Assessment of Financial Distress Conditions of Commercial Banks in Ethiopia:
A Case Study of Selected Private Commercial Banks

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Abstract
The current trend in Ethiopian banking industry is that it is showing progress in performance and almost all banks are reporting positive accounting profit. However, profitable companies should not be a guarantee that the companies can survive to fulfill its liabilities. This is due to the fact that not all of profit can be cashed as source of funds or be available for covering its obligations. Based on this fact, in this study attempts are made to identify the financial distress conditions and its determinants in selected private commercial banks in Ethiopia. The study first assessed the financial health conditions of the selected private commercial banks using Altman Z-score model (ZETA Analysis) and estimated determinants of financial distress using panel data starting from 2002/03 to 2011/12 and six private commercial banks in Ethiopia. Finding of the study shows that the financial health of the selected private commercial banks is good and improving from time to time, but some fluctuating trend is observed.

Keywords: Financial Distress Conditions, Altman Z-Core Model Analysis (AZMA), Private Commercial Banks

Introduction
It is only over a few decades quite a few issues have been carried out as financial distress in developed, developing and transitional economies (Zulkarnian 2009). The issues of financial distress were so diverse and approached from various disciplines perspective including but not limited to political theory, legal theory, management, economics, and accounting and finance (Pindado 2001). As a result any attempt of studying financial distress inherently necessitates defining its scope. Financial distress is defined as “the probability of bankruptcy and it depends on the level of liquid assets as well as on credit availability.” (Hendel 1996) as cited by (Andualem 2011). This is the probabilistic definition given by IBD, but various scholars given various contextual definitions for financial distress. Due to its complexity variety of causes, so far no one has given a single and exact definition for financial distress. Very often financial distress is determined in terms of failure, default, bankruptcy, or distressed restructuring, based on the underlying methodology applied by the researcher and the objectives of the overall research. Financial distress can be the reflection of corporation’s management condition. Consequently the distress score of corporations should be considered as a new predictor variable in predicting the financial distress (Shleifer and Vyshin 1992). Thus, the intent of this study is to assess the financial health in commercial banks in Ethiopian context so as to provide some recommendations and as the same time to contribute to the body of knowledge and filling of the gap in the literature.

Objective of the Study
To evaluate the financial health (that is the financial distress position) of selected private commercial banks in Ethiopia

Significance of the Study
The research is expected to contribute first and for most; to the selected commercial banks in order to know their financial distress position under the study. Its findings are highly important for the management of the banks in the area of financial distress.

Scope of the Study
The scope of the study is within the private commercial banks in Ethiopia on financial distress in Ethiopia. Seven years data from 2005 through 2012 was used for the study.

Literature Review
A micro definition of bank failure is provided by (Hambrick and D’Aveni 2004). According to the authors, “a bank is deemed to have ‘failed’ if it is liquidated, merged with a healthy bank (or purchased and acquired) under central government supervision/pressure, or rescued with state financial support.”
Nonperforming loan to total loan ratio.

According to the existing literature, so far there is no single universally accepted definition and measure of financial distress that can be applied to banks. He identified the most accurate, reliable, simple, and consistent distress classification tool that can be used based on accounting measures of the financial soundness of banks. Accordingly, results of his study show that the most adequate and consistent measures of distress are the ones based on non-performing loans to total loans. He argues that this is because banks’ assets are longer term and less liquid than their liabilities. The interest income that they earn through lending is primary source of operating income for them. Therefore, conventional accounting indicators of distress such as the interest coverage ratio cannot be applied to analyze the financial soundness of banks.

Among the scholars who defined financial distress from the perspective of financial institutions particularly banks, (Chang-e 2006), defined “as the condition of being in severe difficulties over money, especially being close to bankruptcy” they assert that the difficulties come in whenever the banks cannot meet or have difficulty paying off its financial obligations to its creditors.

The classical scholars who did the first studies about financial distress and corporate bankruptcy models in particular are: Smith and Winakor (1935) as cited by (Skogsvik and Skogsvik 2013), (E. Altman 1968). They were followed by (Merwin 1942) as cited by (Anduallem 2011). Both in their studies pointed out that failing firms show significantly different ratios than successful firms do.

Another academic who studied on ratio analysis and bankruptcy prediction models was (Bever 1966). His study is considered as one of the classical works on this subject. He questioned the use of multivariate analysis. Instead, Beaver strongly believes in the use of univariate analysis of financial analysis to predict corporate bankruptcy.

(E. Altman 1968), is one of the classical researchers of financial distress and bankruptcy. He had been continuously conducting researches in the area of distress and distress classification model, and to develop improved model for bankruptcy prediction. He first developed a Z score model which is widely accepted distress classification model and had been in use since its development in 1968. In 1977 being accompanied by Haldeman and Narayanan, he developed a new revised Z score model which he calls ZETA model. Also in 1983 he set up a new model in predicting financial distress of companies by revisiting the ZETA model. The prediction model applied discriminating function by linear regression model where Z is overall index and other financial variables to be independent variables such as: working capital to total assets, earnings before interest and tax/total assets, book value equity to book value of total liabilities and sales to total assets. The empirical findings of distress and non-distress companies’ Z-Score was very accurate to predict failure model and useful to suggest the causes of financial distress. And again in 2002 he revisited this model for testing of accuracy of the model given the fact that it has been a long time since it was first developed and the dynamics of economic and other factors have been changing for these all years. Accordingly, he improved the model to be wide enough to embrace non-manufacturing sectors such as financial institutions. The new model is developed to serve for service giving organizations including financial institutions. The detail about this model is discussed in the methodology part under model specification.

(Almeida and Philippon, 2000), analyzed the Risk-Adjusted Cost of Financial distress. The research has been done in United States for public companies which have issued corporate bonds and got difficulties to pay debt. Other variables which have been evaluated: corporate valuation practice and Capital structure in related with financial distress in direct cost and indirect cost. The empirical result is indicated that distress costs are too small to overcome the tax benefits of increased leverage. The marginal tax benefit is constant up to a certain amount of leverage and then it start declining because firms do not pay taxes in all states of nature and because higher leverage decrease additional marginal benefits.

(Berg 2005), have compared several accounting based models for bankruptcy prediction which are developed and tested on large data sets containing annual financial statements for Norwegian limited liability firms. Finding of the study shows that generalized additive models significantly outperform popular models like linear discriminate analysis, generalized linear models and neural networks at all levels of risk. He also compared a multiple period model, developed on all available data from three consecutive years, with a one-year model, developed on data from the most recent year only. The result of the comparison indicate that the multi-year model exhibit a desirable robustness to yearly fluctuations that is not present in the one-year model.
problems was attributable to problems of moral hazard and adverse selection. According to him several factors
because of insolvency and illiquidity caused by non-performing loans. He asserts that the severity of bad debt
prudential policy. His study concentrated on banks in Kenya, Nigeria, Uganda and Zambia. Accordingly many of
prevent future crises, with reference to the last banking crises in Turkey. They used Artificial Neural Network
power of ten different accounting measures using media coverage as the benchmark for a sample of 1,175  banks
of non-financial institutions. (Demiguc and Detragiaialche 1998), studied what happens to the banking system in the
aftermath of a banking crisis by using aggregate and bank level data for several countries. They found that
contemporary crises are not accompanied by declines in aggregate bank deposits, and credit does not fall relative
to output, although the growth of both deposits and credit slows down substantially. Output recovery begins in the
second year after the crisis and is not led by resumption in credit growth. Banks, including the stronger ones,
reallocate their asset portfolio away from loans. (Gomathy 2012), analyzed the financial health of selected oil refineries in India by using the Altman Z-score model. And he found that almost all of the selected firms are above the standard bankruptcy line which is put by Altman in his model.
Financial distress literature specific to the banking sector are limited in number when compared to that
of non-financial institutions. (Demiguc and Detraigiaialche 1998), studied what happens to the banking system in the
aftermath of a banking crisis by using aggregate and bank level data for several countries. They found that
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to output, although the growth of both deposits and credit slows down substantially. Output recovery begins in the
second year after the crisis and is not led by resumption in credit growth. Banks, including the stronger ones,
reallocate their asset portfolio away from loans.

(Gunay and Ozkan 2007), conducted a research with a purpose of proposing a new technique to
prevent future crises, with reference to the last banking crises in Turkey. They used Artificial Neural Network
(ANN) as an inductive algorithm in discovering predictive knowledge structures in financial data and used to
explain previous bank failures in the Turkish banking sector as a special case of emerging financial markets.
Their finds indicate that ANN is proved to differentiate patterns or trends in financial data. Most of the bank
failures could be predicted long before, with the utilization of an ANN classification approach, but more
importantly it could be proposed to detect early warning signals of potential failures, as in the case of the Turkish
banking sector.

(Carpeto, et al. 2010) Studied distress classification measures in the banking sector. They tested the
power of ten different accounting measures using media coverage as the benchmark for a sample of 1,175 banks
which participated in merger and acquisitions or divestiture deals over the 22 years. According to the results of
the study, a bank should be defined as distressed if the ratio of its non-performing loans to total loans is in the
two highest deciles of the industry, using a three-year moving average. This measure is typically favored by
practitioners, who maintain that other common measures e.g., those involving provisions for loan losses are not
as accurate as they express only a managerial forecast. Interestingly, measures that capture capital adequacy too
often depict the bank as healthy even if it is de facto distressed, while measures of asset quality, though highly
 correlated with each other, tend to overestimate the number of distressed banks.

(Amadasu 2012) evaluated the financial distress of selected commercial banks in Nigerian from 2003 to
2007 with four packages of analysis, i.e. multiple discriminate analysis, ordinary least squares regression,
correlation Matrix and Logit-Probit regression, for sophistication and effectiveness instead. The finding is that working capital/total asset (default ratio) among others should be closely taken care of and the major recommendation is that bank officials or corporate managers whose firms failed should not be with impunity.

**Methodology**

**Data type and source**
The study is based on quantitative data which is gathered from annual audited financial statements of the sample banks. Thus, the data type that which is used in this research is a quantitative one.

**Sample Design and Sample Size**
Target population of the study is the six private commercial banks in Ethiopia which have been operating for the last 10 years in the industry. The researcher chooses to study only six private commercial banks due to their age in the industry. It is well known that the culture of commercial banking in Ethiopia is recent phenomena and the sector is in its infant stage since its only eighteen years after private banking is allowed by proclamation in the country following the 1995 economic reform. The 2012 annual report of Ethiopian National Bank indicates that there are 18 banks out of which 16 are commercial banks (NBE 2012). According to the report the total number of privately owned commercial banks is 15. And out of the 15 private commercial banks, only six are old enough to be taken for ten years data analysis. Ten years data is used for the analysis in ordered to increase the number of the observation and reduce the probability of committing type I error.

The researcher takes these banks as a target population of the study. Thus inferences made from the findings of this study will apply only for the selected banks. This is due to the fact that it is difficult to infer about other banks that are in the industry by taking banks that operated for ten years as the scope of the study is to analyze ten year data. The other reason is that banks that stayed long in the industry cannot be compared with those of the new comers.

**Model Specification**
The study first assessed the financial health condition of selected private commercial banks in Ethiopian by using the Altman’s Z score model. Altman’s Z score analysis has been applied by financial analysts to evaluate the general trend in the financial health of the enterprises over a period by applying Multiple Discriminate Analysis (MDA). Using only some individual accounting ratio frequently to predict financial performance of an enterprise may only provide warnings when it is too late to take a corrective and single ratio does not convey much of the sense (Gomathy 2012) On the other hand there is no internationally accepted standard for financial ratio against which the results can be compared. However, (E. Altman 1968) combined a number of accounting ratios, (liquidity, leverage, activity and profitability) to from an index of the probability, which are effective indicators of corporate performance predicting bankruptcy, well over a year or two in advance. Various researches have been conducted using this model by applying Multiple Discriminate Analysis (MDA). Some of the researchers who used this model in their research include; (Mullu 2011)(Sinkey, et al. 2012)(Gomathy 2012) The data collected are first analyzed with the help of five accounting ratios. These different ratios are combined into a single measure Zeta score analysis with the help of Multiple Discriminate Analysis (MDA). The formula used to evaluate the Zeta score analysis as established by Altman is:

\[
Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 0.999X_5
\]

Where:
- X1= Working capital / total assets,
- X2= Net operating profit / total assets,
- X3= EBIT / total assets (where EBIT is earnings before interest and taxes),
- X4= BVE / total debt (where BVE is the book value of equity and total debt is book value of total liabilities)
- X5= Sales / total assets

Altman assigned all firms with a Z-score higher than 2.99 to the category of non-bankrupt, whereas he assigned firms with a Z-score below 1.81 to the category of bankrupt firms. Firms with a Z-score between 1.81 and 2.99 were allocated to the gray area, which means that the model cannot link a conclusion to these firms. However, for simple predictive purposes, Altman classified the firms as bankrupt ifZ≤2.675 (the 1968 model’s cutoff score) and as non-bankrupt if Z >2.675. Altman used an accuracy matrix to test the accuracy of his Z-score model. Where H stands for correct classifications, M1 for a Type I error and M2 represents a Type II error. To see how accurate the model is, you have to sum the H diagonal and divide this number by the total number of firms in the data set. This will give the accuracy percentage.

However, the above model only works for manufacturing industry and variable X7 that is sales/total assets can’t be used for financial institutions such as banks. Thus, (Altman, 2000) revise his model and developed a new Z score model which can be applied for non-manufacturing firms which embraces financial institutions as well. Accordingly, the new Z"-Score model is:

\[
Z'' = 6.56X_1 + 3.26X_2 + 6.72X_3 + 1.05X_4
\]

The new model is identical with the old one except for the only difference in coefficient of
independent variables which resulted from removal of variable \( X_5 \) (sales/total assets). In this model Altman stated Z’ Score which is less than 1.21 as financially distressed zone (Zone I) and is Z’ score is greater than 2.90 it is called Zone II which is financially not distressed zone. The result of the Z’ Score which is in between 1.23 to 2.90 is categorized as a “gray area”. A “gray area” as defined by (ALTMAN 1983) is an area where there no clear line between bankruptcy and non-bankruptcy. It is in deeded undesirable condition of financial health of the firms. It is characterized by distress than healthiness.

In this study, this model of Altman’s Z score is used to evaluate the current financial distress positions of private commercial banks in Ethiopia mainly because it is prediction models that predict future financial distress based on the “best” correlations detected in historical samples of bankrupt institutions.

Data Analysis and Discussion of Results
In this section the researcher presents the results of the analysis made to determine the financial health position of selected private commercial banks. To achieve the first objective of the study, which is to evaluate financial distress (health) passion of selected commercial banks in Ethiopia, the data collected are first analyzed with the use of five accounting ratios which are part of the Z –score analysis. These accounting ratios are then combined into a single measure of Altman’s Z-score with the help of Multiple Discernite Analysis (MDA). The result of the analysis for each bank under study is presented as follows.

1. Zeta score analysis of Dashen bank
The following table indicates the Z-score of Dashen Bank which is calculated based on the (Altman1991) Model.

<table>
<thead>
<tr>
<th>Year</th>
<th>X1</th>
<th>X2</th>
<th>X3</th>
<th>X4</th>
<th>Z-Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>0.34</td>
<td>0.02</td>
<td>0.05</td>
<td>0.09</td>
<td>2.71</td>
</tr>
<tr>
<td>2003</td>
<td>0.33</td>
<td>0.01</td>
<td>0.03</td>
<td>0.07</td>
<td>2.46</td>
</tr>
<tr>
<td>2004</td>
<td>0.33</td>
<td>0.02</td>
<td>0.04</td>
<td>0.07</td>
<td>2.56</td>
</tr>
<tr>
<td>2005</td>
<td>0.3</td>
<td>0.02</td>
<td>0.04</td>
<td>0.08</td>
<td>2.38</td>
</tr>
<tr>
<td>2006</td>
<td>0.25</td>
<td>0.03</td>
<td>0.06</td>
<td>0.09</td>
<td>2.21</td>
</tr>
<tr>
<td>2007</td>
<td>0.28</td>
<td>0.03</td>
<td>0.06</td>
<td>0.1</td>
<td>2.39</td>
</tr>
<tr>
<td>2008</td>
<td>0.37</td>
<td>0.03</td>
<td>0.06</td>
<td>0.1</td>
<td>3.05</td>
</tr>
<tr>
<td>2009</td>
<td>0.48</td>
<td>0.03</td>
<td>0.06</td>
<td>0.1</td>
<td>3.71</td>
</tr>
<tr>
<td>2010</td>
<td>0.43</td>
<td>0.03</td>
<td>0.06</td>
<td>0.1</td>
<td>3.34</td>
</tr>
<tr>
<td>2011</td>
<td>0.42</td>
<td>0.03</td>
<td>0.07</td>
<td>0.11</td>
<td>3.41</td>
</tr>
</tbody>
</table>

As it can be seen from the table above, in period from 2002 through 2007, the bank had been in a category of “gray” area as Altman names it when a Z” score between 1.23 and 2.90. This area is called “gray” to indicate that the intermediate position of the firms between distress and healthy zones. However, in the year 2008 and 2009 it showed a sharp increase to 3.05 and 3.71 respectively from the score 2.05 in 2007 it clearly put the bank in the financially healthy zone. This could be attributable to the bank’s working capital to total asset ratio (x1) which has been increasing in the same period in which the financial health of the bank has shown a sharp improvement. In 2010 an 2011, it showed a slight decree but sill it remains in a healthy zone.

In order to ascertain the financial health of Dashen Bank (S.co, Z” score has) it has been as follow

![Z’-Score](image)

Fig 4.1 General trends in financial health of DB (source: author analysis)

In general, as it can be observed from the figure above, the bank has never experienced financial distress in the entire period of the study. The Z’ score of the bank has been above the distress zone which is 1.21. Thus it can be concluded that the bank has never been distressed in the entire study period even if it had been in
intermediate (gray) zone in some point and its financial health is improving continuously since 2007.

II. Zeta score analysis of Nib International Bank (NIB)
The following table indicates the Z-score of Nib International Bank which is calculated based on the (Altman1991) Model.

Table 2 Z score analysis of NIB (source: author competition)

<table>
<thead>
<tr>
<th>Year</th>
<th>X1</th>
<th>X2</th>
<th>X3</th>
<th>X4</th>
<th>Z-Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>0.31</td>
<td>0.02</td>
<td>0.06</td>
<td>0.23</td>
<td>2.51</td>
</tr>
<tr>
<td>2003</td>
<td>0.28</td>
<td>0.01</td>
<td>0.03</td>
<td>0.16</td>
<td>2.11</td>
</tr>
<tr>
<td>2004</td>
<td>0.27</td>
<td>0.03</td>
<td>0.05</td>
<td>0.16</td>
<td>2.17</td>
</tr>
<tr>
<td>2005</td>
<td>0.27</td>
<td>0.03</td>
<td>0.05</td>
<td>0.15</td>
<td>2.16</td>
</tr>
<tr>
<td>2006</td>
<td>0.21</td>
<td>0.03</td>
<td>0.06</td>
<td>0.16</td>
<td>1.85</td>
</tr>
<tr>
<td>2007</td>
<td>0.27</td>
<td>0.03</td>
<td>0.06</td>
<td>0.19</td>
<td>2.23</td>
</tr>
<tr>
<td>2008</td>
<td>0.37</td>
<td>0.03</td>
<td>0.06</td>
<td>0.20</td>
<td>2.89</td>
</tr>
<tr>
<td>2009</td>
<td>0.49</td>
<td>0.03</td>
<td>0.06</td>
<td>0.18</td>
<td>3.66</td>
</tr>
<tr>
<td>2010</td>
<td>0.51</td>
<td>0.03</td>
<td>0.06</td>
<td>0.18</td>
<td>3.87</td>
</tr>
<tr>
<td>2011</td>
<td>0.51</td>
<td>0.03</td>
<td>0.07</td>
<td>0.20</td>
<td>3.88</td>
</tr>
</tbody>
</table>

The Z’’ score analysis of NIB indicates that the financial health of the bank was fluctuating until 2007. In 2002, the score of the bank was 2.51 which indicates that the bank was in an Intermediate state between distress & healthy zones. In the succeeding years it showed fluctuation of having the score of 2.11, 2.17 & 2.16 in the year 2003, 2004 & 2005 respectively. In 2006 the bank was near financial distress zone with score of 1.85 which is the lowest score ever in the period covered in the study. However, from the year 2007 on the bank has been showing continuous improvement in its health. In 2011 if Z’’ score was 3.88 which is the highest in the period covered under the study.

The general trend of the financial distress position of the bank is presented in a graphical form in the following figure.

Fig 2 General trends in financial health of NIB (source: author analysis)

Again in the case of NIB, the working capital to Total Asset ratio (x) appears to be the one having more influence on the financial health of the bank than other valuables included. As it can be observed from the table, it showed continues increase from 2007 through 2011, the period in which the same trend is observed with Z’’ score of the bank.

III. Zeta Analysis of Awash International Bank (AIB)
The table below indicates Z’’ score of Awash International Bank for the period from 2002 to 2011 is computed based on the (Altman1991) Model.
Table 4.3 Z-score analysis of AIB (source: author competition)

<table>
<thead>
<tr>
<th>Year</th>
<th>X1</th>
<th>X2</th>
<th>X3</th>
<th>X4</th>
<th>Z-Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>0.36</td>
<td>0.01</td>
<td>0.04</td>
<td>0.13</td>
<td>2.80</td>
</tr>
<tr>
<td>2003</td>
<td>0.40</td>
<td>0.01</td>
<td>0.03</td>
<td>0.11</td>
<td>2.92</td>
</tr>
<tr>
<td>2004</td>
<td>0.43</td>
<td>0.01</td>
<td>0.04</td>
<td>0.10</td>
<td>3.17</td>
</tr>
<tr>
<td>2005</td>
<td>0.39</td>
<td>0.02</td>
<td>0.04</td>
<td>0.11</td>
<td>2.97</td>
</tr>
<tr>
<td>2006</td>
<td>0.31</td>
<td>0.03</td>
<td>0.05</td>
<td>0.11</td>
<td>2.64</td>
</tr>
<tr>
<td>2007</td>
<td>0.29</td>
<td>0.06</td>
<td>0.07</td>
<td>0.13</td>
<td>2.72</td>
</tr>
<tr>
<td>2008</td>
<td>0.38</td>
<td>0.06</td>
<td>0.06</td>
<td>0.14</td>
<td>3.27</td>
</tr>
<tr>
<td>2009</td>
<td>0.50</td>
<td>0.06</td>
<td>0.05</td>
<td>0.13</td>
<td>3.90</td>
</tr>
<tr>
<td>2010</td>
<td>0.51</td>
<td>0.11</td>
<td>0.06</td>
<td>0.13</td>
<td>4.23</td>
</tr>
<tr>
<td>2011</td>
<td>0.40</td>
<td>0.16</td>
<td>0.07</td>
<td>0.15</td>
<td>3.74</td>
</tr>
</tbody>
</table>

Table 3 depicts Z’’ scores of AIB for the period from 2002 to 2011. The general trend in the financial health of AIB has been depicted in the graph. The Z’’ scores of the bank were 2.80 & 2.92 in the year 2002 and 2003 respectively indicating that the bank was in the “gray” area which is an area between health zone & distress zone. But in succeeding years the bank scored 3.17 which put the bank in the health zone. However, the bank’s health deteriorated back to the gray area in succeeding three years. It is evident from the table that the bank has enjoyed very good financial health during the period of 2008 to 2011 the bank’s highest score ever in the entire period of the study is recorded in 2010 which is 4.23.

Fig 3 General trends in financial health of AIB (source: author analysis)

As it can be noticed from the trend of the financial health of the bank from the graphical presentation below, the health of the bank had been improving for the first three years of the study period. However, it started to decline in the end of 2004 until it started to improve again in 2007. In general, continuous fluctuation is observed in the financial health of the bank throughout the study period. But it is clearly observed that the bank had not been distressed for the entire period covered in the study. The worst financial condition for the bank is being in the gray area.

IV. Zeta scores Analysis of Bank of Abyssinia (BOA)

Table below indicates Z’’ score of Bank of Abyssinia for the period from 2002 to 2011 is computed based on the (Altman1991) Model.

![Z’’-Score Graph]
Table 4 Z score analysis of BOA (source: author competition)

<table>
<thead>
<tr>
<th>Year</th>
<th>X1</th>
<th>X2</th>
<th>X3</th>
<th>X4</th>
<th>Z-Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>0.38</td>
<td>0.00</td>
<td>0.04</td>
<td>0.14</td>
<td>2.87</td>
</tr>
<tr>
<td>2003</td>
<td>0.38</td>
<td>0.00</td>
<td>0.03</td>
<td>0.13</td>
<td>2.80</td>
</tr>
<tr>
<td>2004</td>
<td>0.40</td>
<td>0.02</td>
<td>0.05</td>
<td>0.14</td>
<td>3.15</td>
</tr>
<tr>
<td>2005</td>
<td>0.37</td>
<td>0.03</td>
<td>0.06</td>
<td>0.14</td>
<td>3.02</td>
</tr>
<tr>
<td>2006</td>
<td>0.28</td>
<td>0.03</td>
<td>0.06</td>
<td>0.17</td>
<td>2.45</td>
</tr>
<tr>
<td>2007</td>
<td>0.30</td>
<td>0.02</td>
<td>0.05</td>
<td>0.13</td>
<td>2.47</td>
</tr>
<tr>
<td>2008</td>
<td>0.34</td>
<td>0.00</td>
<td>0.03</td>
<td>0.11</td>
<td>2.50</td>
</tr>
<tr>
<td>2009</td>
<td>0.49</td>
<td>0.02</td>
<td>0.05</td>
<td>0.10</td>
<td>3.69</td>
</tr>
<tr>
<td>2010</td>
<td>0.47</td>
<td>0.02</td>
<td>0.06</td>
<td>0.10</td>
<td>3.59</td>
</tr>
<tr>
<td>2011</td>
<td>0.40</td>
<td>0.02</td>
<td>0.06</td>
<td>0.10</td>
<td>3.16</td>
</tr>
</tbody>
</table>

The financial health of BOA was in a “gray” area for the first two years of the study period with the scope of 2.87 & 2.80 respectively in 2002 & 2003. The bank’s health had shown improvement & it fall in to the healthy zone 2004. However, the health of the bank deteriorated & returned back to the “gray” area in the period 2006 to 2008 the banks. It is noticed from table 4.4 that there was a sudden imprudent in the financial health of the company in 2009 & it continued to increase through the imagining periods. This increase could be attributable to positive changes in the net profit, working capital utilization & maximum utilization of the available capital as it can be seen from the table by the values of working capital (x) and (x^2) Equity to debt (x_1) which have been showing the same trend in specified period. Table Z” score of BOA for the period from 2002 to 2011 is computed and presented in table 4 above. The data is also presented in a graphical way to depict the general trend of financial distress position of the bank.

The data is also presented in a graphical way to depict the general trend of financial distress.

![Z'-Score](image)

Fig 4 general trends in financial health of BOA (source: author analysis)

The graphical presentations of the financial health of the banks clearly show the unstable flow of the financial health of the Bank for the study period.

V. Zeta Analysis of Wogagen Bank (WB)

Table below indicates Z” score of Wogagen Bank for the period from 2002 to 2011 is computed based on the (Altman1991) Model.
Table 4.5 Z score analysis of WB (source: author competition)

<table>
<thead>
<tr>
<th>Year</th>
<th>X1</th>
<th>X2</th>
<th>X3</th>
<th>X4</th>
<th>Z-Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>0.38</td>
<td>0.00</td>
<td>0.04</td>
<td>0.14</td>
<td>2.87</td>
</tr>
<tr>
<td>2003</td>
<td>0.38</td>
<td>0.00</td>
<td>0.03</td>
<td>0.13</td>
<td>2.80</td>
</tr>
<tr>
<td>2004</td>
<td>0.40</td>
<td>0.02</td>
<td>0.05</td>
<td>0.14</td>
<td>3.15</td>
</tr>
<tr>
<td>2005</td>
<td>0.37</td>
<td>0.03</td>
<td>0.06</td>
<td>0.14</td>
<td>3.02</td>
</tr>
<tr>
<td>2006</td>
<td>0.28</td>
<td>0.03</td>
<td>0.06</td>
<td>0.17</td>
<td>2.45</td>
</tr>
<tr>
<td>2007</td>
<td>0.30</td>
<td>0.02</td>
<td>0.05</td>
<td>0.13</td>
<td>2.47</td>
</tr>
<tr>
<td>2008</td>
<td>0.34</td>
<td>0.00</td>
<td>0.03</td>
<td>0.11</td>
<td>2.50</td>
</tr>
<tr>
<td>2009</td>
<td>0.49</td>
<td>0.02</td>
<td>0.05</td>
<td>0.10</td>
<td>3.69</td>
</tr>
<tr>
<td>2010</td>
<td>0.47</td>
<td>0.02</td>
<td>0.05</td>
<td>0.10</td>
<td>3.59</td>
</tr>
<tr>
<td>2011</td>
<td>0.40</td>
<td>0.02</td>
<td>0.06</td>
<td>0.10</td>
<td>3.16</td>
</tr>
</tbody>
</table>

The general trend of the financial health of the bank depicted in figure 5 indicates that the financial health of the bank has increasingly improved through at the tail end of the study period. At the beginning area & in 2006 the bank was in a “gray” area which not that health. But in remaining all years of the study period the banks health was. This improvement in health of the bank be associated to increase in working capital to Total Asset ratio BOA & Equity to Debt ratio as it can be evidenced from the table above.

![Z-Score](image)

Fig 5 general trends in financial health of WB (source: author analysis)

The graph above indicates that the financial health of the bank has been fluctuating. It has shown steady improvement from the beginning 2006 through 2008 and started to decline in the end of the year.

VI. Zeta analysis of United Bank.

Table below indicates Z” score of United Bank for the period from 2002 to 2011 is computed based on the (Altman1991) Model.
Table 4.6 Z score analysis of UB (source: author competition)

<table>
<thead>
<tr>
<th>Year</th>
<th>X1</th>
<th>X2</th>
<th>X3</th>
<th>X4</th>
<th>Z&quot;-Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>2002</td>
<td>0.34</td>
<td>0.02</td>
<td>0.05</td>
<td>0.09</td>
<td>2.71</td>
</tr>
<tr>
<td>2003</td>
<td>0.33</td>
<td>0.01</td>
<td>0.03</td>
<td>0.07</td>
<td>2.46</td>
</tr>
<tr>
<td>2004</td>
<td>0.33</td>
<td>0.02</td>
<td>0.04</td>
<td>0.07</td>
<td>2.56</td>
</tr>
<tr>
<td>2005</td>
<td>0.30</td>
<td>0.02</td>
<td>0.04</td>
<td>0.08</td>
<td>2.38</td>
</tr>
<tr>
<td>2006</td>
<td>0.25</td>
<td>0.03</td>
<td>0.06</td>
<td>0.09</td>
<td>2.21</td>
</tr>
<tr>
<td>2007</td>
<td>0.28</td>
<td>0.03</td>
<td>0.06</td>
<td>0.10</td>
<td>2.39</td>
</tr>
<tr>
<td>2008</td>
<td>0.37</td>
<td>0.03</td>
<td>0.06</td>
<td>0.10</td>
<td>3.05</td>
</tr>
<tr>
<td>2009</td>
<td>0.48</td>
<td>0.03</td>
<td>0.06</td>
<td>0.10</td>
<td>3.71</td>
</tr>
<tr>
<td>2010</td>
<td>0.43</td>
<td>0.03</td>
<td>0.06</td>
<td>0.10</td>
<td>3.34</td>
</tr>
<tr>
<td>2011</td>
<td>0.42</td>
<td>0.03</td>
<td>0.07</td>
<td>0.11</td>
<td>3.41</td>
</tr>
</tbody>
</table>

The trend in the case of UB seems a bit different as it can be seen from table 4.6 and figure 4.6. As it can be evidenced from the analysis of Z" score, the bank had been in healthy zone for almost entire period covered under the study except for the years of 2003. It is only 2003 that the bank has been in unhealthy “gray” area with Z" score of 2.87 which is the lowest score of the bank for the entire period of the study. The highest score was observed in 2010 which is 23.

Fig 6 general trends in financial health of UB (source: author analysis)

As it can be understand from the general trend of financial health of the bank, the bank has never been distressed for the entire period of the study. It even remain to be too healthy for almost all years of the period under study with Z" score above 2.91.

The general trend of the financial health condition of all banks is summarized in the following figure in order to easily capture the overall trend in all banks under the study.
Conclusion
Generally, the financial health status of selected private commercial banks of Ethiopia has been healthy for the entire study period. However, the financial health of the banks was in a gray area in the early 2000s. In the beginning of 2000s almost all banks were not that much healthy since they were in the gray area which is an intermediate zone between bankruptcy and healthy zone. The zone of gray area is undesirable area of financial health that is characterized by financial distress than healthiness. Since banks are the backbones of the economy they should be kept healthy. And they are not supposed to be in a “gray” area an area in which financial health of the firm is not good. The financial health status of these banks had a similar trend of fluctuation. Although there is continuous fluctuation in their health status it can be observed that the banks are continuously improving their health status. The Z' score of the bank has shown continuous increase despite the fact that there in fluctuation. The following figure presents the general trend of financial health all selected private commercial banks.

Recommendation
Finally, having conducted the financial distress analysis and based on the findings and conclusions of the study, the researcher recommends the following points which are believed to be important in taking care of the financial health of the selected private commercial banks. Accordingly:
- There should be more supervision from the National Bank of Ethiopia on the banks. This is due to the fact that a financial health condition of the banks is found to be fluctuating. Despite finding that indicates that the ZETA score of the banks have been in an improving trend from time to time, still fluctuation is observed a result of absence of the fixed trend in the improvement. Thus, more follow up from the regulatory body is needed for more assurance and prevention of possible bankruptcy in a worst case.
- Those banks with high ZETA score should keep it up by dealing with the factors identified to be influencing the financial health of the banks.
- The banks with low ZETA score need to work hard towards improvement of their financial healthiness. The possible measures they should take are: Decreasing their nonperforming loan ratio by increasing the loan collection efforts. Improving their capital adequacy by preserving high capitalizations of their banking system.

Bibliography
Altman, E. "Bankruptcy prediction model." 1968.


Gomathy, P. "Analysis of Profitability and Productivity Performance of Selected Oil Refineries in India." (Bharathir University) 2012.


Pindado. "corporate governance in emerging capital market." corporate governance an international review,


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