

Determinants of Microfinance Sustainability and Outreach to the Poor: Evidence from Microfinance Institutions in Sub-Saharan Africa

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Abstract:

Poverty eradication is a continuous global incident, however the global severity have never been the same, on that specific note, developing countries such as Sub Saharan Africa countries (SSAC) with wide scale poverty prevalence have employed various poverty reduction institutions such as microfinance institutions as appropriate mechanisms to remove many poor people from poverty trap. A sample of 200 microfinance institutions from 30 Sub Saharan African countries was taken for research investigation with three-stage least square (3SLS) method adopted as appropriate model for investigation, the fondness is owing to the fact that the 3SLS is an amalgamation of the 2SLS and seemingly unrelated regressions (SUR) which produces more efficient results. From our result, as evidence suggest, there is enormous disagreement between sustainability and outreach of MFIs mission as regression results interestingly demonstrates trade-off between sustainability indicators and outreach indicators among MFIs in Sub Saharan Africa. Furthermore, from regression outcome, we found no complementary relationship between sustainability and outreach, additionally as evidence further suggest, we see that, the degree of different of coefficient on influence of sustainability on outreach is slightly bigger compare to degree of influence of outreach on sustainability, from that view, we deduced that concentrating on sustainability in Sub Saharan Africa is tremendously dangerous to the social goal of microfinance institutions, this therefore concurred with the mission drift emphasized in most literatures. We have also been able to identify major institutional determinants of sustainability and outreach as yield, loan portfolio, operating expense and not-for-profit, the results are particularly important to policy makers and institutional managers in deciding matters of outreach and sustainability. furthermore, by Looking at the possibility on whether MF can lead to poverty alleviation, we found no substantial evidence in support of the fact that microfinance institutions can be final panacea for poverty alleviation in Sub Saharan Africa.



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1. Introduction

The services of Microfinance Institutions have emerged as a practicable and significant financial substitute for poor people with no access to credit from conservative financial institutions, where its objectives include eradication of poverty by fostering small scale entrepreneurship through simple access to credit, however, there are numerous problems in low income Countries and it is particularly severe in developing countries, and even more so in the context of Sub Saharan Africa (SSA), majorly for two observable reasons, one of the fundamental reasons is that, most of the conservative banks in these countries are concentrated in cities while mainstream population is in rural areas. Another imperative reason as (Shu and Oney 2014, Hermes and Lensink 2007) argued is that most traditional banking sector analytically does not consider the rural poor due to the cost involve in the process of screening, monitoring, and provision of a limited loan, moreover, (Demirguc-Kunt et al. 2018; Wolday 2004) explained that most underprivileged have no tangible assets that can be secured by a bank as collateral requirements, thus, a great or considerable number of the underprivileged in Sub Saharan Africa obtain financial services from informal lenders, who are able to enforce loan contracts but at a high interest rate. However, the governments in these countries are making efforts in trying to restrain the role of informal lenders all the way through the support of microfinance institutions (MFIs). It is understandable throughout the world that poor people are barred from formal financial systems, exclusion ranges from fractional exclusion in developed countries to full or nearly full exclusion in lesser developed countries (LDCs), in an absent access to formal financial services, the underprivileged have developed a wide multiplicity of informal and community-based financial preparations to meet their financial requirements, in previous years, an estimated number of modern sector institutions have been formalized preferably for rationale of summing to those same needs. For purpose of background knowledge, many studies have defined microfinance to refer generally to such informal and formal arrangements offering financial services to the poor, it is clear that microfinance has existed, although in specific cases not captured by institutional managers, since the start of conventional financial systems, and indeed probably predates them. It has only been within the last four decades, however, that serious global efforts have been made to formalize financial service provision to the poor, and this process began around the early to mid-1980s and has since gathered an impressive momentum. According to (Christen et al. 1995), today there are thousands of MFIs engaged in the financial provision to an estimated 100-200 million of the world's poor. It started as small policy but developed largely into paradigm equivalent to a global industry informed increasingly by a commercial paradigm, the rise of the microfinance industry represents a remarkable accomplishment taken within historical context; it has overturned customary ideas of the poor as consumers of financial services, shattered stereotypes of the poor as not bankable. Spawn variety of lending methodologies demonstrated that it is possible to provide less costly financial services to the poor, and accumulate millions of dollars of social investment for the poor (Mutua, et al. 1996) argued that it must also be emphasized too that the animating motivation behind the microfinance movement was poverty alleviation, not only that, but microfinance also offered the potential to alleviate poverty while paying for themselves and perhaps even turning a profit to their potential, perhaps motivate them than anything else, and accounts for the emergence of microfinance onto the global stage.

The main distinctive characteristics of MFIs in the financial market include, but are not restricted to the subsequent roles, they offer financial services to the underprivileged, which are usually not considered to be creditworthy by banks; and they also solve the problem of

information asymmetry and ease collateral requirements by establishing strong personal relationships, which generates social collateral. (Assefa et al. 2013; Postelnicu and Hermes 2018), noted that MFIs face the twofold challenges of availing financial services to the poor and attaining financial sustainability. Notably, there are two schools of thought concerning the ultimate goal of MFIs, welfarists and institutionalists, Welfarists argue that the essence of establishing MFIs is to serve the poor, and hence, they should focus on outreach, whereas institutionalists argued that as emphasize by Tsegaye (2009), MFIs should be financially sustainable for them to serve the poor. Recently, however, there seems to be concentration shift of microfinance institutions to further focus on sustainability and outreach programs and financial sustainability provide important recipe for meaningful outreach to the poor. This study is comprised of five (5) sections: Section (1) is introduction, section (2) is literature review, section (3) is data methodology, section (4) is descriptive statistics and finally, section (5) is conclusions and recommendation. The research focuses on three main questions, What are the likely determinants of microfinance sustainability?, Is there significant relationship between sustainability and outreach of MFIs in Sub Saharan Africa and lastly, can microfinance outreach in Sub Saharan Africa leads to poverty alleviation.

2. Literature Review

2.1 Microfinance Sustainability

MF sustainability is characterized as earnings from microfinance services that cover operational and funding costs and take care of bad loans while allowing further expansion of services, it may be further delineated as Operational Self Sufficiency (OSS) and Financial Self-Sufficiency (FSS), where OSS refers to the ability of an institution to generate enough revenue to cover operating costs, and FSS refers to an institution's dependency on subsidies for successful operations, most MFIs started operations with subsidy or external funds with a mission of serving poor clients, hence, there are different arguments for measuring MFI sustainability and efficiency, some adopt the Subsidy Dependence Index (SDI) for measuring self-sustainability while others are against it due to unavailability of required data, meanwhile measuring sustainability requires detailed information about MFI. The basic question is however how a MFI can attain sustainability? It can also be define to imply financial performance of MFIs, which potentially determine the institutions permanency, thus, profitability measures are widely used as proxies for sustainability, a number of studies have also considered institutional financial performance and efficiency measures as viable proxies for sustainability, although some schools of thought, however, remain skeptical about the use of efficiency measures as proxies for sustainability, for example, Balkenhol (2007) amongst others have argued that a more precise measure for sustainability is operational and financial self-sufficiency, nonetheless, the widely used proxies for sustainability include operational self-sufficiency (OSS), return on assets (ROA) and profit margin, in this study, we also used these measures, and we use them characteristically as proxies for sustainability and also in the development of the measurement index for sustainability, meanwhile, OSS is the ratio of financial revenue of the MFI to the sum of operating/financial expense and impairment loss, profit margin is the ratio of the net operating income of the MFI to its financial revenue, whereas, ROA is the ratio of the net operating income of the MFI to the average total assets, ROA is argued to be a viable measure of sustainability since it reflects the average returns from the total assets of the MFIs, (Cull et al. 2007; Olivares-Polanco 2005) used ROA as a important measure of profitability. Unlike formal sector financial institutions, the large majority of MFIs are not "sustainable," where sustainability is equated in microfinance literature and parlance with financial self-sufficiency, instead, most MFIs are

able to operate without covering their costs due to subsidies and gifts from governments and other donors, despite the fact that, the microfinance industry is commonly operate largely in an interest of institutionist paradigm (Morduch 2000, Woller et al. 1999) asserting that an MFI should be able to cover its operating and financing costs with program revenues, the conceptual foundations of the institutionist paradigm stem to a large degree from the work of researchers at the Ohio State University's Rural Finance Program, their analysis of the failed rural credit agencies established by several LDC governments during the 1960s and 1970s diagnosed the most important reason of malfunction to be the deficiency of institutional capability, (Gonzalez-Vega (1994), This diagnoses led logically to two principal conclusions, (1) institutional sustainability was key to successful provision of financial services to the poor and (2) financial self-sufficiency was a necessary condition for institutional sustainability, the institutionist argument is consistent with Hollis and Sweetman (1998) who discuss six historical cases in an attempt to identify the institutional designs that facilitated success and sustainability for 19th century loan funds in the UK, Germany, and Italy, the authors conclude that subsidized loan funds were more delicate and lost focus more quickly than those that obtained funds from depositors. The financial spread of MFIs depends on their viability and sustainability, to be able to supply services on a sustainable basis, MFIs must maintain high repayment rates, and any stoppage to undertake proper policy can influence institutional efficiency and financial sustainability due to the demand to provide for bad debts, Christen and McDonald, (1997) argued that minimization of administrative expenses is therefore vital for MFIs sustainability, since well-managed MFIs that adhere to optimal lending practices should be able to maintain administrative expenses expressed as part of gross portfolio of 15–25 per cent, Gibbons and Meehan, (2000) noted that personnel expenses constitute the bulk of administrative costs and they vary from 50 to 70 per cent of the entire quantity of MFI administrative expenses. The studies of Hollis and Sweetman (1998) compared six microcredit organizations in 19th-century europe to identify institutional designs that were a prerequisite for financial sustainability, they found that organizations that derived their funding from deposits were more reliable than those depending on charitable sources, which tended to be more fragile without focus, Hollis and Sweetman (2001) further showed that MFIs were financially sustainable for decades due to their adaptation to the local economic and social environment, furthermore, Ayayi and Sene (2010) examined the key drivers of microfinance sustainability using data from 101 countries for the period 1998–2006, they reported that portfolio quality, higher interest rates and prudent management are critical enablers of MFI financial sustainability, similarly, Tehelu (2013) found loan intensity and loan size to be significant positive determinants of financial sustainability in east Africa, however, management inefficiency and portfolio at risk had negative impacts on sustainability, the fundamental issues surrounding MFI sustainability and self-sufficiency, and the implications/tradeoffs implied therein seem well-suited for finance researchers, few thorough research have been conducted in a financial institutions structure to develop and test theory pertaining to MFI self sufficiency, some evidence does exist however, that MFIs have historically been very resilient and sustainable, in addition to work of Hollis and Sweetman (2001) who discussed the microloan funds in 18th and 19th century Ireland, they report that Irish loan funds thrived for over 100 years due to their ability to change rapidly to external conditions, at one point providing financial services for 20% of Ireland's population, it took a combination of traditional bank lobbying that resulted in anti-MFI regulation and the Irish potato crisis to cause the failure of these early loan funds, additionally, (Patten et al. 2001) provide a more recent historical example of the resilience of MFIs and their clientele, they compare the performance of the Indonesian MFI Bank Rakyat Indonesia (BRI) to formal

Indonesian banks during the East Asian financial calamity, they find that BRI performed higher to the formal banking sector when comparing both loan repayment rates and savings rates of members. Welfarists take a different path with institutionists over the issue of microfinance sustainability, Welfarists argue that MFIs can achieve sustainability without achieving financial self-sufficiency (Morduch 2000, Woller et al. 1999), argue that donations serve as a form of equity, and as such, the donors can be viewed as social investors, unlike private investors who purchase equity in a publicly traded MFI, social investors do not expect to earn monetary return, instead, these donor-investors realize a social, or intrinsic, return, social investors can be compared to equity investors who invest in socially responsible funds, even if the expected risk-adjusted return of the socially responsible fund is below that of an index fund, these socially responsible fund investors are enthusiastic to accept a lower anticipated monetary return because they also receive the intrinsic return of not investing in firms that they find offensive. Microfinance communal investors take this notion to the limit, normally earning zero monetary returns and relying totally upon intrinsic income. Ideally, Welfarists tend to emphasize poverty alleviation, place relatively greater weight on depth of outreach relative to breath of outreach, and gauge institutional success more so according to social metrics, this is not to say that neither breadth of outreach nor financial metrics matter are not important, Welfarists feel these issues are important, but they are less willing than institutionists to sacrifice depth of outreach to achieve them, Welfarists envision an industry characterized by a plurality of institutional types including both profit-seeking and social-mission entities targeting different markets, with different combinations of market and non-market funding, and with different levels of commitment to social versus financial return, furthermore, Morduch (2000) refers to the debate between institutionists and welfarists as the microfinance schism, driving the schism are competing perceptions of the implications for financial self-sufficiency on depth of outreach, general consensus holds that there exists a tradeoff between financial self-sufficiency and depth of outreach, but masked by this consensus is much disagreement about the nature, extent, and implications of this tradeoff, nonetheless, what little evidence exists suggests that those MFIs that have accomplished genuine financial self-sufficiency have also intended to loan to borrowers who were either slightly, below is the summary of institutionalist and Welfarist focus

Table 1: Summary of Theoretical Approaches

Summary of Institutional and Welfarist approach to MFIs sustainability and outreach			
Institutionalist	Approach	Welfarist	Approach
Performance	Performance assessment are approach from institutional point of view	Performance	Performance assessment is from customers point of view
Targets	Small scale business enterprises or entrepreneurs	Target	Poor people below poverty the line
Types of institutions	Commercially bounded institutions	Types of institutions	Socially bounded institutions
Examples of institutions	Bank of Rakyat, Indonesia, SKS Microfinance and Uganda Microfinance Union	Examples of institutions	Grameen Bank, Bangladesh and FINCA of Latin America
Methodology to sustainability and social outreach	Operational self sustainability with high interest rates	Methodology to sustainability and social outreach	Subsidies with low or no interest rates
Saving	Saving mobilization is part of this approach	Saving	Saving mobilization is not part of this approach

Source: Researchers' Summary

2.2 Microfinance outreach

Microfinance outreach refers to the ability of MFIs to provide financial and non-financial access to large numbers of borrowers denied access previously to conventional banking, that is from a financial viewpoint and economies of scale definition of an outreach, several measures of outreach have been proposed in the literature, for example Schreiner (2002) discussed six main dimensions of outreach and their measures to include depth, breadth, cost, worth, length and scope, the depth and breadth are the most frequently explored magnitude of outreach in most pragmatic analyses. Adhikary P, (2014) and Quayes (2012), argued that due to the fast expansion in the sector which has led to increased breadth of outreach both at the firm and individual levels and has generated concerns among policy makers and practitioners regarding the depth of outreach and the overall social mission of MFIs, in addition, the unavailability of data on the other dimensions of outreach limits their usefulness in most empirical studies, however, Paxton (2003) notes that outreach measures such as average loan size (ALS) only reflect the lending technique rather than exclusion of individuals, and are therefore unsatisfactory as a measure of outreach. The depth of outreach index which integrate clients socioeconomic distinctiveness is professed as a more appropriate measure, the breadth logic is nevertheless supported by (Navajas et al. 2000), as many poor people compete for the few dollars in aid, as we continue, other measures of outreach proposed in the literature include the amount saved, the value of loan portfolio, a number of village posts, annual augmentation in MFI assets, women's involvement, percentage coverage of rural population, and a variety of financial services offered (Yaron 1992). Ledgerwood (1999) proposed three more dimensions for measuring outreach, loan outreach, clients and staff outreach, and savings outreach, in all these proposals, the central theme is to ensure that microfinance interventions are reaching the core poor, number of variables have been used to study MFIs outreach globally, and loan size is usually taken as a proxy for the depth of outreach, while the number of customers reached has been used to proxy breadth of outreach (Cull et al. 2007; Hermes et al. 2011), explained that, the assumption behind the loan size is reflected in the fact that smaller loan sizes suggest outreach to poorer clients, as Adhikary and Papachristou (2014) in analyzing the financial performance and outreach of 133 South Asian MFIs found the depth of outreach to relate positively to financial performance, suggesting that MFIs on sustained financial expansion paths can reach their social goal at minimized risk, furthermore, both breadth and depth of outreach were found to be positively related to profitability and efficiency, in addition, Bos and Millone (2014) show that some MFIs successfully coalesce both depth and breadth of outreach and operated efficiently, they, however, note that decreases in efficiency occur as the loan portfolio becomes larger, previously, Vanroose and D'Espallier (2013) studied the relationship between MFIs outreach performance and financial sector development, they found that MFIs were reaching more clients and operated profitably in countries with low access to banking services, their conclusion sustain the market failure hypothesis which specify that MFIs respond to needs not satisfied by banks and flourish where bank failures occur. In most literatures, (Zeller, 2001; Hulme and Mosley 1996) average loan size serves as a proxy for outreach depth to characterize the poverty level of target customers, smaller size loans with shorter repayment periods have been set up to sustain the poor, but higher costs are engrossed due to screening, monitoring, and administration, hence, small loan size relate negatively with sustainability due to the cost involved and proportion of female borrowers (PFB) and the number of active borrowers (NAB), both of which measure the breadth of outreach. Hermes et al. (2011), argued that focusing on women clients increases the chances of lower rates of loan

repayments, which affects the sustainability of MFIs, in contrast, other studies have shown that focusing on women supplement outreach and sustainability since it is easier to convalesce loans from them (Mersland and Strøm, 2010; Boehe and Cruz, (2013). D'espallier et al. (2013) argue that having more female borrowers reduces portfolio at risk and is associated with fewer write-offs and provisions, hence, it is obvious that PFB to have a negative impact on sustainability and relate positively to outreach, moreover, various studies have used the number of borrowers as a measure of microfinance breadth of outreach (Ganka, 2010; Mersland and Strom, 2009; Harmes et al., 2008), it is generally assumed that the larger the number of borrowers the better the outreach, according to LOGOTRI (2006) larger number of borrowers found to be the biggest sustainability factor, on the contrary, Ganka (2010) on Tanzanian microfinance institutions reports negative and significant relationship between breadth of outreach and financial sustainability, furthermore, Ganka concludes on the result that increased in number of borrower itself does not improve financial sustainability of microfinance institutions, the reason could be increased inadequacy as consequence of increased number of active borrowers, however, Hartarska (2005) reports that number of borrowers had no significant impact on financial sustainability. The studies of Hulme and Musley (1996) further assert that without the poor the supposed MFI is no longer different from a bank, their argument is that outreach should not be measured by just total number of clients but it should rather be based on the number of poor clients, besides, according to Ledgerwood (1999) the number of borrowers or clients as a measure of outreach considers only the total number of clients served from various products of MFIs without their comparative altitude of poverty, thus, average loan size has been used as a proxy measure of depth of outreach using comparative level of poverty, smaller loans designate poorer customers (Mersland and Strom, (2009); Cull et al., (2007), argued that average loan size does not consider the relative number of the poorest with small loan sizes, moreover, the majority of microfinance clients may be average poor or non poor whose loan sizes are relatively large and, therefore, could easily influence the computed average loan size figure. Woller and Schreiner (2002), the relationship between depth of outreach and financial self-sustainability is multidimensional, in their study they established that depth of outreach has a positive relationship with financial self-sustainability. In the elaborative studies of Woller and Schreiners' finding put evidence against a wide spread belief that small loans are highly risky and associated with lower financial sustainability, moreover, Cull et al., (2007) designate that institutions that make small loans are not less profitable compared to those making bigger loans, and the study by Paxton (2003) confirms that there is a negative correlation between depth of outreach and subsidy dependency index, this exhibits that there is a positive relationship between profitability and depth of outreach, opposing to the above, Hulme and Musley (1996) point out that delivering small loans to the poor and the fairly hard-to-reach clientele is inherently costly

2.3 Relationship between Sustainability and outreach

There is disagreement on the relationship between MFI sustainability and outreach, both for-profit and non-profit MFIs face challenges to balance sustainability and outreach, profit oriented MFIs face the question of whether they can develop innovations that reach poorer households without compromising profits. Cull R, Demirguc-Kunt (2009) noted that nonprofit MFIs face the question of whether their social and economic impact is large enough to justify

and ensure continued support, while Meyer RL (2008) argue that outreach and financial sustainability are complementary, as the number of customers increase, MFIs benefit from economies of scale and, hence, reduce costs that help them achieve financial sustainable. The additional work of Fernando NA (2004) analyzes 39 transformed MFIs and finds that their financial positions improved without affecting their mission, Cull R, (2009) examines financial performance and outreach in a large comparative study based on a dataset of 124 microfinance institutions in 49 countries, their results suggest MFIs that primarily, provide individual loans perform better in terms of profitability, but magnitude of poor and female borrowers in the loan portfolio are lower than for institutions that primarily provide group loans. Woolley J (2008) finds some institutions perform financially better in terms of outreach without being affected by domestic GDP growth, by using random effects panel data estimations, Mersland R, Strom RO, (2010) study finds no difference between non-profit organizations and shareholder firms in financial performance and outreach; they find outreach is lower in the case of lending to individuals than with group lending, in other studies, there appears to be an inverse relationship between MFI outreach and financial sustainability, the argument is that higher outreach means higher transaction costs to gather information about client creditworthiness, making MFIs financially unsustainable, PaxtonJ, Graham D, Thraen C, (2000) argues there is a trade-off between serving the poorest segments and being financially solvent since transaction costs associated with smaller loans are high in comparison to larger loans. in addition, Conning (1999) expressed that, getting to the poorest of the poor is more expensive than getting to other segments even when there are no fixed lending costs; leverage is much harder to attain for MFIs that target the less profitable market, similarly, Khalily (2006) argues the high transaction costs of providing financial services to the doorsteps of borrowers and limited size of operations and make the process of ensuring sustainability difficult, however, sustainability is achievable through efficient management and product diversification.

3. Data Methodology

The data source was collected from Mix market, a web-based platform which contains elaborate financial information for MFIs, Mix market provides information about MFIs covering standard financial performance indicators and audited report globally, it is the most reliable source for most researchers in the field of microfinance and has publicly available information, most of the MFIs provide copies of their financial statements on sustainability and outreach reports to Mix Market, which in turn converts the individual local currency figures into United States dollars using the prevailing exchange rate, next, they transform the information from the financial statements on sustainability and outreach reports into a list of standardized financial variables that are publicly available from their database. Hartarska and Nadolnyak (2007), Hisako (2009) and Manos and Yaron (2009), Quayes, (2012); (Hermes et al., 2011; Ayayi and Sene, 2010; Cull et al., 2007) have used data from Mix Market. This research looks at the determinants of microfinance sustainability and outreach for 30 Sub Saharan Africa Countries, from 2008-2018, after adjustment for missing data, we have information for 200 MFIs over period under study out of full sample of MFIs that reported to the database during the period for those countries, the country's selection was purely based on data availability, correctness and quality, however, it is important to admit the inadequacy of the data supply in some countries. The Tables below is a representation of microfinance sample distribution by region, year and countries involve in the sample as well as variables descriptions.

3.1 Sampling Distribution

Table 2: Microfinance by Region in Sub Saharan Africa

Region	Number of MFIs	% of the sample
Eastern Africa	58	29
Central Africa	32	16
Southern Africa	56	28
Western Africa	54	27
Total	200	100

Table 3: MFIs by year in Sub Saharan Africa

Year	Number of MFIs	% sample distribution
2008	5	2.5
2009	20	10
2010	11	5.5
2011	30	15
2012	14	7
2013	9	4.5
2014	20	10
2015	20	10
2016	13	6.5
2017	33	16.5
2018	25	12.5
Total	200	100

Table 4: Sampled Countries

Chad	Zambia	Togo
Mali	Senegal	Ivory Coast
Gabon	Rwanda	Uganda
Swaziland	Angola	Liberia
Cameroon	Sierra Leone	Benin
Kenya	Ethiopia	Namibia
DR Congo	Tanzania	Burundi
Nigeria	Burkina Faso	Gambia
South Africa	Niger	Guinea-Bissau
Malawi	Ghana	Djibouti

Table 5: Variables Description

Variables	Description	Modeling	Literature and Expectations
Sustainability Index	Measurement index for sustainability derived from profit margin, OSS and ROA	SUS	OSS, Profit margin and ROA
Outreach Index	Measurement index for outreach derived from percentage of female clients and average loan size	OUT	Percentage of Female borrowers and Average loan Size
Return on Assets	Net operating Income after taxes/Total assets	ROA	(Morduch 2000) and Cull et al (2007) found trade-off between profitability and outreach when MFIs reach to clients below poverty line because penetration to poor segment implies higher lending cost and lower profitability. We expect negative association between profitability and depth of outreach. Shakil Guayes (2012) also found trade-off between outreach and financial sustainability
Profit Margin	Net operating Income/Financial Revenue	PRO	Morduch (2000), Woller et al (1999) argue that MFIs can achieve sustainability without achieving self sufficiency because donation is a form of equity
Operational Self-	Financial Revenue / (Financial Expense +	OSS	Adhikary and Papchristou (2014) found that financial

sufficiency	Impairment Loss + Operating Expense)		sustainability and outreach relates positively
Female Clients	Percentage of borrowers who are women	PFB	Strom (2010), Boehe and (Cruz 2013) argue that focusing on female borrowers supplement sustainability and outreach
Average Loan Size	Gross Loan Portfolio/Number of active borrowers	ALS	(Zeller 2010), Hulme and Morley (1999) found that small loan size with shorter repayment period favor the poor but with higher cost of monitoring, screening and administration
Write-off Ratio	Adjusted value of loans written off /Adjusted Average Gross Loan	ROR	Despallier et al (2011) stipulate that focusing on female borrowers is connected with small degree of write-off. We expect female borrowers to be positively related to outreach Hermes et al (2011) argue that focusing on female borrowers increase chance of loan repayment which affect sustainability of MFIs
Operating Expense	Adjusted Operating Expense / Adjusted Average Gross Loan Portfolio	OE	Daniel Nyamsongorom (2010) found that operating expense strongly affect sustainability. Dissanayake (2012) Srilankan MFIs found significant negative relationship between operating expense and sustainability and conclude that OE is a significant predictor of OSS
Gross Loan Portfolio	Outstanding principals due for all outstanding client loans.	GLP	Okumu (2007) found negative impact of gross loan portfolio on MFI sustainability
Yield on Gross Portfolio	(Yield on Gross Portfolio (nominal) - Inflation Rate) / (1 + Inflation Rate)	YLP	Nadiya (2011) found that sustainability of MFIs depends on how much interest income they earn from operation and they recommend that MFIs should set interest rate which cover total cost ie transaction cost and default cost
Deposit mobilization	Percentage of to gross loan portfolio	DEMO	Marwa (2015) found deposit mobilization negatively influencing financial sustainability and conclude that it is due to too much saving than loan
Mature MFI	Dummy variable, Mature MFIs=1, New and Young MFIs=0	Mature MFIs	Gonzales(2007), Robinson (2001) found AGE of MFIs relating to sustainability positively
New MFI	Dummy variable, New MFIs=1, Mature and Young MFIs=0	New MFIs	Gonzales (2007) found that new MFIs perform poorly in terms of outreach compare to old MFI- experience matters
Not-for-Profit MFI	Dummy variable, Not-for-profit MFIs=1,for profit MFIs=0	Not-fo-profit	Morsland, R Strom Ro,(2010) found no difference between for-profit and not-for profit MFIs and they conclude that outreach is more lower in individual lending than group lending

3.2 Empirical Methodology

This study adopts three-Stage Least Squares (3SLS) which was developed by Zellner & Theil in their 1962 paper, it combines 2SLS + SURE, the first step is to get an equation which is comparable to the 2SLS estimator, consider a general linear model containing G jointly-dependent endogenous variables with K predetermined variables where the i^{th} equation is,

$$Y_i = Y_i\beta_i + X_i\gamma_i + u_i \tag{i}$$

Where y_i is an $n*1$ vector of sample observations on dependent variable in the i^{th} equation, i is an $n*g_i$ matrix of observation on other endogenous variable, Y_i is variable in the equation, X_i is an $n*k_i$ matrix. This can be written as

$$Y_i = Z_i\delta_i + u_i \tag{ii}$$

The 3SLS estimator of δ is then:

$$\delta_{3SLS} = (W'V^{-1}W)^{-1}W'V^{-1}w \tag{iii}$$

$$Asyvar(\delta_{3SLS}) = (W'V^{-1}W)^{-1} \tag{iv}$$

Zellner A. and Theil H., 1962. Three-Stage Least Squares: Simultaneous Estimation of Simultaneous Equations. *Econometrica*, Vol. 30, No. 1. pp. 54-78.

It is important to note that one of the primary purposes of this study is to deal with the problem of simultaneity between sustainability and outreach we took the three-stage least square (3SLS) system as appropriate methodology because, under general condition, it is asymptotically more efficient than 2SLS. The two-staged least square (2SLS) is also practically advanced in dealing with simultaneity and endogeneity, this fondness is owing to the fact that the 3SLS is an amalgamation of the 2SLS and seemingly unrelated regressions (SUR), while, the 2SLS part deals with the relationship between the unobserved error term and the regressors (Basmann, 1957), the error terms in each system of equation encompasses in the investigation may be correlated and consequently, the need to description for this, this takes us to the third stage of 3SLS, which practically include the SUR element, the SUR element report for the correlation between the error terms of the equations (Zellner, 1963), Particularly, we have to specify our equations in systems or simultaneous order as follow,

3.3 Model Specification

$$SUS_{it} = \alpha_1 + Y_{OUT_{it}} + \beta_1 ROR_{it} + \beta_2 OE_{it} + \beta_3 YLD_{it} + \beta_4 DEMO_{it} + \beta_5 AGE_{it} + \beta_6 PRO_{it} \dots (v)$$

$$OUT_{it} = \alpha_1 + Y_{SUS_{it}} + \beta_1 OE_{it} + \beta_2 YLD_{it} + \beta_3 DEMO_{it} + \beta_4 GLP_{it} + \beta_5 AGE_{it} + \beta_6 PRO_{it} \dots (vi)$$

Where, **SUS**: mean sustainability and is measured by (OSS, ROA and profit margin), for all of these three benchmark indicators, an increase in ratio advocates superior results, consequently, in building the measurement index, we first scale the observations in each variable, allowing all observations to fall between 0 and 1, the lowest observation is assigned to 0 and the highest to 1, and all other observations are scaled to fall between 0 and 12, after scaling the variables, we take the average of the scaled values to get our measurement index, normally, **OSS >1, or 100%**, and for operational self-sufficiency (OSS), values below 1 indicate that the respective MFI is not covering costs from operating revenues, **OUT**: mean outreach and is measured by (percentage of female borrowers and average loans size), consequently, for average loan size, it is anticipated that, the smaller the value, the greater the level of outreach, since smaller loans reflect better outreach, we therefore used a scaling approach which assigns a value of 1 to the lowest observed value and 0 to the highest observed value, the average of these two variables is then taken to get our measurement index, **OE**: is Operating expense; this variable is considered an effective indicator and is given by the ratio of the operating expense to adjusted gross loan portfolio, **YLD**: is the yield on gross portfolio and it is widely considered in the literature as a measure of interest rates faced by customers, **DEMO**: is deposit mobilizations, this variable explained the number of savings and deposits held by clients of MFIs, **AGE**: is MFI age dummy, based on the information provided by the MIX, we adopt dummies for new MFIs and mature MFIs in our model, leaving out young MFIs as the omitted type to stop multi-collinearity problems. We hypothesize superior results for older MFIs. This proposition is informed by the assumption that older MFIs usually have the merit of familiarity and also a stronger existence supported by a huge number of employees and offices, **PRO**: is MFI profit status dummy and we added a dummy for not-for-profit MFIs, our arrangement is to scrutinize the authenticity of subjective proof in the conventional way which suggests that not-for-profit MFIs are habitually more concerned with the social goals and as a result, would do better in terms of outreach, **GLP**: is gross loan portfolio and it is anticipated that an increase in gross loan portfolio would lead to an increase in outreach, since the sustainability of MFIs does not depend on the gross loan portfolio, **ROR**: is write-off ratio and following usual common sense, we anticipate that as the write-off ratio of a MFI increases, the level of sustainability would reduce. In this research, we

initiate two sets of IVs given that we have two endogenous variables, sustainability and outreach, to deal with, for sustainability, we take cost per loan and administrative expense ratio as instruments, depending on the measure of sustainability in use, these IVs are considered effectual measures in microfinance, as a result, they are highly correlated with sustainability but not with outreach (average loan size). For outreach, we use average outstanding loan balance and assets as instruments, the assets of MFIs include the number of offices they have and this is correlated to outreach as an increase in the number of MFI offices reflects positively on outreach, the legitimacy of using assets as an instrument for outreach is probably controversial, for example, it can be debated that with assets as an instrument for outreach may not be appropriate as it is likely that assets are associated with sustainability, given that return of assets (ROA) is a sustainability measure, despite the fact that the correlation between ROA and sustainability may be valid, assets do not have direct correlation with sustainability, assets reflect the magnitude of capital that MFIs possessed to reach out to the poor, on the other hand, ROA is a ratio, which is a complete change of both assets and net income, consequently, while it may be correlated with sustainability, the asset element of the ratio does not have a correlation with sustainability.

4. Descriptive Statistics

In this section, we illustrate and discuss the outcomes of descriptive statistics, hypotheses tests, regression results, implications and their analysis on both dependent and independent variables, the presentation is done mainly for the years under investigation, which is 2008-2018, means, minimum and maximum were used to analyze descriptive statistics.

Table 6: Descriptive Statistics

Variable	Description	Mean	Std Dev	Min	Max
Sustainability Index	Measurement index for sustainability derived from profit margin, OSS and ROA	0.624	0.078	0.288	0.811
Outreach Index	Measurement index for outreach derived from percentage of female clients and average loan size	0.521	0.187	0.019	0.954
Return on Assets	Net operating Income after taxes/Total assets	1.005	1.080	-4.505	3.734
Profit Margin	Net operating Income/Financial Revenue	2.397	1.038	-2.696	3.812
Operational Self-sufficiency	Financial Revenue / (Financial Expense + Impairment Loss + Operating Expense)	3.577	0.357	3.547	5.398
Female Clients	Percentage of borrowers who are women	49.549	35.492	0.530	99
Average Loan Size	Gross Loan Portfolio/Number of active borrowers	6.684	1.005	3.312	7.451
Write-Off Ratio	Adjusted value of loans written off /Adjusted Average Gross Loan	0.396	1.487	-4.705	6.301
Operating Expense	Adjusted Operating Expense / Adjusted Average Gross Loan Portfolio	148.829	216.852	5	2246
Gross Loan Portfolio	Outstanding principals due for all outstanding client loans.	14.495	1.885	7.354	19.108
Yield on Gross Portfolio	(Yield on Gross Portfolio (nominal) - Inflation Rate)/ (1 + Inflation Rate)	24.093	19.404	-23.08	158.39
Deposit mobilization	Percentage of to gross loan portfolio	9.564	40.444	0	402.525
Mature MFI	Dummy variable, Mature MFIs=1, New and Young MFIs=0	0.508	0.468	0	1
New MFI	Dummy variable, New MFIs=1,Mature and Young MFIs=0	0.158	0.381	0	1
Not-for-Profit MFI	Dummy variable, Not-for-profit MFIs=1, for-profit MFIs=0	0.507	0.389	0	1

The table above demonstrates that MFIs in sub Saharan Africa are sustainable and therefore capable of generating revenues for their self operation, this evident from the fact that all indicators of sustainability (OSS, ROA and profit margin) have a mean value of 1 and above. For average loan size, the smaller the size of the loan, the shorter the repayment period which favor the poor and therefore demonstrate greater level of outreach, the mean value for average loan size is 67% which is above average and indicates that loans are too expensive for the poor to afford and this favor the wealthy clients, in addition, the mean value for female borrowers is 50% indicating average level of outreach to female borrowers

4.1 Discussions of the Results

The table (7) below demonstrates 3SLS results for the relationship between the sustainability and outreach of microfinance institutions and institutional factors that determine them, the results are discussed as outlined in column (1-7)

Table 7: Sustainability and Outreach Determinants (A)

(1)	(2)			(3)			(4)	
VARIABLES	SUSTAIN	OUTREACH	OSS	Loan Size	OSS	Female	Profit M	Loan Size
Sustainability	-	-1.2964*** (0.1267)	-	2.0275*** (0.1794)	-	-25.6935*** (3.3486)	-	0.4567*** (0.0837)
Outreach	-	-	0.29045*** (0.0189)	-	0.0324*** (0.0052)	-	0.5236*** (0.1029)	-
Write-off Ratio	-0.0104** (0.0025)	-	-0.0295** (0.0089)	-	-0.0179 (0.0160)	-	-0.1032** (0.0373)	-
Operating expense	-	-0.0004*** (0.0000)	-0.0006*** (0.0000)	0.0025*** (0.0001)	-	-0.0244*** (0.0030)	-0.0005*** (0.0003)	0.0014*** (0.0001)
Yield	0.0013*** (0.0002)	0.0040*** (0.0004)	0.0020*** (0.0002)	-	0.0083*** (0.0028)	0.0170*** (0.0041)	0.0014 (0.0047)	-0.0069** (0.0017)
Deposit mobilization	0.0000 (0.0001)	0.0000 (0.0001)	0.0000 (0.0003)	-0.0005 (0.0006)	-0.0000 (0.0008)	-0.0050 (0.0248)	0.0007 (0.0015)	-0.0006 (0.0004)
Mature MFI	-0.0088 (0.0065)	-0.0076 (0.0145)	-0.0516 (0.0396)	0.1209 (0.0784)	0.0886 (0.0728)	2.4905 (2.4708)	-0.0637 (0.1846)	0.0908 (0.1147)
New MFI	-0.0432** (0.0149)	-0.0401* (0.0280)	-0.1486*** (0.0493)	0.3006*** (0.1343)	0.0490 (0.1217)	1.8405 (4.0378)	0.3633 (0.2289)	-0.2057 (0.1543)
Not-for-Profit	-0.0138** (0.0064)	-0.0168* (0.0176)	-0.0827*** (0.0270)	0.1488*** (0.0787)	-0.0086 (0.0756)	-0.0396 (1.3914)	-0.3929*** (0.1241)	0.2888*** (0.1005)
Loan Portfolio	-	-0.0159*** (0.0036)	-	0.0564*** (0.0201)	-	0.0187 (0.4628)	-	0.1520*** (0.0361)
Constant	0.8856*** (0.0254)	1.6460*** (0.0979)	3.0918*** (0.1270)	-	5.8422*** (0.6584)	6.5007*** (0.2310)	149.1595*** (19.5354)	-0.9002 (0.3240)
Time Dummies		Yes		Yes		Yes		Yes
Observations	432	432	432	432	432	432	265	265
<i>Diagnostic Tests for IV Estimations</i>								
First Stage F-Stat	42.25***	66.58***	32.92***	140.85***	33.92***	10.58***	10.54***	79.55***
Partial R-squared	0.5422	0.6424	0.4795	0.6962	0.4815	0.2187	0.3340	0.6938

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

The results demonstrate that there is a trade-off between sustainability and outreach in Sub Saharan Africa, this is consistent with arguments of Paxton J, Graham, D Thraem C (2000) who found trade-off between serving the poorest segments and sustainability, foremost, for first column, which described the association between the sustainability and outreach, we view that the degree of the coefficient different demonstrates that the negative influence of sustainability on outreach is greater compare to what is seen in the case of the influence of outreach on sustainability, this finding contradicts the studies of Kipesha and Zhang (2013), who did not find trade-off in their analysis of the relationship between MFIs outreach and sustainability in east Africa, these differences can be attributed to number of variables undertaken for studies and extend of geographical coverage, from this, we deduced that paying attention to sustainability in Sub Saharan Africa is tremendously unfavorable to the social goals of microfinance and this reveals a rigorous mission drift when MFIs endeavor to achieve sustainability and consequently, MF that endeavor to become operationally self-sufficient do poorly in terms of achieving considerable level of outreach.

As of second column, we view that at the 1% significance, there is a significant association between OSS and ALB, results specify that an increase in OSS is related with an increase in average loan size, this is consistent with the finding of Kipesha and Zhang (2013) who found similar association but do not found trade-off, similarly, Sustainability has a negative effect on outreach and therefore, MFIs which are operationally self-sufficient (OSS), have superior average loan sizes compare to MFIs in the contrary, the outcome of this study therefore, contradicts some arguments in literature which demonstrates complementary relationships between sustainability and outreach, in essence, a 1% increase in the average loan size results in an estimated 0.29% increase in OSS, additionally, a more rigorous result is seen in the other trend, where a 1% increase in OSS produced 2.03% increase in the average loan size, accordingly, our results specify that MFIs that give bigger loans turn out to be sustainable, and this is obvious from the positively significant coefficient elucidating the results of average loan size on sustainability.

Third column portrayed a negative association between OSS and the number of female borrowers of MFIs, at this point, we view that a 100% change in OSS produced a 25.7% reduction in the percentage of female borrowers, this is consistent with Khalily (2006) argument, detailing that cost of providing financial services to the doorsteps of the poorest category of borrowers makes sustainability difficult, furthermore, we realized that a percentage change in the percentage of women borrowers produced up to 3.24% increase in OSS, this demonstrates that self-sufficient MFIs have a propensity to stay away from a huge number of female clients, moreover, the negative influence on sustainability as characterized by MFIs with great effort to reach out to female clients is trivial, specifically, women are more often than not considered susceptible in society; therefore, capacity building for women is considered one of the crucial social goals of MFIs. With this understanding in mine, bigger numbers of female clients are projected to be benchmark of good recital in terms of significant level of outreach. In the same way, it is projected that women would go for smaller loans in order to augment appropriate administration, based on this indulgent, MFIs with the mean of serving small number of female clients can be seen as drifting away from the mission of women capacity building, in addition by means of the profit margin as benchmark variable for sustainability in fourth column, we also observed that there is a trade-off between sustainability and average loan size, this finding is also consistent with Kipesha and Zhang (2013) who reached the similar conclusion on their studies MFIs of Eastern Africa and

contradicts Shakil Guayes (2012) findings who found no trade-off between average loan size (ALS) and financial sustainability when he analyzed 702 MFIs from 83 countries, at this juncture, we view that MFIs with bigger profit margin or more profitable MFIs have bigger average loan sizes, likewise, average loan size has a negative result on profit margin correspondingly, this is consistent with the findings of Morduch (2000), Cull et al (2007) who found negative association between profitability and average loan size, in essence, bigger loans are associated with bigger profit margins, in actual fact, the results demonstrate that up to 100% increase in profit margin leads to an estimated 46% increase in average loan size, correspondingly, up to 100% increase in average loan size result to up to 52% enhancement in financial performance.

Analogously, association is observed for ROA's relationship with average loan size as demonstrated in column six in the table 8, this confirmed that profitable MFIs execute very poorly in terms of outreach, however, MFIs that are extra vigilant on their social goals, despite the fact that, they perform weakly in sustainability, they are not excruciatingly affected in terms of profitability taking into consideration the outreach result of sustainability, this argument is consistent with that Morduch (2000) and Woller (1999) who argued that MFIs can still achieve sustainability without financial self sufficiency and elaborated that donation is a form of equity to keep them sustainable even when they pay keen attention to their social goal, the deductions drawn from results demonstrated in (column 5 and 7 table) are not unusual, we see that as the number of female borrowers increase, there is a reduction in the profit margin and returns on asset of MFIs, this contradict the finding of Strom (2010), Boehe and Cruz (2013) who argued that focusing on female borrowers supplement sustainability and outreach, moreover, MFIs with bigger profit margins and returns on assets serve a small number of female clients, the outcomes from this research do not sustain the opinion advanced forwards by the advocates of the sustainability theory, for real, as seen from the empirical evidence, the twofold goal of sustainability and outreach are not complementary, as sustainability does not encourage the social mission of MFIs and this contradicts Morduch (2000) argument. Many point of view offered by the proponents of the sustainability theory, which leads to the winding up that increasing the level of outreach can significantly happen when MFIs are sustainable, does not support the narrative in the context of MFI in Sub Saharan Africa, in detail, if MFIs would perform in the significance of effectiveness, concentrating on outreach appear more sensible than concentrating on sustainability given that the negative effects felt while concentrating on outreach is trivial while indisputably there is a trade-off between these two goals, there is a greater unpleasant effect on outreach when MFIs become sustainable, our outcome implies that sustainability does not assure a triumphant end of outreach increase as proposed by the advocates of the sustainability theory, still though, concentrating on achieving sustainability, MFIs still discover it tough to accomplish this goal and in the progression, drift away from the social goal, in fundamental nature, we come to the contentious finish that decreasing outreach is not the most excellent way to accomplish sustainability, in reality, bearing in mind the weaker effects of an increase in outreach on sustainability, we maintain that the repeated existence of subsidies to sustain the performance of MFIs might result to a more effective performance in which outreach is expanded and MFIs stay in operation, though this may not appear like a suitable long term arrangement to sustain the MFIs sector, it appears to be a more practicable resolution than the sustainability theory of concentrating on profitability to the damage of outreach. The truth remains that donor finances may dry out and the prolongation of subsidies can be condensed, consequently, a prospective part of future research with momentous policy recommendations

for developing economies is to study how the microfinance industry can practice sustainability without harmfully influencing outreach performance.

Table 8: Sustainability and outreach Determinants (B)

VARIABLES	(5) Profit M	(6) Female	(6) ROA	(7) Loan Size	(7) ROA	(7) Female
Sustainability		-8.1361*** (2.5754)		0.3922*** (0.0673)		-5.5794*** (2.3452)
Outreach	-0.0198* (0.0187)		0.4661*** (0.1053)	-	-0.01919* (0.0180)	-
Write-off Ratio	-0.0764* (0.0643)		-0.0659*** (0.0368)	-	-0.0835*** (0.0530)	-
Operating expense	-0.0007 (0.0005)	-0.0182*** (0.0064)	-0.0021*** (0.0004)	0.0024*** (0.0002)	-0.0006* (0.0004)	-0.0183*** (0.0052)
Yield	0.0034 (0.0080)	0.2831*** (0.0766)	0.0165*** (0.0055)	0.0129*** (0.0024)	0.0145*** (0.0044)	0.3324*** (0.0712)
Deposit mobilization	0.0014 (0.0011)	0.0194 (0.0254)	0.0005 (0.0010)	-0.0004 (0.0006)	0.0011 (0.0013)	0.0046 (0.0256)
Mature MFI	0.1166 (0.1408)	4.4404 (3.8144)	-0.0583 (0.1704)	0.0279 (0.1251)	0.0616 (0.1724)	3.5846 (3.3524)
New MFI	0.2844 (0.3432)	2.7511 (7.8772)	0.2654 (0.1972)	-0.0547 (0.2054)	0.3522 (0.3006)	3.4321 (6.5303)
Not-for-Profit	-0.1851** (0.1833)	-4.5462 (3.2882)	-0.2655*** (0.1247)	0.3243*** (0.0892)	-0.2812** (0.1289)	-3.2525 (3.1972)
Loan Portfolio		-2.8791*** (1.1878)	-	0.1882*** (0.0235)	-	-2.2159** (1.0565)
Constant	3.5986*** (0.6644)	120.9003*** (19.5245)	-2.5242*** (0.6412)	2.4912*** (0.5242)	1.6635*** (0.5932)	85.5632*** (16.8744)
Times Dummies		Yes		Yes		Yes
Observations	262	262	263	263	263	263
<i>Diagnostic Tests for IV Estimations</i>						
First Stage F-Stat	28.99***	76.95***	12.86***	70.34***	15.66***	45.88***
Partial R-squared	0.3264	0.1895	0.3695	0.6945	0.3496	0.1952

Standard errors in parentheses

*** p<0.01, ** p<0.05, * p<0.1

Looking at the regressions depicting relationship between control variables and our endogenous variables, we view that at 5% significance level, there is a negative and significant relationship between write-off ratio and sustainability in the (1st and 2nd column), and at the 1% level for (column 6th and 7th), in column (4th), we view a significant negative relationship at the 5% while, on the opposite, there is no significant relationship in the case of (column three) at any significance levels, bearing in mind these results, we can illustrate a wrapping up that there is a negative association between write-off ratio and sustainability. Write-off ratio is perceived as an evaluation of default and as expected, an increase in this ratio has an unpleasant effect on sustainability and other financial performance estimations, therefore, an increase in the default rates confirm that considerable segment of the loan portfolios are at risk and this would negatively influence the profitability indicators of MFIs, in addition, with high cost of giving out small loans, an increase in the write-off ratio indicates the prospect of MFIs having trouble in covering administrative expenses. Furthermore, operating expense ratio (OE) recorded a negative coefficient, as expected, with sustainability and profitability, this finding are consistent with that of Daniel Nyamsongorom (2010) who found operating expense to strongly affect sustainability and Dissanake (2012) who in Sri Lankan MFIs identifies negative relationship between operating expense and sustainability as OE is statistically significant

at 1%, this suggests that an increase in OE decreases the operational sustainability of MFIs in SSA and vice versa, it therefore important to note that administration of operational expenses is, therefore, central to attaining microfinance sustainability and this result supports previous conclusion by Kosmidou (2008) who found poor expense management as a factor that impedes MFIs profitability. For column which do not comprised average loan size as the measure of outreach (column 1, 3, 4 and 7), we discover that operating expense has a negative effect on both sustainability and outreach, this is also the case for results demonstrated in (column 2, 4 and 6), in these columns, we view a positive effect of operating expense on average loan size, this demonstrates that as operating expense increases, average loan size increases, consequently, across all columns, operating expense has a negative influence on both endogenous variables, on the other hand, there appear to be a weaker negative influence on sustainability and profitability measures, clearly, operating expense is an appropriate measure of efficiency and effectiveness of managerial agility in loan recovery process and with a greater negative effect of operating expense on outreach, it can be characterized that when the operating expense is soaring, MFIs are anticipated to have high cost of administrations arising from increased expense.

As anticipated, empirical outcome specify a positive relationship between yield and sustainability, we view that at the 5% significance level, there is a positive relationship between yield and all measures of sustainability and profitability transversely in all columns, this is consistent with Nadiya (2011) finding that found significant relationship between yield and sustainability and elaborate that how much interest income earned from operation determine sustainability of MFIs, in essence, large interest rates have long been related with profitability and it is not astonishing that this is the true for microfinance institutions as well, however, this fundamentally show the magnitude up on which the enhancement of soaring interest rates influence profitability as the results position out, it is at the same time demonstrated that there is a positive relationship between yield and all measures of outreach. All of a sudden, we view that there is no significant relationship between the variable deposit mobilization and all measures of sustainability and that of outreach, traditionally, it is anticipated that for lenders, an increase in savings impart adequate credence for extension and also profitability, nonetheless, for microfinance in Sub Saharan Africa, the results depict interestingly otherwise, this contradicts the finding of (Marwa 2015) who found negatively significant relationship between financial sustainability and outreach of Tanzanian microfinance, and this could probably be as a consequent of the methodological approach and variable undertaken for studies. Deposit mobilizations reflect a number of parameters including savings of clients MFIs administer and saving, moreover, the majority MFIs has unavoidable loan reimbursement schemes and loan repayments deposited by customers to the MFIs are also identified by this variable, owing to model scope, we cannot come to a strong closing statement that an increase in savings has no influence on the sustainability or outreach of MFIs, nevertheless, our results point to the likelihood of such an observable truth in Sub Saharan Africa, we can only deduce that there is high evasion rate by clients or MFIs keep in custody too much cash without giving them as loadable funds.

We at this juncture consider the effects of the dummies for MFI age and profit status on sustainability and outreach, looking to the effects of MFI (AGE) on sustainability and outreach, we discover that in nearly all cases, the age of a MFI has no significant effect on sustainability and average loan size and this contradict Gonzales (2007) and Robinson (2001) who found

positive significant relationship of (AGE) with sustainability citing to the fact that more experience MFIs are likely to be sustainable, conversely, where a significant association exists, new MFIs perform extremely poorly in terms of sustainability and profitability, this is not astonishing given that new MFIs normally experience demoralizing challenges of breaking even and submission to the managerial costs, furthermore, outcome from second (column) show that new MFIs are also challenged with complexity in giving out small loans.

In addition, we discover that when the dummy for not-for-profit MFIs shift from 0 to 1, there is a reduction in both sustainability and outreach, the unfortunate performance of not-for-profit MFIs in term of sustainability and other profitability measures is estimated as commonly not-for-profit MFIs are not profit sloping and depends greatly on subsidies, the unfortunate performance in term of level of outreach is to some extent a mystery bearing in mind that not-for-profit MFIs are likely to be more outreach sloping, and this is consistent with the argument of Cull et al, Dermriguc (2009) who explained that not-for-profit are face with the question of whether their social and economic impact is large enough to justify and ensure continued support, furthermore, Mersland R, Strom Ro (2010) found no difference between not-for-profit and shareholders firm in financial performances and outreach and they identify that outreach is lower with individuals lending than with group lending. Finally, gross loan portfolio (GLP) had a positive and statistically significant coefficient with average loan size and, GLP is the most important revenue source for most MFIs, a higher loan portfolio therefore, if well managed, with improved loan recovery, should lead to increased profits and hence sustainability of the institution, this finding contradict the studies of telehu (2013) but consistent with findings of Okumu (2007) who found a negative impact of loan portfolio on MFIs average loan size, there is negative association between GLP and female borrowers and return on assets, this demonstrate the cost caught up with in serving poorer clients as discussed in previous studies (Conning, 1999; lapenu and Zeller, 2001) with implications for MFIs performance, this tends to sustain the impression that, even despite the fact that women represent a greater share of MFI clients, the financial impacts of the program on their welfare are less sustainable, as view the gross loan portfolio of MFIs increase, there is a decrease in outreach, this could be consequent to the shift from inferior clients to richer clients and also the issuance of superior loans and therefore, we find it consistent with Hermes et al (2011) who emphasized that focusing on women increase chance of poor rate of loan repayment which therefore affect microfinance sustainability.

5. Conclusions and Recommendations

The research review sample of 200 microfinance institutions from 30 Sub Saharan African countries, we adopt three-stage least square (3SLS) method, the two-staged least square (2SLS) is also a suitable mechanism in dealing with simultaneity and endogeneity problem, however, our favorite approach is the 3SLS; this fondness is owing to the fact that the 3SLS is an amalgamation of the 2SLS and seemingly unrelated regressions (SUR) and produces more efficient results, as evidence suggest, there is enormous disagreement on the relationship between MFIs outreach and sustainability, both for-profit and not-for-profit are battling to meet the challenging quest of attaining sustainability without compromising their social mission or goals. On the question of relationship between sustainability and outreach, our regression interestingly demonstrates trade-off between sustainability and outreach among MFIs in Sub Saharan Africa, the degree of different of the coefficients demonstrates that negative influence of sustainability on outreach is greater compare to what is seen in the case of influence of outreach (loan size) on sustainability, we also see trade-off between

sustainability and average loan size when profit margin was used as benchmark variable, we conclude that there is no complementary relationship between sustainability and outreach measures, additionally as evidence suggests, concentrating on sustainability in Sub-Saharan Africa is tremendously dangerous to the social goal of microfinance institutions, this therefore concurred with the mission drift emphasized in most literatures. We have also been able to identify major institutional determinants of sustainability and outreach as yield on gross loan portfolio, gross loan portfolio, operating expense and not-for-profit, the results are particularly important to policy makers and institutional managers in deciding matters of outreach and sustainability, furthermore, there is no significant indication in support of the fact that microfinance can be the final panacea for poverty alleviation in Sub-Saharan Africa. Given that the findings do not reveal a complementary relationship between sustainability and outreach among Sub-Saharan African microfinance institutions where majority of people are living below the poverty line, the recommended appropriate policy development is to concentrate more on the social welfare than on sustainability, this argument is consistent with the basic narrative of social welfarist debates, the inspiration is that top microfinance institutions worldwide supported social welfare more than sustainability as an elementary accomplishment corridor for poverty alleviation. It's also recommended that policy development should be more innovative, robust and consistently align with financial inclusion mechanisms in order to appropriately ensure extension of financial service delivery to the poor people in the region, the essence is to ensure that capital availability becomes relatively cheaper to the less privileged people because microfinance institutions are supposed to be welfare oriented than geared toward profit making motives, furthermore, for microfinance institutions to continue to operate while ensuring their sustainability consistent with social welfare, they must pay strict attention to those determinants of factors that are positively associated with sustainability, it could also be imperative to reduce huge transaction costs associated with prevention of microfinance institutions from achieving sustainability through provision of financial subsidies, (Morduch 2000) and (Woller et al 1999) argue that microfinance institutions can achieve sustainability without achieving financial self-sufficiency because they widely believe that donations that come in the form of subsidies are actually an equity. Additionally, microfinance institutions in Sub-Saharan Africa must design appropriate subsidy policy programs supported by modern technological infrastructural innovation which can help in speeding up delivery of financial services, for instance mobile money transactions which are consistent with lower cost transactions, it will make financial services cheaply available to most less privileged groups in the society. Microfinance institutions in Sub-Saharan Africa should adopt the group lending approach which is highly promoted by Grammen Bank of Bangladesh, Ghana and Kenya are some of the countries which used this model at least in Africa from my knowledge informed from literature in this research, the program emphasized cooperative capacity because it encourages joint abilities among the cooperative group, the important of this design is that it concentrates on liaison between group magnitude and social investment, the supply-side cost for information asymmetry and failure to footpath borrowers' financial evidence can be proportionately minimized.

One of the major limitations of the study was that average loan size was used as a proxy variable to measure the poverty level and the major reason for using average loan size is a lack of information in measuring the level of poverty of the recipients of credit, basically, one would like to use the income level or wealth level of the individual borrowers to measure the level of outreach, since such information on income or wealth is usually not collected by an MFI, and it is not revealed due to privacy and ethical considerations, average loan size was

appropriate and it has been used by various studies in this field, additionally, data unavailability for some countries was also challenging part of this research. This study recommend further investigation in the following areas, more research is advised in the same field but on a wider scope, probably including more countries in the region would be absolutely necessary, furthermore, more research is recommended in smaller context of smaller regions such as Eastern Africa, Western Africa and Southern Africa to see if appropriate results can be ascertain for that matter, moreover, the study scope was limited to 2008-2018 and therefore, more investigations are recommended in a bigger scope to find out if there would be any difference in effect and outcome on determinants, sustainability and outreach relationship of Microfinance in Sub Saharan Africa (SSA). In addition, this research focus on 30 countries and 200 microfinance institutions in SSA, for more investigations, recommendation is advised on individual countries by using country level data to understand specific country level determinants and MFI effect on livelihoods of the poor people, finally, microfinance is diverse discipline, and so more research could be carried out on institutional governance and competence of microfinance service deliverance as well as, human resource, program and mission of microfinance sustainability and outreach in sub Saharan Africa.

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