# Microfinance Institutions' Operational Infrastructure in India: Assessing the Efficiencies through OLS Model

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**ABSTRACT:**
This study attempts to examine the operational efficiency of thirty-two microfinance institutions in India. Operational efficiency in microfinance institutions refers to how well microfinance institutions allocate the input resources. Since the study is an exploratory nature, therefore, the data are collected from mix market on annual basis. It covers the seven-year period ranging from 2005-06 to 2012-13. A panel data technique is employed as the key analytical framework. From the statistical analysis, it may be observed that portfolio at risk and borrower per staff member has positive impact on the operational efficiency of microfinance institutions in India. The cost per borrower of MFIs has negative impact on its operational efficiency. The results of study put forward that cost efficient managers of MFIs are superior in managing their loan borrowers and appropriately monitoring MFIs operational costs. Moreover, operational efficiency level of microfinance institutions is supportive in achieving the economies of scale and reduces costs. On the other hand, the future directions may offer an opportunity of public private partnership in augmenting MFIs in India.

**Keywords:** *Operational efficiency, Client, Performance, MFI, India*

## INTRODUCTION

India is an emerging economy and poverty is still one of the major problems of the country. Micro, small and medium enterprises are the backbone of the country industrial development and economy (Mukherjee, 2013). According to Robinson, "Microfinance refers to small-scale financial services for both credits and deposits that are provided to people who farm or fish or herd; operate small or microenterprises where goods are produced, recycled, repaired, or traded; provide services; work for wages or commissions; gain income from renting out small amounts of land, vehicles, draft animals, or machinery and tools; and to other individuals and local groups in developing countries, in both rural and urban areas."So, governments of emerging economies take an action till they provide microcredit to poor people by microfinance institutions. Microfinance institutions mission is to provide financial services to low-income households. In emerging countries, microfinance institutions also offer loans and technical assistance that tells how to start and develop a business (Hartungi, 2007). In the South Asian region of the country microfinance operation exist, but they seem to be reaching limits of both outreach and sustainability. Operational efficiency in microfinance institutions refers to how well microfinance institutions allocate the input resources such as asset, subsidies and personnel to produce output measured in terms of the loan

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portfolio and poverty outreach (Bassem, 2008). (Hulme and Mosley, 1996) the unit cost for small loans is higher as compared to unit cost of larger loans which is providing by microfinance institutions to the poor clients. Furthermore, making small loans to customers involves high transaction costs in terms of screening, monitoring and administration costs per loan (Conning, 1999; Paxton and Cuevas, 2002; Lupenu and Zeller, 2002; Zerai and Rani, 2012). Operational efficiency is the most effective way of delivering small loans to the very poor (Woller, 2000). Operational efficiency refers to the cost per unit of output. Operational efficiency ratios can be used to compare performance over time and to measure improvements in an MFI's operations. So, scheme of microfinance as an effective instrument for lifting the poor above the level of poverty by providing them self-employment opportunities and making them credit worthy (Shastri, 2009).

Microfinance is an effective tool which may be helpful in reducing poverty and spread economic opportunity by giving poor people access to financial services, such as credit and insurance. Interventions through the delivery of microfinance services have been considered as one of the policy instruments of the government to enable rural and urban poor increase output and productivity, technology adoption, improve input supply, increase income, reduce poverty and attain food security (Mekonnen and Aemiro, 2012). So, operational efficiency of microfinance institution plays a vital role in the economy. Microfinance is assuming a special significance in the context of increasing emphasis on poverty alleviation, women empowerment and rural development in India (Ananda and Colaco, 2012). For increasing the operational efficiency, MFIs need to develop trust among their clients and ensure that borrowers understand the responsibilities associated with financial transaction. So, it can say that microfinance institutions play a vital role in emerging economy for developing the standard of living to the poor people.

## Literature Review

Ayuub (2013) examined the impact of microfinance on poverty alleviation. The result showed that microfinance scheme help people to improve their living standard and provide them financial opportunity to expand their business. Akoijam (2013) analyzed the issues and concerns of Indian rural credit, which was a powerful tool for enhancing production and productivity and for poverty alleviation. It was found that rural credits serve as a tool for providing a sustainable livelihood for millions of rural Indians. Urgeghe and Mersland (2013) studied whether there was a relationship between a microfinance institutions accessed to international debt and its financial and social performance. Saout and Daher (2013) studied the financial performance of MFIs. Result indicated that microfinance investment have increasingly attracted many investors looking for alternative assets to diversify their investment portfolios. Vichore and Deshpande (2012) analyzed the performance and growth of MFIs. It suggested that proper training should be provided to the employees of MFI's especially in disbursing loans and collection of the loan amount so that the cost per borrower could be managed efficiently. Rai and Rai (2012) studied about the factor affecting financial sustainability of microfinance institution. Ananda and Colaco (2012) overviewed the performance and prospectus and described how microfinance was effective and financial viable method of addressing sustainable rural development through provision of microcredit to rural poor for productive activities. Christopher (2011) assessed the impact of microfinance on small and medium enterprises. Roy (2011) examined the delivery process and profitability of MFIs. Delivery mechanism was explained in terms of four parameters namely collateral requirement, size of the loan amount, repayment time and purpose of the microfinance loan. Shastri (2009) studied about the microfinance and poverty reduction in India and found that scheme of microfinance as an effective instrument for lifting the poor above the level of poverty by providing them increased self-employment opportunities and making them credit worthy. Rauf and Mahmood (2009) viewed the growth strategy adopted by the microfinance sector and its impact on performance of the microfinance institutions.

Haq (2009) study found that alleviating poverty through increased outreach and simultaneously achieving financial

sustainability. Coleman (2007) examined the impact of capital structure on the performance of MFIs. Found that most of the MFIs used long term debt and employ high leverage. Farrington (2000) identified a number of accounting variables to reflect the operational efficiency of MFIs. These accounting variables were number of loans per loan officer, portfolio size, loan size, capital structure etc.

From the review of literature it may be underlined that studies on operational efficiency of MFIs are very few. So, the academic motivation behind this study is to examine the growth of operational efficiency of selected MFIs in India.

## RESEARCH METHOD

The following research methodology has been framed for this paper:

### Research Objective

Correlation and OLS regression have been carried out on panel data to check the impact of portfolio at risk, return on asset and cost per borrower on the operational efficiency of microfinance institutions.

### Data and Time Duration

The main source of data is financial and income statement and social report. Data have been taken from the MIX market and official website of MFIs. The data are annual in nature and it covers the seven-year period 2006 to 2013. These 32 MFIs are purposely selected due to data availability and accessibility. After screening and removing missing variables, unbalanced panels of 32 Indian MFIs with 207 observations have been left for estimation.

### Research Hypotheses

For achieving the above mentioned objectives following hypothesis have been developed.

$H_{01.}$ Operational efficiency is positively influenced by portfolio at risk.

$H_{02.}$ Operational efficiency is positively influenced by borrowers per staff member.

$H_{03.}$ Operational efficiency is positively influenced by return on assets.

$H_{04.}$ Operational efficiency is positively influenced by cost per borrower.

The following set of data is captured to represent both the endogenous and explanatory variables.

The operational efficiency of the MFIs was analyzed using multiple regression models with various assumptions about the endogenous and explanatory variables.

### Variable Description

In this study, operational efficiency will be used as a dependent variable. Endogenous variables- Operational efficiency will be measured by earnings ratio which is financial income/operating expenses of firm i in time t. Explanatory variables- PAR which is portfolio at risk, it is measured by outstanding balance, portfolio overdue > 30 days + renegotiated portfolio/Gross loan portfolio. ROA which is return on assets, it is measured by (net operating income – taxes)/average total asset. Cost per borrower measured by operating expenses/average number of active borrowers. Borrowers per staff member which is measured by total number of borrowers/total staff member of firms.

### Tools of Analysis

In carrying out the analysis, we employ the basic panel data regression equation

$$Y_{it} = \alpha + \beta X / + \varepsilon_{it}, \ i = 1\ldots N; \ t = 1\ldots T \qquad (1)$$

Where, i denote the individual microfinance institutions and t denoting time. In this case, i represent the cross-section identifier and t the time identifier. $\alpha$ is a scalar, $\beta$ is a K-dimensional vector and $X_{it}$ is the $it_{th}$ observation on the K explanatory variables. In estimating a panel data model, most applications make use of a one-way error component model for the disturbances, with

$$\varepsilon_{it} = \mu_i + v_{it} \qquad (2)$$

Where, $\mu_i$ denotes the unobservable individual specific effect and $v_{it}$ denotes the remainder disturbance. $\mu i$ is time invariant and essentially accounts for any unobserved effect that is not captured in the specification. $v_{it}$ on the other hand varies with both the cross-sectional variables and time and could even be considered as the usual disturbance in the regression.

*Model specification:* Since the data is of panel nature consisting of both time series and cross sectional data, Ordinary Least Square (OLS) regressions are used for the purpose of analysis.

We estimate the following specific regression model:

$$\text{Operational efficiency}_{it} = \alpha 0 + \beta 1 PAR_{it} + \beta 2 ROA_{it} + \beta 3 BPSM_{it} + \beta 4 CPB_{it} + \varepsilon_{it} \qquad (3)$$

It also checked to ensure that our model meets the basic regression assumption of normality. It is observed from the visual plot that most of the variables do not meet the normality assumption and linearity. These are: the number of borrower per staff and cost per borrower.

Again to remedy this paper adopted variable transformation using log transformation. The log transformed variables also help to attain the linearity in parameters which is a requirement for the regression analysis (Cameron and Trivedi, 2009; Wooldridge, 2006; Verbeek, 2004; Greene, 2003; Hair et al., 2006).

The visual plots output indicating the distributions (kernel estimates) after the transformation of the variables (figures 1 and 2).

Figure 1 shows the kernel estimate of borrower per staff member after the log transformation.

Figure 2 shows the kernel estimate of operational efficiency cost per borrower after the log transformation.
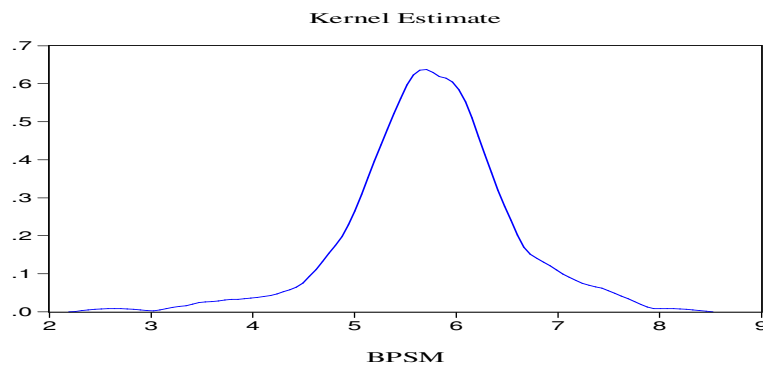

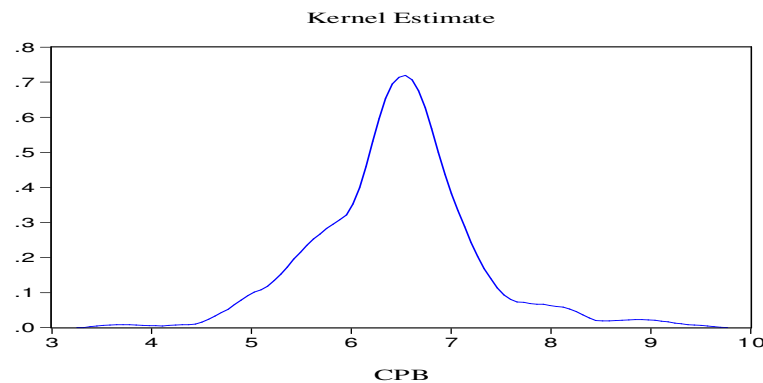
**Figure 1: Kernel estimate of BPSM**



**Figure 2: Kernel estimate of operational efficiency**

## RESULTS AND DISCUSSION
### Empirical Findings

Table 1 provides the result of descriptive statistics of MFIs. Earnings ratio measures the ability of an MFI to generate enough earnings to cover for the operating costs. Earnings ratio above 1 indicates that the earned income is higher than the operating expenses. From the descriptive statistics table indicated that the mean of earnings ratio is 2.57 percent. It shows MFIs able to generate enough earnings to cover the operating costs. PAR is effect the MFIs operational efficiency. The higher PAR will indicate inefficiency in making collections, an indication of poor repayment rates. The table indicated that the mean of portfolio at risk is 5.26 percent. So, it appeared to have higher repayment rate.

Borrower per staff member is another indicator of microfinance productivity and, therefore operational efficiency. All things being equal, the higher no. of borrowers per staff indicate the operational efficiency of MFIs staff, as they combatively handle more borrowers. From the table, the mean number of borrower per staff is 424; the minimum number of borrower per staff is 31 while the maximum is 3230 borrowers per staff member. This shows the operational efficiency of Staff members. Cost per borrower is also important for operational efficiency. An increase in total asset in itself may not indicate good performance. What these assets generate is a point of interest to investors.

Table 2 shows the result of the correlation analysis of Indian MFIs. Result shows that Eartio is significantly positively correlated with borrower per staff member, return on asset and portfolio at risk but significantly negatively correlated with cost per borrower (at 1 percent significance level). Return on asset is negatively significantly correlated with portfolio at risk and cost per borrower (at 1 percent significance level). Borrower per staff member is significantly positively correlated with portfolio at risk (at 1 percent significance level).

**Table 1: Descriptive statistic of MFIs**

|  | Eartio | PAR | BPSM | ROA | CPB |
|---|---|---|---|---|---|
| **Mean** | 2.570 | 5.262 | 423.961 | -3.271 | 863.227 |
| **Median** | 2.369 | 0.790 | 315.000 | 1.280 | 631.000 |
| **Maximum** | 8.788 | 99.950 | 3230.000 | 10.270 | 11133.00 |
| **Minimum** | 0.182 | 0.0000 | 31.000 | -104.350 | 41.000 |
| **Std. Dev.** | 1.220 | 14.630 | 388.138 | 18.386 | 1168.685 |
| **Observations** | 207 | 207 | 207 | 207 | 207 |

**Table 2: Correlation probability of MFIs**

|  | Eartio | PAR | BPSM | ROA | CPB |
|---|---|---|---|---|---|
| **Eartio** | 1.000 | | | | |
| **PAR** | 0.046 | 1.000 | | | |
| **BPSM** | 0.431* | 0.217* | 1.000 | | |
| **ROA** | 0.396* | -0.374* | 0.097 | 1.000 | |
| **CPB** | -0.481* | -0.049 | -0.212* | -0.541* | 1.000 |

Churchill (2005) has argued that multicollinearity condition reduces the operational efficiency of the estimates. How much correlation causes multicollinearity, it is not clearly defined. Hair et al. (2006) and Nuredin (2012) argue that correlation coefficient below 0.9 may not cause serious multicollinearity problem, Kennedy (1985) recommended that if the correlation between explanatory variables exceeds 0.8 then it would be a problem of multicollinearity. Here, the above results are showing correlation much below it. So, there is no presence of multicollinearity among the variables.

### Results of OLS Regression

Levin, Lin and Chu (2002) unit root test is applied before running the OLS regression, to check the stationary of the data. It is applicable on panel and pooled data. Results of the test lead to reject the hypothesis of the unit root. This study uses panel data models where the random effect and fixed effect models could be used to estimate the relationships among variables and thereby taking care of the omitted variables. Results of both the models are checked through applying Hausman Specification Test (1978). In case where both models are found significant then Random Effect Model results are taken into consideration.

Table 3 shows the results of OLS regression where operational efficiency (earnings ratio) being the dependent variable and borrower per staff member, return on asset, portfolio at risk and cost per borrower are the independent variables. Assessment of the table revels that Chi2 result indicates that fixed effect model is more appropriate because it reject the null hypothesis for operational efficiency measure indicator eartio at 5 percent. R-squared of operational efficiency measure is 69 percent indicating a reasonably fair explanatory power of the model. Results of the study stand to accept the null hypothesis $H_{01}$, $H_{02}$ and $H_{03}$ because return on asset and borrower per staff member of MFIs is significantly and positively explaining the operational efficiency of MFIs in India. Result also indicated that cost per borrower of MFIs is significantly and negatively explaining the operational efficiency of MFIs. So, it rejects the null hypothesis $H_{04}$.

**Table 3: OLS regression results for operational efficiency of MFIs**

| Regressor | Fixed Effect | Random Effect |
|---|---|---|
| Intercept | 5.418[*] | 6.170[*] |
| | (5.000) | (7.367) |
| PAR | 0.005 | 0.004 |
| | (1.139) | (1.077) |
| ROA | 0.017[*] | 0.014[*] |
| | (4.684) | (3.952) |
| BPSM | 0.280[**] | 0.3323[*] |
| | (2.319) | (3.748) |
| CPB | -0.692[*] | -0.8580[*] |
| | (-5.347) | (-9.634) |
| Rsquare | 0.689617 | 0.500604 |
| F-statistics | 10.85523[*] | 50.62211[*] |
| Hausman test | χ2 10.343689[**] | |

Note: [*], [**] represent level of significance at 1 percent, 5 percent respectively. The Hausman specification test is used to check the suitability of fixed effect model versus random effect model. Values of t-statistics are provided in parenthesis below the co- efficient estimates.

## CONCLUSION

Present study measures the operational efficiency of MFIs in India. Model is applied on a sample of 32 MFIs. Operational efficiency is measured by the earnings ratio. Result indicated that return on asset of a firm has significantly and positively effect on operational efficiency of MFIs. Mean of the return on asset shows the negative value, which is not good for self-sufficiency of MFIs. To increase its self-sufficiency, the MFI must either increase in return on assets. The return on assets ratio is an important indicator to analyze when pricing or loan term structures are changed. Analysis of this ratio will improve the ability of an MFI to determine the revenue impact of policy changes, improved delinquency management or the addition of new products. Cost per borrower of MFIs has significantly and negatively impact on its operational efficiency, as expected indicating that higher cost reduction improves operational efficiency of MFIs. If cost per borrower will increase the operational efficiency of MFIs will go down. Operational efficiency ratio measures the cost of providing services to generate revenue. For each MFI there are an optimal number of clients that each credit officer can manage effectively. While salary cost may be appear lower when credit officer carry a large number of clients. Operational efficiency level of microfinance institutions is helpful in to achieve economies of scale and reduce costs (Otero and Rhyne, 1994; Christen et al., 1995; Rhyane, 1998; Woller, 2000; Mersland and Strom, 2009).

## RECOMMENDATIONS

From the foregoing discussion, it may be concluded that return on asset, portfolio at risk and cost per borrower are all having impact on the operational efficiency of microfinance institutions. It also suggests that cost efficient managers are better managing their loan clients and properly monitoring MFIs operating costs. Furthermore, the level of operational efficiency has much more to do with the efficient utilization of resources rather than scale of production. In a study of this nature it would have been more appropriate to examine all MFIs in India. However, data availability and accessibility was a limitation. In spite of this limitation, we would want to indicate that findings of the study are not compromised. The finding of the study have attempted to direct attention towards the importance of operational efficiency of MFIs. It can be observed from the results of the study that operational efficiency has positive impact on the performance of MFIs. So, MFIs should increase operational efficiency. Thus to become efficient, MFIs should strive to operate at relatively low cost while keeping the borrower per staff member and repayment rates higher. Overall, the society may get the benefits through the MFIs because operational efficiency level will increase and poor people access to credit and their standard of living will increase.

## Policy Implications and Future Directions

The findings of the study attempts to draw on attention towards the significance of portfolio at risk, return on assets and borrower per staff member of MFIs. It may be observed from the results of the study that the borrower per staff member, ROA and portfolio at risk has positive impact on MFIs. An increase in total assets in itself may not indicate good performance. What these assets generate is a point of interest to investors. A measure indicate how much is earned for each rupees invested in total assets is known as return on assets. So, MFIs need to give an attention on it because they affect the operational efficiency of MFIs. However, the overall institutional importance of MFIs needs special attention of policy maker at different levels and my own into attention to that public-private partnership should be because they reached masses and employment will increase. Focus of MFIs needs to be on rural masses till the standard of living substantially goes up. However, to serve the underlying objective. The possibility of public private partnership (PPP) model may be explored to ensure the desired productivity and optimum level of operational efficiency of MFIs in India. Further, enhancing the capacity and capability of existing MFIs appear the need of the hour. There appears the need of some missing link between training institutes and MFIs so as to develop required training modules. Many training modules are working like Sa-Dhan (The association for community development finance institution, BIRD (Bharati Integrated Rural Development Society). These are interested in expanding their activities to infrastructure provision. The future

of MFIs in India is critical if nation, in reality, needs overall employment and tiny professions to grow faster in rural India.

## REFERENCES

Akoijam, S. (2013). Rural Credit: A Source of Sustainable Livelihood of Rural India. *International Journal of Social Economics*, 40 (1), pp. 83-97.

Ananda, S. and Colaco, X. F. (2012). Micro Finance in India: An Overview of Performance Prospects, International Conference on Advances in Computing and Management.

Ayuub, S. (2013). Impact of Microfinance on Poverty Alleviation: A Case Study of NRSP in Bahawalpur of Pakistan. *International Journal of Academic Research in Accounting, Finance and Management Sciences*, 3 (1), pp. 119-135.

Bassem, S. B. (2008). Efficiency of Microfinance Institutions in the Mediterranean: An Application of DEA. *Transition Studies Review*, 15 (2), pp. 343-354.

Cameron, A. C. and Trivedi, P. K. (2009). *Microeconometric Using Stata*, USA: Stata Press Publication.

Christen, P., Rhyne, E., Vogel, R. C. and McKean, C. (1995). Maximizing the Outreach of Microenterprise Finance, an analysis of Successful Micro finance programs. Program and Operations Assessment Report No. 10, Washington, D.C: USAID.

Christopher, F. I. (2011). Impact of Microfinance on Small and Medium-Sized Enterprises in Nigeria. Proceedings of the 7th International Conference on Innovation and Management.

Churchill, G. A. and Iacobucci, D. (2005). *Marketing Research: Methodological Foundations*, 9th ed., USA: Thomson South-Western.

Coleman, K. A. (2007). The Impact of Capital Structure on the Performance of Microfinance Institutions. *The Journal of Risk Finance*, 8 (1), pp. 56 –71.

Conning, J. (1999). Outreach, Sustainability and Leverage in Monitored and Peer-Monitored Lending. *Journal of Development Economics*, 60 (1), pp. 51-77.

Farrington, T. (2000). Operational Efficiency in Microfinance Institutions. *Microbanking Bulletin*, pp. 20-23.

Greene, W. (2003). *Econometric Analysis*, 5th International ed. New Jersey: Prentice Hall.

Hair, J. F., Black, W. C., Babin, B. J., Anderson, R. E. and Tatham, R. L. (2006). *Multivariate Data Analysis*, 6th ed., Pearson Education.

Haq, M., Skully, M. and Pathan, S. (2009). Efficiency of Microfinance Institutions: A Data Envelopment Analysis. Available at: http://ssrn.com/abstract=1405709

Hartungi, R. (2007). Understanding the Success Factors of Micro-Finance Institution in a Developing Country. *International Journal of Social Economics*, 34 (6), pp. 388–401.

Hausman, J. A. (1978). Specification Tests in Econometrics. *Econometrica*, 46 (6), pp. 1251-1271.

Hulme, D and Mosley, P. (1996). *Finance Against Poverty*, London, UK, 1 (2).

Kennedy, P. (1985). *A Guide to Econometrics*, 2nd ed., MIT Press, Cambridge, MA.

Lapenu, C. and Zeller, M. (2002). Distribution, Growth, and Performance of the Microfinance Institutions in Africa, Asia and Latin America: A Recent Inventory. *Savings and Development*, 26 (1), pp. 87 -111.

Levin, A., Lin, C. and Chu, J. (2002). Unit Root Tests in Panel Data: Asymptotic and Finite-Sample Properties. *Journal of Econometrics*, 108 (1), pp. 1-24.

Mekonnen, D. and Aemiro, T. (2012). The Financial Performance and Sustainability of Microfinance Institutions During the Current Financial Crisis: The Case of Amhara Credit and Saving Institution (ACSI) in Ethiopia. *International Journal of Business and Public Management*, 2 (2), pp. 81-87.

Mersland, R. and Urgeghe, L. (2013). International Debt Financing and Performance of Microfinance Institutions. *Strategic Change*, 22 (1/2), pp. 17-29.

Merssland, R. and StrØm, S. (2009). Microfinance Mission Drift? *World Development*, 38 (11), pp. 28–36.

Mukherjeee, P. (2013). Micro, Small and Enterprises. The Economic Times. Available: http://economictimes.indiatimes.com

Nuredin, M. (2012). Determinants of Dividend Policy of Insurance Companies in Ethiopia. Available: etd.aau.edu.et/dspace/bitstream/.../4665/1/Muhammed%20nuredin.

Otero, M. and Rhyne, E. (1994). *The New World of Microenterprise Finance: Building Health Institutions for the Poor*, West Hartford, CT: Kumarian Press.

Paxton, J. and Fruman, C. (1997). Outreach and Sustainability: A comparative analysis of Savings-First versus Credit-First Financial Institutions. *Sustainable Banking with the Poor*, The World Bank, Washington, D.C., U.S.A.

Paxton, J., Graham, D. and Thraen, C. (2000). Modeling Group Loan Repayment Behavior: New Insight from Burkina Faso. *Economic Development and Culture Change*, 48 (3), pp. 639-655.

Rai, A. A. and Rai, S. (2012). Factors Affecting Financial Sustainability of Microfinance Institutions. *Journal of Economics and Sustainable Development*, 3 (6), pp. 1-10.

Rauf, A. S. and Mahmood, T. (2009). Growth and Performance of Microfinance in Pakistan. *Pakistan Economic and Social Review*, 47 (1), pp. 99-122.

Rhyne, E. (1998). The Yin and Yang of Microfinance.

Reaching the Poor. *Micro Banking Bulletin*, pp. 6-9.

Roy, A. (2011). Managing Performance of MFIs – A Look into Their Microfinance Delivery Process and Profitability. *International Journal for Business, Strategy and Management*, 1 (1).

Saout, L. E. and Daher, l. (2013). Microfinance and Financial Performance. *Strategic Change*, 22 (1), pp. 31-45.

Shastri, K. R. (2009). Microfinance and Poverty Reduction in India (A Comparative Study with Asian Countries). *African Journal of Business Management*, 3 (4), pp. 136-140.

Verbeek, M. (2004). *A Guide to Modern Econometric*, 2 nd ed., England: John Wiley and Sons Ltd.

Vichore, S. and Dashpande, S. (2012). Microfinance in India - A Comprehensive Analysis of the Growth and Performance of MFI's. *The International Journal's Research Journal of Social Science and Management*, 2 (1), pp. 51-56.

Woller, G. (2000). Poverty Lending, Financial Self-Sufficiency, and the Six Aspects of Outreach. Whasington DC: The SEEP Network: Poverty Lending Working Group.

Wooldridge, J. M. (2006). *Introductory Econometric: A Modern Approach*. International Student Edition, 3rd ed., Canada: Thomson South–Western.

Zerai, B. and Rani, L. (2012). Is There a Tradeoff between Outreach and Sustainability of Micro finance institutions? Evidence from Indian Microfinance Institutions (MFIs). *European Journal of Business and Management*, 4 (2). pp. 90-99.