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ABSTRACT

The Kenyan banking industry plays a vital role in economic development of the country. However, performance in the banking sector has not be satisfactory given that there are commercial banks that have collapsed while others are under receivership or operating under statutory management. In light of this fact, the purpose of the study was to investigate the effect of macroeconomic factors on financial performance of commercial banks in Kenya. The study was informed by the following objectives: to determine the effect of exchange rate on financial performance of the commercial banks in Kenya; to establish the effect of real Gross Domestic Product on financial performance of the commercial banks in Kenya; to assess the effect of inflation rate on financial performance of commercial banks in Kenya; and to determine the effect of real interest rate on financial performance of the commercial banks in Kenya. The study utilized a causal research design and carried out a census of all the 35 commercial banks that were fully operational for the period 2011-2019. The study used secondary data, which was extracted from the Central Bank of Kenya, Kenya National Bureau of Statistics, and banks’ audited financial statements. Both descriptive and inferential statistics were used in data analysis. Panel regression model was used to establish the effect of macroeconomic factors on financial performance of commercial banks in Kenya. Presentation of data was aided by tables and diagrams. The findings of the study showed that exchange rate and interest rate significantly affected financial performance of commercial banks in Kenya. On the other hand, GDP growth rate and inflation rate did not significantly affect financial performance of commercial banks in Kenya. The study concluded that exchange rate and interest rate affected financial performance of commercial banks. Conversely, the study concluded that financial performance of commercial banks in Kenya was not affected by GDP and inflation rate. The study recommends that policy formulation in the banking sector should take into consideration the exchange rate as the basis of managing its effect on financial performance. Moreover, the study recommends that commercial banks should moderately raise their interest rates in the quest to increase profitability in the banking industry.

Key Words: Exchange Rate, Real Gross Domestic Product, Inflation Rate, Real Interest Rate, Financial Performance

I.0 INTRODUCTION

1.1 Background of the Study

Financial institutions contribute greatly to growth and development of the economy in many parts of the world (Ouyang & Li, 2018). Commercial banks and other financial institutions act as financial intermediaries where they collect deposits from customers and advance loans and other credit facilities to businesses and investors, a process that culminates in development of the economy (Kiragu, Riro, & Maina, 2019). To ensure seamless financial intermediation, the banking system has to be efficient, which in turn makes it possible to achieve sustainable investments in the private sector investment. More importantly, this role played by the banking sector depends on bank performance and thus, understanding the factors influencing performance of banks is necessary for financial institutions as well as towards stabilization of the economy (Ali & Puah, 2019).
Countries across the globe value financial systems, more especially the banking system where banks provide capital to sections of the economy experiencing deficits (Neanidis, 2019). Notwithstanding the enormous banking reforms that have been undertaken in Africa, banks have not been successful in carrying out their intermediation roles for the reason that they have been performing poorly. In effect, poor performance of commercial banks in continental Africa has led to liquidity risk levels and loss of confidence by investors and customers in some cases. The cost of financial intermediation has grown incrementally because of unsatisfactory performance (Werner, 2016).

According to Ngile and Simiyu (2015), macroeconomic factors, such as gross domestic product (GDP), National Income, inflation, unemployment, price level, saving and investment and economic output are some of the key determinants of the economic performance and are closely monitored by the financial institutions as well as the government. Ongore (2014) posits that the financial performance of the banks generally is influenced by both microeconomic and macroeconomic factors. Macroeconomic variables form a huge portion of the external profit determinants in most academic research carried out and the most macroeconomic factors that have been identified are Gross Domestic product (GDP), inflation, interest rate and exchange rate.

Macroeconomic factors are financial indicators showing growth or decline in the economy. In the banking industry, macroeconomic factors are viewed as external factors, which management of financial institutions has no control over. Other scholars state that macroeconomic factors are simply factors external to organizations, which influence the general increase or decline in profitability and performance either directly or indirectly. Macroeconomic factors include exchange rate, interest rate, inflation, and economic growth (Low & Chan, 2017). The rate of exchanging the currency of one country with another denotes exchange rate (Chen, Du, & Hu, 2020). Foreign exchange has an effect on the country’s economy while from a microeconomic perspective it affects the organizations performance. Depreciation in exchange rate leads to a decrease in the price of the domestic currency in terms of a foreign currency while an appreciation in exchange rate is an increase in the price of the domestic currency corresponding to the foreign exchange (Bahmani-Oskooee & Gelan, 2018).

Economic growth, as measured through gross domestic product, refers to the aggregate economic progress at the national level in a country (Ngile & Simiyu, 2015). It reflect the process of an increase in the total worth of goods and services produced in a domestic economy year after year as well as the income generated within that economy (Trinh, 2017). The universal measure for the observation of the evolution of economic growth is the actual GDP per capita. Long term economic growth is usually processes in which the real GDP per capita grows at rate of few per cent per year. Inflation is the general increase in prices of commodities and services in economies over a given timeframe (Nyoni, 2018). Credit accessibility, commercial banks, and consumer price index (CPI) are some of the factors that cause inflation in the economy. Inflation is typically a broad measure, such as the overall increase in prices or the increase in the cost of living in a country. The demand for money is negatively affected by volatile and high inflation. Inflation has welfare implications on people given that money offers services valued by producers and consumers (Duraj & Moci, 2015). Interest rates are the cost of borrowing capital for a given period of time (Bikker & Vervliet, 2018). Interest rates risks is the exposure of the firm’s financial position due to the interest rates volatility, which over time poses a significant threats to the firms earnings and capital base changes and increases operational expenses of the firm. Interest rate volatility may also affect the underlying worth of assets, liabilities and present value of the future cash flows (Salim, 2019).

1.1.2 Commercial Banks in Kenya

Based on the data provided by the Central Bank of Kenya (2019), there are 40 commercial banks in Kenya where 2 are under receivership and 1 under statutory management. The Central Bank classifies the 37 operational banks into three different tiers; large, medium and small depending on their market share. Commercial banks rated strong, satisfactory, fair, marginal and unsatisfactory as of December 2019 were 8, 20,
7, 2 and 2, respectively, as compared to 6, 20, 10, 3, and 1 in December 2018, respectively. Out of 40 privately owned banks, 25 institutions were locally owned, private owned commercial banks reduced by 3 from 28 in 2008 to 25 in 2017 representing a decrease of 10.71 per cent, and an increase of foreign owned banks by 3 from 12 in 2008 to 15 commercial banks in 2017 depicting a 20 per cent increase. (Central Bank of Kenya, 2019)

1.2 Statement of the Problem

The CBK consolidated annual bank supervision reports for the period 2010–2014 depict that Kenya’s banking industry experienced stable performance as profit before tax (PBT) grew at average of 18% year on year until 2014 (CBK, 2014). However, beginning the year 2015, the Kenyan banking sector begun to experience a dip in growth where PBT declined by 5% (CBK, 2015). During this period, Dubai Bank was placed under receivership whereas Imperial Bank was put under statutory management (CBK, 2015), with Chase Bank being put under receivership in 2016. Year on year PBT grew by a meagre 10% in 2016 before plunging by 10% in 2017 (CBK, 2017). In 2018, the industry showed signs of resurgence after recording 14% year on year growth in PBT (CBK, 2018). Nonetheless, this recovery is lower than the average growth in profit before tax witnessed at the start of the decade. Based on the 2018 performance rating, fair and strong banks declined from 12 to 10 and from 9 to 6 in that order, whereas one bank experienced unsatisfactory performance. A drop in profitability, decreased interests on loans and advances, and capped interest rates in the banking sector are possible explanations for the reduced financial performance.

Extant studies in Kenya show that indeed macroeconomic factors have been studied extensively and, to some extent, their relationship with financial performance established among commercial banks. However, these studies seem to have arrived at inconclusive results given that there was no consensus among them on the effect of macroeconomic factors on financial performance of commercial banks in Kenya. For instance, Ajayi and Atanda (2012); Kiganda (2014), among others, established that there was an insignificant relationship between inflation, as one of the macroeconomic factors, and financial of commercial banks in Kenya. On the other hand, Rono, Wachelonga and Simiyu (2014) established that interest rate had a significant effect on return on assets, a proxy measurement for financial performance. Internationally, Ahmed, Rehan, Chhapra, and Supro (2018) found out that bank profitability was negatively affected by interest rate while a study carried out in South Africa by Moyo and Tursoy (2020) established a significant inverse relationship between inflation and financial performance of banks.

The existing stream of empirical studies, both locally and internationally, do not seem to converge into a clear picture on the effect of macroeconomic factors on financial performance of commercial banks. In view of this, active research linking macroeconomic factors to financial performance of commercial banks in Kenya is, therefore, worth exploring. Based on the above highlighted research gaps, this study sought to explore the effect of macroeconomic factors on financial performance of commercial banks in Kenya.

1.3 Research Objectives of the Study

The main objective of this study was to examine the effect of macroeconomic factors on financial performance of commercial banks in Kenya.

1.3.1 Specific Objective of the Study

i. To determine the effect of exchange rate on financial performance of the commercial banks in Kenya.

ii. To establish the effect of real Gross Domestic Product on financial performance of the commercial banks in Kenya.

iii. To assess the effect of inflation rate on financial performance of commercial banks in Kenya.

iv. To determine the effect of real interest rate on financial performance of the commercial banks in Kenya.

1.4 Hypotheses of the Study

H0: Exchange rate has no significant effect on financial performance of the commercial banks in Kenya.
**H02**: Real Gross Domestic Product has no significant effect on financial performance of the commercial banks in Kenya.

**H03**: Inflation rate has no significant effect on financial performance of commercial banks in Kenya.

**H04**: Real interest rate has no significant effect on financial performance of the commercial banks in Kenya.

**1.5 Scope of the Study**

Scope of the study shows the parameters upon which a study operates as well as the extent to which an area of research will be explored. In effect, the content scope of this research work comprised of exchange rate, GDP, inflation rate, and interest rate as the explanatory variables, while the outcome variable of the study was financial performance of commercial banks in Kenya. The study considered 35 commercial banks that were fully operational for the period 2011 to 2019. This, therefore, means that the study utilized panel data on commercial banks in Kenya for the period of 9 years using panel regression model, which is specified in chapter 3 of the study. The choice of the period 2011-2019 is informed by the fact that this was the time when interest rate capping was introduced as well as when some banks experience drop in profitability. The study adopted a causal research design

**LITERATURE REVIEW**

**2.1 Theoretical Framework**

**2.1.1 Purchasing Power Parity Theory:**

The Purchasing Power Parity (PPP) theory, developed by Cassel in 1918, suggests that exchange rates between two countries should be in equilibrium when their purchasing powers are similar. In other words, the exchange rate should reflect the ratio of the two countries’ price levels for a fixed basket of goods and services. When domestic prices rise (inflation), a country's exchange rate depreciates to restore purchasing power parity. The theory is based on the law of one price, assuming that prices for the same goods are equal when expressed in a common currency, considering no transaction or transportation costs. Changes in relative price levels between countries are expected to result in corresponding alterations in exchange rates. While PPP may not always hold, the theory argues that any deviations should eventually correct themselves, making the real exchange rate self-adjusting.

**2.1.2 Standard Trade Theory:**

Standard Trade Theory focuses on the interplay between exports and imports in foreign trade. Exports encompass goods and services produced domestically but consumed abroad, while imports involve goods and services produced abroad but consumed domestically. The theory highlights the influence of exchange rates on export volumes. An appreciating domestic currency makes exports relatively expensive, reducing their volume. Conversely, a depreciating currency leads to an increase in export production and import substitution. This can cause inflation as export prices and import substitutes contribute to a country's overall price index. The elasticity of demand and supply determines how resources shift from non-tradable goods to exports and import substitutes, affecting the degree of inflation. While standard trade theory explains the relationship between exchange rates, exports, and imports, it does not address how sector-specific exports or imports impact exchange rate volatility.
2.2 Conceptual Framework

**Independent Variable**

**Macroeconomic factors**

- **Exchange Rate**
  - USD/KSHS
- **Gross Domestic Product**
  - National Income
- **Inflation rate**
  - CPI
- **Interest Rate**
  - Real interest rate

**Dependent Variable**

- **Financial Performance**
  - ROA

Figure 2.1 Conceptual Framework

2.3 Empirical Literature Review

2.3.1 Exchange Rate

In the empirical reviews conducted by Keshtgar, Pahlavani, and Mirjaliili (2020), Moyo and Tursoy (2020), Manyo, Sabina, and Ugochukwu (2016), and Lagat and Nyandema (2016), the impact of exchange rates on the financial performance of banks in various countries was examined. Keshtgar et al. (2020) focused on Iranian banks and found that exchange rate volatility had a negative and statistically significant effect on banks' capital return ratio. Moyo and Tursoy (2020) studied South African banks and found a weak relationship between exchange rates and return on equity. Manyo et al. (2016) investigated Nigerian banks and concluded that foreign exchange income had a negative and insignificant effect on profitability. Finally, Lagat and Nyandema (2016) explored Kenyan commercial banks and discovered a positive and statistically significant relationship between foreign exchange rates and financial performance indicators. These studies collectively provide insights into the complex relationship between exchange rates and bank performance, with variations observed in different countries and contexts.

2.3.2 Real Gross Domestic Product (GDP)

In the four empirical reviews by Islam, Amin, and Molla (2019), Kanwal and Nadeem (2013), Ledhem and Mekidiche (2020), and Kiganda (2014) investigate the relationship between financial performance and economic growth in different countries and contexts. Islam et al. (2019) focus on Bangladesh and find that indicators of financial performance, such as return on equity and return on investment, significantly influence Gross Domestic Product (GDP) growth. Kanwal and Nadeem (2013) study Pakistan’s listed commercial banks, revealing that GDP has an insignificant positive effect on return on assets but an insignificant negative effect on equity multiplier and return on equity, while inflation has a negative relationship with all financial performance...

2.3.3 Inflation Rate
In the four empirical reviews conducted by Duraj and Moci (2015), Almaqtari et al. (2019), Katircioglu et al. (2020), Osamwonyi and Michael (2014), and Kiganda (2014) investigate the factors influencing the profitability of banks in various countries. Duraj and Moci (2015) focus on Albanian banks and find that inflation, GDP, and the non-performing loan (NPL) ratio have statistically significant relationships with return on equity (ROE), with inflation and the NPL ratio negatively related to profitability. Almaqtari et al. (2019) explore Indian commercial banks and discover that inflation rate, exchange rate, interest rate, and demonetization significantly impact ROA and ROE. Katircioglu et al. (2020) examine the Turkish banking sector, revealing that oil price changes indirectly affect profitability through inflation channels, while direct effects of oil prices on bank profitability are negative. Osamwonyi and Michael (2014) analyze Nigerian commercial banks and find that inflation has a negligible impact on bank performance, while Kiganda (2014) studies Kenyan commercial banks and similarly concludes that inflation has a negligible effect on bank performance. These studies collectively offer insights into the multifaceted relationship between macroeconomic factors, inflation, and bank profitability in diverse contexts.

2.3.4 Interest Rate
In the four empirical reviews conducted by Alpha and Anber (2011), Nadeem et al. (2013), Amollo (2015), and Macharia (2013) investigate the impact of interest rates on the profitability of commercial banks in different countries. Alpha and Anber (2011) focus on Turkey and find a positive and significant relationship between interest rates and the performance of commercial banks. Nadeem et al. (2013) study Pakistani commercial banks and discover that the real interest rate has a positive and significant effect on bank profitability. Amollo (2015) examines Kenyan commercial banks, revealing that lending interest rates have a positive and significant impact on bank performance. Macharia (2013) also studies Kenyan financial institutions and finds that the lending rate ratio positively influences the financial performance of commercial banks. These studies collectively suggest that interest rates play a significant role in influencing the profitability of commercial banks across different countries.

2.4 Critique of the Existing Literature
The critique of the existing literature highlights the extensive research conducted on the impact of macroeconomic factors on financial performance, with various proxy measurements for financial performance employed. It notes that studies, such as Keshtgar, Pahlavani, and Mirjalili (2020), Moyo and Tursoy (2020), and Islam, Amin, and Molla (2019), have used different indicators like capital return ratio, return on equity (ROE), return on assets (ROA), and explored various macroeconomic factors. However, it emphasizes that many of these studies were conducted outside Kenya, used different proxies, and employed statistical methods inconsistent with the current study's approach. For instance, Keshtgar et al. (2020) focused on exchange rate volatility rather than direct exchange rates, and Moyo and Tursoy (2020) used correlation analysis. There are also conceptual and methodological gaps, including the consideration of only one bank in the Kenyan context by Kiganda (2014). The current study seeks to address these gaps by utilizing panel regression analysis and considering all operational commercial banks in Kenya over the period 2011-2019.

2.5 Research Gaps
Based on the review of empirical studies, it has emerged that several studies have been carried out on the effect of macroeconomic factors on financial performance of commercial banks. However, studies on the relationship between macroeconomic factors and financial performance of commercial banks in Kenya are not exhaustive.
for the reason that they have generated inconsistent results where some of them have concluded that macroeconomic factors significantly affect financial performance while others have established the contrary. Moreover, studies in Kenya have considered either one commercial bank, investigated other sectors of the economy as opposed to the financial sector, examined financial performance in a shorter timeframe, and used statistical procedures, such as correlation analysis, which might not be reliable methods to approximate the effect of macroeconomic factors on financial performance of commercial banks (Chemngorem, & Njeru, 2023).

3.0 Research Methodology

In the research design section, it is explained that a causal research design was employed to investigate the cause-and-effect relationship between macroeconomic factors and the financial performance of commercial banks in Kenya. The choice of this design is justified because it allows for explaining patterns between macroeconomic factors and financial performance, and it enables the assessment of the impact of changes in the independent variable on the dependent variable.

The target population consists of all licensed commercial banks in Kenya from 2011 to 2019, with a total of 35 fully operational banks meeting the inclusion criteria. The sampling frame is derived from a list of these banks, which provided the basis for selecting the sample. The study adopted a census as the primary sampling technique, including all 35 active commercial banks within the specified period (Charles, M., & Benson 2023). For data collection, secondary data was used, and a data extraction tool (Appendix I) was employed to gather relevant information. Data sources included the Central Bank of Kenya and the Kenya National Bureau of Statistics, as well as audited financial statements from individual banks. The data was systematically collected for the period 2011 to 2019, aligning with the study's context (Sheikh, & Oluoch, 2023).

Data analysis involved cleaning the collected data to remove irrelevant or erroneous information. Stata software was used for statistical analysis, employing both descriptive (mean, standard deviation, minimum, and maximum) and inferential (panel regression) statistics. The findings were presented using tables and diagrams. Finally, the panel regression model was applied to assess the effect of macroeconomic factors on the financial performance of commercial banks, considering both fixed and random effects in the panel data analysis.

4.0 Findings and Discussions

4.1 Descriptive Analysis

4.1.1 Financial Performance of Commercial Banks

To determine the financial performance of commercial banks in Kenya, return on assets (ROA) was used as a proxy measurement. ROA is an indicator that is used to indirectly measure financial performance of financial institutions. Findings presented in table 1 below provide the descriptive summaries of ROA for the period 2011 through 2019 for commercial banks in Kenya.

<table>
<thead>
<tr>
<th>Year</th>
<th>Mean</th>
<th>Std. D</th>
<th>Median</th>
<th>Max</th>
<th>Min</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>.0333353</td>
<td>.0215931</td>
<td>.0381</td>
<td>.0695</td>
<td>.025</td>
</tr>
<tr>
<td>2012</td>
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<td>.0179196</td>
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<tr>
<td>2013</td>
<td>.0302353</td>
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<td>.029</td>
<td>.104</td>
<td>.048</td>
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<tr>
<td>2014</td>
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<td>.0221501</td>
<td>.037</td>
<td>.077</td>
<td>.033</td>
</tr>
<tr>
<td>2015</td>
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<td>.0244003</td>
<td>.0339</td>
<td>.0726</td>
<td>.0278</td>
</tr>
<tr>
<td>2016</td>
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<td>.0249009</td>
<td>.0326</td>
<td>.0656</td>
<td>.0453</td>
</tr>
<tr>
<td>2017</td>
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<td>.0308196</td>
<td>.025</td>
<td>.06</td>
<td>.0701</td>
</tr>
<tr>
<td>2018</td>
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<td>.0367371</td>
<td>.0134</td>
<td>.0649</td>
<td>.1414</td>
</tr>
<tr>
<td>2019</td>
<td>.0175882</td>
<td>.0234574</td>
<td>.017</td>
<td>.066</td>
<td>.033</td>
</tr>
</tbody>
</table>

Source: Research Data (2021)

Based on the findings of the study, financial performance of commercial banks in Kenya, as measured by ROA, remained relatively stable for the period 2011-2012, dropping by a smaller margin in 2013 before rising considerably in 2014. For the period 2015-2018, ROA was in a downward trend, increasing by a smaller margin.

4.1.2 Exchange Rate

The first objective of the study was to determine the effect of exchange rate on financial performance of the commercial banks in Kenya. The descriptive statistics for exchange rate between the US dollar and the Kenyan Shilling for the period 2011-2019 are collated in the table below.

Table 2: Exchange Rate

<table>
<thead>
<tr>
<th>Year</th>
<th>Mean</th>
<th>Median</th>
<th>Max</th>
<th>Min</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
<td>80.75</td>
<td>80.75</td>
<td>80.75</td>
<td>80.75</td>
</tr>
<tr>
<td>2012</td>
<td>86.66</td>
<td>86.66</td>
<td>86.66</td>
<td>86.66</td>
</tr>
<tr>
<td>2013</td>
<td>85.99</td>
<td>85.99</td>
<td>85.99</td>
<td>85.99</td>
</tr>
<tr>
<td>2014</td>
<td>86.31</td>
<td>86.31</td>
<td>86.31</td>
<td>86.31</td>
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<tr>
<td>2015</td>
<td>87.92</td>
<td>87.92</td>
<td>87.92</td>
<td>87.92</td>
</tr>
<tr>
<td>2016</td>
<td>98.26</td>
<td>98.26</td>
<td>98.26</td>
<td>98.26</td>
</tr>
<tr>
<td>2017</td>
<td>101.5</td>
<td>101.5</td>
<td>101.5</td>
<td>101.5</td>
</tr>
<tr>
<td>2018</td>
<td>103.41</td>
<td>103.41</td>
<td>103.41</td>
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</tr>
<tr>
<td>2019</td>
<td>101.3</td>
<td>101.3</td>
<td>101.3</td>
<td>101.3</td>
</tr>
</tbody>
</table>

Source: Research Data (2021)

Results presented above demonstrate that the exchange rate between the US dollar and the Kenyan Shilling exhibited an upward trend for the period 2011-2017 followed by a decline in 2017. For the period under study, the lowest exchange rate was in the year 2011 where it stood at 80.75. The figure below illustrates the general trend in the exchange rate between the US dollar and the Kenyan Shilling for the period 2011-2019.

4.1.3 GDP Growth Rate

The second objective of the study was to establish the effect of real Gross Domestic Product on financial performance of the commercial banks in Kenya. The study utilized data on GDP growth rate to model the relationship between GDP and financial performance. Descriptive statistics on Kenya’s GDP for the period 2011-2019 are indicated in the table below.

Table 3: GDP Growth Rate

<table>
<thead>
<tr>
<th>Year</th>
<th>Mean</th>
<th>Median</th>
<th>Max</th>
<th>Min</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
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<td>.084</td>
<td>.084</td>
<td>.084</td>
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<td>2012</td>
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<td>.061</td>
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<td>2013</td>
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<tr>
<td>2014</td>
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<tr>
<td>2015</td>
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<tr>
<td>2016</td>
<td>.057</td>
<td>.057</td>
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<td>.057</td>
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<tr>
<td>2017</td>
<td>.059</td>
<td>.059</td>
<td>.059</td>
<td>.059</td>
</tr>
<tr>
<td>2018</td>
<td>.049</td>
<td>.049</td>
<td>.049</td>
<td>.049</td>
</tr>
<tr>
<td>2019</td>
<td>.063</td>
<td>.063</td>
<td>.063</td>
<td>.063</td>
</tr>
</tbody>
</table>

Source: Research Data (2021)

The descriptive statistics on GDP presented in the table above show that the growth rate in Kenya’s economy declined sharply for the period 2011-2013, rising slightly in 2014 before dipping in 2015. For the period 2016-
2017, there was slower growth rate in the economy, which declined in 2018. However, there was a surge in GDP growth rate in 2019. Trend in the GDP growth rate is represented in the figure below.

4.1.4 Inflation Rate

The third objective of the study was to assess the effect of inflation rate on financial performance of commercial banks in Kenya. The table below presents the average inflation rate for the period 2011-2019.

Table 4: Inflation Rate

<table>
<thead>
<tr>
<th>Year</th>
<th>Mean</th>
<th>Median</th>
<th>Max</th>
<th>Min</th>
</tr>
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<tbody>
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<tr>
<td>2019</td>
<td>.0469</td>
<td>.0469</td>
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<td>.0469</td>
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</tbody>
</table>

Source: Research Data (2021)


4.1.5 Interest Rate

The fourth objective of the study was to determine the effect of real interest rate on financial performance of the commercial banks in Kenya. Descriptive statistics on the average rate of interest charged by commercial banks in Kenya are collated in the table below.

Table 5: Interest Rate

<table>
<thead>
<tr>
<th>Year</th>
<th>Mean</th>
<th>Median</th>
</tr>
</thead>
<tbody>
<tr>
<td>2011</td>
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<td>13.87</td>
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<tr>
<td>2012</td>
<td>20.04</td>
<td>20.04</td>
</tr>
<tr>
<td>2013</td>
<td>18.13</td>
<td>18.13</td>
</tr>
<tr>
<td>2015</td>
<td>15.99</td>
<td>15.99</td>
</tr>
<tr>
<td>2016</td>
<td>16.16</td>
<td>16.16</td>
</tr>
<tr>
<td>2017</td>
<td>16.58</td>
<td>16.58</td>
</tr>
<tr>
<td>2018</td>
<td>13.67</td>
<td>13.67</td>
</tr>
<tr>
<td>2019</td>
<td>13.06</td>
<td>13.06</td>
</tr>
</tbody>
</table>

Source: Research Data (2021)

Based on the results contained in the table above, the average interest rate in 2012 stood at 20.04% up from 13.87% in 2011 before dropping to 18.13% in 2013 followed by a further decline in 2013. For the period 2014-2017, the interest rate was generally low and stable, dropping to 13.67% and 13.06% for the year 2018 and 2019 in that order.
4.2 Diagnostics Tests

The study established diagnostic tests like panel model specification test, multicollinearity, and heteroskedasticity tests before a panel regression model was fitted to the data on macroeconomic factors (predictor variable) and financial performance of commercial banks (dependent variable).

4.2.1 Hausman Test

Hausman specification test was carried out to determine whether the study was to adopt fixed effects model or random effects model when undertaking panel regression analysis. Panel data is analysed using two heterogeneous models, which majorly examine the fixed or random effects of the units under consideration. The null hypothesis for the hausman model specification test is that the random effect is preferred whereas the choice of fixed effects model is the alternative hypothesis. When p>0.05 the null hypothesis is not rejected and thus, the random effects model is used. A p-value of less than 0.05 means the null hypothesis is rejected and as such, the fixed effect model is adopted in panel regression analysis.

Table 6: Hausman Test

<table>
<thead>
<tr>
<th></th>
<th>Coefficients</th>
<th>(b)</th>
<th>(B)</th>
<th>(b-B)</th>
<th>sqrt(diag(V_b-V_B))</th>
<th>S.E.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>fixed</td>
<td>random</td>
<td>Difference</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Inflation</td>
<td>-.0591578</td>
<td>-.0591578</td>
<td>4.36e-15</td>
<td>5.43e-09</td>
<td></td>
<td></td>
</tr>
<tr>
<td>GDP</td>
<td>.0777415</td>
<td>.0777415</td>
<td>-5.60e-14</td>
<td>2.95e-08</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exchange_R-e</td>
<td>-.0006418</td>
<td>-.0006418</td>
<td>-6.26e-17</td>
<td>5.38e-11</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Interest_R-e</td>
<td>.0016279</td>
<td>.0016279</td>
<td>-2.36e-16</td>
<td>2.29e-10</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

b = consistent under Ho and Ha; obtained from xtreg
B = inconsistent under Ha, efficient under Ho; obtained from xtreg

Test: Ho: difference in coefficients not systematic

\[
\text{chi2}(4) = (b-B)'[[V_{b-V_B}]^{(-1)}](b-B)
\]

\[
\text{Prob}>\text{chi2} = 0.00
\]

Source: Research Data (2021)

Based on the findings of the hausman model specification test, a p-value of more than 0.05 was obtained and thus, the null hypothesis of the study was not rejected, implying that the study utilized random effects model to undertake panel regression as the basis of determining the effect of macroeconomic factors on financial performance of commercial banks in Kenya.

4.2.2 Multicollinearity

Multicollinearity test is often used to establish whether correlation exists between independent variables of the study. Presence of multicollinearity was established using the variance inflation factor (VIF) or the formal detection-tolerance. Values of variance inflation factor more than 10 are often regarded as indicating multicollinearity. Based on the table below on multicollinearity test, the tolerance values were more than 0.1 and those of variance inflation factor were less than 10. This indicates lack of multicollinearity between the variables and thus, the predictor variables of the study were not correlated.
Table 7: Multicollinearity Test

<table>
<thead>
<tr>
<th>Predictor Variables</th>
<th>VIF</th>
<th>1/VIF (tolerance)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Interest rate</td>
<td>3.63</td>
<td>0.2751</td>
</tr>
<tr>
<td>Inflation</td>
<td>2.93</td>
<td>0.3411</td>
</tr>
<tr>
<td>Exchange Rate</td>
<td>1.91</td>
<td>0.5246</td>
</tr>
<tr>
<td>GDP Growth</td>
<td>1.75</td>
<td>0.5717</td>
</tr>
</tbody>
</table>

4.2.3 Heteroscedasticity

Breusch Pagan test was used to test whether there is constant error variance in the data. The null hypothesis for constant error variance (assumption of equal variance) was tested, where p<.05 shows that data heteroskedastic while p>.05 concludes that data is homoscedastic.

Table 8: Heteroscedasticity Test

Breusch-Pagan / Cook-Weisberg test for heteroskedasticity
Ho: Constant variance
Variables: Infalation GDP Exchange_Rate Interest_Rate
F(4 , 301) = 1.35
Prob > F = 0.2525

Based on table 10, the probability value was found to be greater than the alpha level of significance, that is; 0.2525>0.05, we fail to reject the null hypothesis of homoscedasticity. Thus, the conclusion is that the model was homoscedastic. Hence, there was absence of heteroscedasticity in the model.

4.3 Panel regression

Panel regression analysis was used to determine the effect of macroeconomic factors on financial performance of commercial banks in Kenya. A panel regression model was fitted to the data on independent variable (macroeconomic factors) and the respective response variable (ROA). The dimensions of the explanatory variable (macroeconomic factors) included exchange rate, GDP, inflation rate, and interest rate. The study used the random effects model to carry out panel regression analysis. The output of the regression model is presented in the table.

Table 9: Panel Regression Model

| ROA         | Coef.    | Std. Err. | z       | P>|z|      | [95% Conf. Interval] |
|-------------|----------|-----------|---------|----------|---------------------|
| Infalation  | -.0591578| .0474447  | -1.25   | 0.212    | -.1521477            |
| GDP         | .0777415 | .1013846  | 0.77    | 0.443    | -.1209686            |
| Exchange_R-e| -.0006418| .0001344  | -4.77   | 0.000    | -.0009053            |
| Interest_R-e| .0016279 | .0007027  | 2.32    | 0.021    | .0002507             |
| __cons__    | .0589002 | .0234424  | 2.51    | 0.012    | .0129538             |

| sigma_u     | .02224057|           |         |          |                      |
| sigma_e     | .01372555|           |         |          |                      |
| rho         | .72418548|           |         |          | (fraction of variance due to u_i) |

The model was significant, as Prob > chi2(4) = 0.0000, indicating that the model is a good fit.
According to the panel regression results contained in the table above, the R-square ($R^2$) value of 0.067 suggests that macroeconomic factors accounted for 6.7% variation in the financial performance of commercial banks in Kenya. In this regard, 93.3% of the variation in financial performance of commercial banks in Kenya is explained by other factors outside the scope of this research work.

The constant regression coefficient value of 0.0589 suggests that if macroeconomic factors were zero-rated, financial performance of commercial banks in Kenya would be 0.0589. The stated performance is statistically significant as presented by a p-value of less than 0.05 ($p=0.012$). In addition, a unit change in exchange rate would cause a decrease in ROA by -0.00064. The decrease in financial performance by exchange rate is statistically significant since the p-value is less than 0.05 ($p=0.000$). A unit change in GDP leads to 0.07774 unit increase in ROA albeit this relationship is statistically insignificant ($p=0.443$; $p>0.05$). The results of the study also demonstrate that a unit change in interest rate would lead to 0.00162 unit increase in financial performance of commercial banks in Kenya. This increase is statistically significant ($p=0.021$; $p<0.05$).

The overall panel regression model on the effects of macroeconomic factors on financial performance of commercial banks in Kenya is specified as follows;

$$Y_{it} = 0.0589+ -0.00064X_{1it} + 0.07774X_{2it} + -0.059157X_{3it} + 0.00162X_{4it} + \epsilon_{it}$$

Where:

$Y_i$ = ROA  
$X_1$ = Exchange rate  
$X_2$ = GDP  
$X_3$ = Inflation rate  
$X_4$ = Interest rate  
$\epsilon$ = Error term

$\bar{it} =$Number of listed commercial banks for each period

### 4.4 Hypotheses Testing

#### 4.4.1 Exchange Rate and Financial Performance

The first objective of the study was to determine the effect of exchange rate on financial performance of the commercial banks in Kenya. The corresponding null hypothesis states that exchange rate has no significant effect on financial performance of the commercial banks in Kenya. According to the findings of the study, exchange rate had a statistically significant effect on financial performance of commercial banks in Kenya. This is because the stated null hypothesis was not rejected since the p-value was less than 0.05 ($p=0.000$). However, it is worth noting that exchange rate had a negative association with return on assets, meaning that financial performance of commercial banks improves as the exchange rate between the US dollar and the Kenyan Shilling decreases. This result is in agreement with the findings of existing studies on the relationship between exchange rate and financial performance of commercial banks. For instance, a study by Keshtgar et al. (2020) found out that exchange rate volatility had a negative and statistically significant effect on performance of banks in Iran. A study by Lagat and Nyandema (2016) established that foreign exchange rate exhibited a positive and statistically significant relationship with indicators of financial performance.

#### 4.4.2 GDP Growth Rate and Financial Performance

The second objective of the study was to establish the effect of real Gross Domestic Product on financial performance of the commercial banks in Kenya. The respective null hypothesis states that real Gross Domestic Product has no significant effect on financial performance of the commercial banks in Kenya. Based on the
results of the study, GDP growth rate exhibited a statistically insignificant effect on financial performance of commercial banks in Kenya ($p=0.443; p>0.05$). In this regard, the null hypothesis of the study is not rejected and thus, GDP growth rate insignificantly affects financial performance. Nonetheless, GDP growth rate depicted a positive association with financial performance as measured by return on assets. This finding of the study is consistent with other empirical studies done locally, regionally, and internationally. A study by Kanwal and Nadeem (2013) established that GDP had an insignificant positive effect on ROA. A study by Kiganda (2014) found out that GDP had an insignificant relationship with the profitability of Equity Bank, Kenya.

4.4.3 Inflation Rate and Financial Performance

The third objective of the study was to assess the effect of inflation rate on financial performance of commercial banks in Kenya. The null hypothesis of the study states that inflation rate has no significant effect on financial performance of commercial banks in Kenya. The findings of the study revealed that inflation rate had a negative insignificant effect on financial performance of commercial banks in Kenya. In effect, the null hypothesis of the study was rejected ($p=0.212; p>0.05$). This result of the study partially agrees with extant empirical studies, which have delved into the relationship between macroeconomic factors, and in particular inflation rate, and performance of commercial banks. For instance, a study by Duraj and Moci (2015) established that Inflation was negatively and statistically related with profitability of the Albanian banks. Results from a study carried out by Kiganda (2014) showed that inflation had a negligible effect on performance of commercial banks. A study by Osamwonyi and Michael (2014) established that inflation had a negligible impact on banks performance.

4.4.4 Interest Rate and Financial Performance

The fourth objective of the study was to determine the effect of real interest rate on financial performance of the commercial banks in Kenya. The null hypothesis of the study states that real interest rate has no significant effect on financial performance of the commercial banks in Kenya. The results of the study showed that interest rate had a statistically significant effect on financial performance of commercial banks in Kenya ($p=0.021; p<0.05$). Interest rate depicted a positive association with ROA. The result of the present study is consistent with past empirical studies carried out within the context of inflation and performance of commercial banks. For example, a study by Alpha and Anber (2011) revealed that interest rate had a positive and significant relationship with performance of commercial banks in Turkey. A study by Nadeem et al. (2013) found out that real interest rate had a positive and significant effect on bank profitability. Results from a study by Amollo (2015) revealed that performance of commercial banks was positively and significantly affected by interest rate.

Summary, Conclusions and Recommendations

5.1 Summary of Findings

The rationale of this research work was to explore the effect of macroeconomic factors on financial performance of commercial banks in Kenya. The study was anchored purchasing power parity theory and the standard trade theory. The study was informed by the following objectives; to determine the effect of exchange rate on financial performance of the commercial banks in Kenya; to establish the effect of real Gross Domestic Product on financial performance of the commercial banks in Kenya; to assess the effect of inflation rate on financial performance of commercial banks in Kenya; and to determine the effect of real interest rate on financial performance of the commercial banks in Kenya. The study used secondary data, which was obtained from audited financial statements of commercial banks, KNBS, CBK. Stata (version 15) statistical software was utilized for data analysis. Summary of the findings has been carried out systematically based on each of the objectives of the study.

5.1.1 Exchange Rate

The first objective of the study was to determine the effect of exchange rate on financial performance of the commercial banks in Kenya. Based on the results of panel regression analysis, exchange rate had a statistically significant effect on financial performance of commercial banks in Kenya ($p=0.000; p<0.05$). However, exchange rate had a negative relationship with financial performance of commercial banks, which was measured using return on assets.
5.1.2 GDP Growth Rate
The second objective of the study was to establish the effect of real Gross Domestic Product on financial performance of the commercial banks in Kenya. Based on the results of panel regression analysis, GDP growth rate exhibited a statistically insignificant effect on financial performance of commercial banks in Kenya (p=0.443; p>0.05). Nonetheless, GDP growth rate had a positive relationship with financial performance of commercial banks.

5.1.3 Inflation Rate
The third objective of the study was to assess the effect of inflation rate on financial performance of commercial banks in Kenya. The findings of the study revealed that inflation rate had insignificant effect on financial performance of commercial banks in Kenya (p=0.212; p>0.05). However, inflation rate had a negative relationship with financial performance of commercial banks in Kenya.

5.1.4 Interest Rate
The fourth objective of the study was to determine the effect of real interest rate on financial performance of the commercial banks in Kenya. The results of panel regression analysis showed that interest rate had a statistically significant effect on financial performance of commercial banks in Kenya (p=0.021; p<0.05). Interest rate depicted a positive relationship with return on assets, which was the proxy measurement for financial performance of commercial banks.

5.2 Conclusions of the Study
The results of this research work demonstrated that exchange rate and interest rate significantly affected financial performance of commercial banks in Kenya. On the other hand, GDP growth rate and inflation rate did not significantly affect financial performance of commercial banks in Kenya. Generally, it was concluded that the effect of macroeconomic factors on financial performance of commercial banks was weak as espoused by the R-square value of 0.067. Macroeconomic factors accounted for 6.7% variation in the financial performance of commercial banks in Kenya. In this regard, 93.3% of the variation in financial performance of commercial banks in Kenya is explained by other factors outside the scope of this research work.

The results of study showed that interest rate and GDP were positively correlated with financial performance of commercial banks in Kenya. Conversely, the findings of the study demonstrated that exchange rate and inflation rate had a negative correlation with financial performance of commercial banks in Kenya. At 95% confidence level, exchange rate and interest rate significantly affected financial performance of commercial banks in Kenya. In this context, the study concluded that exchange rate and interest rate affected financial performance of commercial banks. In addition, the study concluded that financial performance of commercial banks in Kenya was not affected by GDP and inflation rate.

5.3 Recommendations of the Study
The findings of the study established that exchange rate and interest rate significantly affected financial performance of commercial banks in Kenya. Nonetheless, financial performance of commercial banks in Kenya was not affected by GDP and inflation rate. Based on these key findings, this study makes the following recommendations:

Policy formulation in the banking sector should take into consideration the exchange rate as the basis of managing its effect on financial performance. Equally, it is important that the future as well as the present exchange rate is taken into consideration when banks are making investment decisions.

In the quest to increase profitability in the banking industry, commercial banks can moderately raise their interest rates. Similarly, fluctuations in interest rates should be kept minimal by the Central Bank of Kenya to enhance financial performance of commercial banks in Kenya. Accordingly, operational and investment decisions made by commercial banks ought to be informed by the present and anticipated interest rates.

Whilst GDP growth exhibited a statistically insignificant effect on financial performance of commercial banks, the relationship between these two variables was positive. In effect, it is important that that regulatory agencies and the government manage this crucial macroeconomic variable to spur its growth since this will translate into great improvement in the other sectors of the economy.

Inflation had an inverse relationship with financial performance of commercial banks in Kenya and thus, there it is important that this macroeconomic factor is managed well by the banking system management by increasing interest rates through the Federal Reserve and increasing reserve requirements on the amount of money banks are legally required to hold to cover withdrawals.

5.4 Suggestions for Further Research
Exchange rate, GDP, inflation rate, and interest rate accounted for 6.7% in the performance of commercial banks in Kenya. Thus, it is imperative to explore other factors e.g. non-camel factors that contributed to 93.3% of the variation or changes that occurred in financial performance of commercial banks in Kenya.
References


