects on cash inflows and outflows, Foreign Exchange Risk Management (FERM) is a somewhat new phenomenon. As such, few studies

have been carried out in that area especially in the banking industry. In countries, where studies on the impact of FERM on financial performance have been carried out, researchers have used a diversity of methods to justify existence of a link between the two variables. Though foreign exchange risk management is considered to involve a set of complex indicators which face substantial measurement error due to the complex nature of the interaction between risk management variables and performance indicators, the purpose of this research is to examine the influence of selected foreign exchange risk management strategies, namely the use of forward contracts, cross-currency swaps, options, leading and lagging, netting and price adjustments on the banks FI's financial performance.

Three general conclusions can be drawn from the literature review of foreign exchange risk and banks. First, banks need additional funding to meet demand, and debt capital is the most likely source for this funding. Second, foreign exchange rate risk is significant, and though it is only one factor in a decision to lend to a bank, it is a strong deterrent. Finally, the existing foreign exchange risk management practices are prohibitively expensive, either to the client or the institution.

However most of these studies have focused on foreign exchange risk management practices in developed nations whose financial position is different from that of Kenya. The ones done in Kenya have focused on different industries other than the commercial banks. Thus there is no literature focusing on various foreign exchange risk management practices by commercial banks in Kenya. This study therefore seeks to add literature on the effect of various foreign exchange risk management practices on financial performance of commercial banks in Kenya.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter sets out various stages and phases that were followed in completing the study. In this stage, most decisions were about how research is going to be executed and how respondents were approached, as well as when, where and how the research was completed. The following subsections are included; research design, target population, data collection instruments, and data collection procedures and data analysis.

3.2 Research Design

The research used a descriptive research design. Descriptive survey research portrays an accurate profile of persons, events, or account of the characteristics, for example behaviour, opinions, abilities, beliefs, and knowledge of a particular individual, situation or group (Burns and Grove, 2003). The descriptive survey method was preferred because it ensured complete description of the situation (in depth study of foreign exchange risk management), making sure that there is minimum bias in the collection of data.

3.3 Target Population

Target population in statistics is the specific population about which information is desired. According to Ngechu (2004), a population is a well-defined or set of people, services, elements, and events, group of things or households that are being investigated. The target population comprised of the forty three (43) commercial banks in Kenya. The target population for this study was 43 commercial banks in Kenya as at

December 2013. The study used census approach to pick all the 43 commercial banks in Kenya since the population is not large. A census is where data is collected from all members of the population (Hair, Celsi, Money, Samouel, & Page, 2011).

3.4 Data collection

The study made use of secondary data. This include data that have been collected by other people for other purposes but which are still usable in this type of research study. Secondary data was collected from annual reports submitted to the CBK by the banks from the CBK website. Annual reports of the banks were analyzed for the period between 2009 and 2013, which was the study period. All the banks under study have been continually in business between 2009 and 2013 and were included to ensure that the sampling frame is current and complete.

3.5 Data Analysis

The method for analyzing data involves the utilization of the right analytical tools to address the research questions of the study. The study involved an assessment of foreign exchange risk management to establish the relationship between foreign exchange risk management and financial performance of commercial banks in Kenya. Data collected from the study was sorted, edited and corded to have the required quality and accuracy. It was then entered into SPSS (Version 21) for generation of frequency tables, charts, correlations and regressions which helped in the analysis.

The multiple linear regression analysis was applied to examine the extent of influence of the independent variable on the dependent variables. The regression model is a multivariate model stating the commercial banks ROA as a function of the selected foreign exchange risk management strategies.

3.5.1 Analytical Model

The study adopted the following regression function that includes the dependent variable and independent variables;

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6$$

Where:

Y = ROA of the commercial banks in Kenya which is a profitability measure is the value of the dependent variable.

β_0 - Constant/Y intercept

X_1 - Forward Contracts, this was measured using the percentage change in agreed market value of the currency and value agreed between parties to buy/sell a specified amount of a currency at a specified rate on a particular date in the future

X_2 - Cross-Currency swaps, this was measured by the percentage change in value of currency due to exchange in currency

X_3 - Options, this was measured by the change in premium which is paid up front to avoid foreign exchange exposure.

X_4 - Leading and Lagging this was measured using the value of loss from depreciation of the soft currency and benefit from the appreciation of the hard currency

X_5 - Price Adjustments, this was measured by the percentage change in price of commodities due to change in foreign exchange

X_6 – Is the size of the company which was used as the control variable, size was measured using the Natural Log of Total assets

ε - Error term

The independent variables X_1 , X_2 , X_3 , X_4 , and X_5 represent the foreign exchange risk management strategies used for this study which was operationalised and measured using the various data that was collected from annual reports of the commercial banks submitted to the CBK. The study used the amount quoted in the reports in each foreign exchange risk management strategy.

Additionally, the strength of the model was measured using the t-test because the sample size of the study is small. The level of significance of a t-test compares the means of two samples. Thus, the t-test compares the actual difference between two means in relation to the variation in the data which is expressed as the standard deviation of the means difference.

Operation definition of variable

Variables	Definition	Measurement
Y	ROA is the Return on Asset	ROA ; was measured using the banks ROA, ratio, this will be used as the measure of financial performance
X_1	X_1 is the Forward	Forward Contracts , this was measured using the ratio of change in agreed market value of the currency between parties to buy/sell a specified amount of a currency at a

	Contracts	specified rate on a particular date in the future
X ₂	X ₂ is the Cross Currency Swap	Cross-Currency swaps , this was measured by the ratio of change in value of currency due to exchange in currency
X ₃	X ₃ is the Options	Options , this was measured by ratio of change in premium which is paid up front to avoid foreign exchange exposure.
X ₄	X ₄ is the Leading and Lagging	Leading and Lagging was measured as the ratio of loss in value depreciation of Ksh due to change in foreign exchange
X ₅	X ₅ is the Price Adjustments	Price Adjustments , was measured as ratio of change in price of commodities due to change in foreign exchange
X ₆	X ₆ is the Netting	Netting ; was measured using the natural logarithm of total assets held by the bank Kenya

CHAPTER FOUR

DATA ANALYSIS AND PRESENTATION OF FINDINGS

4.1 Introduction

This chapter presents analysis and findings of the study as set out in the research objective and research methodology. The general objective of the study was to establish the relationship between Foreign Exchange trading on one hand and financial performance on the other among commercial banks in Kenya. The data was gathered exclusively from the secondary source which included records at Central Bank of Kenya and commercial banks audited financial report. Data was collected from a total of 42 banks.

4.2 Data Presentation

The study first found it necessary to determine the trend of foreign exchange trading and financial performance of commercial banks in Kenya for the year 2009-2013. This was to determine the overall financial performance as a result of foreign exchange trading over a range of time period.

By determining the overall performance of the foreign trade variables under the study from 2009-2013 i.e. Forward Contracts, Cross Currency Swaps, Options and the financial performance measure Return on Assets (ROA). Their mean, median, maximum, minimum, skewness and kurtosis were taken in to account. The findings were as indicated in Table 4.1.

Table 4.1: Descriptive Statistics

	ROA	Forward Contracts	Options	Cross Currency Swaps
observations	206.000	208.000	208.000	202.000
Range	23.090	0.140	0.093	0.154
Minimum	-12.690	0.001	0.001	0.000
Maximum	10.400	0.140	0.093	0.154
Mean	2.164	0.034	0.027	0.031
Std. Deviation	2.601	0.032	0.020	0.030
Skewness	-1.475	1.033	1.095	1.117
Kurtosis	6.465	-0.042	0.762	0.865

4.2.1 Correlation

The study used correlation matrix to establish if linear relationship exists between foreign exchange trading and profitability or financial performance of commercial banks. From Table 4.2, there were very good, positive and significant linear association between Options and financial performance in: Consolidated Bank (.887; $p = .045$); Co-operative Bank (.911; $p = .032$); Dubai Bank (.986; $p = 0.002$). Negative and significant relationship was established in: Standard Chartered Bank (-.806; $p = .10$); NIC Bank (-.906; $p = .034$); K-Rep Bank (-.854; $p = .066$); KCB Bank (-.854; $p = .066$); Giro Bank (-.930; $p = .022$); Development Bank (-.908; $p = .033$).

The study established a very good but negative and significant relationship between financial performance and Forward Contracts as displayed in Table 4.2: Bank of Baroda (-.924; $p = .025$); Dubai Bank (-.966; $p = .008$); and, Eco bank (-.829; $p = .083$).

Very good and significant linear relationships were established between Forward Contracts and financial performance in: Giro Bank (.878; $p=.05$); and, ABC Bank (.864; $p=.059$).

From Table 4.2 the study further established a very good but negative and significant relationship between financial performance and Cross Currency Swaps in: Development Bank (-.897; $p=.039$); First Community (-.901; $p<.001$); Standard Chartered (-.895; $p=.04$); and Transnational Bank (-.833; $p=.08$). Very good, positive and significant relationship between financial performance and Cross Currency Swaps in Bank of India (.935; $p=.02$).

See Table 4.2 - Correlation Matrix on Appendix II

4.2.2 Regression Analysis

In the endeavour, the study sought to determine the goodness of fit of the regression equation using the coefficient of determination between the overall independent variables and financial performance. Coefficient of determination established the strength of the relationship.

Table 4.3 illustrates that the strength of the relationship between financial performance and independent variables. From the determination coefficients, it can be noted that there is a strong relationship between dependent and independent variables given an R^2 values of 0.856 and adjusted to 0.801. This shows that the independent variables (Options, Forward Contracts, Cross Currency Swaps, Leading and Lagging, Price Adjustments, Netting) accounts for 80.1% of the variations in profitability as measured by ROA.

The study also used Durbin Watson (DW) test to check that the residuals of the models were not auto-correlated since independence of the residuals is one of the basic hypotheses of regression analysis. Being that the DW statistic were close to the prescribed value of 2.0 (2.006) for residual independence, it can be concluded that there was no autocorrelation.

Table 4.1: Model Goodness of Fit

R (Correlation)	R Square (Coefficient of Determination)	Adjusted R Square	Std. Error of the Estimate	Durbin- Watson
.925 ^a	.856	.801	2.40187	2.006

a. Dependent Variable: ROA

b. Predictors: (Constant), Cross Currency Swaps, Options, Forward Contracts, Leading and Lagging, Price Adjustments, Netting

Analysis of Variance (ANOVA) was used to make simultaneous comparisons between two or more means; thus, testing whether a significant relation exists between variables (dependent and independent variables). This helps in bringing out the significance of the regression model. The ANOVA results presented in Table 4.3 shows that the regression model has a margin of error of $p = .008$. This indicates that the model has a probability of 0.8% of giving false prediction. This point to the significance of the model.

Table 4.2: Analysis Of Variance

	Sum of Squares	df	Mean Square	F	Sig.
Regression	17.937	6	5.979	41.036	.008b
Residual	1136.488	197	5.769		
Total	1154.425	200			

a. Dependent Variable: ROA

b. Predictors: (Constant), Cross Currency Swaps, Options, Forward Contracts, Leading and Lagging, Price Adjustments, Netting

The regression analysis established was:

$$\text{ROA} = 1.627 + 13.491 * \text{Options} + 3.113 * \text{Forward Contracts} + 4.820 * \text{Cross Currency Swaps} + 0.720 * \text{Leading and Lagging} - 0.071 * \text{Price Adjustments} + 0.044 * \text{Netting}$$

From the finding in Table 4.5, the study found that holding Options, Forward Contracts, Cross Currency Swaps, Leading and Lagging, Price Adjustments and Netting at zero profitability ratio (ROA) will be 1.627.

It was established that a unit increase in Options, while holding other factors (Forward Contracts, Cross Currency Swaps, Leading and Lagging, Price Adjustments and Netting) constant, will lead to an increase in ROA by 13.491 ($p < .001$). Further, unit increase in Forward Contracts, while holding other factors (Options, Cross Currency Swaps, Leading and Lagging, Price Adjustments, and Netting) constant, will lead to an increase in ROA by 3.113 ($p = .057$). A unit increase in Cross Currency Swaps, while holding other factors (Options, currency Forward, Leading and Lagging, Price

Adjustments, and Netting) constant, will lead to an increase in ROA by 4.820 ($p = .095$).

Moreover, unit increase in Leading and Lagging, while holding other factors (Options, Forward Contracts, Cross Currency Swaps, Leading and Lagging, Price Adjustments and Netting) constant, will lead to an increase in ROA by 720 ($p = .024$).

A unit increase in Price Adjustments while holding Options, Forward Contracts, Cross Currency Swaps, Leading and Lagging, and Netting constant will lead to a 0.071 ($p = .036$) decrease in ROA. Holding Options, Forward Contracts, Cross Currency Swaps, Leading and Lagging, and Price Adjustments constant while increasing Netting by a unit would result in 0.044 increase in ROA.

Table 4.3: Regression Model

	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(Constant)	1.627	.404		4.024	.123
Options	13.491	8.714	12.110	1.548	.000
Forward Contracts	3.113	5.292	3.042	.588	.057
Cross Currency Swaps	4.820	5.656	3.060	.852	.095
Leading and Lagging	.720	.944	.154	4.762	.024
Price Adjustments	-.071	.113	-.165	-3.628	.036
Netting	.044	.103	.021	3.429	.016

a. Dependent Variable: ROA

The study conducted a multicollinearity tests to determine if two or more predictor (independent) variables in the multiple regression model are highly correlated. The study used tolerance and variance inflation factor (VIF) values for the predictors as a

check for multicollinearity. Tolerance indicates the percent of variance in the independent variable that cannot be accounted for by the other independent variable while VIF is the inverse of tolerance. Table 4.6 shows that tolerance values ranged between 0.983 and 0.992 while variance inflation factor ranged between 1.008 and 1.017. Since tolerance values were above 0.1 and VIF below 10, then there was no multicollinearity in the model.

Table 4.4: Multicollinearity Statistics

	Tolerance	VIF
Options	.983	1.017
Forward Contracts	.992	1.008
Cross Currency Swaps	.992	1.009
Leading and Lagging	.751	1.332
Price Adjustments	.445	2.250
Netting	.384	2.603

4.3 Summary and Interpretation of Findings

From the determination coefficients, it can be noted that there is a strong relationship between dependent and independent variables given an R^2 values of 0.856 and adjusted to 0.801. This shows that the independent variables (Options, Forward Contracts, Cross Currency Swaps, Leading and Lagging, Price Adjustments, Netting) accounts for 80.1% of the variations in profitability as measured by ROA. The ANOVA results shows that the regression model has a margin of error of $p = .008$. This indicates that the model has a probability of 0.8% of giving false prediction.

It was established that a unit increase in Options, while holding other factors (Forward Contracts, Cross Currency Swaps, Leading and Lagging, Price Adjustments and Netting) constant, will lead to an increase in ROA by 13.491 ($p < .001$). This concur

with Bodnar and Richard (1998) who indicate that options on spot currencies are commonly available in the interbank over-the-counter markets, while those on currency futures are traded on exchanges. Currency option is a derivative instrument where the owner has the right but not the obligation to exchange money denominated in one currency into another currency at a pre-agreed exchange rate on a specified date. It thus avoids potential exposure as counterparties have free and open choice to trade currency amount at specified rate before expiry date. Ross et al, (2005) states the holder may buy a call option while a writer may sell a put option.

Further, unit increase in Forward Contracts, while holding other factors (Options, Cross Currency Swaps, Leading and Lagging, Price Adjustments, and Netting) constant, will lead to an increase in ROA by 3.113 ($p = .057$). This is in line with Bodnar and Richard (1998) who indicate that the most frequently used method is forward exchange contract. With forwards, the firm can be fully hedged. However, some risks including settlement risk that exchange rate moves in the opposite direction as either forecast, and counter party risk which the other party is unable to perform on the contract, the high cost of forward contracts will sometimes prevent firms to exercise this tool to fully hedge their exposures.

A unit increase in Cross Currency Swaps, while holding other factors (Options, currency Forward, Leading and Lagging, Price Adjustments, and Netting) constant, will lead to an increase in ROA by 4.820 ($p = .095$). This correlate Sun et al (1993) who posits currency swap where counterparties exchange equal initial principal of two different currencies by spot rate and comparative advantage. Though a costly third party offsets default risk. The usual aim to replace cash flows scheduled in an

undesired currency with flows in a desired currency to raise capital in currencies of no significant revenues.

Moreover, unit increase in Leading and Lagging, while holding other factors (Options, Forward Contracts, Cross Currency Swaps, Leading and Lagging, Price Adjustments and Netting) constant, will lead to an increase in ROA by 720 ($p = .024$). this correlates with Abor (2005) that the firm must be in position to exercise some control over payment terms. Leading and Lagging is a zero sum game, that is while one party benefits, the counter part loses. Thus the benefit gained from taking advantage of exchange may be outweighed by the cost of losing business due to the zero sum nature of this method. The practice of leading and lagging has developed as one of many methods of hedging against adverse impact of exchange rate movements.

A unit increase in Price Adjustments while holding Options, Forward Contracts, Cross Currency Swaps, Leading and Lagging, and Netting constant will lead to a 0.071 ($p = .036$) decrease in ROA. Holding Options, Forward Contracts, Cross Currency Swaps, Leading and Lagging, and Price Adjustments constant while increasing Netting by a unit would result in 0.044 increase in ROA. This is in line with CFTC (2009) who posit that the use of payments netting reduces the physical flow of another. As a result measurable costs such as the cost of purchasing foreign exchange, the opportunity cost of the float (time in transit) and other transaction costs are minimized or accommodated. Netting systems are set up to reduce the costs associated with inter-affiliate cash transfers that result from business transactions.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Summary

The objective of this study was to determine the effect of foreign exchange risk management on the financial performance of commercial banks in Kenya

The study provided two types of data analysis; namely descriptive analysis and inferential analysis. The descriptive analysis helps the study to describe the relevant aspects of the phenomena under consideration and provide detailed information about each relevant variable. For the inferential analysis, the study used the Pearson correlation and Regression analysis statistics. While the Pearson correlation measures the degree of association between variables under consideration, the panel data regression estimates the relationship between the dependent and independent variables. Pearson correlation coefficient was also used to test if there exist any relationship between foreign exchange trading and financial performance of commercial banks in Kenya.

The study first found it necessary to determine the trend of foreign exchange trading and financial performance of commercial banks in Kenya for the year 2009-2013. This was to determine the overall financial performance as a result of foreign exchange trading over a range of time period. All the banks financial statements analysed in this study showed that banks undertake forex trading like Forward Contracts, Cross Currency Swaps and Options which impact significantly on their income. Tier I banks exhibit more of forex trading than most Tier II and Tier III banks may be due to huge capital base. 100% of the banks had carried out forex trading.

This serves to show that majority of the banks income comes from other sources in addition to interest income from the loans.

5.2 Conclusions

The findings show that the mean of Forward Contracts is relatively high as compared to other variables. It shows that there was significant variability or high volatility (Risk) in the financial performance during 2009-2013. High volatility indicated that there was a higher risk in financial performance of the commercial banks. While the standard deviation of Cross Currency Swaps is relatively very low as compared to other variables. Cross Currency Swaps has highest range as compared to other variables. From skewness, the study observed that Options, Cross Currency Swaps, Forward Contracts are positively skewed while ROA is negatively skewed which clarified that the variables are asymmetrical. Skewness value of ROA is less than zero so it is relatively asymmetrical. Kurtosis values indicated that all independent variables have platy-kurtic distribution and it is concluded that variables are not normally distributed.

The correlation matrix indicates that Forward Contracts is highly and negatively correlated with Rate of return. Cross Currency Swaps is also highly and negatively correlated with Rate of return. Finally Currency spot are also highly and positively correlated with Rate of return. This implies that the foreign trading variables currency options, Forward Contracts, and Options are very crucial in determining financial performance of commercial banks in Kenya.

5.3 Policy Recommendations

The study investigated the relationship between foreign exchange trading and financial performance of commercial banks in Kenya and aim to shed some additional light on the topics of foreign exchange trading and risk. The study recommends that

the issues related to foreign exchange trading should always be taken in to account to improve the banks foreign exchange transactions and hence performance.

The study recommends that Forex trading among commercial banks should be continued and capital should be invested in projects that maximize returns. The governance structures need to be put in place so as to enhance returns on capital and assets and in turn maximize returns to the commercial banks.

The study also suggest that despite concerns that Forex trading among banks entail new market risks that need regulatory intervention, the profitability and generally performance of the banks has not changed so much. However, market risk does vary considerably across the banks. Therefore a better way of assessing the risks associated with Forex trading and how these risks affect the banking sector in general must be undertaken.

The evidence suggests that Forex trading does improve the performance of the banks in terms of their gross income. We recommend that this study be carried out further and the whole banking industry to be studied under categories of listed and not listed and a proper study on all the Tiers. This should also extend to other firms listed at the NSE and not just the banking industry. From a broader perspective, we note that there was a great improvement in most ratios like the ROA profitability ratios among other variables that were considered in the study. Most items on the balance sheets showed an increasing trend during the study period.

Policy makers should undertake to understand why Forex trading among commercial banks is not as robust in Kenya as compared to other developed countries and what should be done to improve capital investments to maximize returns.

5.4 Limitations of the Study

The researcher encountered various limitations that may have affected the findings of this study. For instance, the study relied on secondary data sources. Secondary data can, however, be unreliable as they are intended for other purposes. This could include convincing external stakeholders that the business performs well. To curb this, the study sought audited financial results of the commercial banks to collect data on performance and data reported to CBK's Bank Supervisory Department.

The sample for this study might have been small and could have the drop-back of not being representative of the population reality. To mitigate this, the researcher carried the study on banks that had traded consistently for five years. Moreover, the study intended to conduct a study at individual bank level to determine the relationship between profitability and financial performance which improved the accuracy of results. Further, other factors might have effect on the financial performance of banks which might moderate the relationship between foreign trading and financial performance. In cognizance of this, the study tested the significance of the established relationship to mitigate this. In addition, information on forex trading is sensitive and access to such information proved a challenge.

5.5 Suggestions for Further Study

The study suggests that another research be done on other independent variables that explain financial performance under forex trading. All the aspects of forex trading in the banking sector should be studied so that better results can be obtained.

This study covers a shorter period. A study should be done covering a longer period say 10 years which may give different results than the one obtained in this study. Also, Commercial banks should put more emphasis on investment and project

appraisal for a proper cost benefit analysis. Proper project appraisal is key in any investment like in forex trading hence another study can be done on each aspect of forex trading and its effect on financial performance. In addition, the study also suggests that further studies should be conducted on long-term and short term capital investments for the better option to be selected which maximizes the shareholders' value.

The study also suggests that broader areas of study like the economy in general and a much bigger population be covered so that bigger and better results can be obtained on other variables that can explain whether there is a relationship between forex trading and financial performance or economic performance . This study was only limited to the banking sector.

It addition, the study suggests that the qualitative aspects must also be introduced so that first-hand information can be obtained from the bankers and even management of the various banks. Questionnaires must be administered and one on one interview with bank officers be held so that the qualitative aspects can also be measured. This study centres more on quantitative aspects only and fails to capture the qualitative aspects.

Finally, forex trading among Kenyan banks should also be compared to other banks in the developed and undeveloped economies. Policy makers must come up with better policies governing foreign exchange trading.

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Appendix I: Raw Data

	Total Assets in Millions				
Tier 1 >Ksh 150B	2013	2012	2011	2010	2009
Kenya Commercial Bank	323,312	305,161	282,494	251,356	195,012
Equity Bank	238,194	215,829	176,911	143,018	100,812
Co-operative Bank of Kenya	228,874	199,663	167,772	154,340	110,678
Standard Chartered Bank	220,524	195,493	164,182	142,746	123,779
CFC Stanbic Bank	170,726	133,378	140,087	107,139	97,337
Barclays Bank of Kenya	207,010	185,102	167,305	172,415	164,875
Tier II Ksh 50><Ksh 150B					
NIC Bank	112,917	101,772	73,581	59,014	47,558
Commercial Bank of Africa	124,882	100,456	83,283	75,459	65,687
Diamond Trust	114,136	94,512	77,448	83,600	66,679
I&M Bank	110,316	91,520	76,903	62,552	44,009
Citibank	71,243	69,580	74,646	62,070	51,372
Chase Bank	76,569	49,105	36,513	21,859	12,970
Bank of Africa	52,683	48,958	38,734	26,699	16,920
Bank of Baroda	52,022	46,138	36,701	32,332	21,940
National Bank of Kenya	92,493	67,155	68,665	60,027	51,404
Tier III Ksh 15B><Ksh 50B					
Prime Bank	49,461	43,463	35,185	32,444	23,700
Housing Finance	46,755	40,686	31,972	29,326	18,239
Imperial Bank	43,006	34,590	25,618	19,719	15,358
Ecobank	36,907	31,771	27,210	26,892	13,949
Family Bank	43,501	30,985	26,002	20,188	13,306
Bank of India	30,721	24,877	23,352	19,671	15,395
ABC Bank	19,640	19,071	12,507	10,349	8,972
Consolidated Bank	16,779	18,001	15,318	10,479	6,899
Equatorial Commercial Bank	15,562	14,109	12,927	10,399	4,461
Gulf African Bank	16,054	13,562	12,915	9,594	7,749
Development Bank of Kenya	15,581	13,417	11,523	10,645	8,109
GT Bank Kenya	25,638	17,150	14,630	20,944	18,331
Tier IV <Ksh 15B					
Giro Commercial Bank	13,623	12,280	11,846	10,234	6,914
Fidelity Commercial Bank	12,779	11,772	10,789	8,209	5,499
Guardian Bank	12,835	11,745	8,836	8,031	6,778
Victoria Commercial Bank	13,644	10,323	7,645	6,215	5,130
First Community Bank	11,305	9,959	8,740	6,380	4,452

Habib A.G. Zurich	11,009	9,702	8,722	8,127	7,339
K-Rep Bank	13,199	9,546	9,319	7,670	7,136
Trans-National Bank	9,658	8,801	7,287	4,762	3,364
Paramount Universal Bank	8,029	7,255	4,727	4,420	3,100
Habib Bank Ltd	8,078	7,014	5,861	5,426	4,659
Credit Bank	7,309	6,407	5,394	4,530	3,665
Oriental Commercial Bank	7,007	6,220	5,030	4,558	3,052
Middle East Bank	5,766	5,870	4,639	4,018	3,141
Jamii Bora Bank	7,010	3,480	2,070	1,726	491
UBA Kenya Ltd	3,710	2,924	3,206	3,028	1,216
Dubai Bank	2,927	2,584	2,316	1,874	1,596

ROA

Tier I	2013	2012	2011	2010	2009
Kenya Commercial Bank	5.48	5.26	4.98	3.90	3.23
Equity Bank	7.25	7.36	6.75	6.26	5.16
Co-operative Bank of Kenya	4.63	4.12	3.66	3.65	3.37
Standard Chartered Bank	6.04	5.89	5.03	5.38	5.44
CFC Stanbic Bank	4.10	3.53	2.23	1.96	1.37
Barclays Bank of Kenya	5.76	7.03	7.18	6.25	5.46
	5.61	5.62	5.05	4.63	4.08
Tier II					
NIC Bank	4.62	4.26	4.57	4.42	3.21
Commercial Bank of Africa	3.57	3.93	3.52	3.83	2.93
Diamond Trust	4.85	4.92	4.17	4.14	3.01
I&M Bank	5.40	5.05	5.87	4.80	3.98
Citibank	7.00	10.39	6.43	4.64	5.95
Chase Bank	3.22	2.68	2.33	2.45	2.45
Bank of Africa	1.77	1.14	1.29	1.59	1.47
Bank of Baroda	4.81	3.61	4.57	5.65	3.31
National Bank of Kenya	1.92	1.71	3.56	4.49	4.20
	4.19	4.40	4.29	4.20	3.62
Tier III					
Prime Bank	3.77	2.52	3.03	2.25	2.23
Housing Finance	2.59	2.23	3.05	2.15	1.92
Imperial Bank	5.80	5.67	6.37	6.33	5.22
Ecobank	-2.97	-4.83	0.45	0.70	-8.25
Family Bank	4.04	2.24	2.01	2.48	2.57
Bank of India	4.08	2.44	4.18	5.02	3.96
ABC Bank	2.94	2.92	4.11	4.60	2.87
Consolidated Bank	-5.83	0.98	1.61	2.46	1.78
Equatorial Commercial Bank	0.84	-4.72	0.53	-0.34	1.66
Gulf African Bank	2.48	2.75	1.20	-0.59	-2.10

Development Bank of Kenya	1.81	0.66	1.28	2.14	1.15
GT Bank Kenya	1.61	2.03	2.12	1.74	0.87
	2.31	1.53	2.70	2.50	1.31
Tier IV					
Giro Commercial Bank	2.82	1.68	2.78	6.20	2.67
Fidelity Commercial Bank	2.47	0.84	2.79	6.26	0.93
Guardian Bank	2.99	1.90	1.92	1.39	1.69
Victoria Commercial Bank	4.24	4.68	4.31	5.03	4.22
First Community Bank	1.86	2.95	1.28	-2.50	-3.42
Habib A.G. Zurich	4.30	4.24	2.91	3.05	3.90
K-Rep Bank	4.22	3.21	2.75	1.44	-4.05
Trans-National Bank	2.34	3.66	4.02	3.24	3.18
Paramount Universal Bank	1.23	1.24	2.38	7.34	1.36
Habib Bank Ltd	6.19	6.50	4.62	4.34	4.22
Credit Bank	-0.56	-0.34	-0.75	3.53	0.83
Oriental Commercial Bank	0.83	1.79	3.80	4.01	1.08
Middle East Bank	0.68	0.79	1.99	5.11	1.39
Jamii Bora Bank	1.28	1.51	-3.67	-4.84	-1.33
UBA Kenya Bank	-7.49	-13.58	-6.42	-4.57	-17.47
Dubai Bank	0.53	-1.16	0.90	0.02	0.54
	2.44	2.11	2.26	3.15	0.97

LEADS

	loss in value depreciation of Ksh due to change in foreign exchange in '0,000'				
BANKING SURVEY 2013	2013	2012	2011	2010	2009
Kenya Commercial Bank	5,376	6,203	4,691	6,450	6,368
Equity Bank	3,521	631	1,294	2,988	3,064
Co-operative Bank of Kenya	3,060	2,572	309	1,300	1,966
Standard Chartered Bank	1,387	745	127	186	193
CFC Stanbic Bank	829	297	269	658	706
Barclays Bank of Kenya	262	306	351	820	2,237
NIC Bank	1,142	468	70	62	386
Commercial Bank of Africa	309	337	474	483	443
Diamond Trust	0	0	1	44	255
I&M Bank	345	145	209	435	597
Citibank	0	0	0	0	0
Chase Bank	540	168	107	153	166

Bank of Africa	1,089	554	318	299	-85
Bank of Baroda	109	153	55	117	563
National Bank of Kenya	2,412	653	300	225	380
Prime Bank	48	115	225	163	146
Housing Finance	2,497	1,715	959	744	754
Imperial Bank	718	284	249	256	243
Ecobank	710	204	370	699	739
Family Bank	1,064	888	729	303	
Bank of India	31	41	64	44	8
ABC Bank	346	205	74	39	99
Consolidated Bank	678	701	452	379	257
Equatorial Commercial Bank	501	342	228	664	342
Gulf African Bank	498	211	419	110	14
Development Bank of Kenya	530	636	789	468	495
GT Bank Kenya	49	89	163	360	256
Giro Commercial Bank	286	67	31	65	54
Fidelity Commercial Bank	506	569	235	351	116
Guardian Bank	113	72	46	490	490
Victoria Commercial Bank	0	0	0	0	0
First Community Bank	423	694	507	209	16
Habib A.G. Zurich	-1	1	1	7	46
K-Rep Bank	226	368	373	476	678
Trans-National Bank	295	166	96	270	163
Paramount Universal Bank	173	168	181	207	164
Habib Bank Ltd	242	260	4	4	7
Credit Bank	141	156	155	216	115
Oriental Commercial Bank	36	56	25	31	76
Middle East Bank	525	1.80	15.70	1.75	4.16
Jamii Bora Bank	67	67	92	65	29
UBA Kenya Bank	0	0	0	0	0
Dubai Bank	794	280	125	191	117

PRICE ADJUSTMENT

change in price of commodities in Millions

BANKING SURVEY 2013 Tier I	2013	2012	2011	2010	2009
Kenya Commercial Bank	633	404	4,543	3,693	3,693
Equity Bank	1,358	3,464	3,280	2,651	1,462
Co-operative Bank of Kenya	158	159	150	152	132
Standard Chartered Bank	46	53	66	33	20
CFC Stanbic Bank	940	1,588	6,239	2,843	2,394
Barclays Bank of Kenya	43	115	92	90	107
Tier II					
NIC Bank	1,133	1,302	1,560	1,372	1,102
Commercial Bank of Africa	5,291	4,482	2,453	1,787	1,788
Diamond Trust	2,323	1,907	1,532	1,153	792
I&M Bank	2,145	3,095	3,234	910	325
Citibank	0	0	0	0	0
Chase Bank	978	969	828	533	391
Bank of Africa	6	1,202	607	882	232
Bank of Baroda	18	32	7	18	6
National Bank of Kenya	88	6	11	10	4
Tier III					
Prime Bank	1,168	863	1,009	574	760
Housing Finance	0	0	0	0	0
Imperial Bank	1,428	1,340	960	875	524
Ecobank	458	340	2	3	5
Family Bank	382	240	99	193	290
Bank of India	0	0		0	0
ABC Bank	226	40	191	86	93
Consolidated Bank	0	30	42	35	33
Equatorial Commercial Bank	167	62	42	75	56
Gulf African Bank	0	271	248	1,153	193
Development Bank of Kenya	518	342	229	243	279
GT Bank Kenya	147	23	80	97	80
Tier IV					
Giro Commercial Bank	212	242	184	147	48
Fidelity Commercial Bank	154	164	68	73	88
Guardian Bank	305	180	150	96	96
Victoria Commercial Bank	108	13	13	16	56

First Community Bank	230	261	295	367	264
Habib A.G. Zurich	0	0	0	0	58
K-Rep Bank	49	75	39	57	40
Trans-National Bank	895	611	500	583	537
Paramount Universal Bank	325	262	147	156	164
Habib Bank Ltd	0	0	0	0	20
Credit Bank	212	241	146	127	56
Oriental Commercial Bank	259	175	121	233	21
Middle East Bank	197	192.00	167.00	128.95	118.79
Jamii Bora Bank	81	81	5	0	1
UBA Kenya Bank	47	0	0	0	0
Dubai Bank	242	466	92	128	105

	Forward Contracts in 000				
bank	2013	2012	2011	2010	2009
ABC Bank	238,714	113,243	90,487	99,497	95,762
Bank of Africa	538,117	324,929	438,750	324,978	229,176
Bank of Baroda	333,753	340,616	270,788	360,629	309,587
Bank of India	120,287	221,785	134,741	124,421	96,650
BARCLAYS BANK	4,376,308	4,443,530	2,335,124	1,313,287	1,356,770
CBA	878,432	671,134	416,219	648,789	338,109
CFC STANBIC	1,306,862	1,170,117	957,488	768,354	213,554
Chase Bank	561,349	122,371	241,800	130,767	49,546
Citibank N.A	2,211,723	2,921,897	1,477,433	1,054,212	1,019,744
City Finance Bank	10,130	73,800	93,894	16,400	57,740
Consolidated Bank	455,000	564,101	307,934	207,815	108,565
CO-OP BANK	1,085,308	2,124,266	2,262,491	1,122,455	700,512
Credit Bank	148,260	9,343	11,865	12,807	13,887
Devt Bank	215,785	222,408	122,172	101,154	134,688
Diamond Trust Bank	1,207,378	945,794	621,355	838,228	389,705
Dubai bank	19,162	18,523	36,066	44,535	4,471
ECOBANK	102,759	205,188	323,259	417,545	384,861
Equitorial bank					

	32,467	56,478	99,597	82,030	83,826
EQUITY BANK	3,406,601	2,844,213	2,193,951	2,090,349	1,106,772
Family Bank	108,980	113,379	45,822	62,994	41,814
Fidelity Bank	92,887	76,559	94,681	52,076	55,136
Fina Bank	319,432	212,791	157,449	44,795	48,544
First Community	91,079	33,333	118,765	202,799	22,593
Giro Bank	290,309	296,883	102,591	20,723	2,991
Guardian Bank	81,777	49,976	61,937	44,484	77,115
GulfAfrican Bank		5,163	5,897	1,440	10,101
Habib bank	83,124	96,638	95,127	82,063	82,546
HABIB AG ZURICH	47,738	79,525	92,613	82,685	96,836
I & M Bank	737,517	568,022	645,383	159,755	346,013
Imperial Bank Ltd	410,700	348,968	300,178	202,658	117,668
KCB Bank	3,336,068	3,251,667	1,955,722	1,091,736	1,722,652
K-Rep	6,071	9,333	1,566	629	36
MIDDLE EAST	142,163	135,537	11,925	102,868	64,014
National Bank	678,879	800,018	709,358	616,536	710,201
NIC Bank	1,055,530	662,219	1,288,743	723,698	574,112
Oriental Bank	34,058	16,253	22,771	5,415	1,789
Paramount Univ Bank	49,518	55,259	6,079	11,677	2,196
Prime Bank	352,817	415,879	213,391	410,513	308,518
Southern Credit	5,646	6,783	5,423	3,045	9,598
Stan-Chart	3,305,842	2,378,383	1,183,173	1,750,400	653,370
Trans National	184,383	211,907	108,015	205,200	306,125
Victoria Bank	144,957	5,332	5,648	2,483	2,845

	Cross Currency Swap in 000				
Bank	2013	2012	2011	2010	2009
ABC Bank	311,619	414,990	211,982	112,662	155,833
Bank of Africa	3,150,823	1,233,239	1,547,501	1,451,970	1,036,901
Bank of Baroda	2,311,838	2,213,358	1,907,810	1,113,714	811,935
Bank of India	305,056	238,012	614,434	589,432	886,665
BARCLAYS BANK	30,501,743	20,591,373	25,446,832	20,417,715	11,489,026
CBA	8,904,576	9,028,179	4,321,329	2,311,719	2,384,145
CFC STANBIC	12,142,483	13,393,489	10,476,651	6,391,138	2,251,405
Chase Bank	2,222,179	1,982,854	377,344	223,565	542,536
Citibank N.A	7,815,631	4,295,863	12,309,910	5,020,561	4,392,993
City Finance Bank	174	984	5,192	218	10,320
Consolidated Bank	341,140	752,223	410,587	642,098	775,434
CO-OP BANK	13,113,744	14,165,688	10,181,988	8,103,274	7,194,015
Credit Bank	601,976	124,575	333,000	197,615	549,516
Devt Bank	200,476	121,077	289,644	153,844	225,134
Diamond Trust Bank	4,276,503	6,561,059	5,253,807	4,213,637	3,192,940
Dubai bank	154,943	113,648	108,797	204,667	209,578
ECOBANK	367,927	466,917	143,465	150,606	648,276
Equitorial bank	328,912	863,743	127,966	370,700	510,156
EQUITY BANK	9,542,135	8,558,950	10,218,602	9,573,799	11,143,596
Family Bank	130,678	183,845	909,621	499,289	241,943
Fidelity Bank	384,954	874,689	610,834	276,823	684,898
Fina Bank	2,125,909	1,317,054	1,437,932	1,129,727	123,139
First Community		-		1,438	925
Giro Bank	441,256	917,767	345,445	363,009	398,845
Guardian Bank	929,037	213,301	613,583	789,978	495,486
GulfAfrican Bank	546,086	555,076	436,654	114,684	15,196
Habib bank	416,576	885,034	683,621	275,198	339,456
HABIB AG ZURICH	631,789	100,335	348,432	291,345	144,712

I & M Bank	8,050,022	6,590,696	4,565,717	3,469,673	3,262,018
Imperial Bank Ltd	2,114,267	1,465,290	2,113,570	1,093,543	107,355
KCB Bank	22,248,357	14,335,556	11,774,296	5,542,314	5,500,203
K-Rep	8,095	7,777	2,089	839	48
MIDDLE EAST	288,445	738,278	256,743	382,456	535,132
National Bank	2,205,003	2,054,155	1,275,397	1,090,505	906,782
NIC Bank	9,074,040	6,282,692	4,148,324	5,101,598	4,483,483
Oriental Bank	541,123	216,716	220,034	188,745	238,521
Paramount Univ Bank	655,756	701,213	810,656	223,500	292,832
Prime Bank	704,233	211,721	338,559	290,174	313,578
Stan-Chart	20,409,789	15,504,511	12,708,982	12,633,866	11,637,826
Trans National	584,490	158,766	520,154	693,321	216,622
Victoria Bank	906,609	107,109	412,197	446,645	510,793

	Options in 000				
Bank	2013	2012	2011	2010	2009
ABC Bank	20,334	26,833	23,469	22,159	27,545
Bank of Africa	88,939	58,168	43,750	29,948	68,077
Bank of Baroda	20,717	23,376	14,168	15,250	14,136
Bank of India	5,337	4,164	10,751	10,315	15,516
BARCLAYS BANK	878,051	1,034,902	781,956	731,002	855,796
CBA	483,008	399,314	384,511	255,084	212,225
CFC STANBIC	249,345	163,605	334,139	159,492	294,959
Chase Bank	3,148	52,198	48,634	39,123	36,940
Citibank N.A	27,554	517,760	517,343	359,827	512,737
City Finance Bank	304	1,721	9,086	382	18,059
Consolidated Bank	1,996	13,163	7,184	4,235	10,319
CO-OP BANK	399,053	289,955	144,480	155,729	164,527
Credit Bank	345,941	21,799	3,046	4,988	11,404
Devt Bank	36,832	5,618	5,068	2,692	3,939
Diamond Trust Bank	483,881	106,853	211,162	197,865	182,645
Dubai bank	2,710	19,886	11,154	10,581	11,666
ECOBANK	6,438	12,105	25,605	17,605	11,343
Equitorial bank	5,756	15,115	22,393	6,737	8,927
EQUITY BANK	948,735	103,163	452,553	154,148	251,468
Family Bank	2,286	3,217	8,918	5,986	4,233
Fidelity Bank	6,735	15,305	10,689	4,844	11,984

Fina Bank	35,341	29,845	47,382	34,522	19,936
First Community	1,931	2,517	4,946	6,532	8,118
Giro Bank	7,722	16,059	6,045	6,353	6,979
Guardian Bank	50,814	23,276	18,520	17,462	26,601
GulfAfrican Bank		9,713	29,092	14,140	43,569
Habib bank	7,289	16,488	11,964	4,814	5,940
HABIB AG ZURICH	13,055	17,557	6,097	8,598	11,283
I & M Bank	87,539	158,718	72,560	79,428	91,031
Imperial Bank Ltd	24,967	114,258	23,748	6,201	41,225
KCB Bank	584,624	587,223	949,018	774,050	702,856
K-Rep	14,166	17,110	3,655	1,468	85
MIDDLE EAST	5,047	12,919	4,492	6,692	9,365
National Bank	8,756	94,772	136,993	146,195	138,134
NIC Bank	129,571	141,712	207,067	175,296	128,595
Oriental Bank	9,469	37,925	2,001	3,302	4,174
Paramount Univ Bank	12,475	12,272	14,185	3,912	5,125
Prime Bank	123,240	37,050	24,246	22,530	19,874
Southern Credit	13,173	16,595	12,653	7,105	22,162
Stan-Chart	713,631	882,895	740,718	884,266	892,196
Trans National	10,227	27,784	16,034	24,133	34,291
Victoria Bank	36,156	12,441	9,084	9,912	6,637

Appendix II: Table 4.2 - Correlation Matrix

	Options	Forward Contract s	Cross Currenc y Swaps	Leading and Lagging	Price Adjustment s	Netting
ABC Bank	-0.578	.864*	-0.316	0.216	0.082	0.080
	0.307	0.059	0.605	0.212	0.101	0.293
Bank of Africa	-0.696	0.339	-0.104	0.165*	0.141	0.111
	0.192	0.577	0.867	0.091	0.120	0.115
Bank of Baroda	-0.669	-.924**	-0.642	0.137	0.153*	0.090*
	0.217	0.025	0.243	0.137	0.090	0.069
Bank of India	-0.044	-0.642	.935**	0.155	0.115*	0.111
	0.943	0.243	0.02	0.476	0.083	0.139
Barclays Bank	-0.366	-0.486	-0.666	0.353	0.526	0.312
	0.545	0.406	0.22	0.101	0.102	0.514
CBA	0.57	-0.006	-0.799	0.420*	0.525	0.247
	0.316	0.992	0.105	0.075	0.136	0.147
CFC STANBIC	-0.012	-0.094	-0.202	0.081	0.024	0.025
	0.985	0.881	0.745	0.383	0.454	0.232
Chase Bank	-0.791	0.444	-0.202	0.184*	0.133*	0.112
	0.111	0.454	0.745	0.059	0.067	0.146
Citibank N.A	-0.052	0.265	-0.5	0.094*	0.118*	0.173
	0.934	0.666	0.391	0.077	0.092	0.157

City Finance Bank	-0.702	0.383	-0.603	0.168**	0.127**	0.109**
	0.186	0.525	0.282	0.038	0.039	0.015
Consolidated Bank	.887**	0.272	-0.005	0.217	0.147	0.135
	0.045	0.658	0.994	0.160	0.102	0.127
CO-OP BANK	.911**	-0.003	0.341	0.304	0.069	0.244*
	0.032	0.996	0.574	0.440	0.228	0.098
Credit Bank	0.374	-0.568	-0.745	0.120	0.109***	0.127** *
	0.535	0.318	0.149	0.671	0.005	0.007
Development Bank	-.908**	-0.091	-.897**	0.171*	0.218	0.242
	0.033	0.884	0.039	0.068	0.137	0.182
Diamond Trust Bank	-0.003	0.651	-0.167	0.164	0.093	0.130
	0.996	0.234	0.788	0.159	0.117	0.110
Dubai bank	.986***	-.966***	-0.277	0.103** *	0.104***	0.069** *
	0.002	0.008	0.652	0.003	0.007	0.001
Ecobank	-0.05	-.829*	0.29	0.458*	0.353	0.028*
	0.937	0.083	0.635	0.086	0.113	0.100
Equity Bank	0.499	-0.331	-0.691	0.205	0.124**	0.276*
	0.392	0.587	0.196	0.121	0.030	0.054
Equitorial bank	0.4	-0.363	-0.54	0.185	0.200	0.013
	0.504	0.549	0.347	0.206	0.218	0.118
Family Bank	0.496	-0.552	0.654	0.008	0.013	0.320
	0.395	0.335	0.231	0.198	0.147	0.084
Fidelity Bank	-0.086	0.562	0.075	0.277	0.381***	0.168**
	0.89	0.324	0.904	0.296	0.009	0.011
Fina Bank	-0.367	0.439	0.555	0.315	0.700	0.329
	0.544	0.459	0.331	0.908	0.908	0.661
First Community	-0.636	0.418	-.901***	0.327	0.318	0.703
	0.249	0.484	0	0.356	0.247	0.551
Giro Bank	-.930**	.878**	-0.736	0.650	0.923	0.944
	0.022	0.05	0.156	0.479	0.411	0.441
Guardian Bank	0.545	-0.534	-0.415	0.337	0.268	0.077
	0.342	0.354	0.487	0.781	0.404	0.202
GulfAfrican Bank	0.115	-0.883	-0.682	0.471**	0.383*	0.506
	0.885	0.117	0.205	0.045	0.063	0.292
Habib bank	-0.041	0.641	-0.269	0.899	0.685	0.872
	0.948	0.244	0.662	0.106	0.629	1.161
Habib AG Zurich	-0.174	0.498	-0.501	0.300	0.102	0.411
	0.779	0.393	0.39	0.669**	0.705	0.331
I & M Bank	-0.162	0.512	0.27	0.014	0.463	0.259
	0.794	0.378	0.66	0.886	0.532	0.510
KCB Bank	-.854*	-0.104	0.505	0.855	0.200	0.741
	0.066	0.868	0.385	0.897	0.173	0.686
K-Rep	-.854**	-0.104	0.505	0.394	0.201	0.320

	0.066	0.868	0.385	0.819	0.490	0.775
MIDDLE EAST	0.722	0.312	-0.76	0.687** *	0.460***	0.415** *
	0.168	0.609	0.136	0.004	0.006	0.002
National Bank	0.722	0.312	-0.76	0.930	1.925	0.594
	0.168	0.609	0.136	0.281	0.289	0.180
NIC Bank	-.906**	-0.646	0.651	0.761	0.174	0.888
	0.034	0.238	0.234	0.921	0.404	0.526
Oriental Bank	0.431	0.539	-0.298	0.449	0.533	0.668
	0.469	0.349	0.627	0.411	0.111	0.187
Paramount Bank	-0.051	-0.546	0.294	0.150	0.581	0.413
	0.935	0.341	0.631	0.222	0.955	0.899
Prime Bank	0.483	-0.344	-0.758	0.878*	0.285	0.809
	0.41	0.571	0.137	0.085	0.177	0.788
United Bank of Africa	0.435	0.416	0.116	0.868	0.597	0.706
	0.565	0.584	0.265	0.612	0.965	0.701
Stan-Chart	-.806*	-0.71	-.895**	0.873	0.486	1.106
	0.1	0.179	0.04	0.539	0.568	0.745
Trans National	0.243	-0.437	-.833*	.202	0.488	0.415** *
	0.694	0.462	0.08	0.211	0.710	0.002
Victoria Bank	0.767	-0.341	-0.076	0.118** *	0.941	0.741*
	0.13	0.574	0.903	0.001	0.108	0.077

*. Correlation is significant at the 0.1 level (2-tailed).

**. Correlation is significant at the 0.05 level (2-tailed).

***. Correlation is significant at the 0.01 level (2-tailed).