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Capital Structure and Performance of Microfinance Institutions in Asia

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Abstract Microfinance institutions play a crucial role in poverty alleviation and provide financial services to low-income households. Microfinance growth rate is quite high in Asia but an undesirable development achieved due to high borrowing cost and inadequate reserves. Capital structure is being affected by lack of funds and interest rates charged by commercial institutions. For microfinance institutions, there is a need to determine a suitable mix of financing to stay sustainable. This study examines the impact of capital structure on the performance of microfinance institutions in Asia. Using a unique unbalanced panel data set of 253 microfinance institutions from 2000 to 2015, performance is measured in terms of sustainability, financial performance, social performance and efficiency. It is evident from the findings that capital structure and microfinance characteristics play a significant role in the performance. Grants to assets increase operational self-sufficiency and debt to equity increases the financial self-sufficiency of microfinance institutions. Microfinance characteristics like borrowers, loan intensity, and size of institutions upsurge sustainability. Banks and NGOs positively affect the financial and social performance of microfinance institutions. Deposit to asset ratio, debt to assets, and debt to equity impact outreach and return on the asset while grants decrease financial self-sufficiency and return on equity. At macroeconomic level, gross domestic product contributes to sustainability and management efficiency. However, inflation declines financial performance. Implications emerge from the findings are a crucial element in the performance of financial institutions. Microfinance institutions should maintain an optimal capital to ensure that their going concern is assured at

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all times. Therefore, managers should appropriately justify capital structure to stay sustainable. It also provides some managerial suggestions for microfinance institutions that help stakeholders to make decisions.

Keywords Sustainability, Outreach, Capital structure, Social Performance, Efficiency

1 Introduction

Microfinance institutions have grasped attention for the last few decades due to their significance in poverty reduction worldwide (Widiarto and Emrouznejad 2015). Microfinance is the establishment of financial services for households and enterprises. It includes saving accounts, loans, insurance and money transfers plus offering services of financial advisors who lack access to financial knowledge. Mostly the clients are poor and have limited access to funds, which obliges them to avail loans (microfinance) at any interest rate (Adusei 2021). Asia is the prime addressee of microfinance providers to a large population, in the world (Bibi et al 2018). It continues to direct the global microfinance industry with large debtors in 2018 (85.6 million) than the other regions (+13.8%). A rapidly growing lower middle class is found in Asia which is not the same as the United States middle class. In 2018, 3.4 billion people were striving to meet their basic needs, which is approximately 50% of the world population (García-Pérez et al 2017; Meyer 2019). Over the last ten years, microfinance institutions have served hundreds of billion dollars with an average annual growth of 11.5% over the past five years. Moreover, the number of borrowers increased at the rate of 7% after 2012. Middle-class households live in an unstable situation, and a little shock put them back into poverty. Microfinance helps to fillup the gap in their income to improve their savings and living style. Microfinance institutions face many trials due to inadequate reserves and high interest rates charged by banks (from an average increase of \$68.4 to 106.7 in 2018) which affects capital structure choices. Capital structure choices affect firm value and stock prices in the security market (Vätavu 2015). Stakeholders are involved to decide a mix of financing. Various macroeconomic factors affect interest rate, growth and security prices whereas microeconomic factors are prompted by the firms management (Green et al 2003). It reveals the importance of financing choices to maintain the going concern of the business. Otherwise, it would not determine the firm value in security market (Swain and Patnaik 2013).

Financial structure theory supports the idea of organized capital structure, which defines stock prices in the security exchange market (Vätavu 2015). Whereas, Miller and Modiglianis theory endorses with perfect market conditions and is ignored by capital structure choices (Siddik et al 2017). On the contrary, pecking order theory suggests large firms should leverage firms with equity than debt to finance their investments (Mwakabumbe 2013). The trade off theory postulates that firms comprise of many assets that need to invest via debt to evade illiquidity issues. Agency theory states that firm should decide on capital structure to minimize agency costs associated with the investment

project and maximize shareholders wealth (Siddik et al 2017). Microfinance institutions in Asia are fast-growing in credit portfolio and customers, so to remain sustainable is an important aspect of performance in our study. The number of clients increased more than 30% from 2012 and reached 2.5 million in 2018 and It has experienced a 5% increase after a decrease in 2015 and 2016. Microfinance institutions get into commercial capital e.g, debt/leverage, bonds etc through which they are capable to avail extra financing to enable their activities. Such financial services cost high due to high-interest rate (Mwakabumbe 2013). Therefore, microfinance institutions ought to project capital through reliable sources.

Previous studies examine capital structure impact performance of microfinance institutions Bich (2016); Bogan et al (2007); Iezza (2010); Kinde (2012); Ngo (2013); Tehulu (2013) but uncover the social performance and management efficiency of microfinance institutions. Asian development bank has accepted 121 projects of \$2.59 billion in 2012 to support microfinance in Asia and the Pacific to increase outreach (Chatterjee 2012). In some countries, financial inclusion is directed due to its inclusive growth and development. However, inclusive financial growth is key to maintain economic and social development to stay financially stable. Due to this reason, Asian countries implement their policies and set a target to enhance outreach (Ayyagari and Beck 2015). Microfinance institutions depend on external financing to promote growth (Ritzer et al 2007). It is also important how financial institutions increase social and financial performance through financing. Therefore, this study contributes to the existing literature in the following ways: To examine the impact of capital structure on performance (financial and social) of microfinance institutions and to examine the impact of capital structure on management efficiency. Most of the previous studies limit their discussion of trade-off between breadth of outreach and depth of outreach. This study also examines a tradeoff between operational and financial self-sufficiency of microfinance institutions.

Macroeconomic variables are also included in the analysis, because they affect interest rate and stock prices. An important difference is analyzed by including regional dummies for Asia. It covers the four regions where sustainability is of utmost importance and the poverty level is quite high. It is found that capital structure (debt and grants) and microfinance characteristics significantly affect the performance of microfinance institutions. Type of microfinance institutions (Banks, NGOs, legal, unregulated) reveal mixed results with performance indicators. At a macroeconomic level, an increase in gross domestic product increases sustainability and management efficiency of microfinance institutions while inflation declines financial performance (measured by return on assets and return on equity). These findings will help to improve managerial policies on the performance of microfinance institutions with an adequate capital mix. Moreover, it will be helpful for the credit reference bureau for the improvement of lending strategies in Asia.

The remaining paper is structured as Section 2 reviews the literature. Section 3 comprises empirical analysis. Section 4 includes results and Section 5 conclusion.

2 Literature review

This section presents the literature review of the study.

2.1 Theoretical framework

This section includes a theoretical framework on capital structure theories and microfinance performance.

2.1.1 Irrelevance theory

It is challenging for a firm to choose a capital structure. M-M postulates deal with the irrelevance of debt to determine the firm value (Modigliani and Miller 1958). Capital structure is irrelevant to firm value in a perfect market (Abor 2005). Modigliani and Miller (1963) factored corporate taxes, it hypothetically establishes an increase in firm value due to a high tax shield. A high tax shield for debt leads to liquidity supported by (Kiogora (2000)) while negatively linked by Abor 2005; Champion 1999; Gill et al 2011). Irrelevance theory of capital structure is sustained in studies (Hamada 1969; Stiglitz 1974). The propositions of Miller and Modigliani are the estates of investment decision though it is built on stringent bases which are not applicable in reality (Abor 2005). Following literature have consideration of irrelevance theory (Myers and Majluf 1984; Jensen et al 1986; Titman and Wessels 1988; Bradley et al 1984; Lippman and McCall 1982; Kyereboah-Coleman 2007a; Faulkender and Petersen 2006).

2.1.2 Tradeoff theory

It is hard to find the exact level of debt or equity in microfinance institutions. Due to MFIs industrial organization, a firm should borrow where the marginal cost of tax shield on external financing will be offset with the increase of net presence of financial dissolution. This financial upsetting reduces firm value which refers to the cost of bankruptcy. Microfinance institutions offer fixed assets, which leads to a high debt ratio. It makes microfinance institutions exceedingly indebted due to fixed interest. Highly obligated institutions perform well and improve operational costs and profitability (Kyereboah-Coleman 2007b). The trade off theory highlights the importance of time, expectation, and the adjustment cost of financing. Normally firms take such financing decisions beforehand. Few firms distributes their funds whereas others use for next year. Trade off theory suggests optimal financing depends on what is likely to be optimal in the subsequent period. The trade off theory expounds a debt limit that varies from microfinance institutions to microfinance institutions among a host of other factors (Kar 2012).

2.1.3 Agency theory

When the interest of shareholders and managers and not inline agency conflicts arise [Jensen et al \(1986\)](#), the cost of equity arises due to separation in ownership and firm controllers. Managers focus to maximize their wealth instead of firm value. Shareholders rights allow them to take advantage of shares holding via maximizing profits. Shareholders are thus assured to protect them, unfavorably effecting corporate operations and cost of efficiency.

Firms should increase leverage [Modigliani and Miller \(1963\)](#) but the cost to protect covenants increases with the debt ratio. Managers favour shareholders moving share capital from owners. Risk for leverage maximizes and value of the firm reduces. For asset replacement firms use external financing, ultimately enhancing uncertainty. Investment through debt turns to favor shareholders maximizing returns whereas reverse when a price cannot be endured by creditors.

2.1.4 Pecking order theory

Pecking order theory developed by [Myers 1984](#)) that firms have a preference order for capital structure. With asymmetric information among the firm and the lenders, the cost of financing varies between the choice of financing. When the fund provider in the firm retained earnings, the new equity holders can expect a high return on the investments, result from new equity finance a costly source of finance as compared to internal financing ([Kisgen 2006](#)). The same clause can be suggested between retained earnings and the new debt-holders. The higher the risk associated with asymmetric information, the higher will be the return on capital demand through each source. Therefore the firms favor retained earnings in their capital structure, short term debt over long term debt, and debt over equity ([Hall et al 2000](#)).

2.2 Microfinance institutions performance

The purpose of microfinance institutions is twofold that is poverty reduction and sustainability. Microfinance institutions are supported by subsidies and donor funds to stay sustainable. The performance of MFIs can be indicated by several measures such as sustainability and outreach. Some basic performance indicators were suggested by ([Christen and Rosenberg 2000](#); [CGAP 2003](#)) are outreach and efficiency.

2.2.1 Sustainability

When operating income is enough to generate funds to coverup operating expenses is known as sustainability ([Sharma 1997](#)). Sustainability is well-defined

by operational self-sufficiency and financial self-sufficiency.

Operational self-sufficiency When the operating income is adequate to meet operating costs irrespective of subsidies is known as operational self-sufficiency (Meyer 2002). Microfinance institutions would be able to attain OSS within three to seven years of formation. It is calculated as the ratio of operating earnings to the sum of administrative cost, loan loss provision and the interest expense. An institution is self-sufficient if it is 100% or more.

Financial self sufficiency When microfinance institutions cover up cost of funds and subsidies received are valued at market rate, became financially self-sufficient (Meyer 2002). FSS is a subsidies adjusted indicator employed by grant receiving institutions. Financial self-sufficiency is calculated by dividing business returns excluding grants from the operating cost of the business. An MFI is financially self-sufficient when it is 110% or more operationally self-sufficient. Microfinance institutions achieve financial self-sufficiency within five to ten years of their establishment. To attain long-term sustainability, microfinance institutions should manage efficiency, maximize saving mobilization, reduce operating costs and high-interest rates (Rutherford 2000).

2.2.2 Financial performance

From previous studies, it is found that the financial performance of microfinance institutions has been measured through financial ratios. Two financial ratios are used return on asset (RA) and return on equity (RE) obtained from financial reports of individual institutions (Kyereboah-Coleman 2007a; Rosenberg et al 2009).

Return on Assets Return on asset is the ratio of net profit to the total asset of the firm and used to measure the profitability of microfinance institutions.

Return on Equity Return on equity is calculated as net profit to shareholders equity.

2.2.3 Social performance

Social performance is a nonfinancial performance indicator of microfinance institutions. It depends on the breadth of outreach (AB) and depth of outreach (AL) (Woller and Schreiner 2002; Mersland and Strøm 2008).

Branch of Outreach The breadth of outreach is defined as a number of active borrowers (Mersland and Strøm 2008; Hartarska 2005). The breadth of outreach is a key for the sustainability of microfinance institutions.

Depth of outreach Depth of outreach is measured by average loan size (AL) (Stork 2005; Cull et al 2007; Hartarska 2005; Woller and Schreiner 2002).

2.2.4 Management efficiency

It is defined as operating expense to total asset ratio (Tehulu 2013). Efficient microfinance institutions incur low operating cost to asset ratio to remain viable (CGAP 2003).

2.3 Empirical literature

Capital structure is a debatable agenda for years, to maintain an optimal level of debt and equity. Researchers proposed capital structure theories but were unable to present an exact model for the optimal level of financing. The purpose of microfinance institutions is two-fold—poverty reduction and profitability (Tchakoute Tchuigoua 2015). Up-to-the-minute microfinance institutions are performing task to attain sustainability through financial services for unbanked clients (Armendáriz de Aghion and Morduch 2005; Hartarska 2005). Financing is affected by the same characteristics in developed and emerging countries of lending institutions e.g., Non-Government organizations (NGOs), Credit unions (CU), Non-bank financial intermediaries (NBFIs), and banks (Bogan 2012). Some literature findings related to capital structure on performance are presented as:

Microfinance institutions need to support their activities through external financing for poverty alleviation and to support poor clients (Armendáriz de Aghion and Morduch 2005). However, operating cost and capital limits the demand of MFIs. While donor agencies and rivalries increase stress in financial sustainability to enhance outreach (De Aghion and Morduch 2004). High leverage passes up profitable investment prospects for the firms (Myers 1977). Demirgüç-Kunt and Huizinga (2000) examined performance and interest margins depict the efficiency of financial institutions. A traditional view of ideal capital structure depicting a negative relation among returns and leverage is supported by (Kiogora 2000). Whereas, a positive relationship between debt and performance of firms are supported by (Abor (2005); Champion (1999); Gill et al (2011); Hadlock and James (2002)). Highly levered firms increase firm value and reduce agency cost of equity, encourage managers to work in the interest of business Berger and Di Patti (2006) in line with agency theory. No considerable effect of ownership structure is found by (Aburime 2008).

Debt is positively correlated to return on asset and return on equity, which supports the tradeoff theory. Kiiru et al (2008) suggest that debt level is highly linked to profitability of firms. Profitable MFIs rely on long-term debt. It allows to expand outreach and economies of scale with challenges and threats (Kyereboah-Coleman 2007a). Berger and Di Patti (2006) rejected the MM

propositions of capital structure. The study suggests financing structure based on debt negatively affect firm value, supports pecking-order-theory (Cassar and Holmes 2003; Fama and French 1998; Nyamsogoro 2010; Gleason et al 2000; Hirota 1999; Krishnan and Moyer 1997; Majumdar and Chhibber 1999; Nyamsogoro 2010; Olivares-Polanco 2005; Rajan and Zingales 1995; Titman and Wessels 1988). A positive link between funding (customers deposit, assets) and performance is found by (Kiiru et al 2008). Firms account for 72.42% of activities with debt (Kibet et al 2009).

Lafourcade et al (2005) attempts to answer that microfinance institutions, meet up activities from various sources. Mahjabeen (2010) conjectures microfinance institutions highly support grants and subsidies because financing choices influence the return on assets of financial institutions. Uwalomwa and Uadiale (2012) justified short term loans have a positive affect while long-term loans negatively affect the performance. For pecking order theory equity finance is a cheap source that improves the sustainability of microfinance institutions (Nyamsogoro (2010)). However, Garmaise and Natividad (2010) examines information asymmetry affect MFIs lending behavior based on M-M postulates (Myers 1984). Efficient microfinance institutions have access to large investment funds and outreach. There is a tradeoff between financial sustainability and outreach in the microfinance institutions found by (Ponce et al 2021). According to Kinde (2012) outreach, cost per borrower, and dependency ratio contribute to financial self-sustainability of MFIs. Bogan et al (2007) argue share capital to assets negatively effect FSS of MFIs. Lislevand (2012) acknowledge overall financial performance being affected by capital structure choices. Capital structure, growth, and profitability significantly affect the value of the firms (Hasbi 2015).

Ngo (2013) stated that regulated and efficient microfinance institutions depend on debt to constitute sustainability, efficiency, and outreach. It depends on debt to reach a large number of borrowers to attain sustainability which is based on the benefits of economies of scale. Moreover, maturity and performance (financial and social) are the important indicators for access to capital from microfinance investment vehicles. Size and debt to asset ratio are perfectly related to microfinance institutions access to debt capital while there is no evidence of mission drift (Dorffleitner et al 2017). Kar (2012) sanction the postulate of agency theory, increase in leverage enhance efficiency and shareholders wealth. The financial sustainability of microfinance institutions heavily depends on size and loan intensity while debt, management inefficiency, and portfolio risk deteriorate financial sustainability (Tehulu 2013). Individual lending of microfinance institutions improve performance as compared to group lending to borrowers, supporting tradeoff between profitability and outreach (Cull et al 2007).

This section has analyzed the preceding literature related to capital structure and performance of microfinance institutions with the concern of various indicators that provide varied and interesting evidence. Contrary to this no empirical study has been documented on the impact of capital structure on the

sustainability, financial performance, social performance of microfinance institutions in Asia along with macroeconomic variables. Where poverty is high and due to rivalry performance is squeezed. This fast-growing singularity motivates to study this gap to examine the impact of capital structure on performance of microfinance institutions.

3 Research Design

The dataset of this study is derived from two sources. It is collected from individual microfinance institutions reported on microfinance exchange at four and five-star Diamond disclosure ratings. Data set covers all microfinance institutions over Dollar 1.3 million total assets. World bank MIX market database is a web-based platform that ensures the transparency of individual microfinance institutions. Our sample consists of a panel dataset of MFIs from four regions: Eastern Europe and Central Asia, the Middle East and North Africa, East Asia and Pacific and South Asia, being selected for 2000-2015 where microfinance institutions are growing fast and poverty is relatively high. Country-level data of macroeconomic indicators are collected from World Development Index (WDI). In this study financial ratios are also used to test the relationship between capital structure and performance of institutions. The microfinance financial reporting standards recommend the use of return of assets and return on equity as a measure of microfinance institutions' profitability. Operational self-sufficiency and Financial self-sufficiency are used to measure the sustainability of institutions. Financial performance is measured through return on asset and return on equity. Social performance is represented by the breadth of outreach and depth of outreach. Management efficiency is the proxy for corporate performance. The study applies the following baseline model [Bogan \(2012\)](#); [Ngo \(2013\)](#) specified as:

$$perf_{ijt} = \alpha_0 + \sum_t \alpha_i X_{ijt} + \sum_t \beta_i Y_{ijt} + \sum \gamma_i Z_{ijt} + \sum_k \phi_k R + error_{ijt} \quad (1)$$

Where α_0 , α_i , β_i , γ_i , and ϕ_k are parameters of prediction, $error_{ijt}$ denote error terms and 0 constant represents the significance of performance if all the variables are zero. Performance of microfinance institutions is measured by sustainability: operational self-sufficiency and financial self-sufficiency (OSS, FSS), return on assets and return on equity (RA, RE), breath of outreach and depth of outreach (AB and AL-S) and management efficiency (EFF) as dependent variables while capital structure, microfinance characteristic variables, and macroeconomic indicators as independent variables. The set of country-specific variables Z is for j countries and R is the set of the regional dummy.

Independent variables for i microfinance institutions (X_i) are the debt to asset (DA), grants as a percentage of assets (GA), share capital to assets (SCA), deposit to an asset (DEA), debt to equity (DE). Microfinance characteristic

variables for i (Yit) includes size (S), loan intensity (LIN), Portfolio at risk > 30 days (PR), cost per borrower (CPB), productivity (PROD), the female borrowers (FBR), loan loss rate (LL), active borrowers (AB), and average loan size (AL-S). Dummy variables specifically for the region, status (bank, NGO, and regulated) are used to capture fixed effects. Macroeconomic indicators for j countries are gross domestic product (GDP) and inflation (INFL).

The equation for each measure is as follows:

$$\begin{aligned} Sustainability_{ijt} = & \alpha_0 + \alpha_1 DA_{ijt} + \alpha_2 GA_{ijt} + \alpha_3 SCA_{ijt} + \alpha_4 DEA_{ijt} + \\ & \alpha_5 DE_{ijt} + \alpha_6 AB_{ijt} + \alpha_7 PROD_{ijt} + \alpha_8 CPB_{ijt} + \alpha_9 FBR_{ijt} + \alpha_{10} LL_{ijt} \\ & \alpha_{11} LLN_{ijt} + \alpha_{12} PR_{ijt} + \alpha_{13} F_{ijt} + \alpha_{14} GDP_{ijt} + \alpha_{15} INFL_{ijt} + \epsilon_{ijt} \end{aligned} \quad (2)$$

$$\begin{aligned} Financial\ Performance_{ijt} = & \beta_0 + \beta_1 DA_{ijt} + \beta_2 GA_{ijt} + \beta_3 SCA_{ijt} + \beta_4 DEA_{ijt} + \\ & \beta_5 DE_{ijt} + \beta_6 AB_{ijt} + \beta_7 PROD_{ijt} + \beta_8 CPB_{ijt} + \beta_9 FBR_{ijt} + \beta_{10} LL_{ijt} \\ & \beta_{11} LLN_{ijt} + \beta_{12} PR_{ijt} + \beta_{13} F_{ijt} + \beta_{14} GDP_{ijt} + \beta_{15} INFL_{ijt} + \epsilon_{ijt} \end{aligned} \quad (3)$$

$$\begin{aligned} Social\ Performance_{ijt} = & \gamma_0 + \gamma_1 DA_{ijt} + \gamma_2 GA_{ijt} + \gamma_3 SCA_{ijt} + \gamma_4 DEA_{ijt} + \\ & \gamma_5 DE_{ijt} + \gamma_6 AB_{ijt} + \gamma_7 PROD_{ijt} + \gamma_8 CPB_{ijt} + \gamma_9 FBR_{ijt} + \gamma_{10} LL_{ijt} \\ & \gamma_{11} LLN_{ijt} + \gamma_{12} PR_{ijt} + \gamma_{13} F_{ijt} + \gamma_{14} GDP_{ijt} + \gamma_{15} INFL_{ijt} + \epsilon_{ijt} \end{aligned} \quad (4)$$

$$\begin{aligned} Management\ Efficiency_{ijt} = & \delta_0 + \delta_1 DA_{ijt} + \delta_2 GA_{ijt} + \delta_3 SCA_{ijt} + \delta_4 DEA_{ijt} + \\ & \delta_5 DE_{ijt} + \delta_6 AB_{ijt} + \delta_7 PROD_{ijt} + \delta_8 CPB_{ijt} + \delta_9 FBR_{ijt} + \delta_{10} LL_{ijt} \\ & \delta_{11} LLN_{ijt} + \delta_{12} PR_{ijt} + \delta_{13} F_{ijt} + \delta_{14} GDP_{ijt} + \delta_{15} INFL_{ijt} + \epsilon_{ijt} \end{aligned} \quad (5)$$

The empirical literature related to capital structure faces two conflicts highlighting missing values and the endogeneity problem. To overcome, the generalized method of moment (GMM) is employed which deals with the omitted values and endogeneity issue best suited for this study (Arellano and Bond 1991). For panel data fixed effects and random models are compared through the Hausman test. For such a purpose the instruments must be valid and uncorrelated to error terms. Here, the Sargan test overcomes identified restrictions. The results are computed through EVIEWS-9.

4 Results and discussion

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Table 1: Descriptive statistics

	Mean	Standard deviation	Skewness	Kurtosis	Observation
DA	0.389	0.445	0.999	8.842	2546
GA	3.44	2.225	0.135	2.011	2544
SCA	0.103	0.191	1.822	10.207	2546
DEA	0.069	0.159	2.731	10.519	2489
DE	4.873	37.635	20.009	63.79	2546
F	3.332	3.5	0.149	1.123	2546
PRO	5.623	1.696	-0.005	3.114	2527
CPB	13.28	49.85	20.123	62.6	2528
FBR	0.407	0.465	0.357	1.205	2499
LL	0.046	0.041	23.951	70.37	2509
LIN	2.094	13.708	15.215	32.48	2421
PR	0.0326	0.1882	25.107	85.7	2521
OSS	0.456	0.628	1.183	6.256	2546
FSS	0.341	0.604	1.761	8.359	2546
RA	0.0015	0.066	-6.157	71.485	2527
RE	0.208	5.647	46.755	28.5	2527
AL-S	4.89	0.632	1.037	7.12	2544
AB	10.315	2.131	-0.306	5.489	2500
EEF	0.054	0.086	1.756	30.09	2522

Table 2: Results of MFI performance along with MFI characteristics on capital structure part 1

	OSS	FSS	RA	RE	AB	AL-S	EEF
C	0.907** (-0.05)	0.038** (-0.024)	0.002*** (-0.969)	0.066*** (-0.817)	0.050** (-1.462)	0.0173*** (-1.528)	0.015*** (-1.036)
DA	0.120*** (-12.47)	0.950*** (-8.67)	0.039** (-1.97)	0.914 (-1.38)	0.202* (-1.74)	0.235*** (-2.26)	0.033*** (-2.72)
GA	0.005*** (-9.3)	0.004*** (-7.03)	0.001*** (-2.62)	0.001*** (-1.63)	0.010* (-1.72)	0.013*** (-2.66)	0.006*** (-6.79)
SCA	0.565*** (-5.31)	0.381*** (-3.39)	0.043*** (-2.44)	0.314 (-1.05)	0.161 (-1.39)	0.365*** (-2.62)	0.234*** (-11.66)
DTA	0.029*** (-2.90)	0.149*** (-1.83)	0.043*** (-1.76)	0.186 (-1.06)	0.113* (-1.94)	0.219*** (-2.2)	0.052*** (-3.11)
DTE	0.183*** (-2.30)	0.029*** (-2.85)	0.001*** (-4.23)	0.003*** (-2.77)	0.002* (-1.77)	0.116 (-1.18)	0.20*** (-2.23)
AB	0.008*** (-11.79)	0.006*** (-8.53)	0.001*** (-2.63)	0.001* (-1.78)		0.002*** (-3.42)	
RA	0.156*** (-8.48)	0.126*** (-6.38)	0.002*** (-3.05)	0.137 (-2.96)	0.428 (-1.39)	0.226 (-0.88)	0.643*** (-8.255)
F	0.001*** (-3.44)	0.001*** (-2.97)	0.002 (-0.72)	0.001 (-0.02)	0.138* (-1.77)	0.735*** (-4.88)	0.006*** (-3.77)
PRO	0.027*** (-3.61)	0.015*** (-2.23)	0.001*** (-2.34)	0.001 (-0.59)	0.001 (-1.32)	0.000 (-0.55)	0.001*** (-3.64)
CB	0.368 (-0.72)	0.593 (-1.13)	0.001*** (-4.95)	0.587 (-1.13)	0.029 (-1.22)	3.023*** (-6.38)	0.055 (-7.44)
FBR					0.567* (-1.8)	0.176*** (-5.25)	0.059*** (-6.49)

Note: Significance level: 1%, 5%, 10% : ***, **, *, . Hausman test: it is distributed asymptotically as chi square following null hypothesis of explanatory variables are not correlated with error terms. Sargan J test: this is a test of over identifying restricted terms and distributed asymptotically as chi square following null hypothesis that all used instruments are valid and un-correlated with reor terms.

Table 3: Results of MFI performance along with MFI characteristics on capital structure part 2

	OSS	FSS	RA	RE	AB	AI-S	EEF
LL	0.631*** (-4.48)	1.276*** (-7.85)	0.004*** (-2.17)	0.072** (-1.79)	0.132 -1.18	1.701 -0.3	0.002*** (-1.76)
LI	0.056*** -3.25	0.055*** -3.27	0.001 (-4.39)	0.002 (-1.37)	0.132* (-1.77)	0.772** -1.88	0.001* (-1.76)
PR	0.368 (-1.06)	0.606 (-1.39)	0.064** (-1.79)	1.4 (-0.79)	0.982 (-1.41)	0.369 (-0.98)	0.032** (-1.94)
YN	9.285** -2.89	11.154*** -3.29	0.041*** -3.02	0.085 (-0.51)	12.572 -1.36	9.848 -0.18	0.029** -4.17
MT	9.771*** -1.98	11.838*** -2.29	0.040*** -3.84	0.038 (-0.25)	32.793* (-1.76)	27.265 -0.72	0.003 (-1.04)
NGO	8.791*** -3.3	6.284*** -2.43	0.011*** (-1.94)	0.250** (-2.11)	18.868* (-2.27)	39.61*** (-2.54)	0.023*** -2.77
Bank	0.002 0	9.193 0	0.01 0	0.110* -0.001	0.009 0	0.004 0	0.019*** (-3.44)
REG	5.666 (-1.16)	9.193*** (-1.88)	0.001* (-1.92)	0.001** -2.03	12.181* -1.78	12.878** -1.9	0.001** (-3.44)
GDP	0.003*** -3.61	0.472*** -3.55	0.001*** -2.91	0.005** -0.97	0.167 -0.78	0.006*** -2.49	0.001** (-2.14)
INFL	-0.428 -1.05	0.665 -1.12	0.002* (-2.73)	0.004** (-0.72)	0.848 (-1.54)	0.132*** (-1.72)	0 -0.71
SA	7.782 -4.3	5.998*** (-3.35)	0.002* (-0.38)	0.109* (-0.89)	16.713 -1.248	35.88** -1.81	0.032*** (-6.75)
EE	6.393 (-1.74)	8.619* (-1.74)	0.04* -0.63	0.018*** (-0.54)	14.97*** (-1.74)	9.183 -0.68	0.016*** (-3.14)
EA	9.682 -2.21	8.619 -1.16	0.041** (-2.27)	0.677 -0.895	26.531 (-1.64)	2.804 (-0.06)	0.104*** (-5.53)
Hausman test	0.001	0	0.001	0.003	0.002	0	0.001
Sargan J test	0.09	0.07	0.091	0.075	0.072	0.09	0.091
R2	0.401	0.43	0.423	0.45	0.44	0.69	0.788

Note: Significance level: 1%, 5%, 10% : ***, **, *, Hausman test: it is distributed asymptotically as chi square following null hypothesis of explanatory variables are not correlated with error terms. Sargan J test: this is a test of over identifying restricted terms and distributed asymptotically as chi square following null hypothesis that all used instruments are valid and un-correlated with error terms.

Equation 2 reports the results of operational and financial self-sufficiency, and indicates that Debt to assets (DA), Share capital to assets (SCA), Deposit to assets (DEA) have a negative impact on operational self-sufficiency of microfinance institutions. On the other hand, grants to assets (GA) positively affect the operational self-sufficiency of microfinance institutions. It is inferred that subsidized financing has a positive impact on operational self-sufficiency, to cover up operating costs. Any change in capital composition contributes undesirably to the performance of microfinance institutions. From the findings, it is evident that not only does capital structure effect performance of MFIs, microfinance characteristic variables also affect the performance in different ways. In the case of operational self-sufficiency as dependent variable, a number of active borrowers declines operational self-sufficiency because it is pretentious due to the type of borrowers which increase operating expense (Bogan et al 2007). Size and loan intensity of MFIs are significant with operational self-sufficiency because large size MFIs are linked to operational self-sufficiency due to minimal operating expense and loan intensity (Bourke 1989). However cost per borrower decreases operational self-sufficiency, findings are in line with (Dissanayake 2012). The status of microfinance institutions also affect the legal status of MFIs for example NGOs, young and mature MFIs increase OSS. The results reveal Gross domestic product (GDP) has a positive impact while any change in exchange rate does not influence the operational self-sufficiency of microfinance institutions in Asia. The regional comparison indicates no association between OSS and capital structure. The value of R_2 presents the percentage change in the dependent variable explained by explanatory variables is 40%. For panel data analysis the value of R_2 more than 0.20 is suitable for the reliability of decisions (Nyamsogoro 2010). Sargan-J test supports instruments of the model are valid.

Equation 2, column 3 report the findings of financial self-sufficiency as the dependent variable. Debt to equity ratio (DE) positively impact financial self-sufficiency of MFIs while the other capital structure indicators decrease financial self-sufficiency of MFIs in Asia. Debt negatively affect financial self-sufficiency, indicating debt an expensive source for microfinance institutions. Equity is the cheapest source of financing and a high debt ratio may reduce sustainability. It reveals that MFIs attract investors through loans instead of dividends to shareholders. There is no dividend payment which makes equity an inexpensive source of finance as compared to leverage. These results support the pecking-order theory by indicating this negative relationship between financing and financial self-sufficiency inline with (Tehulu 2013). As a dependent variable, a tradeoff between operational self-sufficiency and financial self-sufficiency is examined. Microfinance institutions can achieve either operational self-sufficiency or financial self-sufficiency, both can not be achieved at a time.

AB (number of borrowers), size and CPB (cost per borrower), and loan intensity are positively influencing the financial self-sufficiency of MFIs supported by various studies (Bogan et al 2007; Cull et al 2007; Mersland and Strøm 2008; Kyereboah-Coleman 2007a). Financial sustainability is positively influenced by loan intensity consistent with (Tehulu 2013). Type of microfinance institutions

like NGO, YN (young) and MT (mature) positively contribute in financial self-sufficiency of institutions. Regulated institutions and loan loss rates negatively influence FSS. Gross domestic product (GDP) affects financial self-sufficiency whereas INFL has no effect. On the regional basis from the Middle East, financial self-sufficiency is significant in the Eastern European region and poor in the South Asian region due to high non-performing loans and overheads.

Column 4 in table 2 explains the results of return on assets following equation 3. Debt to asset (DA), debt to equity (DE), and grants to assets (GA) negatively affect return on asset (RA) whereas Deposits to asset positively affect (Kiiru et al 2008). Deposits increase the income of microfinance institutions, the higher the deposit more the return on assets ratio. Regarding agency cost theory, debt is penalized because it enforces to maximize shareholders income (Jensen and Meckling 1976). It is evident from the findings that a number of active borrowers (AB), size (F), and productivity (PROD) increase return on assets of microfinance institutions in line with (Woller and Schreiner 2002) whereas increase portfolio risk > 30 days (PR) decrease return on assets due to large nonperforming loans. The legal status of MFIs: Young and mature (YN, MT) institutions help to upsurge return on assets, serving a large number of poor. Non-Government organizations (NGOs) do not generate profits and hence decrease return on assets, same results found for Banks. Because they are more concerned with profit maximization. An increase in the Gross domestic product (GDP) increases return on assets (RA). However reverse effect for INFL is observed due to the high cost of capital and disbursement. For the Middle East, return on assets is positively linked while negative with East Asia (EA) and South Asia (SA).

In the same pattern following equation 3, column 5 explains the results of return on equity as a performance measure with capital structure indicators. It reveals equity improve the performance of microfinance institutions supports pecking order theory (Bich, 2016). A number of borrowers (AB), LLI negatively affect the return on equity whereas PROD, CPB, type of institutions (NGO, BANK, REG) increase return on equity. Gross domestic product positively and inflation negatively affect return on equity of MFIs. That means country-level growth increases return on equity (RE) and the rise of exchange rate minimizes return on equity (RE). There is a comparatively decreased return on equity (RE) in the South Asian region and the Eastern European region with the comparison of the Middle East region. There is an open economic market conditions in Asian region where financials feat every chance to avail funds.

Social performance is measured by the number of borrowers (AB) and average loan size (AL). findings approve a tradeoff (between breadth and depth of outreach). Following equation 4, Deposit to asset (DEA), debt to equity (DE) and debt to an asset (DA) tends to increase in the number of borrowers by serving large clients. This infers deposits and a mixture of debt and equity enhance the breadth of outreach, serving large clients. Female borrowers (FBR), size (F), legal status: NGO, MT, REG, and GDP positively affect the breath

of outreach (Hartarska 2005). Moreover, equity finance is exclusive to leverage which is an essential element to expand the breadth of outreach in an early stage of microfinance institutions. Cost per borrower (CPB) and LII lowers the efficiency to achieve a target of large borrowers. Breadth of outreach is more in the East European region while the other three regions do not take into account any debt financing to increase outreach.

It is evident from column 7, debt is more expensive for institutions to increase the depth of outreach of microfinance institutions. Debt to an asset (DA), grants to assets (GA), and share capital to assets (SCA) is not a source to expand the depth of outreach. Deposits to asset (DTA) increase depth of outreach, provide large size loans to poor. The legal status: regulated microfinance institutions also contribute to achieve outreach because regulated MFIs are at the biggest scale, attracting more deposits. NGOs type MFIs increase the depth of outreach at 5% significance level results are consistent with (Hartarska 2005) while loan intensity (LII) and cost per borrowers (CPB) at 1% level of significance. Moreover, the breadth of outreach (AB) leads to a decline in the depth of outreach (AL-S) confirms a tradeoff between the breadth of outreach and depth of outreach. It is difficult for microfinance institutions to achieve both goals at a time. Loan size increases the social performance of MFIs due to high efficiency cost, supported by literature (Gregoire and Tuya 2006). Regulated type microfinance institutions increase the depth of outreach. These are more efficient to serve clients providing large loans which can reduce the cost associated to small loans. Regulated MFIs enjoy more depth of outreach than unregulated inline with (Hartarska 2005). The effect of GDP on depth of outreach is significant at 5% while negatively related to INFL significant at 1%. The effect of depth of outreach on microfinance institutions does not perform well in the East Asian region and the South Asian region due to large poverty and small access to clients.

Column 7 explains the results of equation 5, the management efficiency of MFIs. Management efficiency is measured as Operational expense to total asset. It is observed that debt to an asset (DA), grants to assets (GA), deposits to assets (DEA), and share capital to assets (SCA) improve the efficiency of microfinance institutions while the debt to equity (DE) ratio presents the reverse relationship. External financing increase the efficiency of MFIs whereas equity minimizes (Cassar and Holmes 2003; Chiang et al 2002; Fama and French 1998; Gleason et al 2000; Hirota 1999; Krishnan and Moyer 1997; Majumdar and Chhibber 1999; Nyamsogoro 2010; Olivares-Polanco 2005; Rajan and Zingales 1995; Titman and Wessels 1988). Results of the study point out regulated MFIs are inefficient because high leverage increases their operational cost (Masood et al 2010). Bank-type MFIs negatively contribute to efficiency. High debt creates a threat of liquidity, financial risk, and cost of equity. Size (F), female borrowers (FBR) positively increase management efficiency.

While productivity (PROD), loan intensity (LII), and loan loss rate (LL) lead to the inefficiency of microfinance institutions. Young (YN) type microfinance institutions have strict goals to achieve efficiency to sustain their position

in market as compared to mature (MT) type MFIs who ultimately approve their sustainability in this study. Loan size decreases the efficiency of MFIs in line with (Hermes et al 2011). Consequently, this study put an additional insight into the current works with loan intensity which contribute to management inefficiency as the loan intensity increases. The same relationship between efficiency, female borrowers and loan intensity is found by (Ngo 2013). An increase in return on assets (RA) leads to efficiency, and a drop in administrative costs. An increase in portfolio risk >30 days (PR) tends to high nonperforming loans in due course decrease efficiency with a 5% significance level. Efficient institutions are always the profitable ones. From the findings, increase in GDP lead to inefficiency of MFIs at 5% significance. In the Eastern European region, the East Asian region and the South Asian region microfinance institutions are inefficient due to the high proportion of debt financing and operating cost for each loan.

5 Conclusion

This study has identified the impact of capital structure on the performance of microfinance institutions for the period of 2000 to 2015, through unbalanced panel data analysis. It analyzes whether capital structure theories approve our findings and the characteristic variables of microfinance institutions impact performance. The findings of the study highlighted an important role of capital structure in the performance of microfinance institutions. Pecking theory approves a negative impact of financing on financial self-sufficiency of microfinance institutions. However, subsidized finance positively increase operational self-sufficiency of microfinance institutions. A tradeoff exists among operational and financial self-sufficiency of microfinance institutions.

With regard to MFI specific characteristics, a number of borrowers (AB), cost per borrowers, productivity (PROD), regulated type institutions (REG), loan loss (LL) decrease while the size of institutions (F), loan intensity (LIN), and type of microfinance institutions (YN, MAT, NGO) increase operational viability of microfinance institutions. It is evident from the results that not only does capital structure affect microfinance institutions, but characteristic variables also contribute to the performance of microfinance institutions. With the increase in gross domestic product (GDP) sustainability increases whereas exchange rates does not improve sustainability of microfinance institutions. The financial sustainability of Eastern European MFIs as well.

Regarding agency theory, debt financing is a penalizing device that enforces managers to maximize shareholders' wealth rather than building domains. Deposits to assets increase the financial performance of microfinance institutions whereas other capital structure variables decrease return on assets. For microfinance characteristics, a number of active borrowers, size of microfinance institutions, and productivity increase the return on assets. Whereas the portfolio risk ≥ 30 days reduces return on assets. Young and mature microfinance institu-

tions can enhance financial performance. Because they are more concerned with profit maximization. An increase in Gross domestic product increases returns on assets. The Middle East, return on assets is positively linked while negative with the East Asia (EA) and the South Asia (SA).

With the perspective of pecking order theory, financial performance is improved by equity as evident from the results in table 2. A number of borrowers and loan intensity negatively affect return on equity whereas productivity, cost per borrowers and type of institutions (NGO, BANK, REG) increase the return on equity. GDP positively and inflation negatively affect return on equity of MFIs. That means country-level growth increases return on equity (RE) and the rise of exchange rate minimizes return on equity (RE). There is a comparatively decreased return on equity (RE) in the South Asian region and the Eastern the European region with the comparison of Middle East region. There is an opened economic market conditions in Asian region where financial institutions achieve every chance to avail funds.

Deposits and a mixture of debt and equity enhance the breath of outreach, serving large clients. Female borrowers (FBR), size (F), legal status: NGO, MT, REG and GDP positively affect breath of outreach. Equity finance is exclusive to leverage which is an essential element to expand breath of outreach in an early stage of microfinance institutions. Breath of outreach is more in East European region while other three regions do not take into account any debt financing to increase outreach. Debt is more expensive for institutions to increase the depth of outreach of microfinance institutions. Deposits to asset (DTA) increase depth of outreach. Regulated microfinance institutions, NGOs type MFIs increase depth of outreach at 5% significance level while loan intensity (LII) and cost per borrowers (CPB) at 1% level of significance. Whereas, the breath of outreach (AB) leads to a decline in the depth of outreach (AL-S). A tradeoff between breath of outreach and depth of outreach is determined. It is difficult for microfinance institutions to achieve both goals at a time. Regulated type microfinance institutions are more efficient to serve clients providing large loans which can reduce the cost of small loans. GDP is positively significant at 5% while negatively related to INFL at 1%.

It highlights that external financing increases the efficiency of MFIs whereas equity minimizes. Regulated MFIs are inefficient and Bank type MFIs negatively contribute to efficiency. The size of MFIs and female borrowers increases management efficiency. While productivity, increasing loan intensity and loan loss rates, lead to inefficiency of microfinance institutions. Young microfinance institutions have strict goals to achieve efficiency to sustain their position in the market as compared to mature types of micro-financing institutions who ultimately approve their sustainability in this study. Return on assets leads to efficiency and an increase in nonperforming loans (PR) tends to decrease the efficiency with a 5% significance level. Gross domestic product leads to the inefficiency of MFIs at 5% significance. In the Eastern European region, the East Asian region and the South Asian region microfinance institutions are inefficient

due to the high proportion of debt financing and operating cost for each loan. There are mixed results found about performance of microfinance institutions. Not only capital structure variables, characteristics of microfinance institutions also affect performance of microfinance institutions. Performance also varies according to the legal status of MFIs. At macroeconomic level, the Gross domestic product increases performance whereas inflation do not. These findings are valuable to shareholders of microfinance institutions to develop managerial policies on the performance with respect to capital structure choices.

Further Research Due to data limitations, this study attempts to examine the performance of microfinance institutions from 2000-2015. A secondary data set reveals the results provided in this study. Further research can be done to expand the data set to get further insights into the study. Microfinance outreach can be better measured from the primary data.

Policy Implication Policymakers formulate development projects to increase outreach towards rural areas, enable formal financial institutions to intermeditate among creditors and borrowers. Financial systems can be renewed. Which can show a positive association between sustainability of the financial system and economic growth. Push financial frontiers to low-income clients, tackle information flow through innovative techniques, monitoring and enforce procedures. It would be valuable for central bank of Asia to develop effective policies on capital structure to improve the performance of lending institutions.

References

- Abor J (2005) The effect of capital structure on profitability: an empirical analysis of listed firms in Ghana. *The Journal of Risk Finance*
- Aburime T (2008) Impact of ownership structure on bank profitability in Nigeria. Available at SSRN 1107760
- Adusei M (2021) Interest rate and the social performance of microfinance institutions. *The Quarterly Review of Economics and Finance* 80:21–30
- Armendáriz de Aghion B, Morduch J (2005) *The economics of microfinance* MIT Press. Cambridge, Massachusetts
- Arellano M, Bond S (1991) Some tests of specification for panel data: Monte Carlo evidence and an application to employment equations. *The Review of Economic Studies* 58(2):277–297
- Ayyagari M, Beck T (2015) Financial inclusion in Asia: An overview. Asian Development Bank Economics Working Paper Series (449)
- Berger AN, Udell P (2006) Capital structure and firm performance: A new approach to testing agency theory and an application to the banking industry. *Journal of Banking & Finance* 30(4):1065–1102
- Bibi U, Balli HO, Matthews CD, Tripe DW (2018) Impact of gender and governance on microfinance efficiency. *Journal of International Financial Markets, Institutions and Money* 53:307–319
- Bich NN (2016) The effect of capital structure and legal status on financial sustainability of MFIs in developing countries. *Review of Business and Economics Studies* (2):53–64
- Bogan V, Johnson W, Mhlanga N (2007) Microfinance institution capital structure and financial sustainability. Tech. rep., Working Papers

- Bogan VL (2012) Capital structure and sustainability: An empirical study of microfinance institutions. *Review of Economics and Statistics* 94(4):1045–1058
- Bourke P (1989) Concentration and other determinants of bank profitability in europe, north america and australia. *Journal of Banking & Finance* 13(1):65–79
- Bradley M, Jarrell GA, Kim EH (1984) On the existence of an optimal capital structure: Theory and evidence. *The Journal of Finance* 39(3):857–878
- Cassar G, Holmes S (2003) Capital structure and financing of smes: Australian evidence. *Accounting & Finance* 43(2):123–147
- CGAP C (2003) *Microfinance consensus guidelines*. Washington: The World Bank
- Champion D (1999) Finance: the joy of leverage. *Harvard Business Review* 77(4):19–22
- Chatterjee AK (2012) Regional: Improving financial inclusion in asia and the pacific
- Chiang SH, Arpaci-Dusseau A, Vernon MK (2002) The impact of more accurate requested runtimes on production job scheduling performance. In: *Workshop on Job Scheduling Strategies for Parallel Processing*, Springer, pp 103–127
- Christen RP, Rosenberg R (2000) The rush to regulate: Legal frameworks for microfinance. Occasional Paper 4
- Cull R, Demirgüç-Kunt A, Morduch J (2007) Financial performance and outreach: A global analysis of leading microbanks. *The Economic Journal* 117(517):F107–F133
- De Aghion BA, Morduch J (2004) *Microfinance: Where do we stand?* Londres: Palgrave/Macmillan
- Demirgüç-Kunt A, Huizinga H (2000) Financial structure and bank profitability. Available at SSRN 632501
- Dissanayake D (2012) The determinants of return on equity: evidences from sri lankan microfinance institutions. *International Refereed Research Journal* 3(2):2
- Dorflleitner G, Röhe M, Renier N (2017) The access of microfinance institutions to debt capital: An empirical investigation of microfinance investment vehicles. *The Quarterly Review of Economics and Finance* 65:1–15
- Fama EF, French KR (1998) Value versus growth: The international evidence. *The Journal of Finance* 53(6):1975–1999
- Faulkender M, Petersen MA (2006) Does the source of capital affect capital structure? *The Review of Financial Studies* 19(1):45–79
- García-Pérez I, Muñoz-Torres MJ, Fernández-Izquierdo MÁ (2017) Microfinance literature: A sustainability level perspective survey. *Journal of Cleaner Production* 142:3382–3395
- Garmaise MJ, Natividad G (2010) Information, the cost of credit, and operational efficiency: An empirical study of microfinance. *The Review of Financial Studies* 23(6):2560–2590
- Gill A, Biger N, Mathur N (2011) The effect of capital structure on profitability: Evidence from the united states. *International Journal of Management* 28(4):3
- Gleason KC, Mathur LK, Mathur I (2000) The interrelationship between culture, capital structure, and performance: evidence from european retailers. *Journal of Business Research* 50(2):185–191
- Green CJ, Murinde V, Suppakitjarak J (2003) Corporate financial structures in india. *South Asia Economic Journal* 4(2):245–273
- Gregoire JR, Tuya OR (2006) Cost efficiency of microfinance institutions in peru: A stochastic frontier approach. *Latin American Business Review* 7(2):41–70
- Hadlock CJ, James CM (2002) Do banks provide financial slack? *The Journal of Finance* 57(3):1383–1419
- Hall G, Hutchinson P, Michaelas N (2000) Industry effects on the determinants of unquoted smes' capital structure. *International Journal of the Economics of Business* 7(3):297–312
- Hamada RS (1969) Portfolio analysis, market equilibrium and corporation finance. *The Journal of Finance* 24(1):13–31
- Hartarska V (2005) Governance and performance of microfinance institutions in central and eastern europe and the newly independent states. *World Development* 33(10):1627–1643
- Hasbi H (2015) Islamic microfinance institution: the capital structure, growth, performance and value of firm in indonesia. *Procedia-Social and Behavioral Sciences* 211:1073–1080
- Hermes N, Lensink R, Meesters A (2011) Outreach and efficiency of microfinance institutions. *World Development* 39(6):938–948
- Hirota S (1999) Are corporate financing decisions different in japan? an empirical study on capital structure. *Journal of the Japanese and International Economies* 13(3):201–229

- Iezza P (2010) Financial sustainability of microfinance institutions: An empirical analysis. Department of Economics, Copenhagen Business School, Copenhagen
- Jensen MC, Meckling WH (1976) Theory of the firm: Managerial behavior, agency costs and ownership structure. *Journal of financial economics* 3(4):305–360
- Jensen MC, Meckling WH, Holderness CG (1986) Analysis of alternative standing doctrines. *International Review of Law and Economics* 6(2):205–216
- Kar AK (2012) Does capital and financing structure have any relevance to the performance of microfinance institutions? *International Review of Applied Economics* 26(3):329–348
- Kibet LK, Mutai BK, Ouma DE, Ouma SA, Owuor G (2009) Determinants of household saving: Case study of smallholder farmers, entrepreneurs and teachers in rural areas of kenya. *Journal of development and agricultural economics* 1(7):137–143
- Kiiru JM, Mburu JG, Klaus F (2008) Does participation in microfinance programs improve household incomes: Empirical evidence from makueni district, kenya. Tech. rep.
- Kinde BA (2012) Financial sustainability of microfinance institutions (mfis) in ethiopia. *European Journal of Business and Management* 4(15):1–10
- Kiogora GM (2000) Testing for variations in the capital structure of companies quoted at the nairobi stock exchange. PhD thesis
- Kisgen DJ (2006) Credit ratings and capital structure. *The Journal of Finance* 61(3):1035–1072
- Krishnan VS, Moyer RC (1997) Performance, capital structure and home country: An analysis of asian corporations. *Global finance journal* 8(1):129–143
- Kyereboah-Coleman A (2007a) The determinants of capital structure of microfinance institutions in ghana. *South African Journal of Economic and Management Sciences* 10(2):270–279
- Kyereboah-Coleman A (2007b) The impact of capital structure on the performance of microfinance institutions. *The Journal of Risk Finance*
- Lafourcade AL, Isern J, Mwangi P, Brown M (2005) Overview of the outreach and financial performance of microfinance institutions in africa. *Microfinance Information eXchange*, Washington, DC [http://www mixmarket org/medialibrary/mixmarket/Africa.Data.Study pdf](http://www.mixmarket.org/medialibrary/mixmarket/Africa.Data.Study.pdf)
- Lippman SA, McCall JJ (1982) Taxation, incentives, and risk sharing. *Operations Research Letters* 1(3):83–84
- Lislevand CJ (2012) The effect of capital structure on microfinance institutions performance. Master's thesis, Universitetet i Agder; University of Agder
- Mahjabeen R (2010) On the provision of micro loans-microfinance institutions and traditional banks. *Journal of economic development* 35(1):59
- Majumdar SK, Chhibber P (1999) Capital structure and performance: Evidence from a transition economy on an aspect of corporate governance. *Public choice* 98(3):287–305
- Masood T, Ahmad M, et al (2010) Technical efficiency of microfinance institutions in india-a stochastic frontier approach. *Technical Efficiency of Microfinance Institutions in India-A Stochastic Frontier Approach* (October 8, 2010)
- Mersland R, Strøm RØ (2008) Performance and trade-offs in microfinance organisations: does ownership matter? *Journal of International Development: The Journal of the Development Studies Association* 20(5):598–612
- Meyer J (2019) Outreach and performance of microfinance institutions: the importance of portfolio yield. *Applied Economics* 51(27):2945–2962
- Meyer RL (2002) Track record of financial institutions in assisting the poor in asia
- Modigliani F, Miller MH (1958) The cost of capital, corporation finance and the theory of investment. *The American economic review* 48(3):261–297
- Modigliani F, Miller MH (1963) Corporate income taxes and the cost of capital: a correction. *The American economic review* 53(3):433–443
- Mwakabumbe CA (2013) Effect of capital structure on performance of microfinance institutions: a survey of success in shinyanga municipal council. PhD thesis, Mzumbe University
- Myers S (1977) Determinants of corporate borrowing *journal of financial economics*.1977
- Myers SC (1984) Capital structure puzzle
- Myers SC, Majluf NS (1984) Corporate financing and investment decisions when firms have information that investors do not have. *Journal of financial economics* 13(2):187–221
- Ngo TV (2013) Capital structure and microfinance performance: a cross-country analysis and case study of vietnam. PhD thesis, University of Birmingham

- Nyamsogoro GD (2010) Financial sustainability of rural micro finance institutions (mfis) in tanzania. PhD thesis, University of Greenwich
- Olivares-Polanco F (2005) Commercializing microfinance and deepening outreach? empirical evidence from latin america. *Journal of Microfinance/ESR Review* 7(2):5
- Ponce LAB, Rocha AR, Navarro RP (2021) A causality approach in the analysis of the trade-off between financial sustainability and outreach. *Finance Research Letters* 42:101,920
- Rajan RG, Zingales L (1995) What do we know about capital structure? some evidence from international data. *The journal of Finance* 50(5):1421–1460
- Ritzer G, et al (2007) *The Blackwell encyclopedia of sociology*, vol 1479. Blackwell Publishing New York
- Rosenberg R, Gonzalez A, Narain S (2009) The new moneylenders: Are the poor being exploited by high microcredit interest rates? In: *Moving beyond storytelling: Emerging research in microfinance*, Emerald Group Publishing Limited
- Rutherford S (2000) *The poor and their money*: Oxford university press
- Sharma SR (1997) Strengthening of credit institutions/programs for rural poverty alleviation in nepal. ESCAP, Bangkok
- Siddik M, Alam N, Kabiraj S, Joghee S (2017) Impacts of capital structure on performance of banks in a developing economy: Evidence from bangladesh. *International journal of financial studies* 5(2):13
- Stiglitz JE (1974) On the irrelevance of corporate financial policy. *The american Economic review* 64(6):851–866
- Stork C (2005) Factors influencing the financial sustainability of selected microfinance institutions in namibia
- Swain R, Patnaik B (2013) Financial structure analysis of indian companies: A review of literature. *Asia Pacific Journal of Research in Business Management* 4
- Tchakoute Tchuigoua H (2015) Capital structure of microfinance institutions. *Journal of Financial Services Research* 47(3):313–340
- Tehulu TA (2013) Determinants of financial sustainability of microfinance institutions in east africa. *European Journal of Business and Management* 5(17):152–158
- Titman S, Wessels R (1988) The determinants of capital structure choice. *The Journal of finance* 43(1):1–19
- Uwalomwa U, Uadiale OM (2012) An empirical examination of the relationship between capital structure and the financial performance of firms in nigeria. *EuroEconomica* 31(1)
- Vătavu S (2015) The impact of capital structure on financial performance in romanian listed companies. *Procedia Economics and Finance* 32:1314–1322
- Widiarto I, Emrouznejad A (2015) Social and financial efficiency of islamic microfinance institutions: A data envelopment analysis application. *Socio-Economic Planning Sciences* 50:1–17
- Woller G, Schreiner M (2002) Poverty lending, financial self-sufficiency, and the six aspects of outreach. Disc Paper, Ohio