MONETARY POLICY INSTRUMENTS AND FINANCIAL PERFORMANCE OF COMMERCIAL BANKS IN KENYA

ABONYO OWUOR FREDRICK

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A THESIS SUBMITTED TO THE SCHOOL OF BUSINESS IN PARTIAL FULFILLMENT OF THE REQUIREMENTS FOR THE AWARD OF THE DEGREE OF MASTER OF SCIENCE (FINANCE) OF KENYATTA UNIVERSITY

OCTOBER, 2020
DECLARATION

This research thesis is my original work and has not been presented for a degree or another award in any other University. No part of this research should be reproduced without authority of the author and/or Kenyatta University.

Signature: ………………………… Date: ……………………………

ABONYO OWUOR FREDRICK
D58/CTY/PT/26335/2013

We confirm that the work in this thesis was done by the candidate under our supervision.

Signature: ………………………… Date: ……………………………

Mr. Gerald Atheru
Department of Accounting and Finance,
Kenyatta University.

Signature: ………………………… Date: ……………………………

Ms. Gladys Kimutai,
Department of Management Science,
Kenyatta University.
DEDICATION

To my beloved wife Lilian, son Kerith, mother Benter, and my father Dr. Akoko and loving siblings who have given me the moral, financial and spiritual support, and whose encouragements ensured I sacrificially finish this good course I had begun is this thesis dedicated. Many thanks, and may be abundantly blessed of God.
ACKNOWLEDGEMENT

Unto the Lord God Almighty be glory and honour for the blessed gift of long, and healthy life, intellect, strength, and ability to enable me write this thesis. Secondly, I convey my sincere appreciation to my supervisors; Mr. Gerald Atheru and Ms. Gladys Kimutai for the knowledge that they imparted into me that made the writing of this thesis successful.

God richly bless you all.
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OPERATIONAL DEFINITION OF TERMS

**Capital adequacy**
This is the amount of capital holding of a financial entity in line with the financial institution’s regulators’ requirements. This variable was measured using capital adequacy ratio.

**Cash Reserve**
The proportion of deposit liabilities that must be deposited by commercial banks at Central Bank of Kenya. Cash reserve was measured by use of a ratio, cash reserve ratio.

**Central bank rate**
This is the rate at which regulator rediscounts bills and provides advance to commercial banks against approved securities. CBR was measured by use of a ratio.

**Financial performance**
Financial performance refers to how well an institution uses its resources to meet the pre-set objectives thus generating revenues within a given period of time and can be used for comparison purposes across industries. This variable was measured by return on asset in this research. It was measured using a ratio known as return on assets in this research work.

**Monetary policy**
The tool used by the CBK to influence liquidity in an economy so as to manage inflation, and foster growth in the economy. It is operationalized by the Central bank by using tools like open market operations, cash reserve ratio, and central bank rate.

**Open market operations**
This is the trading of securities in the open market so as to regulate the amount of money in circulation in the economy. This research adopted a ninety-one-day bill rate.
# ABBREVIATIONS & ACRONYMS

<table>
<thead>
<tr>
<th>Abbreviation</th>
<th>Description</th>
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<tbody>
<tr>
<td>ANOVA</td>
<td>Analysis of Variance</td>
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<td>CAR</td>
<td>Capital Adequacy Ratio</td>
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<td>CBK</td>
<td>Central Bank of Kenya</td>
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<tr>
<td>CBR</td>
<td>Central Bank Rate</td>
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<td>CRR</td>
<td>Cash Reserve Ratio</td>
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<td>DMBs</td>
<td>Deposit Money Banks</td>
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<tr>
<td>GDP</td>
<td>Gross Domestic Product</td>
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<tr>
<td>KBRR</td>
<td>Kenya Bankers’ Reference Rate</td>
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<tr>
<td>KCB</td>
<td>Kenya Commercial Bank</td>
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<tr>
<td>MFIs</td>
<td>Micro-Finance Institutions</td>
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<tr>
<td>NACOSTI</td>
<td>National Commission for Science, Technology and</td>
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<td></td>
<td>Innovation</td>
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<tr>
<td>NBFIs</td>
<td>Non- Bank Financial Institutions</td>
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<tr>
<td>NSE</td>
<td>Nairobi Securities Exchange</td>
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<td>OMO</td>
<td>Open Market Operations</td>
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ABSTRACT

The commercial banks in Kenya have witnessed a general decline in their profitability over the years occasioned by the global financial crisis of 2008 which ravaged the banking sector. Financial performance of Kenyan banks has since declined from 4.43% in 2010 to 2.8% in 2018. Consequently, some banks were put under receivership a few years after the crisis while others navigated through the difficult times, albeit with declining profitability. The Central Bank of Kenya responded with a myriad of monetary policy interventions to protect the banking industry from such a crisis. The main objective of this study was, therefore to investigate the influence of these monetary policy instruments and the mediating effect of capital adequacy ratio on the relationship between monetary policy instruments and financial performance of commercial banks in Kenya. The specific objectives of the study were: To examine the effect of open market operations, cash reserve, and central bank rate on the performance of commercial banks; and to establish the mediating effect of capital adequacy ratio on the relationship between monetary policy instruments and financial performance of commercial banks in Kenya. The theoretical framework of the study was guided by the Loan pricing theory of money, the neo-classical theory of interest, efficiency theory, and financial intermediation theory. The study was anchored on the positivism philosophical orientation. Both the descriptive and the explanatory research designs were used for the study. Secondary data obtained from archival data of the Central Bank of Kenya and specific data from the various banks under study were used. Data was then edited, presented, and analysed using Microsoft Excel spread sheets, and STATA. The study was a census of all the 42 commercial banks licensed and supervised by the Central Bank of Kenya. Data analysis was done using descriptive and inferential statistical techniques such as mean, standard deviation, correlation, coefficient of determinant, and tables. The analysis showed that 58.4% of the variability of financial performance was accounted for in the model. The p-value for the overall model was 0.000, which is significant at 5% level of significance, implying that monetary policy has a significant influence on commercial banks' performance. The correlation analysis showed a very weak negative correlation between OMO and ROA, a strong negative correlation between CRR and ROA, a very weak positive correlation between CBR and ROA and a very strong positive correlation between capital adequacy ratio and ROA. The study concluded that open market operations, cash reserve, and central bank rate have a statistically significant influence on the performance of commercial banks. The analysis also showed that the capital adequacy ratio partially mediates the relationship between monetary policy and financial performance of commercial banks. The study recommends that the regulator make OMO more appealing to commercial banks, increase the volume of trade in the open market, and keep CRR and CBR at manageable levels to enhance banks' profitability. Capital requirements need to be reviewed regularly to keep banks liquid. This study recommends to scholars to investigate the influence of monetary policy on the profitability of both commercial banks and non-bank financial institutions. The effects of fiscal policy on the performance of commercial banks also need to be studied.
CHAPTER ONE
INTRODUCTION

1.1 Background of the study

Financial intermediation as undertaken by commercial banks across the globe is vital for the survival of the global economy (Imeokpararia, 2013). Banks provide long-term financing to all other sectors of the global economy. The excellent returns of commercial banks underpins the existence of banks and global economic growth. With intensifying competition in the banking industry on the one hand and the rising cost of intermediation on the other, banks must respond with higher levels of operational efficiency if they have to avoid crises (Mahorta et al., 2011). Financial performance is an important determinant of economic growth (Nazir et al., 2012). It is an indication of capital accumulation. Good performance of banks is an indication of reallocation of limited resources, hence optimal use. The banking industry is crucial in that it both finances other sectors, and also aids in creation of employment in the economy (Pagoulatos & Triantopoulos, 2009).

The global financial crisis of 2008 left the Grecian economy more vulnerable because of enormous public debt and internal weaknesses. The banking industry was reasonably healthy but quickly suffered the consequences of the crisis (Pagoulatos & Triantopoulos, 2009). In Pakistan, the global financial crisis had a substantial impact on the financial performance and profitability of Pakistani banks, which left them weaker than pre-crisis times (Nazir et al., 2012). The same crisis brought the Nigerian economy down as evidenced by the crashing of the Nigerian stock market. Nigerian banks registered the weakest performance since the new millennium began (Njiforti, 2015). Generally, African banks were adversely affected resulting in an abrupt stop in the rapid growth the region experienced between 2000 and 2008 (Trust, 2018). The crisis led to poor financial performance among many banks globally. In Kenya, the domino effect of this crisis occasioned the collapse of some banks. Entities such as Chase Bank, Imperial bank and Dubai Bank were put under receivership. A summary of the declining performance (from a return on asset of 4.43% in 2010 to 2.8% in 2018) is illustrated below:
Table 1.1 Financial performance of Commercial Banks in Kenya

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<tbody>
<tr>
<td>ROA</td>
<td>4.43%</td>
<td>4.40%</td>
<td>4.70%</td>
<td>4.70%</td>
<td>4.46%</td>
<td>3.86%</td>
<td>3.30%</td>
<td>2.70%</td>
<td>2.80%</td>
</tr>
<tr>
<td>% Change</td>
<td>0.00%</td>
<td>-0.03%</td>
<td>0.30%</td>
<td>0.00%</td>
<td>-0.24%</td>
<td>-0.60%</td>
<td>-0.56%</td>
<td>-0.60%</td>
<td>0.10%</td>
</tr>
</tbody>
</table>

Source: CBK (2019)

The financial environment of Sub-Saharan African economies, which is a host to many banking institutions, has been categorized as both risky and volatile in nature. These economies also have weak legal institutions (Trust, 2018). To strengthen the legal framework and to avert a further slump in the performance of Kenyan banks, the Central Bank of Kenya, like other regulators across the globe, introduced a raft of measures to protect the industry. The use of monetary policy instruments implemented these measures (Kamaan, 2014). The CBK uses the monetary policy as the principal tool to preserve the value of the shilling in our economy. The tool is used to regulate the economy's liquidity to levels in harmony with GDP and inflationary levels to effectively manage the economy (Central Bank of Kenya, 2013). Interest rates and the foreign exchange rates of the local currency, the Kenya shilling, against international currencies, is largely dependent on the volume of money circulating in the economy. To that extent, the CBK is tasked with formulating and operationalizing the monetary policy, a work undertaken by the Monetary Policy Committee (Central Bank of Kenya, 2016). In the wake of the global financial crisis that was first witnessed by American banks, there has been a greater need to strictly regulate banks through the monetary policy to avoid poor financial performance (Macharia, 2013).

The Central Bank of Kenya Act (Cap 481) of 1966 established the CBK, with the Bank being mandated formulate and implement the monetary policy targeting the achievement and maintaining general stability in prices, and manage solvency, liquidity and proper functioning and stable markets based on an effective and efficient financial system (Kamaan, 2014). This is in view to enhance the national treasury’s predetermined employment rate and desired growth in the production of various commodities across various sectors in the economy (Central Bank of Kenya, 2013).
According to Kenya Institute for Public Policy Research and Analysis (2006), the monetary policy programming framework under which the CBK operates comprises monetary aggregates (both credit and liquidity) targets that are in tandem with some economic growth projections and targeted inflation levels. For example, the key objective of the bank in the financial year 2005/06 was to realize a less than five-percent rate of inflation by use of quarterly reserve targets. For this to be achieved, a ceiling of reserve money and a net foreign assets floor was set by the bank. This was chief support for the policy until the central bank rate was introduced. The Institute also noted the criticism of the use of the monetary targeting.

Multilateral financial organizations like the International Monetary Fund and banking regulators throughout the world recommend commercial banks to be well-capitalized (Adrian et al., 2019). They observed that well-capitalized banks are more stable and are well-positioned to withstand market shocks than undercapitalized banks. Further, bank profitability is a factor of core capital (Akinleye & Fajuyagbe, 2019). This capital allows banks to collect more deposits to advance more loans to the deficit units to make more revenues thereby make more profits (Gudmundson et al., 2013).

1.1.1 Financial performance of banks

It is important for the financial performance of players in the banking industry to be sound and satisfactory. Sound financial health of commercial banks can be measured by use of return on assets, liquidity and capital adequacy (Sangmi & Nazir, 2010). Profitability of commercial banks significantly influences financial leverage and capital adequacy. Higher capital adequacy ratio has an adversely affect the profitability of commercial banks (Pinto et al., 2017). Essentially, commercial banking works in resource allocation; that is, they channel resources from excess or surplus units to deficit units in the economy (Alshatti, 2015).

Sustainable financial intermediation requires banks to be profitable. Since decent performance will reward the shareholders for their faith in management and investment, they will be motivated to make an additional investment, hence fostering economic growth. Conversely, poor banking performance is also likely to lead to bank panics, and
consequently, bank runs. Such crises always hinder economic growth (Panayiotis et al., 2006).

A unit of measure is, therefore, crucial to appraise the performance of a going concern. The method often used is a ratio linking two quantities of financial information (Bragg & Burton, 2006). Financial ratio analysis allows one to compute and relate parameters consequential to information in the financial statements. The current interaction and historical trends of these ratios are used to infer an entity’s financial condition, the operations of that firm, and its desirability as an venture or credit risk (Webster, 2004).

Oyier (2016) observed that the major indicators, such as revenue generation, cash flow, operating income, among others, could be used. The common ratio for financial performance used by most commercial banks include: return on investment (ROI), earnings per share, return on equity (ROE), as well as sales growth (Pinto et al., 2017). The popular ratios that are used to measure the performance of a business organization are summarized as growth and profitability. They include: increase in market shares, return on investment (ROI), return on asset (ROA), revenue growth, and return on equity (ROE), return on sales (ROS), the price of stocks, liquidity, and efficiency in operations and growth in sales. ROA ROE are universally used as key measures in establishing financial performance of banking entities (Maria et al., 2002).

In this thesis, the researcher used return on asset as a unit of measure of the financial performance, against which the monetary policy instruments rates and capital adequacy ratio were regressed. The conventional formula for computing ROA is shown below:

$$ROA = \frac{\text{Profit After Tax}}{\text{Net assets}} \times 100\%$$

Where $\text{net assets} = \text{Non} - \text{current assets} + \text{working capital}$
1.1.2 Monetary policy

The policy approved and operationalized by the monetary authority of any country to control interest rates chargeable on loanable funds is known as the monetary policy. It also controls money supply in an economy (Nguyen et al., 2017). Monetary policy is purely employed to manipulate the quantity of money in circulation. Financial economists are responsible for developing optimal monetary policy for various economies for either contractionary or expansionary periods. Contractionary monetary policy is adopted when an economy wants to lessen inflation (Rao, 2006). Interest rates are raised higher than usual. Expansionary policy is adopted when the monetary policy stimulates the economy to grow. Interest rates are lowered, money supply in the economy increases, hence raising both aggregate demand and the GDP (Ogbeifun & Akinola, 2019). The relative worth of the currency is also diminished comparatively to other major world currencies. Tight monetary policy decreases output, exchange rate and interest rates (Ülke & Berument, 2016).

The legality of a monetary authority is pegged on the fundamental assumption that the actions of the policy are or will be transmitted to the various market interest rates immediately, proportionally and linearly. Nonetheless, experiential evidence put forward show that the pricing behaviour for commercial banks, collusion and organization of the financial system has an vital bearing to the implementation of changes prompted by the policy to the broader economy (Makambi et al., 2013). During the inflationary period, the real value of money diminishes resulting in a devaluation of the Kenya shilling (Central Bank of Kenya, 2016).

The monetary policy constitutes design and implementation of guidelines and decisions by Central Bank to accomplish preferred objectives, intended to guide the lending rates of banks (Loayza & Schmidt-Hebbel, 2002). Through MPC, CBK intends to stabilise the value of the Shilling, lower inflation rate to manageable levels, make it possible to achieve full employment and foster sustainable economic growth. Nevertheless, the effectiveness of monetary policy differs from one economic jurisdiction to another depending on variances in economic environments (Faure, 2007). According to Loayza & Schmidt-
Hebbel (2002), monetary policies the Bank often use influence economic growth includes bank rates (CBR), open market operations (OMO), reserve rates, discount window operations system and statutory liquidity preference (compulsory deposit).

The Central Bank of Kenya expand or contracts the economy by use of open market operations, cash reserve, central bank rate, discount window operations and operations in the foreign exchange market (Ananchotikul & Seneviratne, 2015). Open market operations is operationalized in the short run by use of treasury bills and in the long run by use of treasury bonds. This thesis measured OMO by use of treasury bills. Cash reserves were measured in this thesis by use of cash reserve ratio. Lastly, central bank rate was adopted as the third instrument.

The CBK uses OMO to implement monetary policy through treasury bills (Kimani, 2013). The government can either give or take liquidity (to and from commercial banks) through buying or selling treasury bills and bonds in the open market. The central bank does this by targeting desirable levels of interest rates, inflation and foreign exchange rates (Ananchotikul & Seneviratne, 2015). The CBK withdraws liquidity from the commercial banks by selling government securities. The same objective is achieved when the T-bills rate is increased to trigger banks to purchase government securities. Banks that trade in T-bills during such times improve their profitability (Ekpung et al., 2015).

Reserve requirements by the central bank also significantly determine the volume of trade by banks. The requirements are measured by cash reserve ratio (Hsing, 2014). When this ratio is increased, commercial banks find themselves with less money at their disposal to advance loans (Ananchotikul & Seneviratne, 2015). When the rate is lowered, they sanction more loans as a result of more cash at their disposal. The rate is lowered to implement expansionary policy and increased to execute contractionary policy measure (Ekpung et al., 2015).

The central bank rate is the rate at which commercial banks are allowed under the law to borrow from the central bank (Adesina et al., 2018). When CBR is increased, the cost of borrowing also increases. This makes both credit and investment expensive. Increase in CBR therefore targets curbing inflation hence moderating the growth of the economy
As the cost of interest chargeable on loanable funds increases, disposable funds reduce thereby curtailing growth in consumer spending. The CBK also uses CBR to stimulate the economy by reducing the rate. Under such circumstances, commercial banks register a growth in consumer banking hence improved profitability (Ekpung et al., 2015).

### 1.1.3 Capital adequacy ratio

Also termed as capital to total risk-weighted asset ratio (TRWA), capital adequacy ratio (CAR), is a percentage of each bank’s risk-weighted exposures to credit. The regulator uses CAR to promote the efficiency and stability of financial institutions, hence cushioning depositors from any potential losses of their wealth deposited with banks (Ariwidanta & Wiksuana, 2018). The study adopted CAR as a mediating variable in the study since CBK uses it often to influence operations in the banking industry. Regulators use CAR as a cushion to absorb a considerable amount of (potential) losses before a bank becomes insolvent. Hence, it is used to run stress tests for every industry player. Ariwidanta & Wiksuana (2018), confirmed in their work that the Basel III guidelines set the minimum capital adequacy ratio at 8% for all financial institutions. The ratio was set after the global financial crisis to avert potential bank runs.

Thus governments have gone to great lengths to legislate stringent capital adequacy requirements in their respective banking legislation to assure banking sector stability (Gudmundson et al., 2013). As the Kenyan Cabinet Secretary to the National Treasury presented the Budget 2015/2016 to the National Assembly, a fundamental change affecting banks was made. Commercial banks were given up to 2018 to increase the minimum core capital to five billion shillings from KSh. 2 billion. This was reached during the deliberations of the Monetary Policy Committee meetings, where they also raised the CBR in two consecutive sessions. A well-planned program of monetary policy transmission and the financial performance of commercial banks will enable banks to absorb external shocks and enhance the growth and development of the banking industry (Ogbeifun & Akinola, 2019).
Most scholars have not investigated the mediating effect of capital adequacy ratio on the relationship between monetary policy and financial performance. Studies by Ariwidanta & Wiksuana (2018), used CAR as a mediating variable. They asserted that CAR does not significantly mediate the effect of credit and liquidity risk on Indonesian banks’ profitability. Other studies indicate a striking relationship with return on assets (Simbolon & Simanjuntak, 2020). The different conclusions make capital adequacy an interesting variable to study together with monetary policy as independent variable.

1.1.4 Commercial banks in Kenya

The legal framework of the banking sector in Kenya is regulated by several Acts of Parliament namely the Central Bank Act coupled with numerous prudential guidelines given out by the Central Bank; the Banking Act, and Companies Act. The banking regulator in Kenya is the Central Bank of Kenya (Central Bank of Kenya, 2009). Upon the liberalization of the banking sector in 1995, exchange controls were lifted. This correspondingly led to the rapid growth of this industry, and by close of the financial year 2009, there were 44 banks and NBFIs, 15 MFIs while Forex bureaus were one hundred and nine. This number has comparatively remained more or less the same over the years (Meshack & Nyamute, 2016). The Kenya Bankers Association (KBA) was after that formed as banks came together under one umbrella body which functions as a group that lobbies for the interests of the banking sector. Through this association, members have an environment and ideal platform to put forth matters affecting them, for instant government legislation (Ngugi & Karina, 2013).

Banks are defined and referred to in this work as deposit-taking institutions that advance loans to the public (their customers) in view of making profit. This, therefore, makes commercial banks to advance credit or loans to various kinds of entities that borrow to use the money for many different purposes. It is, therefore, good practice for banks to ensure they maintain an optimal loan portfolio which is the most profitable asset in their balance sheet (Mishkin, 2003). This will cushion banks against the various risks they are faced with as they undertake their lending activities.
It is vital to note that banks perform a very notable role in financial intermediation in economies, so they have been keenly watched by governments through the legislature and central banks, multilateral financial agencies, and the general public, among others (Dermirguc-Kunt et al., 2010). The global economic meltdown that was experienced in 2008 was a clear manifestation that the current regulation of capital, in its design or its implementation, has glaring inadequacies to avert bank panics and bank runs. This made regulatory authorities around the globe to respond with extra provision to foil a collapse of the industry and the entire economy (Ogbeifun & Akinola, 2019).

In the recent past, the banking industry in Kenya has sustained its expansion in profitability, assets base, deposits, and product offering thanks to financial deepening and product diversification. The industry-wide expansion strategy of branch networks across the East African region, automation of many services which were traditionally offered at a bank hall coupled with creating prominence on the myriad and composite customer needs instead of the old-style ‘off-the-shelf’ banking experience are the key reasons to the evolution and expansion of the financial industry in Kenya (CBK, 2006).

Mwenda (2011) observed that during the fiscal period ended 31st December, 2009, the banking sector in Kenya recorded significant increase in assets chiefly due to an increase in deposits received, additional funds and non-attributable income to shareholders. The industry recorded high liquidity ratios, high capital adequacy levels and a drop in non-performing loans vis-à-vis the same variables in the previous year. Similarly to 2008, the industry’s overall performance was still rated strongly in 2009. Total net assets significantly increased by 14.3%, while customer deposits also rose by over sixteen per cent (16.4%), which occasioned an industry-wide rise in PBT by 12.9%. Capital adequacy ratios were kept above the minimum requirements of 12.0%. That notwithstanding, ROE declined to 24.9% from 26.1% recorded in December 2008 which was elicited by a rise in equity at a higher rate than the increase in profits (CBK, 2014).

1.2 Statement of the problem

The financial performance of commercial banks has been poor over the years (from a return on asset of 4.43% in 2010 to 2.8% in 2018 as in Table 1.1). Besides the declining
performance, the regulator had also put some institutions under receivership. This is in line with IMF report, that Sub-Saharan African banks recovery from the financial crisis is not yet complete (Adrian & Shin, 2009). Regulators therefore must use necessary policies to stabilize the financial sector.

In Kenya, the CBK regulates the banking sector through the actions of the MPC. The stance of the MPC is signalled by the changes in the rates of the CBR (Mulwa, 2015). Such instruments as OMO, CRR and transactions in the foreign exchange are also used to operationalize the MPC’s directive. As lender of last resort, it also offers the commercial banks Overnight Discount Window (Central Bank of Kenya, 2013). As these tools are implemented through transmission into the financial system, their results are generally felt in the entire economy through stabilization of prices in the economy. This, therefore created the need to study the effect of monetary policy instruments on the financial performance of commercial banks in Kenya.

Studies by Gertler & Gilchrist (1994), Kashyap & Stein (1994), Punita & Somaiya (2006), and Knight (1970) only attempted to examine the special effects of monetary policy instruments on bank credits and their stimulating impact on the economic growth of the country but not on the financial performance of commercial banks. Vikram (2012), researched on the use of monetary policy instruments in curbing inflation in an economy but did not study the effects of the instruments on the performance on Indian banks. There was therefore left a methodological problem to be solved by other scholars. Analytically, Nasserinia et al. (2014) included six other banks specific factors making monetary policy instruments have less weigh in their study. Kiganda (2014) only considered one bank (Equity bank) making generalisation difficult. Njiru (2014) only concentrated on the CBR as a monetary instrument in all her work, leaving out other monetary policy tools.

Kamaan (2014) failed to contextualise the study to sectoral performance while Ananchotikul & Seneviratne (2015) could not reveal the response by all banks in the industry to monetary policy transmission. Meshack & Nyamute (2016) only considered a small population of 11 banks. Time scope was also limited to financial report as at 30th June 2015, which has been overtaken by major monetary policy cycles. Nguyen et al.,
(2017) failed to consider the effect of OMO, which is a significant tool for transmitting monetary policy stance. Kemboi & Tibbs (2018) used a limited time scope that has been overtaken by many policy cycles. The aforementioned researchers did not also consider capital adequacy ratio in their study while studies by Ariwidanta & Wiksuana (2018), and Simbolon & Simanjuntak (2020), were not based on monetary policy instruments.

A careful analysis of the previous literature and research works reveal a research and knowledge gap in the current literature regarding the effects of monetary policy instruments and the performance of Kenyan commercial banks after the 2008 global economic meltdown. The preceding literature is a manifestation that, whereas much effort by the government is placed through the CBK to influence the quantity of money flowing in the economy, the net effect of these tools on commercial banks' financial performance remains inconclusive with scholars reaching different conclusions (Kamaan, 2014). Following the deteriorating performance of commercial banks and inconclusive attempts to explain the trend, it is imperative to conduct this study in Kenya. Therefore, this research explored the effect of principal monetary policy instruments and the mediating effect of capital adequacy ratio on the financial performance of commercial banks in Kenya during the period immediately following the 2008 financial crisis.

1.3 Objectives of the study

1.4.1 General objective

The general objective of the study was to analyse the influence of monetary policy instruments on the financial performance of commercial banks in Kenya.

1.4.2 Specific objectives

The following specific objectives directed the researcher:-

1. To examine the influence of open market operations on the financial performance of commercial banks in Kenya.
2. To assess the influence of cash reserve on the financial performance of commercial banks in Kenya.

3. To determine the influence of central bank rate on the financial performance of commercial banks in Kenya.

4. To establish the mediating effect of capital adequacy on the relationship between monetary policy instruments and financial performance of commercial banks in Kenya.

1.5 Hypotheses

The researcher tested the following hypotheses: -

\( H_{01} \): Open market operations have no significant influence on the financial performance of commercial banks in Kenya.

\( H_{02} \): Cash reserve has no significant influence on the financial performance of commercial banks in Kenya.

\( H_{03} \): Central bank rate has no significant influence on the financial performance of commercial banks in Kenya.

\( H_{04} \): Capital adequacy has no significant mediating effect on the relationship between monetary policy instruments and financial performance of commercial banks in Kenya.

1.6 Significance of the study

The results of the findings would be of utmost benefit to the researcher, the policymakers, industry players and the academia.

The policymakers in will profit from the results of the study to aid in making sound macroeconomic policies that positively influence the growth of financial institutions, aligning them to Kenya’s Vision 2030. The regulator, CBK, will use the research findings to guide the formulation of the monetary policy statement since they shall be having insight
knowledge on the effect of each instrument of the financial performance of commercial banks. The academia will find a wealth of new knowledge, hence may use report findings of the study as an additional stock of literature and for reference on related areas in future.

Finally, banks, which are the industry players, will use the report of this study in formulating pragmatic policies that will reduce default rate and improve loan performance. The report will also enhance program implementation and performance that are in tandem with the attainment of business permanency and employment creation in the nation. Industry players will thus use report findings to optimally price their loan products to avoid offering expensive loans given the effect of monetary policy transmission on their loaning behaviour and profitability.

1.7 Scope of the study

The study was delimited to four dimensions which (Mugenda & Mugenda, 2003); (Orodho, 2005); (Oso & Onen, 2005) and (Kombo & Tromp, 2009) concurs on to include geographical scope, content scope, sample scope (the representative sample of correspondents from the sample population) and time scope (the period during which time the study is conducted).

This study explored the influence of monetary policy instruments on the financial performance of commercial banks in Kenya during the fiscal years 2010-2018. Commercial banks that are licensed and supervised by the CBK were used in this study since their operations affect the entire economy to a large scale. The banks under the supervision of the CBK file their financial statements with various authorities making access to information easy. The monetary policy tools under consideration are the open market operations, central bank rate and cash reserve ratio since they are the instruments mostly employed by the CBK to sway the banking sector in one way or the other. Capital adequacy ratio was used as a bank-specific factor, since core capital adequacy significantly determines the degree of activity of commercial banks. The period under study is significant since it had several policy interventions to alleviate the effects of the 2008 global financial crisis. The banks are assumed to have stabilised by the fiscal year starting 2010. The study was a census of all banks licenced and supervised by the CBK to analyse
industry-wide performance. The researcher used secondary data in this research since the figures (various rates for all variables) are historical.

1.8 Limitations of the study

The problem of banks being put under receivership and possibilities of mergers and acquisitions was thought to affect the operations and disclosure of crucial information that may render generalization a problem. However, the researcher remained as objective as possible by excluding the institutions under receivership from the analysis from the financial year such was put on receivership. The researcher also faced challenges in collecting additional data to update the time scope from 2010-2015 to 2010-2018. Additional data was however mined from the CBK website.

1.9 Assumptions of the study

The major assumption made by the researcher is that the data used met the assumptions of OLS method. Diagnostic tests were therefore done to ascertain that these assumptions were met.

1.10 Organization of the study

The foregoing chapter dealt with background of the study, objectives and scope, limitations and assumptions of the study. Theoretical and empirical review, research gap and the conceptual framework are dealt with in Chapter two. The third chapter tackles the research philosophy, design, empirical model, target population and sampling design and ends with data collection instruments, procedure and data analysis and presentation. Research findings is in chapter four while chapter five handles the summary of the study findings, conclusions, recommendations and suggestions for further research.
CHAPTER TWO
LITERATURE REVIEW

2.1 Introduction

This section explored the various components comprising the monetary policy specially used in Kenya by the CBK. In particular, it covered such variables as the open market operations, cash reserve, central bank rate and capital adequacy as a bank-specific factor. The researcher, therefore, considered the theoretical and empirical review. The conceptual framework came at the tail end.

2.2 Theoretical review

This research was led by the Keynesian theory of money, the neo-classical theory of interest, efficiency theory and the financial intermediation theory.

2.2.1 Loan Pricing Theory

This theory was formulated by John Keynes in the 1930s. Keynesians hold that consumer demand for money is the driving force for the expansionary policy measures. Commercial banks therefore come in to meet this apparent demand for money (Dymski, 1988). However, banks suffer the challenges of moral hazard and adverse selection. On account of the moral hazard and adverse selection by customers, financial institutions have never been in the best locus to set high rates of interest to obtain maximum interest income (Stiglitz & Weiss, 2001). This makes it perplexing to predict the kind of debtor at the commencement of the banking engagement.

According to the Loan Pricing theory, high lending rates often induce adverse selection problems by attracting high-risk borrowers (Chodechai, 2004). It is common practice in banking to find that lending rates set by banks may not have born with the risk of borrowers. For this reason, banks may adjust their lending rates in so as to absorb the shocks of monetary policy transmission up to a point beyond which they will out-price all borrowers (Tsiang, 1980).
Through all the years, banking institutions have been vilified for overpricing loans to the best consumers of their products. They underprice loans to their worst or riskiest customers on the other hand (Dymski, 1988). In verity, a survey of credit practices at 100 of the leading American banks backs this argument. The study showed that loan approval and monitoring procedures are inconsistent with the nature and types of risks involved in the loans. Appropriate appraising of loans has significant ramifications for the economy of the nation and the financial health and soundness of different banks (Chmura, 2016).

For banks, optimal appraising of loans is a pointer to better sharing out of funds, which in turn leads to more returns. Loan appraisal is specifically vital at the opposite ends of the credit quality spectrum. At one extreme end, borrowers considered to be low-risk are expected to seek out more efficient, low-cost sources of funds should banks overprice their loanable funds. At the other extreme end, underpricing of borrowers considered to be high-risk leads to the commitment of a more substantial portion of a bank's funds that potentially will not perform. These have the tendency to increase the volatility of returns of a loan portfolio. Nationally, the optimal loan appraisal leads to a more effectual apportionment of resources in the whole economy (Bertocco, 2013). The theory therefore guides banks to optimally price loans. Commercial banks would therefore use monetary policy rates as base rates for determining the lending rates.

2.2.2 The Neoclassical theory

The neoclassical theory is also called the loanable funds theory. Knut Wicksell first enunciated it in 1898 by a Swedish economist then later developed by other economists like Bertil Ohlin, Robertson, Myrdal, Lindahl, and Viner. The two aspects of interest constituting non-monetary and monetary features are well addressed by this theory to give a wholesome approach to loan pricing.

This theory postulates that tangible forces, like parsimony, waiting, time-preference and productivity of capital are not the only determinants of the interest rate. Monetary forces too, like hoarding and dishoarding of money, money created by banks, monetary loans for consumption purposes also play a significant part in the determination of the rate of
interest. Hence, there is the interplay of monetary and non-monetary forces in the ascertainment of the interest rate. The loanable funds theory is a monetary theory of interest. However, it is only partially monetary as it also recognises the import of real forces such as thriftiness and efficiency of capital in the determination of the interest rate (Guru, 2016).

Guru (2016) further explains that the rate of interest is determined by the demand for and supply of loanable funds. The supply of loanable funds comprises savings out of disposable income, dishoarding, and money created by the banks and disinvestment. The demand for loanable funds consists of the demand for investment, demand for consumption and demand for hoarding money. The supply of money constitutes the savings by individuals and households, dishoarding of the past accumulated savings, and the bank money. As an essential source to the supply of loanable funds, the players in the banking system create and advance credit as loans to the businessmen and industries for investment. Banks can also reduce the supply of loanable funds by contracting their lending. Banks also purchase and sell securities and thereby affect the supply of loanable funds. The supply curve of funds provided by banks is, to some degree, interest elastic. Nevertheless, banks prefer lending money at higher rates of interest than at lower rates since it is from such transactions that the banks derive profitability and determines their performance and consequent growth.

Any loan pricing model should therefore help lenders make informed decisions and improve the competitiveness of lenders. Commercial banks need to find an optimal credit pricing in a framework regulated by the monetary policy (Bertocco, 2013). It therefore guides on the balance banks need to keep on the loan portfolio. The theory informs commercial banks on the extent of their operations in the open market and the extent of extending loans to households.

2.2.3 Efficiency theory

Efficiency theory draws its foundation from the concepts postulated by Vilfredo Pareto (1848-1923). He developed Pareto efficiency where resource allocation is considered efficient if no further improved satisfaction can be realized (Chen & Yeh, 1998). That
Effectual management of resources has effects on the performance of a going concern is the main argument in favour of efficiency theory. According to this theory, high bank expenses will have a corresponding decrease in the profitability of banks. Such an inverse relationship has been supported by various scholars in their works like Bourke (1989) and Obamuyi (2013), concluding that money-making banks are cost effective.

Nevertheless, other studies also show that this variable gives mixed results. Molyneux & Thornston (1992) found out that expenses influence positively on profits, thus a direct relationship. They concluded that high profitability accrued to going concerns in a regulated industry might be appropriated to such costs as higher salary and wage expenditure which directly impacts profitability since the workforce is motivated to go an extra mile in their duties. Their discoveries corroborate the theory of wage efficiency. The theory underpins that employees’ productivity increase with increase in wage rate (Onuong’a, 2014).

This direct relationship between profitability and expenses was also asserted by Naceur & Goaied (2008), in their study in Tunisia, and in Malaysia where Guru et al. (2002), reached the same conclusion. These scholars argue that banks are in a position to transfer their high operational costs to depositors and borrowers and thus boost their profitability.

This theory guided the research in that amidst the constant communication by Central Bank regarding the government’s stance on monetary policy. Industry players need to manage every resource at the disposal very efficiently to realize their desired profit margins (Chen & Yeh, 1998). The investment by shareholders must be rewarded handsomely for the management to continue enjoying the faith of the shareholders.

2.2.4 Financial intermediation theory

This theory was formulated by Gurley and Shaw in 1960. According to the theory, financial intermediation is possible because there is an information gap, and that the cost of direct engagement between surplus units and deficit units is high (Maggiori, 2017). The two factors make banks to act intermediaries between the two units to allow the efficiency of the market and make it operate seamlessly. Since rational investors are risk-averse, it is
only logical, therefore to hold wealth in liquid form that is easily accessible on demand. This is the essence of the role of commercial banks as they provide the platform for surplus units to deposit such wealth with them for safety and ready access. Banks, on the other hand, would use the wealth accumulated with them to create credit and advance such to deficit units at a cost (Adrian & Shin, 2009). If the intermediation role of commercial banks were done away with, investments would reduce considerably, and the economic growth of the county would be adversely affected.

As intermediaries, commercial banks have to solve the problem of information gap since information asymmetry is the foundation for financial intermediation (Molnár, 2018). The problem mentioned above helps the banking sector to solve two further problems, namely, moral hazard and adverse selection. The net effect is increase in banks profitability since risks emanating from potential borrowers are significantly reduced. This would also make banks to guarantee depositors that they can access their deposits on demand (Adrian & Shin, 2009).

The central bank rate affects interest rate for loans extended by commercial banks (Mutinda, 2014). He argues that lending rate has a strong relationship with economic growth and that banks have a significant part in the growth of the economy. As they finance the deficit units, they spur investments. As they accept deposits from surplus, they enhance efficiency by reallocating such funds which would otherwise be idle. The business of financial intermediation is done at a fee, and this is what is translated into banks’ profitability. Financial intermediation theory laid the platform for the use of the dependent variable in this study. ROA, therefore, is the price charged on intermediation by commercial banks (Molnár, 2018).

2.3 Empirical review

Monetary policy is one of the key macro-economic management tools to direct the performance of the economy in a certain desired direction. It is more often used by the government to manage economic shocks. Other than the main objectives of the CBK, it also works to promote growth in the economy, reduce unemployment, and contain
economic crises, thereby smoothening business cycles. The various variables are empirically reviewed below:

2.3.1 Open Market Operations and financial performance

Open market operations is the trading of government securities in the open market. The securities include treasury bills and bonds. The government swaps bonds and bills for currency (Guillaume et al., 2018). OMO was measured by treasury bills rate in this thesis. Regarding the open market operations, the CBK can expand the economy by purchasing government securities, thereby increasing the mount in the hands of the commercial banks to lend. This generally increases the credit that can be advanced to consumers, and hence improved profitability over the years. Conversely, the CBK can contract the economy by selling government securities to banks, thereby reducing the capacity to create credit and hence reduction in the level of profitability (Central Bank of Kenya, 2009).

Kubasu & Mutwol (2016), researched on the effects of selected monetary policies on loans portfolio performance among commercial banks in Kenya. They sampled 30 out of the 42 commercial banks and used both primary and secondary data. Their findings indicated a mild positive correlation between OMO and performance of commercial banks. A change in OMO registered a mild positive effect on performance. They concluded that OMO has no statistically significant relationship between OMO and performance of banks proxied by loans portfolio performance.

Adesina et al. (2018) explored the impact of monetary policy on financial performance of Nigerian deposit money banks (DMBs). The study was done during the period following the restructuring of the Central Bank of Nigeria. The autoregressive lag model was used in analysis. They found out that OMO significantly affected financial performance of Nigerian DMBs in the short run. They however, asserted that this effect became insignificant in the long run. This conclusion partly agrees with that of Meshack & Nyamute (2016) who conducdted their study in Kenya.

Meshack & Nyamute (2016) investigated effect of monetary policy on financial performance of the commercial banks listed on the Nairobi securities exchange. Their study
was a survey of the eleven listed banks as at 30/06/2015. The study revealed that open market operations positively influenced ROA of the listed firms. The correlation between OMO and ROA was also positive. The study concluded that OMO significantly affected the financial performance of Kenyan banks listed at the NSE. This study however suffer generalization problems since the sample size was small. It also patterns itself after cross sectional analysis as the data used were as at a specific time.

Kemboi & Tibbs (2018), also conducted a study on the monetary policy and performance of commercial banks in Kenya. Their findings show that monetary policy contributes to 72% of banks profitability and that OMO had the biggest effect of financial performance of Kenyan banks. Research findings point to a positive correlation between open market operations and performance of banking institutions. According to the findings, a unit increase in OMO translates into a 0.057 increase in the financial performance of commercial banks. Time scope (2011-2015) they used, however, was small and overtaken by major monetary policy changes.

Thuc et al. (2019), researched on the relationship between monetary policies and financial performance of Kenyan banking institutions. The research was, however, a case study of commercial banks within Nairobi City. Secondary data was used and SPSS was used in the analysis. The findings show that open market operations had a positive influence on the financial performance of Kenyan banks. The study findings indicate that an increase in OMO leads to a corresponding increase in financial performance of banks in Kenya by 0.036 units. OMO was also found to be statistically significant determinant of banks’ performance.

2.3.2 Cash Reserve and financial performance

Cash Reserve is also another monetary policy tool for controlling the economy. It is measured by use of a ratio called cash reserve ratio (CRR) in this thesis. Cash reserve ratio is that percentage of deposits by commercial banks that must be deposited at the CRR Account maintained by the CBK at no interest. Commercial banks are required to preserve their CRR as a monthly average for a cycle running from the 15th of the month to the 14th of the next month and not to reduce to a level below a CRR of three per cent each day. This
preserves liquidity of commercial banks. A decrease in the CRR relieves liquidity, hence improving the ability of commercial banks to increase credit. Liquidity is tightened when the CRR is increased, and this may depress demand-driven inflationary pressures (Central Bank of Kenya, 2014).

Meshack & Nyamute (2016), investigated the effect of monetary policy on financial performance of the commercial banks listed at the NSE. They found out that monetary policy tools have different degrees of relationship with financial performance of commercial banks listed on the NSE. CRR, particularly, negatively influenced financial performance of the listed banks. They concluded that the cash reserve rate significantly influenced the financial performance of banks. The research was however limited to a sample of only 11 commercial banks that were listed at the NSE at the time of the study. The same findings corroborate the findings of Ibe (2013), who asserted that there was a significant connection between CRR and bank profitability. His study was however limited to only tree banks.

Rao (2006), researched on the impact of monetary policy on the profitability of banks in India. The paper discussed financial sector reforms in the light of monetary policy and the impacts on profitability on indian banks. The study findings found out that cash reserve does not have a statistically significant effect the financial performance of Indian banks. Thuc et al. (2019), also arrived at the conclusion that cash reserve ratio has a negative influence on the financial performance on commercial banks in Kenya. According to this study, CRR does not statistically significantly affect the performance of commercial banks.

Oganda et al. (2018), investigated the effect of cash reserves on performance of commercial banks in Kenya. Their study was a comparative study between Equity Bank Kenya Limited and National Bank. They found out that CRR had a strong negative relationship with financial performance as measured by return on equity. CRR nonetheless had a significant relationship with the performance of Equity Bank Limited. They concluded that an increase in CRR is harmful to the profitability of banks since these reserves are not generating any income to the banks.
MacCarthy (2016), investigated the effect of CRR on the financial performance of commercial banks. The study also incorporated the engagement of these banks in corporate social responsibility in Ghana. The study used data on the 20 commercial banks in Ghana from the 2013 annual reports. Cash reserve ratio had a positive relationship with the financial performance of commercial banks in Ghana. CRR was also a statistically significant predictor of financial performance of commercial banks as measured by their return on investment rates. This study was however a cross-sectional as it only considered the returns for the year 2013.

Abid & Lodhi (2015), also researched on the impact of changes in reserve requirements on banks profitability. The research was a case study of Pakistani commercial banks. Reserve requirements was measured by cash reserve ration while profitability was measured by return on assets. Secondary data was used. The analysis followed quantitative time series data from 2005 to 2014. The findings indicate that reserve requirements had a significant negative relationship with the financial performance of Pakistani banks. An increase in CRR leads to a decrease in profitability by Pakistani banks. The study, however, was limited to only 17 commercial banks in Pakistan and used CRR as the only measure of monetary policy.

### 2.3.3 Central Bank Rate and financial performance

CBR is the rate at which the CBK rediscounts bills and offers advance to commercial banks against approved securities. It is, essentially, the rate at which the Central Bank rediscounts bills of exchange. It is considered the lowest rate of interest charged on loans extended to commercial banks by the Central Bank is the CBR (Ngugi, 2001). Upon review of the level of the CBR at least every two months, it is then communicated to industry players by the Monetary Policy Committee (MPC) and its effects and movements, both in direction and extent, gives a signal of the stance of the monetary policy. Therefore, MPC has made CBR be the basis for all monetary policy operations to foster transparency and confidence in monetary policy implementation (Central Bank of Kenya, 2014).

This makes CBR to be the minimum acceptable rate under the law whenever the Central Bank is adding liquidity by use of other instruments, including Reverse Repo. The opposite
is true in that when the Bank wants to shrink the quantity of money circulating in the economy by use of Vertical Repo, then the Bank will set CBR as the maximum rate that it will pay for any bid that it receives. Ngugi (2001), opined that movements in the CBR are conveyed to changes in short-term interest rates. A decline in the CBR indicates an easing of monetary policy and want for prevailing market interest rates to move down. When interest rates are low, firms and households are signalled of favourable business environment; hence economic activities are encouraged, and this fosters economic growth (Central Bank of Kenya, 2012).

Gambacorta & Mistrulli (2003), used short term rates of interest in their study of Italian banks between 1992 and 2001 and found out that well-capitalized banks can shield their loaning from monetary policy shocks because they can easily access non-deposit funds. Bernake & Blinder (1988,) further revealed that if one takes into consideration the influence of monetary policy on the ability of the banking system to lend, credit succeeds as an intermediate variable where monetary aggregates fail. This happens when the demand for money is not stable, for instance, when an economy is going through a course of financial reengineering and growth. Under these conditions, legislators and policy making authorities may get a clearer picture of inflation, a longer-term economic growth by looking at credit instead of monetary aggregates.

Nguyen et al. (2017), conducted a study on the impacts of monetary policy on commercial banks’ profits in Vietnam. They concluded that monetary base (central bank rate) had a significant positive influence on banks’ profits albeit at 10% significance level. Ajayi & Atanda (2012) researched on monetary policy and bank performance in Nigeria, using a two-step co-integration methodology. They found out that CBR registered a positive but statistically insignificant influence on the financial performance of Nigerian commercial banks.

Njiru (2013), also investigated the effects of monetary policy and commercial banks’ lending rates in Kenya in 2014. The findings of the study pointed to a long-run relationship between banks’ profitability and CBR. The study revealed that commercial banks’ profitability are positively responsive to CBR. In addition, CBR as an instrument of
monetary policy is indeed effective as it increases lending rates and relieves demand pull pressures in the economy. The overall effect is increased profitability of commercial banks. The study did not however link CBR directly to the performance of banks, but to lending rates.

Simiyu & Ngile (2015), researched on the effect of macroeconomic variables on profitability of commercial banks listed in the Nairobi Securities Exchange for the years 2001 to 2012. Analysis was done using panel data. Their study findings indicated that interest rates had a negative effect on profitability of commercial banks listed at the NSE. This implies that as real interest rises, profitability of commercial banks declines, and vice versa. According to the study, increase in real interest rate, occasioned by increase in CBR, makes loans to be expensive. Expensive loans reduce the demand for loanable funds. It also increases default rates. The net effect is reduced interest revenue to banks, hence reduced profitability.

Chepkorir et al. (2018), studied the link between interest rate and performance of Kenyan commercial banks. The study sampled commercial banks that were licensed by the CBK before 2011. They used primary data and found out that a unit decrease in central banks rate decreases performance of commercial banks by 0.025 units, and vice versa. The findings indicates a positive direct relationship between performance of commercial banks and interest rate. In conclusion, they maintained that CBR had a very weak, but positive association with financial performance of Kenya banks. Their research findings also revealed that CBR was a important determining factor for banks’ performance.

2.3.4 Capital adequacy on monetary policy and financial performance

Capital adequacy is defined as the ratio of core capital to the total risk-weighted asset. This ratio is called capital adequacy ratio (CAR). It represents the proportion of capital holding of a commercial bank in line with the financial institution’s regulators’ requirements (Obiero, 2002). It is expressed as the prerequisite equity’s core capital ratio expressed as a percentage of risk-weighted assets. The main aim of the regulator putting this requirement is to limit the amount of leverage that institutions take in order to avoid institutions
becoming insolvent. CAR is the measure of core capital to the risk-weighted asset. It is the quotient of Tier 1 and Tier 2 capital to risk-weighted assets (Akinleye & Fajuyagbe, 2019).

The Third Basel Accord coins out the global foundation for commercial banks’ regulation. It defines core capital as that part of the shareholders’ equity that a commercial bank has to support given the trading, lending and other risks that it may incur (Basel Committee on Banking Supervision, 1999). It primarily consists of retained profits and equity capital. Core capital is also known as Tier 1 capital. It is that part of the equity that would be difficult to distribute to the shareholders and serves as the permanent capital in the bank. Core capital provides a cushion for a bank against business (Ariwidanta & Wiksuna, 2018).

The capital also provides an indication that a financial institution is well prepared to carry out additional businesses (CBK, 2005). Mwenda (2011) reported a statistically significant positive relationship between return-on-equity and capital-asset ratio (CAR, the inverse of leverage) among American banks in the 1980s as was done by Berger (1995). In the same manner, the study of eighty countries between the years of 1988 and 1995 by Demirgüç-Kunt & Huizinga (1999) reveals a statistically significant positive relationship between capital and returns on assets. Kiam (2011) adds that the fact that leverage increases returns seems to follow directly from the very nature of business. Core capital may be seen from an absolute amount perspective (for instance, KShs. 250 Million) or from a ratio perspective (for instance, 8%). This research will focus on the ratio perspective as a measure of capital adequacy for commercial banks (Oyier, 2016).

Barton & Gordon (1987), noted that despite the many research studies carried out concerning the appropriate level of capital over the years, there exists no known consensus as to how the appropriate level of capital influences the performance of firms. Core capital and financial performance are expected to be linearly related. Gudmundson et al. (2013) also observed that the capital structure of a bank has a significant effect on its performance. Capital adequacy ratio was found to significantly influence the performance of commercial banks (Suka, 2011). Adequate capital stimulates the performance of banks (Akinleye & Fajuyagbe, 2019). Obiero (2002) observed that between 1984 and 2001, there were 39
financial institutions which failed, of which 14 failed partly due to non-performing loans and undercapitalization. The core capital enables a bank to lend more because lending to any one person, a group of related persons and even to insiders of the bank is usually linked to the amount held as capital (CBK, 2005). If a bank can lend more, the more interest income, the bank can earn and thus the higher level of profits (Oyier, 2016).

Ariwidanta & Wiksuana (2018), researched on the effect of credit and liquidity risk on bank profitability and capital adequacy ratio as mediation variables in Indonesia. They found out that CAR does not significantly mediate the effect of credit and liquidity risk on Indonesian banks’ profitability. They however did not consider monetary policy tools, which is the main focus of this thesis with CAR as a mediating variable.

Shrestha (2017), did a research on the impact of credit risk management on profitability on commercial banks in Nepal. The study found out that CAR exhibited a positive relationship with ROA. A higher CAR, according to the findings, translated into a higher ROA. The beta coefficient for CAR was statistically significant at 5% significance level. Simbolon & Simanjuntak (2020), also researched on the mediating effect of capital adequacy ratio on the relationship between non-performing loan and return on asset. The results showed that the mediating effect of CAR had a significant relationship between NPLs and ROA among Indonesian banks. This thesis did not however take into consideration the effects of monetary policy on profitability.

Another research was also done by Pradhan & Shrestha (2017), on the impact of capital adequacy and bank operating efficiency on financial performance of commercial banks in Nepal. The study covered the financial years 2005/6 to 2012/13. The study findings indicate that CAR has a negative impact on the performance of Nepalese commercial banks. The findings however contrasts the findings of Kamaita (2018) who also did her research over the same period. She concluded that CAR has a positive correlation with the financial performance of Kenyan banks. The study was however limited to only six banks listed at the Nairobi Securities Exchange between 2007 and 2016. These two studies nonetheless agree that commercial banks need to hold adequate capital to cushion them during hard economic times.
At the 2017 International Conference on African Entrepreneurship and Innovation for Sustainable Development (AEISD), Nestor et al. (2017) presented on the effect of capital adequacy on financial performance of quoted deposit money banks in Nigeria. Their research covered the period from 2010 to 2015. The study showed that CAR has a positive and statistically significant relationship with financial performance of Nigerian deposit money banks. It was further verified empirically that CAR significantly affects the performance of deposit money banks.
### 2.4 Summary of empirical literature review and research gaps

The table below is a summary of research gaps identified through my literature review:

<table>
<thead>
<tr>
<th>Author</th>
<th>Topic</th>
<th>Findings</th>
<th>Research gap</th>
<th>Focus on current study</th>
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<tr>
<td>Vikram (2012)</td>
<td>Impact of monetary policy in India with special reference to CRR, REPO and reverse REPO rate in curbing inflation- An econometric study</td>
<td>The monetary policy, if adopted, can help curb inflation in India.</td>
<td>Vikram researched on the use of monetary policy instruments in curbing inflation in an economy but did not study the impact of the instruments on the financial performance on Indian banks.</td>
<td>This study centred on the influence of OMO, CRR and CBR on financial performance of banks</td>
</tr>
<tr>
<td>Ajayi &amp; Atanda</td>
<td>Monetary policy and bank performance in Nigeria: A two-step co-integration approach</td>
<td>Bank rate has a positive but statistically insignificant effect on financial performance of commercial banks in Nigeria</td>
<td>Study conducted in Nigeria</td>
<td>This study is contextualized to the Kenyan banking sector</td>
</tr>
<tr>
<td>Nasserinia et al. (2014)</td>
<td>Key Determinants of Japanese Commercial Banks Performance</td>
<td>Monetary policy has a negative and statistically significant influence of financial performance of Japanese commercial banks</td>
<td>The study included six other bank-specific factors save capital adequacy ratio as mediating factor</td>
<td>This study excluded bank specific factors save capital adequacy ratio as mediating factor</td>
</tr>
<tr>
<td>-------------------------</td>
<td>----------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Kiganda (2014)</td>
<td>Effect of macroeconomic factors on commercial banks profitability in Kenya: Case study of Equity bank limited</td>
<td>Monetary policy has a significant impact on the financial performance of Kenya commercial banks.</td>
<td>The researcher focused on a case study of only one bank thus making the study to suffer from generalization problem</td>
<td>The focus of this study was a census of the entire population of all banks in Kenya</td>
</tr>
<tr>
<td>Njiru (2014)</td>
<td>Monetary policy and commercial banks’ lending rates in Kenya</td>
<td>Njiru’s study found out a long run relationship between lending rates and central bank rate. The results also indicated that CBR and inflation cause lending rates to increase in the short run while credit to the private sector causes lending rates to decrease in the short run. A statistically significant relationship was also established between lending rates</td>
<td>The researcher only concentrated on the CBR as a monetary instrument in all her work. Again, she also compared CBR and the lending rates in Kenya, leaving a research gap on the impact of all monetary policy</td>
<td>The study focused on monetary policy instruments on the performance of banks, not just lending rates.</td>
</tr>
<tr>
<td>Authors</td>
<td>Title</td>
<td>Description</td>
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<td>---------</td>
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<td></td>
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<tr>
<td>Abid &amp; Lodhi (2015)</td>
<td>The impact of changes in reserve requirements on banks profitability: A case of commercial banks in Pakistan.</td>
<td>The study showed an insignificant relationship between lending rates and asset prices as well as economic growth in short run. The study revealed that commercial banks’ lending rates are indeed positively responsive to CBR and that CBR as an instrument of monetary policy is indeed an effective tool as it increases lending rates and relieves demand pull pressures in the economy. Study findings indicate that reserve requirements had a significant negative relationship with the financial performance of Pakistani banks. The research was restricted to only 17 banks in Pakistan. In addition, only CRR was used as a measure of monetary policy. This study was contextualized to Kenya and took census of all banks. Monetary policy was measured by OMO, CRR and CBR.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Meshack &amp; Nyamute, (2016)</td>
<td>The effect of monetary policy on financial performance of the commercial banks listed on the Nairobi securities exchange</td>
<td>Monetary policy tools have varying degrees of relationship with financial performance of commercial banks listed on the NSE</td>
<td>The study only considered a small population of 11 banks. Time scope was also limited to financial report as at 30th June, 2015 which has been overtaken by most events</td>
<td>There is room for the same study involving the entire industry players with more recent data spanning from 2015 to 2018 as covered in this research</td>
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</tr>
<tr>
<td>Kubasu &amp; Mutwol, (2016)</td>
<td>Effects of selected monetary policies on loans portfolio performance among commercial banks in Kenya</td>
<td>There was no significant relationship between OMO, and CBR and performance of commercial banks</td>
<td>The study sampled 30 out of the 42 commercial banks. Performance of banks was also measured by loans portfolio performance</td>
<td>This research was a census of all the commercial banks in Kenya. Performance of banks was also measured using ROA, which is a more acceptable profitability measure.</td>
</tr>
<tr>
<td>(MacCarthy, 2016)</td>
<td>The effect of cash reserve ratio (CRR) on the financial performance of commercial banks and their engagement in corporate social responsibility in Ghana. Cash reserve ratio was found to have a positive relationship with the financial performance of commercial banks in Ghana. CRR was also a statistically significant predictor of financial performance of commercial banks as measured by their return on investment rates.</td>
<td>This study was a cross-sectional as it only considered the returns for the year 2013. It also sampled 20 banks (71%) in Ghana.</td>
<td>This study covered a wider, and more recent time scope. The researcher also did a census study of all banks in Kenya.</td>
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</tr>
<tr>
<td>Nestor et al. (2017)</td>
<td>The effect of capital adequacy on financial performance of quoted deposit money banks in Nigeria. The study showed that CAR has a positive and statistically significant relationship with financial performance of Nigerian deposit money banks. It was further verified empirically that CAR significantly affects the performance of deposit money banks.</td>
<td>The researchers used capital requirements as an independent variable</td>
<td>The focus of this study was to establish the mediating effect of CAR on the relationship between monetary policy and financial performance</td>
<td></td>
</tr>
<tr>
<td>Nguyen et al., (2017)</td>
<td>Impacts of Monetary Policy on Commercial Banks’ Profits: The Case of Vietnam Only monetary base (central bank rate) has a significant positive impact on banks’ profits at 10% significance level.</td>
<td>The study did not give room for open market operations which is a main tool for transmitting monetary policy stance.</td>
<td>This study considered the use of OMO as well as CBR and CRR.</td>
<td></td>
</tr>
<tr>
<td>Authors</td>
<td>Topic</td>
<td>Findings</td>
<td>Study Focus</td>
<td>Notes</td>
</tr>
<tr>
<td>---------------------------------</td>
<td>----------------------------------------------------------------------</td>
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</tr>
<tr>
<td>Adesina et al. (2018)</td>
<td>Monetary policy and financial performance of Nigerian deposit money banks</td>
<td>Monetary policies of the Central Bank of Nigeria significantly affect financial performance of deposit money banks in the short run but the effect turns insignificant in the long run.</td>
<td>Focus of the study was in Nigeria following the period of restructuring Central Bank of Nigerian banks.</td>
<td>The focus of this study was on Kenyan banks</td>
</tr>
<tr>
<td>Kemboi &amp; Tibbs (2018)</td>
<td>Monetary policy and performance of commercial banks in Kenya</td>
<td>Monetary policy controls 72% of banks profitability and that CRR and OMO had the biggest effect of financial performance of Kenyan banks</td>
<td>Time scope (2011-2015) is thin and overtaken by major monetary policy changes</td>
<td>Study focused on wider time scope of 2010 to 2018</td>
</tr>
<tr>
<td>Ariwidanta &amp; Wiksuana (2018)</td>
<td>The effect of credit and liquidity risk on bank profitability and capital adequacy ratio as mediation variables in Indonesia</td>
<td>CAR does not significantly mediate the effect of credit and liquidity risk on Indonesian banks’ profitability</td>
<td>Monetary policies not studied</td>
<td>Monetary policy studied and how CAR mediates their relationship with profitability of Kenyan banks profitability.</td>
</tr>
<tr>
<td>(Simbolon &amp; Simanjuntak, 2020)</td>
<td>The mediating effect of capital adequacy ratio on the relationship between non-performing loans and return on assets among Indonesian banks.</td>
<td>The mediating effect of capital adequacy ratio had a significant relationship between non-performing loans and return on assets among Indonesian banks.</td>
<td>Monetary policy tools not studied</td>
<td>This thesis took into consideration the effects of monetary policy on profitability. The study</td>
</tr>
</tbody>
</table>
performing loan and return on asset |  | was also contextualized to Kenya.

Source: Researcher (2020)
2.5 Research gap

The forgoing literature has extensively appreciated that there should be a link joining monetary policy to the financial performance of commercial banks, the behaviour of borrowing and lending of borrowers and lending institutions in many developing economies. Surprisingly, this conspicuously missing connection between the effects of monetary policy transmission and the profitability of commercial banks is an under-researched area. Borio et al. (2015), confirmed that many researchers only analysed the relationship between the profitability of banks and various business environments, resulting into the link between the rate of interest structure and profitability of banks only as a by-product. Demirgüç-Kunt & Huizinga (1999) were pioneers in studies relating the profitability of banks to critical macroeconomic pointers like real interest rates.

Several scholars have researched in this area. Njiru (2013), in her study, realized that lending rates, inflation and exchange rates have a long-run relationship. She also pointed that central bank rate and inflation is a recipe for rising lending rates in the short run, whereas loans extended to the households sector leads to a short term decline in lending rates. This makes the performance of banks to be very unpredictable. Kimani (2013) noted that CBR, CRR, OMO and uncertainty resulting from possible outcomes of deviations in monetary policy impact lending behaviour by financial institutions, and hence their profitability. Joshi (2012) concluded that if a country adopts an effective monetary policy, it could help curb inflation as was in India. If the transmission of monetary policy is pragmatic in such a way that inflation can be tamed, and then credit creation will be enhanced, hence banks profitability.

Several scholars have arrived at different results in explaining the effect of monetary policy interventions on the performance of commercial banks. Vikram (2012) attempted to explain the impact of monetary policy on curbing inflation in India. Nasserinia et al. (2014) did not measure the mediating effect of any bank-specific variable in Japanese banks' study. The same study was done in Vietnam by Nguyen et al. (2017), but they failed to give room to OMO. Adesina et al. (2018) conducted the same study in Nigeria but did not consider the mediating effect of capital adequacy ratio. In Kenya, Meshack & Nyamute, (2016)
limited their study to only 11 commercial banks listed at the NSE while Kemboi & Tibbs (2018) used a time scope that has been overtaken by other policy guidelines.

The mediating effect of capital adequacy ratio has also not been given due consideration. Ariwidanta & Wiskuana (2018) on a study among Indonesian banks showed that CAR does not significantly mediate the effect of credit and liquidity risk on profitability. Conversely, the mediating effect of capital adequacy ratio had a significant relationship between NPLs and return on assets among Indonesian banks (Simbolon & Simanjuntak, 2020). This apparent conflicting conclusion makes it important to study the mediating effect of CAR on the relationship between monetary policy and banks profitability. These studies have, therefore, not given due consideration to the effects of monetary policy instruments on the financial performance of commercial banks over the immediate period following the 2008 global financial crisis. This area, therefore, remains under-researched hence the focus of this thesis.
2.6 Conceptual framework

Figure 2.1: Conceptual framework

The above framework outlines the link between the monetary policy instruments as independent variables and performance of banks’ measures, on the other hand, as the dependent variable. Open market operations were measured by use of treasury bills rate. Cash reserve was measured by CRR while CBR was measured by CBK rate. It also included mediating effects of CAR as a non-monetary policy requirement since it impacts the performance of commercial banks.

Source: Researcher (2020)
CHAPTER THREE

RESEARCH METHODOLOGY

3. 1 Introduction

Chapter three covers the philosophy which guided the choice of research design, location of the study, target population, sample and procedure used for sampling, research instruments, procedure used for data analysis, diagnostic tests conducted and also ethical concerns for this study.

3. 2 Research Philosophy

This research was guided by positivism philosophical orientation. According to Machenzie & Knipe (2006), positivism is the oldest philosophy and most widely used in research papers since it grants for the use of qualitative methods, rational empirical technique, and allows for hypothesis testing. Positivism enables the measuring of facts that exist. It also allows the use of a survey approach hence has the strength of covering a wide population area (Mukheriji & Ablon, 2010). Because of causality and objectivism of this research, and due to the popular use of positivism in studies, it was therefore considered an appropriate philosophical orientation in this study.

3. 3 Research Design

The descriptive and explanatory research designs were employed since they helped to give a detailed account of how exactly things are (Kombo & Tromp, 2009). Cooper & Schindler (2003) asserted that a descriptive study marks out a phenomenon, mostly by profiling or a group of phenomena through data collection and tabulating the frequencies on research variables or their interactions. The purpose of this study was well matched by the features of the descriptive research design. This guaranteed an in-depth account of the state of activities as they were in the financial system as well as postulated in the explanatory and descriptive research designs.
The explanatory design was used because it allowed the researcher to present crucial research problems by gathering facts on scientific lines to ensure that this research is completed successfully (Kathuri & Pals, 2003). Explanatory research design allowed the researcher to establish and explain the impact of each monetary policy instrument on the financial performance of commercial banks. It also allowed the researcher explore the extent of mediation of the mediating variable (Noum, 2007).

3.4 Target population

Target population comprises the specific set of elements that the researcher intends to carry the study (Mugenda & Mugenda, 2012). It is the whole cluster of persons, occasions, elements, or items that exhibit mutual observable features that follow a particular description. The target population in this thesis was 42 commercial banks licensed and supervised by the CBK. A study of the entire industry players gave a generalized feature of the banking sector.

3.5 Sampling design

With the study being a census, the sample was all the commercial banks licensed and supervised by the CBK. These are enumerated in the first Appendix hereunder.

3.6 Data collection instruments

Secondary data was used in this research to allow analysis of facts, figures, and principles in documentary sources. This data was collected from published financial statements of the commercial banks under study, monetary policy reports, and other relevant documents and reports from the CBK, from Kenya National Bureau of Statistics and Nairobi Securities Exchange, covering the period under study; that is 2010-2018.

3.7 Data collection procedure

The researcher first acquired a letter of introduction from Kenyatta University to collect data from various institutions. Authority from NACOSTI was also given to allow the
researcher carry out this research. The researcher then personally approached the relevant organizations for the information needed for the research to be a success.

3.8 Operationalization of variables

Operationalization refers to the process of specifying the actual procedures that will produce indicators of some concept (McAuley, 1987). The researcher summarized the manner in which the various variables were operationalized and measured in the table below:

Table 3.1 Operationalization and measurement of variables

<table>
<thead>
<tr>
<th>Variable</th>
<th>Type</th>
<th>Operationalization</th>
<th>Measurement</th>
<th>Hypothesised direction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Open market operations</td>
<td>Independent</td>
<td>Treasury bills rate</td>
<td>Percentage to measure the average monthly rate of T-bills rates</td>
<td>Negative</td>
</tr>
<tr>
<td>Central bank rate</td>
<td>Independent</td>
<td>Central Bank Rate</td>
<td>Percentage to measure monthly Central Bank rates in Kenya.</td>
<td>Negative</td>
</tr>
<tr>
<td>Cash reserve</td>
<td>Independent</td>
<td>Cash reserve ratio</td>
<td>Percentage to measure monthly cash reserve ratio required by the CBK.</td>
<td>Negative</td>
</tr>
<tr>
<td>Capital adequacy</td>
<td>Mediating</td>
<td>Capital adequacy ratio</td>
<td>Percentage to measure the core capital adequacy requirement</td>
<td>Negative</td>
</tr>
<tr>
<td>Financial performance</td>
<td>Dependent</td>
<td>Return on assets</td>
<td>Percentage to measure the return on assets for the banks supervised by CBK.</td>
<td>None</td>
</tr>
</tbody>
</table>

Source: Researcher (2020)
3.9 Data analysis and presentation

A careful examination was conducted on the data to check for completeness and comprehensiveness. The data collected was cleaned for validation purposes. The data was then summarized, coded, tabulated, and analysed using both inferential and descriptive statistics. Descriptive statistics that were used included but not limited to the mean, standard deviation, and minimum and maximum values for all variables. Data analysis was conducted through Microsoft Excel spreadsheets, and STATA. The significance of the model was tested using the analysis of variance (ANOVA), and F-tests at 5% significance level. The coefficient of determination sought to explain the extent to which the model explains the changes in the dependent variable. The results were presented using figures, graphs, and tables.

3.10 Empirical model

A multiple regression analysis was run to test the effect of monetary policy instruments on the financial performance of commercial banks in Kenya. A correlation matrix showing the interrelationships within the variables under study was done. An ANOVA table, which is used to assess the usefulness of a regression model’s independent variables in explaining the dependent variable, was also generated. The study tested the hypothesis at 5% significance level.

The functional relationship of the empirical model used is as under:

\[ Y = \beta_0 + \beta_1 \chi_1 + \beta_2 \chi_2 + \beta_3 \chi_3 + \epsilon_1 \]  

Where:

\( Y \) = Performance of commercial banks

\( \chi_1, \chi_2, \chi_3 \) = Treasury bills rate, cash reserve ratio and central bank rate

\( \beta_0, \beta_1, \beta_2, \beta_3 \) = Coefficients of monetary policy instruments

\( \epsilon_1 = \text{error term.} \)
In the first empirical model above, OMO, CRR and CBR were regressed on ROA. Causal steps approach was then adopted to determine if capital adequacy ratio has mediating effect on the relationship between monetary policy and banks profitability (Judd & Kenny, 1981). Equation 3.2 below sought to establish the relationship between the independent variable (monetary policy, MP) and the dependent variable (ROA).

\[ Y = \beta_{02} + \beta_{20}x_{20} + \varepsilon_{20} \] \hspace{1cm} 3.2

Where: \( \beta_{20} = \) Coefficient of monetary policy

\( x_{20} = \) Monetary policy

The next stage (Model 3.3) was to determine the relationship between CAR and ROA as demonstrated below:

\[ Y = \beta_{03} + \beta_{30}x_{30} + \varepsilon_{3} \] \hspace{1cm} 3.3

Where: \( \beta_{30} = \) Coefficient of CAR

\( x_{30} = \) Capital adequacy ratio

The next stage (model 3.4) sought to determine the relationship between the mediating variable (as dependent variable) and monetary policy (as independent variable).

\[ CAR = \beta_{04} + \beta_{40}x_{40} + \varepsilon_{4} \] \hspace{1cm} 3.4

Where: \( \beta_{40} = \) Coefficient of monetary policy

\( x_{40} = \) Monetary policy

The last stage (model 3.5) was estimated to determine whether there was total, partial or no mediation on the relationship between monetary policy and financial banks’ performance.

\[ Y = \beta_{05} + \beta_{50}x_{50} + \beta_{51}x_{51} + \varepsilon_{5} \] \hspace{1cm} 3.5

Where: \( \beta_{50} \) and \( \beta_{51} = \) Coefficient of monetary policy and CAR
\( x_{50} \) and \( x_{51} \) = Monetary policy and CAR

The schematic display of the model that guided the test for mediation effect is shown below:

Figure 3.1 Mediation Model

Source: Researcher (2020)

Figure 3.1 is a representation of simple mediation model. \( \beta_{20} \) is the total effect of monetary policy (independent variable) on financial performance of commercial banks (dependent variable). Further, \( \beta_{50} \) shows the direct effect of monetary policy after controlling the mediating variable. The effect of the independent variable (monetary policy) on the mediating variable (CAR) is \( \beta_{40} \) while \( \beta_{51} \) is the effect of the mediating variable on the dependent variable after controlling the independent variable (Rucker et al., 2011).
Decision Criteria

Table 3.2 Decision Criteria for Mediation variable

<table>
<thead>
<tr>
<th>Model 3.2</th>
<th>Model 3.3</th>
<th>Model 3.4</th>
<th>Model 3.5</th>
<th>Test</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>$\beta_{20}$; (p&gt;0.05)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>No overall relationship to mediate</td>
</tr>
<tr>
<td>$\beta_{20}$; (p≤0.05)</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>There exists an overall relationship to mediate</td>
</tr>
<tr>
<td>$\beta_{20}$; (p≤0.05)</td>
<td>$\beta_{30}$; (p≤0.05)</td>
<td>$\beta_{40}$; (p≤0.05)</td>
<td>$\beta_{50}$ and $\beta_{51}$; (p≤0.05)</td>
<td>$\beta_{20} - \beta_{50}$</td>
<td>Partial mediation</td>
</tr>
<tr>
<td>$\beta_{20}$; (p≤0.05)</td>
<td>$\beta_{30}$; (p≤0.05)</td>
<td>$\beta_{40}$; (p≤0.05)</td>
<td>$\beta_{50}$; (p &gt; 0.05)</td>
<td>$\beta_{20} - \beta_{50}$</td>
<td>Perfect mediation</td>
</tr>
</tbody>
</table>

Source: Rucker et al., (2011)

The indirect effect is the product $\beta_{40} * \beta_{51}$. Generally, for either kind of mediation, it is expected that the indirect effect $\beta_{40} * \beta_{51}$ would be equivalent to the difference between the total effect and the direct effect $\beta_{20} - \beta_{50}$. The critical beginning point for mediation analysis is a significant relationship between monetary policy and financial performance of commercial banks. The statistical significance of $\beta_{20}$ coefficient in Model 3.2 is an important condition for testing for mediation, otherwise the causal steps methodology would collapse if there is no effect to mediate. Partial mediation emanates from the statistical significance of both direct and indirect effect. Perfect mediation on the other hand, happens when indirect effect is statistically significant but direct effect is not statistically significant.
3.11 Diagnostic tests

The researcher conducted the following diagnostic tests in this study:

3.11.1 Heteroscedasticity test

To find out whether or not there is a difference in the residual variance of the observation period to another period of observation, the researcher tested for heteroscedasticity by Breusch-Pagan/Cook-Weisberg test for heteroskedasticity using STATA. With this test, if the significance value is greater than 0.05 at 95% confidence interval, then it is safe to conclude that there is no heteroscedasticity in the data used. When heteroscedasticity exists, one cannot use the ordinary least-squares method for estimating the regression. Instead, a more sophisticated approach, called generalized least squares (Aczel & Sounderpandian, 2008), should be used to cure heteroscedasticity problems. Robust regression was done to manage heteroscedasticity problems.

3.11.2 Normality test

The assumption for normality must be checked for many statistical techniques, namely the parametric test, since the validity of such tests relies on it. The statistical procedures employed in this research were pegged on the assumption that the data was drawn from a normally distributed population. The researcher assumed that the population is normally distributed. This assumption is particularly vital when formulating reference intervals for variables. A violation of this assumption, makes it difficult to make accurate and reliable conclusions about reality (McClave et al., 2008).

With large sample sizes, more than thirty samples, the violation of the normality assumption should not arise since the parametric procedures can be used even when the data is not normally distributed (Soberón & Stute, 2017). According to the central limit theorem, if the sample data are approximately normal, then the sampling distribution too will be normal. In large samples (more than thirty), the sampling distribution has a tendency to be normally distributed regardless of the shape of the data, and means of random samples from any distribution will themselves have a normal distribution (Lee,
2000). The researcher, therefore, looked for normality by conducting the Skewness/Kurtosis test.

3.11.3 Autocorrelation

In testing for the relationship between the variables under study values separated from each other by a given time lag in the residuals from a regression analysis, the researcher employed the use of the Breusch-Godfrey LM test for autocorrelation. This statistic was applied to the residuals from least squares regressions and developed bounds tests for the null hypothesis that the errors are serially uncorrelated against the alternative that the errors follow a first-order autoregression process (Abdulhafedh, 2017). According to Aczel & Sounderpandian (2008), the distribution of this statistic is not dependent on the estimated regression coefficient and the variance of the errors.

3.11.4 Multicollinearity

Multicollinearity test was done to ascertain whether or not any of the two or more variables under study exhibited a high linear relationship. If multicollinearity exists in the model, then a small change in the data makes the coefficient estimates to change intermittently. That notwithstanding, multicollinearity neither diminishes the reliability of the model, not its predictive power (Kalnins, 2018). In this study, the test was based on VIF value.

3.11.5 Unit root test

Unit root test was done to establish whether or not the variables were non-stationary and possessed unit root. The unit root test was done using Bartlett’s (B) statistic (Cumulative periodogram white-noise test). The null hypothesis (H₀) states that there is unit root in the data. The rule of thumb is H₀ is rejected if \( p \leq 0.05 \).

3.12 Ethical considerations

These are ethical principles that guided the conduct of the study, which, according to Hoyle et al., (2002), refers to ethical practices embraced in research undertaking. Gatara (2010), referred to them as moral principle or code of conduct guiding the conduct of
research, requiring respect for the rights of research respondents.

An introductory letter was first obtained from the relevant authority, and entrance permit obtained to allow the researcher to visit organizations from which data was collected. Finally, the researcher ensured that the findings of the study are reported with honesty and that the document is free of any plagiarism (Mugenda & Mugenda, 2012). After Kenyatta University approved the study, it was then authorized by the National Commission for Science, Technology, and Innovation (NACOSTI) for data to be collected.
CHAPTER FOUR
DATA ANALYSIS AND FINDINGS

4.1 Introduction
Chapter four is a presentation of the findings and analysis on the effects of monetary policy instruments on the financial performance of commercial banks in Kenya. An assessment was done on all the forty-two banks in Kenya within nine years, from 2010 to 2018. Data was collected on return on assets (ROA), capital adequacy ratio (CAR), treasury bills rate (OMO), cash reserve ratio (CRR), and cash reserve ratio (CBR). The data obtained was analysed by the use of STATA to achieve the study’s objective.

4.2 Analysis of descriptive statistics
Descriptive analysis was employed to exhibit the elementary characteristics of the data. The researcher used graphs, with linear trend lines. Other features like the sample size (n), mean, standard deviation, maximum and minimum values were also discussed as shown below:

4.2.1 Descriptive analysis for Open Market Operations

Figure 4.1 Descriptive analysis for Open Market Operations Source: Research data (2020)
The mean treasury bills rate was 0.0874164 (8.74164%) with a standard deviation of 0.0363211 (3.632%). The maximum T-bills rate was 21.65% in October 2015 while the minimum rate was 1.6% in July 2010. From the above graph, treasury bills rate reduced from 6.5% to 1.6% in July 2010 before rising again to a first high of 20.56% in January 2012. This peak was followed by a decline up to 5.62% in July 2013 before a rise up to a second peak of 21.65% in October 2015. The linear trend line shows that the treasury bills rate is generally increasing from January 2010 to December 2018. The graph above presents the actions of the CBK in the economy. As the rate increased from 4.56% to 20.56% and to another high of 21.65% in October 2015, the CBK sold the treasury bills at an attractive rate for financial institutions to buy resulting in increasing profitability from 4.43% in 2010 to 4.7% in 2012 and before a general decline in profitability thereafter (Central Bank of Kenya, 2016).

### 4.2.2 Descriptive analysis for Cash Reserve Ratio

The mean cash reserve ratio was 0.0488426 (4.884%). The standard deviation was 0.0027857 (0.27857%). The maximum rate was 5.25% (January 2016-December 2018) while the minimum value rate was 4.5% (January 2010 to April 2011). The graph also

![Figure 4.2: Descriptive analysis for CRR](source: Research data (2020))
depicts the trend of CRR during the time scope under study. CRR increased from 4.5% in January 2010 to 5.25% in December 2018. This rising trend in CRR demonstrates that there was less money at the disposal of commercial banks to advance credit. This may affect the performance negatively as argued by Teja et al (2013) in their research on the effect of CRR on Indian stock market in the long run. Talreja (2014) confirms the above statement by concluding that a rise in CRR results in a corresponding rise in interest rate loans hence reduced profitability as deficit units will shy away from consuming expensive loans. The impact was revealed by declining profitability as graphically illustrated in the descriptive analysis for ROA below.

4.2.3 Descriptive analysis for Central Bank Rate

![Descriptive analysis for CBR](image)

Figure 4.3: Descriptive analysis for CBR  
Source: Research data (2020)

The mean central bank rate was 0.097963 (9.76963%) with δ=0.0299184 (2.992%). The maximum value for CBR was 18% from December 2011 to May 2012 while the lowest rate was 5.75% in January 2011. Figure 4.3 also shows the trend of Central bank rate from a low of 7.00% in January 2010 to a peak of 18.00% from December
2011 to June 2012. In May 2013, the rate plateaued at 8.5% up to May 2015 then rose again. There was a general rise in CRR during the period under study as revealed by the linear trend line above.

### 4.2.4 Descriptive statistics Return on Asset

![ROA Graph](image)

**Figure 4.4: Descriptive analysis for ROA**

Source: Researcher (2020)

Figure 4.4 is a graphical presentation of the return on assets over the years under study. The mean ROA was 0.0370333 (3.703%) with δ=0.0080113 (0.8011%). The maximum performance measured by ROA recorded was 4.7% in 2012 while the lowest performance was recorded in 2017, being 2.7% followed by a marginal increase in the ensuing year. The returns averaged 4.43% in 2010 followed by marginal drop of 0.03% in the ensuing year. The financial performance increased to 4.7% in 2012 and stagnated in 2013. This was followed by a general decline in financial performance up to 2018 where there was a 0.1% increase from the previous year’s performance.
4.2.5 Descriptive statistics for Capital Adequacy Ratio

The mean for CAR was 0.1756667 (17.57%) with δ=0.0147958 (1.47958%). The maximum rate was 20% in both 2010 and 2012 while the minimum rate was 16% in 2014. The average CAR was on the downward trend as evidenced by the findings in Figure 4.4. With 2010 being the highest at 20.00%, the industry registered a general decrease in CAR to 16.6% in December 2018.

Figure 4.5: Descriptive analysis for CAR

Source: Research data (2020)
4.2.6 Summary of descriptive analysis

Table 4.1 below summarizes the results of descriptive analysis for all the variables in the study. The mean scores, standard deviation and the number of observations are captured.

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>Std. Dev.</th>
<th>Min</th>
<th>Max</th>
</tr>
</thead>
<tbody>
<tr>
<td>OMO</td>
<td>108</td>
<td>.0874164</td>
<td>.0363211</td>
<td>.016</td>
<td>.2165</td>
</tr>
<tr>
<td>CRR</td>
<td>108</td>
<td>.0488426</td>
<td>.0027857</td>
<td>.045</td>
<td>.0525</td>
</tr>
<tr>
<td>CBR</td>
<td>108</td>
<td>.097963</td>
<td>.0299184</td>
<td>.0575</td>
<td>.18</td>
</tr>
<tr>
<td>CAR</td>
<td>108</td>
<td>.1756667</td>
<td>.0147958</td>
<td>.16</td>
<td>.2</td>
</tr>
<tr>
<td>ROA</td>
<td>108</td>
<td>.0370333</td>
<td>.0080113</td>
<td>.027</td>
<td>.047</td>
</tr>
</tbody>
</table>

Table 4.1: Summary of descriptive analysis

Source: Research data (2020)

The data was collected and averaged for the nine years (2010-2018) and 42 banks under study and analysed using STATA. The result shows 108 observations which were monthly figures from January 2010 to December 2018. The mean treasury bills rate was 0.0874164 (8.74164%) while its standard deviation is 0.0363211 (3.632%). The mean cash reserve ratio was 0.0488426 (4.884%); with δ=0.0027857 (0.27857%). The mean central bank rate was 0.097963 (9.76963%) with δ=0.0299184 (2.992%). The mean for CAR was 0.1756667 (17.57%) with δ=0.0147958 (1.47958%). The mean return on assets (ROA) was 0.0370333 (3.703%) with δ=0.0080113 (0.8011%). The maximum and minimum values for every variable across the period under study are also tabulated as above.
4.3 Correlation analysis

Table 4.2 shows the results of correlation analysis of all the variables used in the study.

<table>
<thead>
<tr>
<th></th>
<th>ROA</th>
<th>OMO</th>
<th>CRR</th>
<th>CBR</th>
<th>CAR</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>OMO</td>
<td>-0.0037</td>
<td>1.0000</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CRR</td>
<td>-0.7177</td>
<td>0.1239</td>
<td>1.0000</td>
<td></td>
<td></td>
</tr>
<tr>
<td>CBR</td>
<td>0.0767</td>
<td>0.7559</td>
<td>0.2041</td>
<td>1.0000</td>
<td></td>
</tr>
<tr>
<td>CAR</td>
<td>0.8357</td>
<td>-0.1046</td>
<td>-0.5468</td>
<td>0.1724</td>
<td>1.0000</td>
</tr>
</tbody>
</table>

Table 4.2: Correlation analysis  
Source: Research data (2020)

A correlation analysis was run to determine the strength and direction of the relationship between the variables under study. From this analysis, it was found out that there is a very weak negative relationship between ROA and OMO (r=-0.0037). This means that a change in treasury bills rate has a weak inverse effect of the profitability of commercial banks. The results agrees with the findings by Meshack & Nyamute (2016), who reached a conclusion that OMO negatively correlates with ROA, albeit on a small sample size of only banks listed on NSE. Kemboi & Tibbs (2018), and Thuc et al. (2019), however, point to a positive relationship between OMO and ROA. On the same breath, the analysis above revealed a strong negative relationship between ROA and CRR (r=-0.7177) implying that a change in cash reserve ratio has strong negative effect in banks’ profitability. This is because it negatively impacts the availability of funds for banks to trade with. Meshack & Nyamute (2016), Oganda et al. (2018), and Abid & Lodhi (2015), agree with the finding that CRR negatively influences performance. MacCarthy (2016), however, found a positive relationship between CRR and performance of Ghanaian banks.

The correlation analysis also established a very weak positive relationship between ROA and CBR (r=0.0767). Meshack & Nyamute, (2016), however found a strong positive correlation. The result shows that ROA and central bank rate move in the same direction, though the strength of relationship is weak. As CBR increases so does ROA and as CBR
decreases, so does ROA. Studies by Nguyen et al. (2017), Njiru (2013), and Chepkorir et al. (2018) agree with the finding above that CBR positively relate with performance of commercial banks. Simiyu & Ngile (2015), however, concluded that bank rate negatively associates with performance of banks. CAR also exhibited a strong positive correlation with ROA (r=0.8357). This means that as the capital adequacy ratio increases, the profitability also increases and as it reduces, so does the return on assets. The finding agrees with Mwenda (2011), Nestor et al. (2017), and Kamaita (2018), who also got a positive relationship between CAR and performance of commercial banks. A study in Nepal by Pradhan & Shrestha (2017), however showed that CAR had negative impact on the performance of commercial banks.

4.4 Diagnostic tests

The following diagnostic tests were conducted:

4.4.1 Heteroscedasticity test

In order to inspect whether or not there was a difference in the residual variance of the observation period to another period of observation, the researcher tested for heteroscedasticity by Breusch-Pagan/Cook-Weisberg test for heteroskedasticity. The output is as in the table below.

<table>
<thead>
<tr>
<th>Source</th>
<th>estat hottest</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Breusch-Pagan / Cook-Weisberg test for heteroskedasticity</td>
</tr>
<tr>
<td></td>
<td>Ho: Constant variance</td>
</tr>
<tr>
<td></td>
<td>Variables: fitted values of ROA</td>
</tr>
<tr>
<td></td>
<td>chi2(1) = 2.59</td>
</tr>
<tr>
<td></td>
<td>Prob &gt; chi2 = 0.1074</td>
</tr>
</tbody>
</table>

Table 4.3: Heteroscedasticity test  
Source: Researcher (2020)

Table 4.3 shows that the prob>chi^2 = 0.1074 which is greater than 0.05 indicating the null hypothesis of the constant variance can be rejected at 95% confidence interval. This implies that the data used had no problem of heteroscedasticity.
4.4.2 Normality test

In testing for normality, the researcher employed a statistical procedure assuming that the data follows a normal distribution. The researcher analysed this assumption using the Skewness/Kurtosis test for normality and the output is as below.

<table>
<thead>
<tr>
<th>Variable</th>
<th>Obs</th>
<th>Pr(Skewness)</th>
<th>Pr(Kurtosis)</th>
<th>adj chi2(2)</th>
<th>Prob&gt;chi2</th>
</tr>
</thead>
<tbody>
<tr>
<td>OMO</td>
<td>108</td>
<td>0.0001</td>
<td>0.0007</td>
<td>20.27</td>
<td>0.0000</td>
</tr>
<tr>
<td>CRR</td>
<td>108</td>
<td>0.1414</td>
<td>0.0000</td>
<td>.</td>
<td>0.0000</td>
</tr>
<tr>
<td>CBR</td>
<td>108</td>
<td>0.0000</td>
<td>0.0052</td>
<td>24.50</td>
<td>0.0000</td>
</tr>
<tr>
<td>CAR</td>
<td>108</td>
<td>0.0059</td>
<td>0.0001</td>
<td>18.36</td>
<td>0.0001</td>
</tr>
<tr>
<td>ROA</td>
<td>108</td>
<td>0.7357</td>
<td>.</td>
<td>.</td>
<td>.</td>
</tr>
</tbody>
</table>

Table 4.4: Skewness/Kurtosis test  
Source: Research data (2020)

The Skewness/Kurtosis test for normality above also shows that the individual variables were all drawn from a normally distributed population as all the Prob>chi2 are all less than 0.05. Therefore, according to the Skewness/Kurtosis test for normality, there is no violation of the normal distribution assumption of the error term since the data used was normally distributed.

4.4.3 Autocorrelation

The researcher used Breusch-Godfrey LM test for autocorrelation in testing for the relationship between the variables under study to establish if they are separated from each other by a given time lag in the residuals from the regression analysis. The null hypothesis was that the errors are not serially correlated against the alternative that the errors follow a first order auto regression process. The result is tabulated below:
Breusch-Godfrey LM test for autocorrelation

<table>
<thead>
<tr>
<th>lags(p)</th>
<th>chi2</th>
<th>df</th>
<th>Prob &gt; chi2</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>83.937</td>
<td>1</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

H₀: no serial correlation

Table 4.5: Breusch-Godfrey LM test  
Source: Research data (2020)

From the Breusch-Godfrey LM test for autocorrelation above, the p-value=0.0000 implying that the data used has no autocorrelation problem.

### 4.4.4 Multicollinearity test

After the normality of the data in the regression model was ascertained, the next step was to find out whether there was similarity between the independent variables in the equation. Similarities between the independent variables results in a very strong correlation. There should not exist correlation between the independent variables for a good model and this is revealed by the multicollinearity test. The test was on the basis of VIF value of multicollinearity test results.

The decision making rule in multicollinearity test states that if the VIF value lies between 1-10, then there is no multicollinearity. If the VIF<1 or >10, then there is multicollinearity. The 1/VIF shows tolerance or degree of collinearity. The value should be less than 0.1, otherwise variables with tolerance values of less 0.1 depict linear combination of other explanatory/independent variables.

<table>
<thead>
<tr>
<th>. estat vif</th>
<th>Variable</th>
<th>VIF</th>
<th>1/VIF</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>CBR</td>
<td>3.60</td>
<td>0.277561</td>
</tr>
<tr>
<td></td>
<td>OMO</td>
<td>3.09</td>
<td>0.323470</td>
</tr>
<tr>
<td></td>
<td>CAR</td>
<td>2.14</td>
<td>0.466568</td>
</tr>
<tr>
<td></td>
<td>CRR</td>
<td>1.89</td>
<td>0.530196</td>
</tr>
<tr>
<td></td>
<td>Mean VIF</td>
<td>2.68</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.6: Multicollinearity test  
Source: Research data (2020)
The measure of amount of multicollinearity in the regression set (Varience Inflation Factor) gave a mean of 2.68 that implied a significantly very low correlation. With a VIF of less than 10, we can conclude that there is no multicollinearity problem. Since the tolerance values are greater than 0.1, we can conclude that there is no correlation between the variables under study thus no presence of multicollinearity in the model.

4.4.5 Unit root test

Unit root test was done using Bartlett's (B) statistic (Cumulative periodogram white-noise test). The null hypothesis (H₀) is that there is unit root in the data. The rule of thumb is H₀ is rejected if p≤0.05. The results are shown below:

<table>
<thead>
<tr>
<th>Source</th>
<th>Bartlett's (B) statistic</th>
<th>Prob &gt; B</th>
</tr>
</thead>
<tbody>
<tr>
<td>OMO</td>
<td>5.4160</td>
<td>0.0000</td>
</tr>
<tr>
<td>CRR</td>
<td>6.0500</td>
<td>0.0000</td>
</tr>
<tr>
<td>CBR</td>
<td>6.0325</td>
<td>0.0000</td>
</tr>
<tr>
<td>CAR</td>
<td>5.9693</td>
<td>0.0000</td>
</tr>
<tr>
<td>ROA</td>
<td>6.3253</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

Table 4.7: Cumulative periodogram white-noise test Source: Research data (2020)

Since p<0.05, the data used for OMO, CRR, CBR, CAR and return on assets were non-stationary. The researcher therefore rejected the null hypotheses which stated that there is unit root in the data.
4.5 Regression analysis

The researcher also conducted analysis of variance and multiple regression analysis in order to test the relationship between the independent variables, mediating variable and the dependent variable. The analysis was done on STATA and the results are as below:

<table>
<thead>
<tr>
<th>. regress ROA OMO CRR CBR</th>
<th>Number of obs = 108</th>
</tr>
</thead>
<tbody>
<tr>
<td>Source</td>
<td>SS</td>
</tr>
<tr>
<td>Model</td>
<td>.00401033</td>
</tr>
<tr>
<td>Residual</td>
<td>.00285703</td>
</tr>
<tr>
<td>Total</td>
<td>.00686736</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>ROA</td>
<td></td>
</tr>
<tr>
<td>Coef.</td>
<td>Std. Err.</td>
</tr>
<tr>
<td>OMO</td>
<td>-.0437964</td>
</tr>
<tr>
<td>CRR</td>
<td>-2.218902</td>
</tr>
<tr>
<td>CBR</td>
<td>.1029114</td>
</tr>
<tr>
<td>_cons</td>
<td>.1391573</td>
</tr>
</tbody>
</table>

Table 4.8: Regression analysis and model summary Source: Research data (2020)

The empirical model used was as under:

\[ Y = \beta_{01} + \beta_{1} \chi_1 + \beta_{2} \chi_2 + \beta_{3} \chi_3 + \epsilon_3 \]

Where:

\[ Y = \text{return on assets} \]

\[ \chi_1, \chi_2, \chi_3 = \text{Treasury bills rate, cash reserve ratio and central bank rate} \]

\[ \beta_{01}, \beta_{1}, \beta_{2}, \beta_{3} = \text{Coefficients of monetary policy instruments} \]

The functional relationship therefore is:

\[ Y = 0.1392 - 0.0438\chi_1 - 2.219\chi_2 + 0.1029\chi_3 \]
According to the above regression equation, taking all factors into account, (OMO, CRR, and CBR) constant at zero, the return on assets is expected to be 0.1392 denoting that without monetary policy intervention, the banking sector would be operating at 13.92% return on asset if the resources at the disposal of the management are efficiently used.

### 4.5.1 Model Summary

The number of observations was 108, which was records for all the variables from January 2010 to December 2018. The coefficient of determination (R\(^2\)) was 0.584. This denotes that 58.4% of the variability of financial performance was accounted for by the monetary policy (open market operations, cash reserve ratio and central bank rate) in the model. This means that 41.6% of the variations can be accounted for by other external factors not studied in this research. This leaves room for further studies on how other monetary policy instruments, and other factors, not studied in this research influence profitability of commercial banks. The F (3,104) =48.66 is significant since it is larger than the critical value of 2.70 at 5% significance level.

### 4.5.2 ANOVA

As far as analysis of variance (ANOVA) is concerned, all the p-values were less than the significance level of 0.05. The researcher concluded that there are significant differences between the groups OMO, CRR, and CBR in the model summary. The overall p-value was 0.000 which is less than 0.05 implying that the overall model is statistically significant at 5% level of significance. This study therefore concluded that the effect monetary policy instruments used was statistically significant at five per cent level of significance since the p-value for the model less than 0.05 (Prob>F =0.000).

The above conclusion is supported by several other researchers. Kiganda (2014), concluded that monetary policy has a significant impact on the performance of Kenyan commercial banks. Adesina et al. (2018) asserted that monetary policies of the Central Bank of Nigeria significantly affect financial performance of DMBs in the short run. Kemboi & Tibbs (2018) also arrived at the conclusion that monetary policy controls a large proportion of banks’ profitability hence significantly affecting performance of deposit money banks.
Nasserinia et al. (2014), concluded that monetary policy significantly influence the financial performance of commercial banks. The relationship was however negative.

Kubasu & Mutwol (2016), on the other hand arrived at the conclusion that there was no significant relationship between OMO, and CBR (monetary policy) and performance of commercial banks. Ogbeifun & Akinola (2019), concluded that monetary policy tools do not statistically significantly affect financial performance of banks. Meshack & Nyamute (2016), however, concluded that monetary policy tools have erratic degrees of relationship with financial performance of commercial banks. Adesina et al. (2018), were more elaborate in their conclusion that monetary policies of the Nigerian Central Bank significantly affect financial performance of DMBs in the short run but the effect turns insignificant in the long run.

### 4.5.3 Open market operations and financial performance

The first null hypothesis stated that open market operations have no significant influence on the financial performance of commercial banks in Kenya. The analysis found out the p-value for OMO to be 0.043 implying that there is sufficient evidence to conclude that OMO is a significant variable within the model at 5% significance level. The researcher, therefore, rejected the null hypothesis since open market operations have significant influence on financial performance of Kenyan banks. With $\beta=0.0437964$ and a standard error of 0.0213338, a unitary increase in the treasury rate, correspondingly leads to a 0.0437964 unit decrease in return on assets, with a deviation of ±0.0213338 units in ROA across the industry.

This finding corroborates the findings of Adesina et al. (2018) that OMO significantly influenced the financial performance of DMBs. In their study on the effect of monetary policy instruments on the performance of commercial banks in Kenya, Kemboi & Tibbs (2018) also concluded that had the biggest influence on the financial performance of banks. Meshack & Nyamute (2016) also found out a positive correlation between OMO and the performance of commercial banks. Further, Thuc et al. (2019), investigated the relationship between monetary policies and financial performance of banking institutions in Kenya. They also found OMO to be significantly influencing the performance of commercial
banks. Kubasu & Mutwol (2016), however, did not find the relationship between OMO and the performance of commercial banks to be significant.

### 4.5.4 Cash reserve and financial performance

The second null hypothesis stated that cash reserve has no significant influence on the financial performance of commercial banks in Kenya. The p-value for cash reserve ratio was found to be 0.000. This means that there is sufficient evidence to conclude that CRR is a statistically significant variable within the model at 5% significance level. The researcher therefore rejected the null hypothesis since the relationship between cash reserve ratio and ROA is statistically significant. The coefficient was -2.218902 with a standard error of 0.1860148. For every one unit increase in cash reserve ratio, there is a 2.218902 unit decrease in return on assets, with a deviation of ±0.1860148 units in ROA across the industry.

In their study of the effect of monetary policy on financial performance of the commercial banks listed on the Nairobi securities exchange, Meshack & Nyamute (2016) also found that CRR negatively influenced the performance of listed banks. Ibe, (2013) also found a significant relationship between reserve requirements and profitability of banks. In their investigation of the effect of CRR on performance of National Banks and Equity Bank, Thuc et al. (2019), found a strong negative correlation between CRR and banks’ profitability. However, they did not find any statistically significant relationship. In a different study in India, Rao (2006), also did not find any significant relationship between CRR and profitability. In his study in Ghana, MacCarthy (2016), found a positive and statistically significant relationship between CRR and profitability of banks. Abid & Lodhi (2015) however found a negative relationship between CRR and profitability of Pakistani banks. The aforementioned relationship was statistically significant.

The law empowers the CBK to retain a given percentage of the deposits of all commercial banks. This deposit is not an interest-bearing reserve. A rise CRR limits the capacity of commercial banks to expand and advance credit to deficit units. This generally reduces the general profitability of commercial banks, and the converse is considered credit easing (Central Bank of Kenya, 2016). The CBK uses the CRR as a liquidity management tool
(Central Bank of Kenya, 2010). It is a prerequisite by law for commercial banks to deposit six per cent of their customer deposits with the Central Bank. This deposit, termed as cash reserve, is what the Central Bank uses to sway the amount of loans banking institutions can loan to firms and households, thereby influencing the volume of money circulating in the economy.

When the CRR is increased, the amount of money at the disposal of banks to advance loans reduces drastically. It eventually reduces their profitability (Central Bank of Kenya, 2016). This is because the CRR has the most significant influence on the financial performance of commercial banks (Kemboi & Tibbs, 2018). Any rise in CRR results in an a corresponding rise in interest rate chargeable on loans and that every day when business closes, every commercial bank is under obligation to keep a certain minimum proportion of its net demand and time liabilities as liquid assets. These assets can be held in the form of gold, cash, and unencumbered approved securities (Talreja, 2014).

CRR is maintained chiefly to avoid liquidity problems by banks. When banks keep low cash reserves, it raises the amount of loanable funds at their disposal hence are able to advance more credit. This relaxes the pressure on interest rates and making the interest rates to fall. Further to that, when the loanable funds are available with the bank and if it is ready to give the loan to the different industries at lower interest rate, it directly fuels the economic growth (Teja et al., 2013). Western central banks do not always alter the CRR since CRR immediately causes liquidity problems for banking institutions that hold low excess reserves. This explains why OMO is mostly used to execute their monetary policy interventions (Chodechai, 2004).

Excess reserves is cash (reserves) a bank holds more than the reserves requirements by the central bank. Holding excess reserves is safer since the excess can be put elsewhere to earn the banks some short-term returns. This enhances liquidity. The CRR is, therefore, employed as a monetary policy instrument, but the rate is high, liquidity becomes low, and this hampers credit creation by banks. Cash in the vault checks the ability of every institution/DMBs to grant loans. This is because they have to meet the immediate demand either through cash or bank accounts (Chodechai, 2004).
For this reason, commercial banks must have adequate amounts of cash to meet customers’ demand. When banks extend advances above its excess reserves, they soon start to have problems with meeting immediate demands, followed by bank panics and finally bank runs (Ituwe, 2003). On the other hand, low CRR would imply a high ability for credit creation, thus much money in circulation in an economy. Lartey et al. (2013), researched on the link between liquidity (measured by CRR) and profitability of listed Ghanaian banks. They found out both liquidity and profitability declined over the period of study (2005-2010). The study also showed a very weak relationship between CRR and profitability of the listed Ghanaian banks. The study, nonetheless, used a small sample size of only seven banks. This makes the research findings difficult to generalize.

4.5.5 Central bank rate and financial performance

The third null hypothesis stated that central bank rate has no significant influence on the financial performance of commercial banks in Kenya. The analysis showed that the p-value for CBR was 0.000 implying that CBR is a statistically significant variable within the model at 5% significance level. The researcher failed to reject the null hypothesis as CBR is statistically significant component of the monetary policy. The coefficient was 0.1029114 with a standard error of 0.0262524. For every one unit rise in the CBR, there is a corresponding 0.1029114 unit rise in return on assets, with a deviation of ±0.0262524 units in ROA across the industry.

The findings agree with that of Ajayi & Atanda (2012) that bank rate has a positive relationship with ROA. They however concluded that this relationship was statistically insignificant. Njiru (2013), also found a positive relationship between CBR and profitability of Kenyan banks. This relationship was also statistically significant. Simiyu & Ngile (2015), nevertheless, found out that CBR negatively influences profitability of banks. They asset that an increase in CBR makes loans expensive thereby reducing interest revenue and profitability. In a different study in Vietnam, Nguyen et al. (2017), found out that CBR had a positive significant influence on the profitability of Vietnamese banks. Chepkorir et al. (2018), also reached the same conclusion that CBR positively and directly influence the financial performance of Kenyan banks.
CBR, therefore, substantially influences the cost of credit. Any variation in the bank rate unescapably changes the borrowing rate accessible to commercial banks and lending rates charged by banks. An increase in CBR by the regulator diminishes the capacity of commercial banks to borrow from the lender of last resort. It discourages commercial bank/DMBs from additional credit expansion. This is because borrowing from the regulator becomes a costly and prohibitive affair (Central Bank of Kenya, 2013).

Contrariwise, when the CBK lowers the CBR, commercial banks can borrow with much ease while at the same time, find these loans quite inexpensive. This, in turn, boosts the creation of credit. Therefore, an adjustment in CRR is ordinarily linked with the consequential variations in the lending rate charged by banks and the prevailing market rate of interest. Nonetheless, the efficacy of the bank rate as an instrument of monetary policy hinges on prevailing banking network and visibility or lack of it, size and strength of the money market, interest elasticity of investment demand, and the international flow of funds (Akrani, 2016). When the monetary policy is tight, the capacity to create credit is restricted.

4.4.2.4 Test for mediating effect of capital adequacy ratio

The fourth specific objective was to establish the mediating effect of capital adequacy ratio on the relationship between monetary and return on assets. The null hypothesis was that capital adequacy ratio has no statistically significant mediating effect on the relationship between monetary policy instruments and financial performance of Kenyan commercial banks. The researcher used the causal approach to test for the mediating effect thereof as put forth by Rucker et al., (2011). The first stage was to find the relationship between the independent variable (monetary policy), and the dependent variable (ROA). Table 4.9 shows that the p=0.000 for the regression of monetary policy against return on assets. This means that there exists an overall relationship to mediate.
Equation nParms RMSE "R-sq" F P
--- --- --- ---- ---- ---
ROA 108 2 .008049 0.0000 3.097213 0.0000
ROA Coef. Std. Err. t P>t [95% Conf. Interval]
MP .0010008 .0372649 3.03 0.000 -.0728805 .0748821
_cons .0369552 .0030107 12.27 0.000 .0309861 .0429243

Table 4.9 Monetary policy against performance Source: Research data (2020)

\[ Y = 0.0369552 + 0.0010008\chi_{20} \]

The next stage was to find the relationship between CAR and ROA as demonstrated below:

Equation Obs Parms RMSE "R-sq" F P
--- --- --- ---- ---- ---
ROA 108 2 .0044201 0.6984 245.5036 0.0000
ROA Coef. Std. Err. t P>t [95% Conf. Interval]
CAR .4525102 .0288802 15.67 0.000 .3952525 .509768
_cons -.0424576 .0050911 -8.34 0.000 -.0525512 -.0323641

Table 4.10 Capital adequacy against performance Source: Research data (2020)

\[ Y = -.0424576 + 0.4525102\chi_{30} \]

The next stage (model 3.4) sought to determine the relationship between the mediating variable (as dependent variable) and monetary policy (as independent variable).

Equation Obs Parms RMSE "R-sq" F P
--- --- --- ---- ---- ---
CAR 108 2 .0102511 0.5334 39.63474 0.0000
CAR Coef. Std. Err. t P>t [95% Conf. Interval]
MP -.0018755 .0688233 7.21 0.978 -.1383244 .1345735
_cons .1758131 .0055604 31.62 0.000 .164789 .1868372

Table 4.11 Monetary policy against capital adequacy Source: Research data (2020)

\[ CAR = 0.1758131 - .0018755\chi_{40} \]
The final stage (model 3.5) was estimated to determine whether there was total, partial or no mediation on the relationship between monetary policy and financial banks’ performance.

<table>
<thead>
<tr>
<th>Equation</th>
<th>Obs</th>
<th>Parms</th>
<th>RMSE</th>
<th>&quot;R-sq&quot;</th>
<th>F</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>ROA</td>
<td>108</td>
<td>3</td>
<td>.0044409</td>
<td>0.6985</td>
<td>121.6072</td>
<td>0.0000</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ROA Coef.</th>
<th>Std. Err.</th>
<th>t</th>
<th>P&gt;t</th>
<th>[95% Conf. Interval]</th>
</tr>
</thead>
<tbody>
<tr>
<td>MP</td>
<td>.0018495</td>
<td>.0205605</td>
<td>0.09</td>
<td>0.928</td>
</tr>
<tr>
<td>CAR</td>
<td>.4525172</td>
<td>.0290163</td>
<td>15.60</td>
<td>0.000</td>
</tr>
<tr>
<td>_cons</td>
<td>-.0426032</td>
<td>.0053651</td>
<td>-7.94</td>
<td>0.000</td>
</tr>
</tbody>
</table>

Table 4.12 Monetary policy and CAR against performance Source: Research data (2020)

\[ Y = -0.0426032 + 0.0018495\chi_{50} + 0.4525172\chi_{51} \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \ldots \text{Model 3.5} \]

The summary for Models 3.2, 3.2, 3.4 and 3.5 and the decision criteria is presented in Table 4.14 below:

<table>
<thead>
<tr>
<th>Model 3.2</th>
<th>Model 3.3</th>
<th>Model 3.4</th>
<th>Model 3.5</th>
<th>Test</th>
<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>( \beta_{20} = 0.0010008 ) ( (p=0.0000) )</td>
<td>-</td>
<td>-</td>
<td>-</td>
<td>Necessary condition for mediation</td>
<td>There exists an overall relationship to mediate</td>
</tr>
<tr>
<td>( \beta_{20} = 0.0010008 ) ( (p=0.0000) )</td>
<td>( \beta_{30} = 0.4525102 ) ( (p=0.0000) )</td>
<td>( \beta_{40} = -0.0018755 ) ( (p=0.0000) )</td>
<td>( \beta_{50} = 0.0018495 )</td>
<td>( \beta_{20} - \beta_{50} \Rightarrow 0.0010008 - 0.0018495 = -0.0008487 )</td>
<td>Partial mediation</td>
</tr>
<tr>
<td>( \beta_{51} = 0.4525172 ) ( (p=0.0000) )</td>
<td>and</td>
<td></td>
<td></td>
<td>( \beta_{40} * \beta_{51} \Rightarrow -0.0018755 * 0.4525172 = -0.0008487 )</td>
<td></td>
</tr>
</tbody>
</table>

Table 4.13 Decision criteria for mediation variable Source: Research data (2020)

The table above confirms that the coefficient of \( \beta_{20} \) is statistically significant, hence satisfies the necessary condition for testing whether or not there is mediation. Further, \( \beta_{30}, \beta_{40}, \beta_{50} \) and \( \beta_{51} \) are all statistically significant at 5% significance level. Moreover, there is
no possibility of perfect mediation since $\beta_{5.1}$ is statistically significant (Rucker et al., 2011). This study therefore concluded that capital adequacy partially mediates the relationship between monetary policy and financial performance of commercial banks in Kenya. Consequently, the null hypothesis, which states that capital adequacy does not mediate the relationship between monetary policy and financial performance of commercial banks in Kenya, was rejected.

This finding agrees with the findings by Simbolon & Simanjuntak (2020) that mediating effect of capital adequacy ratio had a significant relationship between non-performing loans and return on assets among Indonesian banks. Tho’in (2020), also concluded that CAR indirectly mediates the relationship between non-performing loans and ROA. Kumar et al. (2020), studied CAR as an independent variable and concluded that it positively impacts on profitability of banks in New Zealand. That notwithstanding, these researchers did not study the mediating effect of CAR on the relationship between monetary policy and ROA. Nestor et al. (2017), also found a positive and statistically significant relationship between CAR and profitability of Nigerian banks. Changes in the monetary policy rates are occasioned by systematic components of the monetary policy as mediated by capital adequacy requirements. Consequently, there is an endogenous change in the economy which makes it therefore challenging to assess the causal effects of the monetary policy on macroeconomic variables (Gerko & Rey, 2017). Ariwidanta & Wksuana (2018), in contrast, reached the conclusion that there was no significant mediation effect of CAR on credit and liquidity risk among Indonesian banks.

In several jurisdictions, a bank with higher core capital is in a position to lend more loans and collect more deposits from the public because the law pegs lending to any one borrower, or a group of borrowers, and connected lending to the amount of core capital (Gudmundson et al., 2013). Likewise, the amount of deposits to be collected from the public by the bank too is pegged to the amount of core capital that the bank holds. This requirement has been enacted in local banking laws, in most countries, such that banks that do not meet minimum thresholds are subjected to punitive penalties and withdrawal of the banking license if the violation persists to the detriment of the general public (Ekpung et al., 2015).
Oyier (2016) observed further that adequate core capital helps minimize the possibility of insolvency of banks in the event of unexpected shocks. Core capital helps determine the financial capacity of a bank in meeting its obligations, and all other risks including but not limited to operational risk, and credit risk, among others. It aids in mitigating the bank against prospective losses and hence protects the interests of the bank’s depositors and other lenders. A bank that is not well capitalized is potentially exposed to high excess costs during periods of tight money. A bank with low capital is faced with many risks which could adversely affect its earnings leading to low financial performance (Sangmi & Nazir, 2010).
CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

Chapter five presents the summary of findings, conclusions and recommendations for policy and practice and suggestions for further research.

5.2 Summary of findings

The main objective of the study was to analyse the effect of monetary policy instruments on financial performance of commercial banks in Kenya. The variables under investigation were OMO, CRR, CBR, CAR, and ROA for a period of 108 months (January 2010 to December 2018). The research followed a descriptive and explanatory research design. Correlation analysis was done. A multiple regression model was used in the study. Having established that the data used had no problem of heteroscedasticity, multicollinearity and that the variables were from a normal distribution, the researcher did a further diagnostic test which established that the variables under study had no autocorrelation problem. The data used also was non-stationary. The coefficient of determination ($R^2$) for the model was 0.584 (that is 58.4%). The p-value was 0.000 which is significant at 5% level of significance.

The first objective sought to examine the influence of open market operations on financial performance of commercial banks in Kenya. The mean treasury bills rate was 8.7% with $\sigma=0.0363211$. The correlation analysis shows a very weak negative correlation between OMO and ROA. The p-value for OMO was 0.043. Consequently, the influence of open market operations on financial performance of commercial banks in Kenya is statistically significant at 95% confidence level. The researcher, therefore, rejected the null hypothesis and conclude that open market operations have significant influence on the financial performance of commercial banks in Kenya. The study disclosed that operations in the open market affect financial performance of commercial banks.
The next objective intended to assess the influence of cash reserve on the financial performance of commercial banks in Kenya. The mean CRR was 4.884% with \( \delta=0.002786 \). The correlation analysis shows a strong negative correlation between CRR and ROA. The p-value for CRR was 0.000 which is statistically significant at 95% confidence level, hence null hypothesis was rejected. From this analysis, it was deduced that cash reserve has a statistically significant influence on financial performance of commercial banks in Kenya. The researcher expected that there would be no significant relationship between cash reserve and return on assets. The study however revealed that changes in cash reserve requirements significantly affect return on assets.

The third objective was to determine the influence of central bank rate on the financial performance of commercial banks in Kenya. The mean CBR was 9.796% with \( \delta=0.0299 \). The correlation analysis shows a very weak positive correlation between CBR and ROA. CBR had a p-value of 0.000. The analysis shows that central bank rate has a statistically significant influence on financial performance of commercial banks in Kenya hence the null hypothesis was rejected. The null hypothesis indicated that there would be no significant influence of central bank rate on return on asset. The findings of the study however revealed that central bank rate significantly affect return on assets for Kenyan banks.

The last objective was to establish the mediating effect of capital adequacy ratio on the relationship between monetary policy instruments and financial performance of commercial banks in Kenya. CAR registered a mean of 0.1757 with \( \delta=0.0148 \). The correlation analysis shows a strong positive correlation between CAR and ROA. The mediating effect of capital adequacy ratio on the relationship between monetary policy and financial performance of commercial banks was tested using the causal approach. The first step was to establish the relationship between the independent variable (monetary policy), and the dependent variable (ROA). The coefficient of \( \beta_{20} \) was statistically significant, thus satisfied the necessary condition for testing for mediation. Further tests revealed that the coefficients for \( \beta_{30}, \beta_{40}, \beta_{50} \) and \( \beta_{51} \) were all statistically significant at 5% significance level. There was also no possibility of perfect mediation since \( \beta_{51} \) was statistically
significant. The researcher rejected the null hypothesis, and concluded that CAR partially mediates the relationship between monetary policy and financial performance.

5.3 Conclusion

The analysis revealed that 58.4% of the variability of financial performance is accounted for by the model after considering the number of predictor variables in the model and that 41.6% of the variations can be explained by other external factors outside of the model. The study also revealed that the influence of monetary policy instruments on financial performance of commercial banks is statistically significant at 5% significance level.

The influence of open market operations on financial performance of commercial banks in Kenya was found to be statistically significant. OMO exhibited a very weak negative relationship with financial performance. The researcher therefore concluded that open market operations (changes in treasury bills rate) affect the financial performance of commercial banks mildly.

The influence of cash reserve on the financial performance of Kenyan commercial banks was found to be statistically significant. Correlation analysis showed a strong negative correlation between cash reserve ratio and return on assets. The researcher therefore concluded that a change in the cash reserve ratio inversely influences the financial performance of Kenyan commercial banks.

Central bank rate was also found to be significantly influencing the financial performance of commercial banks in Kenya. There was a weak positive relationship between CBR and ROA. A change in CBR therefore proportionately influences return on assets. The analysis also showed that capital adequacy ratio partially mediates the relationship between monetary policy and financial performance of commercial banks.

CAR also exhibited a strong positive correlation with ROA. It was also revealed that CAR partially mediated the relationship between monetary policy and bank performance. This is because monetary policy is operationalized within an environment that impacts capitalization, hence amount and volume of trade by banks. The researcher, therefore,
concluded that there should be adequate capital requirement for every commercial bank to fully absorb the shocks in the external environment.

5.4 Recommendations

It is the recommendation of this study that the Central Bank should make treasury bills and bonds more appealing for commercial banks to trade in them. Higher rates will attract commercial banks, and this will translate into more returns. The government will also find it easy to pump more liquidity into the economy or withdraw the volume of money circulating through the operations in the open market. The finding justifies that open market operation statistically significantly affect banks’ operations, hence profitability. The study also recommends that CBK should innovate more ways of trading the T-bills to even household units. This will encourage more activities in the open market; increase the volume of trade through the banks, thereby influencing the profitability of banks.

The researcher also recommends the lowering of CRR using expansionary monetary policy to enable commercial banks to hold more cash. This, correspondingly, increases their capacity to advance loans to deficit units, increasing the money supply in the economy, thereby accelerating economic growth rate. This could influence the performance of banks since the more they lend, the higher their returns, as found by the study that CRR significantly influence banks’ performance. As CRR increased during the time scope under review, the profitability correspondingly dropped.

The study also recommends that CBR should be lowered to allow banks reduce the cost of credit and to create more credit. This, coupled with prudential guidelines, will help banks of different tiers to have sufficient money to advance more credit, which leads to better returns. When these two rates are revised upwards, banks remain with limited funds to advance as loans. This is revealed by the declining ROA during the period of study with a corresponding increase in CBR.

This research also recommends that capital adequacy ratio should be maintained at some optimum level. As the rate dropped, return on assets also correspondingly dropped across the industry. This is a good indication that for banks to register higher returns, they must
have adequate core capital. It also indicated that core capital adequacy does not mediate the relationship between monetary instruments and return on assets.

5.5 Suggestions for further research

The scope of this thesis was limited to monetary policy instruments on the financial performance of commercial banks in Kenya. The researcher recommends that another study be undertaken on the influence of monetary policy instruments on all industry players, that is, both commercial banks and NBFIs. This will show the effect of the policy instruments on the entire financial market. Further, the study recommends research on the influence of done on the effect of interest rate capping on commercial banks' financial performance to establish the effect and extent of CBR capping on industry players. Finally, the study recommends that the mediating effect of fiscal policy be studied since monetary policy is never implemented in isolation.
REFERENCES


The research focussed on all the forty two banks as listed below:

1. ABC Bank
2. Bank of Africa (K) Ltd
3. Bank of Baroda (K) Ltd
4. Bank of India, Barclays bank
5. CFC Stanbic bank
6. Charterhouse Bank
7. Chase bank
8. Citibank
9. Co-operative bank of Kenya
10. Commercial Bank of Africa
11. Consolidated
12. Credit Bank
14. Diamond Trust Bank
15. Dubai Bank Kenya Ltd
16. Eco-bank
17. Equatorial Commercial Bank
18. Equity bank
19. Family Bank
20. Fidelity Commercial Bank
21. Fina Bank
22. First Community Bank
23. I&M bank
24. Giro bank
25. Imperial Bank
26. Guardian Bank
27. Gulf African Bank
28. Habib Bank A.G. Zurich
29. Habib bank
30. Jamii Bora Bank
31. K-Rep Bank
32. Kenya Commercial Bank
33. National Bank of Kenya
34. Middle East Bank (K) Ltd
35. NIC bank
36. Oriental Commercial Bank
37. Paramount Universal Bank
38. Prime Bank
39. Standard Chartered bank
40. Trans- National Bank
41. UBA Kenya Bank
42. Victoria Commercial Bank Ltd.
APPENDIX II: APPROVAL OF RESEARCH PROPOSAL

KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail:  dean-graduate@ku.ac.ke
Website:  www.ku.ac.ke

FROM: Dean, Graduate School
TO: Fredrick A. Owour
      C/o Accounting and Finance Department.

DATE: 9th November, 2017
REF: D58/CY/PT/26335/2013

SUBJECT: APPROVAL OF RESEARCH PROPOSAL

This is to inform you that Graduate School Board, at its meeting of 18th October, 2017, approved your Research Proposal for the M.Sc. Degree entitled “Monetary Policy Instruments and Financial Performance of Commercial Banks in Kenya”.

You may now proceed with your Data collection, subject to clearance with the Director General, National Commission for Science, Technology and Innovation.

As you embark on your data collection, please note that you will be required to submit to Graduate School completed Supervision Tracking Forms per semester. The form has been developed to replace the Progress Report Forms. The Supervision Tracking Forms are available at the University’s Website under Graduate School webpage downloads.

Thank you.

EDWIN OBUNGU
FOR: DEAN, GRADUATE SCHOOL

CC. Chairman, Accounting and Finance Management

Supervisors:
1. Mr. Gerald Atheru
   Department of Accounting and Finance
   Kenyatta University

2. Ms. Gladys Kimutai
   Department of Management Science
   Kenyatta University

3. Dr. Ambrose Jagungo
   Department of Accounting and Finance
   Kenyatta University

EO/wnm
APPENDIX III: RESEARCH AUTHORIZATION

KENYATTA UNIVERSITY
GRADUATE SCHOOL

E-mail: dean-graduate@ku.ac.ke
Website: www.ku.ac.ke

P.O. Box 43844, 00100
NAIROBI, KENYA
Tel. 8710901 Ext. 57380

Our Ref: D58/CTY/PI/26335/2013
DATE: 2nd November, 2017

Director General,
National Commission for Science, Technology
& Innovation
P.O. Box 30623-00100,
NAIROBI

Dear Sir/Madam,

RE: RESEARCH AUTHORIZATION FOR ABONYO OWOUR FREDICK – REG. NO. D58/CTY/PI/26335/2013

I write to introduce Mr. Abonyo Owour Fredrick who is a Postgraduate Student of this University. He is registered for M.Sc. degree programme in the Department of Accounting and Finance.

Mr. Abonyo intends to conduct research for an M.Sc. Proposal entitled, “Monetary Policy Instruments and Financial Performance of Commercial Banks in Kenya”.

Any assistance given will be highly appreciated.

Yours faithfully,

Mrs. Lucy N. Mbaabu
FOR: DEAN, GRADUATE SCHOOL
APPENDIX IV: APPROVAL BY NACOSTI

NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY AND INNOVATION

Telephone: 020 400 7600, 0713 787878/9735404215
Fax: +254-20-318245,318249
Email: dfg@nacosti.go.ke
Website: www.nacosti.go.ke
When replying please quote:

Ref. No NACOSTI/P/17/10949/20437 Date: 4th December, 2017

Abonyo Owuor Fredrick
Kenyatta University
P.O Box 43844-00100
NAIROBI.

RE: RESEARCH AUTHORIZATION

Following your application for authority to carry out research on “Monetary policy instruments and financial performance of commercial banks in Kenya” I am pleased to inform you that you have been authorized to undertake research in selected Counties for the period ending 4th December, 2018.

You are advised to report to the County Commissioners and the County Directors of Education, selected Counties before embarking on the research project.

Kindly note that, as an applicant who has been licensed under the Science, Technology and Innovation Act, 2013 to conduct research in Kenya, you shall deposit a copy of the final research report to the Commission within one year of completion. The soft copy of the same should be submitted through the Online Research Information System.

GODFREY P. KALERWA MSc., MBA, MKIM
FOR: DIRECTOR-GENERAL/CEO

Copy to:

The County Commissioners
Selected Counties.

The County Directors of Education
Selected Counties.
THIS IS TO CERTIFY THAT:
MR. ABONYO OWUOR FREDRICK
of KENYATTA UNIVERSITY, 755-40300
Homa bay, has been permitted to
conduct research in Homabay, Kiambu,
 Nairobi Counties

on the topic: MONETARY POLICY
INSTRUMENTS AND FINANCIAL
PERFORMANCE OF COMMERCIAL BANKS
IN KENYA

for the period ending:
4th December, 2018

Applicant’s
Signature

Permit No.: NACOSTI/P/17/10949/20437
Date Of Issue: 4th December, 2017
Fee Received: Ksh 1000

30^o Halswa
Director General
National Commission for Science,
Technology & Innovation

CONDITIONS
1. The License is valid for the proposed research,
   research site specified period.
2. Both the License and any rights thereunder are
   non-transferable.
3. Upon request of the Commission, the Licensee
   shall submit a progress report.
4. The Licensee shall report to the County Director of
   Education and County Governor in the area of
   research before commencement of the research.
5. Excavation, filming and collection of specimens
   are subject to further permissions from relevant
   Government agencies.
6. This Licence does not give authority to transfer
   research materials.
7. The Licensee shall submit two (2) hard copies and
   upload a soft copy of their final report.
8. The Commission reserves the right to modify the
   conditions of this Licence including its cancellation
   without prior notice.

16796
CONDITIONS: see back page
# APPENDIX V: SCHEDULE OF SOURCES OF DATA

<table>
<thead>
<tr>
<th>SNO.</th>
<th>TYPE OF DATA</th>
<th>SOURCE</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Treasury bill rates (2010-2018)</td>
<td>CBK - Monetary policy reports (2010-2018)</td>
</tr>
<tr>
<td>2</td>
<td>Cash reserve ratio rates (2010-2018)</td>
<td>CBK - Monetary policy reports (2010-2018)</td>
</tr>
<tr>
<td>3</td>
<td>Central bank rates (2010-2018)</td>
<td>CBK - Monetary policy reports (2010-2018)</td>
</tr>
<tr>
<td>5</td>
<td>Return on asset for the entire industry (2010-2018)</td>
<td>CBK - Bank supervision annual report (2010-2018); Data from individual banks</td>
</tr>
</tbody>
</table>

Source: Researcher (2020)
### APPENDIX VI: RAW DATA

<table>
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<tr>
<th>MONTH</th>
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<th>CBR</th>
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</tr>
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