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ABSTRACT

This study aimed at establishing the determinants of financial distress in the context of listed firms where despite there being strict compliance and regulation rules and the reporting frameworks in place firms still struggled to operate and were faced with financial distress challenges. The specific objectives of the study were to show the influence of liquidity, the influence of financial leverage, the influence of capital structure and the influence of asset structure on financial distress of listed firms at the NSE. A descriptive survey design was adopted and the target population for the study was 65 listed firms and a census was conducted for all the listed firms. Document analysis sheet was used to collect secondary data. Data was analyzed using SPSS and multiple regression showed that Liquidity ($\beta=-1.221$, $p\text{-value}=.004$), Financial leverage ($\beta=5.002$, $p\text{-value}=.031$), capital structure ($\beta=0.531$, $p\text{-value}=.025$) significantly influence financial distress of listed firms at the NSE whereas asset structure ($\beta=6.051$, $p=.067$) had an insignificant positive effect on financial distress of listed firms at the NSE. The study concluded that liquidity, financial leverage and capital structure were significant determinants of financial distress and thus firms should strive to adopt moderate thresholds that ensure payment of maturing short term obligations while also ensuring maximum returns on investment. The study recommended that firms should strive to maintain an optimal liquidity and debt level that could lower the cost of borrowing such that the earnings generated by debt financing are not exhausted by fixed charge payments such as interest. Lastly the management of firms listed at the NSE should periodically review their capital structure so as to alter it depending on the financial fortunes of the company. The regulatory authority should continuously play their vigilance roles so as to ensure investor's wealth is safeguarded so as to enhance confidence in the capital markets authority.

Key Words: *Liquidity, Financial Leverage, Capital Structure, Asset Structure, Financial Distress*

INTRODUCTION

For a long time now financial distress has become a famous topic in the field of corporate finance because of its momentous adverse effect on an organization that reduce these entity's existence abilities (Khaliq, Basheer, Mohd, Thaker & Nurun, 2014). When an institution is facing challenges in its operations, management or financing then it can be argued that it is facing financial distress (Adeyemi, 2011).

Therefore, financial distress refers to events before and including bankruptcy, such as violation of loan contracts, constant losses or failure to honour of an organizations commitment to stakeholders (Ray, 2011). Financial distress can be indicated in a case where organizations operating cash flows are not sufficient to satisfy current obligations necessitating it to take corrective action such as restructuring, mergers, renegotiating for new loan agreements, issuing additional capital or an acquisition (Steven, Jayaraman, Shankar & Ally, 2011).

The coming into existence of a firm is assumed to mark the start of an infinite lifetime of the entity where it will operate into the foreseeable future without the need of suspending its operations or closure of business, however in the course of operation some firms face financial difficulties that can eventually cast doubt on its ability to operate if no mitigation mechanisms are put in place (Schmidt, 2010). Normally, a firm in financial distress is faced with two possible problems, either a cash shortage on the assets side of the statement of financial position or an overdue obligation or debt overhang in liabilities. Both sets of circumstances however conclude that cash flow is insufficient to cover current obligations forcing firms into negotiations with creditors about the conditions of deferment on their debt repayment during the ensuing period of distressed restructuring and this occurs when fair valuation of assets fall shorter than liabilities (Ijaz, Hunjira, Hemeed & Maqbool, 2013).

Financial distress doesn't occur in isolation as there are various triggers to this condition. The most prevalent causes of financial distress and business

failure are often a mix of problems and symptoms (Jahur &Quadir, 2012). However, the causes of financial distress in young companies may slightly vary from established entities. For instance, capital inadequacy where the business did not start with enough capital is a characteristic of young companies.

Capital in any business serves as a mean by which losses may be absorbed. It provides a cushion to withstand abnormal losses not covered in the current earning pattern (Adeyemi, 2012).Capital adequacy and net working capital are extremely significant in assessing financial distress (Zeytmoglu & Akarim, 2013).When a firm is unable to meet its current obligation, it may have high probability of financial distress (Ong'era, 2017). Liquidity contributes to firm's growth by enhancing working capital adequacy and ideal cash investment.

The Nairobi Securities Exchange, formally Nairobi Stock Exchange was constituted in 1954 as a voluntary association of stock brokers in the European community. The NSE is regulated by the Capital Markets Authority whose function is overseeing the affairs of listed companies (NSE, 2015). Since then the market has undergone tremendous transformations. At the heart of the Exchange is market liquidity enhancement by fostering transformational and utmost ethical practices amongst the participants so that more investors are assured of free and fair information for their trade related decision making (NSE, 2014).

Statement of the Problem

Financial distress has been present in the corporate world for many years now. For instance, the world has witnessed numerous cases of failure among globally reputed firms that were regarded as drivers of corporate financial soundness and their collapse came with massive losses to jobs and stagnation in the economy which negatively impacted investors, employees and the economy (Bender, 2013). In the local front, a total of 13 listed corporations have either been placed under receivership, faced financial challenges, undertaken financial restructuring or delisted from NSE altogether since

independence (NSE annual bulletin, 2016). Further, more than 56 % of the companies listed in NSE had declining trend on their market capitalization for the years 2011-2016 (CMA, 2016).

Financial distress leads to deterioration in the performance of an entity that leads to a decline in the returns of a company (Muigai, 2016). This situation if left unchecked negatively impacts many stakeholders such as employees, managers, creditors, investors and the Government by eroding their earnings leading to job losses, nonpayment of taxes and a reduction on the GDP (Altman & Hotchkiss, 2010). The investors and lenders return on their investment suffers uncertainty which demoralizes them from investing hence negatively affecting the economy because without investment the GDP suffers stagnation (Bender, 2013).

Various studies conducted in this field reveal conflicting results on the causative agents of financial distress. Whereas some find out liquidity, leverage, capital structure and asset structure to positively impact on financial distress others argue these variables affect financial distress negatively (Tesfamariam, 2014; Khaliq *et al.*, 2014; Muigai, 2016). Firms listed at the NSE should ensure they meet certain minimum operating criteria so as to guarantee investors confidence but despite all these regulations in place it's disturbing that these firms struggle to operate (NSE, 2014). It's also worth noting that financial distress manifests itself over a long period of time whereas most studies conducted in this area in Kenya were for a period of five years and below and therefore may not adequately identify financial distress. This study endeavored to address these challenges and providing a long lasting solution to the problem of financial distress faced by listed firms at the NSE.

Research Objectives

The main objective of the study was to establish the determinants of financial distress among listed firms in Kenya. The **specific objectives were:-**

- To establish the effect of liquidity on financial distress among listed firms at the NSE.

- To assess the effect of financial leverage on financial distress of listed firms at the NSE.
- To evaluate the effect of capital structure on financial distress of listed firms at the NSE.
- To establish the effect of asset structure on financial distress of listed firms at the NSE.

Research Hypotheses

- **H₀₁:** Liquidity has no significant effect on financial distress of firms listed at the NSE.
- **H₀₂:** Financial leverage has no significant effect on financial distress of firms listed at the NSE.
- **H₀₃:** Capital structure has no significant effect on financial distress of firms listed at the NSE.
- **H₀₄:** Asset structure has no significant effect on financial distress of Firms listed at the NSE.

LITERATURE REVIEW

Theoretical Review

Credit Risk Theory

This theory was proposed by Robert C Merton in 1974 and enhanced by Darrell Duffee and Stephen Schaeffer in 1988. Credit is the provision of goods and services to a person or entity on agreed terms and conditions where the payments are to be made later with or without interest. Credit risk is therefore the investor's risk of loss, financial or otherwise, arising from a borrower who does not pay his or her dues as agreed in the contractual terms (Nyunja, 2011). Firms have contractual obligations to fulfill and when they don't fulfill this obligation the risk is that creditors may not extend credit to them in future and may bring an action for winding up the company in a court of law. They also sell on credit and failure to collect the money will destabilize their earnings potential by affecting the liquidity position leading to distress.

This theory is relevant to this study because it helps us understand the effect of credit on liquidity of a business. It proposes that firms that don't manage their credit risks sufficiently are exposed to financial distress due to their inability to meet their present obligations when due.

Pecking Order Theory

According to this hypothesis, there is an order of financing where firms must first exhaust funds from internal sources before going for external borrowing and equity (Myers & Majluf, 1984) as earlier proposed by Donaldson (1961). Thus, firms that are profitable are expected to use less debt capital than those that do not generate high earnings.

The theoretical implication of pecking order theory is that there exists a clear financing hierarchy and there is no well-defined target debt ratio as suggested under the trade-off theory. This theory provides for preference to use of internal funds in place of external funds that encapsulate debt and equity in an effort to preserve value and firm stability. The implication is that increased use of external capital such as debt and equity influences the firm value negatively and increases the chances of financial distress. This theory explains why it's important to maintain a target capital structure that mitigates the effect of financial distress.

Trade-off Theory

Modigliani and Miller (1963) came up with tradeoff theory which assumes that there are benefits to leverage within a capital structure up until the optimal capital structure is reached. Firms achieve the optimal capital structures by trading off the costs against the benefits of the use of debt. This theory states that a firm's optimal financing mix is ascertained by balancing the losses and gains of debt financing. Myers (1977) suggested that although debt financing benefits the firm through tax-shield cash flows, the benefits from use of debt are not perpetual. Effectively, the theory postulates that as debt levels increases, the firm value also increases proportionately until a certain point where further increase in debt use increases both agency costs and bankruptcy costs and reduces the firm value leading to the likelihood of bankruptcy.

This theory supports the study by helping us to understand how tax shield benefit can help improve

liquidity through borrowing. It however cautions that increased borrowing erodes the gains made from tax saving as agency and distress costs increase significantly which may lead to bankruptcy. Therefore, this theory cautions on the effect of increased borrowing on financial leverage of a firm.

Cash Management Theory

This theory was formulated by James Mao and Charlie Sarndral in 1977. Cash management theory is concerned with the managing of cash flows into and out of the firm by financing deficit or investment surplus cash. Short term management of corporate cash balances is a major concern of every firm. This is so because it is difficult to predict cash flows accurately, particularly the inflows, and there is no perfect coincidence between cash outflows and inflows (Aziz & Dar, 2006).

During some periods cash outflows will exceed cash inflows because payments for taxes, dividends or seasonal inventory will build up. At other times, cash inflow will be more than cash sales and debtors may realize in large amounts promptly (Pandey, 2005). An imbalance between cash inflows and outflows would mean failure of cash management function of the firm. Persistence of such an imbalance may cause financial distress to the firm and hence business failure (Aziz & Dar, 2006). This is because a firm's liquidity position fluctuates significantly therefore furthering the effects of financial distress.

Empirical Review of Literature

Liquidity and Financial Distress

Liquidity helps a firm to establish its effectiveness in operations and hence it's prudent that optimal liquidity levels must be maintained to meet short term obligations when they fall due (Bhunias, 2010). It refers to the ease with which current assets can be converted into cash so as to meet the obligation of a firm (Pranowo, 2010).

Therefore, if an organization can easily convert its current assets into cash to offset its short term financial obligations when or before they fall due

the entity liquidity position is said to be better (The Economic Times, 2014). Liquidity is a key concern for any institution and a short fall in liquidity would result into institution failure because it will not be in a position to settle its obligations in a timely manner whereas having too much liquidity means making sub optimal investment decisions which in the long term if left unchecked can erode the gains that could have been made if the funds had been invested. Therefore, a firm with low liquidity level may be unable to meet its current obligation when it falls due which may expose it to financial distress (Ong'era, 2017).

Financial Leverage

Leverage is the increased use of fixed return capital to finance firm's operations, whereas leverage ratios are measures of the relative contribution of stockholders and creditors. In general the higher the firms leverage, the lower the firm's ability to cover its debt services and this will lead to financial distress (Lee *et al.*, 2010). Therefore, to improve on leverage a firm should manage its debt service charge by maintaining higher levels because it improves a firm's leverage and hence reducing the probability of financial distress (Tesfamariam, 2014).

Capital Structure

Capital structure refers to the mix of debt and equity used by a firm in financing its activities. It refers to the way firms finance their assets through a combination of various financing sources such as a combination of earnings (internal sources), debt and finally equity (Siddiki, Kabiraj & Joghee, 2017). Capital structure plays a vital role in determining the success or failure of an entity because firms that plan for a target capital structure eventually succeeds because this contributes to maximizing the shareholder's wealth and minimizing the cost of capital (Muigai, 2016).

Capital structure is ascertained by both debt and equity. Debt comes in the form of bond issues or long term notes payable, while equity is categorized

as common stock, preferred stock or retained earnings. Irwin and Scott (2010) categorizes sources of finance into personal savings, personal and business bank loans, private and business credit cards, grants and others. Uremadu and Efobi (2012) argued that the importance of capital structure cannot be overlooked when determining corporate financial stability, growth, adequate returns and financial performance.

Asset Structure

Asset structure refers to the way in which an entity chooses to hold its assets investments (Pouraghajan, Malekian, Emamgholipour, Lotfollahpour & Bagheri, 2012). It is the extent to which corporations retain their asset investment in one form or another (Cuong, 2014). Assets can either be tangible or intangible. Tangible assets are the physical assets such as property, plant and equipment whereas intangible assets are non-physical assets such as intellectual property, patents and copyrights (Babalola, 2013).

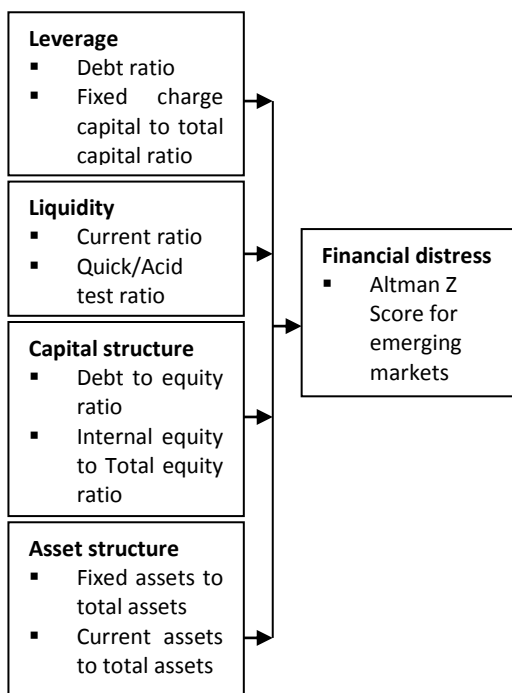
Firms with low and small tangible assets should borrow less because they don't have the capacity to meet constant debt payment contracts which may negatively impact on their financial distress (Maina & Ishmail, 2014). Akintoye (2010) suggests that entities that retain more tangible assets as their investments have the capacity to produce more products that are converted into sales which in turn increases their profitability and reduces their financial distress.

Financial Distress

Financially distressed firms are firms that are experiencing financial difficulties in maintaining their normal operations and in most severe conditions they are exposed to bankruptcy proceedings (Baharin & Sentosa, 2013). These are events preceding and including bankruptcy, such as violation of loan contracts. It is a condition when a company cannot meet (or has difficulties paying off) its financial obligations to its creditors. It occurs when operating cash flows are not sufficient to

satisfy current obligations and the firm is forced to take corrective actions (Ray & Mahavidyalaya, 2011). Recent history indicates that there have been several corporate failures throughout the world. During these last years, the annual flow of failures of companies did not stop growing and this trend became more marked during the periods of world economic crisis of 2007-2008 (Sami, 2013). The world witnessed collapse of reputed institutions such as General Motors (2009), Swissair (2001), The CIT Group (2009), Consec (2002), Pacific Gas & Electric Ltd (2001), Delta Air lines (2005), Parmalat (2003), Enron (2001) and WorldCom (2002) which were icons of corporate financial stability prior to filing for bankruptcy. Corporate financial distress has mainly been attributed to poor governance, severe competition, adverse economic factors and the capital structure (Outecheva, 2007).

Conceptual Framework



Independent variables Dependent variable

Figure 1: Conceptual Framework

Source: Author (2018)

METHODOLOGY

The study adopted descriptive survey research design which assumes several world views (Creswell, 2006). Sekaran and Bougie (2011) argue that descriptive survey design helps one to understand the characteristics of a group in a given situation and assists in systematic thinking about aspects of a given situation. The target population of the study comprised the companies listed at the NSE as at December 2016. In total, there were 65 firms listed at the NSE (NSE, 2017) and participated in the study. Since the target population comprised of 65 firms listed at the NSE, a census of all the firms was conducted for the study on condition that they have published accounts for the years 2012 to 2016. Quantitative data collected was analyzed by the use of descriptive statistics using Statistical Package for Social Sciences and presented through frequencies, percentages, means and standard deviations. The information was displayed by use of tables. This was done by computing percentages of variations in response as well as describing and interpreting the data in line with the study objectives and assumptions through use of SPSS. Inferential statistics involved Pearson correlation while multiple regression was used to test the relationship between independent and dependent variables.

In this study the following baseline model was used:

$$Y_{it} = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + e$$

Where:

Y is the dependent variable (Financial distress),

β_0 is the regression constant,

$\beta_1, \beta_2, \beta_3$ and β_4 are the coefficients of independent variables

X_{1it} is liquidity,

X_{2it} is financial leverage,

X_{3it} is capital structure

X_{4it} is asset structure.

e is error term

RESULTS AND DISCUSSIONS

Table 1: Descriptive Statistics

Variables	N	Min	Max	Mean	Std. Dev.	Skewness	Kurtosis
Liquidity	63	-11.710	45.042	2.4757	6.1298	5.455	38.800
Financial leverage	63	-.0915	1.0550	.56838	.28503	-.360	-.864
Capital Structure	63	-56.650	7.9708	1.23210	7.7862	-6.798	51.165
Asset structure	63	.0064	1.2037	.58529	.25638	.366	-.183
Financial Distress	63	.4924	19.4860	11.5390	5.8669	-.377	-1.258

Table 1 showed variables that were used in this study. The data was obtained from 63 companies listed in Nairobi Securities Exchange. Current ratio which was obtained by taking current assets divided by current liability was used to measure liquidity. It had a mean of 2.4757 and standard deviation of 6.12983. The findings revealed that one of the firms had minimum liquidity of -11.7101 implying that it may be unable to meet its short term financial obligation. However, the maximum liquidity was 45.042. The liquidity was positively skewed meaning that it skewed towards the right.

Debt ratio was obtained by taking total debt divided by total assets and it was used to measure financial leverage. Financial leverage had a mean of .568387 and standard deviation of .28503. This implies that firms listed in the NSE have less debt in comparison to total asset and they are unlikely to fall in financial distress. However, the findings revealed that one of the firms had maximum financial leverage of 1.0550 implying it is likely for suffer from financial distress. The minimum financial leverage was -0.0915 while it was negatively skewed implying the financial leverage was skewed towards left.

Debt Equity ratio was obtained by taking total debt divided by total equity and it was used to measure capital structure. Debt equity ratio had a mean of 1.232101 and standard deviation of 7.786232. This implies that firms listed in the NSE have more equity as compared to total debt and they are less likely to fall in financial distress. However, the findings revealed that one of the firms had minimum financial leverage of -56.6506 implying that it is more likely to suffer from financial distress as a result of capital structure. The maximum debt equity ratio was 7.9708 while it was negatively

skewed implying debt equity ratio was skewed towards left.

Current assets to total assets were obtained by taking current assets divided by total assets and it was used to measure asset structure. Current assets to total assets had a mean of .585 and standard deviation of .2563899. This implied that firms listed at the NSE have more current assets compared to non-current assets and they are unlikely to fall in financial distress. However, the findings revealed that one of the firms had maximum current asset to total asset ratio of 1.2037 implying that it is less likely to suffer from financial distress as a result of asset structure. The minimum current asset to total assets ratio was 0.064 while it was positively skewed implying current assets to total assets was skewed towards the right.

Lastly, Financial Distress was obtained using Altman Z score for emerging Markets. Z score above 2.99 - "Safe" Zones. The company is considered 'Safe' based on the financial figures only. Between 1.8 to 2.99 - "Grey" Zones. There is a good chance of the company going bankrupt within the next 2 years of operations. Z score below 1.80 - "Distress" Zones. The score indicates a high probability of distress within this time period. The minimum score was .4924 while maximum score was 19.4860. The mean score was 11.5390 with standard deviation of 5.86693. The distribution was negative skewed implying the distribution extended towards the left. From the findings, firms listed in NSE were not likely to suffer from financial distress although the minimum value indicated that some firms were not in good financial health.

The Table 2 showed distribution of financial distress.

Determinants and financial distress among listed firms in Kenya

The overall objective of the study was to establish the determinants of financial distress among listed firms in Kenya. The correlation coefficient (r) results

were presented as shown in Table 2 using Pearson correlation analysis, which computed the direction (Negative/negative) and the strength (Ranges from -1 to +1) of the relationship between two continues or ratio/scale variables.

Table 2: Multiple Correlation Matrix

		Liquidity	Financial Leverage	Capital Structure	Asset Structure
Liquidity	Pearson Correlation	1			
	Sig. (2-tailed)				
	N	63			
Financial Leverage	Pearson Correlation	-.105	1		
	Sig. (2-tailed)	.411			
	N	63	63		
Capital Structure	Pearson Correlation	-.165	.471**	1	
	Sig. (2-tailed)	.195	.000		
	N	63	63	63	
Asset Structure	Pearson Correlation	.036	.103	.138	1
	Sig. (2-tailed)	.782	.424	.282	
	N	63	63	63	63
Financial Distress	Pearson Correlation	-.267*	.291*	.265*	.177
	Sig. (2-tailed)	.035	.021	.036	.166
	N	63	63	63	63

*. Correlation is significant at the 0.05 level (2-tailed).

**. Correlation is significant at the 0.01 level (2-tailed).

The correlation of interest was obtained by examining the correlation between financial distress and each of the determinants. From the correlation table above, liquidity was negatively correlated to financial distress as the coefficient was -0.267 (p value < 0.05) this was significant at 95% confidence level. Thus increase in liquidity would make financial distress to decrease. Similarly, the correlation coefficient for financial leverage was 0.291, P=0.021, suggesting that there was significant positive relationship between financial leverage and determinants of financial distress

among listed firms in Kenya. Increase in financial leverage would results to increase in financial distress. Similarly, a correlation coefficient of 0.265 implied that there was significant positive relationship between capital structure and financial distress. However, there was insignificant positive relationship between asset structure and determinants of financial distress among listed firms in Kenya as indicated by .177 p=0.166. This implies that increase in asset structure would result to increase in financial distress.

Table 3: Multiple Linear Regression Results

Model Summary				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.518 ^a	.268	.218	5.0835072

a. Predictors: (Constant), Asset structure, Liquidity, Financial leverage, Capital structure

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	549.399	4	137.350	5.315	.001 ^b

Residual	1498.839	58	25.842
Total	2048.237	62	

a. Dependent Variable: Financial Distress

b. Predictors: (Constant), Asset structure, Liquidity, Financial leverage, Capital structure

Coefficientsa

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	14.469	2.297		6.299	.000
Liquidity	-1.221	.409	-.341	-2.984	.004
1 Financial leverage	5.002	2.683	.238	1.865	.031
Capital structure	0.531	.282	.243	1.884	.025
Asset structure	6.051	2.788	.217	2.170	.067

a. Dependent Variable: Financial Distress

The results from the model summary give us information on the overall summary of the model. From, R square column, determinants account for 26.8% significant variance in financial distress (R square = .268, P=0.001) implying that 73.2% of the variance in financial distress is accounted for by other variables not captured in this model. In order to assess the significance of the model, simply whether the study model is a better significant predictor of the financial distress rather than using mean score which is considered as a guess, the study resorted to F Ratio. From the findings, the F value is more than one, as indicated by a value of 5.315, which means that enhancement as a result of model fitting is much larger than the model errors/inaccuracies that were not used in the model (F (4,62) = 5.315, P=0.001). The large F value is very unlikely to exist by chance (99.0%), thus implying that the final study model had significant improvement in its prediction ability of financial distress of listed firms at the NSE.

The study used unstandardized coefficient column because we wanted to compare determinants effect across different measures. Therefore, unstandardized coefficients which were based on standard deviation were appropriate. If determinants were held at zero or it is absent, financial distress among listed firms in Kenya would be significant at 14.469, p=0.000.

Liquidity had a significant unique contribution to the model ($\beta=-1.221$, p=.004). This implied that a unit increase in liquidity led to a decrease in

financial distress by 1.221. Similarly, Financial leverage had a significant unique contribution to the model ($\beta=5.002$, p=.031). This implies that a unit increase in financial leverage led to an increase in financial distress by 5.002. Capital structure had also a significant unique contribution to the model ($\beta=0.531$, p=.025). This implied that a unit increase in capital structure led to an increase in financial distress by 0.531. However, asset structure had insignificant unique contribution to the model ($\beta=6.051$, p=.067). It was therefore worth noting that financial leverage had the highest contribution to financial distress followed by liquidity and lastly was capital structure. Since asset structure was found to be insignificant in prediction of financial distress it was dropped from the model. Therefore the new model was: $Y = -14.4690 + 1.221X_1 + 5.002X_2 + 0.531X_3$

CONCLUSIONS

The results revealed that liquidity had significant negative relationship with financial distress of firms. Therefore, the first null hypothesis was rejected as the study concluded that liquidity had significant relationship with financial distress. Hence, liquidity was a significant predictor of financial distress. This implies that as liquidity increases, the firms are unlikely to suffer from financial distress. Most of the listed firms were found to be liquid with some firms having current asset over ten times of their current liability. This implied listed firms were able to meet their short term obligation by using their

current asset to pay back their short term maturing obligations. Depending on how the company's assets were allocated, a high current ratio suggested that that company was not using its current assets efficiently, was not securing financing well, or was not managing its working capital well.

Basing on the second objective, the study concluded that financial leverage had significant positive effect on financial distress. Using debt to total asset ratio, it was established that increase in debt relative to total asset would result to financial distress and therefore, firms should seek to lower this ratio. Therefore, the second null hypothesis was rejected as financial leverage has significant relationship with financial distress. Most of the firms were found to use debts to finance their operations. This does not imply that firms are unable to meet their obligation but it can be used to indicate the confidence credit institutions have on the firms listed at the NSE. However, some firms have low debt ratio as indicated by minimum ratio indicating they are unlikely to suffer from financial distress.

The study concluded that capital structure had significant positive effect on financial distress. Therefore, the third null hypothesis was rejected as $P < 0.05$ as obtained from linear regression. This implies that capital structure is a significant predictor of financial distress and increase in debt equity ratio would result to increase in financial distress. This implies that firms are using more debt to meet their obligation as compared to equity. If a lot of debt is used to finance increased operations (high debt to equity), the company could potentially generate more earnings than it would have without this outside financing. However, if the cost of debt financing ends up outweighing the returns that the company generates on the debt through investment and business activities, it may lead to financial distress.

Lastly, the study concluded that asset structure has insignificant positive relationship with financial distress. This implies that, increase in current asset as compared to total assets would result to increase

in financial distress. Therefore, the last null hypothesis was accepted as asset structure is not a significant predictor of financial distress. It was concluded that most firms had high current asset as compared to total asset which indicates that they are able to meet their short term obligation when they fall due. However, inferential results indicated that this relationship is not significant implying other factors may be playing significant roles.

RECOMMENDATION

The study recommended that company management should arbitrage between moderate liquidity and financing. Firms listed at the NSE should maintain moderate liquidity level which is just sufficient to meet their shorter maturing obligations when due and ensure no overinvestment is made in working capital items. This will ensure productive utilization of its most liquid assets in generating earnings to the firm.

As leverage is a significant predictor of financial distress the study recommends that firms should strive to maintain an optimal debt level that will lower the cost of borrowing such that the earnings generated by debt financing are not exhausted by fixed charge payments such as interest. Firms should match their debt covenants with assets pledged as a security to ensure these assets are productive enough to generate sufficient returns that can cover up the fixed financial charges.

The management of firms listed at the NSE should periodically review their capital structure so as to alter it depending on the financial fortunes of the company. If the returns from fixed charge capital are diminishing because of the increase in the cost of capital then the management should consider using more equity compared to debt in its capital structure so as to regulate the impact of financial distress.

The study recommends that less emphasis should be placed on asset structure as a contributor to financial distress. Though current assets are an essential component of curbing liquidity, the management of firms should not over invest in current assets as this will deprive off firms earnings

that will have been generated from noncurrent assets which generates earnings for the firm.

Therefore the study recommended that the securities exchange should continuously be vigilant and monitor listed firms at the securities exchange. This is so because some firms still were found to be in the grey zone and even others experiencing financial distress yet investors had strong belief in listed firms at the securities exchange to generate above average returns yet this firms still struggled to operate on a going concern basis. If not checked investors risk losing the financial fortunes of their investments. As regulators the capital markets authority should review the operations of these firms so as to safeguard investors wealth as some firms may soon be declared insolvent.

Suggestion for further studies

This study was conducted on listed firms at the securities exchange which are highly regulated by

the capital markets authority. Further research should be conducted on privately owned firms which have no mandatory reporting requirements to its shareholders.

This study only focused on liquidity, financial leverage, capital structure and asset structure as the main determinants of financial distress. However, from the regression analysis only 26.3% was significantly accounted by these four factors implying other factors also contribute to financial distress among listed firms at the NSE. Therefore, more research needs to be done on the other factors such as board composition and management, internal control systems and corporate governance framework to determine which other factors significantly affect financial distress among listed firms at the NSE.

REFERENCES

- Adeyemi, B. (2011). Bank Failure in Nigeria: A Consequence of Capital Inadequacy, Lack of Transparency and Non-Performing Loans. *Banks and Bank System*, 6(1), 99–109.
- Aasen, M. R. (2011). Applying Altman's Z-score to the financial Crisis. An empirical study of financial Distress on Oslo Stock Exchange. (Unpublished Master's Thesis). *Norwegian School of Economics*, Norway.
- Ahmed, N., Ahmad, Z., & Ahmed, I. (2011). Determinants of Capital Structure: A Case of Life Insurance Sector of Pakistan. *European Journal of Economics, Finance and Administrative Sciences*, (24), 1450-2275.
- Akhtar, S., Javed, B., Maryam, A., & Sadia, H. (2012). Relationship between financial leverage and financial performance: Evidence from fuel & energy sector of Pakistan. *European Journal of Business and Management*, 4(11), 7- 17.
- Akintoye, I. R. (2009). Sensitivity of performance to capital structure. *Banking and Finance Letters*, 1(1), 29.
- Alifiah M.N (2013) Reduction of financial distress companies in the trading and Services sector in Malaysia using macroeconomic variables. *Jurnal Teknologi*. 64(1) 85–91.
- Altman, E. I. (1968). Financial ratios, discriminant analysis and the prediction of corporate bankruptcy. *The journal of Finance*, 23(4), 589-609. Retrieved from <http://www.jstor.org/stable/2978933>
- Altman, E. I., & Hotchkiss, E. (2010). *Corporate financial distress and bankruptcy: Predict and avoid bankruptcy, analyze and invest in distressed debt* (Vol. 289). John Wiley & Sons.
- Amoa-Gyarteng, K. (2014). Analyzing a Listed Firm in Ghana for Early Warning Signs of Bankruptcy and Financial Statement Fraud: An Empirical Investigation of AngloGold Ashanti. *European Journal of Business and Management* 6(5), 10–17.
- Andualem, U. (2011). Financial distress and its determinants in Selected beverage and metal Manufacturing firms in Ethiopia.

- Argyrou, A. (2006). *Predicting financial distress using neural networks. Another episode to the serial?* (Unpublished Master's Thesis). The Swedish School of Economics and Business Administration, Helsinki.
- Aziz, M. & Dar, H. (2006). Predicting corporate financial distress. Where we stand? *Corporate Governance. The International Journal of Business in Society*, 6 (1), 18-33.
- Babalola, Y. A. (2013). The effect of firm size on firms profitability in Nigeria. *Journal of Economics and Sustainable Development*, 4(5), 90-94.
- Babbie, E. (2007). *The basics of social research*. Belmont, CA: Wadsworth Publishing.
- Baharin, I., & Sentosa, I. (2013). Capital Structure and the Post Performance Factors of Malaysian PN 17 Firms. *International Journal of Business and Management Invention*, 2(3), 50–56.
- Baimwera, B., & Muriuki, A. (2014). Analysis of corporate financial distress Determinants: A survey of non-financial firms listed in the NSE. *International Journal of Current Business and Social Sciences*, 1(2), 58-80.
- Balcaen, S., & Ooghe, H. (2004, June). *35 years of studies on business failure: An overview of the classic statistical methodologies and their related problems*. (WorkingPaperNo2004/248). Retrieved from http://www.FEB.UGent.be/nl/Ondz/wp/papers/wp_04_248.pdf
- Bapat, V. and A. Nagale, 2014. Comparison of bankruptcy prediction models: Evidence from India. *Accounting and Finance Research journal*, 3(4): 91-98.
- Beaver, W. (1966). Financial Ratios as Predictors of Failure. *Journal of Accounting Research*, 5, 71-111. Retrieved from <http://www.jstor.org/stable/2490171>
- Bender, R. (2013). *Corporate financial strategy* (4th Edition). UK: Routledge.
- Bhunia, A., Khan, S. I. U., & Mukhuti, S. (2011). Prediction of Financial Distress – A Case Study of Indian Companies. *Asian Journal of Business Management*, 3(3), 210–218.
- Brigham, E. F., & Daves, P. R. (2004). *Intermediate Financial Management: Study Guide*. New Jersey: Thompson.
- Brigham, E.F. & Ehrhardt, M.C., 2005. *Financial Management: Theory and Practice*. Eleventh Edition. South Western: Thomson.
- Campello, M., & Giambona, E. (2010). *Asset tangibility and capital structure*: Working paper, University of Illinois.
- Cheluguet, J.K. (2014), Determinants of Financial Distress in Insurance Companies in Kenya. *Prime Journal of Business Administration and Management (BAM)* 4(1), 1319-1328.
- Chen, R., Wong & K.A. (2004). The Determinants of Financial Health of Asian Insurance Companies, *Journal of Risk and Insurance*, 71: 469–499.
- Cooper, D. R., & Schindler, P.S. (2011). *Business research methods*. New York. McGraw Hill.
- Cooper, J. & Schindler, P. (2011). An Attempt to Study Intellectual deterioration by Premorbid and Psychotic testing, *Journal of Consulting Psychology*, 14(95-98).
- Cuong, N. T. (2014). Threshold effect of capital structure on firm value: Evidence from seafood processing enterprises in the South Central region of Vietnam. *International Journal of Finance & Banking Studies*, 3(3), 14-29.
- Creswell, J. (2003). *Research Design: Qualitative, Quantitative and Mixed Method Analysis*. SAGE Publications (4ed).

- Damouri, D; Khanagha, J.B and Kaffash, M (2013). The relationship between changes in the financial leverage and the values of the Tehran listed firms.
- Deakin, E. A Discriminant Analysis of Predictors of Business Failure, *Journal of Accounting Research Spring*: pp. 167–179, (1972).
- Dimitras, A., Zanakis, H., & Zopounidis, C.(1966). A Survey of Business Failures With an emphasis on Prediction methods and industrial applications, *European Journal of Operational Research*, 1996, Vol. 90, pp. 487-513.
- Ezeoha, E. A. (2008). Firm size and corporate financial-leverage choice in a developing economy: Evidence from Nigeria. *The Journal of Risk Finance*, 9(4), 351-364.
- Elsas, R., Flannery, M. J., & Garfinkel, J. A. (2004). Major investments, firm Financing decisions, and long-run performance. *Journal of Managerial Economics*, 12(8) 231-253.
- Flannery, C. & Heakins, E. (2011), "External control, corporate strategy and firm performance".
- Gharghori, P., Lee, R., & Veeraraghavan, M. (2009). Anomalies and stock returns: Australian evidence. *Accounting & Finance*, 49(3), 555-576.
- Gharaibeh, M. A., Sartawi, I. I. S. M., & Daradkah, D. (2013). The Applicability of Corporate Failure Models to Emerging Economies: Evidence from Jordan. *Interdisciplinary Journal of Contemporary Research in Business*, 5(4), 313–325.
- Gupta, P., Srivastava, A., & Sharma, D. (2014). Capital structure and financial performance: Evidence from India. *International Research Journal*, 2(6), 112-126.
- Hamid, M., Mustafa, Z., Idris, F., Abdullah, M., & Suradi, N. (2011). Measuring Value Based productivity: Confirmatory factor analytic approach. *International Journal of Business and social science*, 2(6), april 2011
- Hoque, J., Hossain, A., & Hossain, K. (2014). Impact of capital structure policy on value of the firm: A study on some selected corporate manufacturing firms under Dhaka Stock Exchange. *Ecoforum Journal*, 3(2), 9.
- Hu, H. (2011). Predicting Financial Distress in the Hong Kong Growth Enterprises: Market from the Perspective of Financial Sustainability. *Journal of Sustainability*, 7(2), 1186-1200.
- Jahur, M.S., & Quadir, S.M. (2012). Financial Distress in Small and Medium Enterprises (SMEs) of Bangladesh: Determinants and Remedial Measures. *Journal of Business Administration*.
- Jensen & Meckling. (1976). Theory of the Firm: Managerial Behavior, Agency Costs and Ownership Structure. *Journal of Financial Economics*. V. 3, No. 4, pp. 305-360. <http://www.sfu.ca/~wainwrig/Econ400/jensenmeckling.pdf>
- John W. and Kahn, J. (2007) Research in Education, New Delhi, Prentice Hall of India Private.
- Ijaz, M. S., Hunjira, A. I., Hameed, Z., & Maqbool, A. (2013). Assessing the financial failure using the Z-score and current ratio: A case of sugar sector listed companies of Karachi Stock Exchange. *World Applied Sciences Journal*, 23(6), 863-870.
- KAM (2010, January 4). Business Intelligence: *Things look up for Manufacturing Sector*. Retrieved from <http://www.kam.co.ke/?itemld=17&newsld=454>
- KAM (2011, February 7). *Kenya's Economic Outlook, 2011*. Retrieved from <http://www.kam.co.ke/?itemld=17&newsld=459>
- Kariuki, S. N., Namusonge, G. S., & Orwa, G. O. (2015). Firm characteristics and corporate cash holdings: a managerial perspective from Kenyan private manufacturing firms. *International Journal of Advanced Research in Management and Social Sciences*, 4 (4), 51-70.
- Kemboi, J. K. and Tarus, D. K. (2012). Macroeconomic Determinants of Stock Market Development in Emerging Markets: Evidence from Kenya. *Research journal of finance and accounting*.

- Kvale, S. (2007). *Doing Interviews*. Thousand Oaks, CA: Sage.
- Khalid, F. (2016). Prediction of Financial Distress in Manufacturing Industry of Pakistan *Journal of Global Business and Social Entrepreneurship (GBSE) Vol. 2: no. 5 (2016) page 102–12 1 | gbse.com.my | eISSN 24621714*
- Khaliq, A ., Basheer. M., Mohd, T., Thaker, M., & Nurun,. N (2014) Identifying Financial Distress Firms: A Case Study of Malaysia’s Government Linked Companies (GLC). *International journal of finance and management* 3(3) 2307-2466.
- Kihooto, E (2016), Access Financial Distress amongst Commercial and Services Companies Listed at the Nairobi Securities Exchange.
- Koksal, B., Orman, C., Oduncu, A. (2013), “Determinants of capital structure: evidence from a major emerging market economy”, Available at: <http://mpra.ub.uni-muenchen.de/48415/> (Accessed on: September 23, 2014)
- Kothari, C. R. (2004). *Research methodology: Methods and techniques (2nd Edition)*: New Delhi, India: New Age International (P) Limited.
- Kothari, C.R. (2011). *Research Methodology; Methods and Techniques*. New Delhi. New Age International Publishers.
- Lee, S., Koh, Y., Huh, C. (2010). ‘Financial Distress for U.S. Lodging Industry.’ *Effects of Leverage, Capital Intensity, and Corporateization*, University of Massachusetts – Amherst.
- Louis, C. Lawrence, M., & Morrison, K. (2007). *Research Methods in Education*, Routledge, New York, United States of America.
- Malik, R. K. (2013). Determinants of Financial Distress Evidence from KSE 100 Index. *Business Review - Volume 8 Number 1 , 7-19 .*
- Maina, A.M. (2011). The relationship between working capital management and Financial performance of manufacturing firms listed at the Nairobi Securities Exchange.
- Maina F. G., & Sakwa M. M. (2012). Understanding financial distress among listed firms in Nairobi stock exchange: *a quantitative approach using the z-score multi-discriminant financial analysis model*. Media, London. 189.
- Mamo, A. Q. (2011). *Applicability of Altman (1968) model in predicting financial distress of commercial banks in Kenya*. (Unpublished MBA Project). University of Nairobi.
- Memba, F., & Nyanumba, J. (2013). Causes of financial distress: A survey of firms funded by Industrial and Commercial Development Corporation in Kenya. *Interdisciplinary Journal of Contemporary Research in Business*, 4(12), 11711185.
- Mohamed, S., Ang, J. & Ahmadu, U. S. (2013). Predicting corporate failure in Malaysia: An application of the logit model to financial ratio analysis. *Asian Academy of Management Journal*, 6 (I), 99-118.
- Mohammed, A. A., & Kim-Soon, N. (2012). Using Altman's Model and Current Ratio to Assess the Financial Status of Companies Quoted In the Malaysian Stock Exchange. *International Journal of Scientific and Research Publications*, 2.
- Mugenda & Mugenda. (2003). *Research methods quantitative and qualitative approaches*. Nairobi, Kenya: African Center for Technology Studies.
- Muigai R. G (2016), Effect of Capital Structure on Financial Distress of Non-financial Companies Listed at Nairobi Securities Exchange.
- Muller, G. H., Steyn-Bruwer, B. W., & Hamman, W. D. (2010). Predicting financial distress of companies listed on the JSE: Comparison of techniques. *South African Journal of Business Management*, 40(1), 21-32.

- Munga, N. (2012). The Nairobi stock exchange, its history, organization and role in Kenya economy. *Unpublished MBA Project*, University of Nairobi.
- Mwangi, Muathe, S., & Kosimbei, G. (2014). Relationship between capital structure and performance of nonfinancial companies listed in the Nairobi Securities Exchange, Kenya. *Global Journal of Contemporary Research in Accounting, Auditing and Business Ethics*, 1(2), 72-90.
- Myers, S. C. (2001). Capital structure. *The Journal of Economic Perspectives*, 15(2), 81102.
- Myers, M. D. (2013). *Qualitative research in business and management*. New Delhi, ND: Sage Publications Ltd.
- Myers, S.C. & Majluf, N. S. (1984). Corporate financing and investment decisions when firms have information that investors do not have. *Journal of Financial Economics*, 13(2), 187-221.
- Nairobi Stock Exchange (2010). *Annual Reports*. Nairobi: Nairobi Stock Exchange.
- Nairobi Securities Exchange (2013). *The Launch of the 2013 Financial Reporting (FiRe) Award*. Site: <https://www.nse.co.ke/media-center/press-release.html?start=20>
- Nairobi Securities Exchange, NSE, (2014). The History of NSE.
- Neeru S., (2012) Meaning of the term- descriptive survey research method. *International Journal of Transformations in Business Management*, 1 (6), 1-7
- Nyambonga T.O (2014), Determinants of Corporate Financial Distress Case of Non-Financial Companies Listed at Nairobi Securities Exchange.
- Olakunle, A. O., Oni, E. O. (2014) "Assessing the impact of asset tangibility on capital structure: choice for listed firms in Nigeria", Available at <http://www.aebjournal.org/articles/0203/020301.pdf> (Accessed on: September 20, 2014)
- Ong'era, J.B., Muturi, W., Oluoch ,O.,& Karanja, J.N. (2017). Liquidity as a Financial Antecedent to Financial Distress in Listed Companies at Nairobi Securities Exchange. *Journal of Emerging Issues in Economics, Finance and Banking. An Online International Research Journal*, 6(1), 306-367.
- Ongore, V. O. (2011). The relationship between ownership structure and firm Performance: An empirical analysis of listed companies in Kenya. *African Journal of Business Management*, 5(6), 2120-2128.
- Outecheva, N. (2007). *Corporate financial distress: An empirical analysis of distress risk*. Doctoral dissertation, University of St. Gallen, Switzerland.
- Pandey, I. M. (2009). *Essentials of Financial Management* (1st Edition). New Delhi: DN, Vikas Publishing House Ltd.
- Paton, Q. (2002). *Qualitative Evaluation Research Methods*. Pp322.
- Perinpanathan, R. (2014). Impact of financial leverage on financial performance: Special reference to John Keels Holdings Plc, Sri Lanka. *Scientific Research Journal*, 2(2), 15-20.
- Platt, H. D., & Platt, M. B. (2002). Predicting corporate financial distress: reflections on choice-based sample bias. *Journal of Economics and Finance*, 26(2), 184-199.
- Pongsatit, S., Ramage, J., & Lawrence, H. (2014). Bankruptcy prediction for large and small firms in Asia: A comparison of Ohlson and Altman. *Journal of Accounting and Corporate Governance*, 1(2), 1-13.
- Pouraghajan, A., Malekian, E., Emamgholipour, M., Lotfollahpour, V., & Bagheri, M. M. (2012). The relationship between capital structure and firm performance evaluation measures: Evidence from the Tehran Stock Exchange. *International Journal of Business and Commerce*, 1(9), 166-181.
- Pranowo, K., Azam, N., Achsani, M. A.H, & Nuryartono, N. (2010). 'Determinant of Corporate Financial Distress in an Emerging Market Economy": *Empirical Evidence from the Indonesian Stock Exchange 2004-2008*.

- Pratheepkanth, P. (2011). Capital structure and financial performance: Evidence from selected business companies in Colombo Stock Exchange, Sri Lanka. *Journal of Arts, Science & Commerce*, 2(2), 171-183.
- PWC Kenya. (2012). *Pwc Kenya*. Retrieved May 21, 2012, from Pwc Kenya website:<http://www.pwc.com/ke/en/industries/industrial-manufacturing.jhtml>.
- Ray, S. (2011). Assessing Corporate Financial Distress in Automobile Industry of India : An Application of Altman's Model. *Research Journal of Finance and Accounting*, 2(3), 155–169.
- Robinson, R.A. and M. G. Maguire (2001) "Top common causes of construction Contractor failures", *Journal of Construction Accounting and Taxation*, Jan/Feb 2003.
- Sami, B. J. (2013). Financial Distress and Bankruptcy costs. In H. Dincer & U. Hacioglu. *Global Strategies for Banking and Finance* (369–379). United States: IGI Global.
- Schmidt M. (2014). Business Case Essentials. 4th Edition: *Solution Matrix Limited. Ebook*.
- Sekaran, U. (2010). *Research Methods for Business: A skill Building Approach* (4th Edition), John Wiley & Sons, New York.
- Sekaran, U., & Bougie, R. (2011). *Research Methods for Business: A Skill Building Approach*. (5th ed.). Aggarwal printing press, Delhi
- Siddik, M. N. A., Kabiraj, S., & Joghee, S. (2017). Impacts of Capital Structure on Performance of Banks in a Developing Economy: Evidence from Bangladesh. *International Journal of Financial Studies*, 5(2), 1-18.
- Sitati, A., & Odipo, M. (2011). Evaluation of applicability of Altman's revised model in prediction of financial distress. *Journal of Accounting Literature*, 5(2), 117-135.
- Slatter, S. (1984), *Corporate Recovery: Successful Turnaround Strategies and Their Implementation*, Penguin, London.
- Steven, L. Jayaraman, M. Shankar, C. and Ally, M. (2011) Effects of Financial Distress Condition on the Company Performance: A Malaysian Perspective. *Review of Economics & Finance*.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using Multivariate Statistics* (5th ed.). Allyn and Bacon, New York.
- Tamari, M. (1966). Financial ratios as a means of forecasting bankruptcy. *Management International Review*, 6(4), 15-21.
- Tan, T. K. (2012). Financial distress and firm Performance: Evidence from the Asian Financial Crisis. *Journal of Accountancy and Finance*, 11, 5-6. Retrieved from <http://www.aabri.com/manuscripts/121199.pdf>
- Tesfamariam, (2014), *Determinants of Financial Distress in the Case of Manufacturing Share Companies in Addis Ababa, Ethiopia*.
- Theodossiou, P., and E. Kahya (1996). Non Stationarities in Financial Variables and the prediction of Business Failures" *Proceedings of the Business and economic statistics section, American Statistical Association*, pp.130-133.
- Tuvadaratragool, S (2013), *The role of financial ratios in signaling financial distress: Evidence from Thai listed companies*, *DBA thesis*, Southern Cross University, Lismore, and NSW.
- Velnampy, T. (2013). Corporate governance and firm performance: a study of Sri Lankan manufacturing companies. *Journal of Economics and Sustainable Development*, 4(3), 228-235.
- Vuran, B. (2009). Financial Failure Prediction Using Financial Ratios : An Empirical Application on Istanbul Stock Exchange. *Istanbul University Journal of the School of Business Administration*, 3(3), 47–65.
- Xie, C., Changqing, L., & Xiang, Y. (2011). Financial distress prediction based on SVM and MDA methods: the case of Chinese listed companies" *Springer Science*, 45 (10), 671-686.

- Zeitun, R., & Tian, G. G. (2014). Capital structure and corporate performance: evidence from Jordan. *Australasian Accounting Business & Finance Journal*, 7(3), 287-301.
- Zeytinoglu, E. & Akarim, Y. D. (2013). Financial Failure Prediction Using Financial Ratios :An Empirical Application on Istanbul Stock Exchange. *Journal of Applied Finance & Banking*, 3(3), 107–116.
- Zikmund, G., Babin, J., Carr, J. & Griffin, M.(2010). *Business Research Methods* 8th edition. South-Western, Cengage Learning, Natorp Boulevard mason.
- Zhuang, Q. & Chen, L. (2014). *Dynamic Prediction of Financial Distress Based on Kalman Filtering. Discrete Dynamics in Nature and Society (July 2014)* – Hindawipublishing Corporation.