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The rapid credit growth and financial stability in microfinance institutions: Lessons from the past financial crisis

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Abstract

Financial crisis could be transmitted across countries through the contraction of capital inflows to the financial sector. Since credit booms in emerging market economies might be due to large capital inflows, microfinance institutions (MFIs) with higher credit growth during the pre-global financial crisis might have faced a higher credit contraction during the crisis as significant decline in capital flows could be expected. Hence, the study examines the effect of credit expansion on financial stability in the context of MFIs and the moderating effect of legal status on MFI credit boom and bust cycle using panel dataset of 101/121 MFIs in Sub-Saharan Africa (SSA) covering 2004–2009. Using the Ordinary Least Square (OLS) regression, the study confirms that there is weak or no boom–bust pattern in MFI credit growth depending on their legal status. MFIs with rural bank and NGO legal status exhibited a boom–bust pattern in credit growth while the boom had little impact on the subsequent credit growth of NBFIs and micro-banks. Moreover, the rapid credit growth had no any negative effect on credit union/cooperative subsequent lending behavior suggesting that legal status has a moderating effect on credit boom–bust cycle. The study also uncovers that changes in non-deposit borrowings and MFI size have amplified/mitigated credit contractions during the crisis.

Key Words: Boom and bust cycle, Lending behavior, Sustainability, Microfinance, Sub-Saharan Africa

1. Introduction

In developing economies, microcredit is an important intervention in the poverty alleviation endeavor. Although higher credit growth implies greater access to finance which could fuel investment and economic growth, episodes of rapid credit growth could pose a policy dilemma as fast credit expansion may also lead to excessive leverage, deterioration in portfolio quality (due to looser lending standards), and asset price bubbles ((Dell'Ariccia, *et al*., 2012). The literature shows that a credit boom may not necessarily lead to a financial crisis (Tornell & Westermann, 2002); however, it is the main factor for credit growth contractions in subsequent periods (Aisen & Franken, 2010; Wagner & Winkler, 2013). Poverty reduction (social impact) – by providing financial services, particularly credit access, to the poor – is one of the double bottom lines of

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MFIs. In this connection, the microfinance industry in SSA has rapid credit growth, especially, during the pre-subprime crisis period (Tehulu, 2021a). Nevertheless, studies that examine the consequences of the rapid credit growth on the subsequent lending behavior of MFIs in SSA are missing.

In numerous emerging markets, credit has grown rapidly in the recent past (Elekdag & Wu, 2013). The gross loan portfolio of MFIs in SSA has also expanded rapidly (Tehulu, 2021a). While fast credit expansion has generally been linked to favorable funding opportunities, cyclical upturns, financial deepening, or a combination thereof, among others (IMF, 2004) and it is also associated with greater investment and economic growth, it raises concerns given excessive credit growth was the main factor in previous financial crises (IMF, 2004; Schularick & Taylor, 2009). Although credit booms may lead to financial instability, the research debate has paid little attention to the consequences of rapid credit growth in MFIs, especially in emerging Africa.

The boom–bust cycle suggests that the credit fall during a financial crisis is mainly determined by the pre-crisis boom (Vogel & Winkler, 2010). In this regard, Schularick and Taylor (2009) also assert that credit growth is a powerful predictor of financial crises, which suggests that financial crises are "credit booms gone wrong". Similarly, the "Great Recession" was preceded by a rapid credit expansion ((Di Maggio & Kermani, 2017). Tornell and Westermann (2002), however, show that while almost "every crisis has been preceded by a lending boom, not all lending booms end in crisis" (P.6). They show that 91% of the crises tend to be preceded by lending booms; whereas, the probability of a crisis in a given country in a particular year given a lending boom is about 6% suggesting soft landing.

While a credit boom may not necessarily lead to a financial crisis, it is the main factor for credit growth contractions in subsequent periods. This is consistent with the findings of Aisen and Franken (2010) who, using a simple regression, confirm that the credit boom prior to the crisis as an independent variable has a statistically significant negative coefficient (at 1% level) and explains 45 percent (as measured by R-squared) of the variation in bank credit during the crisis period which provides evidence that strongly supports boom and bust cycle in bank lending; the effect is robust among different specifications. Aisen and Franken also revealed that the effect of the credit boom during the pre-crisis on credit growth during the crisis is "stronger for OECD

countries than in emerging or developing countries" (P.14). The literature also suggests that the size of the bust is a function of the magnitude of the pre-crisis credit boom (Aisen & Franken, 2010; Wagner & Winkler, 2013).

Furthermore, research on bank credit booms suggests that credit booms in emerging market economies (EMEs) are due to large capital inflows but not by productivity gains or financial reforms (Mendoza & Terrones, 2008). Similarly, Elekdag and Wu (2013) revealed that episodes of large capital inflows are one of the factors that lead to credit booms in emerging markets. Consequently, there could be a significant negative shock to credit growth when there is a sudden stop or significant decline in capital flows. Currency depreciation during a crisis also leads to mushroom in the value of debt which in turn reduces financial institutions' ability to service their debts further limiting funding to support loan portfolio (Tornell & Westermann, 2002).

While evidences on the boom and bust cycle from the microfinance industry are virtually missing, Wagner and Winkler (2013) – the only existing study – provide evidence for a boom and bust pattern in microfinance credit growth. Using a global dataset, they found that a one percentage point increase in the pre-crisis credit growth is associated with a reduction in credit growth of around 0.5 to 0.6 percentage points in the crisis period relative to the one observed in the year 2007. Although the credit growth of MFIs in SSA is rapid and there was significant contraction in MFI credit growth during the global financial crisis (Tehulu, 2021a), there are, however, no empirical evidences on whether the credit growth exhibits a boom and bust cycle or not. Empirical research on the moderating effect of legal status on boom and bust cycle in credit growth of MFIs in SSA is also missing.

Accordingly, this study tested whether the decline in MFI credit growth in the crisis years is related to the magnitude of credit growth in the pre-crisis period. In other words, this study examined whether the microfinance sector in SSA follows the same boom–bust[1] pattern in credit growth that characterizes the traditional banking sector (Tornell & Westermann, 2002; Aisen & Franken, 2010). We also test whether the boom and bust cycle is asymmetric depending on the legal status

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[1] We followed the approach by Wagner and Winkler (2013) and do not apply econometric techniques in determining booms and busts.

of MFIs. To this end, we use panel dataset[2] of 101/121 MFIs in SSA covering 2004–2009 and the Ordinary Least Square (OLS) regression to study the relationship between financial stability and the rapid credit growth of MFIs in SSA and the moderating effect of legal status of MFIs on the rapid credit growth and subsequent lending behavior nexus.

We find that there is weak or no boom–bust pattern in MFI credit growth depending on their legal status suggesting that MFI credits are a stable source of finance. MFIs with rural bank and NGO legal status exhibited a boom–bust pattern in credit growth while the effect is stronger for rural banks. On the other hand, the boom had little impact on the subsequent credit growth of NBFIs and micro-banks while the rapid credit growth had no any negative effect on the subsequent lending behavior of credit unions/cooperatives suggesting that legal status has a moderating effect on the credit boom and bust cycle in MFIs in SSA. The findings also suggest that certain MFIs are not completely insulated from a global financial crisis. Moreover, we find new evidence that the changes in non-deposit borrowing growth and size of MFIs have amplified/mitigated credit contractions during the crisis.

This article could offer useful insights for policy makers in different ways. In light of our findings which revealed that there is weak or no boom and bust cycle in MFI credit growth, the study suggests that MFIs could be important instruments in financial stability and in mitigating an economic crisis (especially, in the future as the microfinance industry grows larger) since MFI credits are a stable source of finance. Given that the trigger for the credit bust was the global financial crisis, this study also helps to understand which MFIs will be most hurt during a global financial crisis. Moreover, the study could contribute to the body of knowledge in various respects as discussed in Section 5 (Conclusions).

The remaining sections are organized as follows: Section 2 provides a review of the existing literature on the credit boom and bust cycle in financial institutions and on the other drivers of credit growth. Section 3 describes our data and methodology. Section 4 presents and discusses our results. Finally, Section 5 provides the conclusions and practical implications of our study.

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[2] Given that global financial crisis is a rare phenomenon and the 2008–2009 subprime crisis is the most recent global financial crisis, the usefulness of our findings will not be constrained.

2. Data and Methodology

2.1 Data

This paper employs a panel dataset of 101/121 MFIs in Sub-Saharan Africa countries spanning 2004–2009. The use of cross-country data has allowed us to examine the moderating effect of legal status on credit boom and bust cycle of MFIs. IMF (2004) shows that the duration of a credit boom is in the range of two to five years. Similarly, Tornell and Westermann (2002) show lending boom was present within the 3 years before the crisis and hence, the time period 2005–2007 is considered as a boom period and the years 2008 and 2009 as a bust period since the credit growth reached its peak during 2007 to about 64 percent and a sharp decline in MFI credit growth to around 29 percent occurred during the global financial crisis (Tehulu, 2021a). The trigger for the credit bust was the global financial crisis and this study helps to understand which MFIs will be most hurt during a global financial crisis. The dataset was obtained from the MIX Market databank (www.mixmarket.org). The macroeconomic data are taken from the World Bank database[3]. Sample distribution of the MFIs by sub-region is summarized in Table 1.

Table 1: *Sample Distribution by Location*

Category	Location	No. of MFIs	Countries
Sub-Regions[a]	Eastern Africa	34	Ethiopia, Kenya, Rwanda, Tanzania, and Uganda
	Western Africa	51	Benin, Burkina Faso, Cote d'Ivoire (Ivory Coast), The Gambia, Ghana, Guinea, Mali, Niger, Nigeria, Senegal, and Togo
	Central Africa	15	Burundi, Cameroon, Central African Republic, Chad, DR Congo, and Congo
	Southern Africa	22	Angola, Madagascar, Malawi, Mozambique, Namibia, South Africa, Swaziland, and Zambia
Total		122	

[a]We relied on the sub-regional classifications adopted by MIX & CGAP (2010). Sub-regions of Namibia and Cote d'Ivoire (Ivory Coast) are based on UNICEF sub-regional classifications since they were not included in the former source.

2.2 Modeling, hypotheses and estimation techniques

This study follows the approach by Aisen and Franken (2010) and Wagner and Winkler (2013) and uses the Ordinary Least Square (OLS) regression. Building on Wagner and Winkler (2013), we regressed the change of average credit growth[4] of 2008 and 2009 relative to the one observed

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[3] http://data.worldbank.org/data-catalog/world-development-indicators

[4] Wagner and Winkler (2013) used the difference between the real credit growth in 2009 to the one observed in 2007 to measure the depth of the bust; however, we use the change of average credit growth of the year 2008 and 2009 relative to the credit growth in 2007 since the average of credit growth of the year 2008 and 2009 is a more appropriate measure to capture the magnitude of credit growth during the global financial crisis.

in the year 2007 – inversely the credit fall (*CGFA*) – on average credit growth over 2005–2007, the pre-crisis credit growth (*CGPC*) (*Eq.1*).

$$CGFA_{i,c} = \beta_0 + \beta_1 CGPC_{i,c} + \beta_2 NBFI_{i,c} + \beta_3 CUOC_{i,c} + \beta_4 MICB_{i,c} + \beta_5 RURB_{i,c}$$
$$+ \beta_6 CGPC_{i,c} * NBFI_{i,c} + \beta_7 CGPC_{i,c} * CUOC_{i,c} + \beta_8 CGPC_{i,c} * MICB_{i,c} \dots Eq.1$$
$$+ \beta_9 CGPC_{i,c} * RURB_{i,c} + \varepsilon_{i,c}$$

Where *NBFI*, *CUOC*, *MICB* and *RURB* are the legal status of MFIs namely non-bank financial intermediaries, credit unions/cooperatives, micro-banks and rural banks, respectively, where the omitted legal status is NGO MFIs; others are interaction terms of the pre-crisis credit growth with the legal status of MFIs and the last ($\varepsilon_{i,c}$) is an idiosyncratic error term.

In *Eq.1*, we also included interaction terms of the pre-crisis credit growth and MFI legal status to test which MFIs' lending behavior was more resilient during the global financial crisis as financial stability in MFIs might vary across different legal status. Consistent with the boom–bust cycle literature (Aisen & Franken, 2010; Wagner and Winkler, 2013), we expect a negative coefficient for the pre-crisis credit growth. Accordingly, this study tests the following hypothesis:

H1₀: *The credit growth of MFIs does not exhibit a boom and bust cycle.*
H1ₐ: *The credit growth of MFIs exhibits a boom and bust cycle.*

Moreover, the microfinance sector is diverse in charter type where the MFIs are established as micro- banks, non-bank financial intermediaries, credit unions/cooperatives, NGOs or rural banks. MFIs with different legal status have different sources of finance. Rural banks heavily rely on deposits than other type of MFIs (Tehulu, 2021a); whereas, NGOs rely on donated equity. Credit unions/cooperatives largely depend on members' savings. The literature shows that when financial institutions had been active in tapping global financial markets for funds to finance their rapid credit growth, such institutions could face a more severe contraction in credits when a global financial crisis occurs (Wagner & Winkler, 2013) due to the sudden halt or significant decline in capital inflows. Similarly, Laidroo (2012) states that financial institutions with larger deposit holdings could be more likely be affected by bank runs during bad times and might face a greater contraction in credits. Hence, we expect the legal status of MFIs to have a moderating effect on

the boom and bust cycle in MFI credit growth. Therefore, this study also tests the following hypothesis:

H2₀: *The boom and bust cycle in credit growth is the same across different legal status of MFIs in SSA.*

H2ₐ: *The boom and bust cycle in credit growth varies across different legal status of MFIs in SSA.*

In a separate regression (*Eq.2*), we also control for other drivers of credit growth because the credit contraction during the global financial crisis might also be due to differences in the other drivers of credit growth instead of fast credit expansions during the pre-crisis period. In other words, we test whether the macroeconomic factors and different MFI specific factors had amplified/mitigated the credit fall during the crisis. Accordingly, we estimated the following model (*Eq.2*) building on Tehulu (2021b):

$$
\begin{aligned}
CGFA_{i,c} = {} & \alpha_0 + \beta_1 CGPC_{i,c} + \phi_1 CTAR_{i,c} + \phi_2 LIQ_{i,c} + \phi_3 RISK_{i,c} + \phi_4 PROF_{i,c} + \phi_5 \Delta DEPG_{i,c} \\
& + \phi_6 \Delta FUNG_{i,c} + \phi_7 \Delta LNTA_{i,c} + \phi_8 LSCA_{i,c} + \phi_9 SSCA_{i,c} + \pi_1 GDPG_{i,c} + \pi_2 INF_{i,c} \qquad \dots Eq.2 \\
& + \pi_3 EMP_{i,c} + \pi_4 CUP_{i,c} + \varepsilon_{i,c,t}
\end{aligned}
$$

In line with Aisen and Franken (2010), our model uses the capitalization (*CTAR*), liquidity (*LIQ*), portfolio at risk (*RISK*), and profitability (*PROF*) during the *year 2007* as a predictor of credit growth during the crisis. This is due to the fact that it is the 2007 capitalization that is more recent and avalable to absorb losses during the crisis. The same is true for liquidity. It is the 2007 liquidity that could allow MFIs to shield their loan supply against shocks to MFI funding during the crisis. Similarly, while MFIs with higher portfolio risk in the year 2007 are expected to be more cautious and limit their credit supply during the crisis, MFIs that were profitable during the year 2007 could also be expected to limit loans during the crisis in order to limit credit risk and maintain their profitability consistently since credit risk is one of the main detrimental factors for MFI profitability.

Given credit booms are in part due to episodes of large capital inflows and the negative shock to credit growth in subsequent period is due to a sudden halt or decline in capital flows (Elekdag and Wu, 2013), we believe that the magnitude of the fall in non-deposit borrowing growth (*FUNG*)

during the crisis relative to the one observed in the year 2007 could be a better predictor of credit fall during the crisis. For a similar reasoning, we use the difference between the average values during the crisis and that observed in the year 2007 to measure changes in deposit growth (*DEPG*) and changes in MFI size (*LNTA*) as well. In line with Tehulu (2021b), we include large scale and small scale (*LSCA & SSCA*) dummies to control for scale effects as the omission might cause spurious correlations between the outcome and predictor variables given the absolute loan portfolio could be correlated with the included predictor variables.

We use the average values (of the year 2008 and 2009) of economic growth (*GDPG*), inflation (*INF*), employment (*EMP*), and GDP per capita (*CUP*) as macroeconomic determinants of credit growth during the crisis since macroeconomic factors and credit growth have contemporaneous relationships. Burris (2007) states that despite encouraging performance of individual MFIs, the aggregate of MFI loans are too small to measurably impact a nation's economy. Consequently, since it is unlikely that microfinance credit growth influences macroeconomic variables, we believe that endogeneity problem could not be a concern about the nexus between credit growth and macro-economic factors.

Following Tehulu (2021b), we measure credit growth as the growth rate of gross loan portfolio (GLP)[5] where GLP is all outstanding principals including current, delinquent, and renegotiated loans, but not loans that have been written off. Mathematically, it is measured as $(GLP_t/GLP_{t-1})-1$. Given the dataset in MIX Market are in USD, we converted the USD to local currency using the contemporaneous exchange rates (LCU per US$, period average) so as to deal with distortions as a result of significant changes in currency value during the period under consideration. The capitalization of MFIs is measured using the total equity to asset ratio. Liquidity is the proportion of non-earning assets such as cash and cash equivalents to total assets. The profitability of MFIs is represented by the return on assets (ROA) while the portfolio risk is measured as ratio of loans greater than 30 days in arrears (including all renegotiated loans) to gross loan portfolio.

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[5] See Tehulu (2021b) for why this approach is a superior technique for capturing changes in loan supply than other measures in cross-country studies on MFIs.

3   Results and Discussions

3.1 Descriptive statistics

The descriptive statistics results are summarized in Table 2. Table 2 shows a credit growth contraction of about 28 percent during the global financial crisis relative to the one observed just before the crisis (i.e. relative to that of 2007). The credit growth during the pre-crisis period (2005–2007) was rapid – on average about 45 percent annually. During the year 2007, the capitalization of MFIs was about 37 percent suggesting that the microfinance industry was highly capitalized just before the crisis. Nevertheless, the return on assets was slightly negative reflecting the social orientation of MFIs in SSA. The minimum and maximum values of portfolio at risk and liquidity reveal that while some MFIs have high portfolio quality and/or high liquidity, some others are suffering from loan defaults and/or severe liquidity problem.

Table 2: *Descriptive Statistics*

Variables	Obs.	Mean	Std. Dev.	Min.	Max.
Credit fall during the crisis	121	-0.2758672	0.6950004	-5.249613	1.604232
Credit growth pre-crisis	247	0.4480014	0.4992772	-0.527143	4.320442
Capitalization 2007	273	0.3698421	0.7352446	-0.5112	1
Profitability 2007	268	-0.0085067	0.1215429	-0.8507	0.2048
Portfolio Risk 2007	251	0.0787048	0.0999665	0	0.7696
Liquidity 2007	255	0.2111345	0.1516579	0.009	0.7909
Size changes (LN[a])	137	0.0484192	1.743319	-8.060903	8.550049
Deposit growth changes	133	-0.2196241	1.756558	-11.3147	11.9082
Non-deposit borrowing growth changes	137	-1.080746	6.713113	-51.4915	25.8322
GDP growth during crisis	137	0.0533265	0.0258045	0.0082648	0.0979554
Inflation during crisis	137	0.116777	0.0626379	0.0254959	0.2642016
Employment during crisis	137	0.68598	0.1104204	0.37746	0.854955
GDP per Capita (LN[a]) during crisis	137	6.573683	0.5968778	5.279375	8.659159

[a] The figures for size changes and GDP per capita indicate natural logarithm (LN) of total assets (USD) and natural logarithm (LN) of GDP per capita (USD), respectively; other details as discussed in Section 3.2.

The deposit growth and non-deposit borrowing growth have declined by about 22 percent and 108 percent, respectively, during the crisis relative to the growth rates observed in the year 2007. Consequently, the growth (size) of MFIs had been constrained during the crisis significantly. Accordingly, in the next section, we discuss whether the credit boom is the cause for the credit bust and whether the macroeconomic conditions and the aforementioned MFI specific factors amplified/mitigated the magnitude of credit fall during the crisis.

3.2 MFI credit growth: any evidence for a boom–bust pattern?

The regression results are summarized in Table 3 and Table 4. The regression models (Table 3) exhibited a negative coefficient for the pre-crisis credit growth consistent with the literature (Aisen & Franken, 2010; Wagner & Winkler, 2013). This result is robust even after controlling for the MFI specific and macroeconomic factors (Table 4). This indicates that MFIs with higher credit growth in the pre-crisis period had faced a greater reduction in credit growth during the global financial crisis. Our findings support Wagner and Winkler (2013) who using a global cross-country dataset found that the credit growth of MFIs follow a boom and bust cycle similar to the banking sector. Our result, however, holds true only for MFIs with rural bank and NGO legal status while the effect of the pre-crisis credit growth is stronger for rural banks (Table 3). This could be in part, particularly in the case of NGOs, due to high credit growth financed by strong capital inflows (Mendoza & Terrones, 2008; Elekdag & Wu, 2013) which calls for mobilization of local funds and reduce excessive reliance on international funding to improve the financial stability of the microfinance industry in SSA. Given the rapid growth of MFI's deposits where deposits are increasing annually on average by approximately 52 percent (Tehulu, 2021a), local funds can be an important source of finance for MFIs to meet loan demands.

The relatively strong effect in the case of rural banks could possibly be due to the fact that rural banks have higher deposit mobilization in comparison to other types of MFIs and there was a significant reduction in deposit growth during the global financial crisis (Tehulu, 2021a). This implies that rural banks which rely heavily on deposits in the current year could be constrained to meet withdrawal and loan demands in a subsequent year as any individual and institutional depositors could withdraw their deposits at any given time (MIX & CGAP, 2010) and attracting additional deposits may be difficult during bad times. This finding supports Tehulu (2021a) who suggests that MFIs shall expand their depositor base to increase their resilience and sustain the rapid credit growth.

On the other hand, the boom had little impact on the subsequent credit growth of NBFIs and micro-banks while credit unions/cooperatives did not face any fall in credit growth during the crisis but perhaps a higher credit expansion (Table 3). This could be due to the fact that credit unions/cooperatives fund their loans from members' contributions and there is no dependence on international capital flows and hence, their lending behavior is more resilient than the lending

behavior of other types of MFIs. Thus, the evidence for a credit boom and bust cycle in MFIs is weak or absent depending on the legal status of MFIs.

The results also revealed that the coefficients of the pre-crisis credit growth are less than 1 in absolute value for rural banks, NGOs, NBFI, and micro-banks (Table 3). This shows that MFIs with a relatively higher credit growth in the crisis period had maintained their relative higher credit growth during the global financial crisis which suggests that the microfinance industry is a more financially stable financial industry than the banking sector. In this respect, the literature on the banking sector shows that a one percentage point increase in monthly credit growth above the trend in the 24 months prior to the crisis leads to a reduction in credit growth of about 2 percentage points relative to trend during the crisis (Aisen & Franken, 2010). This shows that the lending behavior of MFIs is more resilient to various shocks than bank lending.

Given that the credit fall during the crisis might also be due to other drivers of credit growth instead of just the rapid credit growth during the pre-crisis, we also included (and tested for the effects of) control variables in an alternative regression equation. The results are summarized in Table 4. Our findings show that the pre-crisis credit growth has the highest economic significance. We find that a 10 percentage point rise in credit growth during the pre-crisis led to an 8 to 9 percent contraction in credit growth during the crisis. This finding is in line with the literature (Wagner & Winkler, 2013) that documents a 10 percent increase in credit growth during the pre-crisis contributed to between 5 and 6 percentage point reduction of credit growth during the crisis relative to 2007. The results also show that non-deposit borrowings and size have a significant positive association with credit growth during the crisis. In the light of the mean decline in non-deposit borrowing growth of about 108 percent and its minimum value of about -51.49 (i.e. negative 5,149 percent) (Table 2), we can conclude that difficulty in raising non-deposit borrowings is one of the most important factors amplifying credit contractions during the crisis.

Table 3: *Credit Boom and Bust Cycle in MFIs in Sub-Saharan Africa*

Variables	Coefficients[a]
Credit fall during the crisis (*CGFA*): Dependent Variable	
Pre-crisis credit growth (*CGPC*)	-0.7568014*
NBFI	-0.1937357
Credituorc	-0.1658417
Microbank	-0.223964

Ruralbank	-0.3673512**
CGPC*NBFI	0.505149
CGPC*Credituorc	0.8369773*
CGPC*Microbank	0.4108577
CGPC*Ruralbank	-0.0286059
Constant	0.0728743
No. of observations	121
R Squared	0.1611

[a] Standard errors robust. The benchmark dummy is NGO MFIs. *** show significance at 99 percent confidence interval; ** indicate significance at 95 percent confidence interval and * reflect significance at 90 percent confidence interval. We use OLS regression to estimate the models.

Table 4: *Credit Boom and Bust Cycle in MFIs with Control Variables*

Variables	Model 1[a]	Model 2[a]
Credit fall during the crisis (*CGFA*): Dependent Variable		
Pre-crisis credit growth (*CGPC*)	-0.8789188**	-0.8116927***
Capitalization (*CTAR*)	0.4591105	0.486632
Liquidity (*LIQ*)	0.5339337	0.3947862
Portfolio at risk (*RISK*)	0.6944954	0.3789372
Profitability (*PROF*)	0.1715072	0.1417135
Deposit growth changes ($\Delta DEPG$)	-0.0066312	-0.0038548
Non-deposit borrowing changes ($\Delta FUNG$)	0.0175913**	0.0149808**
Size changes ($\Delta LNTA$)	0.1087846***	0.0962911***
Economic growth (*GDPG*)	2.806195	
Inflation (*INF*)	1.153103	
Employment (*EMP*)	-0.7588408	
GDP per capita (*CUP*)	0.0093756	
Large scale (*LSCA*)[b]	-0.0605472	-0.0622162
Small scale (*SSCA*)[b]	0.0400168	0.01219
Constant	.0305484	-0.1214172
No. of observations	101	101
F Test	F(14, 86) = 3.62	F(10, 90) = 5.26
	Prob > F= 0.0001	Prob > F = 0.0000
R Squared	0.3460	0.3193

[a] We use OLS regression with standard errors robust to estimate the models. [b] We use the lag value. *** show significance at 99 percent confidence interval; ** indicate significance at 95 percent confidence interval and * reflect significance at 90 percent confidence interval.

In addition, Table 4 shows that the size of MFIs is also the other factor explaining the credit growth during the crisis. We stated earlier that there was a significant decline in non-deposit borrowing growth during the crisis. Table 2 also reveals that the deposit growth has declined on average by

about 22 percent during the same period. These reductions in new MFI fundings had constrained the growth (size) of MFIs and hence, the MFIs in SSA were unable to sustain the raid credit growth during the pre-crisis in the crisis period. On the other hand, MFIs that were able to attract more deposit and non-deposit borrowings, among others, and able to grow larger had higher credit growth during the crisis. Size has a positive association with the credit supply of MFIs since large MFIs can attract more loanable funds to support their desired higher credit growth (Hessou & Lai, 2018).

In contrast, the fall in credit growth during the crisis was unrelated to macroeconomic factors. We found GDP growth has little to account for the decline in credit growth during the crisis. The catch-up phenomenon as captured by the natural logarithm of GDP per Capita (USD) is also not significant to explain the credit contractions in the same period. The results contradict with the prior literature which documented that GDP growth (Igan & Pinheiro, 2011; Laidroo, 2012; Tehulu, 2021b) and catch-up effect theory (Igan & Pinheiro, 2011; Tehulu, 2021b) significantly explain the credit growth of financial institutions. This could imply that the within variations might be more important to explain the credit growth of MFIs in SSA. Our model is a cross-section design and captures only the between variations.

4   Conclusions

While the gross loan portfolio of MFIs in SSA is growing fast, little attention has been paid to the consequences of the rapid credit growth on financial stability in these financial institutions. Hence, the aim of this article is two-fold: First, we examine the existence of a boom and bust cycle in MFI credit growth and second, we investigate whether the legal status of MFIs has a moderating effect on the rapid credit growth and subsequent lending behavior nexus. To this end, we use panel dataset of 101/121 MFIs in SSA covering 2004–2009 and analyze the data by applying Ordinary Least Square (OLS) regression with standard errors robust.

The findings reveal that there is weak or no boom–bust pattern in MFI credit growth depending on their legal status suggesting that MFI credits are a stable source of finance. MFIs with rural bank and NGO legal status exhibited a boom–bust pattern in credit growth while the effect is stronger for rural banks. On the other hand, the boom had little impact on the subsequent credit growth of NBFIs and micro-banks while the rapid credit growth had no any negative effect on the

subsequent lending behavior of credit unions/cooperatives suggesting that legal status has a moderating effect on the credit boom and bust cycle in MFIs in SSA. Moreover, we find new evidence that the changes in non-deposit borrowing growth and size of MFIs have amplified/mitigated credit contractions during the crisis.

The study contributes useful insights for policy makers in various ways. In light of our findings which revealed that there is weak or no boom and bust cycle in MFI credit growth, the study suggests that MFIs could be important instruments in financial stability and in mitigating an economic crisis (especially, in the future as the microfinance industry grows larger) since MFI credits are a stable source of finance. Given that the trigger for the credit bust was the global financial crisis, this study also helps to understand which MFIs will be most hurt during a global financial crisis. Our findings provide some support for mobilizing local funds to meet loan demands and reduce excessive reliance on international funding to improve the financial stability of the microfinance industry in SSA.

Our findings also support Tehulu (2021a) who suggests that MFIs shall expand their depositor base to increase their resilience and sustain the rapid credit growth as MFIs with higher deposit mobilization in the current year are likely to be constrained to meet loan demands in a subsequent year given that any individual and institutional depositors could withdraw their deposits at any given time and it might also be difficult to attract additional deposits during bad times. Apart from the aforementioned practical implications, the article could also contribute to the literature in various ways. The study contributes to the body of knowledge by providing new evidence that there is weak or no boom and bust pattern in credit growth of MFIs in emerging Africa. Furthermore, we show that legal status has some moderating effect on the credit boom and bust cycle of MFIs in SSA. Moreover, our findings provide new evidence that changes in non-deposit borrowing growth and size of MFIs amplify/mitigate the boom and bust cycle in credit growth.

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