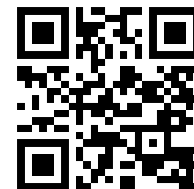


Predicting Financial Stability of Banks in Nigeria Using the Altman Z Score Model.



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ABSTRACT: The global economy has brought with it a lot of complexity to the financial service industry (Banking, Insurance, and FinTech's). With recent global events like the pandemic, the need to forestall and mitigate any corporate business failure has become necessary.

The financial sector is seen as a very important aspect in the growth and stability of any economy. The stability of this sector of the economy has been of utmost concern to regulatory agencies and relevant stakeholders.

Altman Z score is a financial tool for dissecting the stability of entities with published financial statement. This research paper aim to predict the strengths and weaknesses in selected commercial banks in Nigeria using the Altman Z Score model. To achieve this, we look at past records of banks for a period of twelve years to foretell what the future holds and what stakeholders should expect. We look the extent to which the model is been used by the regulatory agency for bank failure particularly after the bank consolidation in the banking sector. Ten (10) banks were selected for this study using purposeful sampling technique. The study concluded that Z-score model is an effective tool for predicting distress in financial institutions and was therefore recommended.

INTRODUCTION

Recent cases of unexpected bank mergers and acquisitions have necessitated the need to perform a due diligence test on selected commercial banks in Nigeria. The failure of Savannah Bank, All States Trust Bank eroded the trust depositors have in these banks, and the recent acquisition of Skye Bank by a lowly placed finance house, Polaris and Diamond bank by Access Bank has brought up the debate on the viability and long-term stability of most banks in Nigeria.

Most literature attributes the cause of failure in corporate entities to many internal and external factors. Government regulations, technological advances, poor corporate governance, and unhealthy competition within a given industry are reasons for some of these failures. All these factors listed are not financial and can be subjective. This research study will look at the ten years audited financial statements, cash flow and income statements of the banks chosen in the study to predict uneventful outcomes. Numerous corporate failure prediction models have been developed based on various modelling techniques. The non-structural statistical models for default probabilities are the most popular, especially logit model. This study seeks to apply the predictive indices in the Altman Z score model, a structural model for predicting bankruptcy and institutional failures in an industry.

The Altman Z score model was first published in 1968. The model is based on analysis of financial data and ratios and again in 1983, which was the most renowned model in predicting company bankruptcy using financial ratios. It is a simple corporate failure prediction model based on an overall index known as the Z score. The Z score was calculated from specially selected ratios drawn from company financials. The Z score discriminates between firms likely to go bankrupt within two (2) years from healthy firms by using a cut-off score for the overall index.

Economies vary with various indices as determining factors to variable derivatives. Considering that the Altman Z score was developed far away in the United States, few reservations abound about its effectiveness in its applications to firms in developing countries.

AIM AND SCOPE OF THE STUDY

Banks are profit-seeking organisations; therefore, they attempt to improve the risk and return trade-off in their decision-making processes. It may be hard for banks to stay afloat without handling these risks, as today's risks may become tomorrow's reality.

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This study aims to find the predictive ability of the Altman Z score model based on an early sign of company distress to determine if the model is appropriate in predicting bankruptcy for the financial services industry in Nigeria.

The main objectives of this study are to:

1. calculate the relevant ratios of selected banks included in the study using the Altman Z score,
2. identify banks which are financially stable from those that are not concerning the calculated ratios, and
3. enlist factors that contribute to bank failures from the data analysis.

DELIMITATIONS OF THE STUDY

This study was conducted in Lagos, Nigeria, using secondary data. Eleven (11) years (2009-2020) of time-series data extracted from ten banks' audited financial statements. Altman's Z score model was tested on the selected banks to predict their stability. Only ten banks were covered in this research, purposely due to available records spanning ten years covered by the study. Also, considering that the Altman z score was formulated far away in the United States, many economic factors limit the generalization of cross-border findings.

LITERATURE REVIEW

The Z-score formula for predicting bankruptcy was published in 1968 by Edward I. Altman. The formula may be used to predict the probability that a firm will go into bankruptcy within two years. Z-scores are used to predict corporate defaults and are an easy-to-calculate control measure for the financial distress status of companies in academic studies. The Z-score uses multiple corporate income and balance sheet values to measure a company's financial health. The quantitative credit analysis literature began with Altman (1968), where the author proposes discriminant analysis to determine combinations of observable characteristics that best differentiate between defaulted and non-defaulted firms (Altman, Financial Ratios, Discriminant Analysis and the Prediction of Corporate Bankruptcy, 1968).

This paper was one of the first examples of a quantitative, credit-scoring approach to credit assessment. This approach has fallen out of favor recently because of the descriptive focus. Discriminant analysis characterizes a firm's likely observable characteristics given the current default status. At the same time, a credit analyst is generally interested in the converse: a firm's likely default status given its observable characteristics.

The Z-score is a linear combination of four or five common business ratios weighted by coefficients. The coefficients were estimated by identifying a set of firms which had declared bankruptcy and then collecting a matched sample of firms which had survived, with matching by industry and approximate size (assets). (Altman, 2005).

Altman applied the discriminant analysis statistical method to a publicly held manufacturer data set. The estimation was initially based on publicly-held manufacturers' data but has since been re-estimated based on other datasets for private manufacturing, non-manufacturing, and service companies. Mare, Moreira, and Rossi. (2016).

Altman's Z-Score model was used to decipher the structural models. The Z-Score model was introduced to predict the probability that a company would collapse in the next two years. The model proved to be an accurate method for predicting bankruptcy several times. According to studies, the model showed an accuracy of 72% in predicting bankruptcy two years before it occurred, and it returned a false positive of 6%. The false-positive level was lower compared to the 15% to 20% false-positive returned when the model was used to predict bankruptcy before it occurred. When creating the Z-Score model, Altman used a weighting system alongside other ratios that predicted the company's chances of going bankrupt.

ALTMAN'S Z-SCORE MODEL FORMULA

The Z-score model is based on five key financial ratios, and it is written as follows: $\zeta = 1.2A + 1.4B + 3.3C + 0.6D + 1.0E$ Where: Zeta (ζ) is the Altman's Z-score

- A** is the Working Capital/Total Assets ratio
- B** is the Retained Earnings / Total Asset Ratio
- C** is the Earnings before Interest and Tax/Total Assets ratio
- D** is the Market Value of Equity/Total Liabilities ratio
- E** is the Total Sales/Total Assets ratio

EXPLAINING THE Z-SCORE RESULT

Usually, the lower the Z-score, the higher the odds that the company is heading for distress. A Z-score lower than 1.8 means that the company is financially distressed.

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Z- score	Likelihood of Failure
1.8 or less	Very high
1.81 - 2.75	High
2.76 – 2.99	Possible
3.00 or more	Very low

The first multivariate study was published by Altman (1968). He has used multivariate discriminant analysis to develop a five-factor model to predict the bankruptcy of manufacturing firms. The "Z-score", as it was called, predicted bankruptcy if the firm's score fell within a specific range. Initiated by Beaver (1966), Altman (1968), and Ohlson (1980), academic studies to measure financial vulnerability continued for three decades. Beaver found that the cash flow to debt ratio was the best single ratio predictor of distress in his univariate discriminant analysis.

Altman's Z-Score model used multivariate discriminant analysis to select the five most significant variables for measuring the financial distress of firms. Ohlson's O-Score model used logit analysis to generate a one-year prediction model, and its academic descendants frequently referred to his discrete variables as a proxy for the probability of financial distress. Altman (1968) collected data from 33 failed firms and 33 matching firms during 1946-1965 to find discriminating variables for bankruptcy prediction. In his seminal paper, Altman evaluated 22 potentially significant variables of the 66 firms using multiple discriminant analysis to build the discriminant function with five variables.

The function is as follows: where:

$$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 0.999X_5,$$

X1-Working Capital/Total Assets

The working capital/total assets ratio, frequently found in studies of corporate problems, is a measure of the net liquid assets of the firm relative to the total capitalization. Working capital is defined as the difference between current assets and current liabilities. Liquidity and size characteristics are explicitly considered. Ordinarily, a firm experiencing consistent operating losses will have current shrinking assets to total assets. This one proved to be the most valuable of the three liquidity ratios evaluated. The inclusion of this variable is consistent with the Merwin study, which rated the net working capital to total asset ratio as the best indicator of ultimate discontinuance.

X2-Retained Earnings/Total Assets

Over time, this measure of cumulative profitability was cited earlier as one of the "new" ratios. The age of a firm is implicitly considered in this ratio. For example, a relatively young firm will probably show a low RE/TA ratio because it has yet to build up its cumulative profits. Therefore, the young firm is somewhat discriminated against in the analysis, and its chance of being classified as bankrupt is relatively higher than another, older firm. However, this is precisely the situation in the real world. The incidence of failure is much higher in a firm earlier.

X3-Earnings before Interest and Taxes/Total Assets

This ratio was calculated by dividing a firm's total assets by its earnings before interest and tax reductions. In essence, it measures the actual productivity of the firm's assets, abstracting from any tax or leverage factors. Since a firm's ultimate existence is based on the earning power of its assets, this ratio is particularly appropriate for studies dealing with corporate failure. Furthermore, insolvency in a bankruptcy sense occurs when the total liabilities exceed a fair valuation of the firm's assets with the value determined by the earning power of the assets.

X4-Market Value of Equity/Book Value of Total Debt

Equity was measured by the combined market value of all shares of stock, preferred and standard, while debt includes both current and long-term. The measure shows how much the firm's assets can decline in value (measured by the market value of equity plus debt) before the liabilities exceed the assets and the firm becomes insolvent. This ratio adds a market value dimension that other failure studies did not consider. It is also a more effective predictor of bankruptcy than a similar, more commonly used ratio: Net worth/Total debt (book values).

X5-Sales/Total Assets

The capital-turnover ratio is a standard financial ratio illustrating the sales-generating ability of the firm's assets. It is one measure of management's capability in dealing with competitive conditions. This final ratio is important because, as indicated below, it is the least significant ratio on an individual basis. Based on the statistical significance measure, it would not have appeared at all.

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However, because of its unique relationship to other variables in the model, the Sales/Total assets ratio ranks second in its contribution to the overall discriminating ability of the model.

The Z-Score, a survival indicator, classifies companies based on their solvency. The higher the value is, the lower the risk of bankruptcy. A low or negative Z-Score indicates a high likelihood of bankruptcy. Altman set critical values between companies based on the survivability indicator, which is given in Table 1 as:

Table 1. Critical values of Altman's Model.

Score	Zone	Result
$Z < 1.81$	Distress	likely to be bankrupt
$1.81 < Z < 2.99$	Gray Zone	Stable
$Z > 2.99$	Safe Zone	Safe

The literature on bankruptcy identified several ratios suitable for predicting bankruptcy. Altman finds that the model's prediction accuracy tapers off for longer prediction horizons, such as four- and five-year horizons. Accuracy tapers from 95 % for a 1-year and 72 % for a 2-year prediction horizon to 48 % for a 3-year, 29 % for a 4-year and 36 % for a 5-year horizon.

RELIANCE ON PUBLISHED FINANCIAL STATEMENTS

Most models for predicting the financial stability of any organisation rely on financial ratios to arrive at a predictable conclusion. Financial ratios are used for their objectivity in measurement and are mostly audited. These ratios have some defects in their usage, but despite these criticisms, they are still very relevant.

An initial problem with the financial statements is that the mandate to prepare these accounts can be relative and differs from industry to industry. Those firms which meet specific criteria relating to the asset size, revenue growth, and the number of employees are obliged to publish their statements where the preparation and publishing of the financial statements are not mandatory for unlisted entities. When predicting financial stability or distress based on financial ratios, researchers implicitly assume that the financial statements would give an accurate and fair view of the financial position.

Due to weak internal control systems, published annual financial statements may be unreliable, particularly with smaller entities. However, it has been seen from other bank distress that this statement may need to present an accurate and fair view and that some unhealthy firms have incentives to manipulate or manage their financial statements. This is known as creative accounting (failing firms adjusting their earnings upwards to give a more positive presentation of their financial position).

METHODOLOGY

A case study approach was adopted for this study. The study was meant to establish the financial stability of the banks in the study using the Altman Z score model. The study included banks listed on the Nigeria stock exchange with financial data spanning a minimum of 10 years. All financial institutions in Nigeria resembled the targeted population. However, convenience sampling restricted the study only to these selected banks. Few banks included at the later stage of the research were delisted primarily because of the researcher's inability to get the updated annual report for the period covered in this paper. The financial ratios data (2009 - 2020) extracted from the annual reports of the ten selected banks was used to calculate the Altman z score.

HYPOTHESIS

Based on the objectives of the study and supported by extensive literature reviews, the following hypothesis was validated:

H₀: The Altman Z score is an effective tool for evaluation and measurement of the financial stability in the banking sector

H₁: The Altman Z score is not an effective tool for evaluation and measurement of the financial stability in the banking sector

DATA ANALYSIS AND RESULTS

The analysis results for each bank were extracted through excel spreadsheets, and the results of the overall analysis. The table below shows the results of the Z value of all the banks included in the study. The analysis was undertaken based on the size, the volume of traded equities, the number of employees, and nationwide spread, which separated these banks into 1st and 2nd tier entities.

Starting with the so-called 1st tier banks (FUGAZ), it can be deduced from the data that Guaranty Trust Bank (GTB) and Zenith Bank are highly stable among their peers. United Bank of Africa (UBA) followed with a stable rating. Access Bank did well in three years of the twelve years under study, which is poor considering the rating as 1st tier entity in the industry. A look at the

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company's financials shows that the bank is taking on too many liabilities unrecovered from its recent mergers. The results show that the ratios were stable before Intercontinental Bank Plc was acquired. More recently, the merger with Diamond Bank took the Z score southwards, putting doubt on the entity's going concern status. First Bank of Nigeria (FBN) did poorly compared to its peers, as some banks in the 2nd tier posted better ratings.

FBN results are worrisome, considering the size and volume of equities traded on the Nigerian Stock Exchange. A further look at the analysis from the spreadsheet shows that the company needs to put its asset to better use, as revealed by the ROA ratio computed. A detailed trend analysis and investigation of the activities of this bank will be necessary to forestall another bank distress.

The 2nd tier banks constitute 50% of this research study. They are Fidelity Bank, First City Monument Bank, Union Bank of Nigeria, Sterling Bank and Unity Bank. All the Z scores associated with this group came up with similar results; this came to the distress zone in our benchmark analysis for stability. Except for the Sterling Bank, a stable result was 1.949 in 2015. Other factors will have to be considered for this abysmal result. The results indicated that most banks in this group have zero or low retained earnings, and some have reported negative EBIT for subsequent years. This is evident and worrisome, especially with Unity Bank and Union Bank of Nigeria. From our findings, these banks need capital reconstruction and reduction to boost investors' confidence and secure depositors' funds.

BANK NAME	YEAR	WC/TA	RE/TA	EBIT/TA	MV/TL	RE/TA	Z-SCORE
ACCESS BANK	2009	0.32086062	0.40771763	0.24014482	2.17887853	0.11712587	3.265
	2010	0.30126225	0.05276736	0.27021664	2.00117954	0.10876122	2.734
	2011	0.23574167	0.04548161	0.23997063	1.45954432	0.10173088	2.083
	2012	0.18812351	0.01743884	0.1850487	1.10991547	0.11923161	1.620
	2013	0.17265385	0.01897404	0.24731393	1.00330692	0.07494361	1.517
	2014	0.16599107	0.02578246	0.14763271	0.9583734	0.08051551	1.378
	2015	0.17932202	0.02870827	0.08917583	1.04886408	0.07630684	1.422
	2016	0.16349622	0.0422173	0.08591793	0.94169693	0.06810893	1.301
	2017	0.16098291	0.04809178	0.06321815	0.92497803	0.07848441	1.276
	2018	0.13330253	0.05230041	0.06257856	0.74605604	0.07398747	1.068
	2019	0.10323642	0.04267601	0.04322589	0.56194558	0.06202764	0.813
2020	0.12349013	0.0531826	0.1288178	0.55999284	0.04486694	0.910	
FIDELITY BANK	2009	0.359703075	0.011414249	0.015558249	0.616415952	0.079684896	1.083
	2010	0.339301598	0.020865673	0.059255753	0.567671905	0.116375355	1.103
	2011	0.237551193	0.002470274	0.011556131	0.355420169	0.067128883	0.674
	2012	0.211892471	0.009482261	0.078046393	0.308797524	0.086394855	0.695
	2013	0.181412242	0.009575321	0.027554506	0.256466491	0.117384392	0.592
	2014	0.165241676	0.032585076	0.043132621	0.245858958	0.111540195	0.598
	2015	0.178789694	0.009998847	0.037572764	0.252109833	0.119302895	0.598
	2016	0.171385389	0.027951663	0.028118132	0.239929471	0.117106693	0.585
	2017	0.175196307	0.023724237	0.045970314	0.246176594	0.130686028	0.622
	2018	0.135648297	0.030226591	0.048139147	0.183523498	0.109817354	0.507
	2019	0.132843465	0.028901481	0.047380864	0.179256354	0.103125442	0.492
2020	0.119007247	0.033856051	0.033565349	0.158530605	0.07476176	0.420	
FIRST BANK	2009	0.20144444	0.02134778	0.01902096	0.90175918	0.13012187	1.274
	2010	0.17661668	0.01429956	0.0480262	0.77143781	0.10069875	1.111
	2011	0.15463981	0.02035607	0.04137794	0.66124574	0.07446238	0.952
	2012	0.16528408	0.0322378	0.0960141	0.71403157	0.09016396	1.098
	2013	0.14632521	0.04175646	0.07790437	0.62075483	0.08364459	0.970
	2014	0.14448912	0.03502268	0.07058272	0.61189931	0.08349226	0.945
	2015	0.16671351	0.05484081	0.01709411	0.72120308	0.09484975	1.055
	2016	0.14758682	0.04777131	0.01598723	0.6268575	0.08555999	0.924
	2017	0.1330053	0.02175129	0.0031551	0.56859923	0.08967491	0.816
	2018	0.14518982	0.04181232	0.0386922	0.59780107	0.07801461	0.901
	2019	0.12788695	0.01651896	0.0391865	0.53320371	0.06962718	0.786
2020	0.11941759	0.0241109	0.03851059	0.49398975	0.05004508	0.726	
FIRST CITY MONUMENT BANK	2009	0.33541376	0.03952096	0.00609691	0.71459864	0.07719172	1.173
	2010	0.30027358	0.04747945	0.05530162	0.61474679	0.11636588	1.134
	2011	0.2341562	0	0.05859755	0.44656882	0.10386559	0.843
	2012	0.17436489	0	0.0590157	0.31315244	0.09578082	0.642
	2013	0.1710319	0.01820297	0.05951572	0.30617155	0.10245392	0.657
	2014	0.16456671	0.03141376	0.06756792	0.29275849	0.1008958	0.657
	2015	0.16805847	0.02074455	0.00725235	0.29998183	0.00362292	0.500
	2016	0.1830249	0.03874692	0.01055077	0.33150455	0.00396847	0.568
	2017	0.16840046	0.02499777	0.02085631	0.30069193	0.13873496	0.654
	2018	0.136099	0.01820968	0.02576453	0.23563692	0.11762792	0.533
	2019	0.14432073	0.02868615	0.03981425	0.25181776	0.10863009	0.573
2020	0.13240629	0.0322948	0.03512869	0.22845056	0.09689067	0.525	

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GT BANK	2009	0.216308701	0.020247769	0.086523758	3.826171276	0.1524143	4.302
	2010	0.219609731	0.022920464	0.138805591	3.897641	0.133600498	4.413
	2011	0.172401137	0.021939534	0.127748335	2.908622611	0.078864941	3.310
	2012	0.196053671	0.033393357	0.195974818	3.39792454	0.09815964	3.922
	2013	0.189658969	0.036753611	0.168058467	3.266289271	0.088158351	3.749
	2014	0.190671732	0.036275587	0.163027764	3.287025879	0.085149901	3.762
	2015	0.196575918	0.028331457	0.157765129	3.408749134	0.090801428	3.882
	2016	0.194418136	0.040554257	0.1748657	3.364097621	0.08423009	3.858
	2017	0.221802093	0.051226833	0.194670794	3.94537382	0.09767952	4.511
	2018	0.210103081	0.045372414	0.216416851	3.693105347	0.093377392	4.258
	2019	0.21942612	0.044413493	0.149817041	3.893653062	0.046007143	4.353
2020	0.198234067	0.045000863	0.120747618	3.443192329	0.0414844	3.849	
STERLING BANK	2009	NIL	NIL	NIL	NIL	NIL	NIL
	2010	0.12167595	0	0.04688825	0.10426233	0.11706223	0.390
	2011	0.09742473	0.00733937	0.02263388	0.08164563	0.08955383	0.299
	2012	0.09646393	0.01452315	0.04265381	0.08077005	0.09227784	0.327
	2013	0.10758658	0.01539997	0.04340743	0.09100034	0.0988599	0.356
	2014	NIL	NIL	NIL	NIL	NIL	NIL
	2015	0.143462	0.0175857	0.04547342	0.12546352	0.13783681	1.949
	2016	0.12375309	0.01051835	0.02390579	0.10624686	0.1338918	0.398
	2017	0.11375815	0.00912833	0.02494542	0.09676715	0.10288369	0.347
	2018	0.10640835	0	0.02839161	0.08990679	0.11392747	0.339
	2019	0.12130838	0.00732384	0.02977767	0.10391194	0.10762883	0.370
2020	0.12539969	0.02724185	0.03142821	0.1078255	0.08579335	0.378	
UNION BANK OF NIGERIA	2009	NIL	NIL	NIL	NIL	NIL	NIL
	2010	NIL	NIL	NIL	NIL	0.13032395	0.130
	2011	0.22082167	NIL	NIL	0.71714507	0.07560401	1.014
	2012	0.21178515	NIL	0.01411298	0.68150844	0.11544818	1.023
	2013	0.23855414	NIL	0.01691867	0.78902226	0.12106534	1.166
	2014	0.26360587	NIL	0.08874274	0.89520708	0.13475915	1.382
	2015	0.27959446	NIL	0.04552389	0.9659985	0.11196093	1.403
	2016	0.26024482	NIL	0.04145936	0.88063204	0.10346281	1.286
	2017	0.28317078	0.01569053	0.03155715	0.98217102	0.11256578	1.425
	2018	0.184962203	0.04244401	0.04159891	0.57946591	0.0994065	0.949
	2019	0.16173773	0.01602997	0.04379011	0.49537194	0.08895537	0.806
2020	0.14476396	0.01495126	0.03912058	0.43625253	0.07315842	0.708	
UNITED BANK OF AFRICA	2009	0.16080104	0.02625851	0.05415436	1.77048435	0.15693218	2.169
	2010	0.15724624	0.02536967	0.03768218	1.72544237	0.11005338	2.056
	2011	0.13131515	0.0180448	0.05242594	1.4059411	0.07568667	1.683
	2012	0.13676747	0.03456283	0.07883542	1.47182604	0.09178636	1.814
	2013	0.14045423	0.04258117	0.07715071	1.51676064	0.31888495	2.096
	2014	0.14465162	0.05041862	0.05979303	1.56830093	0.09780713	1.921
	2015	0.18312973	0.06373579	0.07554154	2.06060739	0.1116157	2.419
	2016	0.18470734	0.06072362	0.07491055	2.08158841	0.10627524	2.508
	2017	0.16407249	0.04664254	0.05942491	1.8122093	0.07754041	2.160
	2018	0.12182691	0.0347795	0.05086034	1.29287547	0.07398369	1.574
	2019	0.1295364	0.03049105	0.05589467	1.38459211	0.07432214	1.675
2020	0.11012796	0.02566749	0.03698045	1.15617615	0.05280027	1.382	
UNITY BANK	2009	0.03378231	NIL	NIL	0.01025447	NIL	0.044
	2010	0.17397953	NIL	0.14574233	0.04759929	0.21217694	0.579
	2011	0.14198393	NIL	0.02745342	0.04750619	0.12111803	0.338
	2012	0.15604263	NIL	0.05384411	0.05291317	0.13585446	0.399
	2013	0.08387688	NIL	NIL	0.02660317	0.12931631	0.240
	2014	0.22142672	NIL	0.10890257	0.08010137	0.15154796	0.562
	2015	0.22351622	NIL	0.01743838	0.08103027	0.14145775	0.463
	2016	0.20241951	NIL	0.01216652	0.0718303	0.14081528	0.427
	2017	NIL	NIL	NIL	NIL	0.55351974	0.554
	2018	NIL	NIL	NIL	NIL	0.1643911	0.164
	2019	NIL	NIL	0.04101309	NIL	0.12266754	0.164
2020	NIL	NIL	0.01491105	NIL	0.07950781	0.094	
ZENITH BANK	2009	0.25048347	0.03329591	0.06660639	3.90953184	0.16154821	4.421
	2010	0.23498557	0.04014053	0.07921846	3.60873989	0.09464877	4.058
	2011	0.20097414	0.03650881	0.0783238	2.98134106	0.10006716	3.397
	2012	0.21568658	0.06090314	0.1273586	3.24741591	0.11450761	3.766
	2013	0.19701524	0.06160754	0.10788104	2.91107704	0.10813067	3.386
	2014	0.18884758	0.06345911	0.11421418	2.76785281	0.1076464	3.242
	2015	0.17500746	0.05988043	0.10138476	2.53037017	0.10576491	2.972
	2016	0.17265854	0.07141192	0.10779355	2.49070017	0.10617088	2.949
	2017	0.17328069	0.08337656	0.11566588	2.50118978	0.16288417	3.036
	2018	0.16346431	0.06741857	0.12793061	2.33715163	0.10856825	2.805
	2019	0.17199291	0.07779826	0.12144565	2.47949152	0.0624297	2.913
2020	0.1524604	0.07511716	0.09726658	2.1569239	0.04806914	2.530	

Predicting Financial Stability of Banks in Nigeria Using the Altman Z Score Model.

FACTORS THAT CONTRIBUTE TO FINANCIAL INSTABILITY AND DISTRESS

In our third research objective, we stated that we were going to enlist some factors contributing to a company moving from solvent to distressed. After careful analysis and many investigations on the relevant financial ratios of the listed entities under study, we concluded the following.

1. When the value of a bank's assets falls below the value of its liabilities for a considerable period of, say, five years, this will cast doubt on the financial stability of such an entity.
2. Reporting losses for a consequent period of years can lead to financial distress.
3. Reporting zero or negative retained earnings for more than five years.
4. When the share price stays at a nominal value for more than five years. This will invariably undermine the market value of equity and put the z score in a distress zone for any firm.

CONCLUSIONS, RECOMMENDATIONS, AND IMPLICATIONS OF FINDINGS CONCLUSIONS

It is concluded from the study that the Altman Z score model is a precautionary tool in determining the financial stability of firms and especially in the financial services industry in Nigeria, to forestall any distress. Our findings show impressive results from the classified 1st tier category of Guaranty Trust Bank, Zenith Bank, and United Bank of Africa. The Z scores predictive ability shows that these banks are stable for the eleven years under review.

Access Bank Plc shows some reservations as to the long-term stability of the entity. A review of the Z score indicated that the bank was stable for three years of 2009-2011. Findings from the published financial statements show that the bank may be taking in too many liabilities from its recent mergers and acquisitions.

First Bank of Nigeria did very poorly when compared to its peers. In the twelve years under review, its activities. The 2nd tier institutions posted similar results. This could result from the banks being similar in size and equity, with the share prices hovering around the equal range. They can be referred to as stable except for Union Bank Plc and Unity Bank Plc, as contradictory to the Z score results.

Results for Union Bank Plc and Unity bank Plc are disturbing and need urgent and immediate regulatory attention. Retained earnings for these banks have been eroded over the years under review. This stems from zero or low figures from earnings before interest and tax (EBIT).

Based on these conclusions, information is more readily available to investors and creditors in making investment decision with more attention to ratio Retained Earning to Total Assets, Earning before Interest and Taxes to Total Assets, Market Value of Equity to Total Liabilities, Sales to Total Assets in Multiple Discriminant Analysis, and Debt Ratio, Return on Assets, Working Capital to Total Assets.

RECOMMENDATIONS

The following are recommended:

- THE Altman Z score model is a tool used to predict financial stability and distress in the financial services industry. Regulatory agencies recommend this model to forestall commercial banks' failures.
- Banks should have a tighter grip on their administration overheads to reduce their negative impacts on earnings before interest and tax (EBIT).
- Retained earnings as a key index in the computation of the Z score. Companies need to have this input on the positive side. The major fallback on banks like Union Bank and Unity Bank was their financial statements' zero or negative values.

SUGGESTION FOR FURTHER STUDY

There are some limitations in this research study that requires improvement in future research. The study should be expanded to include more commercial banks to appraise the financial stability and foretell possible distress and plausible suggestions for avoiding the pitfalls, especially in the financial services industry. Other Z score models like Kida and Ohlson's model should be explored and comparison modelled with the Altman Z score to get a line of best fit on which model is more accurate. This research paper focuses mainly on the financial services industry; other research can broaden the scope to include manufacturing and the fastmoving consumer goods industry. Future research can add more criteria for financial distress so that the results can be more accurate.

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