

PREDICTION OF FINANCIAL DISTRESS IN THE LIGHT OF FINANCIAL CRISIS: A CASE OF LISTED FIRMS IN KENYA

Koech, Emmy Cherotich 

Department of Accounting, Finance and Management Science, Egerton University, Kenya

emmykoech18@gmail.com

Nyang'aya, Akuno R.O.

Agricultural Economics and Agribusiness Management, Kenya

Egerton University

Mugo, Robert

Department of Accounting, Finance and Management Science, Kenya

Egerton University

Abstract

The purpose of this study was to predict financial distress in Kenyan listed firms. The specific objective was to determine the working capital to total assets ratio on financial distress of listed firms. The study adopted a descriptive research design. The target population included all the firms listed at the Nairobi Securities Exchange as at 2008. Secondary data were used in this study and were obtained from the Capital Markets Authority. Purposeful sampling was employed. Both descriptive and inferential statistics were employed in the analysis using SPSS 24. The null hypothesis was tested at 0.05 level of significance. The results of the study were presented in tables and were accompanied by pertinent interpretations and discussions. It was found that an increase in the ratio of working capital to total assets of the surveyed firms was likely to increase financial distress of the surveyed firms. It was concluded that working capital to total assets ratio played a crucial role in determination of financial distress among listed firms. It was recommended that the listed firms should ensure that they have high liquidity in order to effectively mitigate financial distress.

Keywords: Financial crisis, financial distress, listed firm, total assets, working capital

INTRODUCTION

The National Bureau of Economic Research (NBER) defines recession as a significant decline in the economic activity across the country lasting more than a few months and normally visible in real GDP growth, real personal income, employment, and industrial production and wholesale- retail sales (NBER, 2010). These factors are very important in determining whether there is a recession or not (Rachlin, 2009). The study by Koksal and Ozgul (2007), found that managers are usually asked to either delay or abandon investment projects altogether during an economic downturn and get back to normal operations after that period is over in order to avoid risks. It is worth therefore noting that companies that are affected more severely during economic crisis may be forced to either liquidate and cease business or curtail their operations, retrench some of their workers, ask employees to accept a smaller compensation package and find ways and means to cut costs so as to remain competitive.

The year 2008 saw economies in the world dip into a recession. This economic downturn began with industrialized countries and then moved to developing economies creating big cracks in the global world economy. Shortly after that credit flows froze and lender confidence dropped, investors stopped investing in countries and ultimately the value of stocks and domestic currencies plunged (IMF, 2009). In the United States the economy experienced a slackened real GDP growth estimated at 1.4 per cent in 2008 compared to 2.0 per cent in 2007. In Japan, the expansion of the economy experienced a slowdown following the recession in the global economy. The country's real GDP grew at an estimated 0.5 per cent compared to 2.1 per cent in 2007. This was occasioned by external shocks leading to contraction in the country's export markets, reduction in domestic demand, and an appreciation of the Japanese Yen against other major currencies. The unemployment rate in the country increased from 3.9 per cent in 2007 to 4.1 per cent in 2008. In the United Kingdom Real GDP was estimated to have grown at 0.8 per cent in 2008 with the economy facing adjustments in the construction sector, falling house prices and decelerated domestic demand.

Many analysts argue that even with the recent reforms in the economy, growth and development in many African countries is hampered by policies that restrict competition. According to World Bank (2008), Africa is the world's second most trade-restrictive region after South East Asia. The region, also displays the worst attributes in business environment, governance, logistics, and other trade facilitation indicators (World Bank, 2008)

The Kenyan economy did not also escape the recession period and, according to Economic Survey report by the Kenya National Bureau of Standards (KNBS), the economic growth in Kenya was restrained by the 2008 post-election violence, the global financial crisis and high fuel and food prices (KNBS, 2009). Though the post-election violence was

experienced only in the first quarter of 2008, its spill-over effects were manifest throughout 2008 resulting in substantial declines in growths of most of the sectors of the economy leading to a slump in economic growth from 7.1% in 2007 to 1.7% in 2008. Similarly, employment creation was adversely affected by the slow economic growth, in the same period, the annual average inflation rate almost tripled from 9.8 per cent in 2007 to 26.2 per cent in 2008, a record high since that of 28.8 per cent in 1994. This led to a reduction in real average earnings by 16.2 per cent, the stock market also saw a downturn with the 20 share index shedding 1924 points at the end of 2008, while market capitalization remained at 854 billion Kenya shillings in 2008.

The effects of the global financial turmoil explains this stagnation that resulted in reduced investor confidence who offloaded their investments in the Nairobi Securities Exchange due to the anticipation of a global credit crunch and falling stock prices. The Kenya Shilling also weakened against the US dollar to record an average exchange rate of 69.18 Kenya shillings in 2008 compared to 67.32 Kenya shillings per US dollar in 2007. In addition, the earnings from tourism sector which deteriorated in 2008, impacted negatively on the foreign exchange rate. The Central Bank of Kenya (CBK, 2009) on the other hand reported the 91 day Treasury bill rates for January 2008 to be at 6.950 while that of 2009 was at 8.464. The composite consumer index for lower income groups with October 2005 as the base year was 124.88 in 2008 and 142.08 in 2009. The treasury bill rate for Jan 2009 was 8.464 up from 6.950 in Jan 2008.

According to Vuran (2009), the development and use of models can be very important in two different ways. First, as early warning systems, such models are very useful to managers and other authorities. Second, they can be useful in aiding decision making of financial institutions in firms' evaluation and selection. There are many research projects that have been conducted in order to find the early warning signs of distress. Finding a method to identify corporate financial distress as early as possible is clearly a matter of considerable interest to investors, creditors, auditors and other stakeholders. The significance of this issue has stimulated a lot of research concerning the prediction of corporate bankruptcy or financial distress. These studies often used the statistical approach or iterative learning approach to develop prediction models. Researchers used statistical models in the 60s to identify ratios that could help classify companies into failed and non-failed. This statistical approach includes Univariate and multivariate models. In his work, Beaver (1966) used a dichotomous classification test to identify financial ratios for corporate failure prediction. He used 30 financial ratios and 79 pairs of companies (failure/non-failure). The best discriminant factor was the working capital/debt ratio, which correctly identified 90 percent of the firms one year prior to failure. The second best discriminant factor was the net income/total assets ratio, which had 88 percent accuracy. Altman (1968) was the first researcher to develop a multivariate statistical

model to discriminate failure from non-failure firms. He used multivariate discriminant analysis (MDA), Martin (1977) used the logit model for bank failure prediction. This study will evaluate the impact of accounting and market- driven information on the prediction of financial distress for Kenyan Listed firms using the discreet hazard approach.

Statement of the Problem

Several studies done in Kenya with respect to financial distress have focused on discriminant and logit analyses for example Abuga (2013) used weighted mean score and factor analysis to analyze the causes of financial distress which were classified into exogenous and endogenous, Abudo (2011) carried out a study to determine how financial distress can be predicted in the banking industry using the Altman (1968) model, Otom (2014) carried out a study to confirm whether financial ratios are suitable for prediction of financial distress in the non- financial sector of companies listed in the NSE and Kemboi (2013) conducted a study with the objective of using the Altman model to predict corporate financial distress in Uchumi supermarkets.

Since the time of Beaver (1996) and Altman (1968), a significant amount of research has used financial ratios to predict financial distress. More recent ones are based on market information in the measurement of distress risk whose main advantage is that it takes into account all the available firm-year observations. While previous studies were merely based on accounting ratios, Shumway (2001) uses a combination of both accounting and market information that vary over time to estimate the probability of financial distress following the hazard approach. Shumway (2001) goes on to document that ignoring the firm- year observations gives biased and inconsistent estimates of the parameters of the model and that this is properly addressed by using a discreet time hazard model.

According to the study done by Charalambakis (2013) on the prediction of corporate financial distress in the light of the financial crisis in Greek, corporate financial distress prediction is a central issue in finance. The results of the study show that a model that combines sales to total assets, profitability and financial risk best depicts the probability of financial distress for Greek firms. This study, therefore, found it important to determine whether the discreet hazard model, if used in the Kenyan context would contribute significantly to the prediction of financial distress.

General Objective

The general objective of the study was to predict financial distress in Kenyan listed firms in the light of financial crisis using the discrete hazard model.

Specific Objective

To determine the influence of working capital to total assets ratios on financial distress in listed firms

Research Hypothesis

H₀: There is no significant influence of working capital to total assets ratios on financial distress in listed firms.

H_A: There is significant influence of working capital to total assets ratios on financial distress in listed firms.

THEORETICAL FRAMEWORK

This section outline some models and theories that could be employed in prediction of financial distress. The models reviewed and discussed include Univariate model, hazard model, probit model, and entropy theory.

Univariate Analysis

According to Joseph (2011), the very first studies concerning ratio analysis for the prediction of bankruptcy are called univariate studies which mostly involve using t- tests in analyzing the individual ratios and comparing the ratios of failed companies to the ones for the successful companies. This analysis was championed by Beaver (1966) who found that the many indicators of financial distress would discriminate between both bankrupt and non-bankrupt firms for a period as long as five years prior to company failure. In this approach it is worth noting that the information found in financial statements presents both present and future conditions of the firm.

Hazard Model

Shumway (2001) developed the hazard model which is estimated as a dynamic logit model using maximum likelihood estimation method. It uses a combination of both accounting and market information that vary over time to estimate the probability of financial distress. The hazard rate can be defined as the probability of a firm going bankrupt at time t conditional upon having survived up to time t . This therefore means that the probability of bankruptcy changes through time. The survivor function that gives the probability of surviving up to time T can be defined as: $S(T, X; \gamma) = 1 - \sum_{J < T} F(J, X; \gamma)$ And the hazard function that gives the probability of failure at T conditional on surviving to T can be expressed as: $H(T, X; \gamma) = \frac{F(T, X; \gamma)}{S(T, X; \gamma)}$ The sample that Shumway (2001) used was composed of 300 bankrupt firms for the

period between 1962 and 1992. The firms were declared bankrupt within five years of delisting. The model was differentiated from the others in the literature through the calculation of firms' trading years, in order to reduce the loss of firms from the sample over.

Entropy Theory

According to Aziz and Dar (2006), the entropy theory states that a careful look at the changes in the balance sheet of a firm is one way of identifying its financial distress position. This theory employs both Univariate analysis and Multiple Discriminant Analysis (MDA) in examining the changes that occur in the structures of balance sheets. Univariate Analysis is the use of accounting based ratios for the distress risk assessment (Natalia, 2007), while MDA (Multivariate analysis) is a statistical analysis in which more than one variable are analyzed at the same time (Slotemaker, 2008). This means therefore, that the multivariate analysis serves to counter the defects of the Univariate analysis for example, single ratios calculated by Univariate analysis do not capture time variation of financial ratios. If the financial statements of a firm reflects significant changes in the assets and liabilities on the balance sheet, it means that it is more likely that it will have difficulties maintaining an equilibrium state in order to balance liquidity and leverage levels and if these changes are likely to become uncontrollable in future, one can foresee financial distress in these firms (Aziz & Dar, 2006).

EMPIRICAL REVIEW

Charalambakis (2014), in his study evaluates the contribution of market information and accounting to the prediction of financial distress for Greek firms using the discreet hazard approach. The accounting data and market data obtained from the Thomson Reuters DataStream for the period 2002- 2010. The analysis of the paper focused on the accounting ratios of the Z- score based on Altman (1968) and Taffler (1983) and in particular sales to total assets, EBITDA to total assets, current liabilities to total assets and current assets minus current liabilities scaled by total assets. The results show that a model that combines sales to total assets, profitability and financial risk with market capitalization, excess returns and stock return volatility best depicts the probability of financial distress for Greek firms. The model that combines the three accounting ratios with three market – based variables exhibits the highest predictive ability. Charalambakis (2014) also performed out of sample tests which confirmed that the model with the best in- sample predictive ability also allocates the highest percentage of bankrupt firms within the time of financial crisis, which clearly shows that the model provides an early warning signal of the upcoming financial crisis. In a study on corporate financial distress prediction. The findings showed that profitability, leverage, ratio of retained earnings to total

assets, the ability of a firm to export, liquidity and the ability of a firm to pay out dividends are strong predictors of financial distress. The findings of the study strongly recommend accounting for industry effects when forecasting financial distress for private firms. The model that incorporates the six firm specific factors and considers industry effects exhibits the highest predictive ability based on the in- sample accuracy tests.

Akbar (2013) did a comparative study of bankruptcy prediction models of Fulmer and Toffler in firms accepted in Tehran Stock exchange. Financial ratios were considered to be one of the tools used to measure the financial capabilities of the companies. Data was collected from basic financial statements from the stock exchange. The firms accepted in Tehran stock exchange between 2005 and 2010 made up the statistical population. Excel software was used to analyze the data. The data was categorized first two models, that is, Toffler and Fulmer. The results of Toffler model showed that 27 firms out of 90 firms under investigation were introduced as bankrupted and the rest were not bankrupted. Also the results of Fulmer's model showed that 63 firms out of 90 firms under investigation were introduced as bankrupted and the rest were not bankrupted. Akbar (2013) found out that the Fulmer model acted more conservatively compared to the Toffler model and that it is important to use different models to predict bankruptcy since it helps identify the status of organizations and avoid bankruptcy by adequate investigation of financial statements.

Jose (2014) focused his study on survival analysis and its use in predicting company failure. In that research, the hazard rate was placed at the probability of bankruptcy as of time t , conditional upon having survived until time t . Many hazard models are applied in a context where the running of time naturally affects the hazard rate. The model employed in this paper uses the time of survival or the hazard risk as dependent variable, considering the unsuccessful companies as censored observations. Jose (2014) observed that the main advantage of the model used relies on the additional information it provides. With this approach the researcher gets a different perspective, since the survival curve of analysis of a particular company allows knowing the likelihood of a company survival beyond a given time period and hence the risk of falling into bankruptcy. However, similar to what happens with other methods, the accuracy of the model developed in the paper depended utterly on the quality of the data which supports the basis for its modelling. This model was found to rely on the proportionality of risks, which in reality may not be always the case. Another relevant limitation is the difficulty of obtaining the survival times, that is, the time when the phenomenon that is being analyzed occurs.

Abuga (2013) analyzed financial distress, its causes and its effects on firms funded by ICDC. The main objectives in this study were to first identify the nature of the causes of financial distress and then to establish the effects of financial distress. Weighted mean score and factor

analysis were used to analyze the causes of financial distress which were classified into exogenous and endogenous. The sampling frame comprised of companies funded by ICDC. The researcher obtained primary data using questionnaires presented to managers and analyzed the various effects of financial distress using a five-point Likert Scale. Abuga (2013) identified that the most significant causes of financial distress were; improper capital decisions, lack of access to credit, shortage of skilled workers, poor records, highly geared firms and poor internal management. The findings therefore affirmed that endogenous causes dominate the exogenous causes. This can be arrived at by doing the average of the mean weighted score of both the internal and external causes of financial distress.

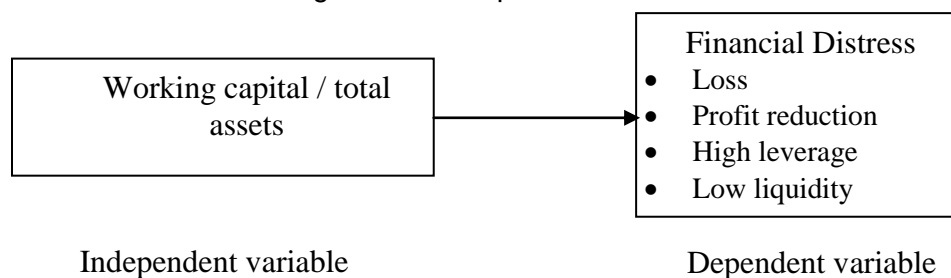
Abudo (2011) carried out a study to determine how financial distress can be predicted in the banking industry using the Altman (1968) model. The argument was that many corporate firms are faced with financial inefficiency and are as a result not in a position to correctly predict their position in both long and short terms. The population of the study consisted of all the 43 banks in Kenya as per Kenya Bankers Association using a census survey. Data collection relied on the 43 banks and from the data, each company and each year ratios were computed. The research design applied was a descriptive study and Data analysis used the following ratios: Working Capital/total assets (liquidity), retained Earnings/total assets (earned surplus, leverage), earnings before interest and taxes/total assets (earning power), Market value equity/book value of total liabilities (solvency), sales/total assets (sales generating capability). The study applied secondary data which was obtained from financial reports and returns filed with the Central Bank of Kenya. Altman (1968) model was applied for failed and non-failed banks. The testing model discriminated 20 failed banks versus 23 non failed ones. This study applied Modigliani and Miller capital structure irrelevancy theory and the financial life cycle theory. The findings of the study indicated that the Altman (1968) model was accurate on 8 out of the 10 failed firms, that is 80% validity of the model and for the non-failed majority proved Altman's financial distress prediction model was a 90% validity of the model. None of the activity and turnover ratios were found to be critical in predicting financial distress. These findings however differed with those of Altman (1968) whose conclusion was that efficiency and profitability ratios were most important and that liquidity ratios were insignificant. The recommendation of the study was that since the model presented in this study was based on stability of financial ratios, other measures of ratio stability such as the coefficient of variation and the standard error of estimate of the financial ratios could be applied to develop similar models and since the linearity assumption, that ratios are normally distributed, is inherent in this study, attempts should be made to develop a non-linear model such as logit and probit models.

Robert (2014) carried out a study to confirm whether financial ratios are suitable for prediction of financial distress in the non-financial sector of companies listed in the NSE. The study was descriptive with secondary data obtained through review of literature including articles, journals and published financial reports. The study examined some financial ratios in the financial reports of both sound and financially distressed firms for the period between 2003 and 2011. The aim was to determine the most reliable and significant ratios that can be used for the prediction of company financial distress. The study drew the sample from companies listed in the NSE in the non-financial sector from 2002 to 2006 which came to a total of 41 companies. After the ratios were selected, they were analyzed using the backward stepwise method to determine the statistically significant ones. Discriminant analysis method was used to estimate the model that predicts financial distress. Statistical models were then used to test the predictive power of the ratios which led to the conclusion that the variables that reveal financial distress are those related to profitability, leverage and operational efficiency. The study also confirms that financial ratios can predict financial distress for non-financial sector Kenyan firms listed in the Nairobi Stock Exchange. According to the study, the best predictor ratios were net income to total assets, total liabilities to total equity, and total liability to total assets and current assets to sales. Profitability, liquidity, leverage and operational efficiency were therefore seen as crucial the determination of the financial health of a company and even though profitability ratios are the most significant, it is of much more importance to have a combination of ratios since it gives a more accurate model.

Conceptual Framework

In the proposed conceptual framework, the independent variable is working capital to total assets ratio and is one of the financial ratios. Financial distress is the dependent variable and its parameters include loss, profit reduction, high leverage, and also low liquidity.

Figure 1: Conceptual Framework



Source: Adopted from Charalambakis (2014)

RESEARCH METHODOLOGY

Research Design

According to Shukla (2010) a research design is a blueprint or a framework used for conducting research. It gives a detailed plan on how research will be conducted. This study will adopt a descriptive research design, which is a type of design in which information is collected without alterations to the source data. According to Mugenda and Mugenda (2003) this type of research design determines and reports the way things are. This method was chosen on the basis that the researcher was to examine and extract information from documents that contain participants' data which were then analyzed to make deductions. The design ensured that the data was collected with precision which defined its reliability; accuracy which defined validity and with minimal error.

Target Population

Mugenda and Mugenda (2003) define a population as an entire group of individuals, events or objects having a common observable characteristic. For the purpose of this study the population included all the firms that were listed at the Nairobi Securities Exchange in 2008 which were 66 in number. This period was selected since it was a time when Kenya faced financial crisis. According to the Economic Survey Report by the Kenya National Bureau of Standards (KNBS, 2009), the economic growth in Kenya was restrained by the 2008 global financial crisis and high fuel and food prices and though the crisis was experienced only in the first quarter of 2008, its spill-over effects were manifest throughout 2008 resulting to substantial declines in growths of most of the sectors of the economy leading to a slump in economic growth from 7.1% in 2007 to 1.7% in 2008.

Sampling Design

Sampling is the process of selecting a number of individuals for a study in such a way that they represent the large group from which they were selected (Mugenda & Mugenda, 2003). Purposive sampling was used since according to Mugenda & Mugenda, (2003), this type of sampling allows a researcher to use cases that have the required information with respect to the objectives of the study. The study sample comprised of companies whose profitability declined in 2008 due to the financial crisis of 2007. Therefore, only the companies which made losses or experienced a 25% reduction in profits in year 2008 compared to year 2007 were chosen and forecasts were done for the years between 2004 and 2009. This was useful in determining whether the model would have helped to prevent distress had it been used before it actually occurred. This, therefore, meant that the sample comprised of only the distressed firms and for

purposes of this study, the event of profit reduction by 25% and over and/ or loss making was treated as a clear signal of financial distress. The sample size comprised of 11 listed firms whose profitability declined or made losses for the period under review.

Data Collection Method

Secondary data were used in this study. These were obtained from published financial reports of listed companies whose profits declined in 2008. This, according to KNBS (2009) is the period where Kenya faced financial crisis. Data were collected for the period between 2004 and 2009 that is, the pre – recession period and during distress which were obtained from the Capital Markets Authority. In addition, data were gathered using data collection sheets. The financial reports included the income statements and the statements of financial position.

Data Analysis

To analyze the collected data, the study employed a discreet hazard model brought forward by Shumway (2001). The competitive advantage of this approach is twofold; first it takes into account all the available firm- year observations and second, it enables the probability of bankruptcy to change over time the same way the explanatory variables also change.

With respect to accounting information, the analysis of this paper was focused on the financial ratios of the Z- Score based on Altman (1968) and Taffler (1983) as applied by Charalambakis (2014). The predictor variable is given as X_1 represent working capital to total assets ratio. Y represents the dependent variable which is financial distress. The variables are summarized in the following regression model.

$$Y = \beta_0 + \beta_1 X_1 + \varepsilon$$

The null hypothesis in the study was tested using the t-statistics where the p-value was 0.05.

FINDINGS

Descriptive Statistics

The descriptive statistics employed include measures of central tendencies represented by mean, median and mode, and also measures of variation or dispersion as characterized by the standard deviation. The choice of these statistics was founded on the fact that the data collected and consequently analyzed were continuous. The descriptive statistics in respect of working capital to total assets ratios and financial distress for the 11 surveyed firms are presented and explained.

Working Capital to Total Assets Ratio

The study analyzed the ratio of working capital against total assets for firms listed on the Nairobi Securities exchange for the period between 2004 and 2009. The averages of the financial ratios indicators over the foregoing duration is presented in Table 1.

The study as shown in Table 1, indicated that highest average working capital/total assets ratio (mean = 0.257) was recorded by Eveready E.A. Limited followed closely by Crown Berger (mean = 0.238). Expectedly, the former company posted the highest median working capital/total assets ratio (median = 0.295) followed by Crown Berger (median = 0.295). On the other hand, Pan-Africa Insurance had the least working capital/total assets ratio (mean = 0.030). However, in terms of median working capital/total assets ratio, TPS Serena posted the least (median = 0.045). Most of the 11 firms surveyed posted mean working capital/total assets ratio of less than 0.2 (mean < 0.2). In terms of stability, Express Kenya was found to experience the largest fluctuation in its working capital/total assets ratio (std dev = 0.234). On the other hand, Williamson Tea was established to be the most stable (std dev = 0.015).

Interpretatively, Eveready E.A. Ltd which recorded the highest financial ratio implied that in comparison to the other listed firms its working capital was far much higher than its total assets. The high working capital/total assets ratio was a manifest of relatively poor performance of the firm; a factor that is likely to have contributed to its ultimate delisting from the NSE. For every 100 units of its total assets, 23.8 units were part of the working capital. On the extreme end where Pan-Africa Insurance recorded a mean of 0.030 in working capital/total assets ratio, it meant that in every 100 units of the company's total assets, only 3 units constituted the working capital. The foregoing is a clear manifest of good financial performance of the firm. It is highly probable that the Eveready E.A. Ltd was more prone to financial distress than all the other surveyed firms whereas the Pan-Africa Insurance was the least likely to suffer from financial distress.

Table 1: Descriptive Statistics for Working Capital to Total Assets Ratio

	Mean	Median	Mode	Std. Dev.
A. Baumann	.163	.165	.01 ^a	.124
Crown Berger	.238	.245	.180 ^a	.035
E.A Portland Cement	.188	.190	.13	.054
Eveready E.A Ltd	.257	.295	.30	.131
Express Kenya	.040	.105	-.28 ^a	.234
Kapchorua	.113	.120	.12	.020

Kengen	.047	.045	.03 ^a	.035
Marshalls E. A	.067	.115	.13	.106
Pan- Africa Insurance	.030	.055	.06	.048
Tps Serena	.070	.045	.01 ^a	.072
Williamson Tea	.112	.115	.12	.015

Table 1...

a. Multiple modes exist. The smallest value is shown

Financial Distress

Financial distress was characterized by the level of liquidity, leverage and profit or loss among listed firms which posted a decline in profitability in 2008. As such the composite score for the three parameters was employed to constitute financial distress. It is apparent that any firm that returned a financial loss, reduction in profits, high leverage, and low liquidity was in some level of financial distress.

The pertinent results of descriptive statistics are as shown in Table 2. According to the results, East Africa Portland Cement exhibited, on average, the highest level of financial distress over the period between 2004 and 2009 (mean = 1.073). The results implied that the foregoing firm was more likely to have posted reduced profits, increased losses, increased leverage, and/or reduced liquidity over the foretasted period of time. On the other hand, over the same period of time, Express Kenya was found to have the lowest level of financial distress (mean = 0.401). In this regard, the firm was found to be the one out of the 11 surveyed firms that posted increased profits, reduced losses, reduced leverage or/and increased liquidity over the indicated period of time.

It was further revealed that between 2004 and 2009, Crown Berger (std dev = 0.048), Express Kenya (std dev = 0.053), and Marshalls E.A. (std dev = 0.08) were the most consistent listed firms in respect of financial distress over the stated period. The foregoing implied that there was quite insignificant variation in financial distress among the three firms. However, Kengen (std dev = 0.374), A. Baumann (std dev = 0.367), and Eveready E.A. Ltd (std dev = 0.316) indicated the largest fluctuations in respect of financial distress. This implied that their profitability, liquidity and/or leverage were highly inconsistent over the 6 years period ending 2009.

Table 2: Financial Distress

	Mean	Median	Mode	Std. Dev.
A. Baumann	.673	.610	.24 ^a	.367
Crown Berger	.700	.715	.72	.048
E.A Portland Cement	1.073	1.005	.93 ^a	.171
Eveready E.A Ltd	.640	.757	.00 ^a	.316
Express Kenya	.401	.423	.33 ^a	.053
Kapchorua	.842	.825	.66 ^a	.166
Kengen	.709	.792	.00 ^a	.374
Marshalls E. A	.591	.627	.46 ^a	.078
Pan- Africa Insurance	.740	.768	.54 ^a	.155
Tps Serena	.766	.695	.56 ^a	.217
Williamson Tea	.961	.923	.80 ^a	.160

a. Multiple modes exist. The smallest value is shown

Inferential Statistics

The study examined the relationship between financial ratios and financial distress among listed companies in Kenya. The foregoing was achieved by correlating the aforesaid ratios against financial distress by use of Spearman rank correlation coefficient. Moreover, the extent to which the financial ratios affected financial distress was also analyzed using multiple regression.

Relationship between Working Capital to Total Assets Ratio and Financial Distress

The results of Pearson's correlation analysis are as illustrated in Table 3. The results of correlation analysis indicated that the relationship between working capital to total assets ratio and financial distress was positive, weak and statistically not significant ($r = 0.216$; $p > 0.05$) at 0.05 level of significance. The results were interpreted to mean that an increase in the ratio of working capital to total assets of the surveyed firms was likely to marginally increase financial distress of the said firms. As such, in order to reduce the financial distress, it was imperative to reduce the aforementioned financial ratio.

Table 3: Correlation between Working Capital to Total Assets Ratio and Financial Distress

	Financial Distress	
Debt to Total Assets Ratio	Pearson Correlation	.216
	Sig. (2-tailed)	.082

The results of this study differed from the results of a study conducted by Abuga (2013). While Abuga's study focused on firms funded by the ICDC, the current study centred on listed firms that recorded declined profits or losses in 2008. Moreover, unlike the present study that analyzed the predictability of financial ratios in respect of financial distress, Abuga's study looked into the causes of financial distress such as improper capital decisions, lack of access to credit, shortage of skilled workers, poor records, highly geared firms and poor internal management.

Influence of Working Capital to Total Assets Ratio on Financial Distress

The study examined the extent to which working capital to total assets ratio affected financial distress among listed firms. The first part as shown in Table 4, illustrates the correlation between the aforementioned financial ratio and financial distress as denoted by R, and also the coefficient of determination (R^2) which shows the proportion of financial distress that could be explained by or attributed to the studied financial ratio. The significance of the regression model is further tested by use of analysis of variance (ANOVA), the results of which are as shown in Table 5. Moreover, as illustrated in Table 6, the extent to which the financial ratios influenced financial distress (β_n) is examined. The results of the t-statistic indicated in the same table (Table 6) facilitated testing of the null hypothesis.

The study as shown in Table 4 revealed that the general correlation between working capital to total assets ratio and financial distress was positive and moderate ($R = 0.376$). In addition, according to the results of coefficient of determination ($R^2 = 0.141$), it was found that 14.1% of financial distress could be explained by the studied financial ratio. The remaining proportion (85.9%) of financial distress could be attributed to other factors besides working capital to total assets ratio. The results indicated the relatively small role played by the aforesaid financial ratio in respect of financial distress among listed firms in Kenya.

Table 4: Regression Weights for Overall Model

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.376 ^a	.141	.128	.24963

a. Predictors: (Constant), Working Capital to Total Assets Ratio

The results as shown in Table 4, significantly departed from the findings of a past study conducted by Ming- Chang (2014) among firms listed in the Taiwan Stock Exchange. Unlike the current study that found that only 14.1% of financial distress could be predicted by the studied

financial ratio, the former study observed that the Cox Proportional Hazard Model could accurately predict 87.93% of financial distress among the aforesaid firms. Similarly, to the present study, Abudo (2011) carried out a study to determine how financial distress can be predicted in the banking industry. Abudo's study examined the prediction accuracy of the Altman model in examining the failure of listed commercial banks in Kenya. This largely mirrored the present study that analyzed the prediction accuracy of discrete hazard model in examining financial distress of firms listed on the NSE.

The significance of the regression model was tested using the analysis of variance whose results are as shown in Table 5. The results indicated that the following linear regression model was significant ($F = 10.520$; $p < 0.05$).

$$Y = \beta_0 + \beta_1 X_1 + \varepsilon$$

Therefore, the model was suitable in analyzing the influence of financial ratios on financial distress among the surveyed listed firms.

Table 5: Significance Test Results

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	.656	1	.656	10.520	.002 ^a
Residual	3.988	64	.062		
Total	4.644	65			

a. Predictors: (Constant), Working Capital to Total Assets Ratio

b. Dependent Variable: Financial Distress

The results of multiple regression analysis shown in Table 6 were used to substitute and interpret the following linear regression model.

$$Y = \beta_0 + \beta_1 X_1 + \varepsilon$$

Where

Y represents Financial distress

β_0 represents Constant

X_1 represents Working capital to total assets ratio

ε represents Error term

β_1 represent Regression coefficients of predictor variables

The linear regression model is substituted as follows

$$Y = \beta_0 + \beta_1 X_1 + \varepsilon$$

$$Y = 0.636 + 0.832$$

The model was interpreted to mean that one unit change in financial distress was subject to 0.832 unit change in working capital to total assets ratio while holding other factors that were not part of the study constant($\beta_0 = 0.636$).

Table 6: Results for Overall Model Testing

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
1 (Constant)	.636	.044		14.589	.000
Working Capital to Total Assets Ratio	.832	.256	.376	3.243	.002

a. Dependent Variable: Financial Distress

The above results indicate that the discrete hazard model could in general significantly predict financial distress among listed firms. This is underscored by the significant effect of working capital to total assets ratio on financial distress ($t = 3.243$; $p < 0.05$) as shown in Table 6. The foregoing results supported earlier findings by Amalendu and Ruchira (2011) where it was found that financial ratios have predictive power in regard to whether a company will fail or not. Moreover, the study's findings were in agreement with Robert's (2014) observations that that financial ratios can predict financial distress for non-financial sector Kenyan firms listed in the Nairobi Stock Exchange. It is rational to conclude that

Testing Null Hypothesis

The results of the T-statistics as shown in Table 6 were used to test the null hypothesis as follows:

H₀: There is no significant influence of working capital to total assets ratios on financial distress in listed firms.

H_A: There is significant influence of working capital to total assets ratios on financial distress in listed firms.

Results of T-statistics indicated that ($t = 3.243$; $p < 0.05$)

Interpretation: There is significant influence of working capital to total assets ratios on financial distress in listed firms.

Hence, the null hypothesis (H_{01}) was rejected.

The null hypothesis was rejected because it was found that the ratio of working capital to total assets indeed significantly influenced financial distress among listed firms, and as such the ratio was a good predictor of financial distress amongst the stated entities.

SUMMARY

The study found that in respect of working capital to total assets ratio for the above-mentioned firms for the period between 2004 and 2009, Eveready E.A. Limited exhibited the highest ratio followed closely by Crown Berger. The Pan-African Insurance had the lowest ratio of working capital to total assets over the stated duration. Express Kenya recorded the largest fluctuation of the foregoing financial ratio over the indicated period while Williamson Tea was found to be the most stable. The fact that Eveready E.A. Limited had the highest working capital vis-à-vis its total assets hence depicting poor financial performance, was likely to be one major reasons that resulted in its eventual delisting from the Nairobi Securities Exchange. The study found that, an increase in the ratio of working capital to total assets of the surveyed firms was likely to moderately increase the financial distress of the 11 surveyed firms. Moreover, it was found that working capital to total assets ratio significantly influenced financial distress in listed firms.

Financial distress was characterized by the level of liquidity, leverage and profit or loss among listed firms which posted a decline in profitability in 2008. East Africa Portland Cement exhibited the highest level of financial distress between 2004 and 2009. Over the same period of time, Express Kenya was found to have the lowest level of financial distress. It was further revealed that over the same period, Express Kenya and Marshalls E.A. were the most consistent in respect of financial distress. In other words, there was quite insignificant variation in financial distress among the three firms. Kengen, A. Baumann and Eveready E.A. Ltd exhibited the largest fluctuations in respect of financial distress, which implied that their profitability, liquidity and/or leverage were highly inconsistent over the 6 years period ending 2009.

CONCLUSION AND RECOMMENDATIONS

The study concluded that both Eveready E.A. Limited and Crown Berger had the highest working capital to total assets ratio. The Pan-African Insurance was concluded to have the lowest foregoing financial ratio between 2004 and 2009. In terms of stability of the aforesaid financial ratio, Express Kenya was concluded to exhibit the largest fluctuation over the stated period of time while Williamson Tea was found to be the most stable. The ultimate delisting of the Eveready E.A. Limited was concluded to have possibly resulted from poor financial performance occasioned by very high working capital to total assets ratio. The study concluded

that, in order to reduce the financial distress, it was imperative to reduce the working capital to total assets ratio of the surveyed firms.

It is advisable for all listed companies to reduce their working capital particularly in respect of their total assets as one way of bolstering their financial performance, and therefore mitigating against financial distress. It is equally important to stabilize the proportion of the working capital against total assets owned by the listed firms. This is important in increasing the precision of forecasting financial performance of the said entities.

LIMITATIONS

The first limitation of the study was that the study restricted itself only to those listed companies that failed in 2008 leaving out other firms that failed in other years and secondly, the study generalized the findings from one period of financial crisis to other periods of financial crises which may not necessarily be the case. The study delimited itself to only those companies whose profits declined by 25% and above and those which made losses in the year under review since they were defined as financially distressed. Secondly, the study focused on the period from 2003 to 2008, since according to the Kenya National Bureau of Standards (KNBS, 2009) Economic Survey report, the economic growth in Kenya was restrained by the global financial crisis and high fuel and food prices. Lastly, the study focused on only the companies which were listed at the Nairobi Securities Exchange (NSE) for the period under study since this information was publicly available in the Capital Markets Authority website which ensured reliability and validity.

FURTHER STUDIES

The following areas are suggested for further research: The influence of financial ratios on financial distress of firms listed on the NSE immediately after 2008 economic crunch; effect of working capital on financial distress among listed firms in Kenya; a comparative analysis of sales and EBIT in relation to financial performance of listed firms in Kenya; relationship between current liabilities and financial distress of listed hospitality firms in Kenya; influence of debt on financial performance of listed firms in Kenya; and effect of capital structure on financial distress of firms listed on the NSE.

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