The mediating role of cost of capital in the relationship between capital structure and loan portfolio quality

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The mediating role of cost of capital in the relationship between capital structure and loan portfolio quality

Ester Agasha
Makerere University Business School, Kampala, Uganda
Nixon Kamukama
Mbarara University of Science and Technology, Mbarara, Uganda, and
Arthur Sserwanga
Makerere University Business School, Kampala, Uganda

Abstract

Purpose – The purpose of this paper is to establish the mediating role of cost of capital in the relationship between capital structure and loan portfolio quality in Uganda's microfinance institutions (MFIs).

Design/methodology/approach – A cross-sectional research design was adopted to collect data and partial least squares structural equation modelling was used to test the study hypotheses.

Findings – Cost of capital partially mediates the relationship between capital structure and loan portfolio quality. Hence, cost of capital acts as a conduit through which capital structure affects loan portfolio quality.

Research limitations/implications – Cost of capital was generalized as financial and administrative costs. The impact of costs like dividend pay-outs, interest rates and/or loan covenants on loan portfolio quality could be investigated individually.

Practical implications – MFIs should be vigilant about loan recovery by using strategies like credit rationing to ensure timely repayments.

Originality/value – The study contributes to the ongoing academic debate by identifying the significant indirect role of cost of capital in explaining loan portfolio quality.

Keywords Uganda, Capital structure, Cost of capital, Mediation, Microfinance, Loan portfolio quality

Paper type Research paper

Introduction

As catalysts of economic development, microfinance institutions (MFIs) have provided financial services to those left out of the formal financial system globally (Otero, 2005; Schreiner and Colombet, 2001). In Uganda, MFIs have reduced client vulnerability to economic shocks, improved savings and contributed to overall poverty reduction (FinScope, 2018). Despite their contribution to the country's growth, these institutions continue to register poor loan portfolio quality characterized by high and unstable portfolio at risk (PaR), high non-performing loans and low risk coverage ratios (AMFIU, 2018/2019). As a solution to the declining loan book, the Government of Uganda (GoU) commissioned the Uganda Microfinance Regulatory Authority (UMRA) in 2017 to act as the MFIs' oversight body. Also, GoU through the Bank of Uganda (BoU) and other development partners supports the informal sector where majority of MFI clients are based. Yet, Ugandan MFIs' PaR is still above 10%, higher than the Sub-Saharan African acceptable standard of 3%. Also, the risk coverage ratio for most MFIs average at 60%, below the acceptable 100% (AMFIU, 2018/2019). These unexplained trends continue to spark a debate in both practitioners and scholars.

Loan portfolio quality is essential since it provides an insight into MFIs' operational efficiency, profitability and sustainability (Gashayie and Singh, 2014). Whereas the concept of loan portfolio quality is extensively studied, the focus has been on formal and highly regulated financial institutions (Dia and VanHoose, 2018; Love and Ariss, 2014). Notably, by the nature of their operations, regulated and formal financial institutions have access to a wider range of funding options and attract a different type of clientele base; one with collateralized assets and stable income. Contrary, most MFI clients are low-income earners, with no stable income flow and no conventional asset-backed securities. Thus, a review of these studies does not provide satisfying grounds for underpinning loan portfolio quality in MFIs. This study focused on understanding the concept of loan portfolio quality from MFIs' perspective. Further, reviewed empirical work indicates that loan portfolio quality is influenced by capital structure (Sekabira, 2013; Bogan, 2012; Lislevan, 2012). However, these studies produced mixed and inconclusive results in explaining the nature of this relationship. Moreover, the literature focuses on the bivariate relations between capital structure and loan portfolio quality. Yet, according to Fairchild and McQuillin (2010), investigating third variables such as mediators permits the researcher to wholesomely inform both theory and practice. Although the literature affirms that cost of capital is influenced by capital structure (Bertomeu *et al.*, 2011; Kar, 2012), there is insufficient empirical research investigating the functional role of cost of capital in the relationship between capital structure and loan portfolio quality. This study investigated the relationship between capital structure and loan portfolio quality, capital structure and cost of capital, cost of capital and loan portfolio quality, and the mediating role of cost of capital in the relationship between capital structure and loan portfolio quality.

The remainder of this paper is organized as follows: literature review, methodology, findings, discussion, conclusions, recommendations, limitations and areas for future research.

Literature review
Theory
This study adopted the transaction cost theory (TCT). The theory assumes that in an imperfect market, there are transaction costs that a firm incurs in running its operations (Williamson, 1981). These are broadly categorized as financial costs and administrative costs. According to Donaldson (1995), a higher capital structure is associated with high transactional costs and an increase in transaction costs may lower a firm's value. This theory is relevant to the current study because MFIs incur transaction costs in running their operations. On one hand, MFIs' incur financial costs like interest rates on loans borrowed, dividend payments on share capital, floatation costs, legal fees and insurance costs. On the other hand, MFIs incur administrative costs like policing costs and enforcement costs.

Capital structure and loan portfolio quality
Past studies on this relationship have remained mixed and irresolute. Bogan (2012) investigated MFIs with total assets of over $ 1.3 million and established a link between capital structure and critical measures of MFI success. His results, though comprehensive, are not a fair representation of Uganda's MFIs whose asset portfolios are far less than $ 1.3 million. Correspondingly, Sekabira (2013) established that better share capital composition results in fewer non-performing loans. Yet, Lislevan (2012) analysed the effect of capital structure on loan portfolio performance of 403 MFIs and observed that equity capital has less influence on loan portfolio quality compared to debt. Conversely, Fersi and Boujelbéne (2017) found that the use of long-term debt puts less pressure on MFIs' management. This study hypothesized that;

H1. There is a relationship between capital structure and loan portfolio quality.

Capital structure and cost of capital
Several empirical studies have found mixed results on the association between these two variables. Scholars like Tehulu (2013) and Muhammad *et al.* (2012) argue that equity comes with low costs given that dividend payment is not an obligation as debt is. Contrariwise, Cheng and Tzeng (2011) note that the tax-deductibility of interest increases the value of a firm because of the tax shield advantage. Tax shield lowers the cost of debt, which in turn lowers the weighted average cost of capital as more debt is introduced into the firm (Bayai and Ikhide, 2016). On the other hand, Singh and Nejadmalayeri (2004) found a non-existent relationship between capital structure and cost of capital. It was hypothesized that;

H2. There is a relationship between capital structure and cost of capital.

Cost of capital and loan portfolio quality
Costs arising from financial transactions affect loan portfolio quality. They cause financial distress as claims of new debt holders are likely to dilute the claim of existing shareholders. Similarly, Kiiru (2007) explains that although debt raises cost-efficiency for MFIs, care must be taken not to over-use it since debt invites high service fees, which in turn spark bankruptcy and nullify loan portfolio quality efforts. Administrative costs associated with small loans could lead to mission drift as MFIs struggle to maintain quality loan portfolios. Empirical studies in Nigeria, Kenya, Ghana and Uganda have shown that such costs push MFIs to limit granting loans to low-income borrowers (Tehulu, 2013; Kamukama and Natamba, 2013; Natamba *et al.*, 2013). This study hypothesised that:

H3. Cost of capital influences loan portfolio quality.

The mediating role of cost of capital
Testing for the mediating role of cost of capital attempts to identify the intermediary process that leads from capital structure to loan portfolio quality. The mediating role of capital structure is crucial in a loan portfolio quality study. According to Ahmed and Abdelfattah (2016), the most robust theoretical contributions to loan portfolio research are studies investigating cost-related mediators. O'Brien *et al.* (2014) integrated funding outcomes to show that cost of capital has a mediating function linking the capital structure to loan portfolio quality. According to Ahmed and Abdelfattah (2016), reduced cost of capital is a tool that is available to reduce the cost of debt and cost of equity and indirectly lead to better performance of the MFI loan book. Because of this, when MFIs use appropriate funding, they reduce the interest on loans, administrative costs, loan covenants, dividend claims and insurance costs. Thus, it was hypothesized that;

H4. Cost of capital mediates the relationship between capital structure and loan portfolio quality.

Methodology
The study employed a cross-sectional design, permitting the researchers to collect data at a single point in time (Welman *et al.*, 2005). We focused on the MFIs registered with the Association of Microfinance Institutions in Uganda (AMFIU). This was considered a reliable source since all members of AMFIU submit their performance monitoring tools which provides their ratings annually. A sample of 82 out of a population of 90 MFIs was arrived at using Krejcie and Morgan's (1970) approach (see Table 1). This approach provides a scientifically approved sample selection table that has been widely used in previous empirical studies.

Category	Description/Features	Population	Sample
A	Not less than 20,000 clients with a loan portfolio of not less than 800 million shillings OR not less than 15,000 clients with a loan portfolio of not less than 1 billion shillings	20	19
B	10,000–19,999 clients with a loan portfolio of not less than 500 million shillings OR: Not less than 5,000 clients with a portfolio of not less than 800 million shillings	18	16
C	1,000–9,999 clients with a loan portfolio of not less than 200 million shillings OR: Not less than 500 clients with a portfolio of not less than 400 million shillings	37	33
D	200–999 clients with a loan portfolio of not less than 50 million shillings OR: Not less than 100 clients with a loan portfolio of not less than 100 million shillings	15	14
Total		90	82

Table 1.
Population and sample distribution

Source(s): AMFIU Directory (2017/2018), Krejcie and Morgan (1970) sample selection table

The study respondents were the staff of the MFIs, that is, senior managers, credit managers and loan officers. Previous research identified these participants as the most relevant groups that understand the issues relating to loan portfolio (Otero, 2005). A maximum of five respondents per MFI were purposively selected: senior manager (1), credit manager (1) and loan officer (3), giving a sample of 410 respondents (5 respondents × 82 sampled MFIs). This is in accordance to Field (2009), who posits that a ratio of respondents to variables for multiple regressions should be at least 5:1 or 10:1. Data were collected using a structured questionnaire anchored on a five-point Likert scale (from 1 = very untrue to 5 = very true) (Yu-Chih, 2008). The Statistical Package for the Social Sciences (SPSS) was used to clean the data, and it was confirmed to be approximately normally distributed. To draw MFI-level conclusions, data were aggregated and a firm-level response rate of 90% was achieved as shown in Table 2.

The study used partial least squares equation modelling (PLS-SEM) software for data analysis because of (1) a small sample size (82 MFIs), (2) many constructs (12) and (3) a large number of items (139) (Sarstedt *et al.*, 2012). PLS algorithms were calculated by computing the measurement model and the structural model separately (Sarstedt *et al.*, 2012). We examined the results of the reflective measurement model. Our focus was on the outer model's loadings.

Findings
Demographic characteristics
Table 3 shows that majority of the respondents were male (58.0%), aged between 40 and 50 years (63%). Majority were married (66.2%), they worked with the MFI for four years (44.6%) and have attained a bachelor's degree (45.6%).

	No. of respondents	Percentage
Sampled firms	82	100%
Discarded	6	10%
Responses	74	90%

Table 2.
MFI-level response rate

Source(s): Primary data

	Frequency	Percent
Gender of respondents		
Male	177	58.0
Female	128	42.0
Total	305	100.0
Age of respondents		
18–28 years	94	30.8
40–50 years	193	63.3
Above 50 years	18	5.9
Total	305	100.0
Marital status of respondents		
Married	202	66.2
Unmarried	103	33.8
Widowed	0	0
In partnership	0	0
Total	305	100.0
The period spent at the firm		
Less than 1 year	86	28.2
1–4 years	136	44.6
5–9 years	66	21.6
10–14 years	17	5.6
15 years and above	0	0.0
Total	305	100.0
Level of education of respondents		
Master's degree and above	29	9.5
Bachelor's degree	139	45.6
Postgraduate diploma	49	16.1
Diploma	70	23.0
A level	16	5.2
O level	2	0.7
Primary level	0	0.0
Total	305	100.0
Source(s): Primary source		

Table 3.
Demographic
characteristics of the
unit of inquiry

Table 4 shows that majority of MFIs (42.7%) lend between Ushs, 500,000 and Ushs. 1,000,000. It takes most MFIs (55.1%) up to three days to give out a loan, indicating the efficiency of their credit departments. Most MFIs (47.2%) have been in operation for 10 years with the main motive of offering micro-credit (62.3%) and making profits (50.2%).

Assessing the measurement and structural model
As seen in Figure 1, all the outer loadings of the measurement model were above 0.7, indicating that item reliability was achieved (Chin, 2010; Hair *et al.*, 2017). We used Hair *et al.* (2018) assessment criterion to examine the collinearity of the items that were retained in the measurement model. We assessed the model's explanatory power-coefficient of determination (R^2). It was found that capital structure accounted for 51.5% of the variability in cost of capital ($R^2 = 0.515$). Capital structure and cost of capital combined explained 38.2% ($R^2 = 0.382$) of the variability in loan portfolio quality, indicating a high predictive power (Hair *et al.*, 2017).

We assessed model fit using two non-exclusive ways; inferential statistics and fit indices. Bootstrap-based tests of the model fit over the unweighted least squares (d_ULS) and the

|	Frequency	Percent
What is the maximum loan amount given to clients (amounts in Uganda shillings)?		
150,000 and below	12	14.6
151,000–250,000	19	23.2
251,000–1,000,000	10	12.2
1,001,000–500,000	35	42.7
501,000–1,500,000	4	4.9
Above 1,500,000	2	2.4
Total	82	100.0
How long does the loan disbursement period take?		
1 day	13	16.1
2 days	16	19.3
3 days	45	55.1
4 days	8	9.5
1 week	0	0.0
2 weeks and above	0	0.0
Total	82	100.0
How long has this microfinance institution been in operation?		
Less than 1 year	9	10.5
1–5 years	16	19.0
6–10 years	38	47.2
Over 10 years	19	23.3
Total	82	100.0
What is the biggest service(s) is this microfinance institution offering?		
Micro-credit	51	62.3
Micro-saving	15	18.0
Micro-insurance	7	8.2
Microfinance training	9	11.5
Total	82	100.0
What is the main objective of this institution?		
To assist the poor	33	40.7
To increase profitability	41	50.2
To assist a government requirement	8	9.2
Total	82	100.0
Source(s): Primary data		

Table 4.
Demographic characteristics of the Unit of Analysis

geodesic discrepancy (d_G) between the empirical matrices were used to allow for assessment of the global goodness of fit (Dijkstra and Henseler, 2015). According to Henseler *et al.* (2014), if the discrepancy between d_ULS and d_G matrices points to an insignificant result, the model may not be rejected. The approximate model fit was measured using the standardized root mean square residual (SRMR) to help quantify the degree of (mis-) fit (Henseler *et al.*, 2014). According to Hu and Bentler (1999) and Ringle and Sarstedt (2016), the SRMR of a well-fitting model does not exceed a value of 0.10. In this study, both categories of fit indices were used to determine the model fit for the estimated and the saturated model. Results in Table 5 indicate that the proposed model fitted the data on all fit indices.

Testing the study hypotheses
Direct relationships
The results in Table 6 reveal that all the three direct paths focussing on the relationships between capital structure, cost of capital and loan portfolio quality are supported as hypothesised.
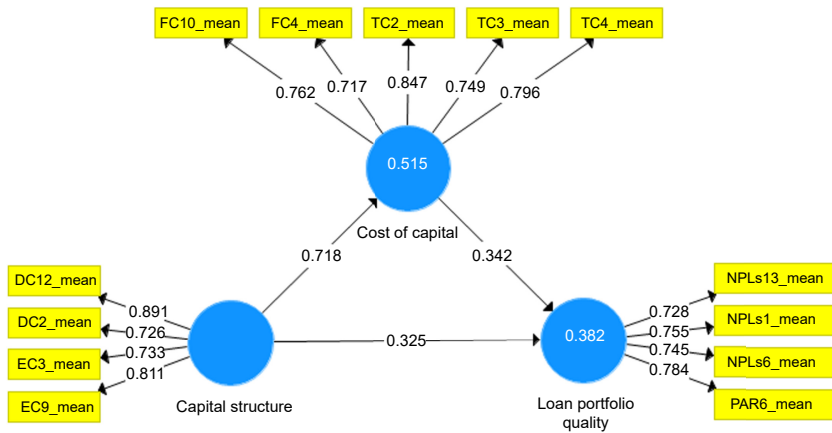
Indicators	Saturated model	Estimated model
SRMR	0.094	0.094
d_ULS	0.807	0.807
d_G1	0.355	0.355
d_G2	0.299	0.299
Chi-square	137.817	137.817
NFI	0.732	0.732
Source(s): Primary data		

Hypotheses		Path coefficients	T statistics	p values	Decision
H1	CS → LPQ	0.325	1.957	0.050	Supported
H2	CS → CoC	0.718	10.429	0.000	Supported
H3	CoC → LPQ	0.342	2.299	0.022	Supported
Source(s): Primary data					

Mediation
This study adopted PLS-SEM guidelines on mediation because of its ability to test different regression equations simultaneously (Henseler, 2017). The PLS-SEM approach provides information on the degrees of freedom "fit" for the entire model after controlling the measurement error (MacKinnon *et al.*, 2007). Precisely, two steps were followed in testing for mediation: a) we established whether mediation existed and b) we assessed the strength of the mediation effect. Baron and Kenny's (1986) conditions for mediation were met (see Table 6). Following the guidelines of Hair *et al.* (2017), the bootstrapping method was used to assess the significance of the indirect path. The path in Table 7 *Capital Structure → Cost of Capital → Loan Portfolio Quality* was statistically significant, confirming the existence of mediation.

We tested the strength of mediation using Preacher and Hayes' (2008) variance accounted for (VAF). A VAF value greater than *80%* indicates full mediation, a value between *20* and *80%* indicates partial mediation and a value less than *20%* indicates no mediation (Hair *et al.*, 2014).

The results in Table 8 indicate a VAF of *43.1%*, implying that cost of capital partially mediates the relationship between capital structure and loan portfolio quality.

Discussion

Capital structure and loan portfolio quality

The results reveal a significant and positive relationship between capital structure and loan portfolio quality (see Table 6). Thus, H1 was supported. These results mean that positive changes in capital structure are associated with positive changes in loan portfolio quality. A favourable capital structure provides an ideal financing mix (debt and equity) that maximises a firm's value while minimising the weighted average cost of capital simultaneously. In the context of Uganda's MFIs, a level of capital structure with favourable terms and conditions provides enough capital base that allows MFIs to meet their financial requirements, credit requirements and improve their creditworthiness. Consequently, MFIs are deemed less risky by borrowers who then are attracted to take more loans, leading to a bigger clientele. The eased financial needs allow MFIs to ease the rates chargeable on loans made to clients. As a result, clients can borrow at affordable terms and take affordable loans, which they can pay back in time. The findings of this study are consistent with Johnson (2020), who emphasise that an appropriate mix of savings and commercial debt in financing is an essential element in improving portfolio at risk. Thus, foregoing one for another limits their capital base and leads to unattractive and restrictive terms to clients, thereby threatening their repayment capacity. This, in turn, reduces clients' payback chances and increases the portfolio at risk, non-performing loans and the overall probability of default. Relatedly, the study findings concur with Sekabira (2013), who investigated the role of capital structure on the MFI loan portfolio in Uganda. The author concludes that better capital composition results in fewer non-performing loans. Hence, most profitable MFIs are well-capitalised, give out many loans and experience high loan portfolio quality.

Capital Structure and Cost of Capital

The findings indicate that capital structure and cost of capital are significantly and positively associated as seen in Table 6. Furthermore, regression results establish that capital structure accounts for 51.5% of the variance in cost of capital. Thus, H2 was supported. This result implies that additional financing attracts a higher cost of capital. As the financing requirements of MFIs increase, the costs associated with such financing needs increase as well. As a result, additional debt or equity capital requirements attract extra interest

	Hypotheses	Path coefficients	*T* statistics	*p* values	Decision
	H3 CS → CoC → LPQ	0.245	2.067	0.039	Supported
	Source(s): Primary data				

Table 7.
Indirect relationships

CS and LPQ
Indirect effect = 0.718* 0.342 = *0.246*
Total effect = Indirect effect + Direct effect = 0.246 + 0.325 = *0.571*
VAF = (Indirect effect/Total effect) *100% = (0.246/0.571) * 100% = *43.1%*
Source(s): Primary data

Table 8.
Variance accounted for (VAF)

payments, insurance fees, dividend payments and loan processing fees, leading to the increased cost of capital. This finding concurs with the conclusions of Bogan (2012), who note that MFIs incur high operational costs because of increased funding. Relatedly, Tehulu (2013) elaborate that acquiring additional capital may require system upgrades and hiring experts, thus increasing the administrative costs. The above opinions are valid because the increments in MFIs' financing attract additional costs, thereby increasing the overall cost of capital significantly. Empirically, the study results rhyme well with Mehta (2008), who investigated the role of capital structure on cost of capital of thirty companies listed on the Bombay Stock Exchange's sensitivity index for five years (2003–2008). Using linear regression, the author found that capital structure is a significant factor in influencing cost of capital of the firms. He acknowledged that when debt is included in a firm's capital structure, it increases both the interest charge and other administration costs. Likewise, Bower (1965), investigated the effect of capital structure on the overall performance of MFIs using data from 403 institutions in 73 countries. He used cost of capital as a measure of microfinance performance. The findings of his study indicated that most MFIs are highly leveraged; they use approximately four times more debt financing than equity. His study revealed that total debt to assets and short-term debt to assets has a positive and significant effect on cost of capital.

Cost of capital and loan portfolio quality

The results indicated that this relationship was significant and positive (see Table 6). Thus, H3 was supported. This finding suggests that a high cost of capital is associated with improved loan portfolio quality. An increase in cost of capital drives MFIs to disburse loans cautiously, which minimises default rates and improves loan portfolio quality. These results are in line with previous scholarly work. Kyereboah-Coleman (2007) point out that lenders in highly levered MFIs induce management to employ measures and mechanisms to reduce annual default rates. This not only helps MFIs to gain a return on their loan portfolio but also enables them to honour their obligations to lenders. Consistently, Orua (2009) emphasises that the high cost of capital encourages institutions to ensure positive cash flows to enhance their capability to honour their obligations to providers of capital. This is indeed possible when MFIs' managers take care of their loans portfolio with utmost care to minimise potential default. Fianto et al. (2018) note that cost of capital increases the supervision measures of a MFI. The authors argue that controlling transactional costs is closely related to the concept of loan management efficiency. Therefore, lack of competence in managing the loan portfolio by MFIs might lead to a failure to honour cost of capital obligations. This thought is consistent with Ahmed and Abdelfattah's (2016) affirmation on loan portfolio quality of banks in the Gulf countries. Using 900 observations, the authors found out that dividend claims, debt covenants and transaction costs arising from the firms "nexus of debt contracts" increase loan default.

This research finding lends support to the transaction cost theory (Williamson, 1979; Donaldson, 1995). The theory argues that firms incur transaction costs in form of financial and administrative costs when running their financing strategy. Therefore, MFIs with higher cost of capital are forced to efficiently monitor their loan portfolios to pay back the providers of capital, leading to higher repayments.

The mediating role of cost of capital

The mediation test was performed and the conditions of Baron and Kenny (1986), Preacher and Hayes (2004, 2008) and Hensler (2017) were met. The results indicated that when cost of capital was introduced in the model, the direct effect of capital structure on loan portfolio quality reduced from $\beta = 0.571$ to $\beta = 0.325$ but remained statistically significant ($p = 0.003$).

This confirms that H4 was supported and proves the existence of a *partial mediation*. This implies that the entire effect on loan portfolio quality does not only go through capital structure but also cost of capital. It signifies that the connection between capital structure and loan portfolio quality is weakened by the presence of cost of capital. The foregoing affirms that the presence of cost of capital acts as a channel in the association between capital structure and loan portfolio quality in MFIs. This result suggests that an increase in MFIs' capital structure attracts higher costs such as higher dividend pay-outs, higher interest rates and higher foreign currency translation fees. This in turn makes MFIs' management to be vigilance about loan recovery in order to make enough cash inflows to pay back the providers of capital. As such, cost of capital acts as a conduit in the relationship between capital structure and loan portfolio quality in Uganda's MFIs.

This reflection is in line with the assertions of previous scholars, such as Muhammad *et al.* (2012), who affirms that cost of capital bridges capital structure and loan portfolio quality. It also mirrors the work of Cull *et al.* (2011), who emphasize that the inclusion of various types of funds in a firm's financing structure attracts restrictive cautions, increases administrative costs and dividend payments. These, in turn, compel management to rationally issue loans to less risky clients, ensuring timely repayment, low portfolio at risk and reduced non-performing loans. These results support the propositions of the transaction cost theory (Williamson, 1979; Donaldson, 1995). The theory asserts that through its impact on the cost of capital, the financing structure of a firm has a significant impact on the overall value (in this case portfolio) of the firm. Indeed, this argument is appropriate in a MFI's setting since borrowing rates do not remain constant, are dependent on additional capital requirements and influence portfolio performance.

Conclusions and recommendations

The study contributes to the capital structure debate by recognizing the significant mediating role of cost of capital on the relationship between capital structure and loan portfolio quality. Henceforth, MFIs should be vigilant about loan recovery so that they make enough money to pay back the providers of funds while at the same time remaining in operation. Strategies such as rationing credit should be embraced as this will guarantee timely repayment. Also, MFIs should keenly assess the terms and conditions of external funds before deciding to acquire such debt. The terms and conditions to look out for include the interest rate on borrowed capital, insurance charges, foreign currency translation fees and any restrictive loan covenants associated with acquiring debt.

Limitations and areas for further study

This study concentrated on the relationship between capital structure, cost of capital and loan portfolio quality in registered MFIs in Uganda. Future studies could look at other factors such as how MFI capital structure needs could be shaped by size and level of their growth. This could explain variations in cost of capital and loan portfolio quality of MFIs across the country. Also, the study generalised cost of capital as financial costs and administrative costs. Other studies could separately investigate the impact of the individual sub-categories of financial costs, such as dividend pay-outs, interest rates and loan covenants on loan portfolio quality.

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Corresponding author

Ester Agasha can be contacted at: agashaester660@gmail.com