FINANCIAL OUTREACH AND FINANCIAL SUSTAINABILITY OF LICENSED DEPOSIT TAKING MICROFINANCE INSTITUTIONS IN NAIROBI CITY COUNTY, KENYA

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Abstract

Purpose: The purpose of this study was to investigate the relationship between financial outreach and financial sustainability of deposit taking microfinance institutions in Nairobi County, Kenya.

Methodology: The study employed a positivism research philosophy to determine the relationship between financial outreach and financial sustainability. A population of 13 licensed Deposit Taking Microfinance Institution was considered for this study. Census method was preferred due to small number of target population. A static Panel linear regression model with fixed effect was developed for both operating self-sufficiency and financial self-sufficiency. Secondary data was obtained from Central Bank of Kenya from audited financial statements. Inferential analysis method was employed using Stata statistics software then descriptive statistics tool such as mean and standard deviations were used. several diagnostic tests were conducted namely: normality, multicollinearity, heteroscedasticity, serial correlation, stationarity and Hausman.

Results: The study found that number of active clients (breath of outreach) had statistically significant relationship; Average loan size (depth of outreach) had insignificant; age of firm (experience of institution) had insignificant relationship on financial sustainability of DTMFIs in Nairobi County, Kenya. The moderating effect between credit risk management (portfolio at risk) and breadth of outreach (number of active clients) was positive while portfolio at risk and experience of institution (age) and depth of outreach (average loan size) was negative on the relationship between financial outreach and (OSS and FSS) financial sustainability. Further, loan loss provision coverage had positive interaction with number of active clients, age, and average loan size on the relationship between financial outreach and   financial sustainability of DTMFIs in Nairobi County, Kenya.

Unique contribution to theory, practice and policy: The study recommended that the government through Central Bank of Kenya should formulate policies that enhance savings with DTMFIs and therefore encourage financial inclusion. Further, DTMFIs should engage in vigorous financial education to boost financial facilities' awareness to boost the breadth of outreach and get involved in information collection and sharing to mitigate credit risk.

Key words: *Breadth of Outreach, Depth of Outreach, Financial Sustainability*

1.0 INTRODUCTION

The emergence of Microfinance can be traced back to the 1970s (Mago 2013).Then, it was used as a means to aid in the reduction of the widespread poverty situation and avail financial services to persons and families that were previously sidelined by the conventional financial system due to certain economic limitations especially lack of collaterals (Mokoros 2010). Mackie (2015) argue that the clients served by MFI were those considered to have high credit risk. Arodi (2013) defined microfinance as delivery of financial facilities to poverty-stricken, inclusive of end users and the self-employed. In 1970s when microfinance gained prominence in Bangladesh with the Grameen bank and the work of advocate Mohammad Yunus, it was geared towards addressing issues of poverty in rural areas (Donou-Adonsou & Sylwester 2016). The rising poverty levels followed the aftermath of the country's liberation war of the year 1971.As of Oct, 2011 the bank had more than 8.349 million borrowers, 97% of whom were women and had disbursed loans worth $17.733 billion since its inception to Sept, 2015.

The need to fight poverty led to emergence of microfinance institutions (Bayai 2017) and a draft of microfinance act. Gashayie (2015) prefer not running MFIs than having unsustainable program. Sustainability in this study refer to financial sustainability which means capability of a Microfinance Institution to meet its costs with earned revenue and without donors' support (Eric, 2015). Measurement of financial sustainability and its indicators have been discussed differently by past researchers.

Ayele (2015) identified frequently used measures of financial viability like: FSS, OSS and the profitability indicators (ROA, ROE). The study points that, transformation starts from operationally unviable to operationally viable then achieves financially viability (able to cover operational costs without subsidy). The study argues that, lesser funds to lend to borrowers is caused by failure to achieve OSS which hold back the survival of an MFI. The study used OSS over FSS since it was not complex measure and allowed easy verification by donors and governments.

Chikaza (2015) used Financial Self-Sufficiency (FSS) computed using financial revenue over total expenses indicating financial sustainability. The study used profitability as a measure of financial sustainability. The study points out that MFIs that relied on their earnings to stabilize operations levels and achieve certain growth targets were considered financially sustainable. The study found that MFIs could only be thought as sustainable depending on the capability to meet both finance and operation expenses from the generated funds, via interest rate charges.

The Formulas adopted to measure Operational and Financial self-sufficiency calculation was provided by Consultative Group to Assist the Poor(CGAP 2003) as in(Henock, 2019):

$$OSS = \frac{Operating\ Revenue}{Total\ Operating\ Expenses}$$

Operational self-sufficiency ratio determines to which extend an MFI covers all operating costs using operating revenue.

The ratio indicates the degree an MFI can sustain, and the break-even point is 100 %. The ratio excludes non-operating revenues and subsidies. When an MFI achieves OSS ratio significantly higher than 100 %, the institution is considered as fully self-sufficient and it does no longer need

donor's support. Operating revenues come from interest, fees and insurance paid by clients and any other MFIs investments. The rule of the thumb is OSS ratio should maintain a gradually increasing trend and avoid fluctuations.

$$FSS = \frac{Adjusted\ operating\ income}{Adjusted\ Total\ operating\ expenses}$$

Financial self-sufficiency indicator measures if the MFI is capable to recoup not only actual operating costs, but also the costs of funds and other forms of subsidies received when valued at market prices. This implies, it should withstand the value of its equity relative to inflation, to operate and grow in absence of any kind of support. Therefore, this indicator requires adjusting for operating expenses (OSS adjusted by subsidy effect). It shows that DTMFI can expand without donors' support and the break-even point is 100 %. The main differences between calculations of those two indicators are in adjusted operating expenses. OSS and FSS will be preferred over the other ratios to measure financial sustainability of microfinance bank. These ratios have been used in most standard reports and empirical studies. Operational sustainability is achieved where operational self-sufficiency level is 100% or more. While Financial sustainability is attained where operational sustainability level is 110% or more. This study used both OSS and FSS indicators for comprehensive measure of two levels (operational and financial) of financial sustainability of the DTMFIs as supported by(Khan & Hossain, 2016).

Kinde (2012) defined outreach as the capability of microfinance institution to render financial facilities to many clients and involve two major components, namely depth and breadth. Conning (1999) argued that outreach level is the effort made by MFIs to increase their products to many clients and targeting the poorest as measured by breadth and depth. Different researchers have different ways of defining outreach. Outreach idea being multidimensional has six views Meyer (2002)," depth, breadth, worth to users, cost to users, length, and scope". Schreiner defined them as follows; worth to clients is the user's willingness to pay for loans that rise as contractual conditions are more jointly harmonized to borrower's demand; cost to clients is the straight settlement for interest and fees(price costs)with cash and transaction costs(non-price costs); Depth of outreach is the worth linked by a society to the net returns from the use of financial service(s)(worth deduct cost)of a customer; Breadth of outreach is clients reached and served in number.

Jaffery and Mamoon (2017) points the major obstacles that confront microfinance are sustainability and outreach. Attaining sustainability and offering financial services to the poorest based on low income level is difficult (Kota 2007). Through experience some institutions have demonstrated the possibility of achieving both reaching the poor and being profitable consequently (Kota, Littlefield & Rosenberg, 2004). Meyer (2002) reiterate that outreach and financial sustainability are complementary. Thus, as the number of customers shoot up, MFIs benefit from economies of scale and hence minimize costs that aid them attain financial sustainability. While Hulme and Mosely (1996) argued that there is inverse relationship between outreach and financial sustainability. Thus, higher outreach shows higher transaction cost which make MFIs financially unsustainable. Different opinions on the two objectives of MFIs exist. Fernando (2004) discussed three views namely first, second and third camps.

The approval of the Risk based Supervision strategy overseeing Microfinance banks in 2010, Credit Information Sharing (CIS) in Kenya has been due to risk management Challenges from (CBK 2011) as reiterated by (Otieno & Nyagol 2016).

Progress of Deposit Taking Microfinance Institutions reported negative growth despite their increase in number of licenses given in CBK (2015) pointing decline in returns and steadiness of the sector. Further, Non-performing loans increase, Risk coverage ratio, loan loss reserve ratio coverage of portfolio reported a worrying negative trend. This indicates an association of credit risk management methods relating to Kenyan Microfinance stability and performance. Kagoyire and Shukla (2016) reiterate that, credit management practices in a financial institution contributes its Stability and profitability with poor performance signaling Weak credit quality.

Deposit Taking Microfinance Institutions in Kenya

Microfinance has its roots in Kenya in the 1980s when Church-based lending programs began (Elrahman & Saaid,2015).In 1990s non-governmental organizations arose to deliver credits and meet the increasing demand from members. During this year most, microfinance institutions transformed from reaching closed groups to more formalized entities. This led to institutionalization of microfinance and micro-credit with a necessity to change from being subsidized to commercialized institutions. K-Rep set a record of embracing this transformation thereby authorized by Central Bank of Kenya.

Kenya microfinance sector has grown over the years and its divided into three forms. The formal entities are commercial banks, non-bank financial institutions and microfinance companies. The semi-formal include co-operative societies, trusts, NGOs, and state corporations (like the Uwezo Fund and Women's Enterprise Fund). Lastly, the in-formal financial institutions cover, Rating Savings and Credit Association (ROSCAs), and Accumulating Saving and Credit Associations (ASCAs).

The Microfinance Act, (2006) (amended in 2013) by the parliament produced DTMFIs which aims to modernize the operation of the MFIs, guide on licensing distributions, minimum capital requirements, minimum liquid assets, submission of accounts to the Central Bank, supervision by the Central Bank, and limits on loan and credit facilities(Elrahman & Saaid, 2015). The 2013 amendment Bill widened several financial facilities DTMFIs to deliver. Moreover, a clear distinct is set for regulated microfinance entities and un-regulated microfinance lenders. These guidelines have boosted investor's confidence (Central bank newsletter 2006). The policy state that DTM initials should be added in the names of regulated MFIs.

The licensed DTMFIs work with public funds and contributes to poverty reduction upon compliance with the required financial sector guidelines. The regulated DTMFIs as per the Microfinance Bill have mandate to conduct third party checks, run current accounts ,operating foreign trade (Moseti 2015).Kenyan microfinance law has transformed the DTMs into microfinance bank hence a relief on their dependency on costly credits from local and international banks. Apart from DTMFIs, other providers of microfinance are regulated under Building Societies and Churches. Other feature of DTMFIs is that Central Bank of Kenya is the main supervisory authority, while the non-deposit taking microfinance operations are overseen by Microfinance Finance Unit of the Ministry of Finance. Reports from different institutions pointed on performance, outreach as institutions increased and operating self-sufficiency.

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AMFI-K (2012) found that the growth had negative trend but, number of licenses granted to DTMFI increased. However, customer deposits remained the main source of funding for microfinance banks but not uniform. Its decline in deposit funding was compensated by increased borrowings from 2014 to 2016(CBK 2015). AMFI and MFR (2013) pointed MFI sector 's Operational Self-Sufficiency (OSS) excluding banks was performing less. Despite being operationally self-sufficient in total, still donations were relied on with 73.3% raised by International partners and 26.7 % from local entities and bodies. CBK (2015) discussed the two types of Microfinance Banks: the nationwide microfinance institution (authorized to operate in any part of Kenya) and a community microfinance institution (limited to operate within one Government Administrative District, Division or any other specified region as directed by CBK). Currently, there are thirteen licensed deposit taking microfinance institutions in Kenya as their number increased from 9 in 2014 with their Headquarters in Nairobi (CBK, 2017).

Table 1 Financial Sustainability trend over the past years for DTMFIs in Kenya

YEARS INDICATORS	2012	2013	2014	2015	2016	2017
Customer deposits (KES Billions)	15.4	25.3	35.9	40.6	40.2	38.9
Borrowings (%)	34	22	12	19	23	20
OSS (%)	108	110.6	109	104	97	99

Source: (CBK Reports, 2012-2017)

CBK (2012),CBK(2013),CBK (2014) ,CBK (2015),CBK (2016),CBK (2017)

Table 1 Classification of Loan Advances in MFBs

Time (Days)	Classification	Provision (%)
1-30	Normal and watch	1-5
31-60	Sub-standard	25
61-90	Doubtful	50
91 and Above	Loss	100

Source: CBK (2017)

1.1 Statement of the Problem

Microfinance sector is very vital in the finance industry due to the role it plays of financial inclusion(Khan & Hossain, 2016). The unbanked poorest of the poor based on national poverty line continue to benefit but a gap still exist due to varied definition by institutions on the poor clients and the better-of poor hence MFIs fall into mission drift. Globally, Microfinance has been used as the way to eradicate poverty and most countries testified of their success. Mecha (2017)

reiterate that the model has been replicated across many countries solving unemployment, minimizing poverty, offering diversified financial products and services to underserved. Omondi (2019) stated that by end of 2017 almost 70 % DTMFIs reported losses and only Faulu DTMFI kept afloat.

The operational self-sufficiency and sustainability of microfinance institutions in Kenya has been under spotlight since they have been inconsistent over the years (AMFI, 2013).Operating Self-sufficiency for the sector was achieved only once in 2013 then it below threshold in 2017(see table 1.1).Despite this, Kenya has been reported with the most developed Microfinance sector in Sub-Saharan Africa(UNNU, 2013). This is due to the continued government regulations and the amendment of the microfinance act streamlining their operations. A concern on sustainability has been pointed as the portfolio at risk level continue to increase the overall riskiness of the portfolio (Chemining'wa ,2013).Majority of past studies have been done in other countries but still not conclusive on their findings (Shahzad 2015; Awaworyi and marr 2014; Kinde 2012; Quayes 2012) thus the true state of health of microfinance banks is not clear. Studies done in Kenya focused on few aspects of financial outreach and financial sustainability on DTMFIs.

Ali (2013) found presence of a strong relationship between the two variables in Kenyan MFIs. Arodi (2013) and (Karanja 2014) found a positive relationship hence increase in financial sustainability of the MFI led to an increase in outreach with majority of microfinance institutions in Kenya not financially sustainable. The current developments and steering towards vision 2030 SDGs are forcing most DTMFIs to focus more on financial sustainability. Past studies have not exploited widely on the outreach variables (number of active clients, average loan size, cost of outreach, experience of institution) neither used both OSS and FSS indicators. Also, credit risk has not been discussed as a moderating variable with key aspect of financial sustainability. This study filled the research gaps which was, financial Outreach and financial sustainability of licensed Deposit Taking Microfinance Institutions in Nairobi County, Kenya.

2.0 THEORITICAL AND LITERATURE REVIEW

2.1 Theoretical Review

2.1.1 Financial Intermediation Theory

This theory was advanced by Keynes 1930 then advanced by Mises 1971. Proponents of this theory as discussed by (Werner 2016) was of this view "The banks' operation as negotiators of credit entailing issuing loans of other people's acquired funds. Banks borrow money with an aim of lending it. Banking involves bargaining between alienors and recipients of credit. Thus, bankers only loan others' money and capitalists loan their own capital". Other popular economists tracing back to the earliest Keynes in 1930 emphasized on financial intermediaries as the role of banks as in Werner (2014) "A banker owns funds that are loanable or invest equal to a large proportion (nearly 90%) Savings deposits, thus playing intermediary role for the transfer of loan-capital.

The role of Microfinance banks of collecting and lending deposits qualify them as financial intermediaries just like non-bank financial institutions. This represents Cash-deposits whereby both depositors and borrowing-customers are served through provision of funds; pointing the two distinct sets of services offered by modern banker. Other modern finance or economic

researchers who have argued on financial intermediation theory include (Krugman 2015; Allen Carletti & Gale 2014; Stein 2014; Admati & Hellwig 2012). The discussion follow after the 2008 financial crisis as reiterated by (Werner 2016).The difference in views and contributions of popular finance and economic researchers has not yet been concluded and we must look in to the issue for settling purpose. The theory seeks to explain the position of microfinance bank as it links the borrowers and savers (indicators of outreach) which sets a strong foundation for achieving financial sustainability. Firstly, financial intermediation theory explains breadth and depth of outreach and their effect on financial sustainability. Secondly, the theory application poses the risk aspects in microfinance banks hence aided to address the moderating effect of credit risk management on financial outreach and financial sustainability.

2.1.2 Life Cycle Theory

This theory was proposed by porter 1980.Bayai and Ikhide (2016) argues that life cycle theory's application aimed in viewing the transformation and progress of firms since their formation till maturity and Product development.. In relation to this theory, DTMFIs evolve and develop despite the dual objectives similar to other firms. Bayai and Ikhide (2016b) defined LCT as a strong conception which focus on the way institutions are born, grow, mature, and finally die. The phases specifically indicate what is communalized in terms of market development, management capacity and financing structure aspects.

Further, the LCT is viewed as "maturational and generational process" (O"Rand & Krecker 1990);the footing for the funding method, marketing, costing, survival, growth and production strategies for institutions (Porter 1980) and indicate advancements in attaining financial sustainability(Innocent Bayai & Ikhide, 2016). The advancements involve the utilization of trading cash in funding operations, wholesome management, innovation, the interest rates levy on loans, minimized operating cost, low PAR equally with large stability and outreach (de Soussa & Frankiewicz 2004).

The evolution of Microfinance Bank can be discussed similar to that of NGO as argued by (Bayai & Ikhide 2016b). Startup phase: MFBs are supported via donations and concessionary funds. At this stage earnings are difficult to come since systems are being set, the customer base is not established and there is absence of experience. Thus, MFBs live on a strict fund plan, not sustainable and excluded from financial markets. Expansion phase: Emphasizes largely in broadening its operations (outreach increase) once the operational setbacks in previous stage are solved.

Consolidation stage: MFBs begin to invest in achieving sustainability (Meehan 2004). Its aim is to formalize operations (complying with guidelines which authorize amongst other things the attraction of deposits). Integration phase: MFBs get into the mainstream financial sector through transformation to formal microfinance banks. The MFB capital structure is not made of Subsidies and grants hence levels of profitability, sustainability with access to financial markets attained. The LCT is broken down into three phases as: 0– 4 years, 'new'; 4 – 8 years is termed as 'young'; age more than eight years is called 'mature'. New MFBs features include financially unsustainable and seldom make an earning but sometimes it might attain operational sustainability. Young MFBs attributes include profitable, operationally sustainable and some periods financially sustainable. For mature MFBs financial sustainability is achieved"(Bayai &

Ikhide 2016b).The LCT was applied to support the relationship of age of DTMFIs on financial sustainability in the study.

2.2 Conceptual Framework

Figure 1 shows the conceptual framework. It illustrates the variables of the research and how they relate

Independent Variables
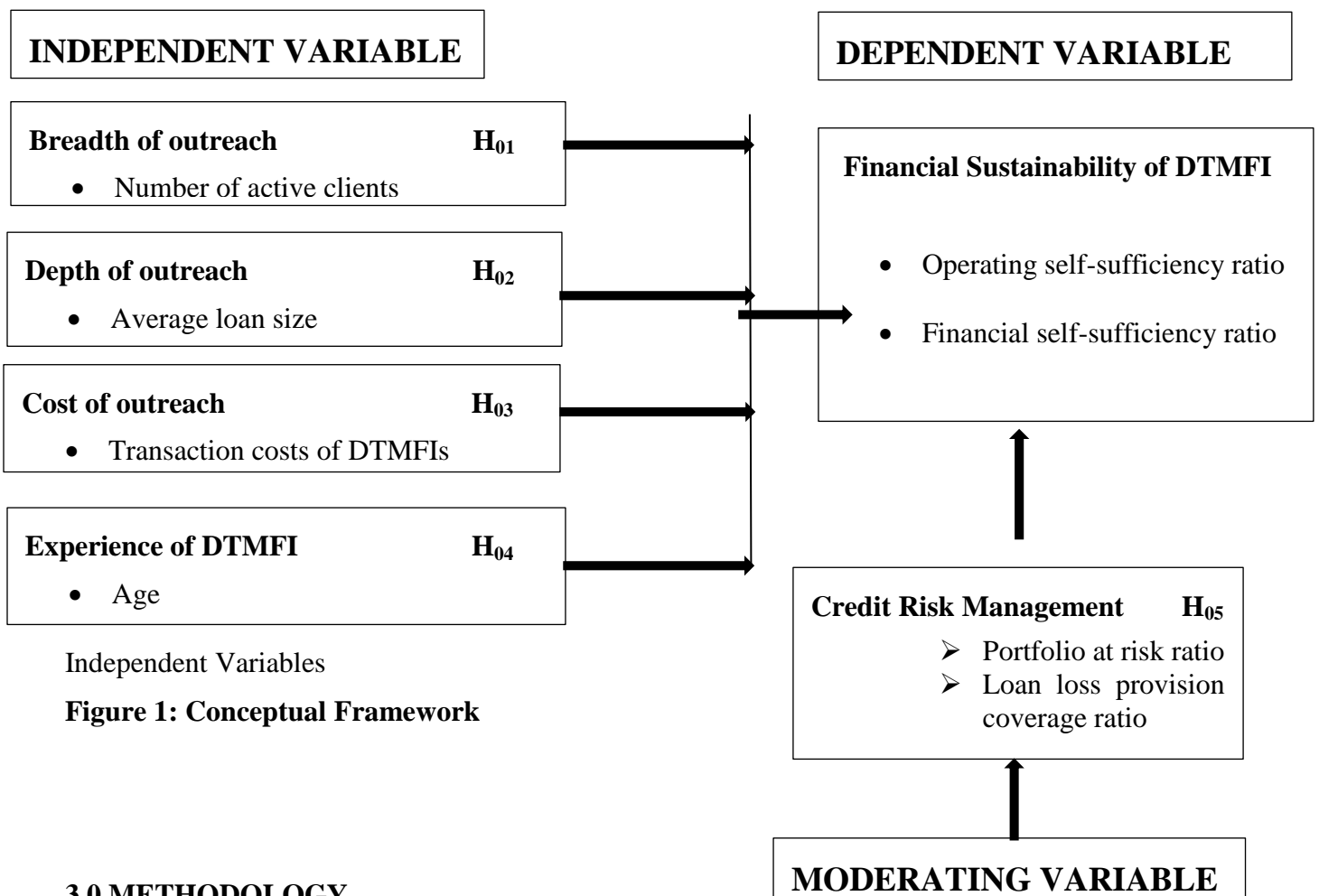
Figure 1: Conceptual Framework

3.0 METHODOLOGY

The study employed a positivism research philosophy to determine the relationship between financial outreach and financial sustainability. A population of 13 licensed Deposit Taking Microfinance Institution was considered for this study. Census method was preferred due to small number of target population. A static Panel linear regression model with fixed effect was developed for both operating self-sufficiency and financial self-sufficiency. Secondary data was obtained from Central Bank of Kenya from audited financial statements. Inferential analysis method was employed using Stata statistics software then descriptive statistics tool such as mean and standard deviations were used. several diagnostic tests were conducted namely: normality, multicollinearity, heteroscedasticity, serial correlation, stationarity and Hausman.

4.0 RESULTS

4.1 Relationship between Financial outreach and Financial Sustainability

The direct relationship between variables produced the tables below.

Table 3 Panel Regression Output for Operating Self Sufficiency

```
. xtreg oss logacc logloan ageoffirm,fe

Fixed-effects (within) regression              Number of obs      =        77
Group variable: mfi                            Number of groups   =        13

R-sq:  within  = 0.3872                        Obs per group: min =         5
       between = 0.6887                                       avg =       5.9
       overall = 0.5784                                       max =         6

                                               F(3,61)            =     12.85
corr(u_i, Xb)  = 0.4377                        Prob > F           =    0.0000
```

oss	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
logacc	5.905442	1.312038	4.50	0.000	3.28186	8.529024
logloan	-.1734852	.8795457	-0.20	0.844	-1.932246	1.585275
ageoffirm	-.9019854	1.803968	-0.50	0.619	-4.509243	2.705272
_cons	22.86902	7.881139	2.90	0.005	7.109704	38.62833
sigma_u	27.516327					
sigma_e	20.929594					
rho	.63349289	(fraction of variance due to u_i)				

```
F test that all u_i=0:       F(12, 61) =     7.01            Prob > F = 0.0000
```

Significant at 0.05 level

Source: Researcher, 2020

Table 4 Panel Regression Output for Financial Self Sufficiency

```
. xtreg fss logacc logloan ageoffirm,fe

Fixed-effects (within) regression              Number of obs      =        77
Group variable: mfi                            Number of groups   =        13

R-sq:  within  = 0.3863                        Obs per group: min =         5
       between = 0.6934                                       avg =       5.9
       overall = 0.5772                                       max =         6

                                               F(3,61)            =     12.80
corr(u_i, Xb)  = 0.4463                        Prob > F           =    0.0000
```

fss	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
logacc	5.669607	1.321125	4.29	0.000	3.027854	8.311359
logloan	.1058793	.8856373	0.12	0.905	-1.665062	1.876821
ageoffirm	-1.173339	1.816462	-0.65	0.521	-4.80558	2.458901
_cons	23.07163	7.935723	2.91	0.005	7.203166	38.94008
sigma_u	27.668578					
sigma_e	21.074549					
rho	.63284991	(fraction of variance due to u_i)				

```
F test that all u_i=0:       F(12, 61) =     6.97            Prob > F = 0.0000
```

Significant at 0.05 level
Source: Researcher, 2020

The study conducted static panel regression for both operating self-sufficiency and financial self-sufficiency as independent variables after diagnostic, transformation, and adjustments in the data. The results were presented in tables 3 and 4 above. Table 4 had (F-test=12.85, P-value=0.000), the model was fit to test the relationship between operating self-sufficiency as the dependent variable and financial outreach as the independent variable. The overall (r^2=0.5784), which means the model explained 57.84 changes in operating self-sufficiency by financial outreach 42.16 percent was explained by other factors beyond the study as captured by the error term. Table 4 had (F-test=12.80, P-value=0.000) indicating the model was fit to test the relationship between financial self-sufficiency as the dependent variable and financial outreach as the independent variable.

Further, the overall (r^2=0.5772), means that the model explained 57.72 changes in financial self-sufficiency by financial outreach 42.28 percent was explained by other factors beyond the study as captured by error term. Discussion of each variable follows as per the study objectives. This study had directional hypothesis (positive) testing thus a one-tail test of hypothesis was done as discussed by(Balling & Hvelplund, 2020). The significance level embraced in interpreting the results was 5%. From table 3 and table 4 the constant (cons) was significant at ($p<0.05$) 5% level. The other coefficients are discussed based on the study objectives.

4.1.1 The Relationship between Breadth of Outreach and Financial Sustainability of DTMFI in Nairobi County, Kenya

The first objective aimed at determining the relationship between breadth of outreach and financial sustainability of deposit taking microfinance institutions in Nairobi County, Kenya. Breadth of outreach was measured using number of active clients as observed in both table (logacc).The results obtained show that number of active clients had a positive statistical coefficient with both operating self-sufficiency (β=5.905, t-value 4.50>1.96, P-value=0.00<0.05) as indicated in table 5 and financial self-sufficiency (β=5.669, t-value 4.29>1.96, P-value=0.00<0.05) as indicated in table 6, significant at 5% level. Thus, increase in number of active clients (breadth of outreach) increases the volume of loan uptake which boost financial self-sufficiency; and the ability to recoup operational costs, costs of funds and other forms of subsidies then achieve operating self-sufficiency. Kinde, (2012) substantiate that outreach and sustainability are complimentary. Thus, as the number of clients served broadens microfinance institutions reap the benefits of economies of scale. This leads to minimized cost of operation hence aid them to attain financial sustainability. These findings show how financial intermediation theory is relevant to help DTMFIs to link depositors and borrowers in line with the mission of reaching the low-income earners.

The study found a strong positive significant relationship between active number of clients (breadth of outreach) and financial sustainability of DTMFIs in Nairobi County, Kenya. These results augment the study done by Ameer (2015); Karanja (2014) and Arodi (2013) who found a positive relationship between the variables used in the studies. However, the study findings contradict that of Hussain et al., (2018); Dessalegn (2018); Churchill &Mar (2017); Shahzad (2015) who found mixed results between breadth of outreach and financial sustainability.

4.1.2 The Relationship between Depth of Outreach and Financial Sustainability of DTMFI in Nairobi County, Kenya

The second objective aimed at establishing the relationship between depth of outreach and financial sustainability of deposit taking microfinance institutions in Nairobi County, Kenya. Depth of outreach was measured by average loan size as observed in both tables (logloan). The results obtained show that average loan size had a negative coefficient with operating self-sufficiency (β=-0.1735, t-value -0.20>-1.96, P-value=0.844>0.05) as indicated in table 5 and positive coefficient with financial self-sufficiency (β=0.1058, t-value 0.12<1.96, P-value=0.905>0.05) in table 6, insignificant at 5% level. This mean that if DTMFIs increase average loan size it will hinder attainment of operational self-sufficiency, but this will aid in achieving financial self-sufficiency. However, this implies that serving the low-income earners will be jeopardized as large loan sizes get availed to wealthier borrowers. As a result, the DTMFIs will drift from their main mission and turn to commercialization.

The results indicate that financial intermediation theory plays a key role in lending loans to the clients in DTMFIs as they pursue financial sustainability thus supports depth of outreach. The study found a negative insignificant relationship between average loan size and operational self-sufficiency; then a positive but insignificant relationship between average loan size (depth of outreach) and financial self-sufficiency of DTMFIs in Nairobi County, Kenya. These results agree with the findings of Churchil and Mar,(2017);Ameer(2015);Arodi,(2013) but, contradicts the findings of Shahzad (2015).

4.2.3 The Relationship between Cost of Outreach and Financial Sustainability of DTMFI in Nairobi County, Kenya

The third objective was to determine the relationship between cost of outreach and financial sustainability of DTMFI in Nairobi County, Kenya. Cost of outreach was measured by transaction cost. However, transaction cost was removed from the model since it suffered from excessive multicollinearity. In econometrics, the problem of multicollinearity is treated by eliminating the offending variable.

4.2.4 The Relationship between Experience of Institution and Financial Sustainability of DTMFI in Nairobi County, Kenya

The fourth objective aimed at establishing the relationship between experience of institution and financial sustainability of deposit taking microfinance institutions in Nairobi county, Kenya. Experience of institution was measured using age.

Age of the institution had a negative but insignificant coefficient with operating self-sufficiency (β= -0.9019, t-value - 0.50>- 1.96, P-value=0.619>0.05) as indicated in table 5 and financial self-sufficiency (β= -1.173, t-value - 0.65>- 1.96, P-value=0.521>0.05) as indicated in table 6, significant at 5% significant level. The study found a negative insignificant relationship between age (experience of institution) and financial sustainability of DTMFIs in Nairobi County, Kenya. This means that experience of DTMFIs as measured by age was not important in determining financial sustainability. Life cycle theory supported this objective implying that DTMFIs can attain financial sustainability at any growth stage *citeris paribus*. There is limited literature on age of institution and its relationship with sustainability. These results are consistent with Abdulai and Tewari, (2017) who found that age of MFI had negative influence on the

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sustainability of MFIs but, contradict that of (Milani, 2015). The coefficients indicated that life cycle theory (LCT) had no notable effect on DTMFIs financial sustainability.

4.3 Panel Regression Results of the Moderation Effect of credit risk on the Relationship between Financial outreach and Sustainability

The moderation effect of credit risk was measured using interaction effect of portfolio at risk and loan loss provision coverage, respectively.

Table 5 Panel Regression Output for Operational Self Sufficiency

```
. xtreg oss logacc logloan ageoffirm accport loanport ageporta,fe

Fixed-effects (within) regression            Number of obs      =        41
Group variable: mfi                          Number of groups   =        12

R-sq:  within  = 0.7490                       Obs per group: min =         1
       between = 0.7715                                      avg =       3.4
       overall = 0.8035                                      max =         6

                                              F(6,23)            =     11.44
corr(u_i, Xb)  = -0.1484                       Prob > F           =    0.0000
```

oss	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
logacc	.146677	1.847031	0.08	0.937	-3.674197	3.967551
logloan	1.408844	1.614153	0.87	0.392	-1.930287	4.747975
ageoffirm	20.64642	9.764128	2.11	0.046	.4477802	40.84506
accport	1.459059	.4082494	3.57	0.002	.6145305	2.303587
loanport	-.7984293	.2975754	-2.68	0.013	-1.414011	-.1828476
ageporta	-1.137106	1.395773	-0.81	0.424	-4.024482	1.75027
_cons	.9096901	6.851067	0.13	0.896	-13.26282	15.0822
sigma_u	21.915767					
sigma_e	17.426556					
rho	.61263979	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(11, 23) =     3.24            Prob > F = 0.0083
```

Significant at 0.05 level

Source: Researcher,2020

The OSS output in table 5 for random effect and fixed effect helped to run Hausman test and fixed effect model preferred for consistency purpose. The R squared of 0.8035 for Fixed effect model shows 80.35% changes in operating self-sufficiency were explained by credit risk management (portfolio at risk) ,19.65% was explained by factors beyond the study as captured by error term. The F statistics was 11.44 and P>F was 0.000 significant at 0.05 meaning the fixed effect model was fit to explain the interaction effect of portfolio at risk >30days.

Table 6: Panel Regression Output for Financial Self Sufficiency

```
. xtreg fss logacc logloan ageoffirm accport loanport ageporta,fe

Fixed-effects (within) regression              Number of obs      =         41
Group variable: mfi                            Number of groups   =         12

R-sq:  within  = 0.7410                        Obs per group: min =          1
       between = 0.8055                                        avg =        3.4
       overall = 0.8123                                        max =          6

                                               F(6,23)            =      10.97
corr(u_i, Xb)  = 0.0250                        Prob > F           =     0.0000

─────────────────────────────────────────────────────────────────────────────
         fss |      Coef.   Std. Err.      t    P>|t|     [95% Conf. Interval]
─────────────┼───────────────────────────────────────────────────────────────
      logacc |   .5854945   1.859045     0.31   0.756    -3.260233    4.431222
     logloan |   1.473434   1.624653     0.91   0.374    -1.887416    4.834285
   ageoffirm |     16.735    9.82764     1.70   0.102    -3.595023    37.06502
      accport |   1.115038   .4109049     2.71   0.012     .2650162     1.96506
     loanport |  -.6500362   .2995111    -2.17   0.041    -1.269622   -.0304504
     ageporta |  -.4227352   1.404852    -0.30   0.766    -3.328892    2.483422
       _cons |   2.833452   6.895631     0.41   0.685    -11.43125    17.09815
─────────────┼───────────────────────────────────────────────────────────────
     sigma_u |  19.746923
     sigma_e |   17.53991
         rho |  .55898351   (fraction of variance due to u_i)
─────────────────────────────────────────────────────────────────────────────
F test that all u_i=0:     F(11, 23) =      3.16               Prob > F = 0.0096
```

Significant at 0.05 level

Source: Researcher,2020

The FSS output in table 16a, b for random effect and fixed effect enabled the specification of the fixed effect model through Hausman test. The R squared was 0.8123 for Fixed effect model meaning it explained 81.23% changes in financial self-sufficiency by credit risk management (portfolio at risk) ,18.77% was explained by factors beyond the study as captured by error term. The F statistic of 10.97 and P>F of 0.000 significant at 0.05 level indicate that fixed effect model was fit to explain the interaction effect of portfolio at risk>30days.

4.4.1 Hausman Test Results for Moderation Effect of PAR>30 in OSS and FSS

```
. hausman re fe

                     ———— Coefficients ————
                     (b)           (B)          (b-B)      sqrt(diag(V_b-V_B))
                     re            fe           Difference        S.E.
    ───────────────────────────────────────────────────────────────────────
         logacc  |  .2242487      .146677       .0775717            .
        logloan  |  .8671649     1.408844      -.5416791            .
      ageoffirm  |  16.40385     20.64642      -4.242569            .
        accport  |  1.279273     1.459059      -.1797862            .
       loanport  | -.6041111     -.7984293      .1943182            .
       ageporta  | -.5539295     -1.137106      .5831765            .
    ───────────────────────────────────────────────────────────────────────

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

       Test:  Ho:  difference in coefficients not systematic

                    chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                            =   -4.03    chi2<0 ==> model fitted on these
                                         data fails to meet the asymptotic
                                         assumptions of the Hausman test;
                                         see suest for a generalized test
```

Source: Researcher,2020

```
. hausman re fe

                     ———— Coefficients ————
                     (b)           (B)          (b-B)      sqrt(diag(V_b-V_B))
                     re            fe           Difference        S.E.
    ───────────────────────────────────────────────────────────────────────
         logacc  |  .5386936      .5854945     -.0468009            .
        logloan  |  .9923832     1.473434      -.4810513            .
      ageoffirm  |  14.5341       16.735       -2.200898            .
        accport  |  1.05196      1.115038      -.0630777            .
       loanport  | -.5161653     -.6500362      .1338709            .
       ageporta  | -.115384      -.4227352      .3073513            .
    ───────────────────────────────────────────────────────────────────────

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

       Test:  Ho:  difference in coefficients not systematic

                    chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                            =   -2.52    chi2<0 ==> model fitted on these
                                         data fails to meet the asymptotic
                                         assumptions of the Hausman test;
                                         see suest for a generalized test
```

Source: Researcher,2020

Hausman test was run for OSS and FSS model respectively and the fixed effect models were chosen for consistency purpose. The two tables show that fixed effect model was appropriate with Chi squared of -4.03 for OSS and -2.52 for FSS.

Interaction effect of loan loss provision produced the tables for OSS and FSS respectively.

Table 7: Panel Regression Output for Operating Self Sufficiency

```
. xtreg oss logacc logloan ageoffirm accprov loanprova ageprova,fe

Fixed-effects (within) regression              Number of obs      =        75
Group variable: mfi                            Number of groups   =        13

R-sq:  within  = 0.5176                        Obs per group: min =         5
       between = 0.8555                                       avg =       5.8
       overall = 0.7628                                       max =         6

                                               F(6,56)            =     10.02
corr(u_i, Xb)  = 0.3284                         Prob > F           =    0.0000
```

oss	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]	
logacc	6.154548	1.218945	5.05	0.000	3.712709	8.596388
logloan	1.000092	.8746488	1.14	0.258	-.75204	2.752224
ageoffirm	-.2065694	1.741666	-0.12	0.906	-3.695546	3.282408
accprov	.2658959	.0876596	3.03	0.004	.0902925	.4414993
loanprova	.0395726	.069534	0.57	0.572	-.0997208	.1788659
ageprova	.2813485	1.012817	0.28	0.782	-1.747567	2.310265
_cons	10.23452	8.04472	1.27	0.209	-5.880995	26.35003
sigma_u	16.94034					
sigma_e	19.303412					
rho	.43507658	(fraction of variance due to u_i)				

```
F test that all u_i=0:     F(12, 56) =    3.15              Prob > F = 0.0018
```

Significant at 0.05 level

Source: Researcher,2020

The OSS output in table 7 for random effect and fixed effect helped to run Hausman test and fixed effect model preferred for consistency purpose. The R squared of 0.7628 for Fixed effect model shows 76.28% changes in operating self-sufficiency were explained by credit risk management (loan loss provision coverage) ,23.72% was explained by factors beyond the study as captured by error term. The F statistics was 10.02 and P>F was 0.000 significant at 0.05 meaning the fixed effect model was fit to explain the interaction effect of loan loss provision coverage.

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Table 7 (b) Panel Regression Output for Financial Self Sufficiency

```
. xtreg fss logacc logloan ageoffirm accprov loanprova ageprova,fe
```

```
Fixed-effects (within) regression              Number of obs      =        75
Group variable: mfi                            Number of groups   =        13

R-sq:  within  = 0.5480                         Obs per group: min =         5
       between = 0.8603                                        avg =       5.8
       overall = 0.7746                                        max =         6

                                                F(6,56)            =     11.31
corr(u_i, Xb)  = 0.2821                         Prob > F           =    0.0000
```

fss	Coef.	Std. Err.	t	P>|t|	[95% Conf. Interval]
logacc	5.957394	1.187357	5.02	0.000	3.578831	8.335957
logloan	1.407331	.8519836	1.65	0.104	-.2993974	3.114059
ageoffirm	-.4152617	1.696534	-0.24	0.808	-3.813827	2.983304
accprov	.2977084	.0853881	3.49	0.001	.1266555	.4687612
loanprova	.0565041	.0677321	0.83	0.408	-.0791797	.1921879
ageprova	.1270325	.9865712	0.13	0.898	-1.849307	2.103372
_cons	8.952349	7.836253	1.14	0.258	-6.745552	24.65025

sigma_u	16.336891	
sigma_e	18.803193	
rho	.43015917	(fraction of variance due to u_i)

```
F test that all u_i=0:    F(12, 56) =     3.30              Prob > F = 0.0012
```

Significant at 0.05 level

Source: Researcher,2020

The FSS output in table 7 for random effect and fixed effect helped to run Hausman test and fixed effect model preferred for consistency purpose. The R squared of 0.7746 for Fixed effect model shows 77.46% changes in operating self-sufficiency were explained by credit risk management (loan loss provision coverage) ,22.54% was explained by factors beyond the study as captured by error term. The F statistics was 11.31 and P>F was 0.000 significant at 0.05 meaning the fixed effect model was fit to explain the interaction effect of loan loss provision coverage.

4.3.2 Hausman Test Results for Moderation Effect of LLPC in OSS and FSS

```
. hausman re fe

                   ──── Coefficients ────
                   (b)          (B)           (b-B)       sqrt(diag(V_b-V_B))
                   re           fe            Difference         S.E.
    logacc        5.782887     6.154548      -.3716612          .
    logloan       1.656001     1.000092       .6559088          .
    ageoffirm      .6040252    -.2065694       .8105945          .
    accprov        .3036489     .2658959       .037753           .
    loanprova      .0375428     .0395726      -.0020298          .
    ageprova       .6039435     .2813485       .3225949          .

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

    Test:  Ho:  difference in coefficients not systematic

                chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                        =    -6.40    chi2<0 ==> model fitted on these
                                      data fails to meet the asymptotic
                                      assumptions of the Hausman test;
                                      see suest for a generalized test
```

Significant at 0.05 level

Source: Researcher, 2020

Hausman test was run for OSS model and the fixed effect model was chosen for consistency purpose. The tables show that fixed effect model was appropriate with Chi squared of -6.40.

```
. hausman re fe

                   ──── Coefficients ────
                   (b)          (B)           (b-B)       sqrt(diag(V_b-V_B))
                   re           fe            Difference         S.E.
    logacc        5.602709     5.957394      -.3546848          .
    logloan       1.965216     1.407331       .5578857          .
    ageoffirm      .2304542    -.4152617       .6457159          .
    accprov        .3246023     .2977084       .026894           .
    loanprova      .0539885     .0565041      -.0025156          .
    ageprova       .4057201     .1270325       .2786876          .

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

    Test:  Ho:  difference in coefficients not systematic

                chi2(6) = (b-B)'[(V_b-V_B)^(-1)](b-B)
                        =    -4.68    chi2<0 ==> model fitted on these
                                      data fails to meet the asymptotic
                                      assumptions of the Hausman test;
                                      see suest for a generalized test
```

Significant at 0.05 level

Source: Researcher, 2020

Hausman test was run for FSS model and the fixed effect models were chosen for consistency purpose. The table show that fixed effect model was appropriate with Chi squared of -4.68.

4.3.3 The Moderating effect of Credit Risk Management on the relationship between financial outreach and Financial Sustainability of DTMFI in Nairobi County, Kenya

The study aimed at determining the moderating effect of credit risk management on the relationship between financial outreach and financial sustainability of deposit taking microfinance institutions in Nairobi County, Kenya. Credit risk management was measured using portfolio at risk and loan loss provision coverage.

4.3.3.1 The Moderating Effect of Portfolio at Risk

The results obtained show that interaction between portfolio at risk and number of active clients had a positive coefficient with both operating self-sufficiency (β=1.45906, t-value=3.57>1.96, P-value=0.002<0.05), financial self-sufficiency (β=1.1150, t-value=2.71>1.96, P-value=0.012<0.05, significant at 0.05 level. This implies that any unit increase of the interaction effect between portfolios at risk on number of active clients explains 145 percent and 111 percent increase for OSS and FSS, respectively. The study found a statistically significant positive interaction effect of portfolio at risk on the relationship between (breadth of outreach) number of active clients and financial sustainability of DTMFIs in Nairobi County, Kenya.

The interaction effect between portfolio at risk and Average loan size had a negative coefficient with both operating self-sufficiency (β=-0.7984, t-value=-2.68<-1.96, P-value=0.013<0.05) financial self-sufficiency (β= -0.65, t-value=-2.17<-1.96, P-value=0.041<0.05) as indicated in table 15 b, significant at 0.05 level. This implies that any unit increase of the interaction effect between portfolio at risk and average loan size hinders financial sustainability by 79 percent and 65 percent for OSS and FSS, respectively. Therefore, these DTMFIs encounter challenges in the timely recovery of loans which lead to high credit risk. The study found a statistically significant negative interaction effect of portfolio at risk on the relationship between (depth of outreach) average loan size and financial sustainability of DTMFIs in Nairobi County, Kenya.

The interaction between portfolio at risk and age of institution had a negative coefficient with both operating self-sufficiency (β=-1.1371, t-value =-0.81>-1.96, P-value =0.424>0.05) and financial self-sufficiency (β= -0.4227, t-value=-0.03>-1.96, P-value=0.766>0.05), insignificant at 0.05 level. This mean that any unit increase of the interaction effect between portfolio at risk and age of firm decreases financial sustainability by 113 percent and 42 percent for OSS and FSS, respectively. This means that DTMFIs takes long period to recoup loan hence high credit risk which threaten pursuance of financial sustainability. The study found a statistically insignificant negative interaction effect of portfolio at risk on the relationship between age (experience of institution) and financial sustainability of DTMFIs in Nairobi County, Kenya.

4.3.3.2 The Moderating Effect of Loan Loss Provision Coverage

Loan loss provision coverage interaction effect with number of active clients had a positive coefficient with both operating self-sufficiency (β=0.2659, t-value=3.03>1.96, P-value=0.004<0.05) and financial self-sufficiency (β=0.2977, t-value=3.49>1.96, P-value=0.001<0.05), significant at 0.05 level. This implies that any unit increase of the interaction effect between loan loss provision coverage on number of active clients explains 26.59 percent and 29.77 percent increase for OSS and FSS, respectively. The study found a statistically significant positive interaction effect of loan loss provision coverage on the relationship between

(breadth of outreach) number of active clients and financial sustainability of DTMFIs in Nairobi County, Kenya.

The interaction effect between loan loss provision coverage and average loan size had positive coefficient with both operating self-sufficiency (β=0.0396,t-value=0.57<1.96, P-value=0.572>0.05) and financial self-sufficiency (β= 0.0565,t-value=0.83<1.96, P-value=0.408>0.05), insignificant at 0.05 level. This implies that any unit increase of the interaction effect between loan loss provision coverage and average loan size explains an increase in financial sustainability by 3.96 percent and 5.65 percent for OSS and FSS, respectively.

The study found a statistically insignificant positive interaction effect of loan loss provision coverage on the relationship between (depth of outreach) average loan size and financial sustainability of DTMFIs in Nairobi County, Kenya. The interaction between loan loss provision coverage and age of institution had a positive coefficient with both operating self-sufficiency (β=0.2813, t-value =0.28<1.96, P-value =0.782>0.05) and financial self-sufficiency (β= 0.1270, t-value=0.13<1.96, P-value=0.898>0.05), insignificant at 0.05 level. This mean that any unit increase of the interaction effect between loan loss provision coverage and age of firm explains an increase in financial sustainability by 28.13 percent and 12.7 percent for OSS and FSS, respectively. The study found a statistically insignificant positive interaction effect of loan loss provision coverage on the relationship between age (experience of institution) and financial sustainability of DTMFIs in Nairobi County, Kenya.

4.3.4 The Overall Models

Weighted Statistics

	OSS direct relationship	FSS direct relationship	OSS moderating effect PAR LLPC		FSS Moderating effect PAR LLPC	
R Squared	0.5784	0.5772	0.8035	0.7628	0.8123	0.7746
F-test	12.85	12.80	11.44	10.02	10.97	11.31
P-value	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

Source: Researcher, 2020

The models for direct relationship and moderating effect were fit to explain the relationship between study variables as shown by F test results and p-values (0.000<0.05). Shibru, (2017) indicate that for panel data, the R squared above 0.2 is still large enough for reliable conclusion.

5.0 SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Summary

The study findings were as follows: firstly a statistically significant positive relationship between active number of clients (breadth of outreach) and (OSS, FSS) financial sustainability of DTMFIs in Nairobi county, Kenya. Secondly, there was a negative insignificant relationship between average loan size and operational self-sufficiency; then a positive but insignificant

relationship between average loan size (depth of outreach) and financial self-sufficiency of DTMFIs in Nairobi county, Kenya. Thirdly, there was a multicollinearity problem due to transaction cost which measured (cost of outreach) and was eliminated hence no statistical significance observed in the final panel models. Fourthly, insignificant negative relationship existed between age (experience of institution) and (OSS, FSS) financial sustainability of DTMFIs in Nairobi county, Kenya. Finally, the moderating effect between portfolio at risk and number of active clients was positive while age of institution and average loan size had negative interaction effect on the (OSS and FSS) financial sustainability of DTMFIs in Nairobi county, Kenya. The moderating effect of loan loss provision coverage and number of active clients, average loan size and age of institution was positive on the (OSS and FSS) financial sustainability of DTMFIs in Nairobi County, Kenya.

5.2 Conclusion

The study deduced that, at 0.05 significance level, breadth of outreach had statistically significant relationship on financial sustainability of DTMFIs in Nairobi County, Kenya. The study sought to establish the relationship between depth of outreach and financial sustainability of the deposit taking microfinance institutions in Nairobi county Kenya. The study deduced that, at 0.05 significance level, depth of outreach had statistically insignificant relationship financial sustainability; the study also sought to determine the relationship between cost of outreach and financial sustainability of DTMFIs in Nairobi County, Kenya, the variable was removed to treat the multicollinearity problem thus no statistical significance obtained. The study also sought to establish the relationship between experience of institution and financial sustainability of DTMFIs in Nairobi County, Kenya, the study deduced that, at 0.05 significance level, experience of institution had statistically insignificant relationship on financial sustainability. On the last objective which pursued to determine the moderating effect of credit risk management on the relationship between financial outreach and financial sustainability of DTMFIs in Nairobi county, Kenya; the study deduced that, portfolio at risk greater than 30days had positive interaction effect with breadth of outreach (number of active clients) then negative interaction effect with depth of outreach (average loan size) and experience of institution (age) on the relationship between financial outreach and financial sustainability. Further, Loan loss provision coverage had positive interaction effect with breadth of outreach (number of active clients), depth of outreach(average loan size),experience of institution(age) on the relationship between financial outreach and financial sustainability of DTMFIs in Nairobi county, Kenya.

5.3 Recommendations

The following significant implications were recommended first to policy makers then those for practice by various individuals. Firstly, the study results show that financial sustainability increases due to broad range of (number of active clients) breadth of outreach which was significant. The study recommends that Central Bank of Kenya and the government should formulate policies that enhance savings with DTMFIs and therefore encourage financial inclusion. Then, Policy makers should recognize that mutualism can be achieved when deposit taking microfinance institutions pursue financial outreach and financial sustainability.

Secondly, this study found that credit risk Management (portfolio at risk, loan loss provision) had positive significant interaction effect on breadth of outreach and financial sustainability. The study recommends that the government through Central Bank of Kenya as the regulator should

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maintain onsite supervision to have real time data on the credit risk policies of microfinance institutions. Further, the government should adopt prudential regulations for microfinance institutions for uniform credit risk management. The study result show that increase in breadth of outreach lead to increased financial sustainability. Therefore, the study recommends that deposit taking microfinance institutions should engage in vigorous financial education to increase awareness of financial products and therefore increase the breadth of outreach.

This study recommends that deposit taking microfinance institutions should engage in active financial information collection and sharing to reduce information asymmetry and therefore minimize credit risk (portfolio at risk, loan loss provision coverage). To the Academicians and scholars, it is recommended that future studies in this area be carried out using a different moderating variable for different observation and conclusion on the relationship between financial outreach and sustainability of all microfinance institutions. It is also recommended that another indicator of cost of outreach be considered for the study.

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