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EVALUATING FINANCIAL DISTRESS CONDITION OF MICRO FINANCE INSTITUTIONS IN ETHIOPIA USING ALTMAN'S REVISED Z-SCORE MODEL

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Abstract

After financial crisis of 2007-08, where many international corporations and financial institutions needed a bail out by government to remain in business, financial solvency and stability have become top most priorities for the financial sector globally (Chotalia, 2014). For this reason, Prediction of financial distress has gained a great deal of interest by researchers in finance recently (Al-Saleh & Al-Kandari, 2012). In view of this, there exist a large number of models and associated ratios propounded by various authors in predicting how healthy a company's financial condition is (Ahmed & Alam, 2015). However, the discriminant analysis as given by Altman is most effective and accurate among different techniques to predict financial distress (Bal, 2015). Accordingly, the purpose of this study was to evaluate financial distress conditions of selected Ethiopian micro finance institutions (MFIs) by applying Edward Altman's revised Z- score model using secondary data for the period 2011 to 2015. To this end, the study revealed that 94 % of MFIs are in the safe zone and 6% in the grey zone among the selected institutions. The finding of the study also indicates fluctuation in Z-score of the institutions from period to period. In view of this, the paper is expected to be used as input for policy makers and practitioners as long as it provides empirical evidence on financial distress condition of MFIs. Moreover, along with the theoretical contribution, this study is expected to contribute insights for academicians as literature for further studies in the area of MFIs and state of financial distress.

Keywords: Atman's revised Z-Score, Financial distress, Micro Finance Institutions (MFIs)

Introduction

Microfinance service is considered as one of the policy instruments to eradicate poverty at the forefront of the development strategy of Africa (Tehulu, 2013). For the reason that finance is an extraordinary effective tool in spreading economic opportunity and fighting against poverty, the main function of micro finance institutions is providing sustained credit to different sectors (Rupa & Manoharan, 2014). Currently, the Ethiopian Microfinance sector is one of the fastest growing financial institutions in the world though its formality is a recent phenomenon that gained momentum after the establishment of micro fiancé institutions proclamation 40 /1996 (Devi, 2017). As financial sector, the health of microfinance institutions is crucial to sustainable economic growth of a country for the reason that an efficient flow of fund between savers and investors cannot be preserved without a sound financial sector (Masud & Haq, 2016). For this reason, many studies in finance support the need for prediction of the financial soundness and the likely occurrence of financial distress in institutions since predicting failure as early as possible with sound accuracy enable firms to take action to reduce the costs of bankruptcy, avoid failure to all stakeholders and contribute towards the business and financial environment stability (Mahama, 2015).

In addition, shareholders will lose their capital, depositors will lose their deposit, business firm will not get capital for investment & government will not be able collect tax if financial institutions are being distressed (Mostofa, Rezina, & Hasan,

2016).In Ethiopia, after the change made on economic policy towards market economy with the objective of economic growth and poverty alleviation, the establishment and expansion of MFIs has been seen as a way of development. Hence, 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 (Aemiro & Mekonnen, 2012).Thus, the main purpose of MFIs is to collect deposits and extend credit to farmers and people engaged in other similar activities as well as micro and small scale entrepreneurs. To do this, however, the institutions should be financially stable. In the same vein, as possible economic implications of developments in the financial sector, financial distress of these institutions should be taken in to account while policy makers decide upon the appropriate stance of monetary policy (Petrovska & Mihajlovska, 2013).m So far, various studies have been carried out in Ethiopia concerning microfinance institutions. However, evaluation of state of financial distress, an important and contemporary issue in finance is missed. Therefore, due to its indispensability, the purpose of this study is to evaluate financial distress condition of selected Ethiopian micro finance institutions using Edward Altman's revised Z -score model as long as the issue is quite contemporary to be dealt with in finance.

Research Methodology

Research Approach, Data Source and Type

This study employed descriptive design and quantitative research approach in which numerical secondary data were extracted from financial statements (statement of comprehensive income and statement of financial position) of Micro finance institutions in Ethiopia from 2011 to 2015 to predict risk of financial distress.

Sampling technique and sample size

According to National bank of Ethiopia, there are 35 Micro finance institutions currently operating in the country. However, required data cannot be generated from all institutions as far as some lack sufficient data. Thus, only 18 Micro finance institutions with full data of five years (2011-2015) were selected for this study purposely to assess risk of financial distress using Altman's Z-score model.

Variable Description and Measurement

The major variable of this study is financial distress. It is a technical term which is used to assess the insolvency as well as bankruptcy of financial organizations. Predicting financial distress is a very powerful tool in making wise and prudent decisions in financial institutions. This is for the fact that with the ability to predict the probability of financial distress, investors can improve their investment decisions and the loss by removing their money from distress-prone companies (Thai, Goh, HengTeh, Wong, & Ong, 2014). Based on finance & accounting literature, it has been found that financial ratio could be the best predictor of the bankruptcy model (Mostofa, Rezina, & Hasan, 2016). Accordingly, an increasing number of prediction models have emerged since 1960s following a triggered corporate financial distress and several methods have been used by researchers to predict corporate financial distress (Mahama, 2015). However, among different techniques to predict financial distress, the discriminant analysis as given by Altman is most effective and typically used one with a high degree of accuracy (Bal, 2015). This model opened new dimension in the field of bankruptcy and it became very famous in bankruptcy literature due to its highest overall accuracy level (almost 94 percent accuracy) (Jan & Marimuthu, 2015). To this end**,** the focus of this study is to apply Altman's revised Z score model to predict financial distress of Ethiopian micro finance institutions.

Edward Altman formulated Z-score differently in different periods. In 1968, He published what has become the best known predictor of bankruptcy prediction model that combines five financial ratios to produce a product called a Z-score (Anjum, 2013). Altman's original *Z*-score model requires a firm to have publicly traded equity and be a manufacturer. Hence**,** the original model of predicting bankruptcy (Altman, 1968) was

Z = 0.012X1 + 0.014X2 + 0.033X3 + 0.006X4 +0.999X5

Where X1 = Working capital/Total assets

X2 = Retained earnings/Total assets,
X3 = Earnings before interest and taxes/ Total assets
X4 = Market value equity/Book value of total liabilities and
X5 = Sales/Total assets.
Z = overall index

Over years, however, many individuals have found that a more convenient specification of the model is of the form: Z = 1.2X1 + 1.4X2 + 3.3X3 + 0.6X4 + 1.0X5 (Muminovic, 2013). Accordingly, low score suggests the firm is in financial distress. In view of this, companies with Z scores below 1.81 would be classified as potential failures; Z scores between 1.81 and 2.99 are said to be in the zone of ignorance or grey area and above 2.99 indicates the company is not in any financial distress.The above model is industry specific, as it was formulated for manufacturing and public held companies only. After publishing the original Z score model, a discussion was brought between academicians and practitioners about how the model could be used for non-stock companies. As a result, Altman modified the original Z score in 1977 to suit these companies. Accordingly, the modification led to an overall reevaluation and changing the market value of owner's equity in X4 with the book value of owner's equity (Sulub, 2014). Hence, the model took the following formula:

Z =0.717X1+ 0.847X2+ 3.107X3+ 0.420X4+ 0.998X5

Since the weight factors were recalculated, classification zones of the model were also changed. For this reason, a company is healthy if the score is above 2.9; going bankrupt if it is below 1.23; and grey area, where there is no clear prediction if values range from 1.23 to 2.9.The next modification of the Z- score model analyzed the characteristics and accuracy of a model without X1-sales/ total assets, to minimize the potential industry effect which is more likely to take place when such an industry-sensitive variable as asset turnover is included. In addition, this model was formed in response to requests for a measure to predict the likelihood of bankruptcy for non-manufacturing firms (Diakomihalis, 2012). This model was revised to make it applicable for private firms and non manufacturers including financial institutions. Hence, the revised Z-score model is represented as:

Z=6.56(X1) + 3.26 (X2) + 6.72 (X3) + 1.05 (X4) where,

X1 = (Current Assets − Current Liabilites) / Total Assets
X2 = Retained Earnings / Total Assets
X3 = Earnings before Interest and Taxes / Total Assets
X4 = Book Value of Equity / Total Liabilities

Results of this newest revised Z-score model exhibit a 90.9% success rate in predicting bankruptcy prior to firm's demise and a 97% accuracy rate for identifying non bankrupt firms with continuing economic solvency (Anjum, 2012) Accordingly, the bankruptcy possibility depends on the value obtained by using the formula. Hence, if $Z > 2.6$, the business is financially sound and there is least probability that the firm will face financial distress (Safe Zone). Besides, if $1.1 < Z < 2.6$, firms fall in the gray area that means there is less probability that the firms will face financial distress in the near future(Grey Zone). Moreover, there is a high probability that business will face financial distress in near future (Distress Zone) if $Z < 1.1$.

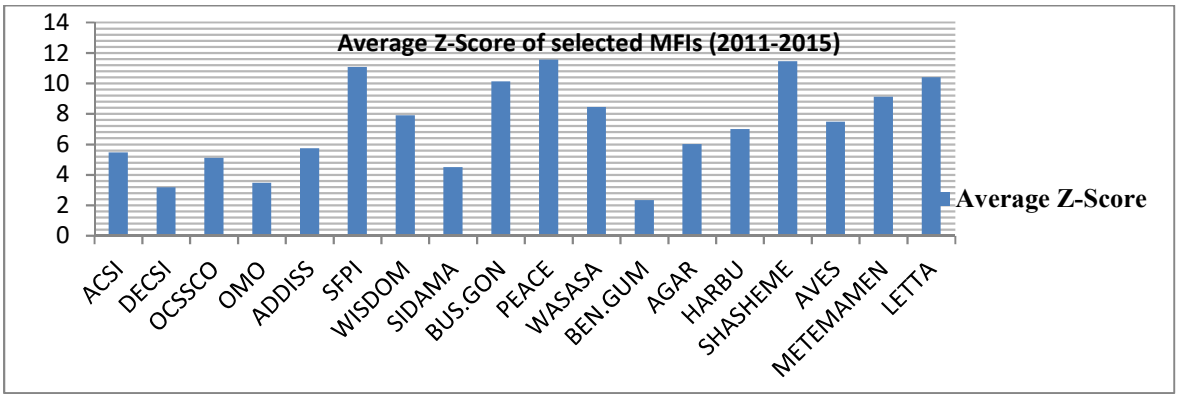
Results and Discussions

In this section, result of Altman's Z-score model is presented to determine financial health of selected micro finance institutions in Ethiopia.

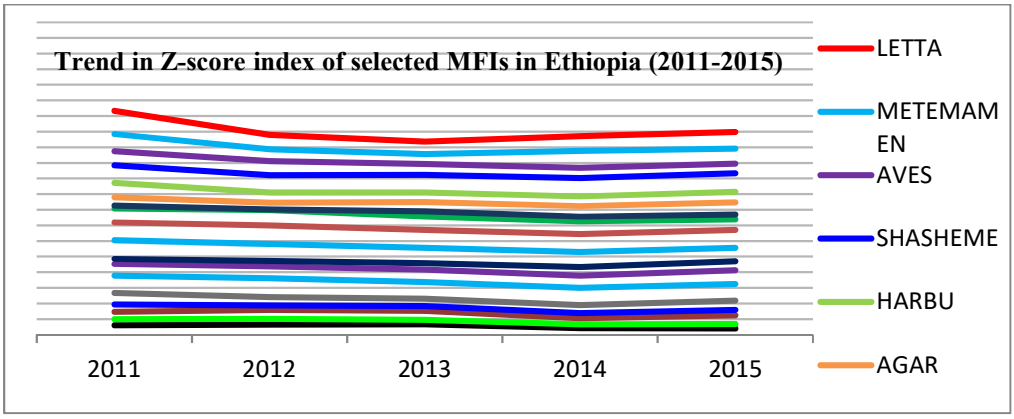
Table: 1 Z- score of selected MFIs

Name	Year					Average Z-score	Discriminant Zone
	2011	2012	2013	2014	2015		
ACSI	6.022325	6.557225	6.619941	4.122455	3.956142	5.45561734	Safe
DECSI	3.969061	3.569576	2.919405	2.593197	2.838526	3.177952884	Safe
OCSSCO	4.659816	5.812506	5.645488	3.807337	5.605103	5.106049958	Safe
OMO	4.672311	2.718146	3.113092	3.351692	3.501249	3.471298138	Safe
ADDISS	7.438139	5.51134	4.736761	5.015429	5.979868	5.736307476	Safe
SFPI	11.10764	11.92619	10.66095	11.17006	10.50217	11.073399292	Safe
WISDOM	7.382142	7.583333	8.052662	7.65963	8.801624	7.895878262	Safe
SIDAMA	3.295048	3.544912	4.006781	5.675643	5.92263	4.489002732	Safe
BUS.GON	11.9299	10.87138	9.83164	9.525379	8.440155	10.11969024	Safe
PEACE	11.43181	11.83006	11.51795	11.50551	11.53412	11.56388985	Safe
WASASA	8.796745	9.859515	8.617942	8.106016	6.812742	8.438591928	Safe
BEN.GUM	1.984273	0.356758	3.220983	3.043405	3.032138	2.327511534	Grey
AGAR	5.347357	4.278443	5.878147	6.788426	7.708636	6.000201974	Safe
HARBU	9.21696	6.684089	6.172294	6.119813	6.8041	6.999451282	Safe
SHASHEME	11.14688	11.08214	11.37966	11.80118	11.89335	11.460642214	Safe
AVES	9.101997	8.883011	6.833445	6.492934	6.119727	7.48622284	Safe
METEMAMEN	10.94443	7.635833	6.416637	11.00723	9.615274	9.123880702	Safe
LETTA	14.85337	9.221559	7.955059	9.37734	10.64796	10.411057482	Safe

The above table shows discriminant zone of selected micro finance institutions in Ethiopia based on data spanned from 2011 to 2015 using Altman's revised Z-Score model. As shown in the table, almost all institutions are in the safe zone where the result of Z-score is greater than 2.6 except Benishangul Gumuz micro finance.

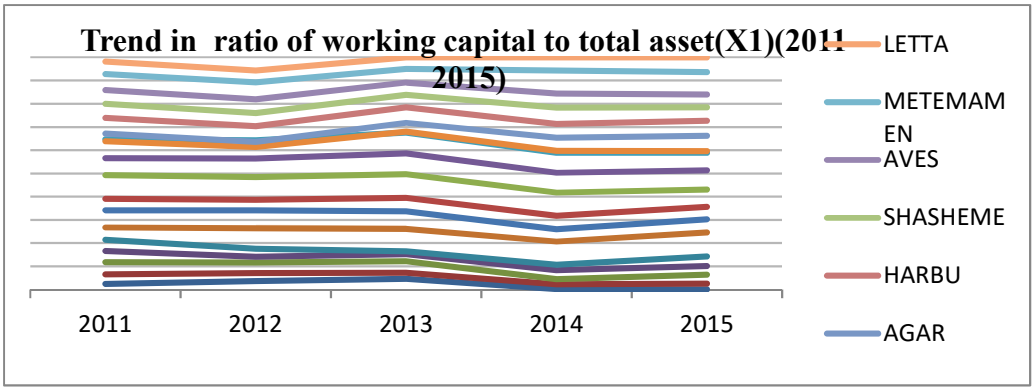


According to the result of the above bar graph, on average, PEACE, SHASHMENE, SFPI and LETTA have highest Z-score relatively. On the other hand, institutions like METEMAMEN, WISDOM, AVES, WASSA, HARBU, and ADDIS are on the middle level. However, BEN.GUM, OMO and DECSI have lowest Z-score although they are not at distress zone.

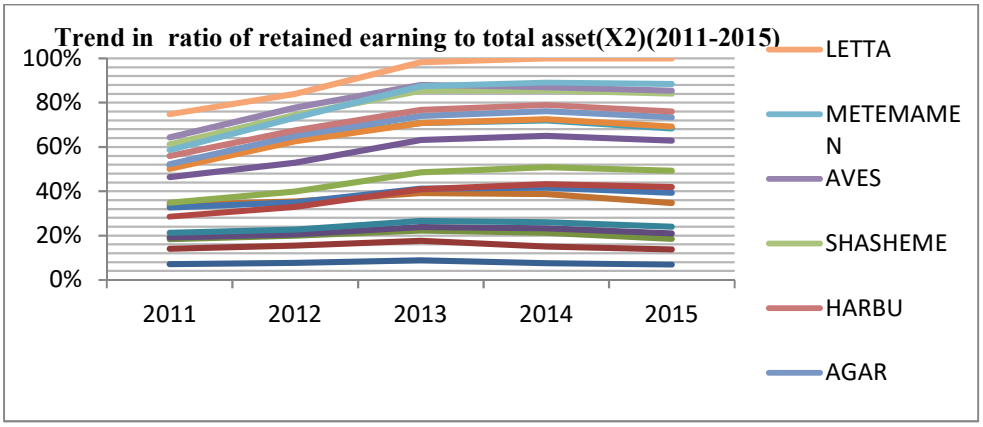


The study also performed trend analysis on the result of Z-Score. As shown in the above chart, Z-score of some institutions shows fluctuation from time to time. For instance LETTA's Z-score moves downward in 2012 and 2013 and goes up during 2014 and 2015. To some extent METEMAMEN's Z-Score, SHASHEMENE's Z-Score, and HARBUS's Z-Score also shows fluctuation. However, Z-score of some institutions like ACCI, DECSI, OMO, and OCSSCO is to some extent in the same position during the entire period of the study.

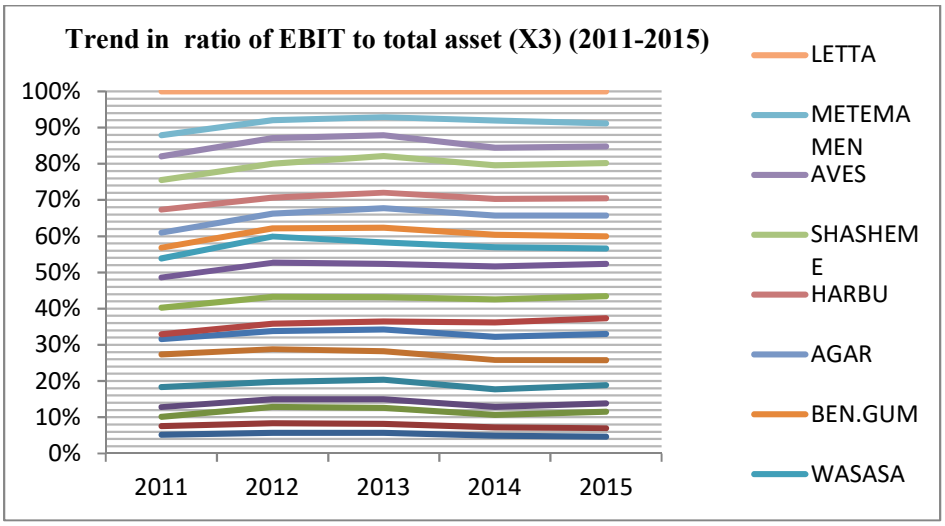
Altman's Z- score applied in this study was developed using four financial ratios that could be considered as separate variables. The first ratio is working capital to total asset as measure of liquidity. Besides, there is ratio of retained earnings to total asset used as proxy of leverage of institutions that analyzes how much of institutions' assets are financed by their own funds. In addition, there is ratio of EBIT to total asset that indicates the capacity of the institutions to generate satisfactory earning to pay off their fixed obligation like interest. Moreover, the index incorporates ratio of book value of equity to liability which is used to ascertain the long-term financial soundness. Accordingly, this study tried to show the trend of each variable during the entire period of the study for each micro finance institution under investigation.



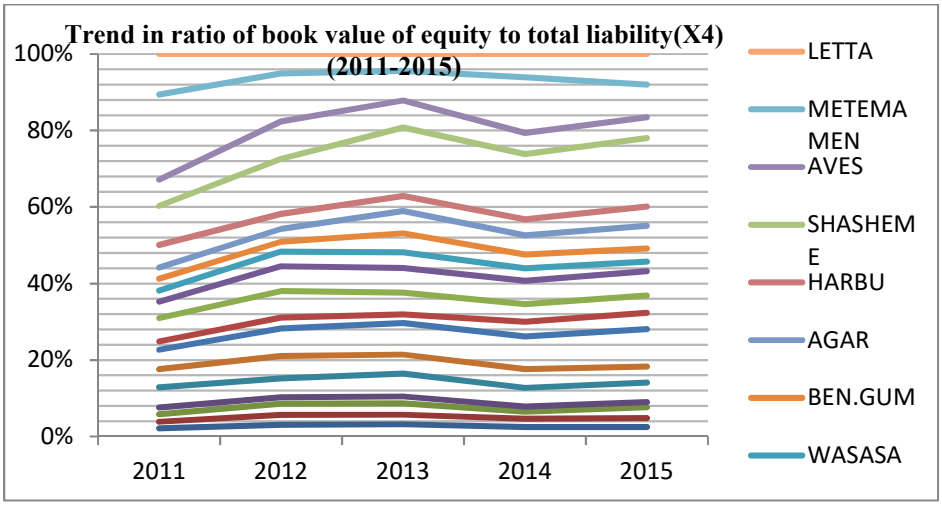
The above chart shows liquidity position relative to total capitalization. Hence, in all selected micro finance institutions, there is fluctuation in ratio of working capital to total asset though the degree of fluctuation varies.



The ratio of retained earnings to total asset indicates how much portion of total asset has been financed by retained earnings. Accordingly, the higher the ratio indicates the greater the financial stability of the institutions at times of low profitability period. In the same fashion, the ratio can reflect the institutions' utilization of own earning as source of finance than debt financing. The result shows an increment of the ratio up to 2013 in most of the institutions. However, there is no growth after 2013.



The value of ratio of earnings before interest and tax to total asset indicates the capacity of firms to generate satisfactory earnings to pay off their fixed obligation like interest. The lower value of the ratio indicates the lower capacity of the firm to pay the interest against borrowing and vice versa. When we look the trend, it's stable to some extent in most of the sampled micro finance institutions.



The ratio of book value of total equity to liability is used to determine long term financial soundness. An institution with 1:1 equity-debt mix is considered as quite good (Chotalia, 2014). This is for the reason that excessive debt tends to cause insolvency. In line with this that ratio of almost all institutions selected for this study is quite lower compared to the standard ratio. Besides, there is fluctuation of the ratio from period to period in almost all institutions.

Conclusion

In a nutshell, this study applied Altman's revised Z-Score model to predict financial distress condition of 18 micro finance institutions in Ethiopia with data set covering the period from 2011 to 2015. Accordingly, the financial health status of most selected Ethiopian micro finance institutions has been healthy for the entire study period. However, the financial health of Benishangul Gumuz micro finance is in a grey area on average. Moreover, although there is good health status, their improvement from year to year is weak, almost in the same position.

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