



## CORPORATE BANKRUPTCYPREDICTIONS: EVIDENCE FROM SELECTED BANKS IN NIGERIA

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### ABSTRACT

*The study is set to examine corporate bankruptcy threats among selected banks in Nigeria. Data were collected from the annual reports of banks 2007-2011 available in 2010-2011 facts book of Nigerian Stock Exchange. In addition to descriptive statistics, t-test difference between mean, analysis of variance (ANOVA) test and multi-discriminant model were used in analyzing the collected data. The study identified five financial ratios – working capital/Total assets, retained earnings/total asset, EBIT/total asset, Equity/Total Asset, Gross earning/total asset that could predict financial distress. Predicated on this, the study recommended that working capital, retained earnings, and governance framework among others should be closely monitored and recommended that there should be adequate supervision from the Central Bank of Nigeria and National Deposit Insurance Commission to ensure compliance and effectiveness of the banking sector in Nigeria and Banks should make use of financial ratio in the assessment of their financial performance.*

**KEYWORDS :Corporate Bankruptcy, predictions, banks, Nigeria.**

### 1.0INTRODUCTION:

The financial sector with special reference to banking has come under the searchlight in recent years as a result of the problem rocking the industry in terms of failure and eventual death(bankruptcy).The failure experienced in the sector over the years can be captured by the number of failed banks, the debt and the extent of required capitalization, the proportion of non-performing credits loss of depositors fund and the general impact on the economy all of which underscore the importance of the sector(Olaniyi,2007). The worst scenario were observed in the banking scandals involving the Chief Executives of banks in Nigeria, where they were accused of irregular financial reporting and corporate governance dysfunctions. These banks had been living on bubble capital all along giving false impression about their actual state and coupled with high debt portfolio that were not disclosed in their financial statements (Sanusi, 2010, ). For instance in between these banks-Oceanic Bank, Union Bank, Afri Bank, Fin- Bank and Intercontinental Bank, out of a total loan portfolio of 2.8 Trillion Naira had aggregate non-performing loans of 1.143 Trillion Naira, a whopping 40.81% of the total. Margin loans granted for investment in the capital market, stood at N456.28 billion; Exposure to oil and gas sector stood at N487.02 billion. With all these credits, lending dried up and the capital market took a huge hit as the money market that support its meteoric rally halted. The banks immediately came face to face with capital-liquidity problems (Osisioma, 2009). In the circumstance, shareholders and depositors funds were wiped away in many banks and they were kept liquid by the special expanded window discount then opened. By July 2009, the five banks had outstanding balance of N127.85 billion at the Expanded Discount Window (EDW), while their net guaranteed inter-bank loans stood at N253.50 billion. The scenario smirks of a mess.

Corporate bankruptcies represent the indicator to prevent allocation of resources from further channeling into failing business (Hochang,1985).Bank distress is the forerunner of bank failure. This involves situation where a financial institution or firms have liabilities exceeding the market value of its asset which may lead to runs and other portfolio shifts and eventual collapse of the financial system. (Mayuku,Ogude,Ibeh and Ohwofasa,2012).The determination of corporate bankruptcy is of critical importance to all stakeholders.Each of those stakeholders ( creditors, customers, investors, employers and management) given their various roles would have somewhat different agendas but with the common objectives being that the company has the best possible state of health and continues as a going concern into foreseeable future(Fufa,2011).

Incessant systematic distress syndrome in the banking sector over the years is worrisome and thus calls for a pressing need for assess-

ing the performance of banks to enhance early identification of those that show signs of ill-health so that preventive measures could be undertaken to prevent ultimate failure (Adeyeye,Fajembola,Olopete and Adedeji,2012). The high individual and social costs of corporate bankruptcy make the problem of bankruptcy prediction very important for managers, banks, investors, policy makers and auditors.(Pociecha,2005)

This has wrecked most business unit while many homes have been negatively affected by loss of funds. However, some households and businesses that opted for alternative means of keeping their funds at offices and homes loses such to bandits and at worse cases their lives inclusive.(Olaniyi,2007).

To avoid bank failure, there is the dire need to detect early warning signals through financial ratio analysis in order to protect ailing banks so that corrective measures can be applied to avert its failure and dire consequences ( Aniani Ugwunta, 2012, the question therefore before us is; To what extent can financial ratios have effect on predicting corporate bankruptcy. It is to this crucial issue, the researcher intends to address. To achieve this, it formulated the following hypotheses to guide the study thus;

1. Ho: Financial ratios have no effect on the prediction of corporate Bankruptcy in Nigerian banks.  
Hi: Financial ratios have effect on the prediction of corporate bankruptcy in Nigerian banks.
2. Ho: Weak and ineffective corporate Governance does not lead to corporate Bankruptcy in Nigerian banks.  
Hi: Weak and ineffective corporate Governance lead to corporate Bankruptcy in Nigerian banks.
3. Ho: Internal control is not a critical factor in the determination of corporate Bankruptcy in Nigerian banks.  
Hi: Internal control is a critical factor in the determination of corporate Bankruptcy in Nigerian banks.

The rest of the paper is organized under the following sub headings: the second section deals with theoretical framework. The third section underlines the methodologies employed, the variables and the method. The fourth section describes the empirical results and discussions obtained using multi discriminant analysis. Finally in the fifth section comes the summary of findings, conclusion and recommendation.

## 2.0 REVIEW OF RELATED LITERATURE

### 2.1 THEORETICAL FRAMEWORK

In the discussion on the Beaver (1966) model, failure means bankruptcy. Beaver used ratio analysis to examine 79 failed firm from 1954 to 1964. This 'failed' set was paired with non-failed samples of the same industry classification and asset size. He selected 30 financial ratios based on their frequent appearance and performance in prior studies and categorized them into the following six groups: cash flow ratios, net income ratios, debt to total asset ratios, liquid asset to total asset ratios, liquid asset to current debt ratios and turnover ratios. Beaver's study tested the predictive ability of financial ratios to determine failure on a univariate basis. His study concentrated in analyzing the ratios by the methods of comparison of mean values, dichotomous classification tests and analysis of likelihood ratios. He concluded that ratios distribution of failed firms begins to deteriorate at least five years before failure. Beavers study confirmed the importance of using financial ratio in the analysis of business bankruptcy. However, the study was weak in terms of explanatory power because only a univariate approach had been applied or in other words, only the discriminatory power of independent ratio had been found. Lin and Piesse in Mosalakae (2007) contends that the problem with the study by Beaver (1966) is the reliance on a single ratio rather than considering the numerous possible factors that may, collectively give indications of future corporate failure.

In related development, Altman studied 66 corporations, with 33 firms in each of the groups. One group has gone bankrupt and one group is still in business. In terms of asset-size, and industry the groups are not homogeneous. Altman also chooses a paired sample as far as asset-size, industry type and period of reporting are concerned. Initially a list of 22 potentially helpful ratios was compiled based on popularity (by financial analysts) and relevance. These are grouped into five categories which include liquidity, profitability, leverage, solvency and activity ratios. Finally, five are selected as doing the best job predicting corporate failure. The choice ratios are based on evaluation of inter-correlation and best result of numerous computations. The final discriminant function is as follows:-

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

WHERE

- X1 = Working capital/total assets (WC/TA)
- X2 = Retained earnings /total assets (RE/TA)
- X3 = Earnings before interest & taxes/total asset (EBIT/TA)
- X4 = Market value of equity/Book value of total liabilities ( MVE/TL)
- X5 = Sales/total assets(S/TA)

He tested the discriminating power of the proposed model. He found the following cut-off points of variable (z)

1.81 Or less – a high probability of bankruptcy (Zone 1 – no errors in bankruptcy classification)

3.00 Or above -a low probability of bankruptcy classification (Zone 11 - no errors in non bankruptcy classification)

1.81 < Z < 2.99 -Area of uncertainty (grey area)

Altman, Haldeman and Narayanan (1977) constructed a second – generation model with several enhancements to the original z –score approach. The two samples of firms consist of 53 bankrupt firms and a matched sample of 58 non bankrupt entities examined in the period 1969 -1975. 27 potential variables of financial ratios and other measures were analyzed. After an iterative process of reducing the number of variables, seven variables have been taken into the model (Altman, 2000).

- X1 = return on Assets
- X2 = Stability of earnings
- X3 = Debt service
- X4 = cumulative profitability
- X5 = Liquidity
- X6 = Capitalization
- X7 = Firms size.

Ohlson (1980) developed a model under this umbrella. He states that the model logically and systematically develops probabilistic estimates of failure; Ohlson explains that he chose the conditional logit analysis to avoid some fairly well known problems associated with multivariate discriminant analysis (MDA). Ohlson study (1980) relies on observations from 105 failed firms and 2058 non failed firms. He selected the variables or frequent mention in the literature. Three models (1, 2 and 3) were estimated and comprised an intercept (cut – off) as well as nine independent variables.

- SIZE = Log (total Assets/GNP Price –level index)
- TLTA = Total Liabilities divided by total assets
- WCTA = Working Capital divided by total assets
- CLCA = Current Liabilities divided by current assets
- OENEG = one if total Liabilities exceeds total assets, zero otherwise
- NITA = Net income divided by total assets
- FUTL = Funds provided by operations divided by total liabilities
- INTWO = One if net income was negative for the last two years, zero otherwise.
- CHIN

These predictors form the basis for the probabilistic model of bankruptcy. According to Mosalakae (2007) the most important predictor is said to be SIZE.

### 2.2 Review of Empirical Literature

Ani, W.C. and Ugwunta, D.O. (2012) Studied ratio analysis, in particular the multi-discriminate analysis (MDA) model in predicting and detecting failing business in the manufacturing and other sectors of the Nigerian economy. Data were gathered for a five year period for eleven firms sampled from manufacturing, oil marketing and the conglomerates sector of the Nigeria economy. The result revealed that MDA is a veritable tool for assessing the financial health of firms in Nigeria. Accordingly, MDA has high predictive power to deduce from a set of ratios the likelihood of failure or otherwise.

Chung-tan and Holdsworth (2008). In their study, utilized multivariate discriminate analysis and artificial neural network to create an insolvency predictive model that could effectively predict any future failure of a finance company value in New Zealand. Financial ratios obtained from corporate balance sheets were used as independent variables while failed/non-failed companies were the dependent variable. The results indicate that the financial ratio of failed companies differ significantly from non-failed companies. Failed companies were also less profitable and less liquid and had higher leverage ratios and lower quality assets.

Wang and Campbell (2010) studied data from Chinese public listed companies for a period of September, 2000–September, 2008 to test the accuracy of Altman's Z-score model in predicting failure of Chinese companies. Prediction accuracy was tested for three Z-score variations: Altman's Original Model, a re-estimated Model for which the coefficients in Altman's model were recalculated and a revised model which used different variable. All the three models were found to have significant predictive ability. The re-estimated model has higher predictive accuracy for predicting non-failed firm but Altman's model has higher predictive accuracy for predicting failed firm. The revised Z-score model has a higher prediction accuracy compared to both the re-estimated Altman model and Altman original model. Their study indicated that Z-score model is a helpful tool in predicting failure of publicly listed firm in China.

Oforegbunam (2011) studied benchmarking incidence of distress in the banking industry in Nigeria on Altman Scale using 5 banks that have been declared distress by central bank of Nigeria (CBN). The study found out that the financial ratios remain a valid index for accessing the financial health of banks as posits by Altman; sustained decrease in the following ratios: working capital to total assets; Retained earnings to total book debt; gross earnings to total asset are signals of distress in banks. It therefore follows that level of capital adequacy, Assets Quality, earning strength; liquidity sufficiency and management competency are critical indices for measuring the health state of banks in Nigeria.

Ukessays (2014) Literature Review studied the importance of financial ratios in evaluation of firm's financial position and performance. Ten

financial ratios covering four important financial attributes namely: liquidity, activity and turnover, profitability and leverage ratios were examined under a two-year prior to bankruptcy. Multiple Discriminate Analysis (MDA) was used as statistical technique with the help of spss 17.0 version on a sample of twenty six (26) Bankrupt and 26 non-bankrupt firm two year prior to bankrupt with an asset range of N5million to N750million from 1996-2010. All companies are registered with Karachi Stock Exchange. The result showed that profit Margin, debt to equity ratio and return on asset has a significant contribution in prediction of corporate bankruptcy. Their estimate provides evidence that firms with z-value below zero fall in 'Bankrupt' while firms with z-value above zero fall into 'Non-Bankrupt'. The model achieved 82% predictive accuracy from the original selected cases and 100% predictive accuracy from original not selected cases when it applied to forecast bankruptcy on the underlying sample.

Olaniyi (2007) evaluated the susceptibility of Nigeria banks to failure with a view to discriminate between sound and unhealthy banks as a guide to investment decisions using First Bank and Trade Bank as case studies. Multivariate analysis of Z-score was carried out on the secondary data obtained from the two Banks annual reports and accounts between 1998-2003 and it was concluded that the model can measure accurately potential failure of unhealthy banks but inaccurately failure status of sound banks. A more rigorous study involving more healthy and unhealthy banks is recommended to establish the accuracy of prediction of the model.

Zeytinoglu, and Akarim, (2013) studied 20 financial ratios to predict the financial failure of firm listed on Istanbul stock exchange National – All share index and developed the most reliable model by analyzing these ratios statistically. It identified that there are 5, 3 and 4 important financial ratios in the discrimination of successful and unsuccessful firms in 2009, 2010 and 2011 respectively. Thus, the discrimination function is formed by using these variables: capital adequacy and networking capital/total assets ratios are seemed to be significant in all the three periods. According to formed model, classification successes are determined as 88.7%, 90.4% and 92.2% in 2009, 2010 and 2011 years respectively. These high accuracy ratios indicate that developed models for three years are efficient to determine the financial failure of the firms traded.

Eksi, (2011) used CART and classification models to predict financial failure of Istanbul stock exchange. Yildiz (2001) Modelled the risk of financial failure by using artificial Neural Network model and concluded that artificial Neural Network model is more successful than multivariate statistical models.

Yuzbosioglu, Yoruk, Demir, Bezirci and Arslan (2011) tested the financial failure of Turkish textiles firms traded in Istanbul stock exchange by applying factor analysis and logistic regression analysis.

**4.0 DATA PRESENTATION AND ANALYSIS  
COMPUTED Z-SCORE**

AITMAN WEIGHT			X1	X2	X3	X4	X5	TOTAL
BANK	YEAR	DATA POINT	1.2 * WC/TA	1.4* RE/TA	3.3* EBIT/TA	0.6* MVE/TL	0.999 * GE/TA	Z-SCORE
ACCESS BANK	2011	1	-0.3790	-0.0040	0.0400	0.0820	0.0850	-0.1760
	2010	2	-0.0180	-0.0020	0.0660	0.1670	0.1130	0.3260
	2009	3	0.0840	0.0160	0.0400	0.1880	0.1020	0.4300
	2008	4	0.1180	0.1530	0.0920	0.1590	0.1030	0.6250
	2007	5	0.1210	0.0090	0.0630	0.0115	0.0580	0.2625
DIAMOND BANK	2011	6	-0.1820	-0.0040	-0.0740	0.0726	0.1289	-0.0585
	2010	7	0.0213	-0.0120	0.0270	0.1317	0.1529	0.3209
	2009	8	-0.0183	-0.0060	-0.0390	0.1720	0.1157	0.2244
	2008	9	0.0932	-0.0190	0.0590	0.1290	0.0853	0.3475
	2007	10	0.0404	-0.0110	0.0840	0.0728	0.0531	0.2393

**3.0 RESEARCH DESIGN AND METHODOLOGY**

The study employed the multiple discriminant analysis models in assessing the bankruptcy status of Nigerian banks. The population of this study consists of 21 licensed commercial banks in Nigeria. The population boundaries are defined by the time period from 2007 to 2011. 15 banks were randomly selected from the commercial banking sector of Nigerian economy. The sample size was influenced majorly by the availability of data for the selected banks. The banks include:-

Access Bank, Diamond Bank, Ecobank, Fidelity Bank, First Bank, First city Monument Bank, GT Bank, Skye Bank, Stanbic IBTC Bank, Sterling Bank, UBA, Union Bank, Unity Bank, Wema Bank, Zenith Bank.

**3.1 MEODEL SPECIFICATION**

The collected data were analyzed using the required financial ratios by Altman. The model used in this study is given as Altman's Z- score .

$$Z = 1.2 \times 1 + 1.4 \times 2 + 3.3 \times 3 + 0.6 \times 4 + 0.999 \times 5$$

Where

- X1 = Working Capital to total Assets
- X2 = Retained Earnings to Total Assets
- X3 = Earnings before Interest and Taxes to Total Assets
- X4 = Market Value of Equity to Total Liabilities
- X5 = Gross Earning to Total Assets
- Z = Overall index

**The decision Rule is that:**

- 1.81 or less – a high probability of bankruptcy
  - 2.99 or above – a low probability of bankruptcy
  - 1.81 < Z > 2.99 - Area of uncertainty (grey area).
- Hypothesis 1 was tested using one way ANOVA Model with 0.05 degree of freedom

$$\text{Model } x_{ij} = \mu + a_i + e_{ij}$$

Where

- Xij = Ratio of the total mean
  - μ = a constant
  - ai = effect of financial ratios
  - eij =error
- While chi-square was used to test Hypothesis 2 and 3  
 $X^2 = (fo - fe)$   
 fe

Decision Rule

Accept Ho, if calculated  $x^2$  is less than tabulated  $x^2$  and Reject Hi

Reject Ho, when calculated  $x^2$  is greater than tabulated  $x^2$  and accept Hi

ECOBANK	2011	11	-0.3711	0.0300	-0.0129	0.0395	0.0673	-0.2472
	2010	12	-0.0090	-0.0038	0.0155	0.1174	0.1283	0.2484
	2009	13	0.0145	-0.0113	-0.0551	0.1564	0.1681	0.2726
	2008	14	0.0130	0.0056	0.0069	0.2842	0.1274	0.4371
	2007	15	-0.5676	0.0244	0.1069	0.0755	0.1049	-0.2559
FCMB	2011	16	0.1229	0.0220	0.0623	0.1459	0.1335	0.4865
	2010	17	0.1848	0.0198	0.0553	0.2002	0.1152	0.5753
	2009	18	0.2422	0.0098	0.0127	0.2237	0.0944	0.5828
	2008	19	0.2591	0.0137	0.0662	0.2124	0.1321	0.6835
	2007	20	0.2777	0.0183	0.1339	0.1991	0.1090	0.7380
FIDELITY BANK	2011	21	0.0133	0.0129	0.0342	0.1367	0.0944	0.2914
	2010	22	0.0601	0.0209	0.0593	0.2365	0.1163	0.4931
	2009	23	0.1418	0.0100	0.0190	0.2380	0.1054	0.5142
	2008	24	0.1918	0.0175	0.0637	0.2067	0.1102	0.5900
	2007	25	0.1699	0.0259	0.0938	0.1717	0.0895	0.5508
FIRST BANK	2011	26	0.0691	0.0209	0.0762	0.0886	0.1043	0.3591
	2010	27	0.0529	0.0143	0.0484	0.1036	0.1005	0.3197
	2009	28	0.0500	0.0018	0.0314	0.1049	0.0928	0.2810
	2008	29	0.1190	0.0087	0.0913	0.1321	0.1071	0.4583
	2007	30	0.1194	0.0270	0.1142	0.1901	0.1013	0.5520
GTB	2011	31	0.2328	0.0266	0.1343	0.1043	0.1171	0.6152
	2010 2010	32	0.2088	0.0230	0.1389	0.1344	0.1336	0.6387
	2009	33	0.0288	0.0203	0.0865	0.1319	0.1524	0.4199
2008	34	0.1020	0.0228	0.1218	0.1439	0.1051	0.4956	
2007	35	0.1044	0.0168	0.1208	0.2479	0.1063	0.5961	
SKYE BANK	2011	36	-0.0632	0.0193	0.0232	0.0818	0.1130	0.1741
	2010	37	-0.0627	0.0273	0.0595	0.1129	0.1169	0.2539
	2009	38	-0.0592	0.0135	0.0044	0.1001	0.2077	0.2665
	2008	39	-0.1147	0.0217	0.0752	0.0865	0.1163	0.1851
	2007	40	0.2052	0.0186	0.0335	0.0589	0.0911	0.4073
STANBIC IBTC BANK	2011	41	0.0166	0.0265	0.0670	0.1082	0.1215	0.3398
	2010	42	0.0319	0.0449	0.1162	0.1718	0.1474	0.5123
	2009	43	-0.0524	0.0437	0.1003	0.1888	0.1754	0.4558
	2008	44	-0.0182	0.0477	0.1376	0.1813	0.1744	0.5228
	2007	45	0.0724	0.0379	0.1195	0.2000	0.1167	0.5465
STERLING BANK	2011	46	-0.7458	0.0073	0.0190	0.0530	0.0895	-0.5770
	2010	47	-0.0378	-0.0010	0.0059	0.0629	0.0109	0.0408
	2009	48	-0.1712	0.0463	-0.1734	0.0631	0.2109	-0.0244
	2008	49	-0.1028	0.0208	0.0521	0.0818	0.1572	0.2091
	2007	50	-0.1221	0.0063	0.0672	0.1154	0.1494	0.2162

UBA	2011	51	-0.1354	0.0036	0.0142	0.0577	0.0950	0.0351
	2010	52	-0.1260	0.0143	0.0323	0.0749	0.1144	0.1099
	2009	53	-0.0379	0.0165	0.0290	0.0823	0.1592	0.2492
	2008	54	0.0191	0.0246	0.0957	0.0799	0.1127	0.3320
	2007	55	0.0630	0.0256	0.0914	0.0923	0.0948	0.3671
UNION BANK	2011	56	-0.0920	-0.3542	0.3782	0.1353	0.0755	0.1427
	2010	57	-0.5251	-0.3326	0.0140	-0.0622	0.1302	-0.7757
	2009	58	0.1580	-0.3455	-0.6656	0.0757	0.1012	-0.6762
	2008	59	-0.1086	-0.0361	-0.2059	0.0432	0.1144	-0.1930
	2007	60	0.0030	0.0483	0.0033	0.0805	0.1263	0.2614
UNITY BANK	2011	61	-0.1644	-0.0554	0.0275	0.0805	0.1263	0.0144
	2010	62	-0.2263	-0.0665	0.1449	0.1017	0.2119	0.1657
	2009	63	-0.4224	-0.1261	-0.2699	0.0171	0.1798	-0.6215
	2008	64	-0.3010	-0.0416	-0.1928	0.0335	0.1147	-0.3870
	2007	65	-1.2994	0.0131	0.0238	0.6178	0.1176	-0.5271
WEMA BANK	2011	66	-0.2806	-0.2234	0.1399	0.0187	0.1276	-0.2179
	2010	67	-0.1615	-0.1884	0.1999	0.0470	0.1003	-0.0028
	2009	68	-0.1218	-0.7262	-0.2870	-0.1402	0.1261	-1.1491
	2008	69	-0.5540	-0.5792	-0.8580	-0.1229	0.1386	-1.9755
	2007	70	-0.4561	-0.6122	-0.8609	-0.0280	0.1646	-1.7926
ZENITH BANK	2011	71	0.0110	0.0449	0.0868	0.1183	0.1056	0.3667
	2010	72	0.0666	0.0462	0.0871	0.1424	0.1015	0.4439
	2009	73	0.0966	0.0378	0.0696	0.1533	0.1669	0.5242
	2008	74	0.1610	0.0455	0.0970	0.1462	0.1279	0.5776
	2007	75	0.1126	0.4060	0.0934	0.1042	0.1054	0.8215

Source: Author's computation from annual reports and accounts of selected banks.

According to table 4.1 above, all banks scored less than 1.81 which is the bench mark. The implication of this is that all the banks have financial difficulties and in bankruptcy zone using Altman's Z – score model.

**TEST FOR HYPOTHESIS**  
**HYPOTHESIS 1**

Ho: Financial ratios have no effect on the prediction of corporate bankruptcy.

Hi: Financial ratios have effect on the prediction of corporate bankruptcy.

From table 3 in Appendix A  $T_{.} = 2.5721$  ,  $x = 0.0114$

Estimating the effects of financial ratios

$$a_i = X_i - \bar{X}$$

$$x_1 = -0.0625, x_2 = -0.0389, x_3 = 0.0017, x_4 = 0.1063, x_5 = 0.1079$$

Calculation of sum of squares

$$SSU = \frac{T_{.}^2}{N} = \frac{(2.521)^2}{75} = 0.0882$$

$$SSa_i = \sum \frac{T_i^2}{N_i} - 0.0882$$

$$= \frac{(-0.7666)^2 + (-0.4126)^2 + (0.1959)^2 + (1.7653)^2 + (1.7901)^2}{15}$$

$$SSa_i = 0.4745 - 0.0882 = 0.3863$$

$$SSe_i = \sum x_i^2 - 0.4745$$

$$= 1.4680 - 0.4745 = 0.9935$$

**ANOVA TABLE 4.2**

SV	Degree of Freedom(D.F)	Sum of Squares(SS)	Mean of Squares (MS)	F- Ratio	F-tab
Constant ( $\mu$ )	1	0.0882	-	-	-
Financial Ratio (a <sub>i</sub> )	4	0.3863	0.0966	6.80	2.48
Error (e <sub>i</sub> )	70	0.9935	0.0142	-	-
Total	75	1.4680			

Since F-ratio = 6.80 > F-tabulated = 2.48, I will reject the Ho.

Then determining the financial ratio with the highest effect in the prediction of bankruptcy, the paired t-test is used in order to compare the effects.

From the estimation of effects

$$x^1 < x^2 < x^3 < x^4 < x^5$$

(I) comparing  $x^1$  and  $x^2$

Ho:  $x^1 = x^2$  Vs Hi:  $x^1 < x^2$ , at  $\alpha = 0.05$

$$T\text{-calculated} = |d| = 0.0346 = 6.07$$

Sd 0.01280

$$\frac{1}{\sqrt{n}}$$

$$\frac{1}{\sqrt{5}}$$

t-tabulated =  $t_{4,0.05} = 2.13$

Since t-calculated = 6.07 > t-tabulated = 2.13, I will reject  $H_0$ , then  $x_2$  is having greater effect than  $x_1$

(ii) Comparing  $x^2$  and  $x^3$

$H_0: x^2 = x^3$  vs  $H_1: x^2 < x^3$ , at  $\alpha = 0.05$

$$t\text{-calculated} = \frac{|d|}{\frac{sd}{\sqrt{n}}} = \frac{0.0546}{\frac{0.4260}{\sqrt{5}}} = 4.54$$

t-tabulated =  $t_{4,0.05} = 2.13$

Since t-calculated = 4.54 > t-tabulated = 2.13, I will reject  $H_0$ , then  $x_3$  is having greater effect than  $x_2$

(iii) Comparing  $x_3$  and  $x_4$

$H_0: x_3 = x_4$  vs.  $H_1: x_3 < x_4$

$$t\text{-calculated} = \frac{|d|}{\frac{sd}{\sqrt{n}}} = \frac{-0.5685}{\frac{0.4260}{\sqrt{5}}} = 2.98$$

t-calculated =  $t_{4,0.05} = 2.13$

Since t-calculated = 2.98 > t-tabulated = 2.13, I will reject  $H_0$ , then  $x_4$  is having greater effect than  $x_3$

(iv) Comparing  $x_4$  and  $x_5$

$H_0: x_4 = x_5$  vs.  $H_1: x_4 < x_5$ , at  $\alpha = 0.05$

$$T\text{-calculated} = \frac{|d|}{\frac{sd}{\sqrt{n}}} = \frac{0.6788}{\frac{0.2677}{\sqrt{5}}} = 5.67$$

t-tabulated =  $t_{4,0.05} = 2.13$

Since t-calculated = 5.67 > t-tabulated = 2.13, I will reject  $H_0$ , then  $x_5$  is having greater effect than  $x_4$ .

Therefore, the financial ratio GE ( $x_5$ ) is having the greatest effect in the prediction of bankruptcy. TA HYPOTHESIS 2

$H_0$ : weak and ineffective corporate governance does not lead to corporate bankruptcy.

$H_1$ : weak and ineffective corporate governance leads to corporate bankruptcy.

Contingency Table for Hypothesis 2

	OBSERVED	EXPECTED
YES	70	37.5
NO	5	37.5
TOTAL	75	75

Extracted from responses

NOTE—Since  $n = 75$ , the expected value is  $75/2$  because only 2 categories of data are involved.

$$X^2 = \frac{(fo - fe)}{Fe}$$

fo = observed frequency

Fe = Expected frequency

Fo	fe	(fo-fe)	(fo-fe) <sup>2</sup>	(fo-fe) <sup>2</sup> /fe
70	37.5	32.5	1056.25	28.17
5	37.5	-32.5	1056.25	28.17

$X^2$  calculated = 56.34

The critical value of  $x^2$  statistics at 1df with 0.05 level of significance = 3.841.

The calculated  $x^2$  (56.34) is greater than critical  $x^2$  (3.841). Therefore,

we reject the null hypothesis and accept the alternate hypothesis which states that weak and ineffective corporate governance leads to corporate bankruptcy

Statistical test of Hypothesis 3

$H_0$ : Internal control is not a critical factor in the determination of corporate bankruptcy in Nigerian banks.

$H_1$ : Internal control is a critical factor in the determination of corporate bankruptcy in Nigerian banks.

CONTINGENCY TABLE FOR HYPOTHESIS 3

	OBSERVED	EXPECTED
YES	50	37.5
NO	25	37.5
TOTAL	75	75

Extracted from Responses

Fo	fe	fo-fe	(fo-fe) <sup>2</sup>	(fo-fe) <sup>2</sup> /fe
50	37.5	12.5	156.25	4.16
25	37.5	-12.5	156.25	4.17

$X^2$  calculated = 8.33

Since  $x^2$  calculated (8.33) is greater than the critical  $x^2$  (3.841), we reject the null hypothesis and accept  $H_1$  which states that Internal control is a critical factor in the determination of corporate bankruptcy in Nigerian banks.

4.0 RESULTS AND DISCUSSIONS

On application of financial figures of variables extracted from data on table 4.1, the ratios  $x_1$ ,  $x_2$ ,  $x_3$ ,  $x_4$  and  $x_5$  value of each bank are obtained as shown in table 4.2

(i) Working Capital to Total Assets Ratio

In this ratio, highest percentage came from FCMB in 2007 23% which means that it is having lower financial difficulties and higher liquidity compared with other banks while lowest percentage came from Unity Bank in 2007 with -1.085% meaning it is having higher financial difficulties and lower liquidity than the rest of the banks.

(ii) Retained Earning to Total Assets

In this ratio, highest percentage 3.4% from Stanbic IBTC Bank in 2008 meaning that it has high profitability by utilizing its assets in the sector more effectively while the lowest percentage of -52% was scored by wema Bank.

(iii) Earnings Before Interest and Tax to Total Assets

Here, Union Bank in 2011 scored highest 12% which means that the bank maximized its productivity by using its assets more effectively while Wema in 2007 scored lowest -26 %.

(iv) Market Value of Equity to Book Value of Liabilities

Ecobank in 2008 scored highest percentage of 47% which means that the bank could guarantee payment of its liabilities from the equities while Wema Bank in 2009 scored lowest 23.4%

(v) Gross Earning To Total Assets

Unity Bank in 2010 scored highest 21.2% meaning that the bank assets are well utilized while Sterling Bank in 2010 scored lowest percentage of 18.7%.

Using Altman's cut off zone of 1.81, all the 15 banks fall below the cut off zone (ie bankruptcy region). The possible weaknesses of banks are:

- > High level of debt
- > Poor liquidity (i.e.) low or negative working capital
- > Profitability that does not sufficiently feed liquidity as well as retained earnings.
- > Weak governance practices which contributed to failure of banks in Nigeria. Compliance to the codes of governance was made mandatory but sanctions for non compliance were not implemented.

#### 4.1 POLICY CONSIDERATION

This paper has offered situations in determining the likelihood of corporate bankruptcy. This is presented on the likely premises that financial ratios provide early warning signals which firms should watch closely. Although, it does not offer 100% accuracy; but offers an indication to vulnerable areas where accounting practitioners, auditors, managers and regulators are likely to concentrate their time, labour and resources in endless chase of red-flags which according to Pincus (1989) takes a considerable length of time and contains numerous questions which may not focus on the targets.

#### 5.0 CONCLUSION AND RECOMMENDATIONS

The early warning signal constructed in this study can be used as analytical decision support tool in both on-site and off-site bank monitoring system to detect the banks that are experiencing serious problems. The ability to detect any problem in bank condition from available data will also lessen the need for on-site examination and equally provide very valuable information to the decision makers as well as other interested parties. It is important to understand the early warning indicators and implications of corporate financial distress. Using Altman's Z score, this study identified five financial ratios – working capital/total assets, retained earnings/total asset, EBIT/total asset, Equity/Total Asset, Gross earning/total asset that could predict financial distress. Consequently, the paper recommended that Management should exhibit good governance practices to ensure soundness of banks and avoid market losing confidence on their ability to properly manage its assets and liability including deposits which could trigger bank liquidity crisis. Secondly, that Adequate measures should be taken by Regulatory authorities (CBN, NDIC, etc.) to enhance efficiency and effectiveness of governance frameworks in the

Banking sector and sanction for non-compliance implemented.

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