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Investigating Productivity of Microfinance Institutions in Nepal: Evidence from Panel Data Approach

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Abstract

The objective of the study is to analyze the factor affecting productivity of microfinance institutions in Nepal. The institutional characteristics (such as age, number of branches and number of staffs), outreach (such as number of active borrowers and average loan size), and efficiency (cost per loan) are taken as independent variables and productivity is taken as dependent variable. The productivity is measured by number of borrowers per staff. The microfinance institutions (established before 2016 AD) operating in Nepal are selected as sample through the convenience sampling method. Taking panel data from 21 microfinance institutions from 2016/17 AD to 2023/24 AD with 168 observations, Fixed Effect regression model is used. The study found that number of operation year, number of branch and number of active borrowers has positive significant impact on borrower per staff but number of staff, average loan size, and cost per loan has negative significant impact on productivity of Nepalese microfinance institutions. The study has important implications for the policy makers of Nepalese microfinance institutions to improve their productivity by utilizing their resources and making sound policy towards staff and borrower.

Keywords: productivity, microfinance, outreach, efficiency, panel data

Introduction

A group of people who would not normally have access to banks can receive financial services from microfinance institutions (MFIs). The goal of microfinance is to use market-oriented and business-based methods to offer a wide range of financial services to those living in poverty (Christen, 2006). MFIs provide a broad range of financial services, including as money transfers, savings accounts, insurance, and payment solutions, in addition to lending products.

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The underprivileged are receiving financial and social intermediation services from MFIs (Ledgerwood, 1998). These institutions' primary goals are to increase the economic power of the impoverished people, obtain the financial capacity to reduce poverty by engaging them in income-generating activities required to build capital, and raise their standard of living (Hulme & Mosley, 1996).

Lending to genuine needy poor people and helping them start their own sustainable businesses are the main goals of microfinance banks. The twin objectives of financial intermediation and poverty alleviation are expected to be followed by an effective MFI management. The former focuses on MFIs making enough money to cover their operations and financial costs, whereas the latter prioritizes poverty reduction, outreach reach, and attaining financial sustainability (Singh et al., 2013).

MFIs aim to incorporate individuals who are currently unbanked in order to empower women by reducing poverty and improving their control over family finances (Yunus, 2003). In the world of microfinance, women make up the majority of borrowers. Similarly, the majority of MFIs' customers in Nepal are impoverished women without access to commercial banks.

Delivering financial services and loans to the underprivileged is the main goal of microfinance organizations. For this reason, skilled managers can fulfill their responsibilities to boost the institutes' productivity, which in turn should lead to a greater outreach to the underprivileged.

On the other hand, to achieve higher productivity in operations, MFIs need to employ fewer resources (like staff) or produce more outcomes (such as loans) from the same level of resources (employees) (Ledgerwood, 1998). Rogers (1998) stated that boosting productivity requires either producing more output with the same input or using fewer inputs to reach the same level of output. High productivity is achieved when the maximum output is generated for a given level of input.

The productivity of MFIs in international context has been studied by different authors taking different input and output ratio (Amin, 2021; Gebremichael & Chawla, 2017; Khaleque, 2024; Rana et al., 2019; Rashid & Twaha, 2013; Tahir & Tahrim, 2015). Similarly, Dhungana (2018), Adhikari (2019), Thapa (2021), Chaulagain and Lamichhane (2022), Lamichhane (2022), Yadav (2024), Thapa and Yadav (2024) have conducted their study on Nepalese MFIs relating to micro-business and enterprises creation of people, socio-economic status of loanees, program of microfinance institutions, performance, operational and financial sustainability, women's status in terms of ownership in assets, autonomy in decision-making, mobility in freedom and

social recognition. Consequently, there is relatively limited empirical evidence regarding the factors that influence the productivity of MFIs. Thus, this research seeks to explore the factors that are important in elucidating the productivity of MFIs. This research specifically investigates how institutional traits, outreach efforts, and efficiency impact the productivity of MFIs in Nepal.

Literature Review

Rashid and Twaha (2013) examined the factors influencing productivity of MFIs in India by utilizing an unbalanced panel dataset from 2005-2011, which consisted of 292 observations from 64 institutions. Their findings indicated that both institutional traits and outreach can exert positive and negative impacts on MFI productivity; however, the efficiency of MFIs detrimentally influences productivity. They further illustrated that the institution's age positively impacts productivity by 6.1581 points, whereas the count of offices and personnel negatively influence it by 26.41% and 8.77%, respectively; the number of active borrowers positively affects productivity by 0.04%. In contrast, the average loan size has a negative correlation with productivity. The cost per loan, which serves as an efficiency proxy, has a significant negative effect of 1.9604 points on the productivity. In the research on MFIs in Cambodia, Tahir and Tahrim (2015) discovered a productivity growth of 1.7% from 2008 to 2009, a decline of 0.6% from 2009 to 2010, and an increase of 0.9% in 2010-2011.

Using data from 2000 to 2014 regarding Ethiopian Microfinance Institutions, Gebremichael and Chawla (2017) discovered that productivity, including active borrowers per staff and borrowers per loan officer, declined from 2000 until 2010, whereas the number of active borrowers per loan officer showed a steady increase from 2011 to 2014 when compared to the industry average.

Using the Malmquist Productivity Index and data from 2007 to 2011 of 13 MFIs in Palestine and Jordan, Rana et al. (2019) found that there was a 2.6% Total Factor Productivity (TFP) improvement each year, with the TFP decomposition indicating that this productivity advancement was primarily attributed to technological change. They additionally discovered that Palestinian MFIs appear to excel compared to Jordanian MFIs. Using panel data from microfinance organizations in Latin American countries between 2006 and 2020, Amin (2021) demonstrated that the depth of outreach negatively impacts staff productivity, while the breadth of outreach positively affects staff productivity. By examining panel and cross-sectional data from 2008 and 2011 in Bangladesh, Khaleque (2024) found that employee training and regulations positively influence the enhancement of employee productivity in the Microfinance sector.

Dhungana (2018) disclosed that the establishment of micro-businesses and enterprises by individuals has notably increased following participation in micro-finance programs, enabling them to create self-employment and job opportunities via the micro-credit services of MFIs in Nepal. Adhikari (2019) discovered that the socio-economic status of borrowers from Nepalese MFIs is greater than that of non-borrowers, indicating that they effectively improve the socio-economic status of impoverished women. Thapa (2021) noted that microfinance has a beneficial effect on the living standards of underprivileged and impoverished individuals in Nepal who participated in MFIs' programs.

Chaulagain and Lamichhane (2022) discovered a positive correlation between the performance of Nepalese MFIs with loan lending system, regulatory framework, information technology, employee motivation, management practices, and efficient risk management. Lamichhane (2022) discovered that effective product design and delivery, prevention of excessive debt, transparency, responsible pricing, fair treatment of clients, protection of client data, and complaint resolution mechanisms are the optimal strategies for the operational and financial sustainability of MFIs in Nepal.

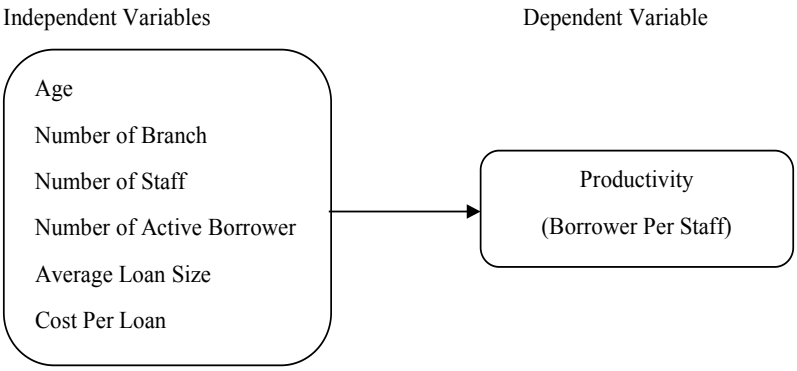
In another research focused on the microfinance sector, Yadav (2024) discovered that the numbers of microfinance user groups, total group figures, progress of borrowing staff, outstanding loans, profits, active loans, and savings all diminished from 2020/2021 AD to 2022/2023 AD, while the ratio of overdue members, passive loans, and non-performing loans (NPL) rose during this time. Thapa and Yadav (2024) discovered that following involvement in microfinance programs, there was a notable improvement in women's status regarding asset ownership, decision-making independence, mobility freedom, and social recognition in Nepal.

Method

The descriptive and explanatory research design is used in the study. To investigate the productivity of MFIs in Nepal, the institutional characteristics (age, number of branches and number of staffs), outreach (such as number of active borrowers and average loan size), and efficiency (cost per loan) are taken as independent variables and productivity is taken as dependent variable (Figure 1). The productivity is measured in terms of number of borrowers per staff. Out of 52 MFIs (Nepal Rastra Bank, 2024) operating in Nepal, 21 retail lending MFIs which were established before 2016 AD are taken as sample based upon the availability of panel data for the period 2016/17 AD to 2023/24 AD with 168 observations. The data and other necessary information are collected from audited annual report of sample units and Nepal Rastra Bank.

Figure 1

Conceptual Framework



Source. Rashid and Twaha (2013)

The regression model for the productivity is as follows:

$$BPS_{it} = \alpha + b_1AGE_{it} + b_2NBR_{it} + b_3NST_{it} + b_4NAB_{it} + b_5ALS_{it} + b_6CPL_{it} + \epsilon_{it}$$

Where,

BPS_{it} represents borrower per staff (Total number of active borrowers / Number of staff) of i-th microfinance institutions at time period t.

AGE_{it} represents the age measured in operation year of i-th microfinance institutions at time period t.

NBR_{it} represents the branches measured in number of branches of i-th microfinance institutions at time period t.

NST_{it} represents the number of staff (Total number of staff members) of i- th microfinance institutions at time period t.

NAB_{it} represents the active borrower measured in number of i-th microfinance institutions at time period t.

ALS_{it} represents of average loan size measured in amount (average loan balance per borrower) of i-th microfinance institutions at time period t.

CPL_{it} represents cost per loan measured in amount (Total cost / total loan) of i-th microfinance institutions at time period t.

α is the constant term.

b_1- b_6 represents parameters to be estimated.

ϵ_{it} is the error term for individual i at time t.

The gathered data has been examined with STATA 14.2 software. STATA 14.2 provided the results of descriptive statistics, correlation analysis, and multivariate regression analysis. Before performing the multivariate regression analysis, it is checked if the collected data is the most appropriate for the Pooled Regression model, the Random Effect model, or the Fixed Effect model (Shrestha, 2020). To accomplish this, the Breusch and Pagan Lagrangian multiplier test and the Hausman test were used.

Results

The descriptive statistics indicates that the borrower-to-staff ratio (BPS) varies from 10 to 385, with an average of 144. Likewise, the operational year span, or the age of MFIs, varies from 8 year to 25 years. The range of branches spans from a minimum of 6 to a maximum of 197, with an average of 86 branches. Similarly, the independent variable regarding the number of staff reveals an average value of 410, with a minimum of 39 staff and a maximum of 1264 staff. The mean value of number of active borrowers, average loan size and cost per loan is 69,079 borrowers, Rs. 97,281 and Rs. 4,746 respectively. Further, correlation between study variables is presented in Table 1.

The correlation matrix depicts that there exists positive correlation of BPS with AGE, NBR, NST, NAB and negative correlation with ALS and CPL (Table 1). The value of correlation of BPS with AGE is 0.5807, with NBR 0.5463, with NST 0.5538, with NAB 0.7796, with ALS - 0.1159 and -0.3823 with CPL. Similarly, highest value of correlation is 0.7796 (correlation with BPS and NAB) and the lowest value of correlation is -0.2309 (correlation between NAB and CPL). It indicates that there is no problem of multicollinearity.

Table 1

Correlation Matrix

	BPS	AGE	NBR	NST	NAB	ALS	CPL
BPS	1.0000						
AGE	0.5807	1.0000					
NBR	0.5463	0.6053	1.0000				
NST	0.5538	0.6640	0.7482	1.0000			
NAB	0.7796	0.7172	0.6492	0.7268	1.0000		
ALS	-0.4159	0.3810	0.3472	0.2631	0.0985	1.0000	
CPL	-0.3823	-0.5038	-0.6350	-0.4925	-0.2309	0.4179	1.0000

On the other hand, result of testing the suitability of the data for the analysis is presented in Table 2 and 3.

Table 2

Breusch and Pagan Lagrangian Multiplier Test for Random Effects

	Var	sd = sqrt (Var)
BPS	3375.9540	58.1030
e	216.3577	14.7091
u	153.2734	12.3804
Test: Var(u) = 0	chibar2(01) = 49.32	Prob > chibar2 = 0.0000

Note. It is calculated to identify whether the data are fit for pooled or panel model before estimating regression model.

The notable value of chibar2 is 49.32 (with a probability value of 0.000), leading to the rejection of the null hypothesis that the Pooled OLS model is unsuitable. Following the determination that the Pooled OLS model is unsuitable, the Hausman test has been employed to assess whether the data is suitable for the Fixed Effect model or the Random Effect model. Table 3 displays the outcome of the Hausman test.

Table 3

Hausman Test Result

	(b) Fixed Effect	(B) Random Effect	(b-B) Difference	Sqrt (diag (V b-V_B))
AGE	5.4956	1.6363	3.8593	0.9899
NBR	0.2581	0.5670	-0.3089	0.0518
NST	-0.3321	-0.3389	0.0068	
NAB	0.0018	0.0016	0.0003	0.0001
ALS	-0.0002	-0.0001	-0.0001	0.0001
CPL	-0.0026	-0.0025	-0.0001	
chi2(5) = 19.52	Prob>chi2 = 0.0015			

Note. It is calculated to identify whether the random effect model and fixed effect model is fit for regression run.

As per the results presented in Table 3, the $\chi 2$ value is 19.52 (with a probability value of 0.0015), indicating significance at the 5 percent level and consequently refuting the null hypothesis that the Random Effects model is inappropriate. It indicates that the Fixed Effect model is appropriate. Since the Hausman test for the dependent variable rejects

the null hypothesis suggesting that the Random Effects model is inappropriate, this research eventually utilized the Fixed Effect model to analyze the productivity of MFIs in Nepal. The outcome of the Fixed Effect model is shown in Table 4.

Table 4
Fixed-effects Regression Result

	Coefficient	Std. Error	t-statistics	p-value
AGE	0.4956	1.2199	4.5000	0.0000
NBR	0.2581	0.1190	2.1700	0.0320
NST	-0.3321	0.0213	-15.5900	0.0000
NAB	0.0018	0.0001	13.1900	0.0000
ALS	-0.0002	0.0001	-2.4900	0.0014
CPL	-0.0026	0.0009	-3.0500	0.0030
Constant	115.6354	8.0321	14.4000	0.0000
R square: within = 0.7593 F (6,141) = 74.14 Prob > F = 0.0000				
F test that all ui= 0: F (20, 141) = 7.79 Prob > F = 0.0000				

Table 4 exhibited that 75.93% of variance on productivity of MFIs is explained jointly by the five study variables. On the other hand, the coefficient of AGE and NAB are positive and significant at 1 percent of level of significance and the coefficient NBR is positive and significant at 5 percent level of significance. Similarly, the slope coefficient of NST, ALS and CPL are negative and significant at 1 percent.

Similarly, the estimated Fixed Effect model is the best fitted model as the value of F (6,141) is 74.14 with p-value of 0.000. There is significant difference between at least some individual microfinance institutions because the value of F test that all ui is equal to zero, i. e. F (20,141), is 7.79 with 0.000 p-value.

Discussion and Conclusion

Result of this study is consistent with the findings of Rashid and Twaha (2013) whose finding were that institutional traits as well as outreach have effects on the productivity of MFIs both positively and negatively but the efficiency of MFIs effects the productivity negatively. It means that the productivity of Nepalese MFIs is highly depended in the working experience i.e. number of operation year, number of branches and number of active borrowers. On the other hand, the average loan size and cost per

loan should be improved providing sufficient and effective training to staff for improving productivity.

The study has important implications for the policy makers of Nepalese MFIs in line to improve their productivity by utilizing their resources and making sound policy towards staff and borrowers. Further research can be conducted by including other areas of MFIs and broader number of sample size as well as participant so as to validate the findings of the study.

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