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Corporate governance attributes and bankruptcy in Nigeria, using Altman bankruptcy prediction model

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Abstract
This study investigated the effect of on corporate governance on bankruptcy deposit money banks quoted on Nigeria stock exchange. Specifically, the study; determine the relationship between board size and bankruptcy in banking sector using Altman bankruptcy prediction model; ascertain the relationship between audit tenure, Independence of Board of director, frequency of board meeting. Based on the data analysed, the following findings were summarized that board size has a negative effect on Altman bankruptcy predicting model which has significant impact on deposit money banks in Nigeria. While audit tenure has a negative effect on Altman bankruptcy predicting model but not statistically significant on deposit money banks in Nigeria. Another finding is that board of director's independency and frequency of board meeting has a positive effect on Altman bankruptcy predicting model and is statistically significant on deposit money banks in Nigeria. since the board of director serves as internal control mechanism in the corporate governance, banks policy makers should provide adequate regulations on the specific number of board to be working with, hence, larger board is likely to reduce the probability of bankruptcy as they bring wider knowledge and better expertise to the bank.

Keywords: bankruptcy, altman model, board size, auditor tenure, frequency of board meeting, deposit money banks

Introduction

In recent times, attentions had been directed to corporate bankruptcy in the accounting and finance literature. Prior of these studies, focus has been mainly on predicting bankruptcy based on financial data (Beaver, 1966; Altman, 1986) [8, 4]. Though issues have already been observed in recent prestigious firms' bankruptcy events, but there are only few researchers that included the relation of corporate governance on the dangers of bankruptcy (Fich & Slezak, 2008) [17]. However, the relation of corporate governance to the likelihood of bankruptcy is an open empirical question.

Cochran and Wartick (1998) [10] documented that the effectiveness of corporate governance is based on connection between boards, stockholder, top management, regulators, auditors, and other stakeholders. Fich and Slezak (2008) [17] reported that corporate governance has two latent effects on the probability of bankruptcy. This can be seen from the scandalous events of Enron and WorldCom, it's obvious that financial and accounting data can be manipulated hence misleading to mask bad performance. In other hand, since firm's governance structure represents a nexus of incentive contracts, the essence of management response to distress will largely base upon the characteristic of firm's governance structure. Therefore, the chances of evading bankruptcy will also depend on the management's respond to a given level of distress, which conceivably depends on the firm's governance structure.

Formerly, institutional failures were caused by instability in the Nigerian financial system, particularly in the banking industry. However, this trend has shifted to generalized failure which is currently sweeping the banking sector. According to Ogunleye, as quoted in Olaniyi (2007) [40], the reasons for bank collapse are divided into institutional, economic, and political factors, as well as regulatory and supervisory incompetence. Some of these indiscriminate failure trends have institutional, economic, political and socio-cultural dimensions. Mismanagement, incompetent debt recovery machinery, poor credit policy and administration, avarice, corruption, and fraud factors are only a few of the biggest offenders (Ifeyinwa, 2012) [21].

Konstandina (2006) said that an attempt in explaining the cause of bank failures constitutes perhaps one of the greatest concerns to stakeholders in the banking sector. Erdogan (2008) [14] also explained that one of the most substantive threats of a national economy is the bankruptcy of its banks. Such bankruptcy will create a serious funding and confidence crisis that threaten the whole economy. In Nigeria, the issue in the financial sector, including total bank failure, has been recorded since 1930, when the first bank failure was reported (CBN, 2007) [9]. The rot in the banking industry is well documented and it did not start yesterday (Odife, 2009) [35]. The

government, regulatory authorities, creditors, equity investors, bankers, and the general public have all been touched by the terrible impact of ill health in the banking industry.
Therefore, we want to update this study using current data up to 2018, to predict healthiness or failure potential of Nigerian banks and ascertain the influence of corporate governance attributes on bankruptcy.

Methodology

Research Design

Due to the nature of the study, Ex Post Facto research design was adopted. The study analysed the audited financial statements/accounts of banks. This involves use of annual financial accounts of all twenty-two deposits money banks quoted on the Nigerian stock exchange under assessment for ten years period, 2009-2018 to generate the financial ratios that discriminated the most in prediction of healthy banks using Altman bankruptcy prediction model.

Method of Data Analysis

To achieve the objectives of this study, the researcher then infused Altman's original model for public companies to extract data and the formulated hypotheses were tested using multiple regression analysis with the aid of SPSS version 20.0.The data required for testing bankruptcy prediction were those of the discriminating variables that include: working capital, retained earnings, earnings before interest and tax, equity as well as total assets and total book debts, the data required for testing corporate governance includes Those obtained from the audited accounts and annual reports of the banks under assessment.

Model 1 The study adapts Altman Model given as Zeta "Z"

$$Z=1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0\ X_5,\ldots\ldots\ldots\ldots\ldots\ldots\ldots\ldots \quad (1)$$

Where X_1 = Working capital to total assets
X_2 = Retained earnings to total assets
X_3 = Earnings before interest and taxes to total asset
X_4 = Value of equity to total book debt
X_5 = Gross earnings to total assets

The decision rule is that

1. For Z<1.81 Bankruptcy region
2. For 1.81<Z>2.675 High bankruptcy potential
3. For 2.675<Z<2.99 Low bankruptcy potential
4. For Z>2.99 Strong (No sign of bankruptcy at all

The Altman Model was then modified thus to incorporate corporate governance

$$BKR_{it} = a_0 + \beta_1 BODSIZ_{it} + \beta_2 AUTEN_{it} + \beta_3 BODIND_{it} + \beta_4 DCCE_{it} + \beta_3 FBM_{it} \ldots\ldots\ldots\ldots \quad (ii)$$

Where;
BKR= Bankruptcy Prediction Model
BODSIZ = Board size
AUTEN = Audit tenure
BODIND= Board independence
DCCE = Duality of chairman of board as CEO
FBM = frequency of board meeting

Data Analysis

Descriptive Analysis

Table 1

	CAL_Z_VALUE	BODSZ	AUTEN	BODIND	FBM	BKA	BKL
Mean	2.514500	14.20000	0.700000	1.700000	0.800000	29.30000	6.094000
Median	1.306500	15.00000	1.000000	2.000000	1.000000	30.00000	5.835000
Maximum	6.577000	16.00000	1.000000	2.000000	1.000000	31.00000	6.930000
Minimum	0.399000	10.00000	0.000000	1.000000	0.000000	32.90000	5.250000
Std. Dev.	2.359651	2.250926	0.483046	0.483046	0.421637	0.674949	0.553598
Skewness	0.669053	-1.370373	-0.872872	-0.872872	-1.500000	1.919795	0.197807
Kurtosis	1.802362	3.105725	1.761905	1.761905	3.250000	5.149911	1.746357
Jarque-Bera	1.343694	3.134527	1.908541	1.908541	3.776042	8.068567	0.720054
Probability	0.510764	0.208615	0.385093	0.385093	0.151371	0.017698	0.697657

Sum	25.14500	142.0000	7.000000	17.00000	8.000000	293.0000	60.94000
Sum Sq. Dev.	50.11156	45.60000	2.100000	2.100000	1.600000	4.100000	2.758240
Observations	10	10	10	10	10	10	10

Shows the mean (average) for each of the variables, their maximum values, minimum values, standard deviation and Jarque-Bera (JB) Statistics (normality test). Also provided some insight into the nature of the Nigerian banks that were used in this study. It was observed that on the average over the ten (10) years periods (2009-2018), the sampled banks in Nigeria were characterized by positive Altman bankruptcy prediction Model (2.514500). Also, the large difference between the maximum and minimum value of the board size (BODSZ), audit tenure (AUTEN), board independence (BODIND), frequency of board meeting (FBM), bank age (BKA) and bank leverage (BKL) show that the sampled banks in this study are not dominated by banks with more bankruptcy.
In this table, at a 5% level of significance, the Jarque-Bera (JB) test, which checks for normality or the presence of outliers or extreme values among the variables, demonstrates that the majority of the variables are normally distributed. This means that any variable with outlier are not likely to distort our conclusion and are therefore reliable for drawing generalization. This also implies that the least square estimate can be used to estimate the pooled regression model.

Descriptive Analysis for Altman Predicting Model of Sampled Banks

Table 2

	ACB	DMB	ECO	FCMB	FBB	FTB	GTB	HTB	IBTC	KSB	PRB	SCB	STB	UBA	UNB	UTB	WMB
Mean	2.52	1.08	0.55	1.60	3.16	3.65	3.39	0.37	0.69	0.47	0.38	0.38	0.62	2.29	1.65	0.20	0.20
Median	1.31	1.05	0.60	0.96	3.50	3.99	3.36	0.14	0.69	0.25	0.20	0.20	0.71	2.26	1.83	0.12	0.11
Maximum	6.58	1.87	1.17	3.98	5.20	4.98	5.86	1.10	1.56	1.33	0.92	0.92	0.90	4.26	3.10	0.59	0.92
Minimum	0.40	0.45	0.04	0.45	0.82	0.58	1.79	0.01	0.04	0.08	0.03	0.03	0.13	0.65	-0.71	0.03	0.01
Std. Dev.	2.36	0.54	0.41	1.26	1.48	1.48	1.18	0.48	0.52	0.47	0.32	0.32	0.24	1.12	1.36	0.18	0.29
Skewness	0.67	0.25	0.06	0.80	-0.07	-1.06	0.59	0.82	0.15	0.76	0.68	0.68	-0.82	0.12	-0.72	1.20	1.84
Kurtosis	1.80	1.60	1.57	2.19	1.84	2.91	3.23	1.75	1.78	2.02	1.90	1.90	2.51	2.33	2.40	3.13	5.16
Jarque-Bera	1.34	0.91	0.86	1.33	0.57	1.88	0.60	1.77	0.65	1.35	1.28	1.28	1.23	0.21	1.01	2.39	7.56
Probability	0.51	0.63	0.65	0.51	0.75	0.39	0.74	0.41	0.72	0.51	0.53	0.53	0.54	0.90	0.60	0.30	0.02
Sum	25.15	10.79	5.45	15.97	31.58	36.54	33.89	3.74	6.90	4.68	3.79	3.79	6.15	22.87	16.51	2.02	2.01
Sum Sq. Dev.	50.11	2.60	1.52	14.24	19.59	19.83	12.46	2.10	2.46	2.02	0.95	0.95	0.53	11.35	16.70	0.29	0.73
Observations	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10	10

Table shows the mean (average) for each of the variables, their maximum values, minimum values, standard deviation and Jarque-Bera (JB) Statistics (normality test). This results provided some insight into the position of Altman Prediction Model of the Nigerian banks that were used in this study. It was observed that on the average over the ten (10) years periods (2009-2018), the sampled banks in Nigeria were characterized by positive Altman bankruptcy prediction Model. However, Access Bank, First Bank, Fidelity Bank, GTB, UAB, (2.52, 3.16, 3.65, 3.39, 2.29) respectively, followed by Diamond Bank, First City Monument Bank, Union Bank with means; 1.08, 1.60, and 1.65 respectively show that the sampled banks in this study are not dominated by banks with more bankruptcy. This indicates that other banks were high bankruptcy potential.
In this table, at a 5% level of significance, the Jarque-Bera (JB) test, which checks for normality or outliers or extreme values among the variables, demonstrates that the majority of the variables are normally distributed.

Correlation Analysis
In examining the association among the variables, we employed the Pearson correlation coefficient (correlation matrix).

Correlation Matrix

Table 3

	CAL_Z_VALUE	BODSZ	AUTEN	BODIND	FBM	BKA	BKL
CAL_Z_VALUE	1	0.229	-0.278	0.538	0.279	0.576	0.372
BODSZ	0.229	1	-0.347	-0.245	0.983	0.176	0.343
AUTEN	-0.278	-0.347	1	0.048	-0.327	0.307	-0.386
BODIND	0.538	-0.245	0.048	1	-0.327	0.307	0.063
FBM	0.279	0.983	-0.327	-0.327	1	0.234	0.342
BKA	0.576	0.176	0.307	0.307	0.234	1	-0.253
BKL	0.372	0.343	-0.386	0.063	0.342	-0.253	1

Source: researcher's computation (2020)

The use of correlation matrix in most regression analysis is to check for multi-collinearity and to explore the association between each explanatory variable (BODSZ, AUTEN, BODIND, FBM, BKA and BKL) and the dependent variable (Altman). Table 4.1.2 focused on the correlation between Altman and the independent variables (BODSZ, AUTEN, BODIND, FBM, BKA and BKL). Finding from the correlation matrix table shows that all our independent variables, (BODSZ=0.229; BODIND=0.538; FBM = 0.279; BKA = 0.576 and BKL = 0.372) were observed to be positively associated with Altman bankruptcy prediction Model except AUTEN = -0.278 which is negatively associated with dependent variable. In checking for multi-collinearity, we notice that no two explanatory variables were perfectly correlated. This means that there is no problem of multi-collinearity between the explanatory variables. Multi-collinearity may result to wrong signs or implausible magnitudes in the estimated model coefficients, and the bias of the standard errors of the coefficients.

Summary of Findings

Based on the data analysed, the following findings were summarized;

1. Board size has a negative effect on Altman bankruptcy predicting model but this effect is statistically significant on deposit money banks in Nigeria.
2. Audit tenure has a negative effect on Altman bankruptcy predicting model but this effect is not statistically significant on deposit money banks in Nigeria.
3. Board of director's independency has a positive effect on Altman bankruptcy predicting model and this effect is statistically significant on deposit money banks in Nigeria.
4. Frequency of board meeting has a positive effect on Altman bankruptcy predicting model and this effect is statistically significant on deposit money banks in Nigeria.

Conclusion

This study assesses whether board size, audit tenure, board of director's independency, and frequency of board meeting have impacted on Altman bankruptcy predicting model of deposit money banks in Nigeria. The study covers the period 2009-2018, by analysing eighteen deposit money banks, the study found that board size, and audit tenure have negative impact on Altman bankruptcy predicting model though board size is statistically significant, while board of director's independency and frequency of board meeting impacted positively on Altman bankruptcy predicting model and this were statistically significant. These results prove that the board of director's independency, and frequency of board meeting serves as internal control mechanism in the corporate governance, and that governance structures do partially contribute to the probability of bankruptcy.

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