ANTECEDENTS OF FINANCIAL DISTRESS AMONG AGRICULTURAL FIRMS LISTED AT THE NAIROBI SECURITIES EXCHANGE

[1] Thinwa Beatrice, [2] Dr. Matanda Joshua

[1] MBA Student., Jomo Kenyatta University of Agriculture and Technology

[2] Lecturer, Jomo Kenyatta University of Agriculture and Technology

ARTICLE INFO

Cite:

ABSTRACT

The purpose of this study was to determine the effect of firm specific determinants on financial distress evidence of Agricultural firms listed at the Nairobi Securities Exchange. The specific objectives were: to establish the effect of Firm size on financial distress of Agricultural firms listed at the Nairobi Securities Exchange, to determine the effect of Liquidity on financial distress of Agricultural firms listed at the Nairobi Securities Exchange. The study adopted a descriptive research design. The target population in the study consisted of the seven Agricultural entities quoted at the Nairobi Securities Exchange, Kenya as at December 2020. The study relied on secondary data to achieve the research objectives. The researcher visited the NSE online database for the years 2016-2020. The researcher then identified the agricultural firms listed and collect the data on firm size, liquidity for the years 2016-2020. The data was collected using a data collection schedule. After the data was collected, it was keyed into STATA software for analysis. The statistics generated were descriptive statistics and inferential statistics. The specific descriptive statistics included mean and standard deviations while the inferential statistics included a multiple linear regression model. The panel regression model was used to determine the relationship between the independent variables and the dependent variable which were explained in the model. The study found that firm size has negative significant influence on financial distress of agricultural firms listed at the Nairobi Securities Exchange in Kenya. Also, liquidity was found to have positive significant influence on financial distress of agricultural firms listed at the Nairobi Securities Exchange in Kenya. Given these findings, it is recommended that Agricultural firms listed on the NSE in Kenya focus on maintaining a manageable size to reduce their likelihood of financial distress. One possible way to achieve this is through a combination of organic growth strategies, such as increasing sales and expanding their product lines, and inorganic growth strategies, such as mergers and acquisitions. Also, maintaining adequate levels of liquidity to reduce their likelihood of financial distress is recommended. This can be achieved by effectively managing their current assets, such as cash and accounts receivable, and their current liabilities, such as accounts payable and short-term debt.

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INTRODUCTION

A firm is said to be in financial distress when it gets into a demanding situation whether financially, operationally or legally such that it cannot honor its obligations when they fall due (Platt & Platt, 2016). Financial distress is also understood as a process, caused by the economic difficulties and (or) poor farm management. Financial distress falls in tight cash situations when the firm is not able to pay the owed amount within the due date. This is in line with the leverage position of a firm. If no interventions are injected, this condition can force a firm into bankruptcy or liquidation (Hu, 2018). This condition arises from wrong financial decisions and poor financial controls made by farm managers in the long run operations of a farm (Filberk & Krueger, 2016).

Financial distress starts when the farm cannot carry out its obligations (Dietrich, Arcelus, & Srinivasan, 2017). Therefore, the farm has to sell its assets, lay off employees, and creditors no longer have the prospects of recovering investments or dealing with creditors can be made complicated. If obligations become disproportionate to the farm's assets, the loss could not be covered by assets. This is the reason why farm can no longer exist in its present form. Financial distress begins in short-term insolvency and ends with leaving farm business.

According to Anyanzwa (2017), many times, a farm suffers financial distress as a result of failures by management. When a company experiences financial distress, operating conditions may deteriorate, heavy financial burdens become common and wages are renegotiated downwards. If the situation continues, bankruptcy may become a reality (Garlappi & Yan, 2018). However, if appropriate management steps are taken and financial distress factors are used effectively, it can recover and experience a resurgence (Wang & Shiu, 2018). Anwar (2018) found that good business strategies are necessary for firms in distressed position in order to enhance their profitability for a turn-around opportunity.

Globally, financial distress determinants and financial distress prediction are highly important to farm business, as majority farms are generally family businesses (Anyanzwa, 2017). Kemboi (2017), noted that in many cases, entities in financial distress strive to get out of the difficult situation by executing different turnaround strategies such as downsizing, elimination of loss making product lines, hiring of experts, restructuring, disposal of unproductive assets as well as improving the working capital cycle. Therefore, farm's financial distress can result in farmers and their families losing their employment, homes and their way of life.

Despite the importance of financial distress determinants and financial distress prediction in agriculture, much of the literature of financial distress determinants is not specific to agriculture. Some of the evidence shows, that researchers pay more attention to farm financial distress determinants or prediction after 1980's agricultural recession, 1990's massive collapse of the cooperatives in the United States and after 1998's Year of the Russian crisis. It is worth looking through farm financial ratios after 2008-2009 World's economic and finance crisis. This study therefore focuses on effect of firm specific determinants on financial distress evidence in agricultural firms listed in NSE between 2017 and 2021.

Farm financial distress can be determined by many factors. Farm failure can be the result of macroeconomic environment, unsuccessful farmer's management decisions, and even natural forces. Different financial distress determinants may have different influence on a farm financial position. Thorley, Perry and Andes (2018) argued that financial distress factors are economic indicators, determinants and variables of financial distress that will affect performance of an organization. The study asserted that liquidity, profitability, leverage, firm's size, paying of dividends and quantified opinion are financial distress variables that measure a firm's performance (Khalid, 2017). This study therefore focused on Firm size, Liquidity, Leverage and Profitability as determinants of financial distress of agricultural firms listed at the Nairobi Securities Exchange.

Problem Statement

Agriculture has remained the engine of Kenya's economic growth, accounting for 27 percent of real GDP, 60 percent of the total earnings and 45

percent of government revenue (KNBS, 2019). Some 75 percent of Kenyans are employed in the agricultural sector (Maina & Sakwa, 2017). When investors are making investment decision at the NSE, they tend to evaluate various stocks and securities which they perceive will optimize their returns. One of the considerations in the investors' portfolio analysis is usually the strength of firms' Balance Sheets as portrayed in firm financial health (Muigai, 2016). The market value of a distressed firms declines substantially. According to Muigai (2016), companies that are strong today may not be strong tomorrow; therefore, the adoption of early warning system models is vital for making a reliable evaluation of any company's financial health.

Despite the importance of agricultural sector to Kenya's economy, agriculture based stocks are anticipated to keep slacking in performance at the Nairobi Securities Exchange (NSE). According to Kinyua, (2019) few investors are interested in agricultural stocks traded on NSE due to the high risk and dependence on favourable climate which is rather unpredictable. According to NSE investors' handbook (2018), financial review report showed that out of all the six listed agricultural firms, three of them indicated poor performance within the period of the year 2014 to 2018. Eaagads' Ltd. net profit for the year 2018 dropped by Kshs. 80,634,000; Limuru Tea Company reported a net loss of Kshs. 22,134,000 for the year of income 2017 indicating a drop by Kshs. 3,060,000; Sasini'sPlc profit for the year of income 2017 dropped by Kshs. 237,578,000. From NSE the investor's data center report 2018, Karuturi Ltd. was put into receivership back in the year 2014 due to liquidity. This was attributed by failure to pay a loan of Ksh. 383,000,000 that was borrowed from CFC Stanbic. The company continued to sink further in debt after it was placed under receivership leading to its closure and delisting from NSE in 2018. According to a study Atosh (2017), financial distress among the listed firms in NSE is one of the factors that threaten economic growth in Kenya.

Several studies have been done on the financial distress. Globally, economists Jolly et al., (2014) analysed incidence, intensity, and duration of financial distress among farms. Hughes, Richardson, Rister (2015) focusing problem was effects of sustained financial stress on the financial structure and performance of the farm sector. Wadsworth, Bravo-Ureta (2012) analyzed financial performance of New England dairy farms. Franks (2008) and Dietrich, Arcelus, Srinivasan (2005) have paid attention to predicting financial distress in farm businesses. Locally, Atosh (2017) established the effect of corporate governance practices on financial distress among listed firms at Nairobi Securities Exchange and found that net profit has a negative correlation effect on financial distress. Sporta, (2018) researched the effect of financial distress factors on financial performance for commercial banks in Kenya and found a significant relationship between liquidity, leverage, operational efficiency, asset quality and capital adequacy as financial distress factors on financial performance. Makini (2015) conducted a study to test the validity of Atman's Z-score model in predicting financial distress of firms listed at the NSE. It is worth mentioning that much of the local literature of financial distress determinants is not specific to agriculture. This study therefore sought to bridge the gap by assessing the effect of firm specific determinants on financial distress evidence of Agricultural firms listed at the Nairobi Securities Exchange.

Objectives of the study

The general objective of the study was to determine the effect of firm specific determinants on financial distress evidence of Agricultural firms listed at the Nairobi Securities Exchange.

Specific Objectives

The specific objective of the study were to;

i. To establish the effect of firm size on financial distress of agricultural firms listed at the Nairobi Securities Exchange.
ii. To determine the effect of liquidity on financial distress of agricultural firms listed at the Nairobi Securities Exchange.

LITERATURE REVIEW

Theoretical Review

Wreckers theory of Financial Distress

The wreckers' theory was developed initially by Campbell, Hilscher, and Szilagy (2005) suggested

that stocks of distressed firms perform in a manner which is vastly inferior to stocks of financially healthy firms. The theory seeks to expound on advantages in favour of stakeholders of arising from financial distress and assert that the negativity of results relating to performance of financially distressed firms should not be associated with market inefficiency or irrationality.

Consequently, the theory assert that for firms that are financially distressed, returns to ownership of non-cash might be the most recommended way of payout and that in the event of market efficiency, the payout of returns will be represented valuation of stock. This can be referred to as 'wrecker's theory' of financial distress. It elaborates the whole system of outcomes thoroughly. Wrecking is the act of ruthlessly withdrawing funds from companies that are already in a condition of financial distress.

Kalckreuth (2005) further argue that it is hard to reconcile the act of participants of financial market as a group can be inefficient or irrational to wreck an already distressed. Therefore, Campbell, Hilscher and Szilagi (2005), provided a clear insight of a company that has been struck by subsequent states of making losses, negative shocks, and going towards a condition of financial distress. With higher influence, instability of share prices goes up with regard to privacy of information; the final fate of the company relies upon issues unfamiliar to the general public. Having a one sided nature of information, it is becoming more crucial, investors who are uninformed, for this case orphans and widows– will go their way, as, from their perception; it is a market that deals with lemons. Sooner than later, the ownership of equity will be under the insiders – participants of market who possess a particular upper hand in acquiring and deducing information associated with the firm in question.

Cash Flow Theory

William Beaver's developed cash flow theory in 1966 and was further elaborated by Taffler (1983). The theory recognizes a firm as a reservoir of liquid assets that has an inlet (cash inflows) that bring in liquid assets and an outlet (cash outflows) that drain the existing resources out of the company. The reservoir act as a buffer against flow variation. The duo linked the theory to five propositions, first,

firm's failure is reduced when in possession of a larger reservoir of liquid assets. Secondly, a high proportion of debt held by a firm increases its chances of failure (Islam, Ghosh & Khatun, 2021). Thirdly, the probability of failure is greatly reduced when a firm has a larger net liquid asset flow from business operations. The fourth proposition explains that the larger the amount of funds used for recurrent operations the higher the likelihood for a firm to fail. The fifth proposition states that high variability between inflows, outflows and claims in a firm, magnifies the possibility of failure (Fernández, 2017). Financial distress as well as corporate failure is considered to originate from the depletion of liquid assets from the firm's reservoir.

The theory assumes that it is inevitable for a firm with less current year's profit as compared to debt obligations to be declared bankrupt. The creditworthiness of a firm is rated high when it has a positive cash flow (Dogru & Sirakaya-Turk, 2018). This grants the privilege of accessing borrowed capital from capital market as such reducing risk of default.

The empirical evidence on a study by Maripuu and Männasoo (2019) confirmed the conceptual propositions postulated by Islam, Ghosh and Khatun (2021) and acknowledge that profitability, leverage and liquidity are a set of financial distress factors to be relied on to predict distress of a firm as measured by its ratios. The cash flow theory underpins the current study on liquidity and firms' financial distress. This theory explains how levels of liquid asset determine; if a firm has adequate funds that cover financial obligations arising from long and short term financial engagements, the risk of a highly leveraged firm and its prevalence to failure and management of recurrent expenses that include handling of inventory and capitalizing on economies of scale. All these are geared towards the management of factors that possess a distressing effect on a firm that if unchecked may lead to corporate failure and even liquidation.

Conceptual Framework

Mugenda and Mugenda (2013) define a conceptual framework a hypothesized model identifying the model under study and the relationship between the dependent and independent variables. Kothari (2014) defines an independent variable also known

as the explanatory variable is the presumed cause of the changes of the dependent variable, while a dependent variable refers to the variable which the researcher wishes to explain. The goal of a conceptual framework is to categorize and describe concepts relevant to the study and map relationships among them. Such a framework would help researchers define the concept, map the research terrain or conceptual scope, systematize relations among concepts, and identify gaps in literature (Creswell, 2013). Below is a figurative representation of the variables to be explored by this study.
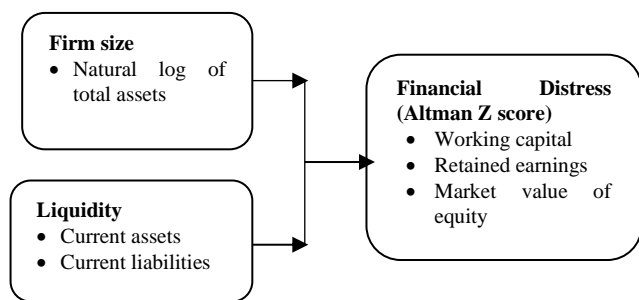
Figure 1: Conceptual Framework

Firm size

In the literature, the vital role of firm size in explaining financial distress is well documented. According to Honjo (2010) small firms have the likelihood to fail than big firms because small firms have poor market experience, limited connection and limited financial resources. Studies conducted to show that firm size is one of the key determinants of corporate financial distress have however shown mixed result. Firm size is a scale in which the size of the company can be classified according to various ways, including the total assets, log size, and market value of shares (Outecheva, 2017). The size of the company will affect the ability to bear the risks that may occur from various situations faced by the company.

Firm size has a significant impact in establishing whether a firm is in distress or not. This is because of the way that extensive firms source funds efficiently because of their capacity to impact the rate interest further bolstering their advantage. Substantial firms can likewise survive in troubled times than little firms because of the level of retained earnings (Ooghe and Prijcker, 2018). Firm size is commonly measured as a natural logarithm

of the total assets. However, existing literature show mixed results on the effect of firm size on finance distress. For instance Nyambura and Memba (2013) researched on effect of firm characteristics on financial distress where firm size was considered. The findings indicated that firm size was significant to financial distress. Yu (2016) concluded that firm size did not significantly affect financial distress.

Liquidity

Levi, Russell and Langemeier (2017) noted that liquidity is a company's ability to finance increment in resources and meet money and collateral commitments at sensible costs and without causing unsuitable misfortunes. Cheluget et al. (2014) researched on liquidity and financial distress of insurance firms and found out that relationship exists. Therefore, they concluded that liquidity is an important factor of financial distress. Solvency and liquidity measures significantly affect enhancing cost efficiency; firms with bigger uses on sourced inputs with respect to capital are more likely to enhance the effectiveness (Mwangi, 2014).

Studies have also shown that liquidity is another determinant of corporate financial distress. Liquidity which indicates the firm ability to meet short term maturing obligation is measured by the ratio of current asset to current ratio. High liquidity means that a company can easily meet its short-term debts while low liquidity implies the opposite and that a company could imminently face bankruptcy (Cheluget et al. 2014). The greater the company's liquidity means the company's current assets are able to cover the company's current debt. Liquidity contributes to firm's growth by enhancing working capital adequacy and ideal cash investment.

Financial Distress

Financial distress expresses financial unfavorable circumstance to identify failure, default and bankruptcy (Pozzoli, & Paolone, 2017). Kumaraswamy (2017) argued that financial distressed as no explicit definition, he believes that firms are financially distressed if they exhibit the following features in two consequent years; negative earnings before interest, tax, depreciation as well as amortization (EBITDA) and negative net income before special items. On the other hand,

Palinko and Svoob (2018) describes the steps that a firm goes through before it reaches liquidation. Their model singled out persistent lack of wealth creation as the starting point of bankruptcy followed by high indebtedness and finally liquidity of the firm.

Profitability refers to the ability of the firm to keep realizing profits through increased sales and investment in capital assets Alemu (2015). Profits are therefore, revenues in excess of the firm's expenses. Profitability ratios are used to indicate the firm's level of profits and they include; the segment of an organization's profit assigned to each ordinary share (earning per share), a measure of net profit returned as a level of investors value (return on Equity (ROE), Return on investment (ROI), measure of the management efficiency in generation of the revenues by using the assets at their disposal (return on asset (ROA).

Altman (1968) propounded Z-score model which is the most preferred tool to predict and measure financial distress. The model uses a combination of five ratios; Retained earnings, earnings before interest and tax, working capital, and sales are all measured relative to total assets while market values of owners' equity are measured relative to total liabilities. Companies with less than 1.81 Z-score are considered financially weak and distressed, a Zscore of more than 2.99 is considered strong financially, and those with Z-score from 1.81 to 2.99 falls under grey areas that require close observation

Empirical Literature
Firm size and Financial Distress

Muigai and Muriithi (2017) sought to establish the moderating effect of firm size on the relationship between capital structure and financial distress of listed non-financial firms in Kenya. Firm size was measured using the natural logarithm of total assets while capital structure was operationalized by total debt, long-term debt and short term debt financing. The degree of financial distress was measured using the Altman's Z-score as reviewed for the emerging markets. Secondary data from audited and published financial statements was collected on the 40 listed non-financial firms between year 2016 and 2015. The study estimated the specified panel regression model for fixed effects as supported by the Hausman test results. Feasible Generalized Least Squares (FGLS) regression results revealed that firm size has a significant moderating effect on the relationship between capital structure and financial distress of non-financial firms. Specifically, the study found that although generally debt has a negative and significant effect on financial distress of the studied companies, this effect becomes positive and significant as the size of the firm increases.

Thim, Choong and Nee (2017) conducted a research on the factors affecting financial distress in Malaysian public listed firms. A sample of 101 companies was selected randomly from Bursa Malaysia during the period 2015-2016 where two models are used to analyze the relationships between financial distress and firms' characteristics and risk. The dependent variables are long-term debt to total equity ratio and short-term debt to total equity ratio. The independent variables are profitability, liquidity, firm size, solvency, growth and risk. Size is found to be significant and has a positive relationship with financial distress. Corporate managers should use these indicators to detect early signs of financial distress and take innovative actions to prevent such occurrences.

Lee (2016) examined the role played by firm size in determining the financial distress of the US publicly –held firms. By using the fixed effect dynamic panel data model and a sample of more than 7000 entities, the study showed that absolute firm size (total assets) had a significant nonlinear relationship with financial distress. This meant that larger firms were more likely to experience financial distress in comparison to smaller firms. The study attributed the negative coefficient between the variables to the tendency by larger firms to finance their assets by large amount of debt capital due to increased borrowing capacity.

Artikis, Eriotis, Vasiliou, and Ventoura-Neokosmidi (2016) conducted a study on 129 Greek companies listed on the Athens Stock Exchange during 1997- 2016. The study showed a negative and statistically significant relationship between firm size and value of the firm as measured by Tobin's Q. The adverse empirical relationship was attributed to the observation that big firms gravitated towards use of more indebtedness than

smaller firms and hence were vulnerable to risks of financial distress.

Ozgulbas, Koyuncugil, and Yilmaz (2016) On the other hand studied the effect of firm size on performance over the firms operating in Istanbul Stock Exchange between the years of 2010 to 2015. The study revealed that big scale firms were less distressed as compared to small scale firms. The researcher attributed this dichotomy in financial distress levels of the firms to the fact that banks were more willing to lend their funds to larger firms partly because they are more diversified and partly because larger firms usually request larger amounts of debt capital than smaller firms. The researcher argued that larger firms were able to reduce transaction costs associated with debt issuance and could arrange a lower interest rate.

Liquidity and Financial Distress

Oktasari (2020) aimed to examine the effect of Liquidity, Leverage, and Firm Size on Financial Distress Studies in Mining Sector Companies Listed on the Indonesia Stock Exchange in the 2014-2018 Period. Based on the results of the analysis, liquidity has a significant positive effect on Financial Distress in Mining Sector Companies Listed on the ISE. The higher the liquidity, the greater the current assets that are not needed, so they do not provide income and a large amount of funds will be collected in the form of trade receivables that may prove to be uncollectible. Uncollectible receivables or unsold inventory cannot be used by the company to pay debts.

Ufo (2015) examined the relationship between leverage and manufacturing firms' financial distress in Ethiopia. The research examines various other factors affecting financial distress. The panel data General Least Square (GLS) regression method is used. The result proves that liquidity, profitability, and efficiency have positive and significant influence on debt service coverage. Banks should supervise the liquidity, solvency, profitability and efficiency of firms in mitigating the debt burden through application of various techniques during loan evaluation process. FD have a negative impact on DSC and leading firms to bankruptcy and liquidation and can cause economic, social and political impact on manufacturing firms and contribute to the CEO

resignation, employee's layoff or loss of jobs, dividend reduction, plant closing and related consequential health and moral distress.

Ong'era, Muturi, Oluoch & Karanja (2017) assessed the effect of liquidity as a financial antecedent of financial distress among listed companies at Nairobi Securities Exchange. The study used descriptive research design. All the 65 listed companies as at 31st December 2017 at Nairobi Securities Exchange were used. Secondary data was collected using designed schedules. Data was analyzed using Statistical Package for Social Sciences (SPSS) as tool of data analysis. Pearson's correlation and regression analysis were used for the analysis. The study established significant relationship between liquidity and financial distress upon evaluation, relationship had an $R2 = .359$, which meant liquidity explained 35.9% of the variance in financial distress. The relationship model provides a moderate fit, but indicates that liquidity was one of the potential predictors of financial distress in listed companies at Nairobi Securities Exchange. It therefore recommends the development of guidelines on the level of liquidity to be held by the listed companies for sustainability.

Saputri and Asrori (2019) conducted a study to analyze the effects of Profitability, Leverage, and Liquidity on Financial Distress which is proxied using Z-scores. The object of research is the sub-sector of property and real estate companies listed on the Indonesia Stock Exchange in 2016-2018. This research was conducted using a sample of 47 companies listed on the Indonesia Stock Exchange. Determination of the sample using a purposive sampling method with criteria by researchers using a causal relationship design. The analysis of data use statistical analysis in the form of multiple linear regression tests. The result of this study is that profitability, and liquidity variables have significant effects and positive on financial distress. The study observed that liquidity is a good predictor of financial distress.

RESEARCH METHODOLOGY

This study used descriptive research design. Lavrakas (2018) describes a descriptive research design as a systematic research method for collecting data from a sample of units. The population of the research study included seven (7)

Agricultural entities quoted at the Nairobi Securities Exchange, Kenya as at December 2021 (Appendix II). The study collected data from year 2017 to year 2021 for all the listed Agricultural entities. Thus a panel dataset of 35 firm-year observations was obtained, with observation of 7 agricultural firms between year 2017 and year 2021. The study examined a panel data of 7 listed agricultural firms from year 2016 to year 2020. Secondary source of data were the main source of data for this research study. The secondary data that was used was collected using data collection sheet and covered a period of five years that is from year 2017 to tear 2021. The data was obtained from the websites of the specific agricultural firms, the website of the Nairobi Securities Exchange (NSE).

The collected data was analyzed using descriptive statistics and inferential statistics. The specific descriptive statistics included percentages and frequencies while the inferential statistics included a multiple linear regression model. Microsoft excel was used to complement STATA software especially in production of tables and figures. Panel regression model was used to measure the relationship between the independent variables and the dependent variable which are explained in the model.

RESEARCH FINDINGS AND DISCUSSION

Table 1: Descriptive Statistics

Variable/Ratio	Obs.	Mean	Std. Deviation	Min.	Max.
Firm size (Log. of total assets)	35	8.977	1.397	6.353	10.858
Liquidity (Current Ratio)	35	1.008	0.643	0.029	2.701
Financial distress (Altman Z score)	35	2.848	1.696	1.112	3.246

Regarding firm size, the findings in Table 4.1 show that the average firm size for the 7 Agricultural entities quoted at the Nairobi Securities Exchange was 8.977 with a standard deviation of 1.397. Since the standard deviation was above 1,it indicated that there was a large deviation in the individual size of firm from company to the other. This is supported by a minimum firm size of 6.353 and maximum of 10.858. This indicates that the firms in the sample are of moderate size, with the largest firm having total assets 10 times greater than the smallest firm. Previous research has shown that firm size can affect various aspects of a firm's performance, including its ability to access capital markets and its level of risk (Artikis, Eriotis, Vasiliou, & Ventoura-Neokosmidi, 2016).

The mean current ratio is 1.008, with a standard deviation of 0.643. The minimum current ratio is 0.029 and the maximum is 2.701. This indicates that the the 7 Agricultural entities quoted at the Nairobi Securities Exchange in the sample have adequate liquidity, with the average firm having the ability to cover its short-term obligations. However, there is significant variability in the liquidity of the firms, with some firms having very low current ratios. The study by Cheluget et al. (2014) found that liquidity is an important factor of financial distress. Also, research by Mwangi (2014) showed that high liquidity is associated with lower levels of financial distress, while low liquidity increases the risk of financial distress.

Financial distress is a term used to describe a situation where a firm is unable to meet its financial obligations or is facing serious financial difficulties. It is an important indicator of a firm's financial health and can have serious implications for its stakeholders, including shareholders, creditors, and employees. The findings in Table 4.1 show that the mean Altman Z score is 2.848, with a standard deviation of 1.696. The minimum Altman Z score is 1.112 and the maximum is 3.246. This indicates that the firms in the sample have low levels of financial distress, with the average firm having an Altman Z score of 2.848. The Altman Z score is a commonly used financial distress prediction model that uses a combination of financial ratios to determine a firm's likelihood of financial distress. A high Altman Z score is associated with a low probability of financial distress, while a low Altman Z score increases the risk of financial distress. The low levels of financial distress of the firms in the sample, as indicated by the mean Altman Z score of 2.848, suggest that these firms are in good financial health and are unlikely to face financial difficulties in the near future. However, it is important to continually monitor the financial health of these firms and take appropriate action if financial difficulties arise.

Trend Analysis

Firm Size

Firm size is a commonly used indicator of a company's financial and operational strength. It is typically measured as the logarithm of total assets, which provides a standardized measure of a firm's size relative to its peers. Figure 4.1 presents trend analysis for firm size between 2017 and 2021.

Firm size (Log. of total assets)
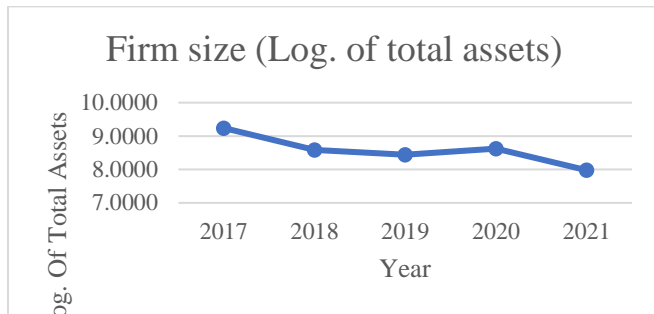
Figure 1: Trend Analysis of Firm Size

The findings in Figure 1 indicate that the average firm size for the listed agricultural firms has decreased from 9.2391 in 2017 to 7.9779 in 2021. This suggests that these firms have experienced a decline in their size over time. The decline in firm size can have several implications for the financial health of a firm. For example, a decrease in firm size may indicate that the firm is losing market share, experiencing operational difficulties, or experiencing financial difficulties (Lang & Stulz, 2018). Furthermore, a decline in firm size may reduce the firm's bargaining power, limit its access to financing, and reduce its ability to invest in growth opportunities (Lang & Stulz, 2018). Therefore, it is important to monitor the size of a firm and understand the factors driving changes in firm size over time. This information can be used to make informed decisions about the future of the firm and to take appropriate action to address any difficulties.

Liquidity

Liquidity is an important indicator of a firm's financial health, as it measures its ability to meet its short-term financial obligations. The most commonly used measure of liquidity is the current ratio, which is calculated as the ratio of current assets to current liabilities. Figure 2 presents trend analysis for liquidity measured in terms of current ratio for the 7 listed agrigultural firms between 2017 and 2021.

**Liquidity (Current Ratio)**
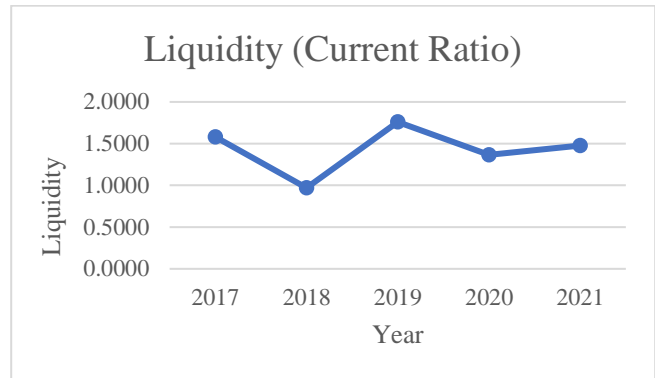
Figure 2: Trend analysis for Liquidity

The findings in the Figure 2 indicate that the current ratio of the listed agricultural firms fluctuates over time, with values ranging from minimum of 0.9701 in 2018 to maximum of 1.7596 in 2019. This suggests that the firm's ability to meet its short-term obligations changes over time. A current ratio of 1 is considered to be a healthy level of liquidity, as it indicates that the firm has an equal amount of current assets and current liabilities. Values above 1 indicate that the firm has more current assets than current liabilities, meaning it is able to meet its short-term obligations, while values below 1 indicate the opposite. In this case, the firm has a current ratio above 1 in all years except 2018, indicating that it is able to pay its short-term obligations in most of the years. However, it is important to note that the current ratio alone is not a complete measure of liquidity, and other measures, such as the quick ratio or the cash ratio, should also be considered to get a more complete picture of the firm's financial health (Gitman, 2014).

Financial distress

The Altman Z-score is a financial metric used to assess a company's financial health and the risk of bankruptcy. The score was calculated using a combination of financial ratios, including working capital, retained earnings, and market value of equity. A score below 2.99 is considered to indicate financial distress and a high risk of bankruptcy. Figure 3 presents trend analysis for the Altman Z-score.
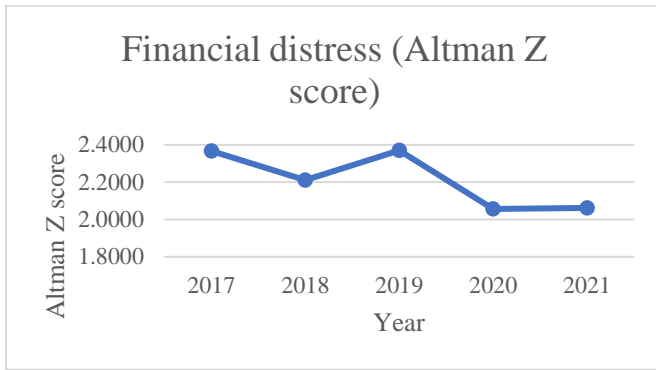
Figure 3: Trend Analysis for Financial distress

Based on the Altman Z-score, a score below 2.99 suggests that a company is in financial distress and at a high risk of bankruptcy. The scores provided in the analysis fall into this category, with the highest score being 2.3701 and the lowest score being 2.0566. This suggests that the company is facing financial distress and may be at a high risk of bankruptcy. It is important to understand the underlying causes of the financial distress in order to fully assess the risk of bankruptcy. A study by Edward (2018) argues that the model has been consistently accurate in predicting the likelihood of bankruptcy and has been widely used in financial analysis. In a related study, Resti and Rossi (2019) found that the Altman Z-score is an effective tool for predicting the risk of bankruptcy. The authors concluded that the model is robust and reliable, and provides valuable information for financial analysis and decision making. The literature supports the use of the Altman Z-score as a reliable indicator of financial distress and bankruptcy risk. The scores provided in the analysis suggest that the company is facing financial distress and may be at a high risk of bankruptcy, and it is important to understand the underlying causes and assess the risk further.

Correlation Analysis

The correlation coefficient is a widely used tool in statistical analysis to quantify the strength and direction of the relationship between two variables. It can help researchers understand the degree to which changes in one variable are related to changes in another. The values of the correlation coefficient can range from -1 to 1, where -1 represents a perfect negative correlation, 1 represents a perfect positive correlation, and 0 represents no correlation. In general, a correlation coefficient value between 0.0 and 0.19 represents a

very weak relationship, 0.20 to 0.39 represents a weak relationship, 0.40 to 0.59 represents a moderate relationship, 0.60 to 0.79 represents a strong relationship, and 0.8 to 1.0 represents a very strong relationship. The correlation coefficient helps researchers to understand the nature of the relationship between the variables and can be used to guide hypothesis testing and model building. Table 4 presents correlation analysis findings for this study.

Table 4: Correlations Coefficient

		Financial Distress	Firm size	Liquidity
Financial Distress	Pearson Correlation	1		
	Sig. (2-tailed)			
	N	35		
Firm size	Pearson Correlation	-.871**	1	
	Sig. (2-tailed)	.000		
	N	35	35	
Liquidity	Pearson Correlation	.778**	. 354	1
	Sig. (2-tailed)	.000	.070	
	N	35	35	35

From the findings as shown in Table 4, firm size and financial distress had an negative and significant relationship (r=-0.871, p-value=0.000). The strong positive correlation between firm size and financial distress implies that larger firms are better equipped to handle economic shocks and uncertainty, which in turn reduces the likelihood of financial distress. These findings disagrees with Thim, Choong and Nee (2017) that size is significant and has a positive relationship with financial distress. It also disagrees with Artikis, Eriotis, Vasiliou, and Ventoura-Neokosmidi (2016) that big firms gravitated towards use of more indebtedness than smaller firms and hence were vulnerable to risks of financial distress..

The results also show that there is a positive and significant relationship between liquidity and financial distress (r= -0.778, p-value=0.000). The findings agree with Cheluget et al. (2014) that high liquidity means that a company can easily meet its short-term debts while low liquidity implies the opposite and that a company could imminently face bankruptcy. The findings however disagrees with Oktasari (2020) that higher the liquidity, the greater the current assets that are not needed, so they do not provide income and a large amount of funds will be collected in the form of trade receivables that may prove to be uncollectible. Uncollectible receivables

or unsold inventory cannot be used by the company to pay debts.

Regression Analysis

From the Hausman test, the study found that random effect model was the most appropriate for our data. The Breusch-Pagan Lagrange multiplier (LM) was further conducted to help decide between a random effects regression and OLS regression. The findings showed that random effect model was appropriate. The study therefore conducted the random effect (re) model and the findings were as presented in Table 5

Table 5: Random Effect Regression Model

```
. xreg Y, X1 X2, re
```

					Number of obs =	35

Random-effects GLS regression
Group variable: Year — Number of groups = 5

R-sq:	Within =		Obs per group:	min =	7
	Between = 0.7402			Avg =	7.0
	Overall = 0.7117			Max =	7
	0.7079				

Adj R-sq: = 0.7049 — Wald chi2(4) = 7.61

corr(u_i, X) = 0 (assumed) — Prob > chi2 = 0.0069

Y	Coef.	Std. Err.	t	P>t	[95% Conf. Interval]	
X1	-0.319116	0.151172	-2.11	0.017	-8.239753	-.431259
X2	0.201699	0.062686	3.22	0.023	-1.049246	-.390605
_cons	1.071514	0.201636	5.31	0.004	-8.998858	-1.59141
sigma_u	0					
sigma_e	.32332089					
rho	0	(fraction of variance due to u_i)				

The model summary results in Table 5 show that the adjusted R-squared is 0.7049, indicating that 70.49% of the variation in financial distress of agricultural firms listed on the NSE is explained by changes in firm size, liquidity, leverage, and profitability. The analysis also indicated that the Prob>Chi^2 value of 0.0069 was less than the significance level of 0.05, suggesting that the model was fit for predicting financial distress of agricultural firms listed on the NSE. The overall R-squared of 0.7079 indicates a strong positive relationship between the dependent variable (financial distress of agricultural firms listed on the

NSE) and the independent variables (firm size, liquidity, leverage, and profitability).

From the coefficients in Table 5, the following regression model was fitted;

$$Y = 1.0715 - 0.3191 \, X_{1it} + 0.2016 \, X_{2it} + \varepsilon$$

The findings showed that firm size (X1) had a coefficient of -0.3191 indicating that holding all other factors constant, a unit increase in firm size would result in a 0.3191 decrease in financial distress of the Agricultural firms listed at the NSE in Kenya. The coefficient was significant since the p-value obtained (0.017) was less than the level of significance of 0.05. It was established that firm size has a negative significant effect on financial distress of the Agricultural firms listed at the Nairobi Securities Exchange in Kenya. This finding is consistent with previous research in the field. A study by Ozgulbas, Koyuncugil, and Yilmaz (2016) found that larger firms have a better ability to manage financial distress, as they possess greater financial resources and have a more diverse revenue stream. Similarly, Lee (2016) found that larger firms are able to access credit more easily and have greater bargaining power with suppliers and creditors, which can help them mitigate financial distress.

The findings of the study also showed that liquidity (X2) has a positive effect on financial distress among Agricultural firms listed on the Nairobi Securities Exchange (NSE) in Kenya. The coefficient of 0.2017 indicates that for every increase in liquidity, financial distress is expected to increase by 0.2017, holding other factors constant. This relationship was found to be statistically significant, as evidenced by the p-value of 0.023, which is less than the commonly accepted level of significance (0.05). This finding aligns with prior research in the field. For example, Saputri and Asrori (2019) found that firms with high liquidity levels are more susceptible to financial distress due to their dependence on short-term financing and their tendency to engage in risky financial practices. Another study by Ong'era, Muturi, Oluoch & Karanja (2017) found that firms with low liquidity levels are more likely to experience financial difficulties, as they may

struggle to meet their obligations when faced with unexpected shocks.

Conclusions

The first objective of the study was to establish the effect of firm size on financial distress of agricultural firms listed at the Nairobi Securities Exchange. The study found that firm size has negative influence on financial distress of agricultural firms listed at the Nairobi Securities Exchange in Kenya. The influence was found to be significant. This meant that a unit increase in firm size will lead to a decline in chances of financial distress of agricultural firms listed at the Nairobi Securities Exchange in Kenya. The study therefore concludes that firm size has negative significant influence on financial distress of agricultural firms listed at the Nairobi Securities Exchange in Kenya.

The second objective of the study was to determine the effect of liquidity on financial distress of agricultural firms listed at the Nairobi Securities Exchange. The study found that liquidity has positive influence on financial distress of agricultural firms listed at the Nairobi Securities Exchange in Kenya. The influence was found to be significant. This meant that a unit increase in firms liquidity will lead to an increase in chances of financial distress of agricultural firms listed at the Nairobi Securities Exchange in Kenya. The study therefore concludes that liquidity has positive significant influence on financial distress of agricultural firms listed at the Nairobi Securities Exchange in Kenya.

Recommendations

The findings of the study indicate that firm size has a positive effect on financial distress among Agricultural firms listed on the Nairobi Securities Exchange (NSE) in Kenya. Agricultural firms listed on the NSE in Kenya should focus on maintaining a manageable size to reduce their likelihood of financial distress. This can be achieved through a combination of organic and inorganic growth strategies, as well as implementing efficient and effective risk management strategies to mitigate the risks associated with growth. In addition, it will be beneficial for these firms to implement efficient and effective risk management strategies to mitigate the risks associated with growth.

The study found that liquidity has a significant negative effect on financial distress among Agricultural firms listed on the NSE in Kenya. The study recommends agricultural firms listed on the NSE in Kenya to focus on maintaining adequate levels of liquidity to reduce their likelihood of financial distress. This can be achieved by effectively managing their current assets and liabilities, as well as implementing cash management strategies to increase their liquidity. Additionally, firms may consider implementing cash management strategies, such as reducing the payment cycle, to maintain adequate liquidity.

Suggestions for Further Studies

This study focused on a cross-sectional analysis of financial ratios and financial distress. Future research can consider conducting a longitudinal study to determine the temporal relationship between financial ratios and financial distress among agricultural firms. This will provide valuable insights into the dynamics of financial distress and the role of financial ratios over time.

The sample used in this study was limited to agricultural firms listed on the Nairobi Securities Exchange (NSE) in Kenya. Future research can expand the sample size to include more firms from other sectors and other countries to establish the generalizability of the findings. The study was also limited to agricultural firms listed on the Nairobi Securities Exchange (NSE) in Kenya. Future research can compare the findings of this study with similar studies conducted in other countries to establish cross-country differences and similarities in the relationship between financial ratios and financial distress.

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