Assessment of Financial Distress Condition of Commercial Banks in Ethiopia: Assessment of Trends using Altman's Z-score Model

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Abstract

Financial distress is a global business challenge for a long period of time. The study on financial distress has become more relevant and important because even large firms are failing under unforeseen circumstances causing economic and social problems and early warning signal is the only detective mechanism. Many companies have gone into bankruptcy despite their high profit and some are still prone to financial distress problems. The main objective of this study was to assess the financial distress condition of CBE using Altman's Z''-score model. The study used a descriptive research design with a quantitative model-based approach. The study covers a period of 5 years (2017-2021). Altman's Revised Z''-score model (formula) was used to estimate the financial distress condition of the bank. The study used a quantitative secondary data collected from audited financial statements (balance sheet and income statement) of top-6 profitable private banks (in 2020/2021). The main cause of financial distress was liquidity position. In addition to this, it is also found that commercial banks have comparatively similar financial distress status in current financial condition. However, CBE's long term financial soundness index is lower than other banks. It is therefore recommended that top managers with board of directors should enhance the dividend policy and practice of the bank.

Keyterms: Financial Distress, Altman's Z-score, Commercial bank of Ethiopia, Liquidity, and Retained earnings.

1. INTRODUCTION

In the ordinary meaning, distress is being in danger or difficulty and needs help. As stated in Donl (2004), it shows inability or weakness which hinders the achievement of goals or aspirations. Distress associated with cessation of normal operation or continuous operation through additional assistance (direct and indirect). Financial distress is the situation when a company cannot meet or face difficulty to meet its financial obligations in the normal business operation (Esmeal, 2022). However, financial distress is not synonymous with corporate death. It represents the situation between financially healthy (illness) and bankruptcy (death). Financial distress can be resolved through enhancing the corporate governance practice of the firm while bankruptcy (failure) cannot be resolved.

Financially distressed bank can experience costs linked to the situation, such as more effort for deposit mobilization, high probability of loan default, opportunity costs of operation, reputational damage, loss of senior staffs, and bank run at the worst. The cost of collecting additional deposit will generally increase, and it needs to increase the interest charge on credit. As a result, to fulfill short-term obligations, management might lose the longer-term profitable credits. According to "*Too big to fail concept*", in case of public companies' distress, higher tax could be levied on the public to save the failure of large institution. This has its own burden on the country's economy (Tibebu, 2018). For instance, in 2004, because of financial distress in Nigeria; 36 banks were closed; 7 banks were restructured and acquired by new investors; 24 banks management were taken-over and controlled by regulatory authority; 2.3 billion Nigerian dollar facilitations were allocated for 10 banks. In USA, 563 banks have failed since October 1,2009. In 2000s, 39 commercial banks were financially distressed in Kenya and cost the economy Kshs. 19.6 billion (Donl, 2004; Taliani, 2010). Different factors such as changes in market policy, economy, political influence, insufficient lending autonomy, fraudulent activity and poor corporate governance may lead to financial distress. The financial distress worst scenario ends in business failure. The impact of bank financial distress on the country's economy is beyond just the distress of a corporation. The distress of banks in the USA (like *Lehman Brothers)* during 2007/08 and in Asia during 2011/12 are clear evidences as banks financial distress is beyond the distress of companies.

Conventionally, to evaluate the financial distress condition of companies', financial managers and advisors used the univariate analysis method through evaluating each individual financial index. However, when indicators were conflicting, it was difficult to conclude. For instance, the liquidity position of the bank using liquidity ratio may show deteriorating while the profitability of the bank is enhancing because of liquidity-profitability trade-off. Therefore, to overcome this shortcoming of ratio analysis, the literature based mostly on multivariate financial distress analysis models. Among these multivariate models, Altman's Z-score has been proven to be a reliable tool across the globe (Mohammed, 2017). Identifying the financial distress condition of

the company can be used by the company itself and various stakeholders to aid in developing proactive and preventive decisions, in order to avoid impending loss. This is considered as early warning signal which could help management to take pre-emptive actions against potential losses. As a result, a dozen of research has been conducted on financial distress condition of companies in different countries and cross countries. Specifically, because of their economic importance, the financial distress condition of banks gets scholars attention. For instance, Cipollini and Fiordelisi (2009) in European commercial banks; *Ephrem and Nidu (2015) and Robel (2021) in Ethiopian Private commercial banks;* Elia, Toros, Sawaya, and Balouza (2021) in Lebanese Alpha bank; Zelie & Wassie (2019) and Yonas (2021) in Ethiopian insurance companies; Taliani (2010) in Kenya commercial banks; *Haregewayin (2017) in Ethiopian micro finance institutions,* Agarwal (2018) in Indian public sector banks, and Parvin et al. (2016) in Bangladesh commercial banks are among the studies which investigate financial distress condition using Altman's Z-score model. However, because of their own reason, prior studies exclude Developing countries from financial distress analysis. Thus, in this study, the financial distress condition of Commercial banks was assessed using Altman's Z-score model.

The general objective of the study is to assess the financial distress condition of commercial banks using Altman's Z''-score model. Specifically, this stud strived to:

✓   Assess the financial distress trends of CBE for the last 5 years.
✓   Compare the trend of top 6 commercial banks financial distress in Ethiopia for the last 5 years
✓   Evaluate the applicability of Altman's Z''- score model in Ethiopian banking industry.

2. REVIEW OF LITERATURE
A. Basics of bank and banking system in Ethiopia
In order to understand financial distress in the banking sector, it is useful to start from the basics of banks. Banks are in the business of borrowing short and lending long. In doing so they provide an essential service to the rest of the economy, i.e., they create credit that allows the real economy to grow and expand. This credit creation service, however, is based on an inherent delicateness of the banking system. If depositors are rapt by a collective movement of distrust and decide to withdraw their deposits at the same time, banks are unable to satisfy these withdrawals as their assets are illiquid (Grauwe, 2008). *However, business is mostly as usual because* in normal times, when people have confidence in the banks, these fragilities do not occur. But confidence can quickly evaporate, for example, when one or more banks experience FD and as a result solvency problem. Specially, in case of large bank distress, Bank run is then more possible.

A liquidity crisis flares-up brings sound banks down. In this case, sound banks become innocent bystanders that are hit in the same way as the insolvent banks by the collective movement of distrust. The problem does not end here. A devilish interaction between liquidity problem and solvency problem is set in motion. Sound banks that are hit by deposit withdrawals have to sell assets to confront these withdrawals. The subsequent fire sales led to declines in asset prices, reducing the value of banks' assets. This in turn erodes the equity base of the banks and leads to a solvency problem. The cycle can start again: the solvency problem of these banks ignites a new liquidity problem and so on (Meher & Getaneh, 2019). In Ethiopian banking system, the authorities have created various credit schemes to promote priority sectors such as exports, manufacturing, and agriculture industries. Among these, the export sector is given top priority. Being state owned bank, CBE is expected to extend preferential credits to a variety of priority sectors and schemes under subsidized terms and conditions. Although preferential lending was not a strict requirement, the authorities exerted moral persuasion to persuade on the bank to comply with the expectations. They were also pressured to lend to public corporations or privatized public corporations. Lending in this situation reduced CBEs' autonomy and may undermine its efforts to maintain good credit approval practices.

B. Concept of financial distress
In corporate finance, the concept of financial distress deals with a situation in which a firm fails to meet debt obligations to its creditors. It is believed that the majority of business failures are attributed to FD. In other words, FD can be put as a condition of being in severe financial diffculties that might lead to bankruptcy (Yonas, 2021). Financial distress in general is a condition in which a company cannot generate sufficient amount of revenue because the company cannot cover its financial obligation. This condition raised due to high fixed cost, liquidity mismatch, revenue sensitivity to the general economy and external factors like government policies. *According to Outecheva (2007), definitions of financial distress can be grouped into three main categories. These are; event-oriented definitions, Process-oriented and technical definitions of financial distress. In the first category, financial distress usually applied in synonymously with the term failure, default, bankruptcy. It defined as the inability of a firm to pay its financial obligations as they mature. Whereas the second category of financial distress concept defined it as it is a basic event whose occurrence separates the time of a company's financial health from the period of financial illness and requires undertaking corrective actions in order to overcome the troubled situation. And the last category interprets financial distress through identification of the main*

indicators such as performance of the firm, restructuring, capital structure change. For this study purpose, the second definition of financial distress has used. Furthermore, FD can be defined as a condition where financial obligations are not met or met with difficulty by a firm (Wua et al. 2008, as cited in Esmeal, 2022; *Manousaridis, 2017*) and according to Steel (2020) a financially distressed firm faces one or more of the following symptoms; frequent cash shortage, violation of contracts, being slow to pay (extended terms), reduction in risk level (lenders and partners ask strong guarantee), low margin, abnormal increase in overhead cost, decrease in sales, customers not coming back, high levels of outstanding receivables, and high turnover and decreased employee's morale. The problem of FD in the banking industry has been a huge concern to all stakeholders of the economy and the world business community at large. If the banking sector of a given country faces financial crisis, chances are high that it would lead to general economic crisis (Esmeal,2022) and According to Demiguc and Detraigaialche (1998, as cited in Ephrem & Nidu, 2015) FD assessment is more important in the less developed and volatile economy country than the stable and developed world. This implies that, given the country's economic condition, financial distress assessment of CBE is a timely issue.

C. Reason and consequences of financial distress
The reasons that lead to FD can be internal factor or external factors. According to Nzenwata (2017) internal factors attributed to poor management. Potential forms of the appearance of poor management are the absence of a sense of a need for change, inadequate communication, overexpansion, unintentionally improper handling of projects, or fraud. External factors could be as a result of inefficiencies in regulatory development, turbulences in the labor market, or natural disasters. Mostly, they attributed to economic change, competitive change, government constraints, social alterations, and technological change. However, it is also considered that financial distress as a result of economic shock occurs as a consequence of management's failing ability to control and anticipate negative economic effects on the firm's profitability and future prosperity. Unless proactively detected and solved, financial distress ultimately forces a company to insolvency. Direct costs of financial distress include costs of insolvency. Insolvency also causes high legal and administrative costs. The expected costs of insolvency raise the lenders' price, which causes a dampening effect on the firm value. It, with or without insolvency, also has many indirect costs. These costs relate to the actions of employees, managers, customers, suppliers and shareholders. These include the following: employees of a financially distressed firm may become demoralized; Suppliers also curtail or discontinue granting credit to the firm fearing liquidation and liquidity problems; investors become concerned; shareholders start behaving differently (in ways detrimental to the firm); and managers generally have a tendency to expropriate the firm's resources in the form of perquisites and avoid risk (*Cindik & Armutlulu, 2021*).

D. Financial distress prediction models
The early prediction of financial distress is essential for managers, investors, regulators and others who have economic interest in the firm. Thus, modeling, prediction and classification of firms to determine whether these are potential candidates for financial distress have become key topics of debate and detailed research for a half century. The following are among the well-known prediction models mostly used by researchers

Author	Approach	Result
Fitzpatrick (1932)	Accounting ratio	Accounting ratios could be used as financial distress indicators.
Beaver (1966)	Univariate analysis	Net cash flow to Total Liabilities explains the distress position of companies
Altman (1968)	Multiple discriminant analysis (Z-score mode)	5 or 4 accounting ratios can explain financial distress condition of companies. It able to reduce a multidimensional problem to a single score with a fairly high level of accuracy. It is the most popular model in predicting financial distress of manufacturing company.
Argenti (1976)	Qualitative approach	It uses non- accounting qualitative variables. The model is based on the assumption that financial distress follows a predictable sequence of: defects (management weakness and accounting deficiency), mistakes (high gearing, overtrading and unmanageable big projects) and symptoms (financial signage, creative accounting, non-financial signage and terminal signage)

Author	Approach	Result
Altman (1993)	Z'' model	The original Altman (1968)5-variable model has modified by removing the variable "sale/total asset" in order to minimize the potential industry impact. According to literatures, the accuracy of the model was 97% for non-bankrupt firms and 90.9% for bankrupt firms It is the most popular model in predicting financial distress of financial institutions and other companies in emerging market

Among these prediction models, Altman's Z-score a widely applicable model which was developed for publicly traded manufacturing companies. In this case, the original formula is:

$Z=1.2X1+1.4X2+3.3X3+0.6X4+0.999X5$. where x1 is the ratio of working capital to total asset, x2 is the ratio of undistributed profit to total asset, x3 is earning before interest and tax, x4 is market value of equity to market value of liability, and x5 is sales to total asset ratio. While in the prediction of non- manufacturing companies (except financial institutions) financial distress, the calculation formula is $Z= 6.56X1 + 3.26X2 + 6.72X3 +1.05X4$. Respectively, in 1995, Altman's formula revised for the applicability in financial institution by including a constant term 3.25. Thus, the formula which proposed to predict the financial distress condition of banks in emerging market is $Z''= 6.56X1 + 3.26X2 + 6.72X3 + 1.05X4 + 3.25$. In this revised model, X4 represents the book value of equity to total liability while other variables are similar with the original model.

2.1. Empirical review

Ephrem and Nidu (2015) endeavored to assess the financial healthiness of some private commercial banks in Ethiopia and found that it is good and improving from time to time, but some fluctuating trend is observed. On the other hand, Yirgu (2017) concludes that sampled private banks in Ethiopia were under distress. It shows that, FD is a dynamic situation and needs a continuous follow up. In addition to this, as per Zelie and Wassie (2019) study, financial health condition of the Ethiopian insurers was not in a safe condition and it shows continuous fluctuations. Meressa (2018) assure that even though there was fluctuation in Z-score of the institutions from period to period, 94 percent of micro-finance institutions in Ethiopia are in the safe zone and only 6 percent are in the grey zone. Parvin, Rahman and Nitu (2016) predict the financial health of banking industry in Bangladesh using Altman's Z Score and tried to compare State-Owned Commercial Banks and Private Commercial Banks FD conditions. Their study revealed that the analysis reveals state owned banks possess better financial health than their counter parts. It is support of the *"Too big to fail"* concept that, state owned banks get government support and their distress condition would be somehow good than private banks. Haregewayin (2017) investigate the determinants of micro financial institutions FD condition in Ethiopia and found that the mean Altman's Z-score was 1.9 with minimum of 0.4 and a maximum of 3.9 using 100 observations for the period 2006-2015. It implies that on average the micro-finance institutions was under *gray zone* of FD discrimination. The zone of gray area is undesirable area of financial health that is characterized by FD than healthiness (*Ephrem & Nidu, 2015*). It indicates that, irrespective of the profitability or capital deployed in the business, FD is a possible problem in Ethiopian Financial sector. In line with the TBTF concept, small institution (i.e., Micro Finance institutions) are healthier than the large financial institution (i.e., banks and insurance). Since banks (specially, CBE) are the back bones of the economy, they should be kept healthy. And they are not supposed to be in a "gray" area. However, the research on private commercial banks is in contrary to this overall expectation. *Agarwal (2018)* assess the FD condition of public sector banks in India using Altman Z-score model and found that the model is the accurate predictor of public banks 5 years prior to failure. This study validates the result of different researchers who used Altman Z-score as analysis model. Thus, despite the justification of pervious Ethiopian researchers, the application of Altman's Z- score model could be applicable and equally valid in government owned bank . Robel (2021) tried to assess the FD Conditions of private banks in Ethiopia using Altman's Z- score 1993 model and found that 9 (nine) banks or 64.29% of banks are under 'Gray Zone'; and 5 (five) or 35.71% are under Distress Zone and there is no bank classified under 'Safe' zone. It implies that all 14 (fourteen) private commercial banks were not running their business in healthy way. The author also states that the financial stabilities of banks in the gray zone are uncertain; the banks will either go-in to FD or not. If they properly respond or take actions immediately to resolve the deficiencies around not to be distressed or may rise and become stable; unless it can be transformed to bankruptcy in the subsequent years with 92% possibilities. Elia, Toros, Sawaya, and Balouza (2021) investigates the FD of Lebanese Alpha Banks using Altman Z'' model and found that the majority of the Alpha Banks were distressed over the period 2009 – 2018. Kisis Tafa (2011) examine the validity of the revised Altman's Z-score model in Ethiopian private enterprises with Emphasis on manufacturing and leather. The result showed that the model can predict the financial distress conditions 60%,70%,40%, and 30% for one, two, three and four years prior to prediction.

3. RESEARCH METHODs

3.1. Research Design and Approach

Based on the nature of the objective and the problem intended to answer, the study used a case study descriptive research design with quantitative research approach. Specifically, in order to triangulate the problem, a model-based research method has been used.

3.2. Sampling Technique

Even though investigating the entire FD condition of commercial banks would be important for detail understanding the problem, time and cost do not allow to do so. Thus, using a convenience sampling technique, 5 years) and top-6 Ethiopian commercial banks has been considered as sample.

3.3. Data type, source and collection

To answer the stated research objective, the study has used a secondary data which has been collected from financial statements (balance sheet and income statement) of the banks.

3.4. Method of data analysis

The secondary data collected from financial statement of banks (balance sheet and income statement) has been analyzed using a descriptive analysis technique, specifically, Altman's Z''-value and graphical trend analysis technique. The results have also been compared each other on FD trend.

3.5. Model specification

Financial distress prediction models like univariate, risk index, Multivariate discriminate analysis (MDA), logit, provit, recursive partitioning, neural networks and other models has been used for many organizations basically manufacturing firms since the first introduction of univariate model in 1966. But they do not account for time series behavior of the variable to analysis the trend of financial distress condition. As a result, most of the researches conducted on financial sectors used the MDA type of techniques developed by Altman (1968). On the applicability of the model to financial institutions, it is considered that the model is 90%– 98% successful in predicting FD before two to five years *(Meressa, 2018)*. Although many literatures use Altman's Z''-score as a best predictor of FD; there are also other known models which has been used by researchers. However, most of these models have used both financial and non-financial ratios as input for their inference to measure the bank performance. In this regard, (Rinaldo et al, 2014, as cited in Robel, 2021) states that in the process of making relevant decisions investors, lenders, auditors, regulators and mainly managers in the banking sector essentially use financial ratio information. As a result, Altman's Z''-score model becomes a commonly used FD predictive model in all over the world. In addition to this, among the eight financial distress relate researches conducted in Ethiopia (as reported in Esmeal,2022), five papers used Altman's model as a proxy of FD in the financial institutions. Thus, to assess the FD conditions of the CBE independently and comparatively, based on the reviewed literature, the following model has been used:

$$\text{Altman's } Z'' = 6.56X1 + 3.26X2 + 6.72X3 + 1.05X4 + 3.25$$

Where Z''= financial distress ; X1 = Working Capital/Total Assets; X2 = Retained Earning /Total Assets; X3 = Earnings before Taxes/Total Assets; X4 = Book Value Equity/Book Value of Total Liabilities. A financial distress condition of the bank discriminated in to three as shown in the table below:

Table 1: Discriminate zone of Altman's Z''-score model

no	Z'' value	Implication
1	Above 2.6	Safe zone. *The financial institution is in good position and safe from financial problem.*
2	Between - 2.6	Grey zone. *It is a warning Sign! It is considered as gray area as the financial institution ~e chances to faces bankruptcy problem.*
3	Below 1.1	Distress zone. It is b*ad indication! The financial institution is most likely to be heading ~ards bankruptcy problem. Necessary actions are needed to avoid from the worst situation.*

The revised Altman's Z- score applied in this study was developed using four financial ratios that could be considered as separate variables. The first ratio was working capital to total asset as measure of *liquidity*. Besides, there was a ratio of book value of equity to liability used as proxy of *leverage position* of the bank that analyzes how much of the bank's assets are financed by its own funds. In addition, the ratio of Earning before tax to total asset that indicates the *management efficiency* was used. Moreover, the index also incorporate ratio of retained earnings to total asset which is used to ascertain its *long-term financial soundness*.

4. DATA ANALYSIS AND PRESENTATION

As illuminated in chapter 3, section 3.5, above the revised Altman's model predicts the financial distress condition using four input financial ratios. These are: (I) Working Capital/Total Assets (hereafter *X1*). Working capital is the difference between current assets and current liabilities or it is a liquidity gap of the bank which

used to measure the liquidity position of the bank. (II) Retained Earning /Total Assets (hereafter $X2$). As per the definition of CBE, retained earnings is *"the profits/loss that the Group has earned to date, less any dividends or other distributions paid"*. It used to examine the possible long-term financial condition or levering position of the bank. (III) Profit before taxes/Total Assets (hereafter $X3$). It represents the profitability position of the bank. And (IV) Book value of equity/Book value of total liabilities (hereafter $X4$). It measures the overall gearing level of the bank.

Table 1 in below shows the comparative financial condition of CBE with top 5- profitable banks in the year 2017- 2021. The result shows that CBE is comparatively in similar financial distress condition with 4-top profitable private commercial banks. In addition to this, it also revealed that, except one bank, four private banks and CBE are at safest financial condition. Table1: trends of financial distress condition

Bank	Year	X1	X2	X3	X4	Z''-value**	Distress Zone
CBE	2017	0.146783	-0.0007	0.025515	0.099916	4.486985	safe
	2018	0.027035	1.41E-05	0.017435	0.089627	3.638668	safe
	2019	0.02856	-0.00029	0.022023	0.075832	3.664021	safe
	2020	0.027082	0.000179	0.018256	0.06475	3.61891	safe
	2021	0.193835	-0.00144	0.019447	0.057415	4.707827	safe
AWASH	2017	-0.00052	0.003665	0.0328	0.129403	3.615068	safe
	2018	-0.3582	0.029416	0.0355	0.133184	1.374768	Gray
	2019	0.00748	0.035289	0.0448	0.148299	3.870954	safe
	2020	0.036908	0.032983	0.0403	0.154803	4.033123	safe
	2021	0.189372	0.027657	0.0375	0.133386	4.974348	safe
BOA	2017	-0.17609	0.01083	0.02615	0.148163	2.461434	Gray
	2018	-0.23955	0.011307	0.023941	0.013038	1.88997	Gray
	2019	-0.14643	0.012492	0.026061	0.014293	2.520256	Gray
	2020	-0.10475	0.007375	0.019009	0.110858	2.83105	Safe
	2021	-0.24397	0.010472	0.019755	0.090857	1.911817	Gray
DASHEN	2017	0.182797	0.046581	0.029332	0.169985	4.976599	safe
	2018	0.216473	0.036475	0.025171	0.148301	5.113837	safe
	2019	0.189631	0.011308	0.022751	0.138678	4.829343	safe
	2020	0.092275	0.017011	0.026222	0.138699	4.232622	safe
	2021	0.140812	0.008409	0.025627	0.119722	4.499065	safe
COOP	2017	0.000235	0.010347	0.013518	0.000003	3.376211	safe
	2018	0.168255	0.006802	0.022411	0.086350	4.617193	safe
	2019	0.108539	0.008005	0.018354	0.08544	4.201163	safe
	2020	0.066671	0.015112	0.027103	0.107875	4.032032	safe
	2021	-0.04749	0.011687	0.020856	0.095592	3.217075	safe
NIB	2017	0.288563	0.016989	0.030541	0.163445	5.57521	safe
	2018	-0.05642	0.012443	0.035923	0.115347	3.282997	safe
	2019	-0.0579	0.014542	0.027536	0.189246	3.301302	safe
	2020	-0.09455	0.017271	0.030841	0.157781	3.058953	safe
	2021	-0.0264	0.01408	0.029955	0.148641	3.480079	safe

** (Z''-value $=3.25+ (6.56*X1) +(3.26*X2) +(6.72*X3) +(1.05*X4)$)

As discussed above in table 1, like CBE, the case of financial distress of BOA is the liquidity position (x1) which is negative for all the sampled five years. Using scenario analysis, the researcher found that, assume other things going similar, if the bank has zero liquidity gap (X1=0), its financial distress condition will be safe. In line with this, the financial distress condition of NIB and BOA assure that multivariate discriminate analysis is the best predictor than single ratio analysis. The liquidity position of NIB during 2018-2021 was also negative like that of BOA 2017-2021 and CBE 2007-2014 case. However, this risk offset by the profitability (x3) of the bank. It implies that high leverage is not a problem for the profitable company. In addition to this the following chart also depicts the trend of relative financial condition of CBE with other banks.

The figure 2 below depicts that, almost the financial distress condition of commercial banks in Ethiopia is volatile and from the sampled six commercial banks, comparatively CBE has stable financial distress condition for the last 5 years next to Dashen. From table 2 in above, it is also possible to say that, on average the five years Z''-score of CBE is 4.023, while Dashen average Z''-score is 4.73. In addition to this, even the individual input variables trend also assure that the performance of CBE was poor relative to Dashen. For instance, the movement of x1 (liquidity index) and x3 (profitability index).
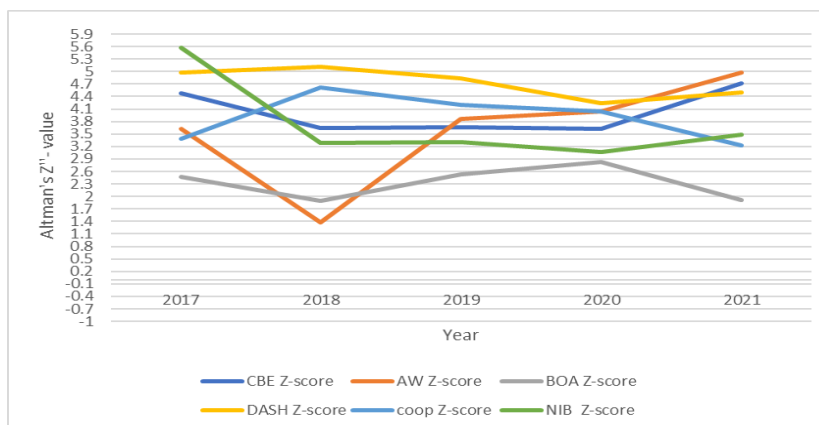
Figure 2: Trends of Comparative Financial distress condition

In addition to the Z''-vales, the input variables have also an implication about the performance of these sampled banks. For the last 5 years the profitability position of CBE is on average 0.0205. It means that, for each birr of asset CBE earns 0.0205 birr before tax. The profitability of AWASH, BOA, DASHEN, COOP and NIB is 0.038, 0.0229,0.0258,0.0204 and 0.0309 respectively. It shows that CBE is relatively less profitable except COOP. As a result, the study concludes that there is no economics of scale in CBE. As per the economics of scale concept of financial distress dilemma, the larger the bank is more profitable and may not face financial distress problem up to a point of scale or it may be in distress because of diseconomies of scale.

During 2015, 2016, 2017, 2019, and 2021, CBE has a negative retained earing to total asset ratio(x2) which used as a proxy of long-term financial soundness which is the result of high dividend (though immediate cause is IFRS conversion) in case of positive profit business. It implies that unless the bank takes a corrective measurement, though the bank is financially sound today, it is not possible to sustain a healthy business growth. Thus, to be a growth-oriented bank and to assure its sustainable long-term financial soundness and profitability, it may need to make some improvement in dividend policy and practice. Comparatively, the 5 years average capacity of CBE to finance its assets by itself (retained earnings) is -0.045% while the capacity of AWASH, BOA, DASHEN, COOP and NIB is 2.58%, 1.04%, 2.39%, 1.03% and 1.5% respectively. This implies that the future success of CBE is relatively highly vulnerable for borrowing (deposit mobilization in bank case) than private banks. Therefore, other things constant, it reveals that, though the current financial distress condition of the bank is safe, unless the dividend policy enhanced, CBE may not have long-term competitive advantage on financial condition.

Applicability of Altman's Model in Ethiopian Banking Sector
The orginal Altman's Z- score model for predicting the financial distress condtion of companies was published in 1968 by Edward l Altman. This model has been used for half of a century to predict the probability that the firm will go to financial dificulty (banckrapcy at worst) with in two-five years. According to Agarwal(2018), the orginal model was found to be 72% acurate in predicting the bankrapcy two years before distress or difficultly with false negative of 6%. Subsiquantly after a series of tests for more than 30 years it was found to be approximately 80-90% accurate in predicting bankrapty one year before it happened with false negative of 15-20%.

Taking this evidence, the predicting ability of the model for sampled banks has been examined. Totally 6-banks has been considered in the sample for 5-years. It gives a total of 30 observation. Then, using the year 2021 as base of prediction, and based on the above paragraph discussion, it expected that the prior year financial distress status predict the possible financial distress status in 2021. Thus, the status of 2017, 2018, 2019, and 2020 can predict the status of 2021 at 4, 3, 2, and 1 year before. Because, the model proposition states that it can predict the financial distress condition 2- 5 years in future.

Table 3 below shows that from the total of 24 prediction period (30 observation period less 5 years which is year 2021 for all banks (30-6=24)) the model correctly predict 95.83% (23 of 24) prediction periods with 4.7% (1 of 24) false negative. The only false prediction is 2020 in case of BOA. 2020's BOA result is safe which means the bank will not face financial difficulty 2-5 years beyoned, however, during 2021 BOA's financial distress becomes gray.

As compared with prior emprical result, this study revealed that Altman's Z'' score has high prediction power on the Ethiopian banking sector than other sector reported in Tibebu (2018) and Kisis (2011).

Table 4: Validity of the model in predicting 2021 financial distress condition

Sampled Bank	Financial distress Zone of the banks using Altman's Z''- score Model					Correct Prediction of future distress zone: base of prediction is 2021			
	2017	2018	2019	2020	2021	4 years before-2021	3 years before - 2021	2 years before-2021	1 Year before-2021
CBE	Safe	Safe	Safe	Safe	Safe	Yes	Yes	Yes	Yes
AWASH	Safe	Gray	Safe	Safe	Safe	Yes	Yes	Yes	Yes
BOA	Gray	Gray	Gray	Safe	Gray	Yes	Yes	Yes	No
DASHEN	Safe	Safe	Safe	Safe	Safe	Yes	Yes	Yes	Yes
COOP	Safe	Safe	Safe	Safe	Safe	Yes	Yes	Yes	Yes
NIB	Safe	Safe	Safe	Safe	Safe	Yes	Yes	Yes	Yes

Note!: Correct Prediction of future distress: base of prediction is 2021 column in the Right side, "yes" denote that the model correctly predicts the financial distress condition of Banks in the mentioned lag and "no" denotes that the model incorrectly predicts the status of 2021.

Though it applied by different scholars and shows high prediction power on Ethiopian bank industry (95.83% in recent 5 year data and 67% in old data), this study argues that thare is an assumption flaw on Altman's Z-score model. The basic critics identified is that if there is an efficient stock market the survival of the bank may depend on its performance. However, with out efficent secondary market, market participants have no option and they may not evaluate the firm on its performance. As a result, though the firm is financialy safe, it cann't borrow from market or its market capitalization cannot enhanced. Therefore, Altman's Z score model needs futher validation test in case of companies with no stock market.

5. Conclusion

Based on the discussion in chapter four and the findings depicted there, the following has concluded. It is concluded that, currently, CBE has comparatively similar financial distress status with top four profitable private commercial banks. Except BOA all sampled private banks financial distress condition is safe. Thus, CBE has no strategic advantage over competitors on the financial condition. Moreover, the trend of X2 (an index for long term financial soundness) of competitors shows that private banks have strong long term financial soundness position over CBE. Therefore, CBE lacks long term competitive position on financial condition. Moreover, the study also concludes that though the model is powerful (95.83%) for performance comparison in the current and historical period, it has an assumption flaw in case of emerging market with no secondary market. Therefore, based on the result of the study it is suggested that, to achieve the sustainable financial soundness objective, companies should diversify the source of finance and investment. As the result of the study revealed, unlike other competitors, CBE has negative (the result of dividend payment exceeds profit) and declined retained earnings to total asset ratio. However, as a growth-oriented companies should retain a percentage (usually high) of profit and re-invest for business expansion, it is suggested that CBE should revise its dividend payment practice and policy.

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