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The Effect of Financial Distress Indicators on the Share Price of Pharmaceutical Firms in Nigeria

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Abstract:

The study examined the effect of financial distress indicators on the share price of pharmaceutical firms in Nigeria. Altman Zeta Score, operating cash flow, and debt-equity ratio were the financial distress indicators used for the study, while the share price was the dependent variable of the study. The study adopted an ex-post-facto research design, covering the period between 2009 and 2018. Secondary data were extracted from the annual reports and accounts of the sampled pharmaceutical firms in Nigeria. Simple fixed-effect regression analysis was used for the panel data analysis. In line with the specific objectives of the study which is to ascertain the effect of Altman Zeta Score, operating cash flow, and debt-equity ratio on the share price of pharmaceutical firms in Nigeria, it was revealed that Altman Zeta Score has a positive and insignificant effect on share price while operating cash flow has a positive and significant effect on the share price. However, the debt-equity ratio has a negative and insignificant effect on the share price of pharmaceutical firms in Nigeria. The study, therefore, recommended that distressed pharmaceutical firms according to the Zeta Score model should improve their management and efficiency of their employees. This is because the failures of these firms are partly caused by poor management of both resources and staff. Means of generating extra cash from operating activities should be vigorously pursued so as to increase the cash these firms generate from the issue of shares, which will help them come out of distress zone. They should reduce the rate at which they use debt to finance their activities. According to Modigliani and Miller (1963), there is a certain point at which further use of debt becomes unfavourable and continuous use of debt will increase both the agency cost and bankruptcy cost which has the implication of reducing the value of the firm leading to the likelihood of financial distress.

Keywords: Financial distress, share price, pharmaceutical industry, der, operational cash flow

1. Introduction

1.1. Background of the Study

Every business has an element of risk, which may result to business failure. Financial distress is good indication that a business is approaching dissolution. Ability to identify that the company is facing financial distress is very helpful to prevent the company from going bankrupt. Muminovic (2013) posit that the manner firms always anticipate bankruptcy has been a subject of interest. It is one of the major tasks of business and financial analysts. Hayes, Hodge, and Hughes (2010) posit that a reliable bankruptcy model with high predictive power is essential in today's business environment because of the high frequency of bankruptcy cases filed by quoted companies and its negative implication on suppliers and other stakeholders who depend on the success of these firms. The fear of most of the pharmaceutical firms in Nigeria going bankrupt is huge due to their poor performances.

The Nigeria pharmaceutical sector plays an integral role in the economy of the nation. This is not surprising as health is the most precious need of man; one necessity human beings can spend their last earnings seeking. The pharmaceutical sector is charged with the responsibility of providing quality and affordable drugs to the citizens of Nigeria. The sector plays an essential role in order to ensure that individuals within the country have access to quality healthcare services. Nigerian pharmaceutical industry has attained a great level of growth over the years starting from the pre-colonial era when the sector only imports drugs from overseas and distribute it in Nigeria. Today in Nigeria, there exist 130 pharmaceutical firms that has the country as its operation centre. Manufacturers Association of Nigeria (2018) states that 5 indigenous companies control 58 per cent of pharmaceutical activities in Nigeria.

Performance matrix for the pharmaceutical sector indicates that they are performing poorly; their capacity utilization is nailed at 40 per cent, the sector's ability to satisfy local demands is 25% while the rest of the 75% local demand for pharmaceutical products are being imported from Asian countries (Manufacturers Association of Nigeria, 2018). The global or world pharmaceutical industry is on a steady and rapid growth, and is estimated to hit \$1.3 trillion by

the year 2020. However, the pharmaceutical sector in Nigeria was not among the 17 growth markets identified in the sector. In as much as sector-specific survival data is unavailable for the pharmaceutical sector, the survival rate of the manufacturing sector of which the pharmaceutical industry is a part of, is still very poor as at 2018. The Manufacturers Association of Nigeria (MAN) carried out a study which showed of the firms in the sector, only 10 percent were deemed to be operating on a sustainable level, with 30 percent classified as closed down while 60 percent were classified as ailing.

The low performance of this sector could be attributed to certain problems they face ranging from intense competition, low capacity utilization, serious faking and adulteration of original brands and even low buying power of customers. Consequently, these pharmaceutical firms need adequate funding to enable them compete globally. However, the inability of most of these pharmaceutical firms to acquire bank loans has forced them into the stock market for finance. The stock price of these quoted pharmaceutical companies cannot never be compared to that of banks, insurance companies, oil and gas companies, and other manufacturing companies. Whether financial distress plays a part in a low share price of pharmaceutical becomes a hard puzzle that necessitated this study. It is in light of this that this study evaluates the effect of financial distress indicators on the share price of pharmaceutical firms in Nigeria by examining the effect of Altman's Zeta Score, operational cash flow, and debt to equity ratio on the share price of Nigeria pharmaceutical firms.

2. Review of Related Literature

2.1. Concept of Financial Distress

Financial distress is a condition when firms lacks the capacity to meet their financial obligations as they due. Ray (2011) opine that a firm experiences corporate financial distress when they violate loan contracts and when the organization incur losses persistently which hinders them from honouring obligations as they fall due. When a firm is in distress financially, the condition at which the firm operates deteriorates hereby increasing the financial burden of the firm thus incapacitating the firm in paying both secured, preferential and unsecured creditors (Garlappi and Yan, 2011). Kazemian, Shauri, Sanusi, Kamaluddin, and Shuhidan (2017) opine that financially distressed firms are those firms that face various financial challenges and have low profitability. Wesa and Otinga (2018) note that financially distressed firms are usually encounter cash shortage and overdue obligation. In this study, Altman's Zeta Score Mode, operational cash flow, and debt to equity ratio were used to measure financial distress.

2.1.1. Altman's Zeta Score Model

One of the most common bankruptcy prediction models is the Altman's Z-score model. Altman's Zscore is one of the best statistically model that is used in forecasting a firm's imminent bankruptcy (Moyer, 2005). In the year 1968 Edward Altman, a financial economist, at New York's Stern School of Business developed the model. Altman's Z-score model is a multiple variable model used to measure the financial health of a firm and to forecast possibility of the firm going bankrupt within a two-year period (Hayes et al, 2010). The model employs different accounting ratios to predict financial distress and imminent bankruptcy. The Z-score gained acceptance by auditors, management accountants, finance experts, and database administrators in the mid-1980s.

2.1.2. Operating Cash Flows

International Accounting Standards (7) submits that the amount of operating cash flows is an essential measure of entities meet its obligations using cash it generates from operating activities and also make investments without sourcing funds externally. Historical information about specific components of operating cash flows is essential in predicting future cash generated from operating activities and predicting financial distress. The standards further indicate that cash generated from operating activities are mainly gotten from the principal revenue-producing activities of the firm. Therefore, they result from transactions and activities that determine profit or loss of an entity. Fabozzi and Markowitz, (2006) opine that operating cash flow is a more accurate measure of financial performance of a firm compared to the conventional profitability measures like net income.

2.1.3 .Debt-Equity Ratio

Nwude (2003) defined debt to equity ratio as a measure of the proportion of debt to shareholders' fund (i.e. Net Worth) in the financing of a business. Items such as accumulated losses and deferred expenditures are excluded from the total equity before it is used as the denominator. The ratio indicates how much naira was raised as debt for one naira of equity. It is derived by dividing debt with shareholders' fund. This is a useful indicator of a firm's financial health as it helps the investor see the way management has financed operations. When debt-equity ratio is high, it signals the current and potential investors that the firm is vigorously financing their business activities with debt. This can result in fluctuations in their earnings due to the marginal interest expenses as well as the principal payment on the debt. If more debt is used in financing the business activity, the firm may generate more earnings but are at the risk of going bankrupt.

2.1.4. Share Price

Share price is the amount a unit of a company's stock is sold. Share prices of publicly-traded companies are determined by forces of demand and supply prevailing in the stock market. Share price fluctuates because it is determined by the expectations of buyers and sellers. For the purpose of this study, the share price refers to the price of the stock on December 31, 2009 (closing price).

2.2. Theoretical Framework

There are several theories underpinning this study. The work focuses on Trade-off theory by Modigliani and Miller (1963) and the Pecking Order Theory by Myers & Majluf (1984).

2.2.1. Trade-Off Theory (Modigliani & Miller, 1963)

The trade-off theory has also been used to explain the determinants of financial distress. The trade-off theory was formulated by Modigliani and Miller (1963). According to this theory, debt raises a firm's value. However, further use of debt as a source of finance becomes unfavourable at certain point, and continuous use of debt in place of other source of finance increases both the agency cost and bankruptcy cost which has the capacity of increasing the likelihood of financial distress by firms by reducing the value of the firm. Hence, the theory, argue that firm can attain optimal capital structure through trade-off of the benefit in the use of debt against cost of debt.

2.2.2 Pecking Order Theory (Myers & Majluf, 1984)

The Pecking order theory has also been used to explain why a firm goes into financial distress. This theory states that firms first exhaust the internal source of funds before going for the external source of funds (debt and equity) in a bid to preserve the stability and value of the firm. According to Wesa and Otinga (2018) the theory implies that an increase in the use of external source of funds such as debt in financing a business could negatively affect the firm if such funds are not adequately utilized. This can consequently increase the possibility of financial distress in a firm.

This study is anchored on Trade-Off Theory because it is more suited for the study considering the empirical background of the study.

2.3. Empirical Review

Babatunde, Akeju, and Malomo (2017) appraised the reliability of Altman's z-score in forecasting bankruptcy of quoted firms in Nigeria manufacturing sector. A sample of 10 manufacturing firms listed on the Nigeria Stock Exchange (NSE) for the 2015 financial year. Using Altman's Z-score Model to analyse the data, the study found that Z-score is a very important tool in finding out companies with declining performance of manufacturing firms in Nigeria.

Al-Manaseer and Al-Oshaibat (2018) evaluated the validity of the Altman z-score model in predicting financial failure in insurance firms quoted on the Amman Stock Exchange (ASE) over the period of 2011-2016. Multiple Linear Regression was used for data analysis. The result shows that Z-Score model could essential for users of the financial statement in decision making in the face of financial failure.

Carlos and Wiyarni (2018) explored the usefulness of the Altman Zeta Score model in predicting bankruptcy of the cigarette companies listed on the Indonesia Stock Exchange. The study also attempted to measure the effects of the Altman's scores on the stock prices of the companies. All cigarette companies that publish their financial report for the periods 2013 – 2016 were sampled. The result of the Z-score analysis depicts that out of the four cigarette firms, only one has the potential of going bankrupt, while the other three companies are healthy. However, the result of T-test, simple regression analysis and value of determinant coefficients showed that the value of Z-score positively influenced the stock price of these firms.

Musaed (2019) investigated the financial soundness of healthcare companies and the impact of Altman's Zeta score model on the stock price of healthcare firms quoted on Kuwait Stock Exchange (KSE). Results revealed that the sampled companies under are experiencing financial distress and are facing the risk of bankruptcy. The study further revealed that there is a significant relationship between Zeta score and the share price of these companies.

Jaafar, Muhamat, Alwi, Karim, and Rahman (2018) using the Fixed Effects Model examined the determinants of financial distress of companies Practicing Note 17 (PN17) listed in Bursa Malaysia. The study used the Altman Z-Score Model as a proxy to financial distress. The findings suggest that leverage and profitability are significant determinants of financial distress.

Ikpesu (2019) sought to ascertain the determinants of financial distress of manufacturing firms in Nigeria. The study made use of fully modified ordinary least square (FMOLS) on annual time series data extracted from annual report and accounts of eighteen quoted manufacturing firms on the Nigeria stock exchange (NSE). The findings revealed that profitability, firm size, liquidity, leverage, revenue growth, and share price are the main determinants of financial distress of firms in the Nigeria manufacturing industry.

Mardaconsita and Soelton (2019) aimed to ascertain the level of bankruptcy of plantations companies using the Altman Z-Score model and models Springate over a period between 2014 and 2017. The results show that plantations industry was facing financial challenges which would lead to potential bankruptcy.

Apergis, Sorros, Artikis, and Zisis (2011) investigated the stock price performance of firms that exhibit financial distress according to the model of Altman. Using cointegration and multiple regression techniques it was revealed that there is a positive cross-correlation between the Altman Z-score and the firm stock price.

Lestari, Oktaviani, and Arafah (2016) examined the effect of financial distress on shares price of chemical subsector firms listed on Indonesia Stock Exchange from 2009-2014 period. The study revealed that Z-score significantly affect the stock price with a probability of 0.004.

Mburu (2018) examined the determinants of financial distress of non-financial firms listed on the Nairobi Securities Exchange. The study relied on secondary data obtained from the financial statements of sampled firms for a period of five years (2013 to 2017). The correlation and regression result depicts that profitability ratios are significant in measuring financial distress of non-financial firms.

2.4. Summary of Review

The summary of empirical literature suggests that a lot of studies have been conducted using Alman's Zeta score model. The bulk of these studies were done outside Nigeria except Ikpesu (2019) and Babatunde, Akeju, and Malomo (2017). However, these works in Nigeria do not attempt to examine the effect of these financial distress indicators on the share price. Furthermore, the two studies in Nigeria were conducted in the manufacturing industry of the economy. Consequently, this study tries to examine the effect of financial distress indicators on the share price of pharmaceutical firms in Nigeria. The sector was chosen because of financial difficulties the firms in this sector are facing, in spite of the importance of the sector to the welfare of Nigeria.

3. Methodology

The study is ex-post-facto (after the facts) research that relied on secondary data extracted from annual reports and accounts of the sampled firms for the period between 2009 and 2018. The population of the study comprises of ten (10) quoted pharmaceutical firms listed on the Nigeria Stock Exchange. Based on the data availability, the study sampled four of these pharmaceutical firms.

The following model was formulated for the study:

$$SP_t = \beta_0 + \beta_1 Z\text{-SCORE}_t + \beta_2 OCF_t + \beta_3 DER_t + \varepsilon_t \quad - \quad [\text{Equation (1)}]$$

Where,

SP: Share Price

Z-SCORE: Altman's Zeta Score

OCF: Operational Cash Flow

DER: Debt-Equity Ratio

ε Stochastic Disturbance (Error) Term

β_0 Coefficient (constant) to be estimated

$\beta_i - \beta_3$ Parameters of the independent variables to be estimated

t Current period

To calculate the Altnan's Zeta score the following model is specified as follows:

$$Z\text{-Score} = 1.2(Z1) + 1.4(Z2) + 3.3(Z3) + 0.6(Z4) + 0.999(Z5)$$

Where:

Z 1 = working capital / total assets

Z 2 = retained earnings / total assets

Z 3 = earnings before interest and tax / total assets

Z 4 = market value of equity / total liabilities

Z 5 = sales / total assets

4. Data Analysis and Discussion of Results

4.1. Analysis

From the graph in figure 4.2.1, it was revealed a pattern of movement of both the focal variable (share price) and the explanatory variables (z-score, operational cash flow, and debt-equity ratio). The table shows that share price has a similar pattern of movement with zeta score of pharmaceutical firms in Nigeria. However, operational cash flow and debt-equity ratio have a similar pattern of movement as can be seen from the curve which slopes from left to right for these variables. This is the nature of the movement of the data extracted from the annual report and accounts of the sampled pharmaceutical firms and Nigeria Stock Exchange Daily Price List.

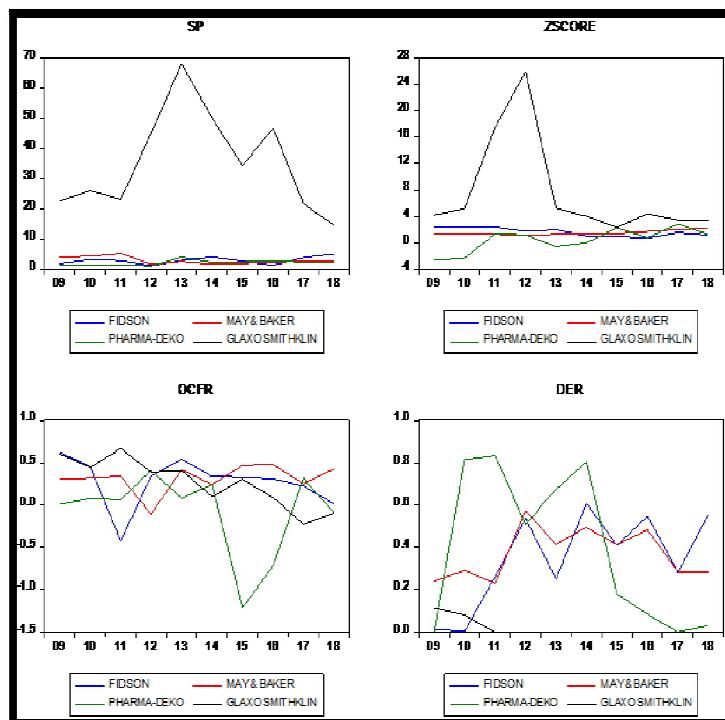


Figure 1: Panel Data Line Graph for the Focal and Explanatory Variables
Source: Computed by Researcher Using EViews 10.0 Statistical Software

Table 1 above reveals the variable description of the 40 observations. From the table, the minimum share price is ₦0.97 while the maximum share price in the industry is ₦68. Pharma Deko Plc is facing more financial distress than any other firm in the industry judging by its lowest zeta score (-2.71) and the maximum debt to equity ratio (0.835604). The normality of the distribution of the data series is shown by the coefficients of Skewness, Kurtosis, and Jarque-Bera Probability. From the result above, SP (1.986192) and ZSCORE (3.612586) are abnormally distributed with a skewness coefficient greater than one. OCF and DER are normally distributed with a skewness coefficient less than one (-0.906496 and 0.512747 respectively). The kurtosis coefficient also suggests that SP (6.036439) and (16.91416) are abnormally distributed with a Kurtosis coefficient greater than three. Meanwhile, the Kurtosis coefficient for OCF (2.852826) and (2.105322) suggests that the data are normally distributed.

	SP	ZSCORE	OCFR	DER
Mean	10.66900	2.743500	0.195325	0.282508
Median	2.735000	1.580000	0.308133	0.256486
Maximum	68.00000	25.89000	0.670873	0.835604
Minimum	0.970000	-2.710000	-1.215490	0.000000
Std. Dev.	16.46111	4.780058	0.363648	0.265142
Skewness	1.986192	3.612586	-0.906496	0.512747
Kurtosis	6.036439	16.91416	2.852826	2.105322
Jarque-Bera	41.66632	409.6781	58.77855	3.086813
Probability	0.000000	0.000000	0.087878	0.213652
Sum	426.7600	109.7400	7.812986	11.30034
Sum Sq. Dev.	10567.75	891.1091	5.157341	2.741708
Observations	40	40	40	40

Table 1: Descriptive Statistic of the Focal & Explanatory Variables
Source: Computed by Researcher Using EViews 10.0 Statistical Software

An insignificant Jarque-Bera Probability for OCF and DER further justify that the panel data are normally distributed. This is the case of the data extracted from annual reports and accounts of sampled pharmaceutical firms in Nigeria.

Table 2 reveals ZSCORE (0.6463) and DER (0.8146) have an insignificant effect on SP. However, OCF (0.0546) has a significant effect on the SP of pharmaceutical firms in Nigeria. The t-Statistic that is greater than 2 for OCF further shows its significant effect on SP. The table further depicts that a unit change in ZSCORE and OCF will increase SP by 0.172758 and 0.564358 respectively. While a unit change in DER results to 1.578343 decreases in SP. The adjusted R-squared (R^2) indicates that about 72% of the change in SP will be accounted for by the explanatory variables. The remaining 28% could be explained by other factors capable of influencing share price of pharmaceutical firms in Nigeria. The probability of the F-statistic is significant which shows the statistical fitness of the multiple regression. There is an absence of serial

autocorrelation in the panel data extracted from annual reports and accounts of sampled pharmaceuticals in Nigeria as suggested by Durbin-Watson stat of 1.102535.

Dependent Variable: SP Method: Panel Least Squares Date: 03/10/20 Time: 02:26 Sample: 2009 2018 Periods included: 10 Cross-sections included: 4 Total panel (balanced) observations: 40				
Variable	Coefficient	Std. Error	t-Statistic	Prob.
ZSCORE	0.172758	0.372995	0.463164	0.6463
OCFR	0.564358	4.440974	2.827080	0.0246
DER	-1.578343	6.677233	-0.236377	0.8146
C	10.53070	2.627676	4.007610	0.0003
Effects Specification				
Cross-section fixed (dummy variables)				
R-squared	0.759283	Mean dependent var	10.66900	
Adjusted R-squared	0.715516	S.D. dependent var	16.46111	
S.E. of regression	8.779871	Akaike info criterion	7.340429	
Sum squared resid	2543.843	Schwarz criterion	7.635983	
Log-likelihood	-139.8086	Hannan-Quinn criter.	7.447292	
F-statistic	17.34837	Durbin-Watson stat	1.102535	
Prob(F-statistic)	0.000000			

Table 2: Multiple Regression Result of Industry Level Panel Data
Source: Computed by Researcher Using EViews 10.0 Statistical Software

4.2. Test of Hypotheses

The three principal testable hypotheses formulated in section one in an attempt to evaluate the effect of financial distress indicators on the share price of pharmaceutical firms in Nigeria. These hypotheses were tested using the following decision rule: Reject H_0 if the P-value tabulated is less than the A-value calculated (0.05) and accept the null hypotheses if reverse becomes the case.

4.2.1. Hypothesis One

Altman's Zeta Score does not significantly affect the share price of pharmaceutical firms in Nigeria.

- Decision: From the panel regression analysis, the P-value of 0.6463 is > 0.05 A-value and the 0.463164 t-statistic is < 2 . Therefore, the null hypothesis is accepted and the alternative hypotheses rejected. This implies that Altman's Zeta Score does not have a significant effect on the share price of pharmaceutical firms in Nigeria.

4.2.2. Hypothesis Two

Operational cash flow does not significantly affect the share price of pharmaceutical firms in Nigeria.

- Decision: From the panel regression analysis, the P-value of 0.0246 is < 0.05 A-value and the 2.827080 t-statistic is > 2 . Therefore, the null hypothesis is rejected and the alternate hypotheses accepted. This implies that operational cash flow has a significant effect on the share price of pharmaceutical firms in Nigeria.

4.2.3. Hypothesis Three

Debt to equity ratio does not significantly affect the share price of pharmaceutical firms in Nigeria.

- Decision: From the panel regression analysis, the P-value of 0.8146 is > 0.05 A-value and the 0.236377 t-statistic is > 2 . Therefore, the null hypothesis is accepted and the alternative hypotheses rejected. This implies that the debt-equity ratio has an insignificant effect on the share price of pharmaceutical companies in Nigeria.

4.3. Discussion of Results

In the test of hypotheses one, the regression analysis result revealed that Altman Zeta Score has a positive and insignificant effect on the share price of pharmaceutical firms in Nigeria. This implies that as Zeta Score increases the share price of pharmaceutical firms in Nigeria will also increase. This is in tandem with the findings of Carlos and Wiyarni (2018), Musaed (2019), and Apergis, Sorros, Artikis, and Zisis (2011) who also found a positive relationship between Z-Score and Share Price.

In the test of hypothesis two, the regression result revealed that operating cash flow has a positive and significant effect on the share price of pharmaceutical firms in Nigeria. This implies that as cash generated from operating activity increases share price also increases. The finding is consistent with the findings of Ikpesu (2019), Jaafar, Muhamat, Alwi, Karim, and Rahman (2018) who made similar findings.

In the test of hypotheses three, the regression result revealed that the debt-equity ratio has a negative and insignificant effect on the share price of pharmaceutical firms in Nigeria. This implies that as debt-equity ratio increases share price will decrease.

5. Summary and Conclusion

Based on the data analysis, findings and discussions, we hereby summarize the findings as follows:

- Altman Zeta Score has a positive and insignificant effect on the share price of pharmaceutical firms in Nigeria.
- Operating cash flow has a positive and significant effect on the share price of pharmaceutical firms in Nigeria.
- The debt-equity ratio has a negative and insignificant effect on the share price of pharmaceutical firms in Nigeria.

Sequel to the findings discussed above, the study therefore, conclude that Altman Zeta score has a positive effect on the share price of pharmaceutical firms in Nigeria. This is in tandem with the prior expectation of the researcher. Cash generated from operating activities proves to have a strong predicting power over share price of pharmaceutical firms in Nigeria with the positive and significant effect it has on the share price. However, the study also found that the higher the use of debt in financing the firm's activities reduces the share price of pharmaceutical firms in Nigeria. This is because the debt-equity ratio has a negative effect on the share price.

Consequently, the study made the following recommendations:

- Distressed pharmaceutical firms according to the Zeta Score model should improve their management and efficiency of their employees. This is because the failures of these firms are partly caused by poor management of both resources and staff.
- Means of generating extra cash from operating activities should be vigorously pursued so as to increase the cash these firms generate from the issue of shares, which will help them come out of distress zone.
- They should reduce the rate at which they use debt to finance their activities. According to Modigliani and Miller (1963), there is a certain point at which further use of debt becomes unfavourable and continuous use of debt will increase both the agency cost and bankruptcy cost which has the implication of reducing the value of the firm leading to the likelihood of financial distress.

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Appendix

	Altman Z Score Fidson PLC										
	Coefficient	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Z 1	1.20	0.25	0.04	0.21	0.20	0.12	-0.08	-0.12	-0.16	-0.14	-0.14
Z 2	1.40	0.19	0.19	0.16	0.14	0.12	0.13	0.16	0.17	0.22	0.17
Z 3	3.30	0.09	0.08	0.02	0.05	0.02	0.06	0.05	0.03	0.09	0.01
Z 4	0.60	1.28	1.72	1.76	0.62	1.28	0.18	0.36	0.18	0.45	0.45
Z 5	1.00	0.70	0.65	0.76	0.66	0.75	0.62	0.49	0.46	0.81	0.79
Z Score		2.32	2.25	2.36	1.64	1.91	0.99	0.95	0.70	1.52	1.15
Zone		Grey	Grey	Grey	Distress	Grey	Distress	Distress	Distress	Distress	Distress

Table 3: Altman Z Score Fidson PLC
Source: Author's Computation Using Microsoft Excel

	Altman Z Score May & Baker PLC										
	Coefficient	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Z 1	1.20	0.00	-0.02	-0.13	0.04	0.03	0.04	0.01	0.14	0.05	0.02
Z 2	1.40	0.12	0.11	0.14	0.13	0.11	0.12	0.12	0.10	0.15	0.20
Z 3	3.30	0.06	0.05	0.05	0.01	0.00	0.02	0.02	0.04	0.10	0.10
Z 4	0.60	0.50	0.53	0.65	0.31	0.49	0.30	0.37	0.40	0.66	0.83
Z 5	1.00	0.75	0.68	0.69	0.70	0.78	0.85	0.90	0.96	0.93	1.02
Z Score		1.40	1.28	1.27	1.13	1.26	1.30	1.36	1.64	1.94	2.17
Zone		Distress	Grey	Grey							

Table 4: Altman Z Score May & Baker PLC
Source: Author's Computation Using Microsoft Excel

	Altman Z Score of Pharma Deko PLC										
	Coefficient	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Z 1	1.20	-0.56	-0.52	-0.46	-0.34	-0.44	-0.34	0.21	0.04	0.05	-0.02
Z 2	1.40	-0.82	-0.91	0.84	0.28	-0.36	-0.28	0.10	0.00	0.01	-0.11
Z 3	3.30	-0.29	-0.24	0.02	0.25	-0.05	0.05	0.27	-0.09	0.02	-0.11
Z 4	0.60	-0.42	0.08	0.07	0.05	0.23	0.11	0.58	0.93	3.30	2.17
Z 5	1.00	0.32	0.26	0.62	0.37	0.42	0.55	0.58	0.47	0.70	0.44
Z Score		-2.71	-2.39	1.36	1.20	-0.63	0.00	2.22	0.79	2.80	1.20
Zone		Distress	Distress	Distress	Distress	Distress	Distress	Grey	Distress	Grey	Distress

Table 5: Altman Z Score of Pharma Deko PLC
Source: Author's Computation Using Microsoft Excel

	Altman Z Score of Glaxo SmithKlin PLC										
	Coefficient	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Z 1	1.20	0.22	0.16	0.17	0.16	0.09	0.05	0.04	0.51	0.56	0.42
Z 2	1.40	0.50	0.55	0.47	0.46	0.45	0.44	0.40	0.58	0.62	0.52
Z 3	3.30	0.20	0.21	0.19	0.19	0.16	0.10	0.03	0.01	0.04	0.07
Z 4	0.60	2.20	3.88	24.56	38.77	4.69	3.18	1.80	4.01	1.84	1.29
Z 5	1.00	1.24	1.18	1.20	1.16	1.11	1.09	0.49	0.51	0.61	1.17
Z Score		4.19	5.14	17.45	25.89	5.21	4.00	2.30	4.36	3.40	3.42
Zone		Safe	Safe	Safe	Safe	Safe	Safe	Grey	Safe	Safe	Safe

*Table 6: Altman Z Score of Glaxo SmithKlin PLC
Source: Author's Computation Using Microsoft Excel*