

AFRICA INTERNATIONAL JOURNAL OF MULTIDISCIPLINARY RESEARCH

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www.oircjournals.org

ISSN: 2523-9430 (Online Publication)

ISSN: 2523-9422 (Print Publication)

BIG OR SMALL?

DOES BOARD SIZE MATTER IN TIMES OF FINANCIAL DISTRESS? EVIDENCE FROM KENYAN LISTED FIRMS- A PANEL APPROACH

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ARTICLE INFO

Article History:

Received 21st February, 2018

Received in Revised Form 18th March, 2018

Accepted 20th March, 2018

Published online 22nd March, 2018

Keywords: Board Effectiveness, financial distress, board size, listed firms. Kenya

firms in Kenya ($\beta = 0.490 > 0.05$). Board size does not matter in times of financial distress in Kenya. Few empirical studies have examined the effectiveness of the board size with financial distress especially in the developing countries. This study contributes to the existing literature by examining such associations and providing updated empirical evidence from a developing country.

Introduction

Financial distress is the inability of a firm to meet its financial obligations as and when they fall due (Grice and Dugan, 2001; Davydenko, 2005; Mumford, 2003). Other researchers view financial distress as a condition when the firm is faced with negative cumulative earnings for at least a few consecutive years (Gilbert, 1990). Undeniably, there is consensus that a firm is deemed to be in financial distress when it is unable to meet its financial obligations.

Financial distress may result unto bankruptcy, liquidation or significant changes in control (Lee and Yeh, 2004). The failure of distressed companies often results in significant direct and indirect costs to many stakeholders; including shareholders, managers, employees, lenders and clients. However, research

indicates that significant cost reductions can be realized if financially distressed companies are identified before failure (Noor and Iskander, 2012).

An examination of many corporate failures indicate that the causes of corporate financial distress are financial factors such as leverage, (Amoa-Gyarteng, 2014) profitability (Zulkarnain and Hasbullah, 2009) and assets turnover (Zulkarnain and Hasbullah, 2009). Furthermore, non-financial factors such as lack of consistent policies, (Milton, 2002) control procedures, guidelines and mechanisms (Jimming and Weiwei, 2011) also play a significant role in financial distress. Studies also indicate that most of the causes of financial distress are dependent on the quality of the decision makers who are the board of directors

ABSTRACT

The study sought to establish the effect of board size on financial distress of listed firms in Kenya. The study used a panel study of a 10 year firm observations from 2004-2013. The study utilized resource dependency theory to underpin the study. Financial distress was measured using Altman Z score. Random effect model was used to achieve the objective of the study. The study findings indicated that board size was positive but insignificant with financial distress of listed

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(Cheng *et al.*, 2009; Daily and Dalton, 1994; Argenti, 1986).

More so, other scholars have attributed financial distress to separation of ownership and management (Lajili and Zéghal, 2010). According to agency theory, separation of ownership and management leads to conflict of interest between managers serving as shareholders' agents and the shareholders (Fich and Slezak, 2008). The management engages in an opportunistic behavior, hence exhorting the firm at the expense of shareholders (Jensen and Meckling, 1976). In this sense, management needs to be monitored so that there is an alignment of interest between management and shareholders.

Research on financial distress has attracted a lot of attention in academic literature (Cruz *et al.*, 2014). Indeed, financial distress has raised anxiety among the investors, banks, credit rating agencies, auditors, regulators and other stakeholders (Bayrakdaroglu *et al.*, 2012). This uneasiness among the stakeholders has attracted the attention of researchers. Husson-Traore (2009) argues that the corporate scandals reflect the inability of the credit ratings agencies, governments and financial creditors and other stakeholders to anticipate and prevent firms' financial distress situations.

Prior studies nevertheless have shown mixed results on the relationship between board size and financial distress (Krause *et al.*, 2014). Manzanegue *et al.*, (2015) and Maere *et al.*, (2014) found a negative and significant effect of board size on the likelihood of financial distress. However, these results are contrary to those obtained by Lajili and Zéghal (2010) and Mangena and Chamisa (2008) who did not find significant relationship between board size and financial distress.

2.0 THEORY AND HYPOTHESIS DEVELOPMENT

2.1 Resource Dependency Theory

A resource dependence perspective would particularly underscore the necessity of having many external representatives on a board in a time of crisis as their presence would provide access to valued resources and information (Pfeffer and Salancik, 1978). Pfeffer and Salancik (1978) further suggest that the primary

benefit that boards bring is the provision of resources such as experience, skills, and knowledge. Directors are viewed to be actively involved and positively influencing strategy and programs (Hillman and Dalziel, 2003). In addition boards provide the management of a firm with important advice and may contribute to the strategic decision making (Finkelstein and Mooney, 2003).

Resource dependency theory considers agents as a resource since they would provide social and business networks and influence the environment in favour of their firm (Pearce II and Zahra, 1992; Carpenter and Westphal, 2001). The board resources of the corporation support in understanding and responding to firm environment (Hillman and Dalziel, 2003). Specific activities that correspond to the fulfillment of the service task include providing expert and detailed insight during major events, such as an acquisition or restructuring, financial crisis as well as more informal and ongoing activities, such as generating and analyzing strategic alternatives during board meetings (Forbes and Milliken, 1999).

Therefore, board of directors may reinforce the top management team's competencies and experiences by providing feedback or refining their strategic proposals (Westphal, 1999). In their study Nielsen and Huse (2010) agree that a board with a certain composition of directors may be effective at performing their task since different sets of board tasks require different skills for their effective performance. Thus, resource dependency perspective is directly related to the service/expertise/counsel role of the board and will offer an insight on the role of directors in providing resources that are necessary to enhance financial soundness. The theory therefore asserts that individuals with different resources in terms of skills and expertise will be more likely to intervene in a manner likely to benefit the firm.

2.2 The Relationship between Board Size and Financial Distress

Board size is defined as the total number of directors on the board in a particular year (Maeri *et al.*, 2014). According to Jackling and Johl (2009) board size is an important determinant of corporate governance

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effectiveness. In addition resource dependency theory views board size as a proxy to measure the diversity of the knowledge pool and the availability of resources provided by the board. A larger board is likely to have a wider range of skills, knowledge and expertise which in turn may contribute to both its monitoring and servicing roles (Corbetta and Salvato, 2004).

Maere *et al.*, (2014) conducted research on the relationship between board size and financial distress of unlisted firms. It was found that board size is negatively associated with financial distress. Hence, Maere *et al.*, (2014) concludes that a large board may counter the influence of the CEO. As per agency theory the main argument in favor of a larger board of directors is that the increase in the number of members raises their disciplinary control over the CEO (Brédart, 2014).

Additionally, large board size also implies more external links (Goodstein *et al.*, 1994) and a diversification of the expertise (Zahra and Pearce II, 1989). Extending the resource dependence perspective to the context of bankruptcy Gales and Kesner (1994) argue that the more directors there are serving on a board, the better connected the firm is to critical resources. These connections may protect the organization from adversity hence reduce chances of financial distress (Zahra and Pearce II, 1989).

However, not all researches support large board as an asset. According to Jensen (1993) larger boards are efficiently incapable of monitoring top management and it may results to causes of financial distress. Eisenberg *et al.*, (1998) found that financial distress is negatively associated to large boards. Salloum and Azoury (2010) agree that financial distress status highly depends on board size that is larger boards could lead to financial distress by impeding coordination. Larger board impedes the coordination, which prevents boards from participating in strategic decision making and in turn lowering both the monitoring and service roles (Raheja, 2005; Harris and Raviv, 2008). More often than not, in the case of large boards the members get divided into sub-groups who are at loggerheads with each other which does more harm than good to the company (Cadbury, 2002). Hermalin &

Weisbach (2003) and Jensen, (1993) opine that larger boards may experience agency problems, such as director free-loading. In such cases, the board becomes more symbolic, and less a part of the management process.

H1: Board size is positively related with financial distress

3.0 RESEARCH METHODOLOGY

This study used exploratory research design. The emphasis of exploratory studies is to study a situation or problem in order to establish whether causal relationships exist between variables. Panel data entails studying of a particular subject within multiple sites, periodically observed over a defined time frame (Gujrati, 2003). In panel data the same cross section unit is surveyed over time. The combination of time series with cross-section can enhance the quality and quantity of data in ways that would be impossible using only one of these two dimensions (Gujrati, 2003). In this study balanced panel data was used in which each cross section unit has same number of observations. Panel data enable stronger claims about causality to be made than analysis of cross-sectional data.

The target population comprised of firms listed in Nairobi Securities Exchange (NSE). There were 57 companies for the period 2004-2013 these firms fall under different sectors of the economy, such as agricultural, commercial and services industry, telecommunications and technology, automobile and accessories, investment, manufacturing and allied, and construction. To ensure completeness of data, only those firms which had remained operational for the entire period of study between 2004 and 2013 were studied. This meant that 39 firms were studied as the other firms' commenced operations during the period of study or were delisted at one point during the period of study. This translated to ten firm years and total 390 firm year observations.

The annual reports were downloaded from the company websites and also NSE bulletins were used. The data on board composition was drawn from financial reports, under the Directors/Corporate Governance Report

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sections. For those firms whose reports did not provide adequate director information, the same information was collected from firm's website. All the data on control variables were collected from financial reports, as well as from the NSE year-end reports and the NSE handbook. The dependent variable was calculated based on the Altman Z'' score formula.

The data was collected using a document analysis guide. According to the Bowen (2009) document analysis is a way of collecting data by reviewing existing documents. This method is relatively inexpensive and unobtrusive and often provides a good source of background

information that may not be captured by other means (Bowen, 2009). Secondary data was used in this study which was derived from company annual reports, and websites. The data was panel in nature as it was collected for the firms repeatedly for ten years. This is in line with other studies by Cheng and Shiu (2007), Chen (2004); Tarus *et al.*, (2012) Ombaba *et al.*, (2018) which made use of panel data. Panel data is reliable since it diminishes the interaction between the variables and the parameters (Hsiao, 2007; 2003). Shumway (2001) advocates that single period models are inconsistent due to the fact that a firm's risk for distress changes over time and its health is a function of its latest financial data.

3.1 Measurement of Variables

Financial distress was measured using Altman Z'' -Score (2006). Altman original Z-score was used for manufacturing firms only however it has been modified since it was introduced to improve the predictive power or accuracy of the model to cater for non-manufacturing and private firms (Altman and Hotchkiss, 2005). Altman amended the formula to allow its application to certain situations not originally included in the original sample set (Altman, 2006).

$$Z'' = 6.56 X_1 + 3.26 X_2 + 6.72 X_3 + 1.05 X_4$$

$$Z'' < 1.10 \text{ bankrupted/distressed}$$

$$Z'' > 2.60 \text{ non distressed/ non-bankrupted (safe)}$$

$$Z'' = 1.10 \text{ to } 2.60 \text{ grey area}$$

Where:

X_1 = Working Capital (current assets - current liabilities)/Total Assets (WC/TA): The Working capital/Total assets ratio is a financial ratio which measures the liquid assets of a firm with respect to the firm size (total capitalization).

X_2 = Retained Earnings/Total Assets (RE/TA): This measure of cumulative profitability is also considered to be a measure of firm's age (Altman, 2006). This is due to the fact that a young firm is considered to not have had enough time to grow and build up their cumulative earnings. X_3 = Earnings before Interest and Taxes /Total Asset (EBIT/TA): The EBIT to Total Assets ratio can be seen as an indicator of how effectively a company is using its assets to generate earnings before its contractual obligations are met.

X_4 = Market value of Equity/ Book Value of Total Liabilities (MVE/TL): This is a measure of a company's financial leverage and shows what proportion of equity and debt the company is using to finance its assets. The ratio is composed from two variables: the market value of equity, which is equal to the market value of all shares of stock, both preferred and common, and the company's liabilities.

Board size is defined as the number of directors on the board (Rivas *et al.*, 2009; Kaymak and Bektas, 2008; Perrini *et al.*, 2008; Kassinis and Vafeas 2002; Agrawal and Knoeber 2001). Thus, consistently with other studies, board size was measured by counting the number of individuals serving on the board of directors (Tarus and Aime, 2014; Maere *et al.*, 2014).

Model Specification

$$Z_{it} = \beta_0 + \beta_1 I_{it} + \beta_2 FS_{it} + \beta_3 P_{it} + \epsilon_{it} \dots \dots \dots \text{Model 1}$$



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$$Z_{it} = \beta_0 + \beta_1 I_{it} + \beta_2 FS_{it} + \beta_3 P_{it} + \beta_4 BS_{it} + \epsilon_{it} \dots \dots \dots \text{Model 2}$$

Z_{it} = Financial distress of the firm i ($i=1, 2, \dots, 57$) in time t ($t=1, 2, \dots, 10$)

Where

BS =Board size of firm i in time t , FS= Firm Size, I= Industry Dummy, P=Profitability, ϵ = the random error term

4.0 RESULTS

Before the results. The assumptions for regression analysis were done in order to ensure that the study does not violate the assumptions thus invalidate the results. The tests are as given below:

4.1 Tests for Regression Assumptions

Regression analysis requires certain assumptions be met before it can be used to analyse any data. These include normality of errors, linearity and independence of errors (William *et al.*, 2013). Additionally, panel data requires testing for multi-collinearity and stationarity before it can be subjected to regression analysis (Gujrati, 2004). Serious assumption violations can result in biased estimates of relationships, over or under-confident estimates of the precision of

regression coefficients, untrustworthy confidence intervals and significance tests (Chatterjee and Hadi, 2012; Cohen *et al.*, 2003). The following sections present the results of the various assumption tests.

4.2 Test for Normality of Errors

Jarque-Bera (JB) test for normality was used to test for normality of error terms. According to Brys *et al.*, (2004) the JB tests the hypothesis that the distribution of error terms is not significantly different from normal ($H_0: E(\epsilon) \sim N(\mu=0, \text{Var.} = \sigma^2)$). The results of the tests are presented in Table 4.2. The results show that the significance levels for the Jarque-Bera statistics were greater than the critical p-value of 0.05 implying that the errors were not different from normal distribution (Tanweer, 2011).

Table 4.2: Test Statistics for Model Residual Normality

Model	JB (Prob.)	Conclusion
	Z-Score _{it}	
Model 1	2.178 (0.268)	Normal
Model 2	2.095 (0.135)	Normal

Source: Research Data (2016)

4.3 Tests for Linearity

A model relating the response variable to the predictors is normally assumed to be linear in the regression parameters (Chatterjee and Hadi, 2012). The parameter linearity assumption is often tested by plotting residuals against predicted values of the response variable (Osborne and Elaine, 2002). Therefore, the relationship should take a linear form for this condition to be met. As shown in Appendices 2 and 3, the linearity in parameter assumption was met for all models of Z score.

4.4 Tests for Independence of Errors

Errors in a regression model are assumed to be independent or not serially correlated across

different observations (Fox, 1997); Weisberg, 2005; Chatterjee and Hadi, 2012). The Durbin-Watson test of serial correlations was used to test for independence of error terms. The Durbin-Watson statistic (D) is typically used to test first order autocorrelations (ρ) with the null hypothesis that there are no residual correlation ($H_0: \rho = 0$) against the alternate hypothesis that positive residual correlations ($H_a: \rho > 0$) exist (Lind *et al.*, 2015). The error terms are independent when D is close to 2.00 (Sosa-Escudero, 2009; Lind *et al.*, 2015). Values of D closer to zero indicate positive autocorrelation whereas large values of D point to negative autocorrelations, which seldom



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occurs in practice (Lind *et al.*, 2015). The results in Table 4.3 show that the error terms were independent for all the regression models of Z-score.

Table 4.3: Test Statistics for Independence of Errors

Durbin Watson Statistic (D)		
Model	Z- Score	Conclusion
Model 1	1.513	Error terms are independent
Model 2	1.763	Error terms are independent

Source: Research Data (2016)

4.5 Testing for Multi-Collinearity

In addition to regression assumption the multicollinearity test was done. Multicollinearity means that two or more of the explanatory variables in a regression have a linear relationship. This causes problems in the interpretation of regression results. Multicollinearity can also be tested by calculating the correlation coefficients for the predictor variables. A tolerance of below 0.10 or a VIF greater than 10 or a correlation coefficient above 0.8 is regarded as indicative of serious multi-collinearity problems (Field, 2009). The VIF is one popular measure of multicollinearity

(Cohen *et al.*, 2003). Tolerance is equal to the inverse of VIF. According to Gujrati (2004) the closer Tolerance is to zero, the greater the degree of collinearity of that variable with other regressors. On the other hand, the closer Tolerance is to 1, the greater the evidence that the variable is not collinear with other regressors. This study followed the procedure set out by (Gujrati, 2004) that included the use of TOL and VIF. As shown in the Table 4.4, the tolerance statistics were all above 0.10 and VIF values were all below 10 implying that there was no problem of multicollinearity among the predictor variables.

Table 4.4: Collinearity Statistics for Predictor Variables

Predictor Variable	Collinearity Statistics	
	<u>Tolerance</u>	<u>VIF</u>
Industry	.727	1.376
Firm Size	.693	1.442
Profitability	.803	1.246
Board Size	.385	2.598

Source: Research data (2016)

4.6 Testing for Unit Roots

Further, the study was subjected to unit root test. According Gujrati (2003) and Granger and Newbold (1974) data series must be primarily tested for stationarity in all econometric studies. Where a series is found to be non-stationary at levels, it is differenced until it becomes stationary (Gujrati, 2004; 2003 and Baltagi, 2001). Since panel data models were used in this study and the data set had a time dimension unit root existence was investigated by panel unit root tests. Maddala and Wu (1999) suggest that using panel unit root tests

yields statistically better results compared to the results of unit root tests like Philips-Perron which are based on a single time series.

This study conducted unit root test for the variables using the Augmented-Dickey-Fuller unit root test. As shown in Table 4.5 the p-values for the ADF-Fisher Chi-square statistic were less than theoretical values of 0.05 financial distress. This implies that these variables/ panels (had no unit roots) and therefore suitable for modelling and forecasting. To correct for non stationarity in board size, firm size the first difference of the

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variables [D (var)] were used in the regression models.

Table 4.5: Panel Unit Root Test Statistics

Series	(ADF- Fisher χ^2),	P-value	Conclusion
Firm Size	62.612	0.669	Do not Reject H_0
Profitability	130.000	0.000	Reject H_0
Board Size	58.367	0.072	Do not Reject H_0
Financial Distress	112.165	0.001	Reject H_0

(ADF), Null Hypothesis: Unit root process

Cross sections: 39

Source: Research data (2016)

4.6 Model Specification Tests Statistics

Model specification was done using the random effects model to construct panel regression models. The decision for using random effects models in this study was based on the Hausman specification test (Wooldridge, 2002; Greene, 2002). According to Gujarati (2004) Hausman specification test should be used to determine between random and fixed effects. Baum (2001) opines that Hausman specification test tests the null hypothesis that the slope coefficients of the models being compared do

not differ significantly, with the fixed effects being used when there are differences in the slope coefficients. Accordingly, the null hypothesis is rejected when Prob. $>\chi^2$ is less than the critical p-value and in such a case the fixed effects regression is appropriate. Hausman test results of these three models are presented along with panel regression results are shown in Table 4.7. All the models were run on random effects since the significance levels were greater than the critical value of 0.05.

Table 4.6: Model Specification Test Statistics for Z score

Model	χ^2 Statistic	χ^2 d.f.	Prob.	Appropriate Model
Model 1	2.320	3	0.356	Random Effects
Model 2	6.217	8	0.572	Random Effects

Source: Research data (2016)

4.7 Descriptive Statistics

In econometrics techniques it is required to transform the values of real variables into their logarithmic values (Harlow, 2005). Accordingly, some of the real variables were transformed into logarithm form as transformation may reduce the problem of heteroscedasticity. This is because

transformation compresses the scale in which the variables are measured, therefore reducing a tenfold difference between two values to a two-fold difference (Harlow, 2005). Thus, profitability, firm size and financial distress variables were transformed for the purpose of this study. The mean, minimum, maximum and standard deviations of the variables of this study are presented in Table 4.1 below.

Table 4.1: Descriptive Statistics

	N	Mean	Std. Deviation	Min	Max
Financial Distress	390	4.882	2.879	0.050	19.110
Profitability	390	0.759	0.248	-0.280	1.940
Firm Size (Log)	390	22.372	-0.429	15.660	26.540
Board Size	390	3.118	2.906	0.000	15.000

Source: Research Data (2016)



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4.8 Correlation Analysis

A bivariate correlation is a measure of strength or degree of linear association between variables. The correlation between the independent variables and the dependent variable is a precursor for regression analysis. Correlation coefficients are used to determine the magnitude and direction of associations. In order to assess the effect of board size on financial distress, Pearson's correlation analysis was performed. The correlation among the variables in this study was done and presented in Table 4.7 below.

Table 4.7: Pearson Correlation Coefficients

	1	2	3	4	5
1. Financial distress	1				
2. Board Size	.052	1			
3. Profitability	-.145**	.152**	1		
4. Firm Size	.008	.199**	.368**	1	
5. Industry	-.068	-.082	-.489**	.097	1

Source: Research Data (2016) **p < 0.01, *p < 0.05

4.9 Regression Results

Regression analysis was done to test the dependence of financial distress on control variables, and the independent variables. Hierarchical regression method was used which involved entering blocks of variables and observing their results. To test the various hypotheses different predictor variables were regressed against the predicted variable. Random effects regression models were run for all the models and the results are presented in Table 4.8. The F-statistics was used to test the regression models Blackwell III (2005) and the goodness of fit (Hoe, 2008). The F-statistics test was used to test significance of the regression parameters at five percent significance level using the following criteria; $H_0: \beta_j = 0$ and $H_a: \beta_j \neq 0$, H_0 being rejected if $\beta_j \neq 0; p\text{-value} \leq 0.05$. Hypothesis H_{01} stated that there is no significant relationship between board size and financial distress. The results found a positive but non-significant relationship between the size of the board and financial distress ($\beta = 0.001; p > 0.05$). The results therefore failed to reject the predicted hypothesis suggesting that board size had no significant relationship with financial distress. This result confirmed the Pearson correlation results in which board size

The study found board size to be positively but insignificantly correlated with financial distress ($p > 0.05$), this shows that number of directors does not significantly affect financial distress. Board size was however found to be positively and significantly related to profitability ($p < 0.05$), implying that profitable firms have more directors as compared to non-profitable. Board size was also found to be positively and significantly correlated with firm size. Implying that bigger firms have more board of directors compared to smaller firms.

was not significantly correlated with financial distress.

The findings of the study indicated that board size had a positive and insignificant relationship with financial distress ($\beta = 0.001; p > 0.05$). This finding contradicted previous studies that board size affects financial distress Daily and Dalton (1994); Kiel and Nicholson (2003) and Maere *et al.*, (2014). However, these results are in line with the results of prior studies Rauterkus *et al.*, (2013); Lakshan and Wijekoon (2012) and Simpson and Gleason (1999) who found board size having insignificant results versus financial distress. The results also concur with Mokarami and Motefares (2013) who found non-significant relationship between board size and financial distress in listed firms in Pakistan.

One possible explanation for non-significant relationship could be that, in many developing countries including Kenya the selection of the directors is not based on their expertise and experience but for political reasons that is to legitimate business activities and contracts (Salloum and Azuory, 2012). This result therefore confirmed the diverging views of researchers regarding the ideal board size those supporting agency theory for small boards so

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that monitoring can be effective and those supporting resource dependency theory view of large boards.

Table 4.8: Regression Analysis

Variables	Model 1	Model 2
Controls		
Constant	0.658(3.677) **	0.559 (3.967) **
Firm Size	-0.000(-0.058)	0.000 (0.121)
Industry	0.007 (0.239)	-0.016 (-0.778)
Profitability	0.180 (1.344)	0.311(1.012) **
Board Size		0.002 (0.490)
R Squared	0.024	0.196
Adjusted R	-0.051	0.107
F- Statistic	0.056	4.415
Prob. of F-Stat.	0.956	0.000

** 1 percent significance level; * at 5 percent level

Figures in parenthesis are t-statistics

Source: Research Data (2016)

The study established that board size does not significantly affect financial distress. Hence the size of the board in the Kenyan listed forms does not matter.

5.0 Recommendations for Further Research

The following suggestions were made for further research based on the findings of this study;

Given the apparent consequences of financial distress, this study would welcome further research addressing factors that may predispose a firm to financial distress, impede the implementation of effective counter strategies during the decline period, and permit the firm to survive.

Secondly, the study do recommend more board composition variables to be included in future research like ownership, audit committee composition, ethnicity, gender, age and level of education with financial distress.

Thirdly, this study only incorporated listed firms with complete data. The study therefore recommends future studies to incorporate those firms with incomplete data.

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