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# Financial structure and financial sustainability of Microfinance Institutions in Kenya

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**ABSTRACT**

This study investigated the effect of financial structure on microfinance firms' financial sustainability. The study utilized panel data from 32 Microfinance Institutions (MFIs), resulting in 320 firm-year observations for the period of 2010-2019. The dataset was obtained from MIX market, a global database that collects self-reported information from MFIs. The study used a battery of panel data regression methods to test the hypotheses. The regression analysis indicated a statistically significant negative association between debts and donations and the financial sustainability of MFIs in Kenya. In contrast, there was a positive relationship between deposits and equity and the sustainability of microfinance firms in Kenya. Therefore, MFIs are strongly advised to prioritize internal financing in order to achieve financial sustainability. In addition, it is advisable for MFIs to avoid excessive dependence on donations and commercial funding, as these sources of funds often come with strict requirements and conditions that could impede their progress towards achieving financial stability. The results of this study can offer valuable insights to MFIs managers and regulators in formulating financing strategies that can assist MFIs in achieving financial sustainability.

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## 1. Introduction

Microfinance Institutions (MFIs) are crucial actors in promoting financial inclusion and reducing poverty, making them significant contributors to achieving sustainable development goals (García-Pérez *et al.*, 2018; Githaiga & Bitok, 2023). However, to achive both their economic and social objectives MFIs must financially sustainable to continue serving financially excluded population poor (Schreiner, 2000). There are several ways to define financial sustainability. Financial sustainability, according to Henock (2019), is the ability of financial institutions to run smoothly, produce profits, and have enough liquidity to avoid insolvency. Dunford (2003) and Kinde (2012) define financial sustainability as an MFI's ability to achieve its aims without donor funding. Harelimana (2017) views a sustainable MFI as one that makes money without subsidies. MFIs need profitability to attract private funding, according to Harelimana. MFIs must generate enough profit to cover transactional, operational, and financial costs without subsidies. OSS, FSS, and ROA as some of the indicators of MFIs financial performance (Nasrin *et al.*, 2018). However, empirical evidence suggests that most MFIs are unsustainable, notwithstanding their role in financial inclusion and economic growth. According to Abdulhakim (2020), Ethiopian MFIs are unsustainable with an OSS score of 0.85. According to Jasmi (2021), MFIs in Sub-Saharan Africa and East Asia and Pacific (EAP) are the most non-financially sustainable. Kumar (2012) concluded that 143 Namibian MFIs were unsustainable. According to Kenyan Central Bank of Kenya the microfinance industry reported loss before tax of Ksh.339 million on

December 31, 2019, compared to Ksh.1.4 billion in December 2018. Several factors make MFIs unsustainable by financial standards. These include decreased donor and government support (Hermes & Hudon, 2019), limited deposit attraction (Sambian, 2023), insufficient revenue diversification (Githaiga, 2021), inadequate equity (Ayele, 2015), intense competition (Hartarska *et al*., 2013), and a high rate of risky loans.

The financial structure of Kenyan MFIs affects their sustainability (Ayele, 2015). These institutions' long-term sustainability depends on their financial structure (Luintel, *et al*., 2008). Responsible debt management is essential to obtain favorable terms and maintain an equilibrium debt-to-equity ratio (Lubega, 2021). Also, MFIs need equity capital to support their financial architecture (Lassoued, 2022). It symbolizes the owner's investment and protects against financial shocks. Equity capital helps a company weather tough times and absorb losses (Nguyen & Nguyen, 2020). Furthermore, MFIs use client and other deposits as a reliable and cheap source of financing (Bogan, 2012). Deposit mobilization must be managed carefully. To maintain deposit funding and expand outreach, one of the most important factors is building customer trust, managing liquidity, and complying with regulatory agencies (Abdullahi & Abdullah, 2021). MFIs can benefit from donations and funding in their fight against poverty and empowering marginalized groups (Firdaus and Kamello, 2023). These funds can expand operations, create new programs, and improve organizational capacity. In order to maintain long-term viability, donations must be balanced with other funding sources. However, too much dependent on donations may pose sustainability issues, especially if other funding sources dry up (Green *et al*., 2021). In addition, having too much debt or too little equity might make a corporation more vulnerable to unexpected events (Addo & Twum, 2013).

Although earlier studies have examined the relationship between financial structure and MFIs financial sustainability the findings are mixed. For instance, Bogan (2012) examined the impact of MFIs' capital structures on their levels of self-sufficiency by analyzing data collected between 2003 and 2006 from microfinance institutions (MFIs) located in Africa, East Asia, Eastern Europe, Latin America, the Middle East, and South Asia. The author found that equity, grants, debt, and deposits all had a negative MFIs financially sustainability. Bayai and Ikhide (2018), found no statistically significant relationship between equity and financial sustainability. The study focused on 60 MFIs operating in the Southern Africa Development Community (SADC). Chikalipah (2019) studied the effect that the source of MFIs' financing has on the organizations' overall financial performance in the Sub-Saharan Africa using a sample of 471 MFIs from 36 different sub-Saharan African nations during the course of the period from 1995 to 2012 was used. The findings indicated that there is a positive and significant connection between equity capital and MFIs' financial performance. In the study by Parvin *et al*., (2020), analyzed data collected from 187 MFIs in Bangladesh from the years 2005 to 2014 and found that net income to expenditure ratio (NIER) and return on assets (ROA) were both positively impacted by the equity to asset ratio (EAR). Khachatryan *et al*., (2017) found a positive and significant link between equity capital and MFI performance in sixteen countries spanning Eastern Europe and Central Asia (ECA) from 2005 to 2009.

Nyamsogoro (2010), using a sample 0f 98 MFIs in Tanzania in 2008 found that whereas debts and equity had a positive impact on MFIs' financial sustainability. Le *et al*., (2020) conducted research on the elements that influence the operational self-sufficiency (OSS) of Vietnamese microfinance institutions. Between 2011 and 2015, the author analyzed the data obtained from 34 MFIs participating in the Microfinance Information Exchange (MIX) market by employing binary logistics and OLS regressions. Chikalipah (2019), using a sample of 471 MFIs drawn from 36 Sub-Saharan Africa countries over 1995 and 2012, found that microsavings and debt both have a negative effect on the financial performance of microfinance firms in Sub-Saharan Africa. Sekabira (2013) employing a sample of 14 MFIs found a negative link between debt, grants and operational and financial sustainability. Githaiga *et al*., (2023) found a negative link between leverage and financial sustainability. Mia and Lee (2017) used a sample of 169 MFIs in Bangladesh from the period of 2009 to 2014 found that commercial loans had a positive and significant effect on the operational self-sufficiency of MFIs. Khachatryan *et al*., (2017) who studied MFIs across 16 different countries located in the Eastern Europe and Central Asia (ECA) from 2005 to 2009 found a positive and statistically significant correlation between donations (grants) and MFI performance. We therefore propose the following hypothesizes.

*H1. Donations has no significant effect on financial sustainability of MFIs*
*H2. Debt has no significant effect on financial sustainability of MFIs*
*H3. Deposits has no significant effect on financial sustainability of MFIs*
*H4. Equity has no significant effect on financial sustainability of MFIs*.

## 2. Research Method

This section discusses the methodology and methods that the study utilized to address the research questions. The study uses a dataset of all MFIs that operated for the for the period between 2010 and 2019. The dataset sourced from the MIX market, a World Data base for all MFIs that self-report with the organization. Kenya has a total population of 53 registered MFIs, however only 32 Kenya MFIs had data for the entire period, resulting to 320 firm-year observation.

The study had three sets of variables comprising the dependent variable, the independent variable and a set of control variables as supported by previous studies. The measurement of the study variables is summarized in table 1 below.

**Table 1.** Measurement of variables

| Variable | Nature of variable | Operational Definition | Measurement | Source |
|---|---|---|---|---|
| Financial sustainability | Dependent variable | Operational self-sufficiency | The ratio of total revenue to operating expenses (Bayai & Ikhide, 2018; Githaiga *et al.*, 2023). | World Bank Mix Market |
| Deposit | Independent variable | Savings that an institution succeeds in mobilizing from its members. | ratio of deposits to total assets(Henock, 2019: Duguma, & Han, 2018) | World Bank Mix Market |
| Equity | Independent variable | Members funds contributed in the form of shares and retained earnings | the ratio of owner's equity to total assets (Khachatryan *et al*., (2017) | World Bank Mix Market |
| Debt | Independent | Commercial bank loan | The ratio of total debt to equity (Githaiga, 2021). | World Bank Mix Market |
| Donation | Independent | Funds from NGOs and government subsidies | Ratio of NGOs support and subsidies to total assets (Henock, 2019: Chikalipah, 2019) | World Bank Mix Market |
| Depth of outreach | Control | Average loan size | average loan size divided by the gross national income per capital (Hartarska & Nadolnyak, 2007; Kipesha & Zhang, 2013 | World Bank Mix Market |
| Breadth of outreach | Control | Number of customers served | The natural logarithm of active borrowers (Khalaf *et al*., 2023). | World Bank Mix Market |
| Par>30 | Control | Quality of loan portfolio | Loans overdue past 30 days (Tehulu, 2013; Ayayi & Sene, 2010) | World Bank Mix Market |
| Firm size | Control | MFI's asset base | the natural logarithm of its total assets (Bogan *et al.*, 2007 | World Bank Mix Market |

*Source: Authors own creation*

We empirically investigate the effect financial structure on financial sustainability of Kenyan MFIs using the model shown below:

$$OSS_{it} = \beta_0 + \beta_1 DOU_{it} + \beta_2 BOU_{it} + \beta_3 FS_{it} + \beta_4 PAR30_{it} + \beta_5 ALS_{it} + \beta_6 DNTA_{it} + \beta_7 DTE_{it} + \beta_8 DTA_{it} + \beta_9 ETA + \varepsilon_{it}$$

Where; OSS, is operational self-sufficiency; DOU is depth of outreach; BOU is breadth of outreach; FS, firm size, PAR>30, is portfolio at risk over 30 days; ALS, average loan size; DNTA, donations to assets; DTE, debt to equity; DTE; deposits to assets; ETA, equity to assets. $\beta_0$ is a constant, $\beta_{1\ldots9}$ are beta coefficients. $\varepsilon_{it}$is an error term.

## 3. Results And Discussions

Table 2 contains descriptive statistics for analysis variables. Average operational self-sufficiency is 1.02, confirming the selected MFIs' financial sustainability. The average breadth of outreach was 3.946666 (range: 2.13033 -5.876042; SD= 0.8156843). The average firm size was 9.087128 (range: 6.769699–11.66768; SD = 0.9828981). The table shows that the average leverage (DTE) was 1.094752 (range: 0.1220985- 1.587315; SD =.2611007). The mean PAR>30 was 0.1079395 (range: =0.0002- 0.5868; SD= 0.1186542). Mean depth of outreach (DOU) was 1.65099 (range: .9188007-2.623271; SD = 0.452756). Total asset donations (DNTA) averaged.0101543 (range=0-.630004; SD= 0.0539706). The mean deposit-to-total assets (DTA) ratio was.4478356 (range =0-.99903; SD = 0.249807), whereas the mean equity-to-total assets ratio was 0.3276986 (range: 0294808-.9808895; SD = 0.205735).

**Table 2.** Descriptive statistics results

| Variable | Obs | Mean | Std. Dev. | Min | Max |
|---|---|---|---|---|---|
| OSS | 320 | 1.019855 | .2559336 | .4381 | 1.557 |
| BOUT | 320 | 3.946666 | .8156843 | 2.130334 | 5.876042 |
| FS | 320 | 9.087128 | .9828981 | 6.769699 | 11.66768 |
| PAR>30 | 320 | .1079395 | .1186542 | .0002 | .5868 |
| DOU | 320 | 1.65099 | .452756 | .9188007 | 2.623271 |
| DNTA | 320 | .0101543 | .0539706 | 0 | .630004 |
| DTE | 320 | 1.094752 | .2611007 | .1220985 | 1.587315 |
| DTA | 320 | .4478356 | .249807 | 0 | .99903 |
| ETA | 320 | .3276986 | .205735 | .0294808 | .9808895 |

*Source: Authors own calculations*

Table 3 provides the correlation matrix of the explanatory variables. Breadth of outreach and OSS are positively correlated as evidenced by the coefficient of 0.3267. The correlation between firm size and OSS is positive and significant (0.3566). Similarly average loan size and OSS are positively correlated (0.4274). On the other hand, debt to equity (-0.3292) ratio and PAR>30 (-0.2458) are negatively and statistically correlated to OSS. The depth of outreach (ALS) and OSS are positively correlated (0.4048). Donations to total assets (DNTA) and OSS are negatively correlated (-0.2548). Equity to total assets (ETA) and OSS are positively correlated (0.2367).

**Table 3.** Correlation results

| | OSS3 | BOUT | FS | PAR>30 | DOU | DNTA | DTE | DTA | ETA |
|---|---|---|---|---|---|---|---|---|---|
| OSS | 1.0000 | | | | | | | | |
| BOUT | 0.3267* | 1.0000 | | | | | | | |
| FS | 0.3566* | 0.7768* | 1.0000 | | | | | | |
| PAR>30 | -0.2458* | -0.1285* | 0.1007 | 1.0000 | | | | | |
| DOU | 0.4048* | 0.0443 | 0.2859* | 0.0422 | 1.0000 | | | | |
| DNTA | -0.2548* | -0.0934 | -0.2026* | -0.1185* | -0.2045* | 1.0000 | | | |
| DTE | -0.3292* | -0.0800 | -0.0559 | 0.1675* | -0.1469* | -0.0543 | 1.0000 | | |
| DTA | 0.4274* | 0.3461* | 0.4474* | 0.0199 | 0.2913* | -0.1831* | -0.1913* | 1.0000 | |
| ETA | 0.2367* | -0.4798* | -0.4370* | -0.1092 | 0.2216* | 0.0373 | -0.2618* | -0.1482* | 1.0000 |

Note(s)*p<0.05

*Source: Authors own calculation*

Table 4 shows the OLS regression findings used to assess the four hypotheses. The ratio of donation to total assets (DNTA) significantly impacted OSS ($\beta$= -0.869, $\rho$<0.05). Hence Unsupported H1. Bogan (2012), Sekabira (2013), Bayai and Ikhide (2018), and Nadiya *et al.* (2012) also identified a positive association between donations and MFI financial sustainability. Khachatryan *et al.* (2017) observed a favorable association between donations and MFI financial viability, contrary to Kinde (2012). MFIs must meet certain standards before donors can lend, even when donors offer lower rates. Donations are good for new MFIs (de Aghion & Morduch, 2005), but they can lead to inefficiency, unreliability, corruption, abuse, and a lower scale of operations (Kapper 2007), which limits MFI expansion. The ratio of debt to equity (DTE) significantly impacted OSS ($\beta$= -0.156, $\rho$<0.05). Therefore, H2 is unsupported. Previous research supports the findings (Chikalipah, 2019; Sekabira, 2013; Githaiga, 2023). Mia and Lee (2017) and Abdulhakim (2020) discovered debt capital positively related to financial sustainability. Hossain and Khan (2016) found no link between debt-to-equity ratio and MFI financial sustainability in Bangladesh. Dabi *et al.* (2023) discovered no statistically significant relationship between debt and MFI financial viability in Ghana.

The ratio of deposits to total assets (DTA) significantly impacted OSS (β= 0.220, ρ<0.05). Therefore, H3 is unsupported. The findings match previous research (Parvin *et al*., 2020; Tehulu, 2013; Khachatryan, 2017; Duguma & Han, 2018). The findings contradict Bich (2016), who showed a positive but statistically insignificant link between deposits and microfinance organization financial viability. Dabi *et al*., (2023) discovered a negative relationship between deposits and Ghanaian MFI financial sustainability. Although regulatory interventions on MFIs' deposit attraction continue, this study shows that small deposits are stable and can support MFIs' lending operations over time, ensuring their sustainability and growth. A significant positive influence of equity to total assets (ETA) on OSS was observed (β= 0.416, ρ<0.05). Hence H4 is unsupported. The findings support previous research (Chikalipah, 2019; Parvin *et al*., 2020; Khachatryan, 2017). They disagree with Dabi *et al*., (2023) and Bayai and Ikhide (2018), who found no correlation between equity capital and MFI financial sustainability. Equity financing relieves MFIs of debt financing's contractual payments. Equity funding comes from owners (profit-driven MFIs) or national and international donors and development banks. Compared to share issuing, retained earnings are cheap equity capital. Control factors showed a strong positive correlation between outreach breadth and OSS (β= 0.060, ρ<0.05). Logotri (2006) found that a larger number of borrowers is the biggest sustainability factor, but Nyamsogoro (2010) on Tanzanian microfinance institutions found a negative and significant relationship between outreach and financial sustainability, indicating that increasing borrower numbers does not improve financial sustainability. Due to more debtors, inefficiencies may increase. Hartarska (2005) found no correlation between borrower numbers and financial sustainability. Thus, MFI productivity (efficiency) may increase with outreach width, which may improve financial sustainability. Large MFIs have a wider reach; hence their active borrowers may indicate their size. Big MFIs have economy of scale (Beccalli *et al*., 2015) and may be more financially sustainable.

Significantly, average loan size positively impacted OSS (β= 0.084, ρ<0.05). As expected, PAR>30 significantly impacted OSS (β= -0.508, ρ<0.05). The average loan size is the average gross loan portfolio divided by active borrowers, indicating outreach depth. Loans are lesser when outreach is deeper. This element indicates MFI development or deep access, which means MFIs can reach very poor people (Christen *et al*., 1995). Larger loans also increase cost efficiency and profitability (Adongo & Stork, 2006; Gregoire & Tuya, 2006; Mahapatra & Dutta, 2016; Nyamsogoro, 2010). However, several studies found a negative relationship between average size and OSS (Nadiya *et al*., 2012; 2014). Another factor affecting MFIs' financial sustainability is portfolio at risk (PAR). The portfolio at risk measures MFI collection efficiency. The higher the PAR, the lower the payback rates and financial sustainability. Nyamsogoro (2010) found a negative correlation between PAR and financial sustainability. Larger firms had a significant beneficial impact on OSS (β=.042, ρ<0.05). The finding shows that larger microfinance institutions are more financially stable. Size positively affects MFI sustainability, according to empirical findings. Nyamsogoro (2010), Bogan (2008), Mersland and Storm (2007), and Cull *et al*., (2008) found that size positively and significantly affects financial performance due to economies of scale.

The study also analyzed panel data using the fixed effect model, random effect model, and system generalized method of moments. Models 2, 3, and 4 support the hypotheses by corroborating the OLS results.

**Table 4.** Regression results

| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| OSS | OLS | Fixed Effect | Random Effect | GMM |
| | Coef.( Std. Err) | Coef.( Std. Err) | Coef.( Std. Err) | Coef.( Std. Err) |
| L1. | | | | .122(0.081) |
| *Controls* | | | | |
| BOUT | .060(0.022)** | .056(0.028)** | .041(0.025) | .012(0.038)** |
| FS | .042(0.019)** | .083(0.019)** | .068(0.018)** | .127(0.024)** |
| PAR>30 | -.508(0.094)** | -.276(0.083)** | -.303(0.080)** | -.185(0.094)** |
| DOU | .084(0.026)** | .114(0.040)** | .115(0.035)** | .102(0.046)** |
| *Predictors* | | | | |
| DNTA | -.869(0.194)** | -.713(0.160)** | -.711(0.157)** | -.908(0.162)** |
| DTE | -.156(0.044)** | -.181(0.050)** | -.187(0.047)** | -.211(0.065)** |
| DTA | .220(0.047)** | .412(0.071)** | .349(0.064)** | .522(0.102)** |
| ETA | .416(0.064)** | .161(0.051)** | .186(0.050)** | .202(0.057)** |
| CONSTANT | .260(0.144)** | -.140(0.209) | .079(0.180)** | -.518(0.290) |
| R-squared | 0.5169 | 0.4099 | 0.4455 | - |
| F/Wald chi2 value | 41.59 | 25.57 | 223.12 | 179.56 |
| *Post estimation* | | | | |
| AR(1) | | | | .054 |
| AR(2) | | | | 0.212 |

| | Model 1 | Model 2 | Model 3 | Model 4 |
|---|---|---|---|---|
| Sargan | | | | 0.905 |
| Hansen | | | | 0.779 |
| *p<0.05 standard errors in parentheses | | | | |

## 4. Conclusion

This study examined the effect of financial structure on financial sustainability of Kenyan MFIs. The findings revealed that debt capital and donations have a negative effect on MFIs' financial sustainability. However, deposits and equity had a positive effect. Given these findings, MFIs should not over rely on donations, subsidies, and donator funding, which may have strict conditions that restrict expansion. There are management and policy implications that may be drawn from these findings. MFIs' managers should consider using equity capital and deposits due to the positive benefits that they provide. For MFIs to be financially sustainable, they need to mobilize their own internal resources and deposits. In addition, policymakers should offer incentives to MFIs in order to support them to raise deposits and equity in order to finance their operations and attain financial sustainability. Despite the novelty of this findings, this study has several limitations. First, this study concentrated on MFIsthat are active in Kenya. Therefore, future research should take into account MFIs in different geographical areas. Furthermore, this study employs operational self-sufficiency as a metric to gauge the financial sustainability MFIs. Therefore, future research endeavours could look into using of other financial and non-financial indicators to assess sustainability. Furthermore, it is imperative for future research to investigate the risk management measures and social performance of microfinance institutions, as well as the operations of MFIs in different jurisdictions.

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