THE EFFECT OF MONETARY POLICY TOOLS ON PERFORMANCE OF LISTED

BANKING SECTOR AT THE NAIROBI SECURITIES EXCHANGE.

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DECLARATION

Declaration by the student

This MBA research project is my original work and has not been presented for examination in any other university or high learning institution.

Signature: ...~K~...   Date...10th NOVEMBER 2020...

Zipporah

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Declaration by the Supervisor

This research project report has been submitted for examination with my approval as the

University supervisor

Signature ...~Wangih~...   Date: 10 November 2020...

Prof. Cyrus Iraya

Add acknowledgement and dedication pages

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ACRONYMS AND ABBREVIATIONS

APT	Arbitrage Pricing Theory
ASEA	African Securities Exchanges
BAT	British American Tobacco
CAPM	Capital Asset Pricing Model
CBK	Central Bank of Kenya
CRR	Cash Reserve Ratio
EABL	East Africa Breweries Limited
GDP	Gross Domestic Product
I&M	Investment and Mortgages
IFE	International Fischer Effect
IRP	Interest Rate Parity
NPL	Non-Performing Loans
NSE	Nairobi Securities Exchanges
OLS	Ordinary Least Squares
OMO	Open Market Operations
ROA	Return of Assets
ROE	Return on Equity
ROI	Return on Investment
VAR	Vector Autoregressive Model
VECM	Vector Error Corrected Model

ABSTRACT

Effective monetary policy should promote return on investment and positive trend of share prices among listed companies. This calls for in-depth understanding of how monetary policies impact financial markets, which would in turn impact financial asset prices and patterns. Hence, main objective of this research in evaluating effect of monetary policy tools on share performance with focus on banks listed in Nairobi securities exchange. This study was based on international Fisher effect, interest rate parity and arbitrage portfolio theory. The reseach relied on time series data. Time series analysis was applied to analyse the data. KNBS and CBK annual reports were the sources of secondary data for this study. Monthly data was adopted. Stationarity tests were carried out and vector autoregressive model was fitted. Descriptive statistics and time series analysis analyzed the data. There was positive effect of central bank lending rate and money supply on share performance. Cash reserve ratio and open market operations has a negative effect share performance. Open market operations have positive effects on share performance. The study concludes, that the rate at which central bank lends, leads to a positive result on share performance, especially of those banks listed in Kenya. On the flipside, an increase in cash reserve ratio, negatively impacted on the share execution for the same banks. Whereas, an increase in open market operations increases share performance of listed banks. The country would also experience negative impact if money supply decreased. It can be recommended that there is need for policy makers to evaluate the extent of co-movement between monetary policy tools and share performance of listed banks so as to develop policies that would aid in achievement of the roles of the banking sector.

CHAPTER ONE:
INTRODUCTION

1.1 Background Information

Development aligned policies are key in the stabilization of the any economy. According to Laopodis (2013) these polices may not always achieve desired results due to sporadic nature of operating environment. Developed and developing economies have consistently adapted monetary policies to manage economic sporadic environment. Theoretical arguments by Irving (1930) on international Fischer theory is adopted in evaluation of spot currency price variations. The theory proposes adoption of interest rate to manage fluctuation of currencies. Use of interest rate free model allows the inclusion of inflation through market arbitrage opportunities. Interest rate parity theory argues that there are arbitrage opportunities that arise from difference between spot and forward rates in currency evaluation.

Business operating environment of commercial banks is subject to sporadic changes that have implications on share performance. According to Pearce and Robinson (2005) from millennium onwards, the operating business environment is sporadic, unpredictable and competitive. There is no guarantee for specific commercial bank competitiveness unless its operations are based on strategic goals. Moreover, they argued that there is no surety that performance will be sustainable even if an organization may have alternative products and services.

1.1.1 Monetary Policies

Monetary policies are measures adopted central banks with the aim of stabilizing return on investment amongst companies trading in securities market through control of interest rate volatility. Consequently, stock prices trends mirror cyclical trends associated with booms and recession. Moment of stock market crash have impact on negative pressure on economic performance and employment. To respond to it, Central Bank of Kenya (CBK), has to lower interest rate and increase money supply. There is no guarantee of these strategies impacting financial market as intended owing to degree of information asymmetry. Consequently, there

is need to pass information on the efficient mode. Consequently, there is need for monetary policies to rhyme with changes in market trends for them to transmit their effect to the real economy. For instance, CBK control on minimum discount rate have direct effect on interest rate and financial asset pricing which is depicted through investment choices and composition adopted (Francis, 2014).

The economy can be broadly classified into closed and open. According to Precious (2014) in an open economy, macroeconomic approach is adapted to stabilize and promote economic development. Anowor and Okorie (2016) argues that adoption of monetary policies have influence on employment, growth of GDP, price stabilization and equalization of BOP. According to Alvinasab (2016) there is need for development of monetary policy tools that would aid in achievement of economic objectives. Moreover, Fasanya, Onakoya and Agboluaje (2013) argued that accuracy on the effectiveness of macroeconomic policy implementation support economic growth.

According to Laopodis (2013) monetary policy tools in an economy have direct and indirect effect on commercial bank operations. For instance, interest rate effect is implemented in balance sheet management through securitization, credit management through use of tools on management of short term and long-term debt portfolio. Indirect monetary policies deploy market include discount rates, reserve requirements and open market operations. In addition, monetary policy framework should incorporate consumer price index for evaluating inflation. In this study monetary policy will be operationalized as central bank lending, CRR, OMO and money supply (Mulwa, 2015; Ayodele, 2014).

1.1.2 Commercial Bank Performance

Firm performance can be defined as yard stick of changes in shareholders wealth upon investment in a given company. Even though, there are alternative measures of firm performance which have been adopted by different empirical studies for instance Sehrish, Saleem and Yasir (2012) used Return on Assets (ROA), share price growth and sales. Locally, Ongore (2011) measured it using ROA, Return on Equity (ROE) and dividend yield. Mule (2013) adopted ROA, ROE and Tobin's Q model.

In some instances, banks have attributed their credit risk poor portfolio composition to insider lending, macroeconomic instability and lending to high risk borrowers whose credit worthiness is not tenable (Kariuki, 2013). Consequently, commercial banks have resulted to investment in government securities to mitigate these challenges (Ngige, 2011). This is in line with recommendations by Kariuki (2013) who argued that there is need for commercial banks to integrate their risk evaluation criterion with prevailing economic conditions and subsequently mitigate themselves against unstable performance. In this study, banking performance will be operationalized as weighted average of equity return of 10 listed banks in Kenya.

1.1.3 Monetary Policies and Commercial Banks Performance

Performance is causally affected by monetary policies as put forth by Central Bank. Loan intake is adversely influenced by prevailing monetary policies. According to Olokoyo (2011) there is causality between central bank lending rate, money supply, foreign exchange policy and micro economic characteristics such as liquidity, asset quality and capital adequacy. Increased uptake of loan would increase interest revenue generation capacity of commercial banks which would increases its performance. Developed and developing economies have consistently adopted measures which are geared towards market condition control or loan portfolio composition controls (Ajie & Nenbee, 2010). These measures include; policy guidelines, risk management guidelines, money policies formulation and review. These aspects have individual or joint effects on commercial banks performance.

Manipulation of monetary policies have effect on supply of money, central bank rate, cash reserve policy and reserve requirements. These policies may create imbalances which create shocks on economic development which would alter the rate of individual or corporate consumption, individual or government investment, balance of payment (Atanda, 2012). Due to these erotic changes the loan supply would be significantly affected and impact on interest income amongst commercial banks which would casually affect commercial bank performance. In Nigeria it has been documented that there is causality between monetary policies on loan supply (Ogunyemi, 2013).

Banking system have pivotal role on economic development through bridging gaps between deficit and surplus savings units (Ngure, 2014). Further, it is anticipated that commercial banks will manage the extent of risk exposure between lenders and borrowers. To achieve this and cushion depositors against losses, then CBK regulates the conduct of commercial banks. Wainaina (2013) argued that profitable commercial banks sustain economic development and growth. For them to make profit then they ought to charge interest rate amongst borrowers (Victor, 2013). Lack of regulation and policy guidelines on rate of interest to be charged may create an avenue for wealth maximization without consideration of customer's interest. According to Corb (2012) failure to control interest rate may escalate inflation rate volatility which may jeopardize profitability of commercial banks entities. Increased reserve requirements may limit the amount of money in supply which would erode commercial bank capacity to lend (Rasheed, 2010). Deprived lending power amongst commercial banks would interfere with their profitability capacity.

1.1.4 Nairobi Securities Exchange (NSE)

NSE, serves as a main financial asset market in Kenya for local and foreign investors. It traces back its history to pre-colonial period when it commenced its operations upon registration in 1954 under guidelines of societies Act. It is the oldest with the highest listing in East Africa. According to Oguna (2014) NSE trading volume is ranked fourth as per market capitalization in Africa. Currently there are 68 listed companies in Kenya.

Although, 43 banks are licensed, only 39 are currently operational owing to some banks being placed under statutory management or placed under receivership (Cytonn, 2015). Listed banks in Kenya are; Absa, CFC Stanbic, DTB, Equity Bank, HFC, I&M, KCB, NCBA, Standard Chartered Bank and the Co-operative Bank.

1.2 Research Problem

Monetary policy formulation is aimed at macroeconomic environment stabilization through price stabilization and employment promotion. Consequently, policy makers should strive to develop policies geared towards economic growth. This is contingent to adoption of tools

geared towards interest rate and credit control management. Effective monetary policy should promote return on investment and positive trend of share prices among listed companies. This calls for in-depth understanding of how monetary policies impact financial markets, which would in turn impact financial asset prices and patterns. Empirical evidence has documented alternative factors contributing to financial assets performance, they include governance, policies and structure, micro economic attributes, government rules and regulations, lagging and leading macroeconomic attributes and climatic conditions.

There has been intensified empirical studies on examination of the causality between monetary policies and share performance. For instance, Kosimbei (2012) revealed that Central Bank of Kenya has been biased on adoption of open market operations to regulate monetary policies. Further, there have been regulatory changes on capping of interest rates in Kenya from 2016, which may have impacted the performance of listed banks. Mulwa (2015) investigated monetary policies on banking performance. It was found that banking performance was affected by CAMEL, macro-economic characteristics and financial structure characteristics. These variables would not have been explored concurrently since macro-economic indicators were time series in nature while the rest were panel.

Ayodele (2014) argued that Nigerian commercial banks performance is dependent on micro and macro-economic characteristics. These attributes ought not to have been combined since there were from different levels of measurement of liquidity ratio. Financial performance were panel and the rest were time series hence it did not warrantee their joint influence examination. Mugure and Koori (2018) reported that in Kenya, commercial bank financial performance is dependent on CRR, Ms, exchange rate, inflation and bank size. It was appropriate to exclude bank size and use index number to measure financial performance. Further, it may not only provide additional theoretical and empirical evidence but also fill any empirical existing gap in developing economies. Moreover, the study investigated policy issues.

1.3 Main of objective of the Study

The research's main goal is to evaluate the effect of monetary policy tools and how its shares perform on listed banks in Nairobi securities exchange.

1.4 significance of the Study

The study may be of value to bank management, regulatory authority, investors and academics: Banks management: Listed banks may benefit through creation of a localized model. Empirical examination is paramount to commercial bank performance since changes in monetary policies,have influence on revenue generation. Through this study commercial banks management can evaluate anticipated earnings as per policies adopted by monetary policy committee.

Regulatory authorities: The CBK is bestowed with regulation role and therefore may be better placed in executing its monitoring policy. Further the study may reveal whether commercial banks exchange transactions are in adherence with provisions as stipulated in commercial banks licensing requirements. In this era of capped interest rate, CBK would be more informed in evaluation of changes to adopt while adjusting commercial bank lending rates.

Investors and Members of the public: The current study may explore past trends on monetary policies and how they have affected the exchange rate. Through this current and potential investor will have investment appraisal evaluation tool. Moreover, members of the public may receive clearly elaborated information on the causality between share performance and monetary policy. Academicians and Scholars: This study may evaluate existing theoretical and empirical review on Kenyan perspective between variables of interest.

CHAPTER TWO:

LITERATURE REVIEW

2.1 Introduction

In this chapter, past empirical and theoretical evidence on effect of monetary policies on share performance will be presented. Empirical literature research will be identified and conceptual framework will be drawn to show the link between respective study variables.

2.2 Theoretical Review

Theoretical arguments, weakness, strengths and how they support the study may be discussed.

2.2.1 International Fisher Effect theory

The proponent of this theory was Fisher (1990). The theory proposes that stabilization of exchange rates can be achieved through changes in interest rates. Further, it argues that there are chances of equal interest rate in different economies, but the situation is not sustainable since there are arbitrage opportunities that may arise promoting flow of capital from one economy to another. Real interest is always higher in those economies whose inflation rates are higher (Lagat & Nyandema, 2016). According to Ebiringa and Anyaogu (2016) spot rates may not be static in two countries since they must reflect nominal interest rates differences. The theory is fit for the study because there is need for understanding the effect of CBK rate, CRR, OMO and Ms which may be impacted by changes in exchange rate in different continents.

2.2.2 Interest Rate Parity

The theory was developed Keynes (1923). IRP depicts the interrelationship of interest and exchange rate in two nations. According to Ebiringa and Anyaogu (2014) there is a likelihood of effect of interest rate differentials in two economies that would promote arbitrage opportunities. In situations where there is no arbitrage opportunities then a state of equilibrium

will be achieved. This may not be sustained for long since risk neutral investors may have expectations that there may be future changes that may impact profitability among parties (Zhang & Dou, 2014).

This study adopted the theory since it is dominant in estimation of exchange rate in different economies. Monetary policies evaluated in the study are CBK rate, CRR, OMO and Ms which may be impacted by changes in exchange rate in different continents.

2.2.3 Arbitrage Portfolio Theory

Ross (1976) was the proponent of the above-mentioned theory. The assumption is that there lack simultaneous opportunities for buying and selling of securities in a stock market. Hence, it is possible to estimate stock return in absence of arbitrage opportunities. It assumes that capital markets are perfectly competitive, and investors have preference for more wealth. APT dominance in stock valuation is due to the fact that it is less restrictive as compared to Capital Asset Pricing Model (CAPM) that assumes that stock return is affected by a single factor.

According to APT there are 'n' factors that affects stock return. Adoption of the model for stock valuation should be customized since there are different attributes that may have effects on stock performance. Further, it does not evaluate the whole stock market but values the effect in respective stock. According to Connor and Korajczyk (1993) the theory is not void of short comings such as it cannot be relied on over a period of time. The theory is appropriate in examination of the effect of CBK, CRR, OMO, Ms on banks share performance in Kenya.

2.3 Determinants of Commercial Banks Performance

2.3.1 Share Performance

Share performance is defined as the value generated from investment made by a corporation or the change in wealth inform of capital gains (Pandey, 2008). Evaluating performance of firms is vital, so as to know the viability of a business with profitability being the ultimate indicator of good performance in banks. In this study banking performance will be operationalized as weighted average of share performance of the ten listed banks in Kenya.

2.3.2 Central Bank Lending

Internal factors were purported to banking capacity to adhere to regulatory requirement guidelines as stipulated by local and international regulators. External influencers include macro-economic attributes; Ms and CBR had significant contribution (Victor, Ozioma, Cheka & Samuel, 2017). These findings are not generalizable in Kenyan situation since the state of economic development and business environment are different in Kenya and Nigeria. Central bank rate will be the reserve rate charged by CBK as determined by the monetary policy committee.

2.3.3 Cash Reserve Ratio

CRR is the minimum portion of customers' total deposits that should be held as reserves as cash or deposit with Central Bank. The amount specified is held as cash and cash equivalents. This is aimed at cushioning banks from running out of cash whenever customers are in need (Francis, 2014).

2.3.4 Open Market Operations

OMO is the period in which central bank of a country buys or sell short term securities in a market so to manage money in circulation. This will control the amount of money that can be lent out to individuals and banks. Government may issue treasury securities to borrow from the public and decrease amount of money in supply and pay back so as to increase the supply of money. This may aid in management of liquidity, interest and inflation rate as well as manipulate the short-term supply of money (Kosimbei, 2012)

2.3.5 Money Supply

Money supply is an economic element that supports economic growth and development through provision of private and public liquidity. Money supply ensures that private sector players have access to credit that would aid in pursuance of business opportunities. According to Prasert, Kanchana, Chukiat and Monekeo (2015) money supply is an important pillar for economic development since it has influence of not only credit costs but also its availability.

2.4 Empirical Review

2.4.1 World overview Studies

Nguyen, Vu and Le (2017) examined monetary policy and banking performance in Vietnam. Panel research design was adopted, and 20 purposively selected commercial banks data collected for periods 2007 to 2014. Panel regression modelling was adopted to model the causality. Monetary policy influenced banks positively. It was recommended that monetary base of commercial banks ought to be continuously evaluated to optimize on commercial banks performance. Panel diagnostic tests were necessary prior to fitting regression models, this would have mitigated on possibilities of drawing biased conclusions.

Francis (2014) investigated the African case on determinants of banking profitability. Through panel regression modelling approach, the study found that commercial banks profitability is dependent on GDP, inflation rate, liquidity, growth in assets and operational efficiency. Although, the study collated banking and macro-economic characteristics it fitted classical model on the same which was not appropriate since some variables were in time series and others in panel.

A Nigerian study by Ekpung, Udude and Uwalaka (2015) evaluated causality between banking performance and monetary policy. Ordinary least squares model was fitted on time series data collected over 36 years. It was concluded that monetary policy had significant contribution on asset liability management in Kenya. There was concern on the need for government's active role in creation of viable business environment which will optimize banking profitability.

In Pakistan Zaman, Arslan, Sohail and Malik (2014) fitted OLS fitted panel data collected from 2007 to 2011. Interest rate had a negative impact while firm size had a positive impact on profitability. There was mix up on types of data since firm size and financial performance were panel in nature and interest rate was time series. Further, the choice of OLS was not appropriate and time series approach ought to have adopted to examine the causality.

2.4.2 Local Studies

In Kenya Kerongo and Nyamute (2016) evaluated effect of monetary policies on banking sector performance. Study findings documented negative effect of CBR, CRR and bank performance while OMO had positive effect. Although, the data was time series in nature the study adopted classical regression analysis which may have exposed the study to biased findings. There was need to adopt weighted average to evaluate banking performance. However, the study failed to report results of any diagnostic test they carried out.

Mutwol and Kubasu (2016) examined the loan performance against monetary policy. Cross sectional research design was adopted. Chi square and descriptive statistics analysed the data. Non-Significant influence of OMO, CBK rate and minimum reserve requirements on loan portfolio performance were reported. It was appropriate to adopt time series analysis or case study rather than cross sectional research design. Also, Chi square and correlation ought to have been complemented with confirmatory factor analysis.

Rotich (2016) examined macroeconomic characteristics and performance of listed firms in NSE. Classical regression was applied to examine the causality despite the data being time series for macro-economic characteristics and panel for firm performance. Negative insignificant effect of interest rate and GDP was reported while inflation rate and money supply had positive non-significant influence. In contrast real exchange rate had positive impact. Time series analysis in favour of regression analysis ought to have been adopted to analyse the data.

Otambo (2016) studied banking performance and macro-economic variables. Correlation research design was adopted. Classical regression model was fitted on the data. Study findings documented positive effect of interest rate and negative effect of GDP and inflation rate on banking performance.

2.5 Conceptual Framework

According to Kothari (2011) conceptual framework is diagrammatic presentation of logical flow between study variables. Monetary policy will be operationalized as Ms, CBK rate, CRR

and OMO. Listed commercial bank performance will be operationalized as weighted average of commercial banks share performance (share return). The effect is as shown in Figure 2.1.
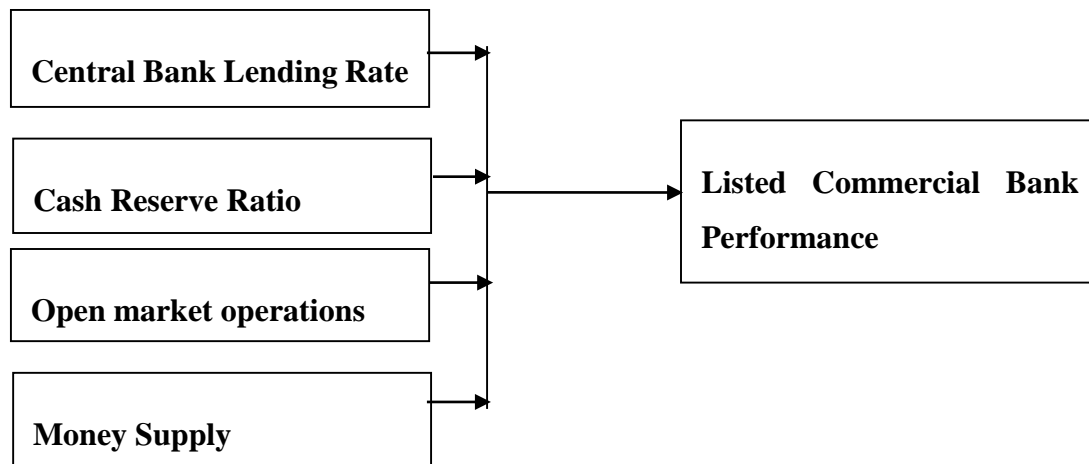
Figure 2.1 Conceptual Framework

2.6 Summary of Literature Review

From theoretical and empirical review, it has emerged that there are inconsistencies on study findings which may be attributed to wrong choices of research design. Most studies have mixed panel and time series data and have gone to the extent of fitting ordinary least squares model without carrying out classical regression test. This may have opened up an avenue for drawing biased findings.

Further, some studies adopted descriptive research design which may not have created reliable measurement of monetary policies such as CBK rate and Ms evaluation using questionnaires. There is need to analyze the study especially after changes in Companies act in 2015 as well as changes in International financial reporting policy on provisions.

CHAPTER THREE:

RESEARCH METHODOLOGY

3.1 Introduction

This chapter discusses methodological approach adopted by the entire the research. This include the design under which it was conducted, data collection and analysis methods are discussed and their choice justified.

3.2 Research Design

This is a procedural framework detailing how research study may be executed (Kombo & Tromp, 2006). The design that was applied was descriptive according to Oso and Onen (2009), should be adopted when the study aims at responding to questions such as when, how and what is the situation under examination.

3.3 procedures for Data Collection

Secondary data was gathered from Kenya National Bureau of Statistics (KNBS). Monthly time series data on monetary policy tools and panel data for listed commercial banks was gathered and later consolidated to form weighted index for listed bank share performance. Data collection tool had six items which were; total assets, monthly share prices, and CBK rate, CRR, OMO and Ms. The study run for a nine-year period from September 2010 and April 2020.

3.4 Data and Data Analysis

The study relied on time series data. Time series analysis was applied to analyse the data. Secondary time series data was collected from KNBS and CBK. Monthly data was adopted. Stationarity tests were carried out and vector autoregressive model was fitted. Multiple regression was as shown:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \varepsilon$$

Y = Share Performance; β_0 = Y intercept, value of Y when all X's are zeros; β = Beta coefficient; X_1= Money supply, X_2= Interest rate, X_3= Inflation Rate, X_4= Reserve Requirements, ε = Error term.

NB: Since there are 10 banks listed in NSE, weighted average share performance index was calculated. Total assets for each commercial bank was used as the weighting factors and relative price changes of each commercial bank shares measured its respective performance.

Regression is anchored on five assumptions and they ought to be evaluated prior to classical modelling. They include: linearity, normality, multicollinearity, homoscedasticity and serial correlation. Moreover, granger causality, cointegration and stationarity were examined to eliminate likelihood of fitting spurious model in time series data.

Predictable and independent variables are assumed to have linear relationship. This can be examined through use of scatter plots and it can be positive or negative. Regression analysis should be adopted in parametric data. Normality may be evaluated through graphical and statistical tests. Dominant graphs are box plots, stem and leaf, histograms, PP plots and QQ plots. Statistical tests include Jarque Berra, Kolmogorov-Smirnov. These tests assume normality of data with P value < 0.05, if the data is not normal, thentransformation should be carried out to normalize it.

Regression modelling assumes that independent variables are not correlated. Collinearity for independent variables is examined through use of variance inflation factors (VIFs) and tolerance limits. Baltagi (2005) argued that when VIF are greater than 10 and tolerance limits less than 0.1 then there is collinearity and calls for model re-specification to delete highly correlated variables from the model. Classical modelling assumes that error term has equal variance. It will be examined through use of likelihood ratio and if p value >0.05, them there will be non-uniform variance and fixed generalized least squares (FGLS) model will be fitted. Autocorrelation assumes that the error term is not dependent on past period's characteristics. It will be examined through use Woodridge test, with null hypothesis of no serial correlation.

Granger causality examines whether there is a nexus between two study variables (Granger, 1988). In the current study granger causality assumes reverse effect between monetary policy tools and share performance. ADF was applied for stationarity analysis.

3.5 Test of Significance

Hypothesis was tested for rejection and acceptance at 5% level of significance. At this level there will be 5% chances of making the wrong decisions and 95% likelihood of making the right decision. Alternative hypothesis may be acceptable whenever p value < 0.05.

CHAPTER FOUR:

DATA ANALYSIS, FINDINGS AND DISCUSSION

4.1 Introduction

This section comprises analysis of data, presentation of findings and discussion. Data analysis include descriptive, correlation, multiple regression and time series analysis.

4.2 Descriptive Statistics

Descriptive analysis for the study is in Table 4.1 study indicates that the average share performance of listed banks was 20% with a maximum of 29% and minimum of 7%. The share performance was not normal since Jarque Berra coefficient was 12.96 with p value < 0.05. The mean central bank lending rate was 9% with the lowest being 8% and highest of 13%. The mean cash reserve ratio was 5% with minimum of 4%. The average open market operations was 15% with a maximum of 34%. The average money supply was 9.25 with a maximum of 9.65.

Table 4.1 Descriptive Statistics

	SP	CBLR	CRR	OMO	MS
Mean	1.20	1.09	1.05	1.15	9.25
Median	1.24	1.08	1.05	1.15	9.24
Maximum	1.29	1.13	1.05	1.34	9.65
Minimum	1.07	1.08	1.04	1.06	8.78
Std. Dev.	0.07	0.03	0.00	0.07	0.26
Skewness	-0.35	1.33	-2.25	0.64	-0.19
Kurtosis	1.52	6.75	6.53	2.77	1.79
Jarque-Bera	12.96	102.22	158.37	8.05	7.73
Probability	0.00	0.00	0.00	0.02	0.02
Sum	139.31	126.16	121.97	133.16	1073.13
Sum Sq. Dev.	0.62	0.13	0.00	0.55	7.95
Observations	116	116	116	116	116

4.2.1 Trend Analysis

Trend analysis was evaluated through use of line graphs as shown in Figure 4.1. Share performance of listed commercial banks had upward and downward trend on its performance, with a sharp decline during electioneering years. Between 2018 and 2019 there was a positive increase in performance which was reversed from 2019 to 2020. The central bank lending rate had upward and downward trends, though from 2016 the rate had minimal changes to 2020. The cash reserve ratio recorded upward change which was hierarchical in order from 2010 to 2012 and stagnated till 2019 which it recorded a decrease. Open market operations of commercial banks recorded spiral trends with upward and downward trends, though from 2017 the rate of change was small compared to 2013 to 2016. The money supply has recorded positive growth within the period under examination though the growth was not linear.
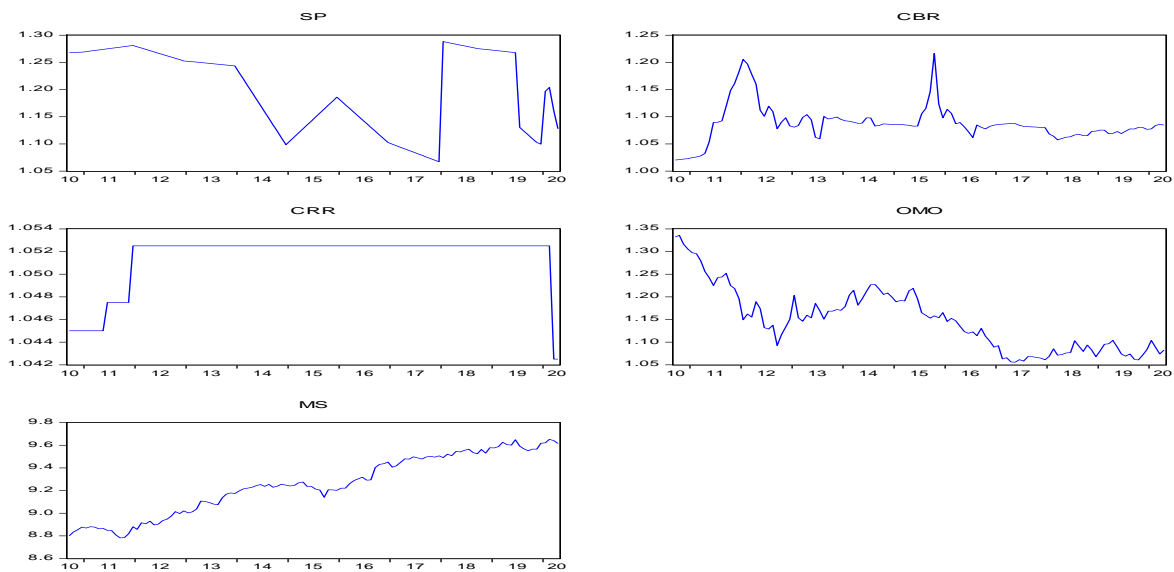
Figure 4.1 Trend Analysis

4.3 Correlation Analysis

Correlation findings in Table 4.2, indicates that there was positive effect of CBR on share performance (rho = 0.001, p value > 0.05). CRR has a negative effect share performance of listed banks (rho = -0.274, p value < 0.05). OMO have positive effects on share performance

of listed banks (rho = 0.324, p value < 0.05). There was negative effect of money supply on share performance of listed banks (rho = -0.445, p value < 0.05).

Table 4.2 Correlation Analysis

	SP	CBR	CRR	OMO	MS
SP	1				
CBR	0.001	1			
	0.993	-----			
CRR	-0.274	0.327	1		
	0.003	0.000	-----		
OMO	0.324	-0.078	-0.555	1	
	0.000	0.402	0.000	-----	
MS	-0.445	-0.237	0.420	-0.797	1
	0.000	0.011	0.000	0.000	-----

4.4 Regression Analysis

Classical model was applied and findings in Table 4.3 indicates that monetary policy have significant effect on share performance of listed banks in Kenya (F=8.217, p <0.05). An R^2 of 0.628, indicates that 62.8% changes of share performance of listed banks in Kenya can be explained by monetary policy tools. Further, there was positive effect of CBR on share performance (β= 0.291, p value > 0.05). CRR have negative effect on share performance of listed banks in Kenya (β= -2.940, p value > 0.05). Open market operations have positive effect on share performance of listed commercial banks (β= 0.257, p value > 0.05). Money supply have inverse effect on share performance of listed banks in Kenya (β= -0.175, p value > 0.05).

Table 4.3 Regression Analysis

Variable	Coefficient	Std. Error	t-Statistic	Prob.
C	6.521	3.253	2.004	0.048
CBR	0.291	0.226	1.289	0.200
CRR	-2.940	3.121	-0.942	0.348
OMO	0.257	0.169	1.522	0.131
MS	-0.175	0.045	-3.898	0.000
R-squared	0.628	Mean dependent variable		1.201
Adjusted R-squared	0.611	S.D. dependent variable		0.073
S.E. of regression	0.065	Akaike info criterion		-2.572
Sum squared residuals	0.476	Schwarz criterion		-2.453
Log likelihood	154.184	Hannan-Quinn criterion.		-2.524
F-statistic	8.217	Durbin-Watson stat		0.204
Prob (F-statistic)	0.000			

4.4.1 Normality Test

Since classical modelling is based on several assumptions five were tested; normality of the error term was examined using histogram. In Figure 4.2 indicates normality of error term with mean zero and variance one.
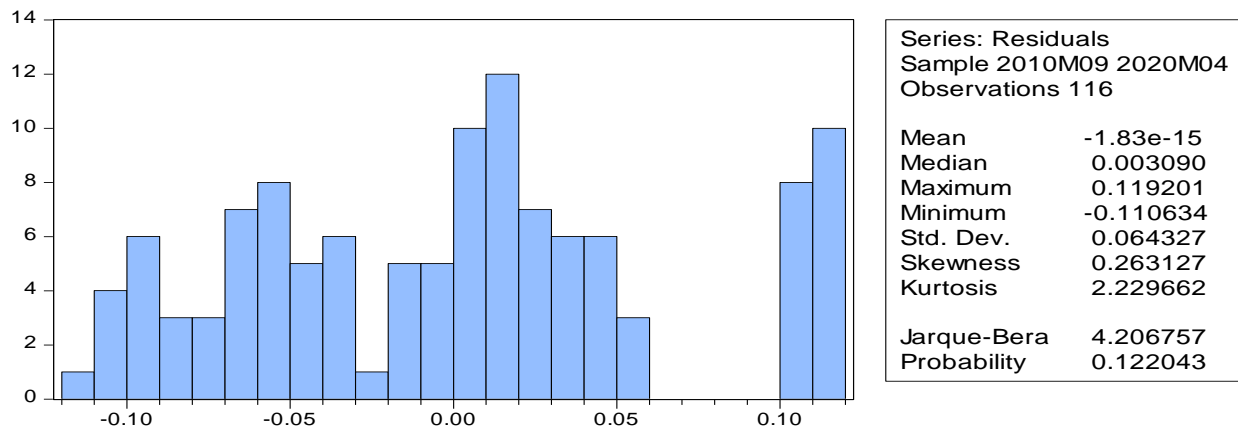
Figure 4.2 Normality Test

4.4.2 Serial Correlation Test

Results in Table 4.4 indicates presence of first order serial correlation since p value <0.05. Hence, ordinary least squares model ought not to be fitted. In its favour feasible generalized least squares can.

Table 4.4 Serial Correlation Test

F-statistic	234.8932	Prob. F(2,109)	0.000
Obs*R-squared	94.15429	Prob. Chi-Square(2)	0.000

4.4.3 Heteroscedasticity

Homoscedasticity is a condition in which the error has a constant variance within the period under examination. Findings in Table 4.5, indicates none homoscedasticity hence there was no uniform variance of error terms across variables under examination.

Table 4.5 Heteroscedasticity Test

F-statistic	32.922	Prob. F(4,111)	0.000
Obs*R-squared	62.944	Prob. Chi-Square(4)	0.000
Scaled explained SS	35.436	Prob. Chi-Square(4)	0.000

4.4.4 Linearity Test

Linearity assumption between monetary policy tools and share performance of listed banks was evaluated through use scatter plot. In Figure 4.3, monetary policy tools have weak positive and negative relationship on share performance of listed banks in Kenya.
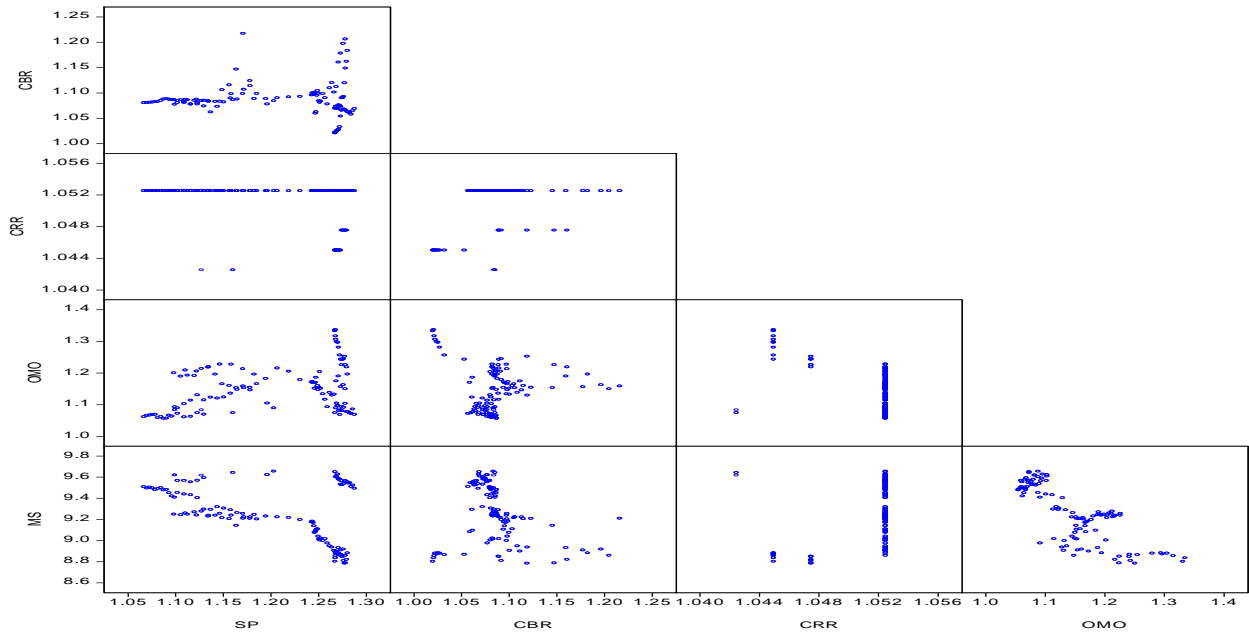
Figure 4.3 Linearity Test

4.4.5 Randomness of Error Term

Findings in Figure 4.4 indicates there was no randomness across the error term.
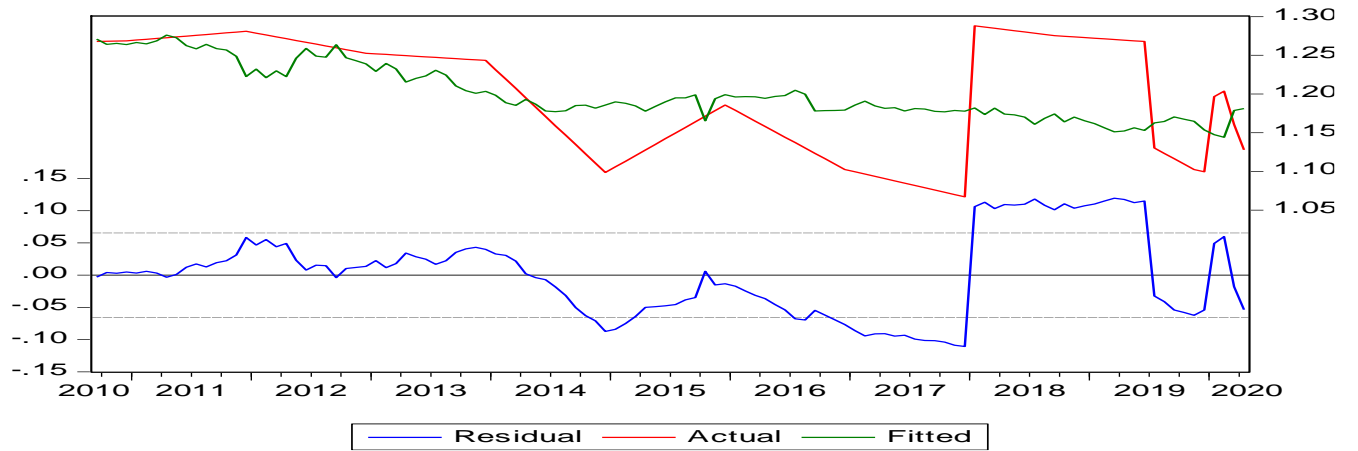
Figure 4.4 Randomness of Error Term

4.4.6 Multicollinearity Test

Multicollinearity is a condition in which there is a high correlation among independent variables. VIF and tolerance limits examined multicollinearity as in Table 4.6. Since the VIFs were less than 10, then there was no collinearity of CBR, CRR, OMO and MS.

Table 4.6 Multicollinearity

| | Collinearity Statistics | |
	Tolerance	VIF
CBR	0.98	1.02
CRR	0.88	1.14
OMO	0.99	1.01
MS	0.89	1.12

4.5 Time Series Analysis

With exception of multicollinearity and normality the other classical assumptions evaluated were violated. Time series analysis was applied.

4.5.1 Stationarity Test

ADF was adopted for examination of stationarity. Results in Table 4.7 indicates that share performance, CBR, CRR, OMO and MS were stationary at levels hence there was no need for differencing them.

Table 4.7 Stationarity Test

Variable		T statistics	Critical Value at 5 %	P value
Share Performance	C	-9.968	-2.886	0.000
	C. V	-9.921	-3.450	0.000
CBR	C	-8.863	-2.887	0.000
	C. V	-8.885	-3.450	0.000
CRR	C	-10.587	-2.887	0.000
	C.V	-11.106	-3.450	0.000
OMO	C	-11.197	-2.887	0.000
	C.V	-11.305	-3.450	0.000
MS	C	-11.597	-2.887	0.000
	C.V	-11.561	-3.450	0.000

Key. C- Constant
     C.V- Constant and Value

4.5.2 Lag Selection

Findings in Table 4.8 indicates that the optimal number of lags were two.

Table 4.8 Lag Selection

Lag	LogL	LR	FPE	AIC	SC	HQ
0	1130.980	NA	1.27e-15	-20.1068	-19.9854	-20.0575
1	1723.441	1121.445*	5.07e-20*	-30.24003*	-29.51186*	-29.94458*
2	1742.738	34.80259	5.63e-20	-30.1382	-28.8032	-29.5965
3	1756.085	22.88096	6.97e-20	-29.9301	-27.9883	-29.1423
4	1769.266	21.41919	8.72e-20	-29.719	-27.1705	-28.685

 * indicates lag order selected by the criterion

4.5.3 Granger Causality Test

Causal link between monetary policy tools and share performance of listed commercial banks indicate that there was unidirectional causality from central bank lending rate and open market operations. There was unidirectional causality between money supply and open market operations. There was no causality between CBR, CRR, OMO, MS and SP.

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Table 4.9 Granger Causality Test

Key : dnGC: does not Granger Cause

Null Hypothesis:	F-Statistic	Prob.
CBR dnGC SP	0.047	0.954
SP dnGC CBR	0.137	0.872
CRR dnGC SP	1.195	0.307
SP dnGC CRR	0.024	0.976
OMO dnGC SP	0.207	0.813
SP dnGC OMO	0.071	0.931
MS dnGC SP	0.737	0.481
SP dnGC MS	1.184	0.310
CRR dnGC CBR	1.564	0.214
CBR dnGC CRR	1.175	0.313
OMO dnGC CBR	4.281	0.016
CBR dnGC OMO	0.074	0.929
MS dnGC CBR	5.847	0.004
CBR dnGC MS	1.474	0.234
OMO dnGC CRR	0.322	0.726
CRR dnGC OMO	1.016	0.366
MS dnGC CRR	1.567	0.213
CRR dnGC MS	1.526	0.222
MS dnGC OMO	0.549	0.579
OMO dnGC MS	4.617	0.012

4.5.4 Cointegration Test

Johansen Co-integration test was fitted to examine long run effect of monetary policy tools on share performance of listed banks. In Table 4.10, there was no co-integration between CBR, CRR, OMO, MS and SP. Due to absence of cointegration the Vector Autoregressive model was fitted to examine the effect of monetary tools on share performance of listed banks in Kenya.

Table 4.10 Cointegration Test

Hypothesized No. of CE(s)	Eigenvalue	Trace Statistic	0.05 Critical Value	Prob.**
None	0.188	64.760	69.819	0.119
At most 1	0.163	41.592	47.856	0.171
At most 2	0.106	21.832	29.797	0.308
At most 3	0.080	9.355	15.495	0.334
At most 4	0.001	0.080	3.841	0.777

Trace test indicates no cointegration at the 0.05 level
* denotes rejection of the hypothesis at the 0.05 level
**MacKinnon-Haug-Michelis (1999) p-values

4.5.5 Vector Autoregressive Model

VAR model indicated that 88% of changes in SP of listed bank was accounted for by two past period SP, CBR, CRR, OMO and MS lagged one period had significant effect on SP of listed banks. There was positive and no significant effect of CBR, CRR, OMO, MS and SP of listed banks. The resultant equation of the study is of the form:

SP = C(1)*SP(-1) + C(2)*SP(-2) + C(3)*CBR(-1) + C(4)*CBR(-2) + C(5)*CRR(-1) + C(6)*CRR(-2) + C(7)*OMO(-1) + C(8)*OMO(-2) + C(9) *MS(-1) + C(10)*MS(-2) + C(11)

Table 4.11 Vector Autoregressive Model

	Coefficient	Std. Error	t-Statistic	Prob.
C(1)	0.97	0.1	9.77	0.00
C(2)	-0.08	0.1	-0.79	0.43
C(3)	-0.01	0.17	-0.06	0.96
C(4)	-0.02	0.17	-0.11	0.91
C(5)	2.01	2.49	0.81	0.42
C(6)	-4.01	3.02	-1.33	0.18
C(7)	0.09	0.16	0.55	0.58
C(8)	-0.21	0.17	-1.25	0.21
C(9)	-0.06	0.1	-0.62	0.53
C(10)	0.03	0.1	0.32	0.75
C(11)	2.68	2.01	1.33	0.18

C(12)	0.01	0.06	0.12	0.9
C(13)	-0.01	0.05	-0.18	0.85
C(14)	0.94	0.09	10.06	0.00
C(15)	-0.1	0.1	-1.03	0.3
C(16)	1.39	1.39	1	0.32
C(17)	-1.74	1.69	-1.03	0.3
C(18)	-0.2	0.09	-2.19	0.03
C(19)	0.18	0.09	1.92	0.05
C(20)	-0.15	0.06	-2.78	0.01
C(21)	0.14	0.05	2.61	0.01
C(22)	0.66	1.13	0.59	0.56
C(23)	-0.002	0	-0.45	0.65
C(24)	0.001	0	0.16	0.87
C(25)	0.001	0.01	0.14	0.89
C(26)	0.001	0.01	0.1	0.92
C(27)	0.94	0.1	9.46	0.00
C(28)	-0.03	0.12	-0.28	0.78
C(29)	0.005	0.01	0.73	0.47
C(30)	-0.01	0.01	-1.26	0.21
C(31)	-0.003	0.001	-0.77	0.44
C(32)	0.002	0.001	0.42	0.67
C(33)	0.12	0.08	1.46	0.14
C(34)	0.02	0.06	0.35	0.72
C(35)	-0.02	0.06	-0.28	0.78
C(36)	0.03	0.1	0.33	0.74
C(37)	-0.1	0.11	-0.9	0.37
C(38)	-1.95	1.52	-1.28	0.2
C(39)	3.59	1.84	1.95	0.05
C(40)	0.86	0.1	8.83	0.000
C(41)	0.06	0.1	0.55	0.58
C(42)	0.02	0.06	0.41	0.68
C(43)	-0.04	0.06	-0.73	0.47
C(44)	-1.4	1.23	-1.14	0.25
C(45)	0.17	0.09	1.79	0.07
C(46)	-0.17	0.09	-1.76	0.08
C(47)	0.22	0.16	1.39	0.17
C(48)	-0.31	0.17	-1.89	0.06
C(49)	0.49	2.38	0.2	0.84
C(50)	2.73	2.89	0.95	0.35

C(51)	-0.38	0.15	-2.48	0.01
C(52)	0.28	0.16	1.75	0.08
C(53)	0.88	0.09	9.3	0.00
C(54)	0.08	0.09	0.86	0.39
C(55)	-2.76	1.93	-1.43	0.15

SP = C(1)*SP(-1) + C(2)*SP(-2) + C(3)*CBR(-1) + C(4)*CBR(-2) + C(5)*CRR(-1) + C(6)*CRR(-2) + C(7)*OMO(-1) + C(8)*OMO(-2) + C(9) *MS(-1) + C(10)*MS(-2) + C(11)

R-squared	0.88	Mean dependent variable		1.2
Adjusted R-squared	0.86	S.D. dependent variable		0.07
S.E. of regression	0.03	Sum squared residuals		0.08
Durbin-Watson stat	2.04			

CBR = C(12)*SP(-1) + C(13)*SP(-2) + C(14)*CBR(-1) + C(15) *CBR(-2) + C(16)*CRR(-1) + C(17)*CRR(-2) + C(18)*OMO(-1) + C(19) *OMO(-2) + C(20)*MS(-1) + C(21)*MS(-2) + C(22)

R-squared	0.8	Mean dependent variable		1.09
Adjusted R-squared	0.79	S.D. dependent variable		0.03
S.E. of regression	0.02	Sum squared residuals		0.02
Durbin-Watson stat	2.06			

CRR = C(23)*SP(-1) + C(24)*SP(-2) + C(25)*CBR(-1) + C(26) *CBR(-2) + C(27)*CRR(-1) + C(28)*CRR(-2) + C(29)*OMO(-1) + C(30) *OMO(-2) + C(31)*MS(-1) + C(32)*MS(-2) + C(33)

R²	0.82	Mean dependent variable		1.05
Adjusted R²	0.8	S.D. dependent variable		0.002
S.E. of regression	0	Sum squared residuals		0.0001
Durbin-Watson stat	1.97			

OMO = C(34)*SP(-1) + C(35)*SP(-2) + C(36)*CBR(-1) + C(37) *CBR(-2) + C(38)*CRR(-1) + C(39)*CRR(-2) + C(40)*OMO(-1) + C(41) *OMO(-2) + C(42)*MS(-1) + C(43)*MS(-2) + C(44)

R-squared	0.94	Mean dependent variable		1.14

Adjusted R-squared	0.94	S.D. dependent variable		0.07
S.E. of regression	0.02	Sum squared residuals		0.03
Durbin-Watson stat	2.02			
MS = C(45)*SP(-1) + C(46)*SP(-2) + C(47)*CBR(-1) + C(48) *CBR(-2) + C(49)*CRR(-1) + C(50)*CRR(-2) + C(51)*OMO(-1) + C(52) *OMO(-2) + C(53)*MS(-1) + C(54)*MS(-2) + C(55)				
R-squared	0.99	Mean dependent variable		9.26
Adjusted R-squared	0.99	S.D. dependent variable		0.26
S.E. of regression	0.03	Sum squared residuals		0.07
Durbin-Watson stat	1.99			

4.5.6 Impulse Response

Results in Figure 4.5 indicate that share performance of listed banks responds to shocks on CBR, CRR, OMO and MS. There was positive effect of OMO and MS while CRR had negative effect on SP of listed banks. CBR had increasing effect on SP though it almost narrowed as time changed from 2010 to 2020.

Response of SP to Cholesky
One S.D. Innovations

Response of CBR to Cholesky
One S.D. Innovations

Response of CRR to Cholesky
One S.D. Innovations

Response of OMO to Cholesky
One S.D. Innovations
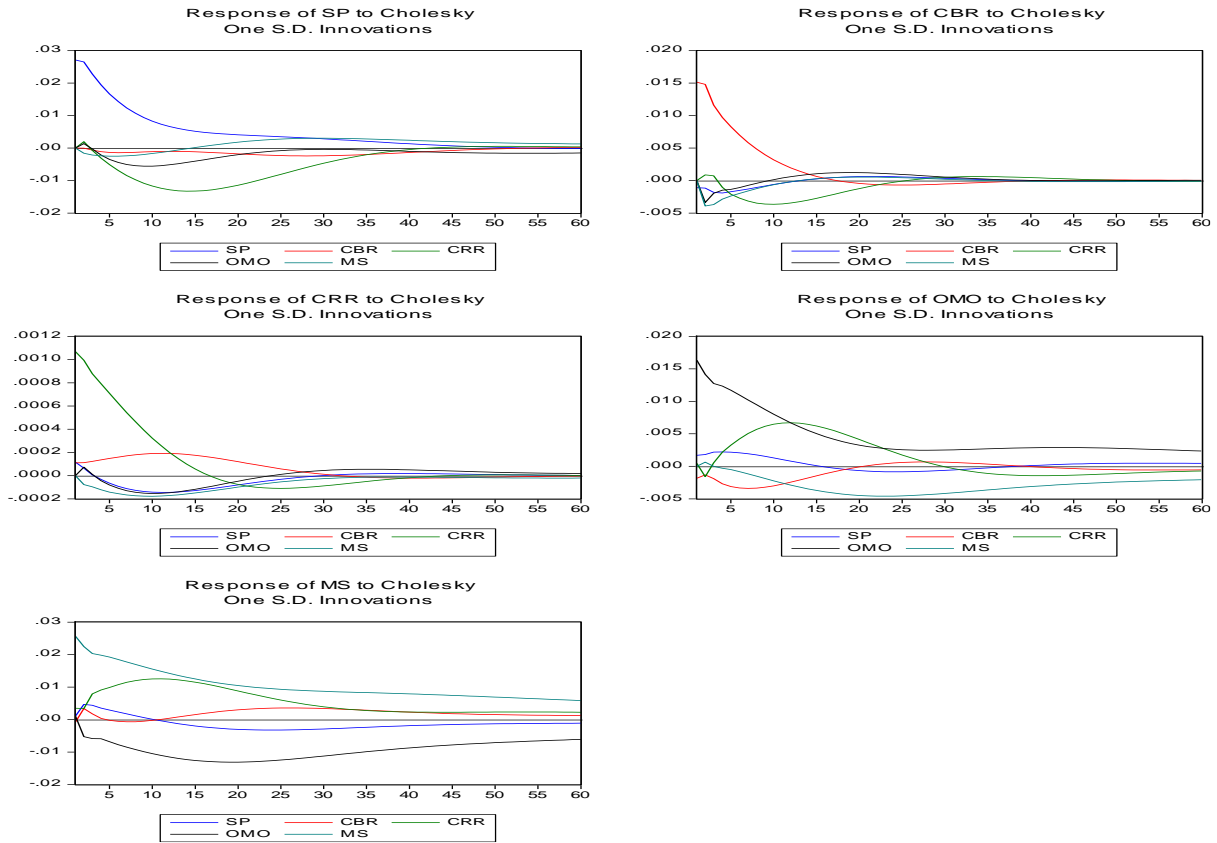
Response of MS to Cholesky
One S.D. Innovations

Figure 4.5 Impulse Response

4.5.7 Variance Decomposition

Results in Figure 4.6 indicate that variance due to shocks started at 100%, declined and stabilized as OMO, CBR and MS. CRR recorded inverse response to shocks on SP of listed banks.

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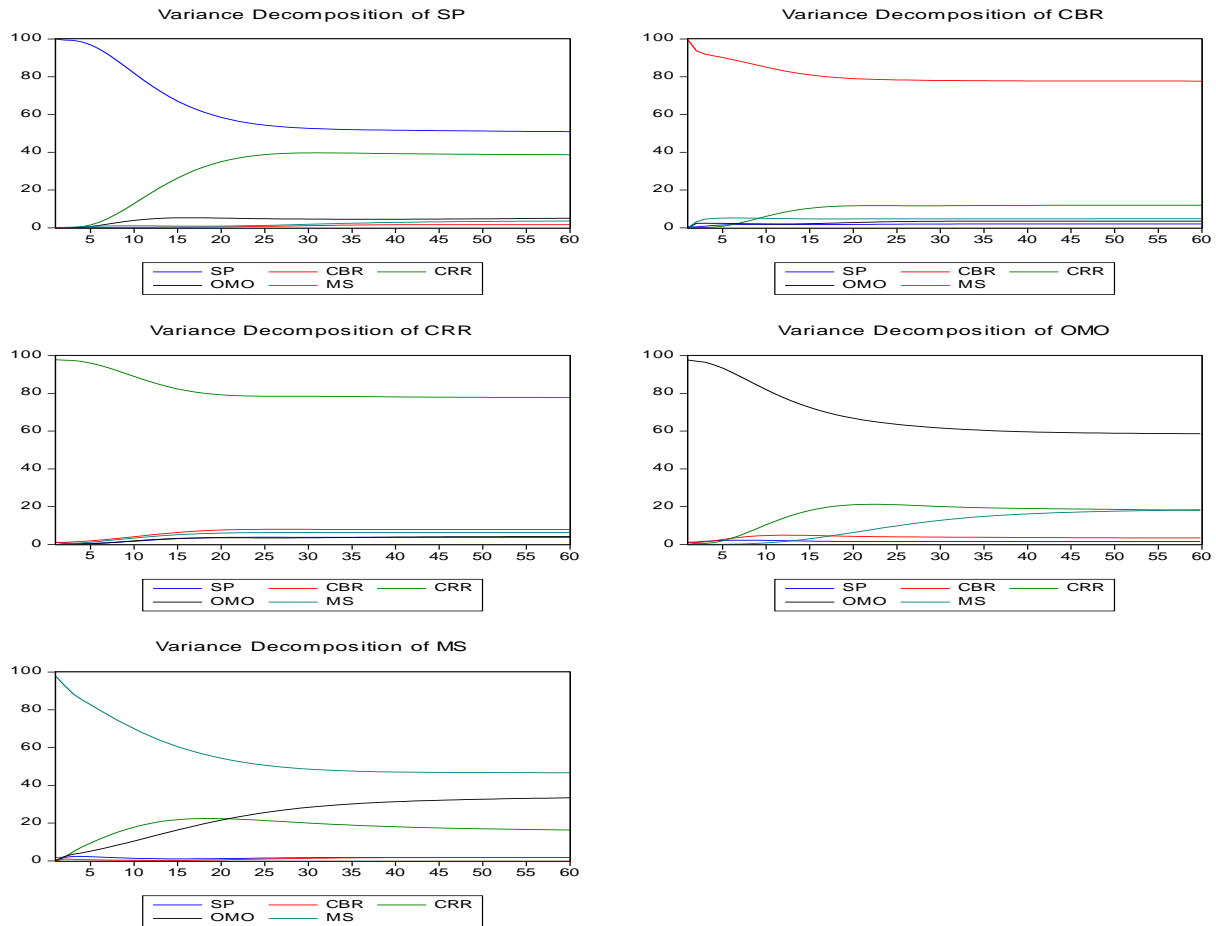
Figure 4.6 Variance Decomposition

4.6 Discussion of Findings

The study findings agreed with Nguyen et al., (2017) who reported that monetary policy have causal effect on performance of banks in Vietnam. Also, the study agreed with Francis (2014) that macroeconomic characteristics such as GDP, liquidity and inflation rates have significant contribution on performance of banks in Sub Saharan Africa. Further, the study did not concur with Ekpung et al., (2015) who reported inverse causality between performance and monetary tools in Nigeria. The study found that increase in discount and deposit rate inversely affected performance though asset liability management was positively affected by monetary policy. There was call for government to seek for measures on how they can be actively involved in banking sector despite of its liberalization.

The findings refuted Kerongo and Nyamute (2016) whose results indicates negative effect of CBR and OMO on performance of banks in Kenya. Though, it confirmed it results on positive effect of CRR. Further, they contradicted Rotich (2016) who found positive contribution of MS on banking sector performance in Kenya. Moreover, they differed with Otambo (2016) who found that macroeconomic characteristics have negative effect on performance of banks in Kenya.

CHAPTER FIVE:

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

The chapter presents a summary of the findings, conclusion and recommendations will be drawn.

5.2 Summary

The study need arose from past empirical, conceptual, methodological and contextual gaps. Empirical evidence had registered mixed findings with positive and negative effects of monetary policy tools on performance of banks. Methodologically, despite of the data being time series most studies had persistently adopted use of ordinary least square regression modelling. Contextually, some studies had been carried in developed economies hence they may not be replicated in Kenyan context. Descriptive research design was applied in the study. Time series monthly data was collected from September 2010 to April 2020. Descriptive statistics, multiple regression and VAR were used for data analysis. Regression modelling indicated positive effect of central bank lending rate and open market operations on listed banks share performance. Cash reserve ratio and money supply have inverse listed banks share performance.

5.3 Conclusion

Results indicates that CBR, CRR, OMO and MS have effect on SP of listed banks in Kenya. Therefore, CBR has a positive effect on SP of listed banks in Kenya. Hence, an increase in CBR increases SP of listed banks in Kenya. Since CRR has negative effect of SP of listed banks in Kenya, it can be concluded that an increase in CRR decreases SP of listed banks in Kenya. OMO has positive effects on SP of listed banks in Kenya. Thus, it can be concluded that an increase in OMO increases SP of listed banks. MS have negative effect on SP of listed banks in Kenya. Hence, it can be concluded that an increase in MS decreases SP of listed banks in Kenya.

5.4 Recommendations for Policy and Practice

Since VAR findings indicated that monetary policy tools have positive effect on SP of listed banks, there is need for policy makers to evaluate the extent of co-movement between monetary policy tools and SP of listed banks so as to develop policies that would aid in achievement of the roles of the banking sector. Secondly there is need for evaluation of the response to shocks associated to specific monetary tools especially during pandemics and whenever the political environment is uncertain.

Since multiple modelling indicates inverse effect of CRR and MS, the management of banks and policy makers in CBK should examine the contribution effect of these measures and align them according to prevailing economic conditions so as to minimize odds of share volatility in NSE among listed banks. Since most listed banks are in tier one, then policies should be aligned to hinder odds of experiencing bank panic and runs.

5.5 Suggestions for Further Studies

From the findings it can be recommended that there is need for consideration of a longer period for the study and consideration of time specific characteristics such as financial crisis of 2008. The direct effect of monetary policy tools on share performance of listed banks in Kenya was studied. There is need for consideration of moderating and intervening of variables such as bank size and portfolio flows of shares on share performance.

5.6 Limitations of the Study

Monthly economic data was relied on. Since the data was not from single sources, the source documents were available from different sources which were accessible to public though there was need for introduction and approvals. This was managed through formal application of data to government institutions such as KNBS and NSE and physical visits were conducted. The study adopted time series analysis whose complexity demanded assistance from statistician. This was mitigated through hiring of statistician who elaborated on requirements for use of time series methods for data analysis.

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APPENDICES

Appendix I: Secondary Data Collection Sheet

Year	Month	Bank	Total assets	Opening share price	Close share price	CBK rate	CRR	OMO	Money supply
2010	9								
	10								
	11								
	12								
2011	1								
	2								
	3								
	4								
	5								
	6								
	7								
	8								
	9								
	10								
	11								
	12								
2012	1								
	2								
	3								
	4								
	5								
	6								
	7								
	8								
	9								
	10								
	11								
	12								

2015	1								
	2								
	3								
	4								
	5								
	6								
	7								
	8								
	9								
	10								
	11								
	12								
2016	1								
	2								
	3								
	4								
	5								
	6								
	7								
	8								
	9								
	10								
	11								
	12								
2017	1								
	2								
	3								
	4								
	5								
	6								
	7								
	8								
	9								
	10								
	11								
	12								
2018	1								
	2								
	3								
	4								
	5								

	6							
	7							
	8							
	9							
	10							
	11							
	12							
2019	1							
	2							
	3							
	4							
	5							
	6							
	7							
	8							
	9							
	10							
	11							
	12							
2020	1							
	2							
	3							
	4							

Appendix II: List of Listed Commercial Banks

Barclays Bank of Kenya Ltd
Diamond Trust Bank Kenya Ltd
Equity Bank Ltd
Housing Finance Bank Ltd
I&M Bank Ltd
KCB Bank Ltd
NCBA Bank Ltd
CFS-Stanbic Bank Ltd
Standard Chartered Bank of Kenya Ltd
The Co-operative Bank of Kenya Ltd