Efficiency of Microfinance Institutions: Analysis of Southern African Development Community (SADC) Member Countries[1]

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Abstract

Microfinance is seen as an important tool for financial inclusion and the fight against poverty because it has both a social and financial focus. The main objective of this paper is to evaluate the financial and social efficiency of 18 microfinance institutions (MFIs) in the year 2016 from 8 member countries of the Southern African Development Community (SADC). The methodology chosen is the data envelopment analysis (DEA) with variable returns to scale (VRS) using an input-oriented production approach. The results indicate higher scores of financial efficiency than social efficiency. This may suggest that microfinance institutions adopt a more institutionalism approach over the welfarist approach. We also find evidence that providing financial services to women or the entire disadvantaged population is profitable. However, non-bank financial institutions (NBFIs) and non-governmental organizations (NGOs) are more efficient in this regard than credit unions or banks.

Key Words– Microfinance, Financial Efficiency, Social Efficiency, DEA and SADC

JEL: G20, G21

1. Introduction

Microfinance is seen as an important tool for unravelling poor people from the web of poverty through financial inclusion, thus providing local economic development and significant social change (Ben Abdelkader et al., 2014; Crabb, 2008). For Balkenhol (2007), providing financial services to poor people on a sustainable basis, unlike other development strategies, sets high expectations that are not met by traditional financial institutions (TFIs), which typically do not provide credit to lower-income populations who are unable to provide any collateral.

The main problem of TFIs in providing credit to poor people is related to the high transaction cost required for a small amount of credit. Without real guarantees. This problem is aggravated because, unlike MFIs, TFIs do not establish a close relationship with communities. MFIs, on the other hand, consider that the communities have business potential and are able to fulfill their contractual obligations. There is evidence that the repayment rates of MFIs are quite high, contrary to what is expected for poor people (Gutiérrez -Nieto et al., 2009). This fact demonstrates the commitment of MFIs to financial inclusion and the fight against poverty through the promotion of local economic development.

For Ejigu (2009), there are three areas of research in the microfinance industry: 1) assessing the impact of microfinance programs on the lives of their beneficiaries; 2) evaluation of their outreach to the poorest people; and 3) analysis of their financial sustainability. According to Zeller & Meyer (2002), these three aspects constitute the vertices of a critical triangle of microfinance. At the center of the triangle are institutional innovations that translate into policy, management and organization. Technological innovations aim to create synergies to achieve the institution's objective.

From a theoretical point of view, there are two schools of thought on the assessment of MFI performance: welfarists and institutionalisms (Ejigu, 2009). The welfarists argue that an MFI can work by pursuing only social objectives, emphasizing social metrics, i.e. reach and impact. For the defenders of this current of thought, the depth of the range is much more important than its length, because it is important to reach the poorer layer. In this sense, donors are seen as social investors, equally achieving "social" returns. The institutionalist current, on the other hand, argues that MFIs should be able to function without grants or subsidies.

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In the opinion of the institutionalists, the fulfillment of the social objective necessarily depends on financial success. They also argue that only with financial self-sufficiency can MFIs meet their social goals.

However, the indicator most commonly used to measure the performance of MFIs is efficiency (see, for example, Balkenhol, 2007; Bassen, 2008; Gutiérrez-Nieto et al., 2009; and Kipesha, 2012). In the context of microfinance, efficiency is defined as the ability of a microfinance institution to optimally allocate its resources and meet its social and financial goals (Bassen, 2008). Social efficiency is linked to welfare policies that reflect the extent to which resources available to the MFI are used for poverty alleviation. Financial efficiency, on the other hand, has to do with the ability of the MFI to make profit in order to ensure its financial sustainability.

This study evaluates the social and financial efficiency of 18 MFIs in the year 2016 from 8 member countries of SADC. One of the main objectives of the integration of SADC countries is to guarantee the economic and social well-being and improve the quality of life of their people. We believe that studying the efficiency of MFIs in SADC countries can help policymakers in this region to better understand the development of the sector, and this understanding can guide the proper design of public policies that contribute to the eradication of poverty. In this context we intend to evaluate the efficiency of MFIs in the SADC region in using their assets, loan officers, and operating expenses to generate diverse financial services for poor people (especially women), and to assess whether these financial services have positive outcomes in the fight against poverty.

To assess the efficiency, we employ the data envelopment analysis (DEA) model with variable returns to scale (VRS), which is an input-oriented production approach. The DEA model enables the relative efficiency of MFIs to be determined by establishing a single evaluation indicator, ranging from 0 to 1. The relative efficiency results produced by the DEA can be used as a management tool, suggesting practices that can be disseminated to the other units evaluated to improve their performance.

The rest of the paper is organized as follows: Section 2 reviews the literature. Section 3 summarizes the DEA technique. In Section 4 we analyze the data, specify the model and define the variables. The results are presented and discussed in Section 5. Finally, section 6 summarizes the main conclusions of the study.

2. Literature Review

There are two approaches widely used to measure the efficiency of MFIs: the stochastic frontier and data envelopment analysis (DEA). The first establishes a relationship between variables by specifying the function of profit, cost and production. The second is a non-parametric model based on linear programming, which allows evaluating the efficiency of productive units. It does not require a functional form of the relationship between variables. For further details on both approaches we refer toNghiem & Rao (2006) or Kipesha (2012).

However, DEA is a model commonly used for measuring efficiency in both the banking sector (Paxtnon, 2007) and the microfinance sector. SeeGutierrez-Nieto et al. (2007), Bassen (2008), Gutiérrez-Nieto et al. (2009), Kipesha (2012) and Wijesiri&Meoli (2015), among others.

In recent years, the number of MFI efficiency studies has grown and the DEA model has been widely used. For example, Gutiérrez-Nieto et al. (2007) studied the efficiency of 30 Latin American MFIs using the DEA model. They found evidence that the efficiency of an MFI depended on the specification of inputs and outputs, and that the status of the institution and the country effect had an influence on efficiency.

Bassem (2008) investigated the efficiency of 35 MFIs in the Mediterranean area using the DEA model and concluded that the size of the institution had a negative effect on efficiency.

Gutiérrez-Nieto et al. (2009) evaluated the relationship between social and financial efficiency in various countries of the world using the DEA model. The results found by the authors indicate that there was a positive but weak relationship between social and financial efficiency. They also noted that financially sustainable institutions were also socially efficient, and that there was a positive relationship between social efficiency and focus on women, as well as between social efficiency and the fight against poverty.

Haq et al. (2010) studied the efficiency of minimizing the cost of providing financial services to poor people by MFIs in African, Asian and Latin American countries using the DEA model. The authors found that in the production approach, MFIs in the NGO category were more efficient. But in the intermediation approach, MFIs in the banking category were more efficient.

Kipesha (2012) assessed the financial efficiency of MFIs in 5 East African countries using the DEA model. The author found evidence that in this region, the average financial efficiency was high. However, banks and NBFIs were more efficient than NGOs and cooperatives.

Segun &Anjugam (2013) assessed efficiency in 70 MFIs in 25 sub-Saharan African countries using the DEA model. The results indicate that MFIs in this region were inefficient.

Ben Abdelkader et al. (2014) assessed efficiency in the Middle East and North Africa(MENA) region using the DEA model bootstrapping approach. The authors noted that efficiency ratios differed according to the legal status of the MFI, having found that NGOs had been highly efficient compared to NBFIs.

Khan &Sulaiman (2015) studied the social and financial efficiency of MFIs in Pakistan using the DEA model. The authors found evidence that NGOs and NBFIs were more socially and financially efficient than banks and credit unions.

Using the DEA model, Wijesiri&Meoli (2015) assessed the change in MFI productivity in Kenya. The results indicate that most MFIs experienced increased productivity over time and that this increase was due to technological innovation in the provision of financial services.

Kaur (2016), using the DEA model, assessed the efficiency of MFIs in India, finding that social efficiency and financial efficiency were positively correlated. However, MFIs in India had met their financial target more than their social objective.

Efendic&Hadziahmetovic (2017) investigated the financial and social efficiency of MFIs in Bosnia and Herzegovina using the DEA model. They found that both the financial and social efficiency scores were below the optimal level. However, financial efficiency was significantly higher than social efficiency, and small MFIs outperformed larger MFIs in both dimensions (financial and social).

Ben Abdelkader & Mansouri (2018) evaluated the efficiency of MFIs in 10 Arab countries using the bootstrap-DEA technique. The authors found mixed results due to the age of the MFI and its regulation, and there was also evidence of positive and solid results in both social efficiency and financial efficiency.

In this paper, the efficiency of MFIs is analyzed from two perspectives: social and financial. The definition of efficiency adopted was inspired by the works of the authors Balkenhol (2007), Bassen (2008), and Gutiérrez-Nieto et al. (2009). Financialefficiencyhas to do with technical efficiency (Sanchez, 1997), and can be viewed from one of two perspectives: production or intermediation. The first perspective considers that the MFI uses its physical resources such as assets, human capital and operating costs to produce financial services such as loans, savings, and revenues. The second assumes that the MFI acts as a financial intermediary between economic agents and borrowers, lending and accepting deposits (see, for example, Bassem, 2008; Gutiérrez-Nieto et al., 2009; Kipesha, 2012). Here we adopted the production approach, because not all MFIs in the region accept deposits. This research contributes to the above-mentioned literature by beginning the first to apply the DEA model to assess the efficiency of MFIs in the SADC region.

3. Methodology

This section presents the basic concepts, advantages, and disadvantages of the DEA model.

DEA was initially conceived by Farrell (1957) and later expanded by Charnes, Coopes& Rhodes (1978), see, for example, Nghiem & Rao (2006) orKipesha (2012).According to Nghiem & Rao (2006), DEA is the most used non-parametric model for determining efficiency.

The DEA is a model that uses linear programming to determine efficiency measures which aid decision-making in production units (DMU, acronym for decision-making units). According to Boussofiane et al. (1991), these productive units can be departments of local authorities, schools, hospitals, shops, banks, and similar institutions. In the context of this study, the DMUs are the MFIs of the SADC region.This model allows measuring the relative productive efficiency of decision-making units by minimizing inputs and maximizing outputs for better decision-making). Eachdecision-making unit uses some inputs to produce several outputs (Bassen, 2008).

The selection of input and output variables is the key aspect of using the DEA model (Gutiérrez-Nieto et al., 2009). For Khan &Sulaiman (2015), input refers to factors that are used to produce a good or provide a service, while output is the result in the form of physical production or service delivery, which has been directly affected by the input through the production process.

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However, this selection is made considering the technical efficiency approach adopted, i.e., whether production or intermediation. In the intermediation approach, the input variables are cost for loans, costs for the deposit, and operating expenses, among others, while the output variables include loan volume and savings volume. In the production approach, the inputs are assets, human capital, and operating costs, while the output variables are gross loan portfolio, and financial revenue. Additionally, for social efficiency, the outputs chosen are the number of women and poverty index of the microfinance program beneficiaries. In this paper, the production efficiency approach has been chosen.

The mathematical expression for a DMU with only one input variable x and one output variable y is $E = \frac{y}{x}$.

If we have multiple input x_i, $i = 1, \dots, I$ and output variables within a unit y_j, $j = 1, \dots, J$ this ratio must consider the weight of each variable within the unit. Thus, the efficiency of a target unit (DMU) n is based on the following mathematical expression,

$$\max_{(u,v)} \ E_n = \frac{\sum_{j=1}^{J} u_j \times y_{jn}}{\sum_{i=1}^{I} v_i \times x_{in}} \tag{1}$$

subject to

$$\frac{\sum_{j=1}^{J} u_j \times y_{jn}}{\sum_{i=1}^{I} v_i \times x_{in}} \leq 1$$

$$u_j, v_i \geq \varepsilon, \ \forall i, j \ , \text{with}, \ j = 1, \dots, J, \ i = 1, \dots, I,$$

where y_{jn} is output j from DMU n; x_{in} is input i of DMU n; u_j is the weight assigned to output j; v_i is the weight assigned to input i; N is the number of DMUs (sample); J is the number of output variables; I is the number of input variables; and ε is a small positive value.

There are two basic DEA models. The first is the constant returns to scale (CRS) (Charnes, Cooper and Rhodes, 1978). It assumes that any variation in inputs leads to the same variety of outputs. The underlying hypothesis of this model is that MFIs are embedded in an environment where there is perfect competition and operate at an optimal scale (Khan & Sulaiman, 2015). The second model is the variable returns to scale (VRS) (Banker, Charnes and Cooper, 1984), which assumes variable returns of scale (increasing or decreasing) taking into account the size of the DMUs. The VRS assumes that an increase in input may lead to an increase or decrease in output, although not necessarily proportional. According to Kipesha (2012), the VRS approach has the advantage of considering that imperfections in competition exist in the microfinance industry, such as differences in the age of institutions or restrictions in the availability of funds.

We used the VRS model with input orientation. Kipesha (2012) considers that it is much easier for MFIs to control the inputs (assets, personnel, expenses) needed to provide varied services to their clients, but it is virtually impossible to control the outputs. The mathematical formulation of the input oriented VRS approach is

$$\max E_n = \sum_{j=1}^{J} u_j \, y_{jn} + u^* \tag{2}$$

subject to

$$\sum_{i=1}^{I} v_i x_{in} = 1$$

$$\sum_{j=1}^{J} u_j \, y_{jn} - \sum_{i=1}^{I} v_i x_{in} + u^* \leq 0 \quad \forall j$$

$$u_j, v_i \geq 0 \ \forall j, i u^* \epsilon \, R,$$

where u_j, v_i are as defined in (2); x_{in}, y_{jn} represent the amount input and output respectively of the DMU n.

The efficiency indicator generated is relative, i.e., ranging from 0 to 1. The closer this value is to 1, the more efficient the DMU, and the closer to 0, the less efficient is the DMU.

4.Data, model specification and definition of variables

4.1 Data

The data used in this paper refer to the year 2016 for 18 MFIs in 8 SADC countries (Mozambique, Angola, Malawi, Tanzania, South Africa, Madagascar, Democratic Republic of Congo and Zambia).

According to the classification in the MIX database, there are 5 categories of MFIs: Banks (B), Credit cooperative (Ccop), Non-Bank Financial Institutions (NBFI), Non-Governmental Organizations (NGOs), and Others (O). Of the 18 MFIs in the sample, 7 are NGOs, 4 NBFIs, 5 B and 2 Ccop, as is shown in Table 1.

Across the SADC region, there are a total of 89 MFIs, of which 36 are NGOs, 21 NBFIs, 20 B, 8 CU, and 4 in the "other" category. Our small sample size is due to the lack of complete information from many institutions for the year under study. For the analysis, both SPSS and Frontier Analyst® were used to obtain the results.

Table 1. Number of organizations by institutional format

Institutional Format	No.
Non-Bank Financial Instittions (NBFI)	4
Banks (B)	5
Non-Governmental Organizations (NGO)	7
Credit cooperative (Ccop)	2
Global	18

Table 2. Descriptive Statistics of Input and Output Variables

Variable	Minimum	Maximum	Mean	Stand. deviation
Assets ($)	888,638	640,675,485	61,931,182	146,632,208
Loan officers (No.)	19	508	190.11	163.131
Operating expenses ($)	16,711,706	5,357,447	4,733,234	537,489
Gross Loan Portfolio ($)	74,970,202	19,216,200	20,188,540	909
Financial revenue ($)	498,117	91,315,841	14,997,193	21,376,835
Number of active borrowers	4705	138827	31432	31928
Percentage ofactive women borrowers	28.77	100	58.37	19.75

Table 2 presents some descriptive statistics of the data. Note that, for example, the minimum number of loan officers was 14 and reached a maximum of 508 in a given MFI. The high standard deviation of all variables indicates a high variation from the mean, suggesting that the data varied depending on the size of the microfinance institution. Women also had access to financial services, reaching an average of 58.37% per MFI.

4.2 Definition of variables

Based on the works of the authors Gutiérrez-Nieto et al. (2009), Ben Abdelkader et al. (2014) and Kaur (2016), the input variables chosen for both models (financial and social) were assets, operating expenses and loan officers. Assets represent the total amount of funds controlled by the financial institution. Operating expenses are related to all loan-

related expenses. The number of loan officers refers to all employees participating in the direct management of the loan portfolio.

The output variables chosen are gross loan portfolio, financial revenue (financial efficiency), number of active women borrowers, and poverty index (social efficiency). The gross loan portfolio refers to the main balance of all MFI loans, including current balance, delinquent balance, and restructured loans, excepting written-off loans. Financial revenue refers to all income generated by the provision of loan services to clients, as well as income from investments and other operations. For social efficiency, the outputs chosen reflect the MFIs' mission to combat poverty and promote financial inclusion. To this end, the number of women benefiting from microfinance programs was chosen as a variable, reflecting the social exclusion they face in rural areas from their families, communities and the formal financial sector.

The poverty index, built on the work of Gutiérrez-Nieto et al. (2009), represents the social reach of the MFI. This index takes into account the average loan balance per borrower and the per capita gross national income of each country. It is determined as follows,

$$pov_n = 1 - \frac{K_n - min(K)}{Range(K)} \tag{3}$$

where $Range(K) = \max(K) - \min(K)$

$$K_n = \frac{Average loan balance per borrower}{per capita gross national income} \tag{4}$$

and the formulas in (4) allows the standardization of the variable pov_n in (3), for values between 0 and 1, where *n* is the indicator associated with each MFI.

4.3 Model Specification

This study presents six (6) efficiency model specifications. Three (3) of them take a financial approach while the three others (3) take a social approach, as shown in Table 3. However, all 6 models have the same input variables.

For financial efficiency, the following models and notation were constructed:

- financial efficiency (FE-FRGL), which comprises two financial outputs (financial revenue and gross loan portfolio);
- efficiency in the gross loan portfolio (FE_GL); and
- efficiency in the financial revenue (FE_FR).

For social efficiency we have:

- the complete social efficiency model (SE_WP), which encompasses both the number of women and the poverty rate;
- MFI efficiency in empowering women (SE_W); and
- efficiency of the MFI in the fight against poverty (SE_P).

These specifications are inspired by the works of Gutiérrez-Nieto et al. (2009), Khan &Sulaiman (2015), and Khan (2016). They allow the authors to better identify the sources of the inefficiency of the MFI.

According to Ben Abdelkader et al. (2014), to specify the DEA model, the number of DMUs must exceed 3 times the sum of the amount of input and output variables and must also exceed the product of the input and output variables.

That is,

$$N > 3(I + J) \quad \text{and} \quad N > I \times J, \tag{5}$$

where, as before N is the number of decision-making units, I and J refer to the number of of input and output variables, respectively.

In our case, we have $N = 18$, $I = 3$, $J = 1$ or $J = 2$ (depending on each concrete specification), which is in concordance with the conditions given by Ben Abdelkader et al. (2014).

Table 3.Financial and Social Efficiency Models

Models	Input	Output
Financial Efficiency Models		
Financial efficiency (FE-FRGL)	• Assets • operating expenses • Loan officers	• Financial revenue • Gross Loan Portfolio
Credit portfolio efficiency (FE_GL)	• Assets • operating expenses • Loan officers	• Gross Loan Portfolio
Efficiency in financial revenue (FE_FR)	• Assets • operating expenses • Loan officers	• Financial revenue
Social efficiency models		
Social Efficiency (SE_WP)	• Assets • operating expenses • Loan officers	• No. of active women borrower • Poverty index
Efficient lending to women (SE_W)	• Assets • operating expenses • Loan officers	• No. of active women borrower
Efficiency in the fight against poverty (SE_P)	• Assets • operating expenses • Loan officers	• Poverty index

5. Results and discussion

The results presented here were obtained with the DEA–VRS model, based on the production approach and input orientation. The models were built with the dual purpose of MFIs in mind – to provide financial services to poor people excluded in the traditional financial sector, while ensuring financial soundness to guarantee their sustainability.

We start by analyzing global efficiency results, considering only the global variables, FE-FRGL and SE_WP. Table 4 and Figure 1 present average efficiency scores by institutional format. No matter the institutional format, on average, SADC MFIs have higher financial efficiency (0.928) compared to social efficiency (0.613). NBFIs take the lead in both financial and social efficiency. Banks, on the other hand, present the lowest average social performance.

Table 4. Average Efficiency by Institutional Format

Institutional Format	Financial Efficiency	Social Efficiency
NGOs	0.928	0.735
Credit cooperative	0.896	0.591
NBFIs	1.000	0.792
Banks	0.8906	0.354
Global	0.928	0.618

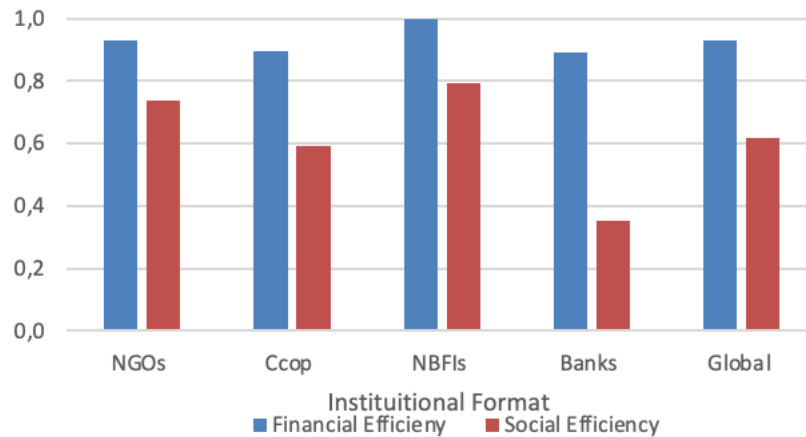**Figure 1. Average efficiency by institutional format**

Figure 2 represents the 18 MFIs under analysis, comparing also global financial efficiency vs social efficiency. There seems to be three clusters. The "red cluster" with 7 MFIs with high financial efficiency (scores in the range [0.8,1]), but extremely low social efficiency (scores below 0.3). 1 MFI is close to this first cluster, but presents social efficiency higher that 0.4. The "green cluster" includes the top 4 MFIs, with financial efficiency scores of 1 or very close to one, and also very high social efficiency (scores above 0.85). Finally, 2 MFIs, present maximal social efficiency (social score equal to 1), while relatively low level of financial efficiency (between 0.7 and 0.85).

Table 5 shows these efficiency results, as well as the scores concerning the other, more specific financial and social efficiency scores. Recap the six (6) specifications presented in Tabel3. From Table 5 FE_FRGL and SE_WP columns, it is possible to identify our three clusters:

- Top financial and social efficiency (green cluster):KixiCrédito, Zef-zaf, CoopecCahi and Microloan Foundation, from Angola, South Africa, Democratic Republic of Congo and Zambia, respectively.
- Top social efficiency, with relative low financial efficiency (yellow cluster): Cumo and AB Bank, from Malawi and Zambia, respectively
- All other MFIs present high to average financial efficiency with, however, low to very low social efficiency (red cluster). Mbc bank, from Mozambique has not been included in this cluster as it presents average financial efficiency, but higher than the red cluster members, social efficiency.

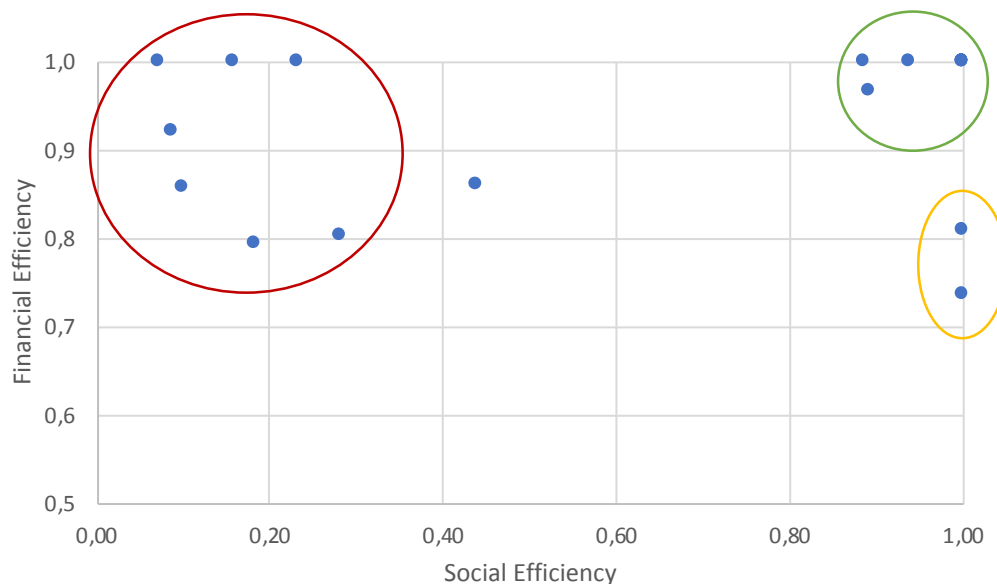**Figure 2. Financial Efficiency Vs Social Efficiency**

Table 5. Financial Efficiency Results vs. Social Efficiency

Country	MFI	Legal Status	Financial efficiency			Social efficiency		
			FE_FRGL	FE_GL	FE_FR	SE_WP	SE_W	SE_P
Angola	KixiCrédito	NBFI	1.000	1.000	1.000	0.937	0.869	0.923
South Africa	Zef – Zaf	ONG	1.000	1.000	0.815	1.000	1.000	1.000
Madagascar	AccèsBanque	B	0.858	0.858	0.461	0.101	0.101	0.086
	Acep Madagáscar	NBFI	1.000	1.000	0.546	0.231	0.231	0.223
	Cecam	Ccop	0.792	0.792	0.517	0.182	0.182	0.109
	Microcred -Mdg	NBFI	1.000	1.000	0.507	1.000	1.000	0.083
Malawi	Cumo	ONG	0.809	0.809	0.809	1.000	1.000	1.000
	Finca - Mwi	ONG	0.802	0.802	0.731	0.281	0.281	0.167
Mozambique	Africaworks	ONG	1.000	1.000	1.000	0.885	0.885	0.885
	Hluvuku	ONG	0.967	0.967	0.904	0.893	0.893	0.892
	Mbc	B	0.859	0.859	0.814	0.440	0.440	0.439
Democratic Republic of Congo	Advans Bank Congo	B	1.000	1.000	1.000	0.160	0.160	0.160
	CoopecCahi	Ccop	1.000	1.000	1.000	1.000	1.000	1.000
Tanzania	Accessbank	B	1.000	1.000	0.540	0.071	0.071	0.065
	Finca - Tza	ONG	0.920	0.920	0.663	0.087	0.087	0.087
Zambia	AB Bank Zambia	B	0.736	0.736	0.526	1.000	1.000	1.000
	Microloan Foundation	ONG	1.000	1.000	1.000	1.000	1.000	1.000
	Amz	NBFI	1.000	1.000	0.968	1.000	1.000	1.000

Table 6. Pearson Correlation Coefficient

	SE_WP	SE_W	SE_W	FE_FRGL	FE_GL	FE_FR
SE_WP	1					
SE_W	.999**	1				
SE_P	.865**	865**	1			
FE_FRGL	.188	.188	.126	1		
FE_GL	.194	.188	.126	.989**	1	
FE_FR	.489*	.481*	.644**	.471*	. 471*	1

* Correlation is significant at the 0.05 level (2 ends).
** Correlation is significant at the 0.01 level (2 ends).

Looking at Table 6, and into the alternative specifications of financial and social efficiency, we can conclude that the main driver of financial efficiency (FE_FRGL) is the gross loan portfolio (FE_GL) with a correlation of 0.989, while

financial revenue (FE_FR) presents much lower correlation. In fact, perhaps surprisingly, financial revenue, seems to be similarly correlated with both financial and social efficiency specifications. In terms of the social efficiency alternative specifications it is possible to identify both empowerment of women and fight against poverty has important contributors (high correlations of SE_W and SE_P with SE_WP).The cross correlation between financial and social efficiency specifications to be positive, but weak, and not statistically significant, except for the mentioned case of financial revenues. A possible explanation could be that existence of financial revenues may help implementing the social role of MFIs.

Figure 3 also highlights this by showing scatter-plot between the financial specifications FE_GLversus FE_FR and the social specifications SE_W versus SE_P. It is clear that in terms of financial efficiency MFIs focus more on the gross loan portfolios than on financial revenues, but this situation varies more institution to institution. On the social from, there seems to be almost equal focus on empowering women and fight against poverty in almost all institutions, except for outlier case of Microcred in Madagascar that seems particularly focused only on women empowerment.

Figure 3. Relationship between Specifications

(a) Financial Efficiency   (b) Social Efficiency
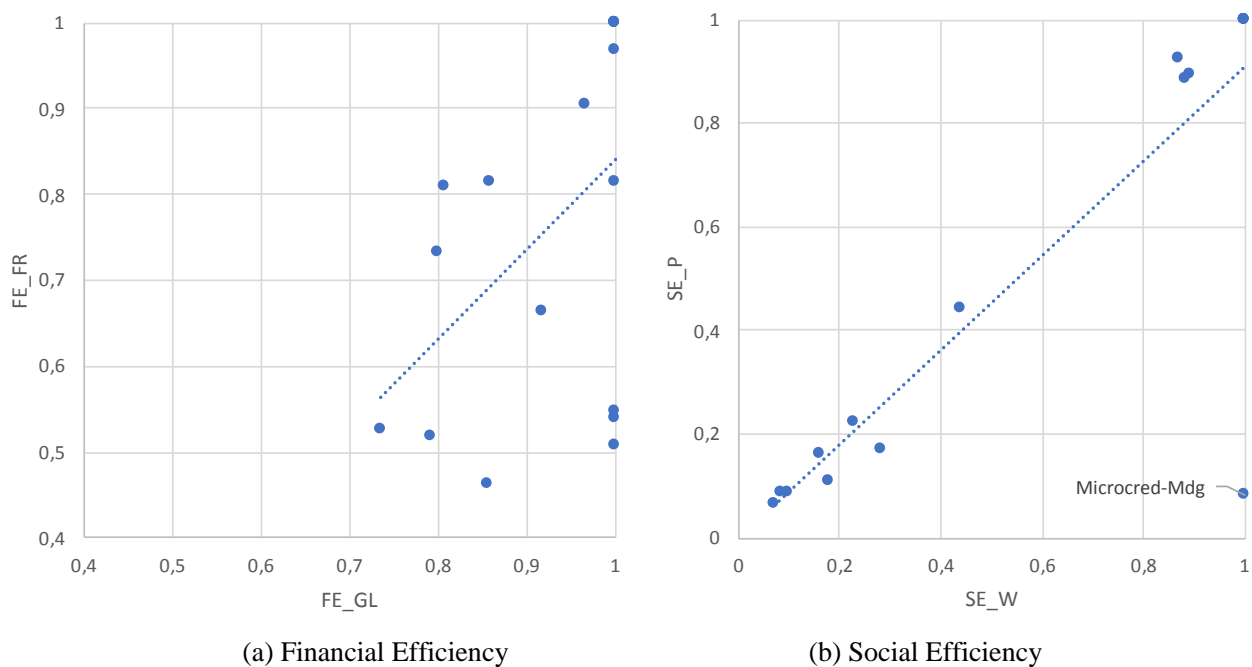
Finally, Figure 4 presents a country by country average efficiency scores for all possible specifications. For the MFIs under analysis, there is no country with a average score of 1 on all six dimensions. South Africa (orange line) does attain it on 5 out of 6 dimensions. Zambia (borrow line) does perform quite well with 3 scores of 1 and very high values for all other specifications.

When taking a social perspective one can almost identify a ranking of countries, from most efficient to less as follows: 1st and 2nd South Africa and Zambia in equality , 3rd Angola, 4th Mozambique, 5th Malawi, 6th D.R.Congo, 7th Madasgascar, 8th Tanzania.

From a financial efficiency perspective the picture is less clear, but looking in particular to the differences in efficiency when measured as financial revenues, a possible ranking would be: 1stand 2nd Angola and D.R.Congo in equality, 3rd Moçambique, 4th South Africa, 5th Zambia, 6th Malawi, 7th Tanzania, 8th Madagascar.

Of course the presented ranking do depend greatly depend on our sample of 18 MFIs, as we are considering average scores and we have only few institutions per country, varying from only 1 institution to up to 4 institutions.

Figure 4. Average efficiency scores by country
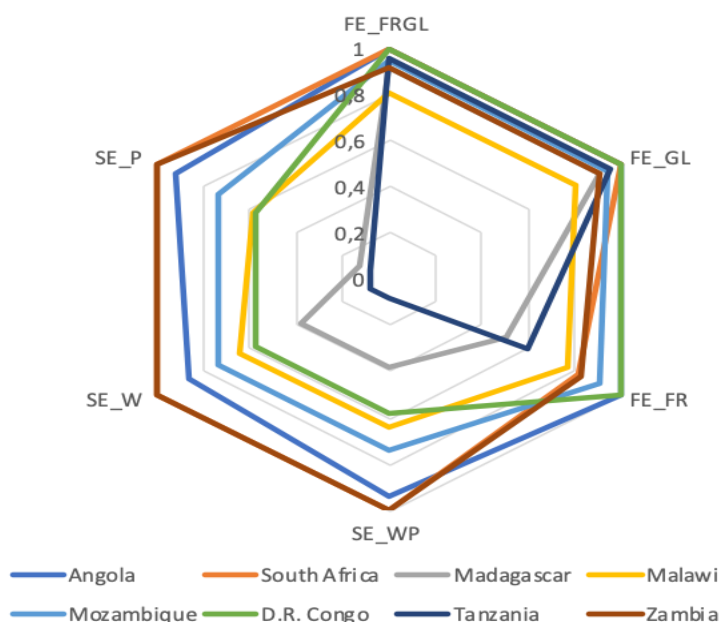
6. Conclusion

As microfinance is considered an important strategy for achieving financial inclusion, women empowerment and poverty alleviation, assessing the achievement of these objectives are of crucial importance to Microfinance Institutions (MFIs) themselves, academics, researchers and policymakers.

In the present study, we evaluate the social and financial efficiency of 18 MFIs in 8 Southern African countries in 2016. The DEA–VRS model using an input-oriented production approach. The DEA methodology has been widely used to determine the efficiency of both traditional financial institutions and MFIs. The input variables used in this paper are assets, operating expenses and loan officers. The output variables represent the financial objective (gross loan portfolio and financial revenue) as well as the social objective (number of active women borrower and poverty index).

It can be concluded that, on average, financial efficiency (0.92) is higher than social efficiency (0.62). This result is consistent with the findings of Kaur (2016), Efendic & Hadziahmetovic (2017). The correlation between financial and social efficiency scores tend topositive, but weak, and not statistically significant, except for the case of financial efficiency when measured as financial revenues. These results may suggest that MFIs in the SADC region have struggled to be able to simultaneously fulfill the dual purpose of MFIs, although higher financial revenues may allow institutions to focus more on their social role.

For the institutionalist approach, we note that only a minority of MFIs were financially and socially efficient (4 out of 18). Overall, NBFIs and NGOs are efficiency in both the social and financial approaches to banks and credit unions. The banks showed no social focus, reaching an average level of social efficiency of only 0.35. We have also explored the relationship between gross loan portfolio and financial revenues (as key financial scores) and where able to conclude institutions of our sample tend to be more efficient in terms of gross loan portfolio. When comparing the social aspect of women empowerment and fight against poverty, there seems to be equal focus on both aspects, although the majority of our sample institutions have still low social efficiency scores.

Although many MFIs in the SADC region have not deposited full information in the MIX database, which is a limitation of the study, we believe that the results help us to understand that there is a heterogeneity of microfinance tissue in the region.

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