The Mediating effect of Firm Growth on the relationship between Financial Risk and Financial Distress of Firms listed at the Nairobi Securities Exchange, Kenya

[1]Walela Elias, [2]Omagwa Job, [3]Muathe Stephen

[1]St. Paul's University, E-mail: b.walela@yahoo.com

[2] School of Business, Kenyatta University, Kenya, Email: jobomagwa@hotmail.com

[3]School of Business, Kenyatta University, Kenya, Email: muathesm@yahoo.com.

Abstract

In Kenya, at least 6 listed firms became insolvent and got into liquidation over a period of 10 years (2009-2018) leading to loss of income, unemployment and other negative outcomes. Firm growth has been observed to mediate the relationship between various variables and financial distress of firms though there is little empirical evidence in developing economies particularly for firms that are listed at the Nairobi Securities Exchange in Kenya. The general objective was to investigate the mediating effect of firm growth on the relationship between financial risk and financial distress of firms listed at the Nairobi Securities Exchange, Kenya for the period 2009-2018. This study was based on Wreckers theory of financial distress, Trade off theory, Distress theory, Early Bankruptcy theory and the Altman's Z-Score Model for financial distress. The study adopted positivism research philosophy and explanatory non-experimental and descriptive research designs. The targeted population entailed all 66 firms listed at the Nairobi Securities Exchange, Kenya as at 2018. Time Series Cross-Sectional (Panel) secondary data was analysed. The following diagnostic tests were carried out before delving into data analysis: Tests for Multicollinearity, Outliers, Heteroscedasticity, Autocorrelation, Linearity, Goodness of Fit, Stationarity and Model Specification. Data analysis was done using descriptive statistics and inferential statistics using Binary Logistic regression model where SPSS version 22 was applied. The findings indicate that Firm growth partially mediates the relationship between financial risk and financial distress of firms listed at the NSE, Kenya at 5% significance levels. The study recommends that financial analysts should come up with recommended firm growth levels that will be optimal in ensuring least financial risk and avoid cases of financial distress of firms. Researchers and institutions should invest in furthering research in areas of factors that mediate the relationship between financial risk and financial distress.

Keywords: Mediating effect, Firm Growth, Financial Risk, Financial Distress, Bankruptcy

1.0 Introduction

Financial distress has been studied across countries all over the world making it a famous topic, with an increasingly upward trend in the interest on the topic due to many reasons and factors (Kazemian, Shauri, Sanusi, Kamaluddin, & Shuhidan, 2017). The subject is increasingly becoming a complex concept by the evidence of many firms deemed stable experiencing distress and becoming bankrupt (Muigai & Muriithi, 2017) is part of the reason, in addition to the fact that many or all firms engaging in any economic activity are not immune to financial distress leading to bankruptcy and closure of operations. Various researchers have tried to delve into this topic with a view of trying to understand, manage or eliminate its adverse effects.

Significant relationships have been proven to exist between financial distress and various firm characteristics including liquidity, firm performance, dividends (Baldwin & Scott, 1983) etc. This is in effect touching on the growth and liquidity levels hence a firm's liquidity risk. Firm performance is therefore of great influence to a firm's financial distress level because when a stock of a firm does well on the market, the profitability will go up and hence the ability to manage the liquidity risks of the firm and meeting their immediate obligations in addition to access to credit and power to negotiate on contracts. Profitability is linked to performance of firms and empirical studies note that a high degree of profitability result in low degree of indebtedness (Vintilă, Gherghina, & Toader, 2019). Financial risk is also linked to performance of firms and studies that have attempted to discuss factors that affect firms' performance have always included financial risks among others (Muriithi & Waweru, 2017).

Financial risk is one major factor that threatens the survival of many firms all over the world due to its adverse effect on the operations of the firms. Risk threatens the financial viability and firms' long term survival (Muriithi & Waweru, 2017), in effect the financial distress levels of firms. Financial risk is a considerable example of factors affecting the financial distress levels a firm is exposed to and its management is of great consequence to the economic activity levels of a firm and economy at large (Madhushani & Kawshala, 2018).

Analysis of risk relating to financial distress of a firm is important for various reasons, among them informing choice of investment between active and passive stocks in financially distressed firms (Outecheva, 2007). Financial risk is important in that it affects almost all firms in operation regardless of location, size, type and other factors (Karanović, Karanović & Gnjidić, 2018), hence partly informing this study. Understanding of the causes of financial distress and failure of a firm is important to all firms and therefore it is essential for the stakeholders ranging from both potential and current investors in the firm, researchers, the government and lending institutions to get to know the effect financial risk has on financial distress.

1.1 Financial Risk

Moles (2016) explains risk as "The chance (or probability) of a deviation from an anticipated outcome". Financial risk implies chance of financial loss arising due to unfavourable changes in the macroeconomic variables such as exchange rates, interest rates etc. that firms are negatively exposed to. Financial risk is an umbrella term that involves various risks associated with financing (Wanjohi, Wanjohi, & Ndambiri, 2017). It is the prospect that financial stakeholders or shareholders will lose money when they make an investment in a firm that is indebted, if the firm's cash flow becomes insufficient

to cover its financial obligations. It has been established from studies that the financial soundness of a business depends on the financial risk management in place (Bokpin, Aboagye, & Osei, 2010). The various risks associated with financing that were employed in this study were credit, currency, interest rate and liquidity risks.

Leverage implies a financial implication where a company is financed to some extent by debt which carries a fixed cost that increases the riskiness of the firm (Abor, 2008; Zubairi, 2010). With recent failures of firms, investments in financial risk models and internal rating systems is crucial in avoiding such failures associated with credit risk (Gazi, 2011). An increase or decrease in a firm's debt implies an increase or decrease respectively in the firm's financial leverage. This study adopted the Degree of Financial Leverage (DFL), measured using earnings before taxes (EBT) to earnings before interest and taxes (EBIT) to measure credit risk. Degree of Financial Leverage implies by definition, the change in earnings per share (EPS) as a percentage that is brought about by earnings before interest and taxes as a percentage (Muriithi, 2016). As employed by Gatsi, Gadzo and & Akoto (2013), DFL focuses directly on the effect of interest from a firm's debt on income before taxes.

Currency Risk refers to the risk that relates to the change in price of one currency with respect to another currency (Gatsi *et al*., 2013). Currency risk is commonly and sometimes referred to as the exchange rate risk or foreign exchange risk because there is always uncertainty in the market concerning the rate of change of a currency relating to another since such rates change or get adjusted from time to time or many times on a given day (Lambe, 2015; Mwaurah, 2015), thus causing currency crises. This study employed the Open Position Ratio to measure foreign exchange risk as used by (Parlak & İlhan, 2016).

Interest rate risk regards the risk arising from adverse changes in the levels of interest rates in the market, which affects an investment (Ngalawa, 2014). Uncertainty in future interest rates affects the economic activity levels in the future (Bretscher, Schmid, & Vedolin, 2016). Firms are faced with the interest rate uncertainty in the market posing a risk to them (Capital Markets Authority, 2018). This study employed the Yield Implied Volatility (YIV) as a measure of interest rate risk. Yield Implied Volatility is a proxy for interest rate uncertainty, i.e., a price for hedging interest rate uncertainty. It predicts the volatility in the activity of a firm due to changes in interest rates (Cremers, Fleckenstein, & Gandhi, 2017).

Liquidity risk concerns market unpredictability where firms end up not getting cash as and when anticipated from the market (Muriithi & Waweru, 2017). It is associated with market volatility whereby assets and securities cannot be easily converted into cash through purchase or sale of the same in the markets leading to the firm suffering from inadequate finances to honour its commitment (Mwaurah, 2015). The understanding is that firms can still experience liquidity risk even with enough capital levels. Lower credit rating is associated with credit risk of firms while high volatility of earnings due to currency movements increases the currency, foreign exchange and interest rate risks of firms.

Coupled together, the risks contribute a great deal concerning the extent of the financial distress levels of firms that can lead to bankruptcy (Capital Markets Authority, 2018). Liquidity coverage ratio was employed in this study as the measure for liquidity risk. The ratio relates to the firms' assets that are highly liquid, which are held by the firms to meet

short-term obligations and in so doing promote the resilience, albeit short-term, of the firms' liquidity risks.

1.2 Firm Growth

Firm growth refers to changes that relate to generation of revenue, addition of value and expansion that relate to the volume of business of a firm (Gupta *et al.*, 2013). Firm growth is important to survival of a firm in addition to having consequences for employment, industry concentration, economic activity and growth, innovation and technological change among other factors (Carrizosa, 2007). For firms to survive in the market, they must overcome financial distress situations that are long term. Regardless of firm size, growing firms are part of the creators of employment opportunities and healthy economies in addition to being a central issue in entrepreneurship research, innovation and venture creation (Donckels & Miettinen, 1997).

While debt markets are not easily accessible to by distressed firms and a no growth strategy may be preferred by some firms, some external influential forces/factors which include increase in demand for firms' products/services and inflation can cause their sales to increase significantly (Platt, Platt & Chen, 1995). Firm growth is found to have a positive association with technological and non-technological innovations (Ali-Yrkkö & Martikainen, 2008; Baron & Spulber, 2017; Obunike & Udu, 2019).

Firm growth increases firm value which has implication on the bargaining power of a firm (Lusi & Swastika, 2013) hence larger firms have higher chances of survival (Fernando, 2011) through negotiated agreements in addition to offering greater allowance for adjustments in terms of capital structure. Firm growth is noted to have a mediating effect that is significant on firm value and capital structure and can be used as a significant tool by management in achieving efficiency and optimality as firms grow (Ater, Kisaka, Iraya & Mwangi, 2017). Growing firms have a window of opportunity due to their value hence increase in their competitive capacities in the market. However, firm growth should be controlled and measured since rapid growth can lead to bankruptcy of a firm.

Studies also show that smaller firms are inclined to grow at a faster rate than the bigger firms, hence smaller firms are exposed to greater risk levels than bigger firms (Amaral, 2008). Firm growth and risk are considered important in guiding decisions and investments. In addition, significant relationships exist between firms' real and sustainable growth differences and financial risk of firms (Kanani, Moradi & Valipour, 2013). The current study therefore sought to put an establishment concerning the effect of financial risk upon financial distress of firms when mediated by firm growth.

Various indicators can denote firm growth. They include growth in: financial/stock market value, number of employees, assets (as also employed by Ater *et al*, (2017), revenue and sales, value of production, added value of production and productive capacity (Delmar, 1997; Ardishvili, Cardozo, Harmon & Vadakath, 1998). This study employed repeated proportional change (involves calculating a percentage decrease or increase) in the total assets of the firms to measure firm growth. This was informed by the following reasons; 1. Assets are insensitive to internal processes of the firm (Carrizosa, 2007) hence the firm growth measured by the proportional change in total assets are not internally manipulated by firms arbitrary decisions as sales could be (Delmar *et al.*, 2003), 2. Assets impact directly on the sales revenue, which can also be used as a measure for firm growth. The direct relationship effect made assets a suitable measure

than sales and 3. Firms' growth prospects are impacted directly by the assets possessed by the firms (Mateev & Anastasov, 2010).

1.3 Statement of the Problem

Financial distress has been a challenge of firms listed at NSE and substantial evidence has been documented to that extent. Empirical literature notes that financial distress, credit, currency and liquidity problems still remain a concern of the firms listed in Kenya (Maina & Sakwa, 2017; Nairobi Securities Exchange, 2019). The NSE market experienced different periods trading with different number of firms at any one time due to various reasons including firms placed under administration, suspension and delisting of some firms from the market (Maina & Sakwa, 2017; Guguyu, 2018). Hence, various regulations have been enacted and modified in the past to recent years with the aim of ensuring that the listed firms are and remain prudently managed and profitable at the same time hence adding to shareholders value (Capital Markets Authority, 2002; 2018).

Despite the listed firms in Kenya contributing much to the economy and their significance, their exposure to increasing financial distress is yet to be clearly linked to their financial risk. As much as this relationship has been documented in other countries, this remains an issue for investigation especially in Kenya hence this study sought to deal with this contextual gap. Evidence in Kenya is that about 9 banks wound up between 2007-2016 and at least 10 firms (including Uchumi Ltd, Kenya Airways, Mumias Sugar company, Marshalls E.A, Sameer Africa etc) listed at the NSE are faced with cases of severe financial distress.

Despite the various reforms, regulations and authorities set up in Kenya to ensure a sound and proper working NSE, financial distress is a problem experienced by listed firms in Kenya. At least 16 firms listed at the NSE have been undergoing financial distress in the past years of 2009-2018. There is need for an in-depth analysis of the factors affecting financial distress outside enacted regulations in addition to measuring the level of their impacts. There is lack of literature on financial distress and financial risk including incorporation of firm growth as a mediator; empirical evidence did not delve into such an analysis. The lack of empirical literature creates conceptual, contextual, empirical and methodological gaps. It is against the backdrop of these needs that this study was conducted.

1.4 Objective of the study

The general objective of the study was to investigate the mediating effect of financial risk on financial distress of firms listed at the Nairobi Securities Exchange, Kenya.

1.5 Research Hypothesis

This study sought to test the following null hypothesis:

H_{06}: Firm growth has no significant mediating effect on the relationship between financial risk and financial distress of firms listed at the Nairobi Securities Exchange, Kenya.

2.0 Empirical Review

An empirical review of studies from a Kenyan context as well as the foreign contexts on financial risk and distress of firms in informing the need for this study is presented in this section. Most of the selected studies are those that were undertaken within 10 years to the current period in narrowing down to the existing gaps in the studies and underpinning the need for this study. Financial risk is as recent and as old as there has been failure of firms due to financial distress. Financial risk is among the major concerns of firms in general. Financial distress is also a major concern in firms and studies have noted that it is

becoming more complex in the immediate past. Generally, stakeholders and studies have shown that financial risk can be measured by Credit, Currency, Interest rate and Liquidity risks, which are broadly categorized as financial risk.

2.1 Financial Risk, Firm Growth and Financial Distress

There is a scarcity in the research conducted concerning the mediating impact of firm growth on the association encompassing financial risk and financial distress, though firm growth has been established to have significant mediating effects. Empirical studies note that firms need to embrace value intensified risks which are evidenced to translate to growth in business and firm performance (Bokpin *et al*., 2010). A positive association exists between firm growth and debt, which is because sufficient funds are needed by firms with high growth rates in order to support their growth and thereby, internal financing is unlikely to be sufficient. Empirical studies note that there exists a higher risk of losing value in financial distress for firms with high growth rates (Vintilă *et al*., 2019). Firm growth is positively correlated with likelihood of survival and has important implications on firm survival, employment, economic growth etc. (Carrizosa, 2007).

Litov, John, and Yeung (2006) studied the impact of corporate governance and corporate risk taking in the USA. The study used cross country panel data from 39 states and results showed that financial risk has a significant positive association with firm growth and that both financial risk and firm growth have a positive relationship with the quality of investor protection. Kanani *et al*., (2013) studied sustainable growth and firm risk. The study examined how relevant sustainable firm growth had an influence on Tehran stock exchange' business risk. The study used 85 firms from Tehran stock exchange fo the period 2003-2010. Results from the study observed that there exists a significant relation between firm growth difference and financial risk.

Demirgüç-Kunt and Maksimovic (1996) conducted a study covering the effect of financial constraints and uses of funds on firm growth in the USA. The study focused on examining whether firms from across the world finance short-term and long-term investments similarly and to interrogate whether differences in both legal and financial systems are reflected in firms' abilities to grow faster. The study found that the portion of firms growing faster than prediction were related to specific features of the financial system, legal system and institutions (Financial risk reflected in creditors). This study is related to the study in that this study hypothesizes the association between financial risk and financial distress being significantly mediated by firm growth.

Thim, Choong and Nee (2011) conducted a study on factors affecting financial distress, a case of public listed firms in Malaysia between the years 2005-2009. The main objective of the study was to analyze the association between financial distress, firm characteristics and risk. As expected, and related to this study, the study found out that growth of operating profits has an inverse relationship with financial distress. The more a firm makes profits in terms of frequency and quantity, the lesser the chances of financial distress. Ater *et al.* (2017) investigated the mediating effect of firm growth on the relationship between capital structures and value of 36 non-financial firms listed at the NSE. The findings indicated that firm growth has a significant mediating effect and a critical tool for management in adjustments for efficiency and optimality as firms grow. This study was based on the belief that firm growth has a significant mediating effect on the relationship between financial risk and financial distress.

2.2 Summary of Empirical Literature Review and Research Gaps

Limited empirical studies have been conducted touching on financial distress. Financial distress has been studied and various interlinks between financial distress and other

variables established. However, evidence indicates that only a few of these empirical studies have been undertaken in developing countries of Africa. The reviewed empirical studies have convergent results revealing that financial risk affects financial distress of the studied firms. In some instances, financial risk has been observed to influence performance of firms (Baldwin & Scott, 1983) which ultimately affects financial distress while in some circumstances risk has been observed to have a direct effect on financial distress (Gichaiya *et. al.*, 2019). The studies agree that reduction in the financial risk levels of firms is imperative if firms want to reduce the financial distress situations that they face. An outline of the empirical literature review and research gaps are summarized in the Table below.

Table: Summary of Empirical Literature Review and Research Gaps

Author (s)	**Purpose/ Objective**	**Findings**	**Research Gaps**	**How the study addressed the gaps**
(Muchori, 2015)	The viability of the Altman's z-score models as predictors of financial distress in firms listed at the Nairobi Securities Exchange, Kenya (A Case Study)	-The original Altman's model can be used in Kenya to forecast the possibility financial distress and bankruptcy in manufacturing firms -The study also found that the 1995's Altman's model has the ability to forecast the bankruptcy of Kenyan non-manufacturing firms.	Used Altman model 1968 and 1995 as opposed to using the modified model 2000 for public firms in emerging markets	-This study used the Altman's Z-Score 2000 model -This study analysed data from all firms listed at the NSE from all the sectors
(Ater *et al.*, 2017)	To test the mediating effect of firm size on the relationship between capital structure and firm value of non-financial firms listed at the NSE	-Firm growth has a significant mediating effect and a critical tool in ensuring efficiency and optimality as firms grow.	-The study failed to li growth on financial r financial distress of t firms -The study focussed o Non-financial firms l NSE	-This study assessed the mediating effect of firm growth on the relationship between financial risk and financial distress of the listed firms -The study focused on all firms listed at NSE

Source: Various Empirical Literatures Reviewed (2020)

2.3 Conceptual Framework

To guide this study, the relationships between the independent variables, moderating variable, mediating variable and the dependent variable are presented in the conceptual framework model shown in Figure 2.1 below;

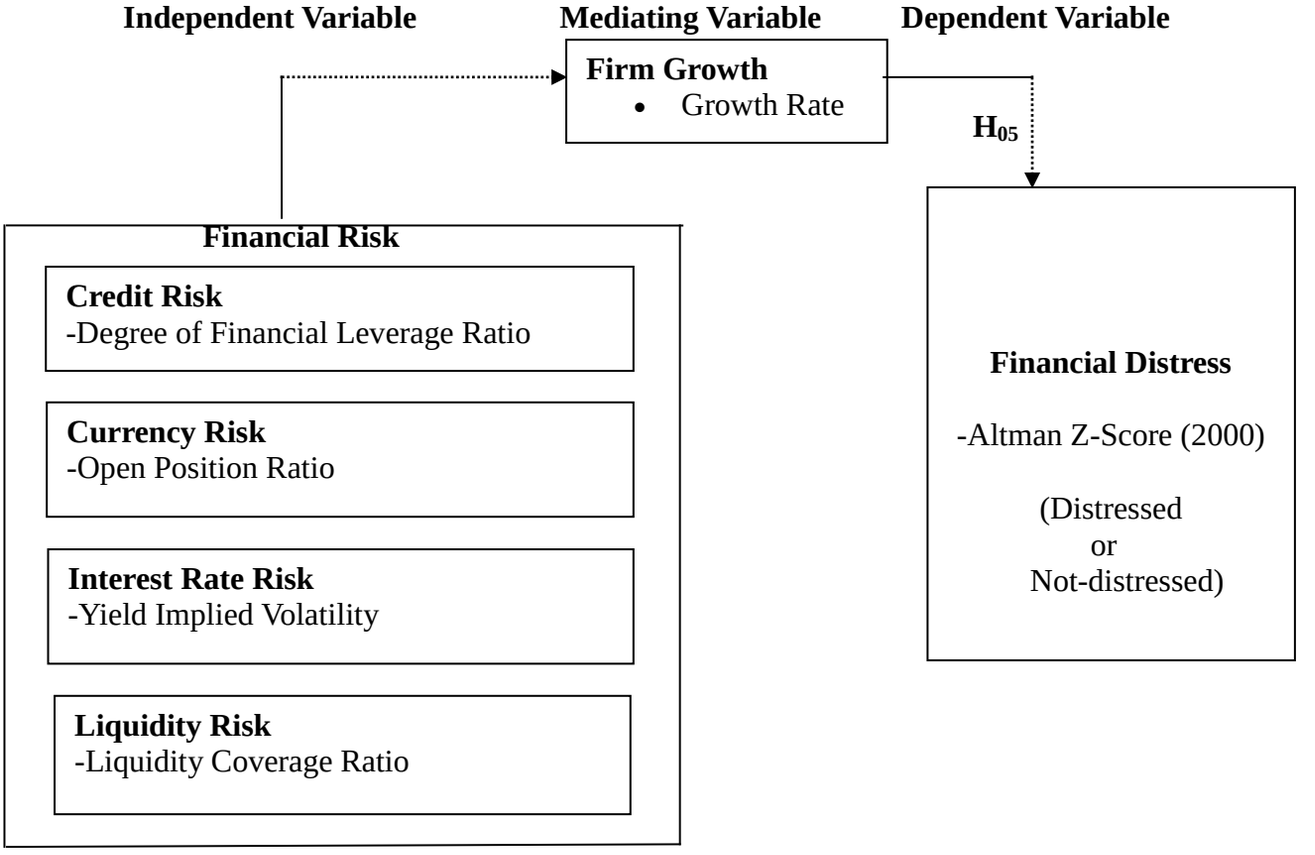


Figure: Conceptual Framework
Source: Researcher (2019)

In this study, financial risk was hypothesized to impact financial distress of NSE listed firms. The independent variables were: Credit risk, Currency Risk, Interest rate risk and Liquidity risk. The dependent variable in the study was financial distress. Furthermore, firm growth, computed by proportionate change in total assets, was hypothesised to mediate on the association between financial risk and financial distress. The dependent variable, financial distress, was measured by the Altman Z-Score model 2000.

3.0 Research Methodology

The study focussed on testing theory in that the framework for developing and testing the hypotheses was formed by theories adopted. This focus emphasized the deductive orientation of the study.

3.1 Research Philosophy

This study was intended to be objective and free from external individual influence hence the philosophical foundation that guided this study is positivism. Positivism seeks facts about social phenomena that are observable, objective, neutral and can be predicted without

undue influence and little regard to subjectivity of individuals (Saunders *et al*., 2007). The practical considerations in using positivism in this study were based on the type of investigation (explanatory), purpose of this study (which was to test hypotheses), data collection time frame (limited period and time), analysis involved (quantitative analysis methods) and the events of interest which are external, objective, factual and not dependent on the researcher. Validity of findings is highly enhanced through positivism given its long and rich tradition historically (Hirschheim, 1985; Nissen *et al.*, 1985) and as cited in (Musau, 2018).

3.2 Research Design

Explanatory non-experimental and descriptive designs were employed in this study. The designs were the most appropriate in delivering optimal results for this study. Saunders *et al*. (2009) acknowledge that there is no lone research design that subsist in confinement, the designs should not be idealized as mutually exclusive. An interpretation of several different but related research designs in a single study is therefore beneficial for conveying results that are optimal. Explanatory studies have an emphasis on establishing and explaining causal relationships (Saunders *et al*., 2007). Explanatory studies aim at obtaining the cause and effect between variables (Robson, 2002; Sekaran & Bougie, 2011) hence was appropriate for this study.

Kerlinger and Lee, (2000) stipulate that application of the explanatory non-experimental research design should be in a situation where there needs understanding of the behaviour of various phenomena by establishing the variables that contribute to the behaviour without influencing the variable via any further analysis on the variable. Descriptive designs afford a researcher with more information from established groundworks through other basic designs (Musau, 2018). The design guards against bias by the virtue of the researcher cannot manipulate variables since they having no control over the variables. Descriptive designs further enable capturing of the characteristics of a population and enables hypothesis testing (Mugenda & Mudenda, 2003; Cooper & Schindler, 2008) hence was relevant for the study because this study sought to test hypotheses. The descriptive design incorporated the longitudinal and cross-sectional nature of the study data. Additionally, the research designs incorporated a quantitative approach to data collection, analyses and reporting, an approach also employed by Muathe (2010).

3.3 Target Population

The target population was a census of 66 firms quoted at the NSE as at August 2018 (Nairobi Securities Exchange, 2018).

3.4 Operationalization and Measurement of Variables

The variables were therefore specified, operationalized, measured and manipulated. This is presented in table below.

Table: Variables Indicators, Operationalization and Measurement Scales

Source: Author and literature review (2020)

Credit Risk	Independent Variable	Chance of financial loss associated with borrowing for running a firm. Credit risk is associated with borrowing money or firm resources including its creditors and debtors who end up being unable to honour their commitment to pay back the same hence affecting a firm's plans and operations.	Degree of Financial Leverage Ratio (DFL)	= EBIT/EBIT-Interest = % Change in EPS / % Change in EBIT
Currency Risk	Independent Variable	The chance of financial loss arising from volatility in share prices and changes in price of one currency in relation to another currency.	Open Position Ratio (OPR)	= (FX Liabilities – FX Assets) / Total Assets
Interest Rate Risk	Independent Variable	Chance of financial loss that arises from a change in interest rate levels in the market affecting the value of an investment.	Yield Implied Volatility (YIV)	Yield Implied Volatility = $C = e^{-rt}(FN(d_1) - KN(d_2)$
Liquidity Risk	Independent Variable	Chance of financial loss associated with meeting current short-term obligations of a firm and concerns market unpredictability where firms end up not getting cash (finance) as and when anticipated from the market.	Liquidity Coverage Ratio (LCR)	LCR =High Quality Liquid Assets Amount /Total Net Cash flows amount
Firm Size	Moderating Variable	The capacity to further production in terms of the total amount of current and non-current assets held by the firms.	Natural Logarithm of Total Assets (lnTA)	Natural Logarithm = LnTA = Ln (Total Assets)
Firm Growth	Mediating Variable	The proportionate change in the total assets per period in terms of percentage decrease or increase.	Proportionate Δ in total assets per period	Growth rate = %age Δ in Total Assets

3.5 Data Analysis and Presentation

Quantitative data can be analysed using several models, including probit, tobit, logistic, regression, discriminant analysis and regression models (Musau, 2018). Probit, tobit and logistic are applicable in the case of the dependent variable being dichotomous (Field, 2005 & Muathe, 2010). The dependent variable in the current study was binary (dichotomous) hence the most appropriate and preferred model was logistic. Logistic was preferred because it is simpler to interpret, easier to estimate, it is applicable to broader spheres and is appropriate in detecting the presence or absence of a characteristic under analysis based on a set of independent variables (Muathe, 2010).

Descriptive statistics are employed to summarize and describe data (Muathe, 2010) in addition to helping in understanding the meaning of the analysed data (Kinyua, 2015; Musau, 2018). The descriptive statistics helped summarize and profile the data sets and results were presented using graphs, tables, percentages, frequencies etc. Explanations from the same presentations was done, which helped in understanding the meaning of the analysed data.

This study adopted Altman Z-Score model 2000, which is a multivariate model employed to measure the firms' financial health in addition to determining the prospect of financial distress of the firms. MDA models are also essential in avoiding type I and type II errors, an essential feature in avoiding misclassification which can be costly to stakeholders (Maina & Sakwa, 2017). The Altman Z-Score model is precise for predicting 95% of the sample accurately with the errors being only 6% and 3% respectively. This reassures the significance of MDA models as practical predictive models.

The Altman Z-Score (applicable to **publicly traded firms)** was employed in this study. The Model is captured below:

$$\mathbf{Z_{it} = 1.2X_{1it} + 1.4X_{2it} + 3.3X_{3it} + 0.6X_{4it} + 1.0X_{5it}} \quad \text{.....3.2}$$

(Altman, 2000**)**

Where: Z_{it} = Overall Index/Score for firm *i* and time *t*

X_{1it} = Working Capital/Total Assets for firm *i* and time *t*

X_{2it} = Retained Earnings/Total Assets for firm *i* and time *t*

X_{3it} = EBIT/Total Assets for firm *i* and time *t*

X_{4it} = Market value of equity/Book value of total liabilities for firm *i* and time *t*

X_{5it} = Sales/Total Assets for firm *i* and time *t*

i = Individual firm

t = Time (year)

The variables are explained as follows:

Z – Signals the financial condition of the company which is classified as either

X_1 – Computes the net liquid asset of a firm considering the total assets

X_2 – This ratio computes the financial leverage level of a firm

X_3 – This ratio computes the productivity of a firm's total assets

X_4 – The ratio computes the segment of a firm's assets that is capable of reducing in value prior to liabilities exceeding the assets.

X_5 – This ratio computes the ability of a firm's assets to bring about revenue

The zones specifications for discriminations which are used to decide on the firms are as follows: $Z > 2.99$ – "Safe" Zone, $1.8 < Z < 2.99$ – "Grey" Zone,$Z < 1.8$ – "Distress" Zone After computing the Z-Score, the scores were grouped into the two categories of distressed vs not-distressed and then loaded into the SPSS statistical software as the values for the dependent variable (Financial distress) for purposes of running the Binary logistic regression analysis.

3.5.1 Binary Logistic Regression Model

Logistic regression analysis with an aim of determining meaningful stable relationships among sets of data was employed in measuring the impact of financial risk on the financial distress of firms listed at the NSE. Logistic regression analysis is best suited to describe and test hypotheses about associations between variables (Tukur & Usman, 2016) and is useful and appropriate where the dependent variable is dichotomous (Field, 2005; Muathe, 2010; Sheikh *et al.*, 2015; Berger, 2017). Binary logistic regression analysis was performed on the prepared data since it is a strong analytical technique employed in data analysis and has been employed in other studies including: (Muathe, 2010; Waithaka, Mburu, Korir, Muathe and Obere, 2013; Mungai, 2015; Githaiga, 2019).

This study employed the Binary Logistic Regression analysis in finding meaningful relationships between and among financial risk and financial distress of firms listed at the NSE since the dependent variable in this study is binary in nature (Classified firms as Distressed (0) vs Not-Distressed (1)). Logistic regression estimates a multiple linear regression function defined as;

Logit (p) $= \log\left(\frac{p(y=1)}{1-(p=1)}\right) = \beta_0 + \beta_1 x_{i2} + \beta_2 x_{i2} + \_ + \beta_p x_{in}$ …….3.3

For i = 1 …… n

The above general logistic regression model was employed in this study as

Logit (p) = Log $\left(\frac{p(y=1)}{1-(p=1)}\right) = \beta_0 + \beta_1 X_{1it} + \beta_2 X_{2it} + \beta_3 X_{3it} + \beta_4 X_{4it} + \varepsilon_{it}$ …… 3.4

Where: *it* = *i* for Firm 1, 2. ….. 66 and *t* for time period 1,2 …10

β_0 = Constant

$\beta_0, \beta_1 \ldots \beta_4$ = Regression coefficients

X_{1it} = Credit Risk for firm *i* at time *t*

X_{2it} = Currency Risk for firm *i* at time *t*

X_{3it} = Interest Rate Risk for firm *i* at time *t*

X_{4it} = Liquidity Risk for firm *i* at time *t*

ε = Error term

The model is not linear and there is no guarantee of a normal distribution, hence obtaining the parameter estimates is by use of the Maximum Likelihood method and not the OLS method. The defined variables employed in the study were described, abbreviated, measured and individually hypothesized direction given as in the table below:

Table: Variables Descriptions, Measurements and Hypothesized directions

Type of Variable	Variables	Measurement	Measurement Scale	Hypothesized Direction
Dependent Variable	Financial Distress	Altman's Z-Score *(Z)* (2000)	Nominal Scale (Distressed vs. Not-Distressed)	Positive / Negative
Independent Variable	Credit Risk	Degree of Financial Leverage (DFL)	Ratio Scale	Positive / Negative
Independent Variable	Currency Risk	Open Position Ratio	Ratio Scale	Positive / Negative

		(OPR)		
Independent Variable	Interest Rate Risk	Yield Implied Volatility (YIV)	Ratio Scale	Positive / Negative
Independent Variable	Liquidity Risk	Liquidity coverage ratio (LCR)	Ratio Scale	Positive / Negative
Moderating variable	Firm Size	Total Assets (LnTA)	Ratio Scale	Positive / Negative
Mediating variable	Firm Growth	Proportionate change in TA	Ratio Scale	Positive / Negative

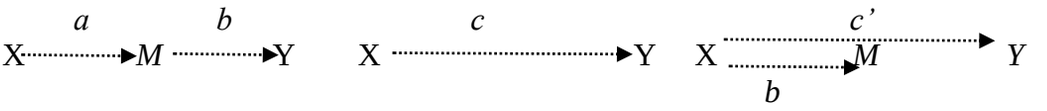
Source: Researcher (2020)

3.5.2 Test of Mediating effect of Firm growth

Mediation is a hypothesized causal chain in which one variable (intervening variable, M) affects a second variable that ultimately affects a third variable (MacKinnon, Fairchild, & Fritz, 2007).

Mediation was originally graphically depicted as follows;

Figure 2.1 Figure 2.2 Figure 2.3



Where;

X = Independent variables (Financial risk, DCL index)

M = Mediator Variable (Firm Growth)

Y = Dependent Variable (Financial Distress)

Baron and Kenny (1986) specified a statistical mediation path diagram from these relationships as presented in figure 3.4 below, which is a stepwise regression process that can be used to test mediation effect (Baron & Kenny, 1986).

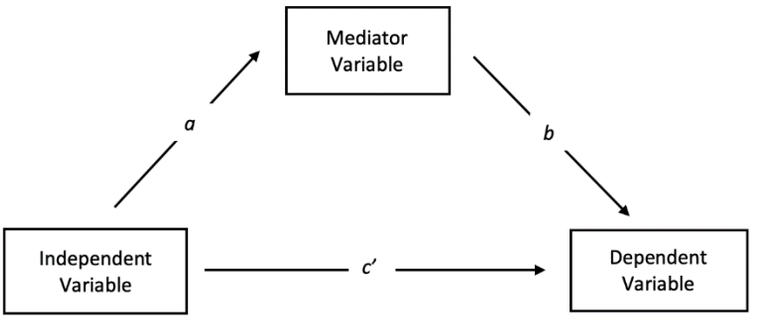


Figure: Mediation Analysis Model

Source: Adopted from Baron and Kenny (1986, pp 1176)

a, b, c and c' are used to represent the regression/path coefficients. Using the path analysis approach, paths *a* and *b* are direct effects while the path *M*, through which X leads to Y through *M* is the indirect effect. Mediation is established through 3 regression models, establishing a significant relationship for each unstandardized regression coefficients *a, b* and *c* depicted in figures 2.1 and 2.2 above. Mediation was to be

indicated by the regression model results with both X and *M* predicting Y. Full mediation was to be indicated by the results if the relationship between X and Y is eliminated entirely when *M* is controlled (i.e., when c' is not significant) and partial mediation by the reduction and not elimination of the X to Y relationship. Such a mediation model was also employed in testing effect by (Musau (2018); Rijnhart, Twisk, Eekhout & Heymans, 2019).

In testing the mediation effect of firm growth on the relationship between financial risk and financial distress, the study adopted the Baron and Kenny (1986) model, which was also employed by Musau (2018) in testing mediation analysis. The study therefore specified the following equations while using standardized variables;

Step 1: Regression analysis with Financial Risk predicting Financial Distress

$\text{Logit } (p)_{it} = \alpha + \beta_1(FR)_{it} + \varepsilon_{it}$ ..... **Model 1**

Step 2: Regression analysis with Financial Risk predicting Firm Growth

$\text{Financial Risk } (FR)_{it} = \alpha + \beta_1(FG)_{it} + \varepsilon_{it}$ ..... **Model 2**

Step 3: Regression analysis with Firm Growth predicting Financial Distress

$\text{Logit } (p)_{it} = \alpha + \beta_1(FG)_{it} + \varepsilon_{it}$ ..... **Model 3**

Step 4: Regression analysis with Financial Risk and Firm Growth predicting Financial Distress

$\text{Logit } (p)_{it} = \alpha + \beta_1(FR)_{it} + \beta_2(FG)_{it} + \varepsilon_{it}$ ..... **Model 4**

Where: FD_{it} = The index of Financial Distress for firm *i* at time *t*

FR_{it} = DCL (Financial Risk Index for firm *i* at time *t*)

FG_{it} = Mediating Variable Firm Growth for firm *i* at time *t*

α = Constant term

βs = Coefficients of the independent variables

ε_{it} = Error term

Table: Decision making criteria for Mediation Decision

	Outcome. If:	**Decision making Criteria**
1	β1 significant in model 1,	Complete Mediation
	β1 significant in model 2,	
	β1 significant in model 3,	
	β1 insignificant and β2 significant in model 4	
2	β1 significant in model 1,	Partial Mediation
	β1 significant in model 2,	
	β1 significant in model 3,	
	β1 significant and β2 significant in model 4	
3	β1 significant in model 1,	No Mediation
	β1 significant in model 2,	

	β1 significant in model 3,	
	β1 insignificant and β2 insignificant in model 4	

Source: Researcher (2020)

4.0 Results and Discussion

The section presents the associations and trends between the variables study.

4.1 Descriptive Statistics

Presented in this section are the results of the descriptive statistics encompassing the following: Trend analysis for the dependent variable (Financial Distress), independent variables (Credit risk, Currency risk, Interest rate risk and Liquidity risk) and mediating variable (Firm growth). The summary of the descriptive statistics from the study for all the variables of the NSE listed firms for the years 2009 to 2018 are presented in table 4.1 below.

Table: Descriptive Statistics

		Financial Distress	Credit Risk	Currency Risk	Interest Rate Risk	Liquidity Risk	Firm Growth
N	Valid	631	631	631	631	631	631
	Missing	0	0	0	0	0	0
Range		1	5.9067	2.0622	0.4854	18.9604	53.6922
Minimum		0	-2.9477	-1.0293	-0.1746	-1.1995	-2.3108
Maximum		1	2.9590	1.0328	0.3108	17.7609	51.3814
Mean Statistic		0.58	0.8056	-0.3154	-0.0016	1.2719	0.1472
Mean Std. Error		0.020	0.0283	0.0145	0.0049	0.0966	0.0828
Std Deviation		0.494	0.7102	0.3650	0.1238	2.4270	2.0789
Variance		0.244	0.504	0.133	0.015	5.890	4.322
Skewness Statistic		-0.332	-1.561	1.142	1.216	3.731	23.818
Skewness Std. Error		0.097	0.097	0.097	0.097	0.097	0.097
Kurtosis		-1.896	5.907	2.966	1.512	16.395	588.135
Kurtosis Std. Error		0.194	0.194	0.194	0.194	0.194	0.194

Source: Study Data (2021)

The results of the descriptive statistics of the study data are presented in table above and included range, minimums, maximums, mean, mean standard error, standard deviation, variance, skewness, skewness standard error, kurtosis and kurtosis standard errors of the study variables. As much as over 70% of the data were obtained from the secondary sources of data collection, some cases of missing data were experienced. Cases of missing data for some firms were encountered and resolved using the Multiple Imputation (MI) technique of filling in missing data. Multiple imputation is a widely adopted statistical method in practice for dealing with missing data. The method removes the potential loss in statistical power and chances of getting biased results (Rezvan, Lee, & Simpson, 2015). The data used was after deletion of 29 missing cases (since they accounted for less than 5% of entire data), hence the descriptive statistics are for 631 valid/complete cases. This processing enabled the ascertainment of the nature of the data that was used in the study. The results of the frequency table after multiple imputation of the various variables are presented in figure below.

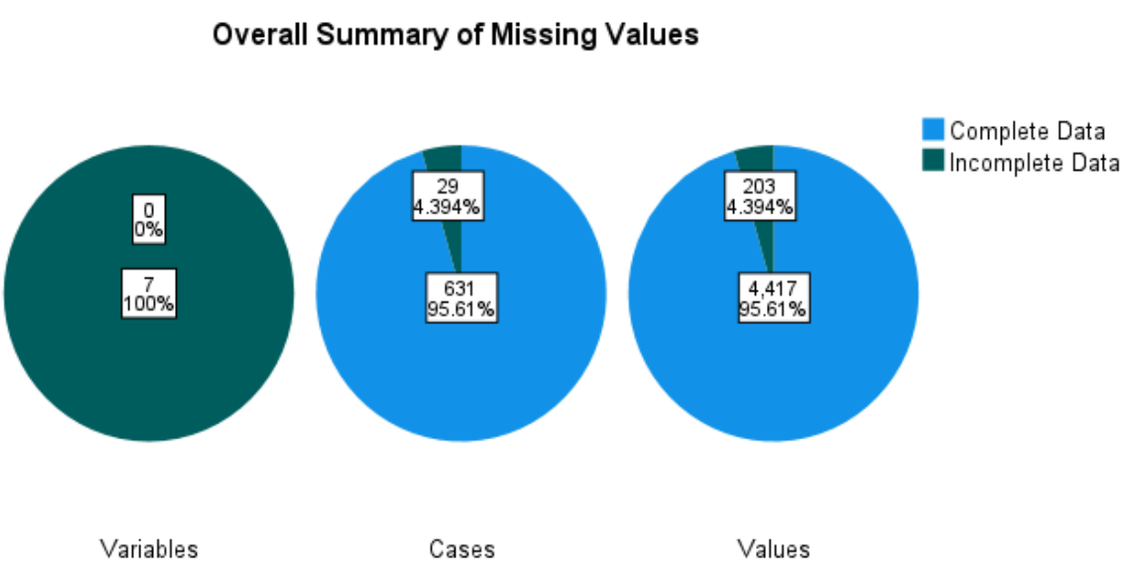


Figure: Summary of Missing Values
Source: Study Data (2021)

The final data collected comprised of 95.61% of complete data and 4.394% of missing data as indicated in figure 4.1 above. The missing data were missing completely at random (MCAR). This indicated 631 complete cases and 29 missing cases. Since the missing cases were MCAR and less than 5%, complete case analysis approach was used where the missing cases were omitted and the remaining data was analysed. The results obtained from the analysis in such cases are unbiased estimates and conservative results (Kang, 2013).

Table: Variables Summary

	Missing				
	N	Percent	Valid N	Mean	Std. Deviation
FirmGrowth	29	4.4%	631	.147198	2.0789213

The trend in Financial Distress levels was also established for the years under study. The results from the analysis are presented in the table below.

4.1.1: Trend in Financial Distress Levels

Figure: Trend in Financial Distress

Source: Study Data (2021)

The observed trend in the distress levels, coded 0 = distressed and 1 = Not-Distressed, showed that most firms were not distressed during the periods 2009 upto 2015. However, the number of distressed firms was on an upward trend from 2015 to almost equal the number of non-distressed firms by the year 2018 (Period 1=Year 2018 …. period 10=Year 2009). Various factors can be attributed to this, including the policies that were introduced during the period. For example, the capping of interest rates law for banks and financial institutions may have affected the operations of firms in terms of their lending and borrowing potential.

The total number of cases used in analysis of distressed verses not-distressed firms are presented in the bar graph in figure below.

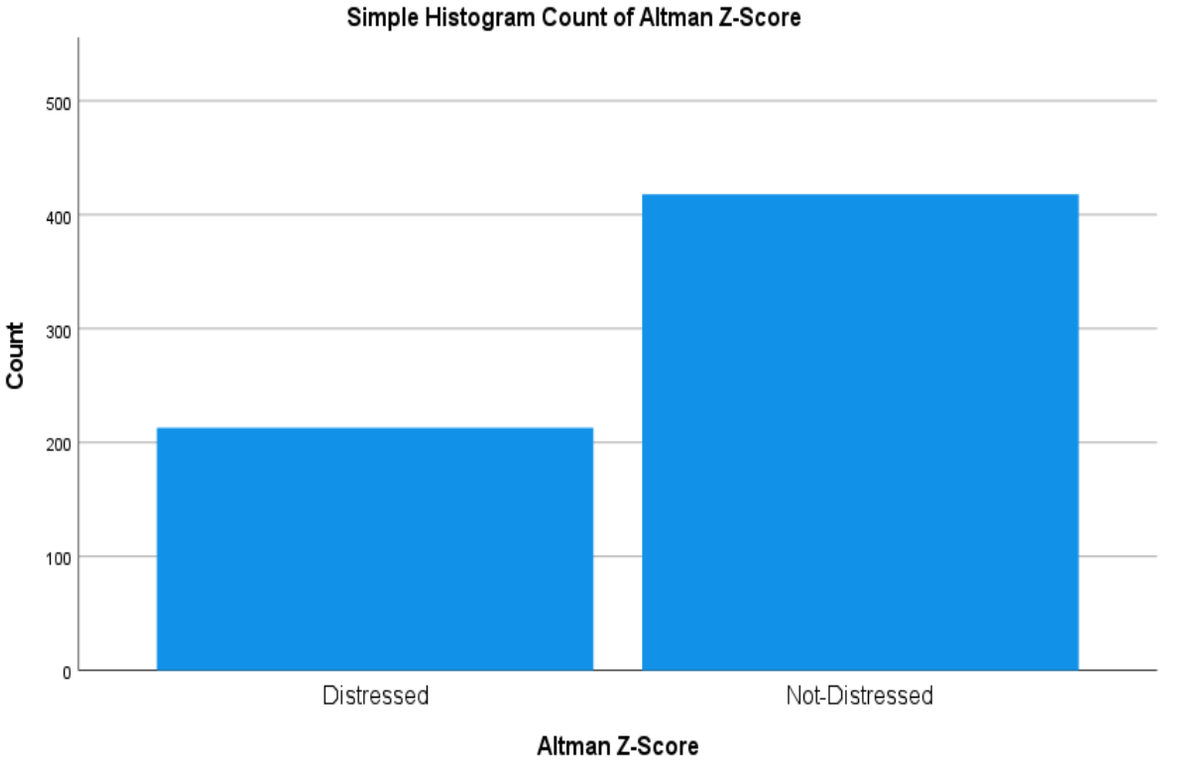


Figure: Cases of analysed Firms (Distressed vs Not-Distressed) at NSE
Source: Study Data (2021)

The results from the figure 4.4 above indicate that the total number of cases for Not-distressed firms were higher than total cases of distressed firms for the years under study. 418 cases of Not-distressed firms and 213 cases of distressed were analysed over the 10-year period. The total valid cases analysed were 631 (418+213) out of the total possible cases of 660 (66 firms * 10 years = 660).

4.1.2 Trend in Firm Growth

There was need to analyse other factors that would explain why or how the relationship between the independent and dependent variables subsist. Firm growth was perceived to mediate this relationship and was therefore analysed. The mediating effect of firm size on the relationship between financial risk and financial distress was measured using the proportionate change of firms' size over the years 2009 to 2018. The results from the analysis of the trend in firm growth for the firms listed at the NSE over the period under study are hereby presented in figure below.

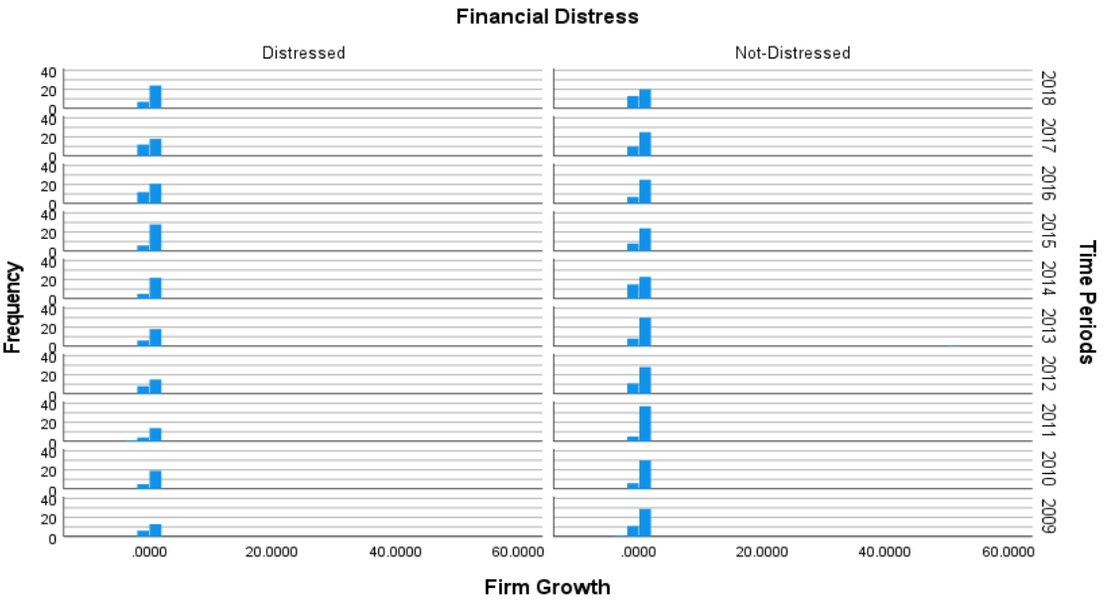


Figure: Histogram of Trend in Firm Growth
Source: Study Data (2021)

The results of the proportionate change showed an almost similar change in firm growth between the distressed and non-distressed firms in the years 2015-2018 as shown in figure 4.15 above. There was however an observed greater firm growth in non-distressed firms as compared to distressed firms in the prior periods of 2009 to 2014. Figure 4.15 indicate that there was a general constant level of growth in non-distressed firms as compared to distressed firms over the period under study. Comparatively, distressed firms showed greater growth levels in the latter years (2014-2018) as compared to prior years under study. Non-distressed firms showed, on average, a constant growth rate and pattern over the whole period under study.

Graphically, firm growth over the 10 years under study showed a trend as indicated in figure 4.16. The result shows a greater disparity in firm growth in the latter years under study (2013-2016) as compared to prior years (2009-2012).

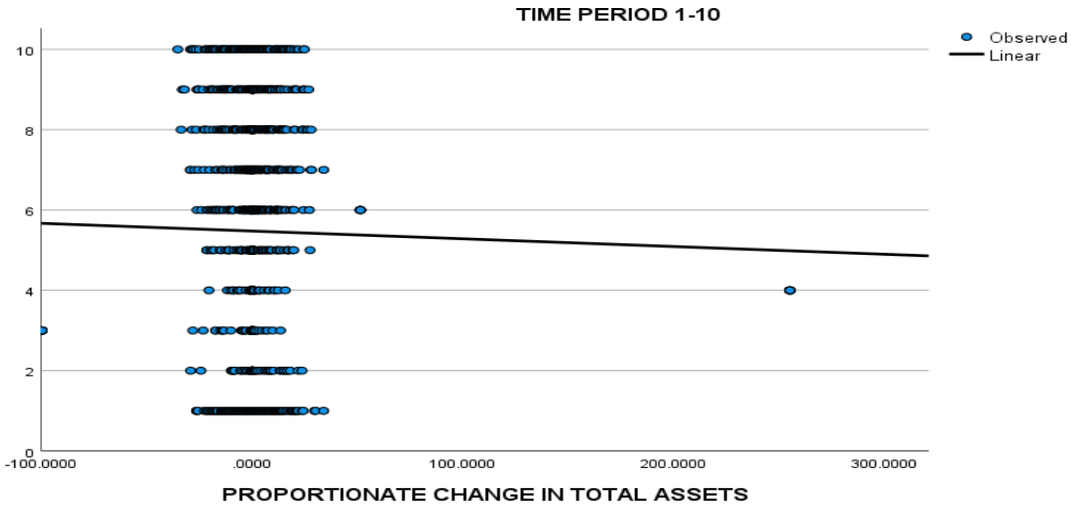


Figure: Graph of Trend in Firm Growth (measured by Proportionate change in Total Assets)

Source: Study Data (2021)

Discussing the periods after 2014, there was an enactment of the interest rate cap law in Kenya in 2014 which gave distressed firms opportunities to grow their asset bases. The law provided a platform for distressed firms to take advantage of the low interest rates charged by banks and borrowed to increase their assets base, hence the growth.

4.2.2 H_{01}: Firm growth has no significant mediating effect on the relationship between Financial Risk and Financial Distress of firms listed at the Nairobi Securities Exchange, Kenya

The researcher employed the four-step approach by Baron and Kenny (1986) to test for mediation and to predict the mediation equations in chapter 3. The tests entailed whether the paths between the independent variables and the dependent variable; between the independent and the mediator and the mediator and the dependent variable were statistically significant. Testing for mediation involves a stepwise regression process (Baron & Kenny, 1986).

The results from the models are presented in tables 4.17 – 4.20 below.

Table: Step 1: Regression analysis with Financial Risk predicting Financial Distress

$(\text{Logit } (p)_{it} = 0.120 + 3.088(FR)_{it} + \varepsilon_{it}$ ..... **Model 1)**

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B) Lower	Upper
Step 1[a]	FR (DCL)	3.088	.802	14.815	1	<.001	21.930	4.552	105.659
	Constant	.120	.162	.551	1	.458	1.128		

a. Variable(s) entered on step 1: FR (DCL)

Table: Step 2: Regression analysis with Financial Risk predicting Firm Growth

$(\text{Financial Risk } (FR)_{it} = 0.126 + 2.828(FG)_{it} + \varepsilon_{it}$ ..... **Model 2)**

Coefficients[a]

Model		Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.	95.0% Confidence Interval for B Lower Bound	Upper Bound
1	(Constant)	16.822	.083		202.522	.000	16.659	16.986
	FR (DCL)	-1.094	.672	-.065	-1.629	.001	-2.413	.225

a. Dependent Variable: Proportionate Growth in TA

Table: Step 3: Regression analysis with Firm Growth predicting Financial Distress

$(\text{Logit } (p)_{it} = 4.742 - 0.239(FD)_{it} + \varepsilon_{it}$ ..... **Model 3)**

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B) Lower	Upper
Step 1[a]	Proportionate Growth in TA	-.239	.043	30.357	1	<.001	.787	.723	.857
	Constant	4.742	.750	39.991	1	<.001	114.649		

a. Variable(s) entered on step 1: Proportionate Growth in TA.

Table: Step 4: Regression analysis results with Financial Risk and Firm Growth predicting Financial Distress

$(\text{Logit } (p)_{it} = 4.166 + 2.907(FR)_{it} - 0.234(FG)_{it} + \varepsilon_{it}$ ..... **Model 4)**

Variables in the Equation

		B	S.E.	Wald	df	Sig.	Exp(B)	95% C.I.for EXP(B) Lower	Upper
Step 1[a]	Proportionate Growth in TA	-.234	.046	25.494	1	<.001	.791	.723	.867
	FR (DCL)	2.907	.808	12.935	1	<.001	18.298	3.754	89.197
	Constant	4.166	.819	25.890	1	<.001	64.477		

a. Variable(s) entered on step 1: Proportionate Growth in TA, FR (DCL)

Table: Summary of results of the mediating effect of Financial Risk on Financial Distress of firms listed at the NSE, Kenya

Analysis Steps	Dependent Variable	Independent Variable	IV Coefficients	Decision
Step 1	Financial Distress	Financial Risk	3.088 (0.001)	Significant
Step 2	Firm Growth	Financial Risk	2.828 (0.001)	Significant
Step 3	Financial Distress	Firm Growth	-0.239 (0.001)	Significant
Step 4	Financial Distress	Financial Risk	2.907 (0.001)	Significant
		Firm Growth	-0.234 (0.001)	Significant

Source: Study Data (2021)

3.2 Summary of Hypothesis Test

The table below presents a summary of the results of the test of hypotheses discussed above. The study presents the summarized results from the combined logit analysis of the four independent variables derived from the null hypotheses based on the four dimensions of financial risk measures, moderating variable, mediating variable and the indicator/measure of financial distress.

Firm Growth: H_{06}			
H_{06}: Firm Growth (Proportionate change in total assets) has no significant mediating effect on the relationship between financial risk and financial distress of firms listed at the NSE, Kenya	*Partial Mediation*	**Failed to reject H_0**	Firm Growth has no significant mediating effect on the relationship between financial risk and financial distress of firms listed at the NSE, Kenya

Source: Study Data (2021)

5.0 Conclusion and recommendations

This study tested the hypothesis and found that firm growth has an insignificant mediating effect on financial distress of firms listed at the NSE, Kenya. This study therefore concludes that firm growth does not indeed mediate the relationship between financial risk and financial distress of NSE, Kenya listed firms. There is an observed partial mediation effect of firm growth on the relationship between financial risk and financial distress. Firms should therefore not be in a hurry for rapid growth but growth should be in measured steps based on other factors within and without the firm since there is lack of evidence that firm growth explains the relationship between financial distress and financial distress.

The governance of the NSE should invest in the area of research and policy in order to enable better understanding of the problem of financial distress of the listed firms, so that to avoid their plunging into bankruptcy. Research organizations and bodies should invest more in furthering and enhancing deeper research on areas listed firms. Financial distress has been a challenge with firms listed at NSE and substantial evidence has been documented to that extent. It is regrettable that financial distress and liquidity problems still remain a concern of the listed firms in Kenya. More studies should be undertaken in the area of how firm growth contributes to financial distress.

Researchers and universities councils should emphasize future studies on the collective effect of financial risk variables on financial distress and against individual cluster of firms listed at NSE. To the extent that financial distress negatively affects firm performance and the economy at large, various studies try to come up with ways of managing financial distress and its effects while ignoring the effects of the various risks associated with financial distress. There is therefore need for investigation of the combined effect of financial risk variables and on all firms at the NSE and outside the NSE by researchers and interested parties.

Researchers and research bodies should conduct in-depth analyses of other factors outside the regulations. In addition, future studies should incorporate the moderating and mediating impacts of other factors on the relationship between financial risk and financial distress of firms listed at the NSE, Kenya. Existing studies have not attempted to delve in such an analysis. The literature or lack of it touching on financial risk and financial distress including incorporation of other variables as moderators and mediators creates contextual, empirical, conceptual and methodological gaps that still need to be addressed. The government and other organizations should encourage research in these areas by directing funding and other incentives to the areas.

This study enhances the knowledge base in the areas of firm growth, financial risk and financial distress of firms in Kenya and all over the world. As initially noted, there is limited empirical literature in the area of financial risk and financial distress of firms, especially listed firms in Kenya. The study extends the conceptualization of firm growth, financial risk and financial distress by integrating firm growth in the discussions. Financial risk variables are many and varied. However, depending on the level and type of analysis, researchers are encouraged to utilize the variables that are most suitable for their discussions and analysis.

References

Abor, J. (2008). Determinants of the capital structure of Ghanaian firms. *African Economic Research Consortium, Research Paper, 176*.

Altman, E. I. (2000). *Predicting Financial Distress of Companies: Revisiting the Z-Score and ZETA® Models*. Stern School of Business, New York University.

Altman, Edward. (2000). *Predicting Financial Distress of Companies*. Stern School of Business, New York University.

Amaral, M. (2008). Examine relationship between firm risk and firm growth. *The Accounting Review*, 180: 54-65.

Ardishvili, A., Cardozo, S., Harmon, S., & Vadakath, S. (1998). *Towards a theory of new venture growth* [Research Conference]. Babson Entrepreneurship Research Conference, Ghent, Belgium.

Ater, D. K., Kisaka, Dr. S. E., Iraya, Dr. C., & Mwangi, Dr. M. (2017). The Mediating Effect of Firm Growth on the Relationship between Capital Structures and Value of Nonfinancial Firms listed at the Nairobi Securities Exchange (NSE. *IOSR Journal of Economics and Finance*, *08*(04), 41–46.

Baldwin, C. Y., & Scott, P. M. (1983). The Resolution of Claims in Financial Distress; the Case of Massey Ferguson. *The Journal of Finance*, *38*(2), 12.

Baron, J., & Spulber, D. F. (2017). The Eff ect of Technological Change on Firm Survival and Growth—Evidence from Technology Standards. *North-western University*, 39.

Baron, M. &. Kenny (1986). *The Moderator-Mediator Variable Distinction in Social Psychological Research: Conceptual, Strategic and Statistical Considerations* (6 ed., Vol. 51). Journal of Personality and Social Psychology.

Berger, D. (2017). *Introduction to Binary Logistic Regression and Propensity Score Analysis; Categorical Data Analysis*. Research Gate.

Bokpin, G. A., Aboagye, A. Q., & Osei, K. A. (2010). Risk exposure and corporate financial policy on the Ghana Stock Exchange. *The Journal of Risk Finance*, *11*(3), 323–332.

Bretscher, L., Schmid, L., & Vedolin, A. (2016). Interest Rate Uncertainty, Hedging, and Real Activity. *SSRN Electronic Journal*.

Carrizosa, M. T. (2007). *Firm growth, persistence and multiplicity of equilibria: An analysis of Spanish manufacturing and service industries.* [PhD thesis, Chapter 2, Universitat Rovira i Virgili. Departament d'Economia].

Cooper, C. R., & Schindler, P. S. (2008). *Business Research Methods.* (10th ed.). McGraw-Hill.

Cremers, M., Fleckenstein, M., & Gandhi, P. (2017). Treasury Yield Implied Volatility and Real Activity. *SSRN Electronic Journal*.

Delmar, F. (1997). *Measuring Growth: Methodological Considerations and Empirical Results*. ESBRI, Entrepreneurship & Small Business Research Institute, Stockholm, Sweden.

Delmar, F., Davidsson, P., & Gartner, W. B. (2003). Arriving at the high-growth firm. *Journal of Business Venturing*, *18*(2), 189–216.

Demirgüç-Kunt, A., & Maksimovic, V. (1996). *Financial Constraints, Uses of Funds, and Firm Growth: An International Comparison*. The World Bank.

Donckels, R., & Miettinen, A. (1997). *Entrepreneurship and SME Research: On its Way to the Next Millennium*. Entrepreneurship and SME Research: On its Way to the Next Millennium, Aldershot, England: Ashgate.

Fernando, E. (2011). *Theory of financial risk*. MPRA - Munich Personal RePEc Archive, Germany.

Field, P. (2005). *Discovering Statistics Using SPSS* (2nd ed.). SAGE Publications, Inc.

Gatsi, J. G., Gadzo, S. G., & Akoto, R. K. (2013). Degree of Financial and Operating Leverage and Profitability of Insurance Firms in Ghana. *International Business and Management*, *7*(2), 57–65.

Gazi, B. (2011). Credit Risk Management. *Journal of Applied Statistics*, *38*(6), 1314–1314.

Gichaiya, M. W., Muchina, S., & Macharia, S. (2019). Corporate Risk, Firm Size and Financial Distress: Evidence from Non-Financial Firms Listed in Kenya. *IOSR Journal of Economics and Finance (IOSR-JEF)*, *10*(4), 75–86.

Githaiga, G. T. (2019). *Employees' separation planning and retirement preparedness among public secondary school teachers in Kirinyaga and Murang'a counties, Kenya*. Nairobi: Kenyatta University.

Guguyu, O. (2018). Deacons Shares suspended by CMA. *Standard Media Group*.

Gupta, P., Guha, S., & Krishnaswami, S. (2013). Firm growth and its determinants. *Journal of Innovation and Entrepreneurship*, *2*(1), 15.

Kanani, M. A., Moradi, J., & Valipour, H. (2013). Sustainable Growth and Firm Risk from The Signalling Perspective. *Asian Economic and Financial Review*, *3*(5), 8 (660-667).

Kang, H. (2013). The prevention and handling of the missing data. *Korean Journal of Anaesthesiology*, *64*(5), 402 - 406.

Karanović, G., Karanović, B., & Gnjidić, M. (2018). *Liquidity risk management: Practice among Croatian firms*. *6*(1), 81–98.

Kazemian, S., Shauri, N. A. A., Sanusi, Z. M., Kamaluddin, A., & Shuhidan, S. M. (2017). Monitoring mechanisms and financial distress of public listed companies in Malaysia. *Journal of International Studies*, *10*(1), 92–109.

Kerlinger, N., & Lee, B. (2000). *Foundations of Behavioural Research* (4th ed.). Fort Worth.

Kinyua, G. M. (2015). *Relationship between knowledge management and performance of commercial banks in Kenya.* [Thesis]. Kenyatta University.

Lambe, I. (2015). Assessing the Impact of Exchange Rate Risk on Banks Performance in Nigeria. *Journal of Economics and Sustainable Development*, *6*(6), 14.

Litov, L. P., John, K., & Yeung, B. Y. (2006). *Corporate governance and corporate risk taking: Theory and evidence* [AFA Meetings]. AFA 2007 Chicago Meetings Paper. SSRN:

Lu, Y., & Road, F. (2016). *Audit quality and financial distress: Evidence from China*. *13*, 11.

Lusi, D., & Swastika, D. (2013). Corporate Governance, Firm Size, and Earning Management: Evidence in Indonesia Stock Exchange. *IOSR Journal of Business and Management*, *10*(4), 77–82.

MacKinnon, D. P., Fairchild, A. J., & Fritz, M. S. (2007). *Mediation Analysis* (Review No. 58; Annual Review of Psychology, p. 593).

Madhushani, I. K. H. H., & Kawshala, B. A. H. (2018). The impact of financial distress on financial performance; Special reference to listed non-banking financial institutions in Sri Lanka. *International Journal of Scientific and Research Publications*, *8*(2).

Maina, F. G., & Sakwa, M. M. (2017). Understanding Financial Distress among Listed Firms in Nairobi Stock Exchange: A Quantitative Approach Using the Z-Score Multi-Discriminant Financial Analysis Model. *Jomo Kenyatta University of Agriculture and Technology*, 16.

Mateev, M., & Anastasov, Y. (2010). Determinants of small and medium sized fast-growing enterprises in central and eastern Europe: A panel data analysis. *Financial Theory and Practice*, *34*(3), 269–295.

Moles, P. (2016). *Financial Risk Management; Sources of Financial Risk and Risk Assessment* (V). Edinburgh Business School, Herriot - Watt University.

Muathe, S. (2010). *The Determinants of Adoption of Information and Communication Technology by Small and Medium Enterprises within the Health Sector in Nairobi.* [PhD thesis]. Kenyatta University.

Muigai, R., & Muriithi, J. (2017). The Moderating Effect of Firm Size on the Relationship Between Capital Structure and Financial Distress of Non-Financial Companies Listed in Kenya. *Journal of Finance and Accounting*, *5*(4), 151–158.

Muriithi, J. (2016). *Effect of Financial Risk on Financial Performance of Commercial Banks in Kenya*. Jomo Kenyatta University of Agriculture and Technology.

Muriithi, J. G., & Waweru, K. M. (2017). Operational Risk, Bank Size and the Financial Performance of Commercial Banks in Kenya. *International Journal of Finance & Banking Studies (2147-4486)*, *6*(3), 39.

Muriithi, J., & Waweru, K. (2017). Liquidity Risk and Financial Performance of Commercial Banks in Kenya. *International Journal of Economics and Finance*, *9*(3), 256.

Musau, S. (2018). *Financial inclusion and stability of Commercial Banks in Kenya* [Thesis]. Kenyatta University.

Ngalawa, J. (2014). Interest Rate Risk Management for Commercial Banks in Kenya. *IOSR Journal of Economics and Finance*, *4*(1), 11–21.

Nissen, H. E., Hirschheim, R., Fitzgerald, G., & Wood-Harper, T. (1985). *Acquiring Knowledge of Information Systems—Research in a Methodological Quagmire. in: Research Methods in Information Systems (IFIP 8.2 Proceedings)*.

NSE. (2018). *Listing Manual*. www.nse.co.ke

Obunike, C., & Udu, A. (2019). Technological innovativeness and growth: A study of small-scale manufacturing firms in Lagos State. *Economics of Development*, *17*(4), 39–53.

Outecheva, N. (2007). *Corporate Financial Distress: An Empirical Analysis of Distress Risk*. University of St. Gallen Graduate School of Business Administration, Economics, Law and Social Sciences (HSG).

Parlak, D., & İlhan, H. (2016). Foreign exchange risk and financial performance; The case of Turkey. *International Review of Economics and Management*, *4*(2), 1–15.

Platt, H., Platt, M., & Chen, G. (1995). Sustainable growth rate of firms in financial distress. *Journal of Economics and Finance*, *19*, 147–151.

Rezvan, H. P., Lee, K. J., & Simpson, A. J. (2015). The rise of multiple imputation: a review of the reporting and implementation of the method in medical research. *BMC Medical Research Methodology* (p. 14). BMC Medical Research Methodology.

Rijnhart, J., Twisk, J., & Heymans, M. (2019). Comparison of logistic-regression based methods for simple mediation analysis with a dichotomous outcome variable. *BMC Medical Research Methodology*, *19*(19).

Robson, C. (2002). *Real World Research: A Research for Social Scientist and Practioners*. Blackwell Publishing.

Saunders, M. L. (2007). *Research Methods for Business Students*. SAGE Publications Ltd.

Saunders, M., Lewis, P., & Thornhill, A. (2007). *Research Methods for business students* (3rd ed.). Pearson Education.

Saunders, M., Lewis, P., & Thornhill, A. (2009). *Research Methods for Business students* (5th ed.). Prentice Hall.

Sekaran, U., & Bougie, R. (2011). *Research Methods for Business: A Skill Building Approach.* (5th ed.). Aggarwal Printing Press.

Sheikh, S. A., Gekara, D. M., & Muturi, D. W. (2015). Firm Value and Derivatives Use: Evidence from Nairobi Securities Exchange. *IOSR Journal of Economics and Finance (IOSR-JEF)*, *6*(6), 18–27.

Thim, C. K., Choong, Y. V., & Nee, C. S. (2011). Factors Affecting Financial Distress: The Case Of Malaysian Public Listed Firms. *Corporate Ownership and Control*, *8*(4).

Tukur, K., & Usman, A. U. (2016). Binary Logistic Regression analysis on admitting students using Jamb Score. *International Journal of Current Research*, *8*(01), 25235–25239.

Vintilă, Gherghina, S., & Toader, D. (2019). Exploring the Determinants of Financial Structure in the Technology Industry: Panel Data Evidence from the New York Stock Exchange Listed Companies. *Journal of Risk and Financial Management*, *12*(4), 163.

Waithaka, Mburu, Korir, Muathe and Obere, (2013). Organizational factors that influence the adoption of interorganizational information systems by universities in Kenya. *International Journal of Education and Research*, 9.

Wanjohi, S., Wanjohi, J., & Ndambiri, J. (2017). The Effect of Financial Risk Management on the Financial Performance of Commercial Banks in Kenya. *International Journal of Finance and Banking Research*, *3*(5), 70.