Comparison of Operational Efficiency of MFIs in South Asia and East Africa

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ABSTRACT

Microfinance is most powerful tool for alleviating poverty. Developing and under developing countries are major user of microfinance. Purpose of this study is to compare operational efficiency of microfinance institutions in South Asia and East Africa. Three countries were included from each region (Pakistan, India, Bangladesh, Kenya, Rwanda, and Uganda). Data Envelopment Analysis (DEA) is used to determine efficiency of microfinance in selected countries for year 2013 to 2015 using input orientation under Constant Return Scale (Technical Efficiency) and Variable Return Scale (Pure Technical Efficiency). Efficiency is measured in terms of transformation of funds (Intermediation approach) and in terms of productivity of financial services provided by microfinance institutions (Production approach). Results of this study revealed that all selected countries were efficient under both approaches (Intermediation and Production). However, microfinance in India was found to have weak efficiency in intermediate approach and Kenya found to have low efficiency in production approach.

I. Introduction

Microfinance now a days is most powerful tool in alleviating poverty. Developing and under developing countries are major users of micro credit programs (Mawa, 2008). Microfinance institutions had shown significant impact on different parts of the world. Impact of MFIs in alleviating poverty is mainly dependent on the level of operational efficiency. The purpose of this paper is to determine and compare efficiency of microfinance institutions in East Africa and South Asia.

Microfinance institutions are intended to serve poor people through wide range of financial services, which include microcredits, micro savings, money transfer and insurance with ultimate purpose of poverty reduction. (Robinson, 2003;ADB, 2000). Main purpose of MFIs is to provide financial services those people who have no access to commercial finance in order to help them in starting or expanding business (CGAP, 2009). In the initial phase MFIs were supported by grants from governments and donor agencies as well as with lower interest rate for the purpose of poverty alleviation (Zeller & Meyer, 2002). Low financial cost was introduced to enable poor's to avail financial services but this was resulted with high level of dependency by

MFIs on subsidies and donations (Armendariz & Morduch, 2005). Consistent performance of MFIs forced donors and governments to think about sustainability and efficiency of institutions (Cull, Demirguk-Kunt, & Morduch, 2009; Barres, et al., 2005). Another reason for this change of pyramid was due to the development in the industry which include involvement of commercial banks in microfinance industry and introduction of advanced technology in banking industry (Rhyne & Otero, 2006). These developments required that MFIs need to be efficient in covering their running cost and utilization of resources (Morduch, 2000; Hermes, Lensink, & Meesters, 2011).

Measuring efficiency of MFIs is defined differently in previous studies. Kipesha (2013), stated that optimal utilization of resources to increase production of goods and services of institutions. Efficiency can be defined as ratio of inputs in form of labor, capital and equipment and outputs in form of goods and services (Farrell, 1957). Efficiency of the organizations can be viewed as ratio with resources are allocated to produce outputs. According to Farrell (1957), economic efficiency can be divided into two components which are Pure Technical Efficiency (PTE) and Allocative Efficiency (AE). Pure technically efficiency of any firm can be explained as

maximum output without the wastage of inputs; so this efficiency can only be obtained if firm utilize resources by avoiding wastage of resources for maximum output. PTE also called as economic efficiency. Allocative efficiency refers to selection of mixture of input and utility derived from selected mix of inputs. In the context of MFIs utilization of input resources such as asset, personal and subsidies to output in terms of outreach and amount of loan distributed (Bassem, 2008).

Kipesha (2012) discussed number of reasons that why MFIs need to be efficient. First reason is that resources of MFIs are limited as donors cannot provide enough funds to serve all target poor people. Secondly competition among donors has increased all over the world because of increasing growth of MFIs. Third reason that required MFIs to be efficient that experts have realized that microfinance is the effective tool for poverty reduction. Fourth reason is immense competition among MFIs which required MFIs to be more efficient in order to attract funds of donors and governments. Finally, profitability of MFIs has attracted many investors to engage in microfinance business.

In 1990's major financial sector reforms were took place in East Africa place which led to development of strong financial sector, mobilization of deposits, healthy competition in financial markets and efficient and effective resource allocation (Kibirango & Kasekende, 1992). One of the major objectives of these reforms was to provide financial services to those areas and people which are unable to access basic financial services. MFIs were established to provide basic financial services to low income people of society in order to enhance their capabilities of earning better income and to help poor people to come out of poverty (URT, 2000; Kavura, 1992). Microfinance institutions were developed in shape of NGOs, government microfinance programs, microfinance companies and community banks in order to provide resources to poor's to help their micro enterprises, household needs and consumptions which ultimately results in economic growth and poverty alleviation (BOT, 2005).

Microfinance was initially found its place in South Asia where it developed rapidly (Ferdousi, 2013). This region is consisting mainly of developing countries characterized by large number of populations living below to poverty line. Through development of microfinance in rural areas of these countries was resulted in increased financial performance (Epstein & Yuthas, 2013). Apart from this financial performance MFIs in South Asia required used of advanced technology and managerial skills to reduce their dependency on subsidies and donations (Qayyum & Ahmad, 2006). Although success of MFIs also depended on environment of particular country therefore success or failure of MFIs cannot be considered as general trend. Performance of microfinance in any country also depended on policies of that country (Atoom & Abu Zerr, 2012).

Microfinance institutions are now a days required to be efficient in operating performance. This efficiency is especially required in developing and under developing part of the world. Efficiency of MFIs in Asia and Africa are not well known as these regions have greatest use of MFIs. Knowing efficiency of MFIs in these regions required by international donors and policy makers in order to allocate resources and restructuring of policies for regions where MFIs are either efficient or inefficient. Comparison of operational efficiency in these regions can be helpful in the allocation of resources to improve as well to strengthen microfinance institutions.

Following are objectives of this study

1. To measure and compare efficiency of microfinance institutions in selected countries of South Asia and East Africa in terms of transformation of funds (Intermediation Approach)

2. To measure and compare efficiency of microfinance institutions in selected countries of South Asia and East Africa in terms of production of services (Production Approach)

II. Literature Review

Hermes, Lensink and Meesters (2009), applied stochastic frontier analysis to determine efficiency of MFIs and found that low average balances and large number of women borrowers are negatively correlated with the efficiency of MFIs. Oteng-Abayie, Amanor, & Frimpong (2011), ascertained efficiency of MFIs in Ghana and found that age of institutions, cost per borrower and productivity are significant factors of economic efficiency. Annim, Lmai, and Arun, (2010) determined technical and scale efficiency of MFIs using data envelopment technique (DEA) and found that financial efficiency and outreach are negatively related, whereas social efficiency is positively related to outreach. Ahmad (2011) had taken gross loan portfolio and number of active borrowers as output and total assets and number of employees as input; study found that in 2003 three out of twelve MFIs are efficient

whereas in 2009 out of 19 four MFIs are efficient. Kipesha (2012) using DEA technique found for five East African countries that MFIs in these countries were found to be inefficient on technical ground.

Kablan (2012) determined social and financial efficiency of MFIs in East Africa using financial expenditure, capital and personal as input, gross loan portfolio as output of financial efficiency and number of active borrowers, proportion of women borrowers and poverty index as output of social efficiency; results indicated that social efficiency and financial efficiency are negatively linked. Abdelkader, Jemma, and Mekki, (2012) examined the efficiency of MFIs of MENA region by taking total assets, operating expenses, number of staff as input variables and financial revenue, benefits to poor's as output variables and found that efficiency of MFIs had reduced over the period. Jayamaha (2012) took deposits, number of deposit accounts, number of branches as input variables and amount of loan, number of loans as output variables for MFIs in SriLanka; study concluded that technical and scale efficiency of MFIs in Srilanka has reduced significantly over the period.

In ASEAN countries Vietnam, Indonesia, Cambodia and Philippines were found to be weak in pure technical efficiency whereas Laos was found to have good performance in pure technical efficiency (Tahir & Tahrim, 2013). Technical efficiency of microfinance in India and China is better than Bangladesh but in pure technical efficiency Bangladesh performed better than India and China.

III. Theoretical Framework

Berger and Mester (1997) used total loans and savings as output using input average size and number of accounts. This study measure efficiency using three inputs: labor, cost per borrower and cost per saver with outputs are savers per staff member and borrowers per staff member. Combination of these inputs and outputs provide way to measure productivity of MFIs in selected countries. One of the main objectives of MFIs is to attain confidence of depositors and borrowers at minimum cost. Therefore, operational efficiency of MFIs in maintaining borrower and savers is mainly dependent upon staff and cost incurred on them.

Another approach of measuring efficiency of MFIs is intermediation approach which means transformation of funds into loans. Berger and Humphrey (1992) criticized approach on the basis that interest cost and transactional cost are not considered under this approach. However previously many studies had used

deposits and loans to measure efficiency of MFIs (Casu & Molyneux, 2003;Isik & Hassan, 2003). Many MFIs are usually provided facility of savings to their clients and can be taken as output for measuring efficiency through intermediation approach. (Berger & Humphrey (1992); Hassan & Tufte (2001);Gutierrez-Nieto, (2006))

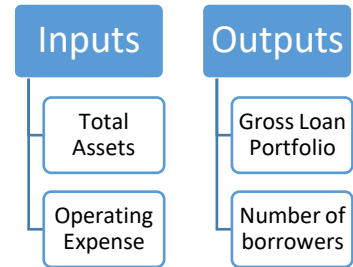Figure 1 and 2 are showing inputs and outputs used for both types of approaches

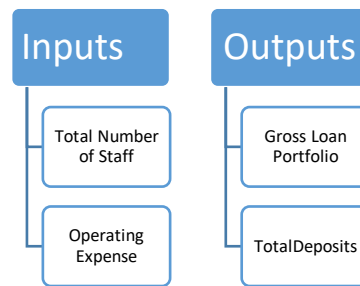
Figure 1: Production Approach

Figure 2: Intermediation Approach

IV. Research Methodology

For the purpose of this study three countries are selected from each region. Nature of this study is quantitative and secondary. Operational efficiency of MFIs in these regions are measured for three years 2013, 2014 and 2015. Aggregate data for each country was obtained from annual reports published by concerned authorities of that country.

For the purpose of measuring efficiency different input and output variables are selected. For production approach input variables are total assets and operating expense whereas, output variables are gross loan and active number of borrowers. For intermediation approach total number of staff and operating expenses are inputs whereas output variables are gross loan and total deposits

DEA, is a non-parametric technique, has the option to measure efficiency on variable return to scale and multiple variables of input and output without prices which make this technique preferable on stochastic frontier analysis Ruggiero (2005). DEA was introduced by Farrell (1957) and main use of the technique was in mathematical programming technique. Later on, further

developments were made by Charnes, Cooper, and Rhodes (1978) and Banker, Charnes, and Cooper (1984) on this model. DEA could project inefficient decision-making units (DMUs) which may include minimization of input, maximization of output or both. Although DEA has certain weaknesses in the form of sensitivity to errors, lack of measurement of error and inability to measure absolute efficiency but still it is considered as most suitable tool for measuring efficiency at firm level and country level. (Berger & Mester, 1997; Jemric & Vujcic, 2002; Zhu, 2003). DEA was previously used in many studies in evaluating efficiency of financial institutions such as studies done by Portela & Thanassoulis, (2007), Akhtar (2002), Sathye (2001) and Aikaeli (2008) had used DEA to evaluate efficiency of financial institutions from different aspects. Similarly, Bassem (2008), Qayyum and Ahmad (2006), had applied DEA to analyze efficiency of MFIs of East Africa.

Evaluation of efficiency of MFIs can be done using two approaches which are production and intermediation. In production approach microfinance institution are considered to have output in form of deposits and loan by using inputs in form of assets, capital and staff. (Haq, 2010; Bassem, 2008). Some previous studies have taken total assets, personal and operating expense as input variable whereas loan portfolio, financial revenue and active number of borrowers as output variables for measuring production efficiency (Kipesha, 2013; Bassem, 2008; Ahmad, 2011).

In intermediation approach MFIs mobilize funds by accepting deposits and advances to poor. Application of intermediation approach in MFIs is limited because in most cases MFIs accept debts for loan advances rather than deposits. Therefore, production efficiency is considered to be more suitable for measuring technical efficiency (Bassem, 2008; Ahmad, 2011). Among the empirical studies which employed intermediation efficiency include Haq (2010) which estimates intermediation efficiency of microfinance institution in Vietnam using cost per borrower, cost per saver and operating expenses as input proxy for funds mobilize to produce gross loan portfolio and Molinero (2004) which employed number of credit officers and operating expenses as input variables to produce number of loans outstanding, gross loan portfolio and interest and fee income. In this study we employed the production approach with total assets and operating

expenses as inputs while gross loan portfolio and number of active borrowers are treated as outputs.

In this study nonparametric DEA technique is used. DEA do not require not examination of shape of production function. To measure efficiency DEA used decision making units (DMUs) which incorporate 'm' inputs and 'n' outputs. Let DMUk be one of s decision units, $1 \leq k \leq s$. There are m inputs which are marked with $k\,i$ (i = 1, ..., m), and n outputs marked with Y k j (j = 1...., n). The efficiency equals to total outputs divided by total inputs. The efficiency of

DEA program use proper weights to maximize efficiency of DMU and determine efficiency score and frontier.

DEA has two ways to measure efficiency which are Constant Return Scale (CSR) Charnes, Cooper, and Rhodes (1978) and Variable Return Scale (VRS) introduced by Banker, Charnes, and Cooper (1984). Both these models are further extended into two orientations which are input and output. In input orientation fixed level of output is attained though minimum level of inputs whereas in output orientation maximum level of output is achieved through fixed level of input.

In Constant Return Scale (CRS) it is assumed that one input can give fixed level of output whereas in Variable Return Scale one input can give different level of output. Technical efficiency is measured through CRS whereas pure technical efficiency is measured through VRS.

In this study DEA is constructed for measure technical efficiency of MFIs using input-oriented approach. There are 'K' DMUs which represent different countries which utilize N inputs to produce M output. Input is denoted by 'xjk' (j=1,2,3,......n) and outputs by 'yik' (i=1,2,3.........,m) for each DMU then using input orientation technical efficiency can be measured as in equation (2) if W=0 then model measures technical efficiency using constant return scale and if W is non zero then pure technical efficiency is measured variable return to scale (Haq 2010; Shui, 2002; Worthington, 1999; Coelli, 1998).

V. Analysis and Results

In this study operational efficiency is viewed through production and intermediation approach using input orientation. Technical and pure technical efficiency are measured under both approaches. Results of DEA for both approaches are given in Table 1 and Table2

Table1: *Intermediation Approach Results*

Country	Technical Efficiency (CRS)			Pure Technical Efficiency (VRS)		
	2013	2014	2015	2013	2014	2015
Pakistan	1.00	1.00	1.00	1.00	1.00	1.00
India	0.86	0.18	0.25	1.00	1.00	1.00
Bangladesh	0.43	0.42	0.42	1.00	1.00	1.00
South Asia	**1.00**	**0.30**	**0.34**	**1.00**	**1.00**	**1.00**
Kenya	1.00	1.00	1.00	1.00	1.00	1.00
Rwanda	1.00	1.00	1.00	1.00	1.00	1.00
Uganda	1.00	1.00	1.00	1.00	1.00	1.00
East Africa	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**

Table2: *Production Approach Results*

Country	Technical Efficiency (CRS)			Pure Technical Efficiency (VRS)		
	2013	2014	2015	2013	2014	2015
Pakistan	1.00	1.00	1.00	1.00	1.00	1.00
India	1.00	1.00	1.00	1.00	1.00	1.00
Bangladesh	0.98	1.00	1.00	1.00	1.00	1.00
South Asia	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**	**1.00**
Kenya	0.31	0.23	0.77	0.45	0.37	1.00
Rwanda	1.00	0.74	0.66	1.00	0.90	0.75
Uganda	1.00	0.87	0.77	1.00	0.89	0.80
East Africa	**1.00**	**0.61**	**1.00**	**1.00**	**1.00**	**1.00**

In Table 1 MFIs in all countries have achieved technical and pure technical efficiency under intermediation approach for year 2013 to 2015 except for Bangladesh and India. Technical efficiency score of India were 0.18 in 2014 and 0.25 in 2015 after having score of technical efficiency in 2013. These low scores indicate that MFIs in India are not efficiently utilizing their resources. Similarly, Bangladesh found to have low scores of technical efficiencies in 2013 and 2014 (0.42 and 0.43) but sector achieved technical efficiency in year 2015. Low score in 2013 and 2014 (0.42,0.43) means that sector in Bangladesh wasting 58% and 57% of their inputs.

In intermediary approach microfinance sector of South Asia had low scores of technical efficiencies in 2014 and 2015 but found to have high scores in pure technical efficiency for all three years. East Africa region is found to have high scores in both technical and pure technical efficiency in all three years.

In production approach all countries achieved high scores in technical efficiency except for Kenya which had low scores in 2013 and 2014 (0.31 and 0.23). Similarly, in purely technical; efficiency Kenya found to have weak position in year of 2013 and 2014 (0.37 and 0.45). This shows that MFIs in Kenya wasted 63% and 55% of inputs to achieve fixed level of outputs. All other countries achieved pure technical efficiency. Overall South Asia is found to have both technical and pure technical efficiency in production approach for all three years whereas East Africa countries found to be weak in technical efficiency in the year of 2014. Apart from year of 2014 East Africa has also achieved both technical and pure technical efficiency.

VI. Conclusion

Operational efficiency was analyzed through intermediation approach and production approach.

Results of study indicated that microfinance sector of India was less technical efficient in mobilizing funds in year of 2013 and 2014 but all other countries were found to be efficient in mobilization of funds. This mean that microfinance sector of these countries is efficient in providing financial services to poor of respective countries.

Overall efficiency of MFIs as producer of services is high in all countries except Kenya which had weak position both in overall technical and pure technical efficiency. This implied for major reforms of MFIs in the country because low efficiency under production approach means MFIs are not providing satisfactory services to their clients. All other countries included in the study (Pakistan, India, Bangladesh, Rwanda and Uganda) are providing satisfactory services to their clients.

Overall productivity of MFIs in South Asia and East Africa is high for all three years except in year of 2014 in which East Africa region had low score in technical efficiency. MFIs in both these regions were found to be working properly in terms of providing financial services to clients as well as in transformation of funds.

Results of the study will be helpful for international policy makers and donor agencies in allocating their funds to those regions where maximum utilization of funds can be obtained. Allocating funds to microfinance sector of that country which is efficient in providing services and mobilization of funds will result in fulfilling ultimate purpose of microfinance program. Similarly restructuring needs to be done in a country found to have less efficiency. Like Kenya under production approach is less efficient which shows that productivity of the sector is low in providing services.

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