MACROECONOMIC VARIABLES AND FINANCIAL PERFORMANCE OF DEPOSIT TAKING MICROFINANCE INSTITUTIONS IN KENYA

Ibrahim Galo Walde.
Master of Business Administration Student (Finance option), Kenyatta University, Kenya
Dr. Daniel Makori.
Department of Accounting and Finance, School of Business, Kenyatta University, Kenya

ABSTRACT

The total loans to deposits ratio for the past ten years up to the year 2019 for the DTMFIs have exceeded the proposed ratio of 70% and indicates that there is a continued reflection that the appetite for loans in the DTMFIs structure outweighs the mobilization of deposits to fund the same and this forced the DTMFIs to finance part of their loans by mobilizing funds from external sources and this affects their liquidity. The rise in the loan to deposit ratio over the years is attributed to macro-economic variables changes such as inflation and interest rate. The general objective of the study was to establish effect of macroeconomic variables on the financial performance of the DTMFIs in Kenya. The specific objectives of the study were to establish the effect of inflation rate, interest rate, gross domestic product and exchange rate on financial performance of DTMFIs in Kenya. Theories that anchored the study include market timing theory, the pecking order theory and trade off theory. The causal research design was employed in the study. The study adopted census where all thirteen (13) DTMFIs that are operational in Kenya were considered. The study utilized secondary data which was obtained from the annual supervisory reports on DTMFIs by CBK and KNBS for duration of ten (10) years (2010-2019). Diagnostic tests that were carried out include multicollinearity test, linearity test, heteroscedasticity test, normality test, unit root test and autocorrelation test. Karl Pearson correlation moment and multiple regression analysis model was used to analyze data. Multicollinearity results showed that there was a weak correlation between interest rate and financial performance. There was a very weak correlation between inflation rate and financial performance, the correlation between exchange rate and financial performance was moderately strong while the correlation between GDP and the financial performance was strong. Additionally, the correlation was positive for interest rate, inflation rate and GDP and negative for the exchange rate. Further the correlation coefficient between the independent variables is below 0.8 hence no severe multicollinearity as Greene (2008) stated that if correlation is 0.8 or -0.8, it shows high multicollinearity level. Linearity test results showed that the data passed the linearity test since the variables were linear in form. Heteroscedastic test results further showed that the data was not heteroscedastic and all VIFs were below one thus it was concluded that there was no normality in the dataset. Unit root test showed that the data passed the stationary test. The regression results showed that the interest rate has a statistically insignificant negative effect on financial performance of DMTFIs at the 5% significance level while inflation rate has a statistically insignificant positive effect on financial performance of DMTFIs at the 5% significance level. Results further showed that the exchange rate has a statistically insignificant negative effect on financial performance of DMTFIs at the 5% significance level while GDP has a statistically significant positive effect on financial performance of DMTFIs at the 5% significance level. The

study recommends that interest rates for the DTMFIs should be controlled by the government through macroeconomic regulators such as CBK for them to be able to provide financial intermediation services effectively and sustainably. Additionally, there is need for the DTMFIs management committees to continuously monitor inflation rate for them to adjust their loan products in line with the inflation rate. The government should also regulate the exchange rates such that they lead to economic growth and in favour of the DTMFIs which will facilitate the financial health of the DTMFIs thus increased economic growth. Finally, there is need for the government to ensure the business environment is conducive to encourage investment in the DTMFIs since they have a great impact on the GDP through creation of employment.

INTRODUCTION

Background of the Study

Nzalu (2015) stated that financial performance focuses on statements of financial positions or firm reports. Financial performance is how efficiently a firm makes use of its assets from its principal role of conducting a business and its subsequent revenue generation (Kajirwa, 2015). Another way of assessing it is using financial parameters such as return on assets (ROA) that assesses profitability of a firm by dividing net income by the total assets. A profit making microfinance firms is essential in keeping up a balanced micro-banking organization. Loss or no profit incapacitates the ability of DTMFIs to soak up distress, which will have an effect on their solvency. The Loan to Deposit ratio, expressed as a percentage is used in assessing bank's liquidity by comparing a bank's total loans to its total deposits for the same period. MFIs with a stronger profit minded approach benefits more, as they charge high interest rates. However, their profits are not higher, partly due to greater salary costs for highly paid executives and the higher costs of for-profit MFIs (Roberts, 2013).

In the mid-1970s, Microfinance started in Bangladesh and parts of Latin America to dispense credit to the poor, who cannot access formal financial facilities. This model gained momentum and has since been used in many countries. Despite the lack of proper regulatory environment for MFIs in many countries, the tremendous growth of the sector in the last decade has led to increase demand for regulation, which enhances financial performance of the institutions (Cull, Demirg-Kunt, & Morduch, 2009). Over time, financial institutions have come up with better packages of financial needs for low-income people. Financial service providers now provide lots of products other than credit i.e. insurance, money transfers and savings thus helping many in managing their financial affairs. Supervision and regulation also ensures that Microfinance banks are run prudently and reports of the poor people losing money through incompetence or fraud are minimized (Kimando, Kihoro & Njogu, 2012). Opportunities are continuously created because of new technologies to broaden the reach and further down the expense of providing financial services to people. With a mobile phone, financial services are now within reach in many markets to anyone, and new

devices and methods steer both enhanced product plan and conveyance. Today, MFI is progressively seen as one piece of the wider financial incorporation structure, made up of different players with the routine goal of providing excellent quality financial dispensation to low-income people.

Simeyo *et al*. (2011) describes microfinance as a small loans; savings mobilization and training in micro enterprise investment services extended to poor people to enable them undertake self-employment projects that generate income. Noreen (2011) confirms that micro-finance is a powerful tool of self-empowerment to the poor globally, particularly needs of the target group like women in developing countries. However, a strong debate among policy-makers, academicians and micro finance practitioners exists regarding the welfare impact of MFI programs and sustainability issues (Rahman, Jianchao, & Minjuan, 2014).

Since the introduction of modern concept of microfinance in the 1970s, these demanding question have been there. Several researches have taken place in various regions to come up with answers. Some report positive effects of programs of microfinance while others find no or negative impacts. Consensus has been reached regarding MFIs extending financial support to people commonly ignored by bigger banking institutions. Accessing fund is crucial for the needy to create wealth, improve health, reduce poverty and empower women. Microfinance institutions and banks have been used as a tool to provide support and microcredit to small businesses (Al-Absi, 2016). For the purpose of the growth of microfinance banks, proper regulation should be in place. The aims of regulation should include: customer protection, financial system stability, effective and efficient use of investors' funds, the setting of minimum standards, depositor protection and clarification of the legal position of MFIs.

Financial Performance

Financial performance is an assessment of institution's goals, plans and its effectiveness expressed in monetary terms. It involves financial health and comparison that can be made between same firms in similar industry (Agola, 2014). It is a measure of systematic application of assets by an organization from the main business mode to generate income. The ROA, ROE and profitability show the financial and operational self-sufficiency in addition to the ability to be profitable thanks to efficiency and productivity (Sene, 2010). Other common indicators include Loans to Deposit Ratio (LDR), margins and economic value added. Financial performance guides management on the strategies and policies to adapt in improving sustainability of organization (Almazari, 2011). A profit making MFI industry is essential in supporting a stable micro- banking arrangement. Loss or no profit reduces the ability of DTMFIs to withstand shocks, which later on affect their liquidity. The loan portfolio share as a percentage of total assets must be above 70% of the total balance sheet and since DTMFIs cannot move up-market due to regulations that guide them to hold at least 70% microfinance loans in their portfolio, the ratio indicates that the MFB financial status sounds healthy (FSD, 2012).

The main area of MFI expertise remains its understanding of its clients (Monyi, 2017). It takes a risk when it moves away from this and causes provisions to put pressure on its profitability. The ability of MFI to generate income based on its asset is measured by ROA (Mersland & Strom, 2014). ROA gives wider viewpoint in comparison to other measures as it surpasses main undertaking of MFIs, including loans provision, keep tabs on revenue from operating activities and evaluation of profit. Return on investment is the ratio of money gained or lost on an investment and is usually expressed as a percentage. Loan-deposit ratio measures bank's liquidity and profitability (Mersland & Strom, 2014). According to Taillard (2014) the ratio is calculated by dividing the total amount of loans by total amount of deposits.

LDR reflects the ratio between loans provided by commercial banks to their customers compared with funds that have been entered or collected from the public. Banks that have large total assets, have the opportunity to extend credit to the borrowers in large numbers, so as to obtain higher profits (Alper *et al.*, 2011). Kiswanto and Ari (2016) stated that the Loan to deposit ratio has a significant effect on Good Corporate Governance. Too high ratio means bank liquidity may not be enough to cover any unexpected fund needed. LDR states how far is the ability of MFB to repay the withdrawals made by depositors relying on the loans advantage given as a source of liquidity. The total LDR for DTMFIs from the year 2010-2019 are 2010; 233%, 2011; 161%, 2012; 129%, 2013; 111%, 2014; 109%, 2015; 112%, 2016; 117% 2017; 110%, 2018; 106%, 2019; 107% (CBK, 2019) far above the recommended ratio of 70% according to Financial Sector Deepening (FSD, 2012).

A customer deposit of DTMFIs in December 2016 was Ksh.40.2 billion and Ksh.38.9 billion in December 2017, declined of 3 percent (CBK, 2017). The gross loan portfolio, as at December 2018 amounted to Ksh. 44.1 billion while deposits amounted to Ksh.40.9 billion, showing that the MFBs to a greater extent fund their loan portfolio from deposits made by customers. The total net assets were KSh.67.5 Billion in December 2017 and KSh.70.7 Billion in December 2018(CBK, 2018). In this study, financial performance is measured by Loan to Deposit ratio (LDR).

Macroeconomic Variables

Macroeconomic variables are factors pertinent to the economy as a whole and affect a large population as opposed to selected number of individuals (Zaman *et al.*, 2012). According to Aghionet (2011), macroeconomic is the study of the economy as a whole as it focuses on the behavior of an entire economy. It includes inflation, employment, productivity, finance and international trade balances. Inflation is an overall increase in the consumer price index, which is a weighted average of prices for different goods and services (Sinclair, 2010). Inflation increases production when the economy is performing at capacity (Maimunah & Patmawati, 2018). This is basically as a result of earnings increase that doesn't correspond to the rise in the manufacturing goods or provision of services. As a result of more money going after few goods and the overall prices are expected to raise triggering valuable decrease in

income and the reduction in low income earners buying capacity (Sinclair, 2010). Kenya National Bureau of Statistics annual reports normally show average inflation through month by month mean of inflation for each of twelve month forming one year (Durevall & Sjo, 2012).

Harvey (2012) defined exchange rate as the amount one would have to part with in the local currency in order to obtain a foreign currency. It is termed as a particular value of a certain currency when compared with another. It is obtained when one currency is exchanged with another, thus its value may either increase or reduce. Exchange rate may have effects on level of price in any economy based on the share/percentage of imported goods meant for consumption.

According to McConnell (2009), interest rates are a price paid for borrowing funds expressed as a percentage per year. It is an additional payment on borrowed money due to the lender in twelve months' time. To lender i.e. DTMFIs, it is a source of income while it is an expense to the borrower. The interest rate is directly proportion and determined by borrower's levels of the risk and is normally charged per annum or per month. To make more economic sense, the amount borrowed should be put to use in business enterprise that generate more returns.

Gross Domestic Product is an aggregate of economic growth representing the market value of country's production, within a given time of all final goods and services produced. It measures output and performance of an economy. GDP is the most commonly used macroeconomic indicator to measure economic output in a country (Mwangi, 2013). GDP expansion is an indicator of overall health of an economy (Dynam & Sheiner, 2018). During economic expansion, there is an increase in firm's profitability and in recession it declines thus GDP growth makes firm's deposits and loans increase and make interest income improves and loans losses decline. Also GDP growth means high income and decrease in defaults on customer loans.

Macroeconomic Variables and Financial Performance

Macroeconomic variables argued by Taher *et al.* (2010) are those forces and conditions that are external and are beyond the control of the business, but they all operate within it. Macroeconomic conditions should be included in predicting firm performance since they affect firm's future performance (Issah & Antwi, 2017). Macroeconomic factors such as savings, inflation and employment are important determinants of economic performance and are closely monitored by financial institution, investors and governments. Although macroeconomic indicators are factors that are outside an organization, they have significant impact company performance. Analysis of macroeconomic impact plays a significant part in the success of financial institutions and predicting wellbeing of an economy (Nzuve, 2016). Pricing and financial performance are affected by economic environment that have effect on the pricing strategy, investment opportunities among other factors. As Muchiri (2012) concluded, earlier studies argued that consumer prices index is a particular element made up

of a number of macroeconomic variables. Sharma and Singh (2011) advocated that banks first acquire detail of particulars about borrowers which is very costly before giving loans to current or potential customers, be it existing or new customers. The utilization of customer data (clientele information) helps bank and MFI in predicting the risk and profitability. The economic condition variability highly affects the available funds allocation and the high probability that nonpayment of loans would significantly affects their lending behavior.

Kimando *et al*. (2012) argues that a microfinance institution is said to have reached sustainability when the operating costs are sufficiently covered by operating income from the loan. Thus to be financially stable, firms has to be sustainable. Changes in macroeconomic variables present opportunities as well as threats to the industry players concurrently; those prepared for the changes, shall realize gains from opportunities that arise thus fostering their financial performance, while those who are unprepared might suffer from the threats and might in turn impact their financial performance negatively.

Microfinance Institutions in Kenya

The passing of the microfinance act and regulations significantly changed the dynamics of the microfinance banks in Kenya and within short time the industry experienced transformation. There was an increase in innovation that changed the direction within the microfinance industry that has experienced growth in customer base and variety in the range of products and services advanced (FSD, 2012). In May 2009, the first microfinance bank was registered and it increased to thirteen (13), as at December 2017. CBK invited important participants in order to kick start the legislative and regulatory review process including the Association of Microfinance Institutions (AMFI) and licensed microfinance banks to present opinion and comments and forward proposals for consideration in the review process in September 2017 (CBK, 2017).

In Kenya, the activities of microfinance date back to 1980's with activities of NGOs. In the 2000's, the mainstream banks entered the competition and created micro finance products (Ochanda, 2012). With this economic contribution of MFIs, there have been many debates that for the MFIs to be sustainable, they need to be profitable. With this profitability, others argue that it will cause a mission drift. Furthermore, for microfinance to fulfill their promise on trimming down poverty, they need to be profitable since support from donor constancy is not given. There was great need for direct lending through MFI in spite of the limitation. From these needs, some organization have advanced and put to trial certain techniques towards their satisfaction (Sene, 2010).

From the beginning, the nongovernmental organizations (NGOs) attempted to fill the gap through advancing of the credit services broadly (Lewis, 2003). In the 1990s, the NGOs came up with a functioning structure to ease credit delivery management. Overtime, these institutions prospered and wooed considerable funding and later on turn into commercial

enterprises. In Kenya, the advancement of microfinance industry made them undertake diverse official structures and was registered under different regulations (Lewis, 2003).

According to FSD (2012), both regional and international transformation experience has shown the significance of having a comprehensive strategy for microfinance, focused on enhancing the regulatory frameworks and environmental policy. This attracts the international donors to invest in the development of the country.

The evidence of the growth was seen in the development of particularly, Sidian bank (formerly K-Rep), Faulu Kenya and Kenya Women Finance Trust (KWFT) and among others. The microfinance Act was the established and became operational from 2nd May 2008. According to (CBK, 2012), the microfinance act of 2006 and the Microfinance laws issued there underneath establishes structure for the MFI. The foremost purpose of MFI act is to oversee the MFIs running in Kenya as business entities by way of licensing and regulations. The Act also allows DTMF establishments permitted by the CBK to organize savings from the members of public so as to encourage effectiveness, access and competition. Consequently, the belief is that MFIs will play an important part in increasing access to financial services by majority of the Kenyans.

Deposit Taking Microfinance Institutions in Kenya

In Kenya, policy makers and practitioners have profound interest in MFIs development as it plays a big role in accessing funds and improving the livelihoods of the many people. Since DTMFIs hold private information of their loan clients, agency cost maybe higher in this industry. Additionally, other safety net protections access by DTMFIs and grant funding may increase incentives for shifting risk, thus the agency costs of outside debt will increase (Counts, 2005).

Microfinance Act enacted in 2008 enabled MFIs to make an application for licenses to allow them to accept deposits. In 2017, according to CBK report (CBK, 2017) there are thirteen (13) DTMFIs operating in Kenya. To enhance performance and because of constant changes in monetary policy that affects the general solvency trend, transactional demands and short term borrowing repayment, DTMFIs should be well equipped in terms of funding and regulations. A number of risks negatively affect the performance of financial institutions that includes interest rate risk and operational risk that may lead to liquidity risk.

Since 2008 DTMFIs in Kenya has witnessed tremendous growth when the first DTMFI in Kenya was licensed and as at December 2017, DTMFIs in Kenya have grown to thirteen (13) with one hundred and fourteen (114) branches (CBK, 2017). Nonetheless, performance challenge was observed in 2017 in total assets which was KSh.69 billion (CBK, 2017), and in the year 2016 the total asset was Ksh.72 billion, a decrease of 4.6 percent (CBK, 2017). In the year 2018, the total net asset was Ksh.70.8 (CBK, 2018). Over the years profits level declined. From the period ended December 2015 when the profit was at KSh.549 million to a

loss of KSh.377 million in December 2016 and ksh.731 million in December 2017 (CBK, 2017). In December 2018, it again made a loss of Ksh.1.192 Billion (CBK, 2018).

In Kenya DTMFIs are confined to restrict loan not to go above two (2) percent of its equity per borrower. Again, as per FSD Kenya, DTMFIs are coerced to channel their mobilized deposits into advancing loans i.e. from the total deposit, 70 % should be dedicated to microfinance loans (FSD, 2012). CBK in its annual supervision report of 2013 indicated that DTMFIs percentage of borrowings reduced notably in 2013, which showed their growing dependency on deposits owing to the enhanced range to marshal savings. Generally, the sectors external debt amount reduced both including and excluding banks.

Statement of the Problem

In Kenya, DTMFIs have been having performance challenges. On average the total loans to deposits ratio for the past ten years (between 2010-2019) for the DTMFIs are, 2010;233%, 2011;161%, 2012; 129%, 2013; 111%, 2014; 109%, 2015; 112%, 2016; 117% 2017; 110% ,2018; 106% and 2019; 107% (CBK, 2019). This is far above the recommended ratio of 70% and indicates that there is a continued reflection that the demand for loans within the DTMFIs system still outweighs the mobilization of deposits to fund the same and this force the DTMFIs to finance part of their loans by mobilizing funds from external sources and this affects their liquidity (FSD, 2012).

The rise in the loan to deposit ratio over the years has been attributed with the changes in macro-economic variables such as inflations and interest rate (CBK, 2014). As per CBK (CBK, 2015), the microfinance institutions interest rates spread have been the highest averaging 12.8% compared to commercial banks 9.2%. The Economic Survey (KNBS, 2015) showed that there has been an association between inflation and microfinance banks' lending volumes. It indicates that as inflation increases, the microfinance bank lending volumes in Kenya declines and when inflation level goes down the lending volume increases.

Studies on effect of macroeconomic variables and financial performance have been inconclusive. Sainz-Fernandez *et al*. (2015) in their studies concluded that macroeconomic variables have a significant positive impact on financial performance of MFIs. Janda and Zetek (2014) have found out that macroeconomic factors have a significant positive effect in influencing interest rates of the microfinance institutions. Kar and Swain (2014) found out that there is positive effect between macroeconomic variables and financial performance of MFIs. Muriu (2011) concluded macroeconomic factors have no effect on performance of MFIs. Ngigi (2014) while studying determinants of lending rates in deposit taking MFIs in Kenya reported that macroeconomic variables have a negative relationship with lending rates. Woolley (2009) found macroeconomic conditions to have no effect on the MFIs' financial performance. These studies exhibit mixed results where some showed positive significant effect while others indicated negative effect. An increasing ratio of the total loans to deposits over the past ten years, (CBK Reports, 2010-2019) shows that the financial soundness of the

DTMFIs in Kenya in terms of liquidity is declining. It is against this backdrop that the present study attempts to investigate effect of macroeconomic variables on financial performance of DTMFIs in Kenya.

Objectives of the Study

General Objective

The general objective of the study is to establish effect of macroeconomic variables on financial performance of the DTMFIs in Kenya.

Specific Objectives

i.   To establish the effect of interest rate on financial performance of DTMFIs in Kenya.
ii.   To investigate the effect of inflation rate on financial performance of DTMFIs in Kenya.
iii. To examine the effect of exchange rate on financial performance of DTMFIs in Kenya.
iv.   To establish the effect of gross domestic product on financial performance of DTMFIs in Kenya.

Research Hypothesis

i.   Interest rate has no significant effect on the financial performance of DTMFIs in Kenya
ii.   Inflation rate has no significant effect on the financial performance of DTMFIs in Kenya
iii. Exchange rate has no significant effect on the financial performance of DTMFIs in Kenya
iv.   Gross Domestic Product has no significant effect on the financial performance of DTMFIs in Kenya

Significance of the Study

To a number of stake holders, the study is of significance. Primarily, the study makes important contribution by helping stakeholders and government in finding answers to issues facing MFIs in the country. The MFIs will know the economic environments that yield high performance by analyzing the good condition of gross domestic product, inflation, exchange rate and interest rate that maximizes their returns.

Limitations of the Study

The study has several limitations and notably, it took only into consideration the financial indicators to determine the performance of DTMFIs, whereas, there could be non-financial benchmark of performance.

Scope of the Study

Study focus was to evaluate the effect of macroeconomic variables on the financial performance of DTMFIs in Kenya. All facts were derived from statements taken from DTMFIs. The study targeted Thirteen (13) DTMFIs in Kenya as those are licensed by the CBK as at 2019. CBK annual microfinance supervision reports were used for the secondary data as well as reports from AMFI and FSD.

Organization of the Study

The study is organized into five (5) major chapters. The first chapter covers the background of the study, macroeconomic variables, financial performance, DTMFIs in Kenya, statement of the problem, objectives of the study, research hypothesis, significance of the study, limitations of study and the scope of study. Chapter two (2) covers introduction, theoretical framework, literature gaps summary and conceptual frameworks. Chapter three (3) covers research design, target population, sampling design and procedure, empirical model, data collection instrument, data collection procedure, operationalization and measurement of variables, data analysis and presentation, diagnostic tests and consideration of ethical matter. Chapter four (4) covers results, interpretation and discussion while chapter five (5) has the summary of the findings, conclusion and recommendations.

LITERATURE REVIEW

Introduction

The chapter entails theoretical framework, empirical studies, summary of literature gaps and conceptual frameworks. It underlines theories anchoring the study, determinants of financial performance and illustrating summary of literature gap and conclusion on the literature review.

Theoretical Literature Review

The pecking order theory, market timing theory and the trade-off theory support this study. The pecking order theory explains how a company tries to utilize its internal financing sources first, and then issues debt and equity as a last resort. The market timing theory states how firms decide whether to finance their investment with equity or with debt instruments

and the tradeoff theory tries to explain how an organization decides how much debt and equity finance to finance its activities.

Pecking Order Theory

Myers (1984) developed the Pecking Order Theory that relates to capital structure in corporate finance field. Pecking order theory, according to Myers (1984) states that organization first tries to utilize its internally generated financing sources i.e. retained earnings and afterwards issue debt and then eventually as a last resort, issue equity. Firm's financial decision making is well explained in this theory. The theory additionally expounds that the lopsided particulars(data) on the belief that gains from outside financing in relation to trade-off theory and the cost associated with it are significantly less as compared to financing from inside i.e. issuance of new securities. According to Kayo and Kimura (2010), profitable companies are likely to have more retained earnings.

Pecking-order theory in terms of using different financing instruments, gives a preferential order. Pecking order theory, Unlike Modigliani & Miller's over simplified Irrelevance theory ponders the ramifications of debt and equity issues for a firm. According to Mazur (2007), in a firm's capital structure decision, transaction costs play an important role. Transaction costs related to obtaining internal financing are not higher than the costs of obtaining new external financing. Myers popularized the pecking order theory and states that equity, when used as source in raising capital is a less favored method for the reason that managers are presumed to have better knowledge of the firm and the market than investors. Thus an ideal order should be to exhaust retained earnings then debt and equity as last resort. Application of debt increases the variance of earnings and this means that investors ask for greater returns on their investments (Markopoulou & Papadopoulos, 2009). This would only mean one thing; that firms would seek capital structure that maximizes tax benefits as result of use of more debt while minimizing probability and possibility of bankruptcy costs. Companies have advantages by utilizing debt instead of internal capital, so as to enjoy from debt tax shields benefit. When using debt capital in place of retained earnings, the tax shield allows the organization to pay less tax. The theory argues that a firm's value is created if they have more debts.

One facet of pecking order theory states that profitable firms, instead of taking new debts or issue equity would always choose internal financing. Sen (2010) recognized that debt financing is neither sustainable nor stable, argues that the financial system requires a more sensible financing method. According to Lemmon and Zender (2009) debt appears to be preferred to equity when there is control for heterogeneity in debt capacity. There are specific costs associated with both debt and equity. Thus in reference to the pecking order theory, microfinance banks in Kenya can choose a specific financing order of retaining earnings, borrowing or equity in their financial structure which ensures the enhancement of their performance in financial terms. When the DTMFIs choose to borrow from outside, there is

interest payments associated with using debt capital depending on the interest rate agreed upon.

Market Timing Theory

The theory, developed by Baker and Wurgler (2002) argues that firms issue securities depending on respective costs, i.e. they are more likely to issue equity if cost is lower compared to the cost of other forms of capital. Alternatively, the theory states that firms whose share prices (market value) are high are more likely to issue equity, compared to past market values, and to repurchase equity when the share prices or values are low. This as well means that, firms prefer external equity for external financing decisions when the cost associated with equity is low. It is based on the assumption that the company selects the financing that is regarded cost efficient at the point in time capital is needed. The issuance of equity, according to theory has a strong effect on capital structure. As observed by Baker and Wurgler *(2002)* high-leverage firms are those firms that have raised funds when their market values are low and on contrary low-leverage firms are those companies that have raised funds when their market to book values were high.

In line with the privilege information, the theory evoke that decision makers should consequently identify situations where organization's shares are at present under or overvalued. Accordingly, organizations move on such information to issue new shares when they consider the stock price to be overvalued and should consider share repurchases when they consider the share price to be undervalued. Making gain from the opportunities in the market to issue new securities or buy back existing securities influences the gearing level (Ater, 2017). As stated by the theory, firm's issuance of securities depends on the relative costs. This means that the cost of equity and debt should be included in the tests in market timing theory. However, in the past tests of the theory, in explaining timing behavior of a firm, cost of the equity was the only cost considered as a factor as the cost of debt is ignored. Saad (2010) gave three explanations on the usefulness of market timing theory which are: managers like to issue equity in lieu of debt when share value is high relative to book value as well as when market value of the past is high; through the analysis of estimated earnings prospects, firms prefer to sell equity at the time investors have high enthusiasm and high optimism.

According to market timing theory, and in reference to this study DTMFIs, when the interest on the debt is low, issue debt in comparison to past and future expected interest rate. The inflationary course of the economy will generally determine the forecasting of the interest rate (future). As stated by Frank and Goyal (2009), when a company expects an inflation rate to be higher in future, or they found out that the current inflation rate is low, the firms will issue debt securities. This indicates that theory shows positive relationship between debt and inflation if it is expected that future inflation will be more.

Trade-Off Theory

This theory, introduced by Myers (1984) is an advancement of MM theorem though it considers the consequences of bankruptcy costs and taxes. Before the development of other theories that focuses on selection of capital structure by organization, this particular theory has to be considered first. The theory explains how organization chooses an optimum debt level. Trade-Off theory argued put importance on stability between bankruptcy and financial distress costs and tax saving arising from debt. The theory expected to choose a target capital structure by minimizing the costs of prevailing market imperfections in order to maximize the firm value (Sheikh & Wang 2010). It assumed that there is cost and return in each source of money and these are associated with earning capacity of an organization and its business and insolvency risks (Awan & Amin, 2014).

Consequently, a company with more tax advantage will issue more debt in order to finance their business operation, when cost of financial distress and benefit from tax shield are balance (Chen 2011). This theory advocates for an optimal capital structure considering a level of leverage unlike the pecking order theory which ranks the different financing methods. The tradeoff theory considers both the positive and negative effects of debt bearing in mind the tax relief earned due to debt financing as well as the present value of expected cost due to financial (Al-Tamimi & Hassan, 2010). The challenging issue in order to ascertain the optimal level of debt is determining the cost of financial distress for a firm as financial distress cost is based on some aspect i.e. the company with very consistent cash flows is less likely to face financial distress. According to Berk and DeMarzo (2014), finding a suitable discount rate for the distress cost is crucial for calculating the financial distress costs, the discount rate chosen depends on the market risk of the firm.

Although it may not be possible to regulate the exact level of debt impartially in MFIs, because of how MFIs industry is organized, trade off theory, in relevance to this study, explains how firm determines the appropriate interest rate on their loans, that debt financing has a limit, and subject to profitability, target debt for a particular DTMFI differ from another. Berk and DeMarzo (2014) argues that in a potential financial distress situation, the size of the costs that a company has to pay is of importance and is suggested to vary by industry. A DTMFI whose marginal tax rate is high are likely to borrow more than one whose marginal tax rate is low. If DTMFI financial distress cost is high, it would likely borrow less than one with a low cost of financial distress. The profitable MFIs can provide tangible asset as security for debt may be in a position to target higher debt ratio. Simply put, high proportion of fixed interest capital to equity would imply that the DTMFI is highly indebted and thus there is a higher risk of insolvency. Consequently, the profitable DTMFIs may prosper stronger by taking advantages of large economies of scale, increasing their capacity to improve profitability.

Empirical Literature Review

This part discusses the literature concerning the Macroeconomic variables effect on Financial Performance of DTMFIs. Variables include interest, Inflation, exchange rate and GDP.

Interest Rate and Financial Performance

Ahmed *et al*. (2018) did a research on interest rates and financial performance of Pakistan banks. Determinants for measuring financial performance were ROA, ROE, and EPS. Annual data of 20 banks operating in Pakistan from 2007-2014 was obtained. The study used Correlation and Regression analysis and the result shows that deposits with other banks and interest rate are negatively affecting the profitability of banks. However, the current study focuses on DTMFIs in Kenya.

Mwangi and Wekesa (2017) did a study on influence of interest rate on performance of Kenya airways. A sample of seventy-four staff from finance department selected and descriptive research design was used. Growth and efficiency were used as a measure of the dependent variable (firm performance). The study used questionnaire as primary data and while testing the hypothesis, multiple regression technique was employed. The study showed that interest rate had significant effect on performance. However, the current study focuses on DTMFIs and use LDR as a financial performance measure.

Rao (2016) conducted a research on link between interest rate and financial performance in Nairobi. Five listed companies at Nairobi Stock Exchange under the Ministry of energy were selected as a sample. Study period was from the year 2004 to 2015. A descriptive research was used constituting collection and analysis of secondary data. Financial performance was measured by EPS. The study found that the interest rate has a significant negative effect on financial performance. The focus of the current study however is on DTMFIs in Kenya.

Alhassan, Anokye and Gakpetor (2018) did a study in Ghana on interest rate spread effect on the commercial banks' profitability. The research adopted descriptive design and 24 banks was used as a sample over a ten - year period and the data for the study include interest rate spread, ROE and ROA among others. Result indicates that there is a significant and positive association between interest rate spread and bank profitability. The study adopted quantitative approach to data analysis through panel regression. The study relied on secondary data from annual reports of commercial banks in Ghana. However, the present study focuses only on DTMFIs in Kenya for a duration of six (10) years (2010-2019) and will use (LDR) as measures of financial performance.

Inflation Rate and Financial Performance

Oleka, Sabina and Ebue (2015) examined impact of inflation on performance of Nigerian firms. The firms in this case are the commercial banks. Secondary data used is from annually published financial statements of 15 years from 2000-2014. Financial performance was

measured by EPS. Ordinary least squares was used as a technique of analysis. Results showed positive insignificant relationship between EPS and Return on Equity. However, the present study focuses on DTMFIs in Kenya.

Adul, Domfeh and Denkyirah (2016) examine the impact of inflation on performance of Ghanaian banks. Five banks were selected as a sample using panel data. The study period is from 2004 to 2013. The empirical analysis and estimation was based on the use of panel data analysis. The research showed inflation would continue to have positive impact on the development of financial sector, except it reaches a threshold of 15%. The research, nonetheless, had been conducted in Ghana, whose prevailing economic conditions is different from Kenya and the present study focuses on DTMFIs in Kenya.

Gado (2015) studied impact of inflation rate on performance of 20 most capitalized firms in Nigeria. The return on assets was used as a measure of dependent variable. *Ex post facto* research design was adopted in the study. The study also adopted correlation and OLS. The results indicate that the inflation variable has a significant and positive impact on performance. The present study however focuses on DTMFIs in Kenya.

Kwakwa (2014) did a research on the indicators of commercial banks performance operating in Ghana. The impact of the money supply, inflation and bank size on commercial banks performance was analyzed. The parameters used in analyzing the performance of banks were ROE and ROA. The results, as measured by ROE and ROA, concluded that inflation has an insignificant positive effect on banks performance. The research, however, was focused on commercial banks in Ghana, thus, its market size and economy level is different compared to Kenya's and hence the findings cannot be generalized for Kenya as the present study focuses on DTMFIs in Kenya.

Exchange Rate and Financial Performance

Manyok (2016) examined the relationship between the variability of exchange rate and commercial banks financial performance in South Sudan. Study duration was from 2006-2015. All financial institutions (banks) in operation were focused on. Banks' consolidated financial statements were obtained as secondary data. As a model, multiple linear regression was employed. To describe data, measures of central tendency was carried out. Independent variable used was exchange fluctuations while return on assets was the dependent variable. The findings show weak negative relationship between variability of exchange rate on performance. The present study however focuses on the DTMFIs in Kenya.

Manyo *et al*. (2016) examined effect of foreign exchange transaction and Nigerian banks profitability. Study used yearly reports published by the banks. The duration of the study was 2010 - 2014. Breitung (2000) test of was deployed to test for the panel data properties. The study employed a pool panel regression model. The result showed foreign exchange income has an insignificant and negative effect on profitability of Nigerian banks. The research,

however, focused on commercial banks in Ghana, thus, its market size and economy level is different compared to Kenya's and hence the findings cannot be generalized for Kenya's as the present study focuses on DTMFIs in Kenya.

Stella and Augustine (2015) examined the effects of exchange rate on manufacturing firm's financial performance in Nigeria. The sample used were eight firms from tobacco, food and beverage manufacturing companies. The study duration was from 2005-2014. Firms' financial statement and statistical bulletin from Central Bank of Nigeria were used as secondary data. Research design employed was *ex post facto* and multiple regression analysis used for analysis of data. The outcome indicates that exchange rate have positive effect on the ROA. The study, however, was focused on manufacturing firm in Nigeria and the present study focuses on DTMFIs in Kenya.

Elbadawi (2014) undertook a research on exchange rates and financial performance of small and medium size business in Australia. Research established that high exchange rates in the economy significantly impacted levels of investment and the financial performance in SMEs compelling investors to fall back on own savings. Furthermore, it determined the expensiveness of long term borrowings which was considered to be riskier compared to short term borrowings and the issue of held funds. The research used cross sectional research and descriptive but analytical research design. The present study however focuses on Kenya's DTMFIs.

Gross Domestic Product and Financial Performance

Otambo (2016) examined effect of gross domestic product (GDP) on financial performance of banks in Kenya. ROA was used as a measure of financial performance by while quarterly GDP was used as the measure of GDP. The model employed was multiple regression. The study duration was from 2006-2015.The study found that GDP affects financial performance positively. The focus of the current study however is on DTMFIs in Kenya.

Ghurstskaia (2018) studied the relationship between GDP and bank profitability in Georgia and the study duration was from 2003-2017. The bank profitability measure used was Return on Asset. The research conducted correlation analysis. The finding showed that the GDP growth has weak relationship with bank profitability. The research, nonetheless, had been conducted in Georgia, whose prevailing economic conditions is different from Kenya and the present study focuses on DTMFIs in Kenya.

Sufian (2011) analyzed Korean commercial banks profitability using GDP between years 1992-2003. Financial statements are available in the bank scope database of Bureau van Dijk's company. The data on GDP was retrieved from the IMF Financial Statistics (IFS) database. Results from linear regression showed Gross Domestic Product (GDP) negative impact on ROA. Nonetheless, present research focused only on DTMFIs in Kenya, for a duration of six (10) years (2010-2019) and uses Loan to Deposit Ratio uses as a measure of financial performance.

Kiganda (2014) examined the effect of GDP on profitability in Kenyan banks. Equity Bank was the focus of study. The dependent variable bank profitability was measured by Return on Asset. Annual data from 2008 – 2012 was used and the Cobb–Douglas production function employed. The study revealed that GDP has insignificant effect on bank profitability at 5% level of significance. Since focus of study was on one bank, the generalizability of the findings is limited. The present study however was on all Kenya's thirteen (13) DTMFIs.

Summary of the Literature Review and Gaps

Existing researches linking different macroeconomic variables and financial performance produced different outcome. Despite many studies, the precise nature of the relationship between macroeconomic variables firm performance is vague. From the analysis of empirical literature, it is apparent that variables influencing the DTMFIs performance are multifaceted and purely dependent on the operating environment of the DTMFIs. Some research has produced positive effect and others have established negative association.

Table 2.1: Summary of the Literature Review and Gaps

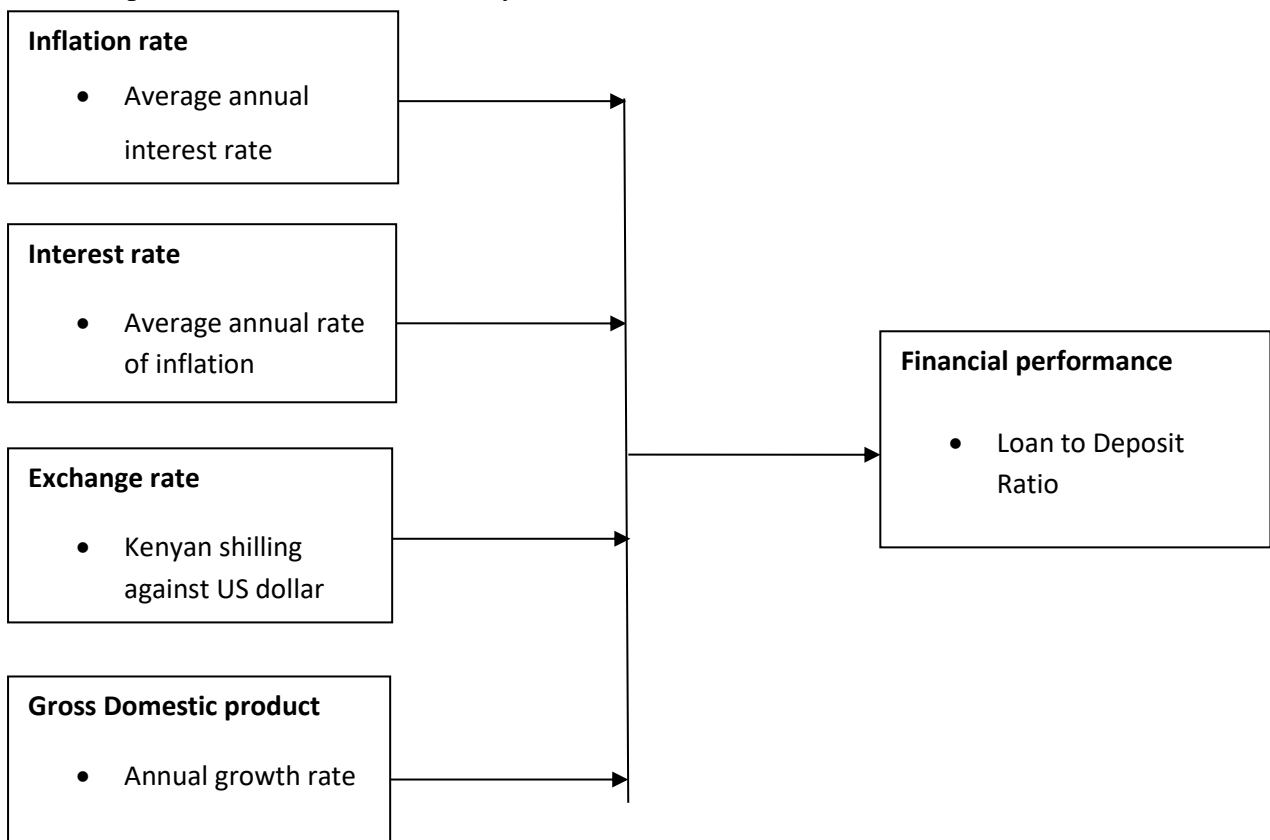| Author(s)	Focus of the Study	Key Findings	Research Gap	Focus of Current study
Ahmed *et al*. (2018)	Interest rates and Financial Performance of Pakistani banks	Found positive effect of Interest rate on performance	Centered on Pakistan banks	The current study is based on Kenyan DTMFIs.
Mwangi & Wekesa (2017)	Influence of economic factors on firm performance in Kenya	Found significant outcome of interest rate factor on performance	Study used primary data.	Study uses secondary data
Alhassan, Anokye & Gakpetor (2018)	Interest rate effect on commercial banks' profitability in Ghana	Found significant and positive effect of interest on banks profitability	Centered on banks in Ghana	Current study focuses on DTMFIs in Kenya
Rao (2016)	Study association between macroeconomic factors and firms performance in NSE	Interest rate has a significant and negative effect of on financial performance	Used Earnings Per Share as measure of performance	The study uses LDR as measure of performance
Oleka, Sabina & Ebue (2015)	Impact of inflation on Nigeria's commercial banks financial performance	Inflation has a positive insignificant effect on commercial banks in Nigeria	The study used Ordinary Least Squares regression	The study uses multiple regression analysis
Adul, Domfeh & Denkyirah (2016)	Inflation effect on Ghana's banks financial performance	Observed positive effect of inflation on financial performance	Study used panel data analysis	The study uses multiple regression analysis

Kwakwa (2014)	The indicators of performance of banks in Ghana.	Inflation has insignificant effect on banks performance	The study's focal point was Ghana. measure of performance used was ROA	The study focuses on DTMFIs in Kenya and LDR is used to measure performance
Gado (2015)	Macro environment effect on performance of capitalized companies in Nigeria	Found inflation variable have significant and positive impact on performance	Used EPS as performance measure	The study uses LDR as performance measure
Elbadawi (2014)	Exchange rate and financial performance of small and medium size firms in Australia.	Found significant impact of exchange rate on performance of small and medium size firms	Study used cross sectional research and analytical research design.	This study uses descriptive research design
Manyok (2016)	Link between the rate of exchange variability and South Sudan banks performance	Found negative and weak association between rate of exchange and performance	Study centered on banks in South Sudan	Focus of current study is DTMFIs in Kenya
Manyo *et al.* (2016)	Foreign exchange transaction effect on the profitability of Nigerian banks	Foreign exchange income has insignificant and negative effect on the profitability	The study adopted a pool panel regression model	This study uses multiple regression analysis.
Stella & Augustine (2015)	Exchange rate effect on financial performance of manufacturing firms in Nigeria	Found positive impact of exchange rate on ROA and ROE of manufacturing companies	The study centered on Nigeria's manufacturing firms	The present study focuses on DTMFIs in Kenya
Otambo (2016)	Macroeconomic factors effect on performance of Kenyan banks	GDP has positive effects on banks' financial performance	Study used ROA as a measure of performance	This study focuses on LDR as a measure of performance
Kiganda (2014)	Macroeconomic variables effect on profitability of Equity bank in Kenya.	Found insignificant effect of GDP on profitability of the bank	The study centered on one bank and used ROA to measure	This study focuses on all DTMFIs and used LDR as a measure

Sufian (2011)	Analyzed Korean banks profitability using bank specific and macroeconomic determinants	Found Gross Domestic Product having negative effect on Return on Assets	Centered on banks in Korea	Centered on DTMFIs in Kenya
Ghurstskaia (2018)	Relationship between economic growth and bank profitability in Georgia	Found GDP growth to have weak relationship with bank profitability	Focused on banks in Georgia. Performance was measured using ROA	This study focuses on all DTMFIs and used LDR as a measure

Source: Empirical Literature (2011-2018)

Conceptual Framework

Conceptual framework is a diagrammatic representation of relationship between variables in a study (Mugenda & Mugenda, 2003). It shows the idea of the researcher regarding the association between the variables of the study. Macroeconomic variables that were used in this study are interest rate, inflation rate, exchange rate and gross domestic product. However, financial performance was measured by LDR.

Inflation rate
- Average annual interest rate

Interest rate
- Average annual rate of inflation

Exchange rate
- Kenyan shilling against US dollar

Gross Domestic product
- Annual growth rate

Financial performance
- Loan to Deposit Ratio

Independent Variables   **Dependent Variable**

Figure 2.1 Conceptual framework

Source: Researcher (2021)

RESEARCH METHODOLOGY

Introduction

The chapter presents research design, target population, sampling design and procedure, empirical model, operationalization and measurement of variables, data collection instrument, data collection procedure, data analysis and presentations, diagnostic tests and ethical consideration. It showed how the researcher designs, target and collects all the useful and requisite data on subject of the study and how to analyze for the presentation.

Research Design

Research design is a comprehensive outline of how the research takes place. According to Borg (2007), it identifies methods and procedures that were used to gather and analyze data. As stated by Cooper and Schindler (2006), research design lay down a blueprint for gathering data and quantifying and scrutiny. The study employed a causal research design to determine the relationship that exists between the variables. According to Brains *et al.* (2011), causal research is the investigation of cause-and-effect relationships. As stated by Bachman (2007), causal effect occurs when variation in independent variable, results in or leads to variation in the dependent variable.

Target Population

Polit and Hungler (1999) refer to the population as an aggregate of all the members, subjects or objects that conform to a set of specifications. According to CBK (CBK, 2019) there are 13 DTMFIs in Kenya. And all thirteen (13) DTMFIs were targeted. This population was presumed to provide information that would help in giving solution to the research problems. All the Thirteen (13) deposit taking Microfinance institutions (Appendix III) were targeted in the study as they were in operation during study period.

Sampling Design and Procedure

This study employed a census approach by picking all the thirteen (13) DTMFIs in Kenya. As stated by Mugenda and Mugenda (2003), if a population sample is small, it is convenient to include the entire population. According to Mugenda and Mugenda (2003), a researcher has to choose a representative number no less than 30% of the total population to determine sample size.

Empirical Model

The study used the following multiple regression model:

$$Y=\beta_0 +\beta_1X_1+ \beta_2X_2+ \beta_3X_3+ \beta_4X_4+ \varepsilon$$

whereby:

Y=Financial Performance

β0   is   a   constant,   intercept   of   the   equation
β1-   β4   =   Independent   variables   regression   coefficient
X1=Interest   Rate
X2=Inflation   Rate
X3=Exchange Rate
X4=Gross Domestic Product
ε=Error Term

β it is presumed to be 0 for calculation purposes. β0 coefficient shows how performance of DTMFIs fluctuates while holding all independent variables constant. β1 coefficient indicates how change in interest rate changes the DTMFIs financial performance holding all other variables constant. β2 explains by how change in inflation rate changes DTMFIs performance holding all other variables constant. β3 coefficient shows how in change exchange rate changes DTMFIs performance holding other factors constant. β4 coefficient shows how GDP changes cause change in DTMFIs performance holding other variables constant.

Operationalization and Measurement of Variables

Operationalization is the procedure of strictly establishing variables into measurable factors. The process defines and allow concepts to be measured, quantitatively and empirically. In this study, LDR were used as dependent variable. Macroeconomic variables constituted independent variables. They were, interest rate, inflation rate, gross domestic product and exchange rate.

Table 3.1: Operationalization and Measurement of Variables

Variable	Type	Operationalization	Measurement
Financial Performance	Dependent variable	Loan to deposit ratio	Total loan over total deposit
Interest Rate	Independent variable	Average Annual interest rate	Annual percentage interest rate
Inflation Rate	Independent variable	Average Annual inflation rate	Annual percentage inflation rate
Exchange Rate	Independent variable	Kenyan shilling against US Dollar	Annual percentage of Kenyan shilling against US Dollar
Gross Domestic Product	Independent variable	Annual growth rate	Annual percentage growth rate

Source: Researcher (2021)

Data Collection Instrument

Secondary data was utilized in the study. The document review guide was used (Appendix IV & V) to collect the required financial information for analysis through the annual reports of CBK from year 2010 to 2019 and KNBS reports from the year 2010 to 2019. Secondary data which includes review of financial performance of DTMIFs was gathered from the CBK through the annual bank supervision reports and AMFI reports.

Data Collection Procedure

In order to use and analyze data from annual supervision report of DTMFIs from CBK, AMFI and KNBS report, a study permit from National Commission for Science, Technology and Innovation (NACOSTI) was acquired.

Data Analysis and Presentation

Data must be cleaned, coded and properly analyzed so as to obtain meaningful information (Mugenda & Mugenda 2003). SPSS version 25 and Stata version 15.0 were the software used for data analysis since both can take data from almost any type of file and further generate tables, charts and plots of distributions and trends, descriptive statistics and can as well conduct complex statistical analyses. Descriptive statistics that were adopted include standard deviation and measures of central tendency such as mean and mode so as to provide summary and highlight the relationship between variables. Karl Pearson correlation was used as analyzing tool to assess relation between the independent and dependent variables. According to Cramer (1998), Karl Pearson's correlation is the ratio of the variance shared by two variables. To assess effect of changes in macroeconomic variables on the DTMFIs performance, multiple regression was carried out. According to Mugenda and Mugenda (2003), a multiple regression model attempts to determine whether a group of variables together predict a given dependent variable.

Diagnostic Test

Diagnostic tests were performed to establish if assumption of multiple regression analysis address various forms of biasness that may occur. Prior to carrying out the regression analysis the following test were carried out; multicollinearity test, linearity test, heteroscedasticity test, normality test, unit root test and autocorrelation test.

Multicollinearity Test

Multicollinearity, or near-linear dependence, is a statistical phenomenon where two or more predictor variables in a multiple regression model are highly correlated (Jensen & Ramirez, 2012). Multicollinearity is done to determine the level of correlation between variables. Correlation matrix was used to evaluate the multicollinearity level. Greene (2008) argued that

if correlation coefficient is 0.8 or -0.8 it shows high multicollinearity level. If correlation is > 0.8 then severe multicollinearity may be present.

Linearity Test

Linearity test is performed to determine the linear reportable range of an analysis (Mugenda & Mugenda, 2003). The test attempts to establish whether the association between independent variable and dependent variable is linear or not. The test is essential for correlation analysis. If the value deviation > 0.05, subsequently association between independent variables are linearly dependent and if the value deviation < 0.05, then the association between independent variables with the dependent are not linear.

Heteroscedasticity Test

Heteroscedasticity occurs when the conditional variance in your data is not constant. Heteroscedasticity happens due to omission of variables from the model. Breusch-Pagan test was used in this study to test for heteroscedasticity as it is a more robust test that tests whether all the variances are equal across your data if it is not normally distributed as argued by Wiggins and Poi (2001).

Normality Test

A normality test is used to determine whether sample data has been drawn from a normally distributed population. Testing for data normality is ascertaining whether the distribution of the data is normal or not normal through tests. Shapiro-Wilk test was employed to determine whether null hypothesis of the distribution is normal. Two main methods of assessing normality are graphical and numerical (including statistical tests). According to Greene (2008), the null hypothesis is when the data is not normality distributed while the alternative hypothesis is when the data is normality distributed. The residuals should not be used in Z tests or in any other tests if they are not normally distributed. If the residuals are not normally distributed, then the dependent variable or at least one explanatory variable may have important variables may be missing (Portney & Watkins, 2000).

Unit Root Test

Unit root test is carried out to determine state of the model to be used. Panel regression model is stationary when it is mean, variance does not show an upward or downward trend. Dickey Fuller tests were employed to test null hypothesis. When null hypothesis is non-stationary in panel regression model, the results (data) are false and the null hypothesis rejected if statistical value of P< 0.05 because data is stationary. According to Gujarati (2003) estimating models without testing the non-stationary of the data leads to spurious results.

Autocorrelation Test

To test for the existence of autocorrelation, the Durbin Watson test was employed. The module presumes the error terms are distributed normally with a mean of zero and is stationery as it tests correlations between errors. Woolridge (2002) stated that failure to spot and account for serial correlation in the idiosyncratic error term in a panel model would result into biased standard errors and inefficient parameter estimates. Statistic test can vary between 0 to 4 with a value of 2 indicating that the residuals are uncorrelated. A value > 2 depict a negative correlation and a value < 2 indicates a positive correlation.

Ethical Consideration

The study ensured due care is taken in compiling and presenting correct information on what was discovered after reviewing the extracts from annual reports of CBK from 2010 to 2019. In addition, author's text books and journals that have been used in this study have been fully acknowledged.

RESEARCH FINDINGS AND DISCUSSION

Introduction

This chapter focuses on the analyses of secondary data that was collected from the annual financial statements for DTMFIs in Kenya from 2010 to 2019. Data was obtained from the CBK website. Descriptive analysis, regression analysis and diagnostic tests were undertaken. The study results are interpreted and discussed accordingly.

Descriptive Statistics

Descriptive statistics were carried out and the results are shown in Table 4.1.

Table 4.1: Descriptive Statistic

Variable	Minimum	Maximum	Mean	Standard Deviation
Interest rate	12.48	20.30	16.02	2.66
Inflation rate	3.97	14.02	7.07	2.91
Exchange rate	79.82	103.39	93.35	8.78
GDP	4.60	8.40	5.85	1.05
Loan to Deposit Ratio	1.07	2.33	1.30	0.40

Source: Study Data (2021)

The study results in Table 4.1 indicate that the interest rate had a mean of 16.02%, with a standard deviation of 2.66, a minimum of 12.48% and a maximum of 20.30%. The inflation rate had a mean of 7.07%, with a standard deviation of 2.91, a minimum of 3.97% and a maximum of 14.02%. The exchange rate had a mean of 93.35, with a standard deviation of 8.78, a minimum of 79.82 and a maximum of 103.39 while the GDP had a mean of 5.85%, with a standard deviation of 1.05, a minimum of 4.60% and a maximum of 8.40%. The loan deposit ratio had a mean of 1.30%, with a standard deviation of 0.40, a minimum of 1.07% and a maximum of 2.33%.

Trend Analysis for the Macroeconomic Variables

Trend analysis for the macroeconomic variables was conducted to find actionable patterns from the macroeconomic variables information and the results are shown in Figure 4.1.
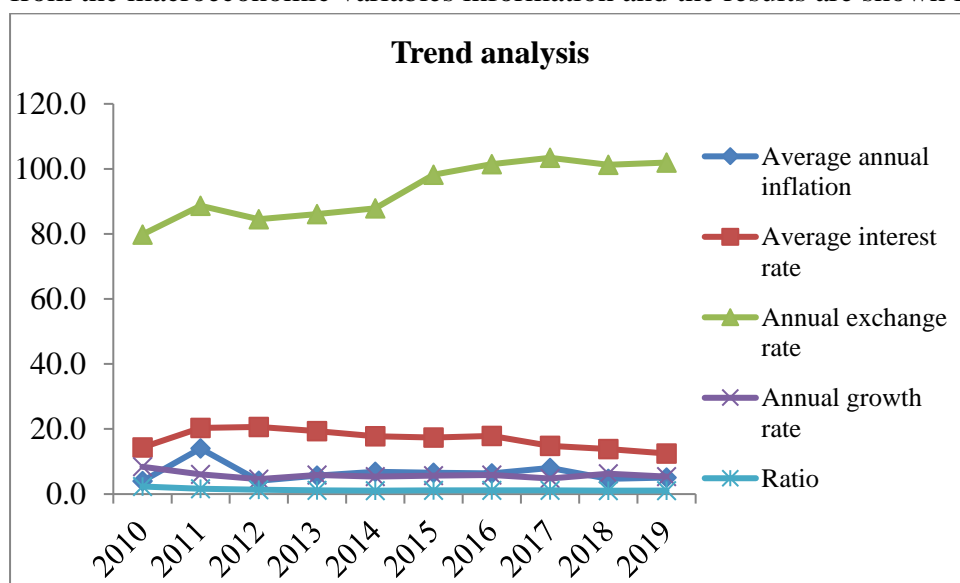
Figure 4.1: Trend Analysis for the Macroeconomic Variables

From the results shown in Figure 4.1, interest rate has been on the downward trend with the highest rate in 2012. There has been capping of interest rates since the promulgation of the new constitution in 2010 where CBK was mandated to formulate monetary policies. Inflation rate on the other hand, has been inconsistent through the years with both downward and upward trend through the years the study was conducted. This is due to the effects of exchange rates, foreign prices and the terms of trade both locally and internationally which have long-run effects on inflation. Additionally, the exchange rate has been consistently on the upward trend from 2010-2019. Results also showed that GDP has been having slight upward trend through the years. The exchange rate and GDP upward trend has been as a result of fluctuations in terms of trade and public debt. Loan to deposit ratio has not risen much through the years making the trend almost flat. Financial institutions are numerous and very competitive and thus low costs deposits and loans banking channels are attractive to customers which DTMFIs have not invested in.

Diagnostic Tests

Multicollinearity test, linearity test, heteroscedasticity test, normality test, unit root test and autocorrelation test are the diagnostic tests that were carried out in this study.

Multicollinearity Test

A correlation analysis is focused to determine the correlation of the independent variables on the dependent variable. It tests whether independent variables are highly correlated. The correlation ranges from 0 to 1 and values of values of 0.00 to 0.01 shows no correlation; 0.02 to 0.09 show very weak correlation; 0.1 to 0.29 show weak correlation; 0.30 to 0.49 show moderately weak correlation; 0.5 to 0.69 show moderately strong correlation; 0.70 to 0.89 show strong correlation; 0.90 to 0.98 show very strong correlation while 0.99 to 1.00 show almost perfect correlation. The correlation may be negative or positive. This study undertook a Pearson correlation and the results are shown in Table 4.2.

Table 4.2: Correlation Matrix

		Financial Performance	Interest rate	Inflation rate	Exchange rate	GDP
Financial Performance	Pearson Correlation	1				
	Sig. (2-tailed)					
	N	10				
Interest rate	Pearson Correlation	0.113				
	Sig. (2-tailed)	0.756				
	N	10	10			
Inflation rate	Pearson Correlation	0.022	0.753*			
	Sig. (2-tailed)	0.952	0.012			
	N	10	10			
Exchange rate	Pearson Correlation	-0.653*	-0.548	-.154		
	Sig. (2-tailed)	0.041	0.101	0.672		
	N	10	10	10		
GDP	Pearson Correlation	0.806**	-0.204	-0.371	-0.408	1
	Sig. (2-tailed)	0.005	0.572	0.291	0.242	
	N	10	10	10	10	10

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

Source: Study Data (2021)

The Pearson correlation co-efficient of financial performance to the interest rate was 0.113, inflation rate (0.022), exchange rate (-0.653) and GDP (0.806). These results show that there was a weak correlation between interest rate and financial performance. There was a very weak correlation between inflation

rate and financial performance while the correlation between exchange rate and financial performance was moderately strong. There was a strong correlation between GDP and the financial performance. The correlation was positive for interest rate, inflation rate and GDP. It was negative for the exchange rate. Greene (2008) argued that if correlation coefficient is 0.8 or -0.8 it shows high multicollinearity level. If correlation is > 0.8 then severe multicollinearity may be present. Thus the correlation coefficient between the independent variables are below 0.8 hence no severe multicollinearity.

Linearity Test

Linearity test is usually undertaken by the use of P-P plots that shows whether the data points are showing linear tendency or not.
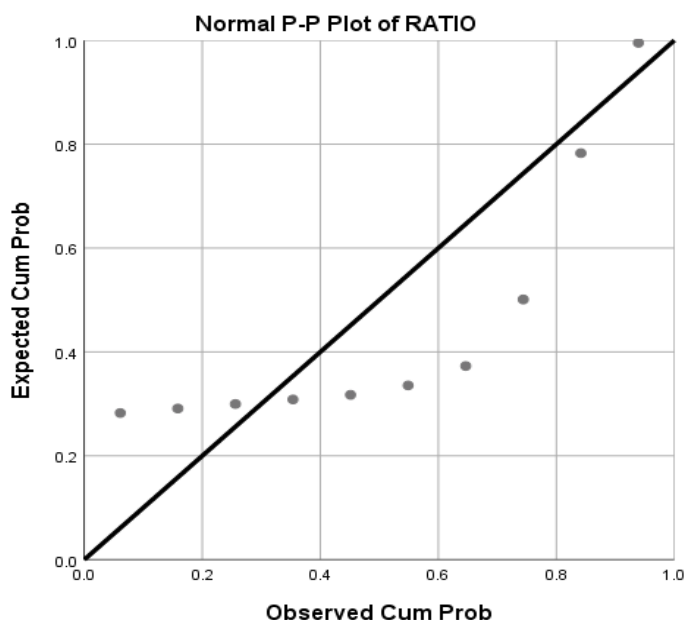
Figure 4.2: P-P Plot
Source: Study Data (2021)
The Figure 4.2 indicates that the P-P Plot is linear in form and therefore the data passes linearity test.

Heteroscedasticity Test

Breusch-Pagan test was used to test for the heteroscedasticity and the results are shown in Table 4.3,
H_0: The data is homoscedastic
H_1: The data is heteroscedastic
The rule of thumb is that if the p-value is less than 0.05, H_0 is rejected.

Table 4.3: Breusch-Pagan Test

Test Statistic	Degrees of Freedom	Sig.
6.235	9	0.637

Source: Study Data (2021)

Heteroscedasticity in data is usually due to the presence of outlier and it means that the observations are either small or large with respect to the other observations that are present in the data sample. The findings of the test as shown in Table 4.3 indicate that the test statistic is 6.235 (p-value= 0.637) and since the p-value is greater than 0.05, the null hypothesis was not rejected and conclusion made that there was no presence of heteroscedasticity in the data thus satisfying the assumption of the regression.

Normality Test

Shapiro-Wilk test was undertaken to determine the normality test. The test results for normality are as presented in Table 4.4.

Table 4.4: Tests of Normality Results

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Y= Financial performance	0.327	10	0.003	0.636	10	0.000
Interest rate	0.134	10	0.200[*]	0.944	10	0.594
Inflation rate	0.225	10	0.162	0.856	10	0.069
Exchange rate	0.217	10	0.199	0.872	10	0.106
GDP	0.234	10	0.130	0.848	10	0.056

* .This is a lower bound of the true significance

a. Lilliefors Significance Correction

Results in Table 4.4 showed that the significance for the Shapiro –Wilk test were above alpha of 0.05 and therefore the null hypothesis that the data is normally distributed was not rejected. Not rejecting the null hypothesis indicates that data is from a population with normal distribution for all the study variables.

Unit Root Test

Dickey Fuller test was carried out and the results are shown in Table 4.5.

Table 4.5: Dickey Fuller Test

Null Hypothesis: DEP does not have a unit root

Exogenous: None

Lag Length: 0 (Automatic - based on SIC, maxlag=1)

		t-Statistic	Prob.*
Augmented Dickey-Fuller test statistic		0.888849	0.8827
Test critical values:	1% level	-2.847250	
	5% level	-1.988198	
	10% level	-1.600140	

*MacKinnon (1996) one-sided p-values.

Source: Study Data (2021)

Data presented for time series analysis is required to be stationary since data that is not stationary might lead to results being spurious (Woolridge, 2012). Brooks (2010) denoted that time series data is deemed stationary if it has a mean, variance and autocorrelation that do not change with time. This study used the Dickey Fuller test to test the study's data for stationarity. A time series is stationary if its test statistic is more negative that the critical values of all levels of significance. Results shown in Table 4.5 denote that the test statistic had a p-value of 0.889 which was higher that the critical values which were -2.847, -1.988 and -1.600 at the 1%, 5% and 10% respectively. Based on the hypothesis tested, the conclusion made was that the null hypothesis was accepted and the alternative hypothesis rejected that the time series data does not have a unit root.

Auto Correlation

Durbin Watson test was carried out as shown in the Table 4.6.

Table 4.6: Durbin Watson Test

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate	Durbin-Watson
1	0.931a	0.867	0.760	0.19480	2.314

a. Predictors: (Constant), interest rate, inflation rate, exchange rate and GDP

Source: Study Data (2021)

This test was conducted to test the strength of the relationship between the macroeconomic variables and the financial performance. Durbin Watson test was carried out to test the null hypothesis that the linear regression residuals of time series data are uncorrelated. The rule of thumb is that the statistic test can vary from 0 to 4 with a value of 2 which denotes that the residuals are uncorrelated. A value > 2 depict a negative correlation and a value < 2 indicates a positive correlation. Results in this study as shown in Table 4.6 showed that the Durbin

Watson value of 2.314 was obtained which shows a negative correlation. Based on the hypothesis tested, the conclusion made was that the null hypothesis was rejected and the alternative hypothesis accepted that the time series data was correlated.

Multiple Regression Analysis

Multiple regression analysis was done using SPSS software to compute the measurements of the linear regressions. Coefficient of determination explains the extent to which changes in dependent variable can be explained by the change in the independent variables or the percentage of the variation in the dependent variable (financial performance of the DTMFIs) that is explained by all the four independent variables (interest rate, inflation rate, exchange rate and the gross domestic product).

Regression Summary

Results shown in Table 4.7 are the summary of the regression model applied in this study.

Table 4.7: Regression Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.931[a]	0.867	0.760	0.19480

a. Predictors: (Constant), interest rate, inflation rate, exchange rate and GDP

Source: Study Data (2021)

The correlation coefficient (r) of 0.931 shows a positive effect of interest rate, inflation rate, exchange rate and the gross domestic product on the financial performance of DTMFIs. The adjusted R-Square statistics of 0.760 implied that interest rate, inflation rate, exchange rate and the gross domestic product explained 76% of financial performance of DTMFIs while 24% of financial performance is explained by other factors other than the ones studied herein.

Analysis of Variance

Analysis of variance is used to compare the p value with alpha value to determine the significance of the relationship between the variables. The ANOVA results are as presented in Table 4.8.

Table 4.8: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	1.235	4	0.309	8.133	0.021[b]
	Residual	0.190	5	0.038		
	Total	1.424	9			

a. Predictors: (Constant), interest rate, inflation rate, exchange rate and GDP

b. Dependent Variable: Financial performance

Source: Study Data (2021)

To test for the level of significance of the regression model, ANOVA was used and the results are shown in Table 4.8. The F value is calculated as 8.133. The significance value of 0.021 was obtained which shows that the regression model used was significant at 5% significance level.

Regression Co-efficient

The linear equation used in this study was
$Y=\beta 0 +\beta 1X1+ \beta 2X2+ \beta 3X3+ \beta 4X4+ \varepsilon$
whereby:
Y=Financial Performance
$\beta 0$ = constant, intercept of the equation
$\beta 1- \beta 4$ = Independent variables regression coefficient
X1=Interest Rate
X2=Inflation Rate
X3=Exchange Rate
X4=Gross Domestic Product
ε=Error Term

Table 4.9: Regression Coefficients

	Unstandardized Coefficients		Standardized Coefficients		
	B	Std. Error	Beta	t	Sig.
(Constant)	2.381	2.007		1.186	0.289
Interest rate	-0.061	0.053	-0.410	-1.164	0.297
Inflation rate	0.070	0.038	0.513	1.823	0.128
Exchange rate	-0.023	0.012	-0.511	-1.895	0.117
GDP	0.268	0.082	0.705	3.263	0.022

a. Dependent Variable: Financial performance
Source: Study Data (2021)

As per the SPSS results generated, the equation translated to;
Financial performance of DTMFIs = 2.381- 0.061 (X_1) + 0.070 (X_2) - 0.023 (X_3) + 0.268 (X_4)
Where: Financial performance = Constant + Interest rate + Inflation rate + Exchange rate + GDP

The regression model as shown in Table 4.9 indicates that if all other factors were held constant and the inflation rate and GDP increased by one unit, then the financial performance of DTMFIs increases by 7% and 26.8% respectively. However, increasing interest rate and exchange rate while maintaining all the other factors constant leads to decrease in financial performance of DTMFIs by 6.1% and 2.3% respectively. Results also showed that the interest

rate has a statistically insignificant negative effect on financial performance of DMTFIs at the 5% significance level (β= -0.061, p= 0.297) while inflation rate has a statistically insignificant positive effect on financial performance of DMTFIs at the 5% significance level (β= 0.070, p= 0.128). Results further showed that the exchange rate has a statistically insignificant negative effect on financial performance of DMTFIs at the 5% significance level (β= -0.023, p= 0.117) while GDP has a statistically significant positive effect on financial performance of DMTFIs at the 5% significance level (β= 0.268, p= 0.022). This could be explained by the fact that public debt has been increasing over the years.

Hypotheses Testing

Hypotheses testing were carried out based on the regression results.

H_{02}: Interest Rate has no Significant Effect on Financial Performance of DTMFIs in Kenya

Results showed that the interest rate has a statistically insignificant negative effect on financial performance of DMTFIs at the 5% significance level and therefore the null hypothesis was not rejected. The findings disagree with those of Rao (2016), Mwangi and Wekesa (2017) and Alhassan *et al.* (2018) who found that interest rate had significant effect on the financial performance of companies listed at the NSE, Kenya Airways and the commercial banks in Ghana respectively. Loans to deposit ratio was the variable used for financial performance in this study while EPS, ROE, ROA and interest rate spread were the measures for financial performance in the studies by Rao (2016), Mwangi and Wekesa (2017) and Alhassan *et al.* (2018) respectively which could explain why the findings were in contradiction.

H_{02}: Inflation has no Significant Effect on Financial Performance of DTMFIs in Kenya

The regression results revealed that inflation rate has a statistically insignificant positive effect on financial performance of DMTFIs at the 5% significance level and therefore the null hypothesis was not rejected. The findings of this study are in agreement with those of Oleka *et al.* (2015) who found positive insignificant relationship between EPS and Return on Equity on performance of commercial banks in Nigeria. Kwakwa (2014) also found similar findings in Ghanian commercial banks. Studies by Adul *et al.* (2016) and Gado (2015) found significant and positive impact on performance in Ghanian commercial banks and capitalized firms in Nigeria thereby disagreeing with the current study findings.

H_{03}: Exchange Rate has no Significant Effect on Financial Performance of DTMFIs in Kenya

The results of the regression analysis showed that the exchange rate has a statistically insignificant negative effect on financial performance of DMTFIs at the 5% significance level and therefore the null hypothesis was not rejected. Studies by Manyok (2016) and Manyo *et*

al. (2016) found an insignificant and negative effect on profitability of South Sudan and Nigerian banks respectively thereby in agreement with the study findings. On the contrary, Stella and Augustine (2015) found a positive effect on the on manufacturing firms in Nigeria while Elbadawi (2014) found significant impact of exchange rate on investment and the financial performance in SMEs.

H$_{04}$: GDP has no Significant Effect on Financial Performance of DTMFIs in Kenya

The regression analysis results showed that GDP has a statistically significant positive effect on financial performance of DMTFIs at the 5% significance level and therefore the null hypothesis was rejected. The findings of this study are in agreement with those of Otambo (2016) who found that GDP affects financial performance of Kenyan commercial banks positively. On the other hand, Ghurstskaia (2018), Sufian (2011) and Kiganda (2014) found a negative insignificant effect of GDP on Georgian banks, Korean and Kenyan commercial banks respectively thus in disagreement with the findings of this study.

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

Introduction

This chapter presents summary of the findings, the conclusions drawn from the study results and the recommendations on the study of the effect of macroeconomic variables on financial performance of DTMFIs in Kenya. Areas for further research are also highlighted.

Summary of Findings

The adjusted R-Square statistics obtained in this study implied that interest rate, inflation rate, exchange rate and the gross domestic product explained 76% of financial performance of DTMFIs. ANOVA results showed that a significance value of 0.021 was obtained which shows that the regression model used was significant at the 5% level of significance. The data passed the linearity test since the variables were linear in form. Results further showed that the data was not heteroscedastic. Variance Inflation Factors were used to test for normality and the result showed that all VIFs were below one thus it was concluded that there was no normality in the dataset. Root unit test showed that the data passed the stationary test.

Effect of Interest rate on Financial Performance of DTMFIs in Kenya

The first objective of the study was to establish the effect of interest rate on financial performance of DTMFIs in Kenya. Results showed that holding all other factors constant and the interest rate increased by one unit, the financial performance of DTMFIs would decrease by a factor of 0.061. Results further showed that the interest rate has a statistically insignificant negative effect on financial performance of DTMFIs at the 5% significance

level. There was a positive and weak linear correlation between the interest rate and financial performance.

Effect of Inflation rate on Financial Performance of DTMFIs in Kenya

The second objective of the study was to investigate the effect of inflation rate on financial performance of DTMFIs in Kenya. Results showed that holding all other factors constant and the inflation rate increased by one unit, the financial performance of DTMFIs would increase by a factor of 0.07. Further, results showed that the inflation rate has a statistically insignificant positive effect on financial performance of DTMFIs at the 5% significance level. There was a positive and very weak linear correlation between financial performance and inflation rate.

Effect of Exchange rate on Financial Performance of DTMFIs in Kenya

The third objective of the study was to examine the effect of inflation rate on financial performance of DTMFIs in Kenya. The regression model results indicated that if all other factors were held constant and exchange rate increased by one unit, the financial performance of DTMFIs would decrease by a factor of 0.023. Results further showed that the exchange rate has a statistically insignificant negative effect on financial performance of DTMFIs at the 5% significance level. There was negative and moderately strong linear correlation between financial performance and exchange rate.

Effect of GDP on Financial Performance of DTMFIs in Kenya

The fourth objective of the study was to establish the effect of gross domestic product on financial performance of DTMFIs in Kenya. The regression model results indicated that if all other factors were held constant and GDP increased by one unit, the financial performance of DTMFIs would increase by a factor of 0.268. Further, results showed that GDP has a statistically significant positive effect on financial performance of DTMFIs at the 5% significance level. There was a positive and strong linear correlation between the financial performance and GDP.

Conclusion

DTMFIs in Kenya have been having performance challenges with a loan deposit ratio of more than 100% which has been on the rising trend. The rise in the loan to deposit ratio over the years has been attributed with the changes in macro-economic variables such as inflation rate and interest rate. These macro-economic variables and the need to understand their effect on the financial performance of the DTMFIs led to this study. The study targeted 13 DTMFIs which are licensed by the Central Bank of Kenya. Secondary data was collected from Central bank's website.

This study found that interest and exchange rates have a negative effect on financial performance of DTMFIs and the study thus concluded that the interest and exchange rates negatively affects financial performance of the DTMFIs as they affect the total returns and financial intermediation in the DTMFIs. This means that increasing the interest rate and exchange rate will negatively affect the financial performance of the DTMFIs.

The study established that inflation rate and GDP have a positive effect on financial performance of DTMFIs and the study thus concluded that when the inflation rate is low and GDP is high, financial performance of the DTMFIs will increase. This means that rising of the inflation rate and decreasing the GDP will positively affect the financial performance of the DTMFIs.

Recommendations

The study established that interest rate has a negative effect on financial performance of DTMFIs in Kenya. Based on this finding, the study therefore recommends that interest rates for the DTMFIs should be controlled by the government through macroeconomic regulators such as CBK depending on inflation rates fluctuations which will go a long way in ensuring that DTMFIs are able to provide financial intermediation services effectively and sustainably. The study also established that inflation rate has a positive effect on financial performance of DTMFIs in Kenya. In reference to this finding, the study therefore recommends that there is need for the DTMFIs management committees to continuously monitor inflation rate for them to adjust their loan products in line with the inflation rate.

The study further established that exchange rate has a negative effect on financial performance of DTMFIs in Kenya. Based on this finding, the study therefore recommends that there is need for the government to regulate the exchange rates such that they lead to economic growth and in favor of the DTMFIs which will facilitate the financial health of the DTMFIs thus increased economic growth.

The study finally established that GDP has a positive effect on financial performance of DTMFIs in Kenya. In reference to this finding, the study therefore recommends that there is need for the government to ensure the business environment is conducive to encourage investment in the DTMFIs since they have a positive effect on the GDP through creation of employment.

Recommendations for Further Research

In this study, four macroeconomic variables affecting the financial performance of DTMFIs were considered which are interest rate, inflation rate, exchange rate and GDP. This study suggests further research through identification of other macroeconomic factors that could significantly affect the financial performance which will be instrumental in aiding policy formulation in the DTMFIs. The study also suggests further research through the use of more

time series data like monthly data since this study utilized annual data. This could aid in improving the significance of the results.

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