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Effect of Financial Inclusion on Performance of Microfinance Banks in Kenya

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Abstract:
Financial inclusion brings closer financial services at affordable costs to sections of disadvantaged and low-income segments of society. There have been many formidable challenges in financial inclusion such challenges include; bridging the gap between the sections of society that are financially excluded within the ambit of the formal financial system, providing financial literacy and strengthening credit delivery mechanisms so as to promote financial economic growth. A nation can grow economically and socially if its weaker section can turn out to be financially independent. Kenya strives to become a regional financial hub with vibrant, efficient and globally competitive financial system to drive savings and investments by the year 2030, where financial inclusion has been identified as a key driver. However, there is paucity of information on the contribution of financial inclusion on performance of micro finance banks in Kenya. It is on this basis that the study sought to determine the effect of financial inclusion on financial performance of micro finance banks in Kenya. The study was guided by Expectations Theory, Contracting Cost Theory and Market Hypothesis Theory. A census study was carried out for all the twelve (12) microfinance banks in Kenya. The study relied on secondary data covering the period 2015-2019 and this was obtained from audited financial statements of the microfinance banks. Correlational research design was adopted. Random and Fixed effects panel data models were estimated to establish the relationships. Choice of the best model between the two was done using the Hausman test where random effect was selected. Post estimation tests including multicollinearity, autocorrelation and heteroscekedastity work conducted. An insignificant negative relationship was established between firm size and return on assets (Coef= -.0014368, p >0.05). Similarly, the study established insignificant negative relationship between interest rates and financial performance as measured by return on asset (Coef= -.0888295, p >0.05). However, there was a significant positive relationship between operational efficiency and return on asset as a measure of financial performance (Coef= .394119, p <0.05). The study concluded that operational efficiency affected financial performance of micro finance banks in Kenya hence recommended that microfinance institutions should leverage on operational efficiency in order to make profit for shareholders.

Keywords: Financial inclusion, micro finance, banks, performance, Kenya

1. Introduction

1.1. Background of the Study

Financial inclusion according to Lopez and Winkler (2017) is the opportunity to access formal financial services to sections of low income and disadvantaged segments of the society. Financial inclusion thus provides low-income individuals in the society to participate in growth and development of the economy. Since commercial banks have stringent rules in providing financial services such as credit facilities Kamaluddeen (2019) asserts that the role of providing finances to low resourced household and communities has always been the domain of microfinance institutions. Such is because microfinance banks have flexible terms of engagement and utilize models such as group collateral to ensure the low-income segments get access to financial services to improve the livelihood of their households and grow their businesses. It is for such reasons that Lopez and Winkler (2017) assert that financial inclusion with respect to microfinance organizations is targeted at reducing poverty levels and empowering the disadvantaged individuals and communities.

Such seemingly philanthropic gesture has led to questions about performance, particularly financial performance of the microfinance banks. According to Mersland and Strom (2009), although there is high risk involved in serving the disadvantaged communities since they may not have collateral for credit facilities, financial performance is still possible

depending on the models used to engage the beneficiaries but with varying degrees of success. According to Bassem (2012), financial performance as measured by profitability, return on equity, return on investment, and return on assets is still within the reach of microfinance institutions given that financial performance is not just dependent on the customers served, but other internal strategies that any microfinance bank can leverage to record performance. However, Mersland et.al (2009) contends that such performance varies from time to time and from one organization to another depending on the variables at play.

One of such variables is the firm size of the banks. According to Wamukota, Munir, and Alaka (2018), firm size has a role to play on financial performance of an organization. According to studies conducted by Pervan (2012), Covin & Slevin (1988), Wang & Kafouros (2020), Ittner, Larcker, & Rajan (1997), and Moghaddam & Foroughi (2012) to establish how firm size of an organization influence financial performance, the studies had mixed results. The studies also had limitations in their methodologies. For instance, the studies utilized small sample size that make it difficult to generalize in every context and situation. As such, there is need for other studies such as the current study to fill the gap on whether firm size influence performance of microfinance banks in Kenya within the domain of given dimensions.

However, firm size is not the only variable in regard to financial inclusion and performance of microfinance banks. Interest rate is another variable which affect financial performance tenaciously and has been investigated with similar tenacity. According to studies conducted by Ogunlade and Oseni (2018), King'ori, Kioko, and Shikomo (2017), Blackwell and winters (2014) Heffernan and Fu (2010), as well as Kurui and Aquilars (2014) to establish the relationship between interest rate and financial performance, the studies were plausible but had mixed findings. The studies also had different motivational focus and as such did not focus on microfinance banks. Therefore, the relationship between interest rates and financial performance among microfinance banks in Kenya is yet to be known.

Furthermore, operational efficiency has also been under the scrutiny of researchers who are interested to establish the effect of operational efficiency on financial performance. To such end, a number of studies have been conducted. For instance, Olaniyi (2018), Shah and Jan (2014), Jabulani and Imka (2012), Oladipo and Obamenyi (2010), as well as Makokha, Mukanzi, and Maniagi (2016) sought to investigate the effect of operational efficiency and financial performance. Although the studies are credible, they had mixed findings. Some studies establish significant correlation while others established insignificant correlation in regard to financial performance. The studies also utilized methodologies which have their own limitations such as qualitative approach which is subjective and hence lead to procedural problems, a gap that the current study intend to fill. Despite the availability of microfinance banks, Gamze (2007); Zhou (2016) asserts that 2.7 billion people around the world do not have access to formal financial services such as savings accounts, credit facilities, and insurance and payment services. In Sub-Saharan Africa, financial inclusion remains low with statistics showing only 34.2% of adult population having an account at formal financial institutions compared to developed economies, like United States of America (93.6%) and Germany (98.7%) (Hendriks, 2019). According to Sindani, Muturi, and Ngumi (2019), financial inclusion in Kenya stands at 83% thanks in no small part to innovative approaches such as mobile money transfer, internet banking, and flexible security requirements especially in microfinance institutions. However, as to whether such financial inclusion translates to financial performance among microfinance banks remains vaguely established.

Microfinance institutions (MFIs) in sub-Saharan Africa include a broad range of diverse and geographically dispersed institutions that offer financial services to low-income clients, non-governmental organizations (NGOs), non-bank financial institutions, cooperatives, rural banks, savings and postal financial institutions, and an increasing number of commercial banks. Overall, MFIs in Africa are dynamic and growing. African MFIs appear to serve the broad financial needs of their clients. Unlike trends in most regions around the globe, more than 70 percent of the reporting African MFIs offer savings as a core financial service for clients and use it as an important source of funds for lending (Bitok, Cheboy, and Kemboi, 2019).

In Kenya, microfinance banks continue to play a pivotal role in the journey of financial inclusion especially in the low resourced settings. According to Talibong and Simiyu (2019), there are 12 microfinance banks licensed by the central bank of Kenya. The microfinance banks include: Maisha, U & I, Uwezo, Caritas, Century, Daraja, Faulu, Kenya Women, Rafiki, Remu, SMEP, and Sumac. The Microfinance banks play a major role in financial inclusion and reach a diverse segment of the market that would be difficult for the commercial banks to serve because of logistical and operational challenges (Bitok et.al, 2019)

1.2. Statement of the Problem

The growth of the microfinance banks in the recent past has been boosted by financial inclusion in Kenya which stands at 83% because of the innovative approaches and flexibility of microfinance banks. However, it is not clear whether the financial inclusion has direct influence on financial performance of microfinance banks in Kenya. Several studies have looked at the link between financial inclusion and financial performance. However, such studies have left out three important variables namely, firm size, interest rates as well as operational efficiency and how they collectively influence financial performance among microfinance banks in Kenya. This therefore necessitated the current study to look into the effect of financial inclusion on financial performance of microfinance banks in Kenya

2. Literature Review

2.1. Theories Underpinning the Study

2.1.1. Contracting Theory

Contracting theory was propounded by Keneth Arrow in the early 1960s as an accounting theoretical model to try and predict, explain and provide theoretical basis in the accounting domain, Lambert (2001). The contracting theory therefore allows organizations to engage on the organization functions knowing that there are contractual arrangements and obligations that they have involved themselves in so that in the event of any risk in the process of business function, such organizations do not lose much compared to when there is no contractual element in the entire process. According to Nwogugu (2007), contracting theory applies within an organization in relation to another organization. It is how contracts are constructed in the presence of information asymmetry given that every player in a given industry such as the banking industry will always be interested in the self-gain in any contractual obligations. The contract which has been constructed by the organizations will therefore ensure that there is a laid down procedure so that the effects of adverse selections are mitigated for the entities involved in the contract.

The assumptions of the contracting theory according to Romuald and Dylan (2019) is found manifest in the understanding that organizations are protected from litigations as a result of their actions which provide them an enabling environment to focus on their core functions within the moral hazard setting. Organizations therefore construct and develop legal agreements that protect the interest of such organization in the process of their operations given that no one organization can be self-reliant in a world of specialization. According to Brickley, Linck, and Smith (2003), organization firm size is inextricably linked with the contractual obligations in several fronts. For instance, poorly executed contracts can significantly affect a firm's incentives to grow. A poorly implemented contractual obligation is more likely to lead to instances of litigation which puts a stop to expansion strategic priorities. Additionally, bigger firms engage more professional organizations with a track record which enhances their development in terms of expansion and hence bigger firm size compared to smaller firms which might prefer less professional partners because of lack of adequate budgets.

According to Paulin, Perrien, and Furguson (1997), the norms of contracting theory are predicated on financial and economic behavior as different entities have different incentives to perform their part of the bargain as required or not to perform them. The latency of performance within the contracting theory is therefore dependent, not just the contract itself, but also the incentives that parties have in their disposal to execute the contractual obligation. It is therefore the extent to which the contract is performed that determines the financial performance of the organization whether it is measured on profitability, return on asset, return on investment or any other indicator. Such is because the performance of the contractual obligation affects the growth of the firm and such growth determines its financial performance.

Contracting theory however has inherent weakness. According to Kaplan and Stromberg (2003), information asymmetry that is relevant in the contract construction means that one party has a better information than the other. The party with better information can therefore use it to disadvantage the other party making the contract and obligations thereof skewed making a win-win scenario only theoretical than normative.

2.1.2. Expectations Theory

Expectations theory was propounded by professor Lutz in the early 1960s in the economic literature to address the cognitive expectations and how such expectations impact the economic analysis of the time, Butos and Koppl (1993) According to Correll and Ridgeway (2006) expectation theory emanates from social psychology but has been widely used in economics and finance in understanding historical covariance and the interplay of economic models to project outcomes, not just in money markets but also in other investment decision making. Some expectations are therefore motivated by scientific waves and past performance of a particular outcome while some expectations are driven purely by optimism of the investor or those who put their investment in the money markets.

The fundamental assumption of expectations theory according to Drager, Lamla and Pfjfar (2016) is that long term interest rates are weighted averages of the future interest of the present interests. As such, expectations theory provides a basis upon which financial institutions and individual investors are able to improve the accuracy of the forecasts about their investments both in the short term and in the long term. Although there is time variation in the consistency of the expectations, Guttman, Kadan, and Kendel (2006) points out that interest rates in micro-financial institutions can still be affected by many other variables such as political environment, competition, and even remittances from foreign countries. However, in the long-term basis such as a period of 20 years, investors end up winning since historical covariance has demonstrated several times that interest rates benefit investors in the long-term basis and the value of stocks generally improves in the waiting game and investment decision making for banks and individual investors hence financial performance for the financial institutions like micro-finance organizations.

According to Hoque, Chishty, and Holloway (2011) expectations affect interest rates if the projections, according to known models, are favorable then the interest rates will favor either the financial institution or the investor or the bank customer in need of credit facility. For instance, external market conditions such as remittances may encourage interest rates in favor of the bank customer in need of loan facility but not necessarily the bank institution especially if the facility required is small. On the other hand, if the market conditions do not favor the bank customer, the bank or the micro-finance institution may charge high interest rate and when there is a high failure rate, the financial institution may dispose the security and still make profits out of the situation. This then leads to financial performance in terms of profits, return on assets, and return on equity or any other measure of performance put in place by the financial institution. As Guttman

(2006) asserts, expectations theory is relevant in predicting the future events in the financial world, the accuracy of such predictions still remains in limbo for the reason that accurate future predications are untenable given the dynamic and unpredictable market conditions.

2.1.3. Efficient Market Hypothesis

Efficient market hypothesis (EMH) is a theoretical model that was propounded by Eugene Fama in the 1960 in the money markets and particularly in the stock market, Borges (2010).   The theory was thus propounded to address the stock market indexes on the understanding that stock market is always perfect and cannot be significantly altered by adjusting risks. According to Ball (2009), efficient market hypothesis postulates that the market cannot be beaten or taken advantage of because all the information that determines the current share prices have been taken into consideration. However, the market can only be segmented into various versions such as strong, weak, or semi-strong depending on the market performance, geographical location as well as performance of the local currency among other external determinants of any money market.

The fundamental assumption of the efficient market hypothesis according to Malkiel (2003) is that stock prices or asset prices reflect all the available information that makes the market efficient and therefore insulates it from nefarious adjustments and internal maneuvers for the benefit of the few. As such, asset prices are to a large extent predictable using either econometrics or even manual historical analysis for a particular stock or a particular industry. According to Timmermann and Granger (2004), efficient market hypothesis plunges the optimality of a forecast in doubt. Such is because although the theory assumes that the market is efficient because all the necessary information has been accommodated in the stock prices, the market is not necessarily predictable. Therefore, efficiency and predictability of the market are two different constructs within the domain of efficient market hypothesis. Even if the econometrics and historical analysis were to be applied there are still variations that can prove significant in any time period under review because of market volatility.

Efficient market hypothesis therefore finds relevance in the current study in the sense that operational efficiency rides on efficient market theory to record performance for the micro-finance institutions. As Hartarska (2005), sustainability and financial performance of micro-finance institution is pegged on operational efficiency. Such efficiency is guided by efficient market theory that ensures that internal risk adjustments do not affect the market negatively. Such is because all the factors of the market prices have been taken into consideration. However, market efficiency theory as Borges (2010) points out, cannot protect the market for failure in adverse cases that can lead to depression and the forces that come outside the market environment. Although such adverse forces are limited, their effects cannot be underestimated even with efficient market theory included.

2.2. Empirical Literature

Empirical literature section addresses the past studies done on the study phenomenon in line with the study objectives. The variables of the objectives were firm size, interest rate and operational efficiency.

2.2.1. Extent to Which Firm Size Influence Financial Performance

A number of studies have sought to establish the influence of firm size and performance in regard to a number of dimensions such as asset base of the firm. According to a study conducted by Pervan (2012), the aim was to investigate the relationship between firm size and success of businesses. The study was done in Croatia and performance was measured in terms of profitability of the organization under study. The study was longitudinal in nature and was conducted between 2002 and 2010. The study findings revealed that asset base of the organization had a significant positive correlation with profitability of the firm.

A different empirical study was put in motion by Covin and Slevin (1988) and the objective was to investigate the influence of firm size in terms of organization structure and organizational performance. The study utilized simple random sampling to include 80 businesses. Data was analyzed using inferential statistics. The findings revealed that organization structure in terms of the number of employees of the organization had a significant positive correlation with performance. A different empirical study was also meant to establish the relationship between firm size and performance. The study was conducted by Wang and Kafouros (2020) with an objective of establishing the influence of geographical spread of the organization and performance. Firm size was measured by the geographical spread of the organization. The businesses involved in the study were sampled in China. Inferential statistics was then applied to make sense of the data. The study established that geographical spread had a significant relationship with performance.

Additionally, a different study was conducted in the same domain of firm size and organization performance. The research study was conducted by Ittner, Larcker, and Rajan (1997). The study employed secondary data and applied inferential statistics to compute the secondary data so collected. The study established that there was no regulatory classification of business in terms of size and financial performance.

According to a different study conducted by Moghaddam and Foroughi (2012), the aim was to establish the relationship between market share of businesses as Hiratsuka measure of firm size and performance of the business. The study sampled 95 Iran manufacturing company. Questionnaires were used as instruments of data collection. The study data was analyzed using inferential statistics. The study results revealed that market share as a measure of firm size had a significant correlation with firm performance.

Although the empirical literature reviewed on the influence of firm size and organizational performance are plausible, they also have their own limitations. For instance, the studies utilized small sample sizes that makes global generalization difficult. The studies also measured performance in general without singling out financial performance.

Furthermore, the studies sought to establish how single dimensions of firm size influence performance. The studies therefore left out how the five dimensions namely: number of employees, asset base of the firm, geographical spread of the firm, regulatory classification of the firm, as well as market share collectively influence financial performance of micro-finance institution hence a gap in knowledge.

2.2.2. Relationship between Interest Rate and Financial Performance
        Empirical studies have been done on how interest rates relate to financial performance using a number of dimensions. According to a study conducted by Ogunlade and Oseni (2018), the aim was to establish the influence of credit management practices and performance in Nigerian banks. The study adopted purposive sampling strategy and employed both descriptive and inferential statistics to analyze data. The results revealed that credit scoring had a positive correlation with financial performance.
        Additionally, a study conducted by King'ori, Kioko, and Shikomo (2017) was intended to investigate the determinants of financial performance. The study sampled 7 micro-finance banks in Kenya. The study also sampled secondary data from 2011 to 2015 which is a period of 5 years. The study adopted correlation and regression analysis to compute data. The results of the study showed that loan size had a significant positive correlation with financial performance in microfinance banks in Kenya.
        Further, a study conducted by Blackwell and winters (2014) was set to determine banking relationships and loan pricing. The study only utilized secondary data. Survey research design was also adopted as the study design. The study utilized inferential statistics to analyze research data. The results revealed that length of time a loan was given had a negative significant correlation with financial performance.
        A different study by Heffernan and Fu (2010) sought to investigate determinants of financial performance. The study was conducted in Chinese banks from 1999 to 2006. Financial performance was measured by return on equity as well as return on assets. Research data was analyzed using inferential statistics. The study findings revealed that loan type as a factor of interest rate had a significant positive correlation with financial performance.
        A different study on interest rate was conducted by Kurui and Aquilars (2014) and was set to determine credit performance and loan performance. The study was done in Baringo, Kenya and descriptive research design was adopted. The study was done among microfinance institutions in Baring County in which case census was used to select the study participants. The study revealed that credit history had a significant positive correlation with microfinance performance.
Although the empirical literature on the relationship between interest rate and financial performance is credible, there are mixed results among the study findings. The studies also suffer from limitations arising from study methodologies. For example, the use of purposive sampling is prone to bias from the researcher. Additionally, the studies sought to establish how a single dimension of interest rate relates with financial performance. The studies therefore left out how five key dimensions of interest rate namely, credit score, loan size, length of time, loan type as well as credit history relates to financial performance among micro-finance banks in Kenya hence a gap in knowledge.

2.2.3. Effect of Operational Efficiency on Financial Performance
        Operational efficiency reduces operational costs while improving productivity in an organization. According to an empirical study conducted by Olaniyi (2018), the aim was to determine operational efficiency and financial performance in Nigeria. Financial performance was measured by profit after tax 20 companies were sampled and the study revealed that innovative new products had insignificant correlation with financial performance.
        A different study conducted by Shah and Jan (2014) was aimed at analyzing private banks in Pakistan and their financial viability. The study sampled 10 commercial banks in Pakistan. Inferential statistics which were regression and correlation were used to analyze the primary data collected from the organizations. The findings revealed that economies of scale as a factor of operational efficiency had a significant positive correlation with financial performance of the banks.
According to an empirical study conducted in South Africa, Jabulani and Imka (2012) sought to find out how leveraging new technology contributes to financial performance in commercial banks. The study utilized simple random sampling to include 40 commercial banks in the study. Secondary data was used in the study and the results revealed that new technology adoption lowered unit cost hence financial performance
        Further, Oladipo and Obamenyi (2010) sought to establish the influence of outsourcing on financial performance among deposit taking banks in Nigeria. Purposive sampling was used to include 15 banks in the study. The study also utilized questionnaire to collect primary data from the top management employees of the bank. Inferential statistics was then applied to analyze data. The study revealed that there was a significant positive correlation between outsourcing non-core activities and financial performance of the banks.
        Furthermore, Makokha, Mukanzi, and Maniagi (2016) sought to investigate the influence of operational risk and financial performance. The study targeted savings and credit co-operative societies in Kakamega County in Kenya. A total of 56 respondents were selected as the study sample. The study utilized both descriptive and inferential statistics to analyze study data. The study results revealed that centralization of the SACCOs had a significant positive correlation with financial performance.
        Although the studies on the effect of operational efficiency on financial performance are credible, they also have mixed findings. Additionally, the studies used small sample sizes which makes it difficult to generalize the findings everywhere. The primary motivational focus was commercial banks and not micro-finance institutions. Further, the studies sought to find out how individual dimensions of operational efficiency affect financial performance. the studies therefore left out how five dimensions namely, innovative new products, economies of scale, new technologies,

outsourcing non-core activities as well as centralization affect financial performance among microfinance banks in Kenya hence a gap in knowledge.

2.3. Summary of Gaps

Although the empirical literature reviewed on the influence of firm size and organizational performance are plausible, they also have their own limitations. For instance, the studies utilized small sample sizes that makes global generalization difficult. The studies also measured performance in general without singling out financial performance. Furthermore, the studies sought to establish how single dimensions of firm size influence performance. The studies therefore left out how the five dimensions namely: number of employees, asset base of the firm, geographical spread of the firm, regulatory classification of the firm, as well as market share collectively influence financial performance of micro-finance institution hence a gap in knowledge

Additionally, the empirical literature on the relationship between interest rate and financial performance is credible, there are mixed results among the study findings. The studies also suffer from limitations arising from study methodologies. For example, the use of purposive sampling is prone to bias from the researcher. Additionally, the studies sought to establish how a single dimension of interest rate relates with financial performance. The studies therefore left out how five key dimensions of interest rate namely, credit score, loan size, length of time, loan type as well as credit history relates to financial performance among micro-finance banks in Kenya hence a gap in knowledge.

Furthermore, the studies on the effect of operational efficiency on financial performance are credible, they also have mixed findings. Additionally, the studies used small sample sizes which makes it difficult to generalize the findings everywhere. The primary motivational focus was commercial banks and not micro-finance institutions. Further, the studies sought to find out how individual dimensions of operational efficiency affect financial performance. the studies therefore left out how five dimensions namely, innovative new products, economies of scale, new technologies, outsourcing non-core activities as well as centralization affect financial performance among microfinance banks in Kenya hence a gap in knowledge.

3. Research Methodology

3.1. Research Design

According to Kothari (2004), research design is the overall strategy adopted by the researcher for purposes of generalization of findings. The current study adopted correlational study design. The relevance of the correlational design according to Saunders, Lewis and Thornhill (2012) is that it allows the researcher to apply inferential statistics on the study and hence determine the strength of relationship of the variables in line with the study objectives. As such, the study adopted correlational research design which was appropriate in determining the effect of financial inclusion on finance performance of microfinance banks in Kenya.

3.2. Study Area

The study was carried out in Kenya and covered all the 12 micro finance banks registered in Kenya and regulated by Central Bank of Kenya as at 2015. The Micri finance banks include: Maisha, U & I, Uwezo, Caritas, Century, Daraja, Faulu, Kenya Women, Rafiki, Remu, SMEP, and Sumac.

3.3. Data Sources and Collection Methods

The study employed secondary data that was obtained from the audited accounts of the banks and published by the Central Bank of Kenya. The period that the study looked into was from 2015-2019 financial years.

3.4. Data Analysis

The study utilized panel data methodology using STATA quantitative Microsoft software. Fixed effect (FE) and Random effect (RE) models were estimated and the Hausman test conducted to determine the best model. Post estimation tests such as: Multi collinearity, autocorrelation and heteroscekedastity were also conducted. The estimated panel data model was specified as:

$$ROA_{it} = \alpha_0 + \alpha_1 F_{it} + \alpha_2 I_{it} + \alpha_3 O_{it} + \varepsilon_{it} \qquad 3.1$$

Where;

ROA - Return on Asset

F- Firm Size

I - Interest Rate

O - Operational Efficiency

α_0 - Constant

$\alpha_1, \alpha_2, \alpha_3$ - Coefficients

$i -$ Item (Bank)

$t -$ Time period

4. Results and Discussion

4.1. Descriptive Results

In the analysis, return on asset (ROA) was measured by firm size (F), interest rate (I), and operational efficiency (O) as captured in Table 1below.

Variable		Mean	Std.Dev	Min	Max	Observations
ROA	overall	.0303837	.0124654	-.0093309	.0613754	40
	between		.0098872	.0147858	.0441103	
	within		.0080929	.006267	.0492816	
F	overall	.343602	.5595469	0	2.613725	40
	between		.5100838	0	1.829227	
	within		.2717384	-1.485625	1.1281	
I	overall	.0114404	.0084888	-.0022845	.051999	40
	between		.0045102	.0064771	.0231111	
	within		.0073044	-.0037316	.0403283	
O	overall	.052281	.0248903	-.016365	.1292025	40
	between		.0167594	.0244578	.0771452	
	within		.0190066	-.007972	.1375954	

Table 1: Descriptive Results
Note: ROA Indicates Return on Asset, F-Firm Size, O-Operational Efficiency, I-Interest Rates (Researcher, 2020)

In table 1, the mean value for return on assets (ROA) is 3.03%. This means that the average return on assets over the 5-year period for all the MFI is 0.0303837 while the minimum and maximum return on assets (ROA) for all MFI for the same period was -0.0093309 and 0.0613754 respectively. The standard deviation for return on assets for all MFI over 5 years is 0.0124654. The average return on assets for each bank out of the 12 MFI varied between 0.0147858 and 0.0441103. Return on assets within varied between 0.006267 and 00.0492816 which means the variation from each MFI's average return on assets. The within number refers to the deviation from each bank's average return on assets and there are some cases where the deviations must be negative for normal distribution. The standard deviation between tells us the variation in individual MFI over time while the standard variation within gives the variation of return on assets for all MFI over the 5-year period. In this case, standard deviation for return on assets for individual bank is 0.0098872 while standard deviation for return on assets among the MFI is 0.0080929.

The mean value for Firm Size (F) is 34.36023%. This means that the average Firm Size over the 5-year period for all the MFI is 0.343602 while the minimum and maximum Firm Size (F) for all MFI for the same period was 0 and 2.0613725 respectively. The standard deviation for Firm Size for all MFI over 5 years is 0.5595469. The average capital adequacy for each bank out of the 12 MFI varied between 0 and 1.829227. MFI within varied between -1.485625 and 1.1281 which means the variation from each MFI average Firm Size. The within number refers to the deviation from each bank's average Firm Size and naturally some of the deviations must be negative for a normal distribution. The standard deviation between tells us the variation in individual MFI over time while the standard variation within gives the variation of Firm Size for all MFI over the 5-year period. In this case, standard deviation for Firm size for MFI is 0.5100838 while standard deviation for Firm Size among the MFI is 0.2717384.

The mean value for interest rate (IR) is 1.14404%. This means that the average interest rate over the 5-year period for all the MFI is 0.0114404 while the minimum and maximum Interest Rate (I) for all MFI for the same period was -0.0022845 and 0.051999 respectively. The standard deviation for Interest rate for all MFIs over 5 years is 0.0084888. The average Interest Rate for each Micro finance out of the 12 MFI varied between 0.0064771 and 0.0231111. Interest Rate within varied between -0.0037316 and 0.0403283 which means the variation from each Micro finance average Interest Rate. The within number refers to the deviation from each MFIs Interest Rate and naturally some of the deviations must be negative for a normal distribution. The standard deviation between tells us the variation in individual MFI over time while the standard variation within gives the variation of Interest Rate for all MFI over the 5-year period. In this case, standard deviation for Interest Rate for individual Micro finance is 0.0045102 while standard deviation for Interest Rate among the MFI is 0.0073044.

The mean value for Operation Efficiency (O) is 5.2281%. This means that the average operation efficiency over the 5-year period for all the MFI is 0.052281 while the minimum and maximum operational efficiency (O) for all MFI for the same period was -0.016365 and 0.1292025 respectively. The standard deviation for Operation efficiency for all MFI over 5 years is 0.0248903. The average Operation efficiency for each Micro finance out of the 12 MFI varied between 0.0244578 and 0.0771452. Operation efficiency within varied between -0.007972 and 0.1375954 which means the variation from each bank's average Operation efficiency. The within number refers to the deviation from each bank's Operation efficiency and naturally some of the deviations must be negative for a normal distribution. The standard deviation between tells us the variation in individual MFI over time while the standard variation within gives the variation of Operation efficiency for all MFI over the 5-year period. In this case, standard deviation for Operation efficiency for individual Micro finance is 0.0167594 while standard deviation for Operation efficiency among the MFI is 0.0190066.

4.2. Stationary Test

The Levin-Lin-Chu unit root test was carried out to establish existence of unit root in the panel data at 5% significant level. The result of the test is shown in Table 2

Levin-Lin-Chu unit-root test for ROA			
Ho: Panels is non-stationary		Number of panels =	10
Ha: Panels are stationary		Number of periods =	5
AR parameter: Common		Asymptotic: N/T -> 0	
Panel means:	Included		
Time trend:	Not included		
ADF regressions: 1 lag			
LR variance:	Bartlett kernel, 6.00 lags average (chosen by LLC)		
	Statistic	p-value	
Unadjusted t	-7.050		
Adjusted t*	-3.020	0.0013	

Table 2: Panel Unit Root Test
Source: Researcher (2020)

The results show Adjusted t* as -3.020 while the p-values are 0. 0013.Therefore, the null hypothesis that the data set is non-stationary is rejected and the alternative hypothesis that the panel is stationary accepted.

Haussmann test was then conducted to allow for the selection of either random effect or fixed effect model. Based on the finding, random effect was selected. The Hausman test results are presented in Table 4. The Table shows probability value (Prob>chi2= 0.2658) that is greater than 0.05, suggesting that the random effects model (REM) was more appropriate than the Fixed effect model (FEM). The resultant equation drawn from the REM is specified in Equation 4.1 below.

$$ROA_{it} = 0.170386 - 0.0014368_{it} - 0.0888295_{it} + 0.047E_{it} \qquad 4.1$$

.xtreg ROA CA AQ ME EA L, re							
Random-effects GLS regression				Number of obs		=	40
Group variable: mfi				Number of groups		=	5
R-sq:	within	= 0.8252		Obs per group: min =			5
	between = 0.8122				avg =		8.0
	overall	= 0.798			max =		8
				Wald chi2(5)		=	343.60
corr(u_i, X)	= 0 (assumed)			Prob > chi2		=	0.0000
	ROA	Coef.	Std. Err.	z	P>|z|	[95% Conf. Interval]	
	F	-.0014368	.0014859	-0.97	0.334	-.0043491	.0014755
	I	-.0888295	.0662891	-1.34	0.180	-.2187538	.0410947
	O	.394119	.0249882	15.77	0.000	.3451429	.443095
	_cons	.0170386	.0066595	2.56	0.011	.0039863	.0300909
sigma_u		.0019938					
sigma_e		.00367664					
	rho	.22724817	(fraction of variance due to u_i)				

Table 3: Random Effect Model Output

Coefficients				
	(b) fixed	(B) random	(b-B) Difference	sqrt(diag(V_b-V_B)) S.E.
F	-.0052698	-.0071463	.0018765	.0016767
I	-.3894854	-.3891408	-.0003446	.0117469
O	-.0333476	-.0322693	-.0010783	.0051649

Table 4: Hausman Test Results

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

chi2(4) = (b-B)'[(V_b-V_B)^(-1)](b-B) =   5.22

Prob>chi2 =   0.2658

(V_b-V_B is not   positive definite)

The hypothetical proposition was that firm size had no influence on financial performance of microfinance banks in Kenya. The results show insignificant negative relationship between firm size and return on assets (Coef= -.0014368, p >0.05). The null hypothesis was therefore accepted. This is in consonance with the finding of Ittner, Larcker, and Rajan (1997) who also established insignificant correlation between firm size and financial performance. However, the finding was at variance with the findings of Pervan (2012), Covin and Slevin (1988), Wang and Kafouros (2020), Moghaddam and Foroughi (2012) who established a significant correlation between firm size and financial performance in varied organizations. The study finding compares with contracting theory unfavorably. The assumptions of the contracting theory are based on the understanding that organizations are protected from litigations as a result of their actions which provide them an enabling environment to focus on their core functions within the moral hazard setting, which improves performance yet the finding in the current study reveals that firm size has negative insignificant relationship with financial performance.

The study further hypothesized that interest rates had no effect on financial performance of microfinance banks in Kenya. An insignificant negative relationship between interest rates and financial performance as measured by return on asset (Coef= -.0888295, p >0.05) was revealed. Therefore, the null hypothesis was accepted. This contradicts the observations by Ogunlade and Oseni (2018), King'ori, Kioko, and Shikomo (2017), Heffernan and Fu (2010), as well as Kurui and Aquilars (2014) who established a significant positive correlation between interest rate and financial performance in varied organizations. The finding however agrees with those of Blackwell and Winters (2014) who established a negative significant correlation between interest rate and financial performance. This is in tandem with expectations theory. The fundamental assumption of expectations theory is that long term interest rates are weighted averages of the future interest at the present time. Therefore, it is possible to record insignificant interest if the weighted averages of the future interest are insignificant.

In addition, effect of operational efficiency on financial performance of microfinance banks in Kenya was established under the hypothetical proposition that operational efficiency does not affect financial performance of microfinance banks in Kenya. The results revealed that there was a significant positive relationship between operational efficiency and return on asset as a measure of financial performance (Coef= .394119, p <0.05). Therefore, the null hypothesis was rejected. This finding supports the results of other researchers. For instance, studies conducted by Shah and Jan (2014), Jabulani and Imka (2012), Oladipo and Obamenyi (2010) Makokha, Mukanzi, and Maniagi (2016) established a significant positive correlation between operational efficiency and financial performance in varied organizations. On the contrary, the study finding is at variance with the study conducted by Olaniyi (2018) who established insignificant correlation between operational efficiency and financial performance. The study supports efficient market hypothesis theory. The fundamental assumption of the efficient market hypothesis is that stock prices or asset prices reflect all the available information that makes the market efficient and therefore insulates it from nefarious adjustments and internal maneuvers for the benefit of the few and thereby leading to financial performance for organization shareholders in general.

4.3. Post Estimation Tests

4.3.1. Multicollinearity

To establish existence of the degree of multicollinearity among variables or multicollinearity between variables, the researcher carried tests in Stata using Collin test which produced the following results:

. Collin test Collinearity Diagnostics				
		SQRT		R-
Variable	VIF	VIF	Tolerance	Squared
ROA	5.13	2.26	0.1949	0.8051
F	1.87	1.37	0.5342	0.4658
I	1.25	1.12	0.7974	0.2026
O	5.04	2.25	0.1983	0.8017
Mean VIF	3.32			
		Cond		
Eigenval		Index		
1	4.7908	1.0000		
2	1.0008	2.1879		
3	0.7832	2.4732		
4	0.3094	3.9351		
5	0.0946	7.1152		
6	0.0170	16.8057		
7	0.0042	33.7417		
Condition Number		33.7417		

Table 5: Collin Test Output

Eigenvalues & Cond Index computed from scaled raw sscp (w/ intercept)

Det (correlation matrix) 0.081

The mean VIF is 3.32. This is lower than the 10 which is taken as standard bench mark for multicollinearity to exist. Thus, there was no multicollinearity in the panel data.

4.3.2. Autocorrelation

The researcher sought to establish if there was autocorrelation in the panel data. This was done in Stata using Wooldridge test and the results presented in Table 6

H0: no first order autocorrelation	
F (1, 10) = 5.771	Prob > F = 0.0372

Table 6: Auto Correlation Using Wooldridge Test
Source: Researcher (2020)

The test statistic shows Prob>F=0.0372, which is lower than the critical value of 5%. We therefore fail to reject the null hypothesis and conclude that there is no first order auto correlation in the panel data set.

4.3.3. Heteroscekedastity

Standard estimation methods are inefficient when the errors are heteroscedastic or have non-constant variance. If the model is well-fitted, there should be no pattern to the residuals plotted against the fitted values. The researcher used graphical method to detect heteroscekedastity by plotting residuals versus fitted (predicted) values using the rvf plot command in the Stata.
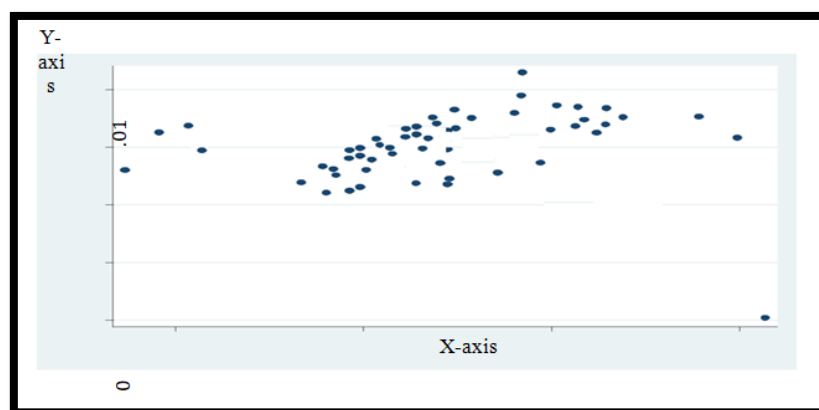
4.4. Residuals versus Fitted Values

Figure 1: Heteroscedasticity

In the sample, residuals are somewhat larger near the mean of the distribution than at the extremes. In this study, it appears that residuals were roughly the same size for all values of X and therefore, it was generally safe to assume that heteroscedasticity was not severe enough to warrant concern. There was also no clear pattern noted in the graph and this further confirms lack of heteroscedasticity.

5. Conclusions and Recommendations

The study findings revealed that both firm size and interest rate had insignificant negative relationship with financial performance as measured by return on asset. The study however revealed that there exists a significant positive relationship between operational efficiency and financial performance as measured by return on asset. The study therefore concludes that firm size and interest rate do not influence financial performance at the microfinance banks in Kenya while operational efficiency has a significant relationship with financial performance as measured by return on asset. Therefore, financial inclusion does not necessarily contribute to financial performance of microfinance banks in Kenya.

The study thus recommends that Microfinance Banks in Kenya should allocate more resource on operational efficiency in order to make more profit for the shareholders given that there exists a significant positive relationship between operational efficiency and return on asset.

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