

**EFFECTIVENESS OF ALTMAN MODEL IN ASSESSING
CORPORATE FINANCIAL PERFORMANCE
OF MANUFACTURING FIRMS LISTED AT NAIROBI
SECURITIES EXCHANGE**

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DECLARATION

I hereby declare that this project is my original work and has not been presented to any university or any institution of higher learning for the ward of Degree or Diploma.

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The Supervisor's Declaration

This project has been submitted for examination with our approval as the university supervisors.

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DEDICATION

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LIST OF ABBREVIATIONS AND ACRONYMS

| | |
|------|---|
| CBK | Central Bank of Kenya |
| CFP | Corporate Financial Performance |
| FDI | Foreign Direct Investment |
| GDP | Gross Domestic Product |
| MDA | Multiple Discriminant Analysis |
| MM | Modigliani and Miller |
| NSE | Nairobi Securities Exchange |
| ROE | Return on Equity |
| SPSS | Statistical Package for Social Sciences |
| WACC | Weighted Average Cost of Capital |
| ZETA | Analysis Model |

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ABSTRACT

Manufacturing industry is the most important sector in the economic growth of Kenya after the banking sector. The government of Kenya and other investors are concerned with the performance of this manufacturing firm because the funds they have invested for the operation of these companies. The Kenya vision 2030 is targeting the contribution from this sector to GDP to be over 10% -15% annually. The amount of funds spent in running these companies is from the National Treasury and need to be accounted for and results seen for any specific period of operation. These firms are likely to have financial difficulties and finally failure and closure of operation. Their closure will result to economic challenges to the government, citizen and investors due to loss of income and capital. This raises valid concerns to investors and all other stakeholders. Therefore, the main objective of the study was to find out whether Altman MDA model is effective in assessing corporate financial performance of Manufacturing firms listed at NSE. This is of important to various interested stakeholders in the Kenya in monitoring the financial performance of this industry by not only relying on financial ratio in detecting performance signals in these firms early enough to avoid corporate failure. Descriptive research design was adopted in this study where a census was carried out on the 8 manufacturing firms listed at NSE. The period of study was five years ranging from the financial year 2013-2017. The audited financial reports of these firms provided secondary financial data. This data was used to extract liquidity, profitability and leverage ratios which were then summed up to arrive at the Z-Score. Data analysis was conducted using SPSS software program where output is tabulated. The study results indicated that Altman's MDA model was appropriate for discriminating firms according to their financial performance at 82.9%. It concluded that MDA model can effectively be used to assess the financial performance in the manufacturing industry especially for listed companies at Nairobi Securities Exchange. The study recommends the adoption of Altman's MDA model in assessing financial performance of listed firms by not only investors but also business analyst, bond brokers, financial security firms and all other stakeholders.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

Corporate financial performance is the evaluation of how well the firm operates on its most important parameters, typically financial, market and shareholders performance. Corporate performance analysis is concerned with the health of the organization measured in terms of financial performance. Every firm in business is to be considered as the going concern, that's in operation for an unforeseeable future, and the risk against the going concern is assessed by the help of discriminant analysis (Geiger& Rama, 2006). To achieve this, a firm must ensure that all of their investments are financed appropriately by making use of optimal capital structure or optimal capital mix. Firm will survive or fail depending on their profitability, debt level, return on capital, cash flow and revenue volatility(Nawaiseh,2015).Evaluation of corporate financial performance is important to management and investor when ascertaining their investment and firm's stability and the performance of their market share. Management and investors need to evaluate their business on financial performance using the most reliable tools that will provide the most correct position of the firm financial performance. This means for any firm to avoid financial failure it should ensure that their operating financial performance is good (Denis & Denis, 1995).

This research was directed by the theory of financial ratio which deals with evaluation of financial soundness of an entity over a period. This theory was supported by the Theory of Capital Structure which is concerned with the composition of capital used

to finance the operation of an enterprise to enhance firm value together with Pecking order Theory which gives the direction on firm funding hierarchy.

Major manufacturing firm are owned by the government meaning they are funded by the same government through the National Treasury. It has a significant input to the country GDP as it's considered to be the economic growth engine in the country. The manufacturing sector in Kenya has since been not performing well and their performance is degrading annually. The manufacturing contribution target towards the GDP in the country is 10% - 15% annually because of the important of the industry in creating employment and wealth creation as per the Vision 2030 agenda (Kenya, 2007). Therefore, the financial performance of the manufacturing firms needs to be monitored in order achieving the vision 2030 and the smooth running of the nation.

1.1.1 Altman Model - Multiple Discriminant Analysis

The Altman Model is Multiple Discriminant Analysis model which is a linear analysis model in that five measures are equitably weighted and summed up to land at a general score that turns into the basis of weighing of firms (Altman, 2000). Edward I. Altman at time when he was the assistant Professor develops the Z-score model in 1968 at New York University. From Beaver (1966) using the financial ratio, Edward I. Altman developed his Altman Z-score using five financial ratios into one model to predict the possibility of bankruptcy (Altman, 1968). Altman, (2000) define MDA as a measurable system used to arrange a perception into one of a few a need gathering subordinate upon the perception's individual attributes. It is utilized basically to group and additionally make expectations in issues where the needy variable shows up in subjective shape, for instance, male or female, bankrupt or non-bankrupt" Altman (2000).

The major strengths of MDA are the ability to classify firms using multivariate measure and among other strengths of this model would include the ability to consider the characteristic which are common and their interaction of these properties, it reduces the analyst space dimensionally, the model is only concerned with grouping firms or its deal with classification problems and lastly the model has the ability to reformulate the problem correctly. The most known weakness of the Altman Model is that it works well for manufacturing firms than for non-manufacturing firms (Altman, 2000). The MDA model is objective in that it seeks to select and put into use the variable that best discriminates among the classes and those with same characteristics within the class. The Z-Score value was either greater than 2.99 or less than -1.81 or in between the two values. Score above 2.99 will mean the firm is safe from financial difficulty and score below -1.81 mean the firm is in financial performance because of poor financial performance and finally score between the two above values will mean the firm is at grey zone translating to average performance (Altman, 2000).

1.1.1.1 Assumptions of MDA

MDA has the following assumption: All the variables are free of one another, bunches are fundamentally unrelated and the gathering sizes are not horribly unique, the sample size ought to be two less than the quantity of autonomous factors, there should be similarity of the dependent variable group and the variance-covariance structure of the independent variables. There is random distribution of errors, the independent variable would follow normal distribution of multivariate in order for the testing of significance.

1.1.1.1 When to use MDA

MDA can be used under the following circumstances; to determine differences among groups, to identify a way to distinguish groups, to eliminate variables with little relation to group separation, to place cases into groups, to validate theory by observing whether cases are classified as predicted.

1.1.1.2 Discriminant function

From the number of collections in the dependent elements, the equations to be computed should be less than one. Meaning for two groups the function should be one and for three require two functions in that order. On account of two capacities, the main capacity intensifies the distinctions among the needy variable gatherings while the second is uncorrelated with it and enhances the contrasts between the gatherings in the needy variable, controlling for the principal work. Numerically this will be extraordinary, each discriminant work as the estimations of the autonomous variable will be a measurement to which separates a case into gatherings in the reliant variable. For discriminant examination, the first function deals with differentiation of dimensions and the following functions may or may not represent additional significant differentiation (Leech, Barrett, & Morgan, 2013).

The Discriminant Function has the following five variables:

$$Z = F_1X_1 + F_2X_2 + F_3X_3 + F_4X_4 + F_5X_5$$

Where F_1, F_2, \dots are discriminant coefficients while X_1, X_2, X_3, \dots are independent variables.

Where;

$X_1 = \text{Working Capital} / \text{Total Assets}$. A firm will be in difficulty when their liquidity fall low. When current assets are more than current liabilities, it is assumed that an enterprise is able to meet its short-term obligation when they fall due. By expressing

net operation capital as a percentage of the total asset, one is determining the proportion of working capital to the total assets. Where the percentage is high this implies that the enterprise is highly liquid and least likely to go to liquidation. Inversely if the percentage is low ,this imply that the firm is less liquid and more likely to go into liquidation since a high proportion of its assets are fixed assets.

$X2 = \text{Retained Earnings} / \text{Total Assets}$. This indicates the cumulative profitability of the firm, as shrinking profitability is a warning sign. This variable measures the extent to which total assets been financed by retained earnings. Firm that demonstrate high finance of their assets by equity through retention of earning rather than borrowing are low geared and are more likely to survive than those that are highly geared.

$X3 = \text{Earnings before Interest and Taxes} / \text{Total Assets}$. This ratio shows how productive a company in generating earnings, relative to its size. This measure the return on capital employed. Firm that has good return on their assets will most likely have funds available to finance their assets and activities are therefore unlikely to have liquidation problem.

$X4 = \text{Market Value of Equity} / \text{Book Value of Total Liabilities}$. This offers a quick test of how far the company's assets can decline before the firm becomes technically insolvent (i.e. its liabilities exceed its assets). The ratio measures the proportion by which the assets are financed by the owners and creditors. Those firms that rely heavily on debt to finance their assets will have a low ratio and hence prone to liquidation

$X5 = \text{Sales} / \text{Total Assets}$. Asset turnover is a measure of how effectively the firm uses its assets to generate sales. This ratio measures the efficiency with which assets are utilized to generate sales. Firms that have a high turnover ratio are assumed to use their assets efficiently are more likely to survive than those that have a low turnover.

1.1.1.3 Discriminant Coefficient

MDA model uses coefficients to get the required results. This coefficient brings out those efforts of every variable for the purpose of the classification of the groups determining the dependent variable. SPSS has a discriminant analysis tool that uses the coefficients value in each independent variable that will result to a discriminant score. In case of regression there would be the standardized discriminant coefficients that are used to assess the importance of independent variable classification. The correlation between the discriminant score and independent variable will be the structure coefficients. When the value is higher, then the higher the discriminant function and the independent variable association. At last the researcher will be able to assign a tag to the dimension the structure coefficients measures (Leech, Barrett, & Morgan, 2013).

1.1.1.4 Group centroid

For two groups in dependent variable it will have only one discriminant function, similarly for three groups of dependent variables it will have two functions. There will be a mean for every discriminant scores in every group at the dependent variable and also in each discriminant function, this mean are the group centroids. These centroids have a one dimensional space, that's only one point for each group (Leech, Barrett, & Morgan, 2013).

1.1.1.5 Eigenvalue

In MDA analysis there will be explained and unexplained variation, the ratio for this is called the Eigenvalue and at time the root of characteristic. A well define MDA model will have an Eigenvalue of more than one. For MDA you should only have in

each discriminant function one eigenvalue. For a bigger value of Eigen, the function will be more powerful in its discrimination. For an analysis of three groups, the discriminating power over the other discriminant function is the ratio between two eigenvalues. When the ratio of two eigenvalues is 1.7 for example, 70% more will be accounted for by the first discriminant function between-aggregate fluctuation for the three gatherings in the reliant variable contrasted with the second discriminant work (Leech, Barrett, & Morgan, 2013).

For you to get the discriminant function relative percentage you will get the function's eigenvalue divided by the sum of all eigenvalues of all discriminant functions in the model. The outcome will imply the percent of discriminating power. In most instances, the percentage is high for the first functions. When you find that the value of the next function is small, then a single function will be much better than the two or more function in the classification.

1.1.1.6 Canonical correlation

The association among the sets in the dependent factors and the equation is the measure of canonical correlation. For high value, it indicates a high degree of association between the two and the contrary is true (Leech, Barrett, & Morgan, 2013).

1.1.1.7 Wilks's lambda

For MDA, there is need to test the significant of the function, the Wilk's Lambda will do this work. Usually, the value should range from 0 to 1 because it is one subtract the explained difference. If you get the lambda coefficient for an equation is small, the function is substantial (Leech, Barrett, & Morgan, 2013).

1.1.1.8 Classification matrix

This is table showing tabulation of the observed output of SPSS MDA and classified groups. A good grouping, should demonstrate that the standards in the slantingshould be high and the standards off the diagonal should be near to 0 (Leech, Barrett, & Morgan, 2013).

1.1.1.9 Box's M

The assumption of equality of variance-covariance matrices in the groups is tested by the help of Box's M tests. If the results of this big Box's M shown by a small p-value will implies that assumption has been violated. However, mostly the figure is large when the sample value is big. To ascertain this situation the natural logarithms of the covariance-variance matrices for the sets are compared.

1.1.1.10 Sample size for MDA

Because the MDA will need the independent and dependent variable, the norm is that there should be at least five items of each independent variable. The MDA will work will with at least twenty cases of each independent variable. The rule is the sample size of the smallest group should exceed the number of independent variables.

1.1.2 Corporate Financial Performance

Corporate Financial performance is the state of firm's profitability and its financial strength over a period ascertained from the financial statement analysis. Financial statement analysis focuses on shading more knowledge, understanding and interpretation of figures in income statement and statement of affairs. Performance can be generally how the organization conduct its all activities and the results they get at a period of time in comparison of the past or projected or budgeted targets. It's through the analysis of financial statements that the financial performance can be

measured, from the analysis the firm profitability and firm financial soundness can be established. This analysis would involve evaluating the relationship between items in financial statements to get a clear understanding of firm's performance. The aim of this analysis is to identify the firm's strengths, opportunities and its weaknesses by properly evaluating relationships between the composition of the income statement and statement of affairs.

Corporate Financial performance is assessing the firm usage of its assets to earn something in return. This process will highlight the overall firm financial health in different bracket of years or annually (Griffin & Mahoni, 1997). From the analysis of financial statement published by the firm, its financial performance can be ascertained. There are different stakeholders with individual interest from the other on the CFP of a specific firm. The three common financial statement to be published by the company at the end of their financial year as required by the companies Act would include the income statement, statement of affairs and finally the cash flow statement of which all this statement should truly and fairly state the firm financial status in those respective years (Chow & Wong-Boven, 1987). ROE and ROA are used to measure the financial performance, ROE is calculated by dividing the net income by the shareholders equity for the period and ROA is obtained by dividing net income by total assets (Nwaolisa & Chijindu, 2016). The ROE obtain should be compared with the industry average ROE, if the firm is having ROE that is higher than the industry, that firm was performing highly (Damodaram, 2007)

Financial statements are of great value to internal management but more to investors for their financial and investment decisions. When a firm publishes its financial statement, they are conveying the message on their financial performance. These statements will give an idea on firms' profitability and its financial position. Financial

performance help understand how well firm's assets and investments are doing in terms of return (Singh & Pandey, 2008). Financial ratios are used to test the firm performance by calculation the ROE of a specific firm over time (Nwaolisa & Chijindu, 2016). High performing firm should have good and stable financial health as compared to low performing firms. A good financial health rating of a certain firm is the assurance that the firm's performance is in the right direction.

This study used the Altman Model to assess and discriminate financial performance of those manufacturing firms listed in NSE because the Altman Model is Multivariate Discriminant analysis Model that best discriminate their financial performance level (Altman, 2000).

1.1.3 Altman MDA Model and Corporate Financial Performance

Financial health of a firm is measured by Altman Model which is a Multivariate Discriminate Analysis and firm financial performance has been known to be measured by the Return on Equity (ROE) and Return On Asset (ROA) (Foo & Pathak, 2016). For firms to have high financial performance, it should be financial healthy also. Investors should have the alternative tool to guarantee them on the firm's financial performance which is the purpose of this study to find the effectiveness of the Altman MDA model in assessing the corporate financial performance of firms.

1.1.4 Nairobi Securities Exchange

The NSE is a financial market which deals with securities and its licenses and regulated by CMA, there are 68 listed firms listed at NSE which its listing is required to comply with the guidelines of CMA. It opens its doors in 1954 after been registered under the societies Act (1954) and it operates in unified market that's it trades in bonds and equity. It provides separation of ownership from owners of capital and

managers. Its divided into various segments such as financial, manufacturing, services, investment, banking etc. The Nairobi Stock Exchange now called Nairobi Securities Exchange is offering world class trading facility to both local and international investors. NSE is run by board and management which include the leading Africa capital market professional who are charged with innovation, diversification and operational excellence of NSE.

Listed firms in the NSE have their financial information available and reliable because the NSE listing rules state that among other requirement that the firm wishing to be listed should have a track record, profitability, future prospects and that the firm should not be insolvent meaning it should have adequate working capital with an opinion from the directors of the adequacy of working capital. NSE is doing a great work in the Kenyan's economy by mobilizing saving and investment, as well as helping international and local firms to easy of cost-effective capital. Among the listed firms in the NSE some have in the recent past go bankrupt and many are still in their good financial health just because of their high financial performance.

The study was focusing on assessing the CFP of manufacturing firms listed in Nairobi Securities Exchange because there is much likelihood of manufacturing firms to fail and are the representative of the major manufacturing firms in Kenya, NSE has its head office in Nairobi which was accessible and lastly the NSE is a large and well-organized securities market in East Africa.

1.2 Research Problem

Many stakeholders in business have different interest on the financial performance of their firms or the prospective firms they wish to invest in or the industry of their interest. Among this stakeholder will include the government as investors, employees, employers, bankers, other investors and may be regulatory bodies. All the firms are guided by the principle of the going concern, a firm is assumed to continue to operate in the unforeseeable future. One of the agendas of the current Kenyan government is in the manufacturing sector. Most Manufacturing firms are owned by the government meaning they are financed by the same state. When the unfortunate happens that certain manufacturing firm is not performing as expected, the government and other investors will be losing their investment not forgetting the financial implication that will fall to its citizen and the general public or the greater economy especially in terms of job losses. Instances of manufacturing firms failing and into financial distress have become the hardest cracking stone to the investors and the stakeholders. This project then seeks to contribute to the body of knowledge in the assessment of financial performance of this manufacturing firms listed at NSE so as to take early precautions to avoid firm failure.

Manufacturing firms in Kenya provide very important services and goods to the general public and foster wider development distribution through the county. Nevertheless these roles, these manufacturing firms still face financial difficulties. We have seen the government been forced to bailout Mumias Sugar Company severally using taxpayers money so as to bring it back to its feet's. Investors who depend on ROE and ROA for the evaluation of financial performance prior to their investment's decision should be cautious. Most management of manufacturing firms can collude with the external auditors to alter the financial statements to portray a ROE and ROA which is healthy and appealing but in real sense its artificially manufactured, they can employ

strategies like using cash reserve to repay the debt which is growing and increasing leverage of the firm in order to sustain that healthy ROE and ROA without minding the profitability that is reducing.

The investor will only realize the impact of the growing and excessive debt the moment the firm is unable to meet its obligation when they fall due which may now lead to financial difficulties as the case of Mumias Sugar Ltd. The management will not allow the ROE and ROA to deteriorate because it will affect immediately the performance of their stock causing them pain which they can postpone through the artificial ROE and ROA. No perfect tool to measure the financial performance, ROE is problematic and should not be over relied on financial performance measure. ROE is only the starting point of in evaluating firm financial performance analysis using ratio combine and using qualitative analysis need to be introduced for effective firm financial performance analysis.

Many studies have been done on the applicability of Altman model to predict the financial performance of a company depending on the firm's financial ratio. Beaver, (1966) study found that the debt to cash flow ratio was the best financial predictor of a firm, but this ratio lack the required consistence. Altman used the Z-core model which is MDA model to challenge Beavers' univariate analysis by not only prediction the financial failure but also grouping firms into bankrupt and non-bankrupt using the five financial ratios. Mbiijiwe, (2005) study confirms MDA was able to group the cardholders in to good and bad one from the Barclaycard holders Kenya. Awino, (2016) conducted a study on applicability of MDA in predicting FD of commercial banks and manufacturing state owned and concluded that the MDA is significant for FD. Mwawughanga, (2017) did a study on commercial bank financial health using the Altman Model and they found the model to be applicable.

The above scholars have been majoring on the bankruptcy prediction using the Altman model and therefore this study seek to use the Altman MDA model to assessing corporate financial performance. Manufacturing firms in Kenya are crucial firms because they are financed heavily by the national treasury and they perform critical roles which ensure the smooth running of the economy. Therefore, their poor performance could bring negative financial implications to the nation. It is for these reasons that the need to assess the corporate financial performance of these firms arise. Therefore, the study sought to answer the question, is the Altman Model effective in discriminating firm corporate financial performance?

1.3 The General Objectives

The general objective was to establish the effectiveness of Altman Model in assessing corporate financial performance of manufacturing firms listed at NSE.

1.3.1 Specific Objective

- i. To determine the model effectiveness in discriminating firm financial performance.

1.4 Value of the Study

Financial performance and health are a situation of any firm or business at a period. This situation will help investor in decision concerning the investment returns and future operation. The information of financial performance to investors cannot be underestimated. Its contribution is of great value to the investors in firms to medicate or prevent financial failure. Investors interested in internal control, better performance, better financial condition will benefit from the finding of this study.

Management will be able to measure the financial performance of their organization in time and to take preventive actions towards poor financial performance, appropriate

policy strategies and capital structure restructuring, Shareholders are concern with firm performance than any other stake holders in the industry because they will bear the burden of poor performance of their companies. Shareholders are always looking out for the stability of their earning. When a firm is performing well there will be high returns accruing to the shareholders.

This model is Multivariate Discriminant Analysis model that uses financial ratio as its components, therefore it would contribute to the theory of capital structure in terms of reorganizing the capital composition of firm for high firm value, financial ratio theory which looks at the analysis of financial statement items in evaluating the firm financial performance and finally the theory of Pecking Order after knowing which ratio affect the firm performance. The target of a research is to inform action to the interested parties. The scholars and academicians are charged with acquisition and dissemination of knowledge to be used to advice the various stakeholders.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

Here the study examines the theoretical review towards financial performance, the CFP empirical review, literature review and finally gives the summary.

2.2 Theoretical Review

This section discusses the theories of financial performance. Theories explaining financial performance include Capital structure theory which guides the capital configuration that is significant in enhancing financial performance, Pecking Order Theory which establishes the configuration hierarchy and finally Financial Ratio Theory that will provide the guide in ratio analysis in evaluation of firm financial stand. Other theories that support this study are Credit risk theory and Cash management Theory.

2.2.1 Capital Structure Theory

This Theory of Capital Structure was proposed by Modigliani and Miller in 1958 when they were the finance professors (Modigliani & Miller, 1958). In their study of capital structure theory, they were able to develop the irrelevance capital structure proposition where they hypothesized that there is no difference on which capital structure the firm implements to finance its operation. They ascertain there is no correlation between firm value and the way it finances its operation and its market value is as a result of its earnings and the risk on the assets. The proposition was guided by the assumption that there are no effects on firm earnings from its debt before interest and taxes, no taxes, no transaction cost, there is information symmetry and that there is no bankruptcy cost.

The M&M irrelevance capital structure proposition did assume existence of bankruptcy cost and taxes (Modigliani& Miller, 1963). They also came up with a trade-off theory of leverage which assumes the possibility of optimal capital structure from the benefit of leverage by recognizing the benefit of taxes and the deductibility of interest. Modigliani& Miller (1958) had two propositions on capital structure, the first one is MM I that is no taxes, meaning the ratio of debt to equity do not matter and MM I plus corporate taxes showing that a firm with more debt is valuable than the one with less debt. The second is MM II that is concern with WACC, it states that as the firm uses more debt, the investors return on capital will increase proportionally because of the need of more compensation due high risk involved. In place of MM I of no taxes this ratio of debt to equity has no impact on WACC because of capital structure irrelevant and in MM II in existence of corporate taxes, the more the debt the more it will reduce the firm WACC.

This theory contributed to the study that it doesn't matter how the company finance its operation in terms of performance but it's as a result of its performance in the industry. The value of the firm was independent of its capital structure and so the managers and investor should not focus so much on capital structure configuration but rather its overall financial performance of their firms (Siro,2013)

2.2.2 Financial Ratios Theory

Wilcox(1971) came up with the Financial Ratio Theory. Financial ratio is used to quantify business operation from that business financial statement analysis. Financial ratio has been categorized to measure different business aspect. Profitability ratio will inform you on the rate of return by measuring the firm's use of its assets and the management of their expenses. Activity ratio will indicate the speed in which the firm will convert its non-liquid assets to cash assets. Debt ratio is concern with the

preparedness of the firm on the repayment of its long term debt. Liquidity ratio shows firm ability to meet its liabilities when they fall due (Ohlson, 1980). Financial ratio is an avenue that allows the comparison between different periods on the same firm, industries and companies. For this to happen, the ratio must have a benchmarked against those of past periods or other company to ascertain its financial performance (Wilcox, 1971)

The theory of financial ratio will contribute to the study in that it will give the warning sign of firm level of performance either its improvement or deterioration.

2.2.3 Pecking Order Theory

Pecking order theory was proposed by Donaldson G. in 1961 (Donaldson, 2000). The theory was popularized by Myers and Majluf through their modification on the theory in 1984. The theory suggests that the firm should finance its operation following certain hierarchy. From within the firm to the outside source of funds (Myers, 1984). Before the manager of any firm issues equity shares as the source of funds, they should have exhausted all the debt options to the point debt is not practical but even before they consider debt they should have depleted all the internal source of financing that was from the firm's retained earnings and capital reserves.

Investors depend on financial information in order to ascertain company performance. There is asymmetry of information among the managers and investors because managers have first-hand information about firm operations and due to lack of the information investors cannot be able to know much about a firm. Myer (1984) gave a guideline to be followed when using pecking order theory. The firm manager should utilize the retained earnings before going for external sources. The next option was debt finance due to its cost compared to the cost of equity because of its tax shield which

will eventually reduce the firm's WACC. The use of debt should continue to a point where the capital leverage is very risky, at that point the issue of equity share is advised as the last option.

Investors are keen on how the firm finances its operation. Firm that uses its internal funds is considered stable and has financial soundness, firm that uses debt is believed to have the ability to meet the debt obligation without a problem and lastly when a firm uses shares as source of finance it conveys a negative signal to the public (Laisi,2016&Abosebe,2012). The Pecking Order Theory will contribute to corporate financial performance the firm management should concentrate their efforts in moving from short term leverage to in the operation financing to longer leverage because this will enhance the firm profitability and liquidity (Dada,2015)

2.2.4 Cash Management Theory

Cash is one of the most liquid assets an organization can have. Organization is as a pool of both fixed and current assets (Beaver (1966). Cash is always ready funds in the hand or in the bank available for use. Solvency of a firm in simple terms can be defined in terms of the probability, that the pool was exhausted at a point the firm was unable to honor its obligation as they fall due (Beaver, 1966). Cash management theory deal with the procedure and process of collecting, managing and investing cash in short-term investment.

Cash balance management in case of short-term is very crucial in a firm because it's not easy to predict cash inflows precisely and there is no perfect balance between cash inflows and outflows (Aziz & Dar, 2006). At times there is positive cash flows, that's when the inflows outweigh the cash outflows, at this point it indicates there is a financial health. In some period, there is a negative cash flow when the outflows

exceed the cash inflows. To avoid this cash imbalance such action as cash flow projection should be done for the future periods to avoid causing financial difficulties and eventually financial distress (Aziz & Dar, 2004).

When operations are negatively affected, sales as well as profitability are also negatively affected which in turn cause poor financial performance. Cash management and in particular cash is very important factor in firm financial stability and solvency. Optimal cash level should be maintained because it is advantageous to the firm (Aziz & Dar, 2006). Large amount of funds on non- liquid assets denies the firm finance for operation. Financial difficulties can be avoided through proper cash management.

2.2.5 Credit Risk Theory

Merton (1974) is the proponent of the credit risk theory. Credit arises when there is a contractual agreement between the two persons the lender and the borrower(Natalia, 2007). It happens through the advancement of funds to the borrower on agreed terms and the repayment with interest charged to be settled on certain date. In the violation of contract terms by the borrower the lender can constitute a proceeding towards the recovery of their credits from the borrower during or after the duration of the contract. In case of the borrower not paying or defaulting in their payment, the lender will have been exposed to credit risks. “Credit risk is therefore the investor’s risk of loss, financial or otherwise, arising from a borrower who does not pay his or her dues as agreed in the contractual terms” (Natalia, 2007). If a company is exposed to credit risk then financial performance is a reality unless measures are taken to avert the situation.

Managers should be having the credit management skills in any organization because their roles are important in management of credit risks especially in the banking

industry. Unmanaged credit leads to bad debts and its associate cost exposing the firm in to credit risks. When the firm continue been exposed to credit risk for longer period then poor financial performance is likely to set in (Natalia, 2007)

2.3 Empirical Studies

Many researches have been done on the Altman Model in different context and time. Altman, (1968) did a study on the manufacturing firms from the year 1946 to 1964. The study incorporated Multivariate Discriminant Analysis (MDA) in order to argue the univariate analysis. He picked on manufacturing companies 33 in number. In this model he used the financial ratio as the model components and among the ratio were profitability, leverage, liquidity, solvency and activity ratio. His MDA has the five variables as the above ratios and the combine results or score from the model gave the best grouping of firms. The model was able to classify firms in to non-bankrupt, bankrupt and the ungroup firms from the Z-score above 2.99, below 1.81 and the score value between the two values respectively (Altman, 1968)

Altman, (2000) adapted a study on revisiting the two venerable financial performance prediction model that was his Z-core model and ZETA analysis model. From the 22 financial ratios, he was able to breakdown to the five ratios as in his earlier paper. The discriminant form remained the same as the previous one although he gave out another almost same as 1968 model. In his MDA there is no constant because of the utilization of computer software program such as SPSS which standardizes score at zero. He concluded that the Z-score model still has high accuracy and it has maintained it for over 30 years ago. On comparing the two models he observed that the ZETA is quite accurate and outperformed the alternative model (Altman, 2000).

Foo Pathak(2016) undertook a study so that he can understand the relationship on corporate financial health and corporate performance, both measure by the Altman Z-Score (1968)and ROE respectively. His context of the study was the manufacturing firms listed at Bombay Stock Exchange and Shanghai Stock Exchange.The finding of that study noted that there was a relationship which is positive and statistically significant on the results obtained on both ROE and Altman Z-score Model. That study was done in a large portfolio firm not found in Kenya.

Mbijiwe, (2005) conduct a study on the applicability of MDA for the credit card consumers at Barclaycard Kenya. His population was 40,000 cardholders but worked with a sample of 200 cardholders. He used secondary data from the customer's application forms and found that the MDA was more applicable in classifying cardholders into two group of good cardholders and bad card holders. He used the exploratory research design and the current study will employ the descriptive research design.

Mamo (2011) conducted a study on the applicability of Altman (1968) model on Kenyan commercial banks for financial performance prediction. The study aim was to evaluate the relevance of this Model in prediction of financial performance. He used the descriptive research design with a population of 43 banks operating in Kenya. He obtained the 43 bank secondary data from the CBK and found out that the model is 90% applicable and valid by accurately predicting 8 out of 10 failed firms. The context was in Commercial banks listed at NSE.

Mohamed (2013) research on firms listed in NSE using the MDA of Altman model of Z-score to ascertain the bankruptcy prediction trend in those firms. He was comparing the two Altman models of 1993 and 1968 and affirmed that Altman 1993 model was

less reliable to differentiate the firms, but the Altman 1968 was the best model in grouping the firms from failed to non-failed after using the descriptive research methodology. He recommended that the Altman 1993 model is good for non-manufacturing firms and that the investors should stick to the 1968 model. The study was to determine which Altman model to use for manufacturing firm financial performance prediction.

Kipruto(2013) did a research on the validity of Altman Model for prediction of financial failure at Uchumi supermarkets. He used secondary data from the reports and the secretariat. He adopted Altman 2006 model as his MDA for the analysis which combine the only four financial ratios for the clear purpose of grouping firms into either non-performers or performers firms. He concluded that the Z-score model was very relevant. The context of the study was one supermarket only – Uchumi Supermarket.

Awino,(2016) carried out a study on the applicability of MDA in predicting financial performance of commercial banks and manufacturing firm that are state owned. Her research design was exploration design with a population of 27 commercial and manufacturing state corporation and this was a census type of a study. Her data collection was from the annual financial reports for the respective firms which was the secondary data. She calculates the financial ratio of liquidity, profitability and leverage ratio and found that the ratio are significant for financial performance prediction. The current study seeks to use the descriptive research design. From the above studies done in different context and different research design, this study will adopt the Altman MDA Model as a discriminant model for financial performance in order to classify firm according to their corporate financial performance.

2.4 Conceptual Framework

Independent Variable

(Coefficient of the determinant, variable)

Dependent Variable

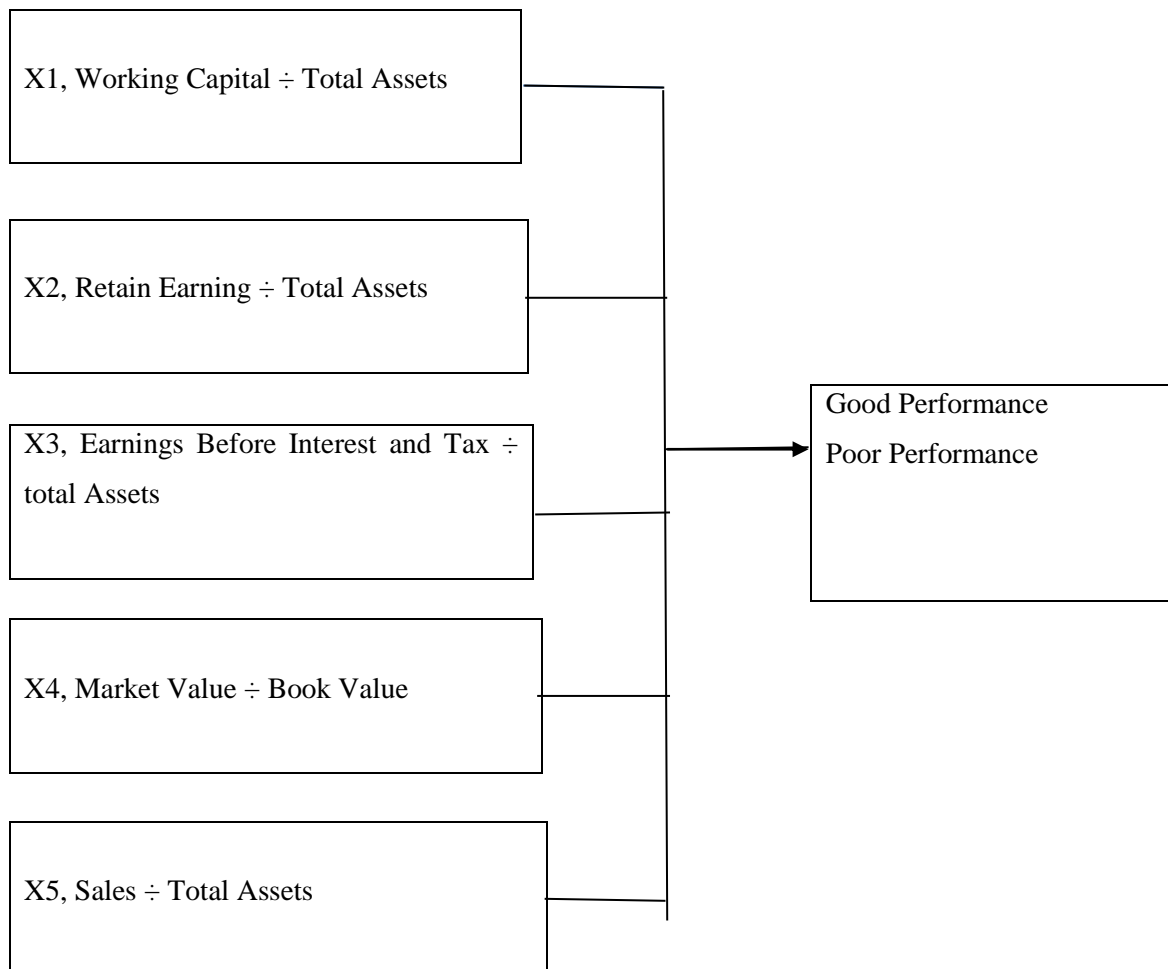


Figure 2.1: Conceptual Framework

Source: Researcher (2018).

The total sum of the product of the independent variable multiplied with the coefficient of the determinant will determine the dependent variable. The dependent variable value was used to classified firms according to the scores.

2.5 Summary of the Literature Review

The aim of the above literature review was to get more knowledge on the Altman Model validity and applicability. From the empirical studies above, there is a contention whether to use Altman 1968,1993 and 2000 model, whether the model is for manufacturing or non-manufacturing firm financial performance prediction or whether the ZETA analysis is more relevant than Altman model. Most of the above studies agree that Altman Model is able to predict financial performance but its only one study that used this model to test the prediction of financial performance of manufacturing firms and that's the research gap that this study wants to investigate the effectiveness of the Altman Model in predicting financial performance of manufacturing firms in Kenyan context.

Multiple Discriminant Analysis has its weaknesses; however, it still compares favorably to other various techniques. Therefore, this study aims at contributing to the body of knowledge by applying Altman MDA to assess corporate financial performance of Manufacturing listed at NSE.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1. Introduction

The chapter outlines the design towards this study, proposed population, data collection and data analysis method and model.

3.2. Research Design

Design for research is a practical roadmap to be employed by the researcher to establish its validity, accuracy, economically and objectivity (Knupfer & McLellan, 1996). The study used the descriptive research design. A descriptive study is ideally formed with clearly stated investigative objective (Cooper & Schindler, 2001). Through the descriptive research design the research had the opportunity to gather a lot of information because of the intensive study. The research aim is to understand and interpret the findings. Achievement of descriptive research is through the process of insight exploration that results to organize the findings with interpretation, understanding and validity.

3.3. Population

Population is the all set of elements that a researcher wishes to study. The population in this case was the entire manufacturing firms listed at the NSE. The study population included the eight (8) companies listed at NSE as at 2017 (Appendix 1). This was a census study because the population is small.

3.4. Data Collection

The study concentrated on the secondary data for the eight listed firms. The researcher did seek authorization from the NSE after obtain a letter introducing him from the

University to conduct the research. The Secondary data used was figures found from the financial statement and audited reports aided by data capture sheet after which the data was coded and entered to SPSS. The specific item of concern was sales, net profit, retained earnings, current assets, current liabilities, outstanding equity, earnings before interest tax and book value of total liabilities. The researcher took time in statement analysis for last five years from each company from 2013 to 2017 only for those 8 firms.

3.5. Data Analysis

The researcher applied Altman Z-Score which is linear MDA statistical tool model to determine the Z-score value (Altman, 2000). It is a model that aims to validate whether a number of variables significantly separate among two or more sets of data, also validate specific combination of variables that most efficiently differentiate among groups. Altman MDA model was adopted in the study since it was modified to suit firms which are not publicly traded, manufacturing, non-manufacturing and firms which are in emerging markets. After the data was collected, the following financial ratio was calculated, profitability, solvency, activity, liquidity and activity which in this case was used to form the five independent variables. The collected data was entered in to SPSS software program which facilitate the quantitative analysis technique so as to run the analysis. To arrive at the classification, the following procedure was used. Observation for the significant statistical and the contribution of the individual independent variables, intercorrelation evaluation of the variable, observe the results and test for significant and lastly the finding and judgment (Altman, 2000)

The MDA form function was:

$$Z = 1.2X_1 + 1.4X_2 + 3.3X_3 + 0.6X_4 + 1.0X_5$$

This form is considered to transform the variable to discriminant z-value used to categories firms.

Where: $1.2, X_1 \dots\dots\dots 1.2 =$ Coefficient of Discriminant

$1.2, X_1 \dots\dots\dots X_1 =$ The Independent variable

After the coefficient of the discriminant value estimated, then the Z-score value was calculated for each firm followed by the assigning the observation into a class or level. The comparison of this grouping was measured based on values, followed by the assignment according to the proximity of the individual firm Z-score value to the two groups. Eigenvalues was used to evaluate the overall discriminant model power.

3.6. Tests of Significance

To determine the significance of the relationship, the following tests were done; the Wilks' Lambda test in place of ANOVA analysis and coefficient of correlation (r) analysis. Df measured the proportion of deviation in the response variable (Z'') with the deviations of the discriminant variables (X1, X2, X3, X4 and X5). The lambda analysis was conducted to test whether there were significant variances among the variables. Finally, correlation coefficients was used to determine the strength and direction of the linear relationship between the dependent variable (Z'') and independent variables (X1, X2, X3, X4 and X5).

CHAPTER FOUR

DATA ANALYSIS, FINDINGS AND DISCUSSIONS

4.1 Introduction

The chapter gives meaning to data analysis and interpretation of the output. The objective of this study is to find the effectiveness of Altman MDA model in assessing corporate financial performance of Manufacturing listed at NSE. SPSS application software was used to analyze quantitative data and the findings were presented as descriptive statistics and in tabulation.

4.2 Descriptive Analysis

In multiple regression model, the goal is to demonstrate one quantitative variable (called the needy variable) as a direct mix of different factors (called the free factors). The reason for discriminant investigation is to acquire a model to foresee a solitary subjective variable from at least one autonomous variable(s). Much of the time the needy variable comprises of two gatherings or arrangements, similar to, high versus typical circulatory strain, advance defaulting versus non-defaulting, utilize versus nonuse of web keeping money and so on. The decision between three applicants, A, B or C in a race is a precedent where the reliant variable comprises of in excess of two gatherings. Discriminant investigation determines a condition as straight blend of the free factors that will separate best between the gatherings in the reliant variable. This direct mix is known as the discriminant work. The weights allotted to every free factor are amended for the interrelationships among every one of the factors. The weights are alluded to as discriminant coefficients.

In this section, descriptive analysis is performed on each variable using SPSS. This show the mean and standard deviation of the ROA, WCTA, EBITA and the RETA. It also shows the minimum and maximum values of the variables which assists in getting a general overview of the data analyzed as shown in Table 4.2.1 below.

Table 4.2.1 Descriptive statistics of manufacturing firms

| | N | Mean | Std. Deviation |
|----------------------------------|----|---------|----------------|
| Working capital/Total Assets | 35 | 1.35496 | 0.2388 |
| Retained Earnings/Total Assets | 35 | 1.34964 | 0.25695 |
| EBIT/Total Assets | 35 | 0.94463 | 0.26263 |
| Market Capitalization/Book Value | 35 | 0.6896 | 0.13918 |
| Sales Total Assets | 35 | 0.27127 | 0.17056 |
| Z Score | 35 | 0.71891 | 0.15973 |

Source: Research Data (2018)

The findings in table 4.2.1 indicate the descriptive statistics of the variables in which the mean of the Z-score value is 0.7189 with standard deviation of 0.15972. The mean of working capital by Total assets is 1.3550 with standard deviation of 0.2388. The findings also indicate that the means of Retained earnings by Total assets, Earnings before interest taxes by total asset and book values by total liabilities are 1.3496, 0.9446, 0.689 and 0.2712 with standard deviations 0.2626, 0.1391 and 0.1706 respectively.

4.3 Manufacturing Firms Listed at NSE

Table 4.3.1: Manufacturing firms

| | Year | WcTa | ReTa | EbiTa | MvBv | SaTa | ROA | CLASS |
|--------|------|--------|--------|--------|-------|-------|--------|-------|
| FLTH | 2015 | -0.638 | 0.491 | 5.879 | 0.453 | 3.220 | 0.490 | 1 |
| BAT | 2015 | 0.191 | 0.138 | 1.355 | 0.540 | 1.251 | 0.411 | 1 |
| BAT | 2013 | 0.127 | 0.148 | 1.162 | 0.515 | 1.257 | 0.352 | 1 |
| BAT | 2014 | 0.118 | 0.137 | 1.152 | 0.482 | 1.210 | 0.349 | 1 |
| BAT | 2016 | 0.170 | 0.147 | 1.107 | 0.485 | 1.127 | 0.335 | 1 |
| EVER | 2017 | 0.884 | 0.591 | 1.106 | 0.576 | 0.461 | 0.335 | 1 |
| BAT | 2017 | 0.141 | 0.214 | 0.994 | 0.530 | 1.101 | 0.301 | 1 |
| FLTH | 2013 | 0.162 | 0.136 | 0.826 | 0.175 | 1.920 | 0.250 | 1 |
| CARB | 2013 | 0.437 | 0.981 | 0.689 | 4.124 | 0.454 | 0.209 | 1 |
| FLTH | 2014 | 0.327 | 0.152 | 0.628 | 0.378 | 1.757 | 0.190 | 1 |
| FLTH | 2016 | 0.312 | 0.360 | 0.518 | 0.455 | 1.756 | 0.157 | 1 |
| CARB | 2014 | 0.391 | 0.986 | 0.489 | 3.439 | 0.343 | 0.148 | 1 |
| CARB | 2015 | 0.351 | 0.999 | 0.405 | 3.021 | 0.286 | 0.123 | 1 |
| CARB | 2016 | 0.397 | 1.057 | 0.385 | 3.934 | 0.283 | 0.117 | 1 |
| EVER | 2013 | 0.860 | 0.274 | 0.358 | 0.435 | 1.592 | 0.108 | 1 |
| UNGA | 2015 | 0.438 | 0.358 | 0.300 | 0.962 | 2.277 | 0.091 | 1 |
| BOC | 2013 | 0.304 | 0.659 | 0.291 | 2.236 | 0.496 | 0.088 | 1 |
| BOC | 2014 | 0.339 | 0.837 | 0.288 | 1.966 | 0.592 | 0.087 | 0 |
| CARB | 2017 | 0.312 | 1.062 | 0.273 | 4.581 | 0.187 | 0.083 | 0 |
| UNGA | 2016 | 0.359 | 0.378 | 0.256 | 0.976 | 2.163 | 0.078 | 0 |
| FLTH | 2017 | 0.217 | 0.413 | 0.237 | 0.547 | 1.789 | 0.072 | 0 |
| UNGA | 2014 | 0.413 | 0.321 | 0.232 | 0.835 | 2.224 | 0.070 | 0 |
| BOC | 2015 | 0.334 | 0.858 | 0.228 | 1.695 | 0.537 | 0.069 | 0 |
| BOC | 2016 | 0.365 | 0.915 | 0.197 | 1.928 | 0.510 | 0.060 | 0 |
| EVER | 2014 | 0.974 | 0.011 | 0.194 | 0.184 | 1.373 | 0.059 | 0 |
| UNGA | 2013 | 0.397 | 0.278 | 0.164 | 0.815 | 1.981 | 0.050 | 0 |
| BOC | 2017 | 0.414 | 0.758 | 0.124 | 1.565 | 0.456 | 0.038 | 0 |
| UNGA | 2017 | 0.301 | 0.355 | 0.087 | 0.687 | 1.997 | 0.026 | 0 |
| MUMIAS | 2013 | -0.060 | 0.367 | -0.181 | 0.578 | 0.460 | -0.055 | 0 |
| EVER | 2015 | 0.495 | -0.204 | -0.275 | 0.592 | 0.885 | -0.083 | 0 |
| MUMIAS | 2014 | -0.320 | 0.268 | -0.393 | 0.494 | 0.583 | -0.119 | 0 |
| EVER | 2016 | 0.286 | -0.502 | -0.447 | 0.591 | 0.537 | -0.135 | 0 |
| MUMIAS | 2016 | -0.397 | -0.123 | -0.640 | 0.236 | 0.246 | -0.194 | 0 |
| MUMIAS | 2015 | -0.653 | 0.063 | -0.819 | 0.173 | 0.285 | -0.248 | 0 |
| MUMIAS | 2017 | -0.755 | -0.510 | -1.100 | 0.019 | 0.091 | -0.333 | 0 |

Source: Research Data (2018)

Table 4.3.1 above shows an average of 1.102 for the as the observations made from 8 Manufacturing firms in the financial years 2013 to 2017. Also, the table shows the

performance analysis for the companies for the period 2013 -2017. Again, it shows that how an average of 1.102 for the as the observations made from 8 Manufacturing firms in the financial years 2013 to 2017.

Table 4.3.2. Standardized Canonical Discriminant Function Coefficients

| Standardized Canonical Discriminant Function Coefficients | |
|---|----------|
| | Function |
| | 1 |
| WcTa | 0.553 |
| ReTa | -0.439 |
| EbiTa | 1.252 |
| MvBv | 0.34 |
| SaTa | -0.4 |

Source: Research Finding (2018)

The study results indicated that all the discriminant canonical values function coefficients were negative for retained earnings and sales total assets and positive for working capital, earnings before interest and taxes and market capitalization by Book value.

Table 4.3.3: Analysis Case Summaries

| Analysis Case Processing Summary | | |
|----------------------------------|---|---------|
| Unweighted Cases | N | Percent |
| Valid | 35 | 94.6 |
| Excluded | Missing or out-of-range group codes | 0 |
| | At least one missing discriminating variable | 0 |
| | Both missing or out-of-range group codes and at least one missing discriminating variable | 2 |
| | Total | 2 |
| Total | 37 | 100 |

Source: Research Finding (2018)

There were 35 valid cases and 5 independent variables. The ratio from the variable to the cases is 22.2 to 1. This ratio has satisfied the minimum requirement of 20 to 1.

Table 4.3.4: Variable Statistics between Firms

| CLASS | | Group Statistics | |
|--------------|-------|--------------------|----------|
| | | Valid N (listwise) | |
| | | Unweighted | Weighted |
| 0 | WcTa | 18 | 18 |
| | ReTa | 18 | 18 |
| | EbiTa | 18 | 18 |
| | MvBv | 18 | 18 |
| | SaTa | 18 | 18 |
| 1 | WcTa | 17 | 17 |
| | ReTa | 17 | 17 |
| | EbiTa | 17 | 17 |
| | MvBv | 17 | 17 |
| | SaTa | 17 | 17 |
| Total | WcTa | 35 | 35 |
| | ReTa | 35 | 35 |
| | EbiTa | 35 | 35 |
| | MvBv | 35 | 35 |
| | SaTa | 35 | 35 |

Source: Research Finding(2018)

There were two classes 0 corresponding to poor performance and 1 correspond to good performance. This table summarizes the analysis dataset in terms of valid and excluded cases. This table presents the distribution of observations into the five groups within financial performance. The number of observations falling into each of the five groups. The default weight of 1 for each observation in the dataset is used, so the weighted number of observations in each group is equal to the unweighted number of observations in each group.

Table 4.3.5: Extent of Equality of Variables

| Tests of Equality of Group Means | | | | | |
|----------------------------------|---------------|--------|-----|-----|-------|
| | Wilks' Lambda | F | df1 | df2 | Sig. |
| WcTa | 0.975 | 0.841 | 1 | 33 | 0.366 |
| ReTa | 0.965 | 1.188 | 1 | 33 | 0.284 |
| EbiTa | 0.73 | 12.176 | 1 | 33 | 0.001 |
| MvBv | 0.984 | 0.552 | 1 | 33 | 0.463 |
| SaTa | 0.966 | 1.153 | 1 | 33 | 0.291 |

Source: Research Finding(2018)

The study results indicated that the extent of equality of groups means and their statistically significant for the independent statistic with a probability of $P < 0.05$ which depicted by the level of significant.

Table 4.3.6: Correlation Analysis

| | | WcTa | ReTa | EBITA | MvBv | SaTa |
|--------------------------------|---------------------|------|-------|--------|--------|--------|
| Wcapital/Total Assets | Pearson Correlation | 1 | 0.310 | -0.209 | 0.249 | 0.055 |
| | Sig. (2-tailed) | | 0.785 | 0.699 | 0.307 | 0.571 |
| Retained Earnings/Total Assets | Pearson Correlation | | 1 | 0.123 | 0.813 | -0.240 |
| | Sig. (2-tailed) | | | 0.262 | 0.053 | 0.494 |
| EBIT/Total | Pearson Correlation | | | 1 | -0.108 | 0.544 |
| | Sig. (2-tailed) | | | | 0.387 | 0.234 |
| MvBV | Pearson Correlation | | | | 1 | -0.475 |
| | Sig. (2-tailed) | | | | | 0.876 |
| Sales Total Assets | Pearson Correlation | | | | | 1 |
| | Sig. (2-tailed) | | | | | |

Source: Research Finding (2018)

The correlations of the variables of the model were calculated and the results are as shown in table 4.3.6 above and the correlation matrix had 33 degree of freedom. The findings in table 4.3.6 indicates that there is a strong positive correlation between Z

values and Working capital/Total asset ($r=0.310$). The findings indicate that the correlation is insignificant at 5% significance level given that p-value (0.785) is more than alpha (0.05) the findings in table 4.3.6 indicate that there is a strong positive correlation between Z values and Earnings before interest taxes/Total asset ($r=-0.209$). The findings indicate that the correlation is significant at 0.05 level of significance since the p-value (0.699) is more than alpha (0.05).

Table 4.3.7: Coefficients of the Model

| Model | Unstandardized Coefficients | | Standardized Coefficients | t | Sig. |
|--------------------------------|-----------------------------|------------|---------------------------|--------|-------|
| | B | Std. Error | Beta | | |
| (Constant) | 0.295 | 0.973 | | 8.269 | 0.007 |
| W capital/Total Assets | 1.418 | 0.394 | 0.553 | 0.040 | 0.319 |
| Retained Earnings/Total Assets | -0.063 | 0.257 | -0.434 | -1.418 | 0.142 |
| EBIT/Total Assets | 1.313 | 0.465 | 1.252 | -1.243 | 0.019 |
| MV/BV | 0.274 | | 0.340 | | |
| Sales Total Assets | -0.511 | 0.789 | -0.400 | -0.345 | 0.210 |

Source: Research Finding(2018)

The findings in table 4.3.7 indicate the regression model generated by the independent and the dependent variable. The general MDA model for this study is given as $Z=0.295 + 1.418$ Working capital by Total Assets– 1.063 Retained Earnings over Total Assets+ 1.313 Earnings before interest taxes by Total asset + 0.274 MV/BV – 0.511 Sales Total by Assets. The short form of the general Z-score function will be:

$$Z = 0.295 + 1.418WcTa - 1.063ReTa + 1.313EbiTa + 0.274MvBv - 0.511SaTa$$

Table 4.3.8: Fisher's linear discriminant functions

| | CLASS | |
|--|--------|--------|
| | 0 | 1 |
| WcTa | -1.934 | .089 |
| ReTa | .371 | -1.145 |
| EbiTa | -1.949 | -.077 |
| MvBv | 1.850 | 2.241 |
| SaTa | 4.316 | 3.586 |
| (Constant) | -3.616 | -4.124 |
| Source: Research Finding (2018) | | |

The above table 4.3.8 shows the Classification Function Coefficients of manufacturing firms for poor (0) performing and good (1) performing firms according to their financial report for the years 2013 to 2017. The Classification function will be of the following forms:

$$Z_0 = -3.616 - 1.934WcTa + 0.371ReTa - 1.949EbiTa + 1.850MvBv + 4.316SaTa$$

$$Z_1 = -4.124 + 0.089WcTa - 1.145ReTa - 0.077EbiTa + 2.241MvBv + 3.586SaTa$$

Z₀ = will classify all the poor performing firm in to their place while Z₁ will classify the good performing firms in to their side. This classification will be separated by a general discriminant function from table 4.3.7.

Table 4.3.9: Model Significant

| Test Function(s) | of | Wilks' Lambda | Chi-square | df | Sig. |
|------------------|----|---------------|------------|----|------|
| 1 | | .650 | 13.151 | 5 | .022 |

Source: Research Finding (2018)

The table 4.3.8 shows the test of model significant for the prediction and classification.

The Lambda value of 0.650 has significant value of .022 thus the group

mean looks to differ. This value indicates that the variability within the group is small in comparison to the total variability.

Table 4.3.10: Model Summary

| Function | Eigenvalue | % of Variance | Cumulative % | Canonical Correlation |
|----------|-------------------|---------------|--------------|-----------------------|
| 1 | .539 ^a | 100.0 | 100.0 | .592 |

Source: Research Finding (2018)

The study findings in table 4.3.10 indicate the percentage of variance and the cumulative of 100% showing that 100% of the variation in Z is accounted for by the independent variables. The canonical correlation value is higher than the Eigenvalue and 0.592 and 0.539 respectively indicating that the discriminating model is strong and powerful.

Table 4.3.11: Model Classifications Summary

| | | CLASS | Predicted Group Membership | | Total |
|----------|-------|-------|----------------------------|------|-------|
| | | | 0 | 1 | |
| Original | Count | 0 | 16 | 2 | 18 |
| | | 1 | 4 | 13 | 17 |
| | % | 0 | 88.9 | 11.1 | 100.0 |
| | | 1 | 23.5 | 76.5 | 100.0 |

a. 82.9% of original grouped cases correctly classified.

Source: Research Finding (2018)

From the table 4.3.10 the classification is good at 82.9%.

4.4. Discussion of Findings

From table 4.3.9 that was indicating the significant test for the model, the value of 0.650 is less than one (1) implying that the function is significant for the prediction of firm performance and so assessing the same corporate financial performances. Table

4.3.10 showed the Eigenvalue of 0.592 for the canonical correlation results pointing the relations among the discriminant score and the dependent variable. The value of 0.592 is substantial and indicates that the function discriminates well. The Eigenvalue of 1 shows that the function is perfect and 0.592 is not far from that value meaning the MDA model is powerful discriminant Model. The variance value of 100% implying that the relationship between Z-score and the variables is very strong and positive. Also, the cumulative value of 100% indicates that all the variations in the Z-score are caused by the variables and that there is no external variation outside the model. Table 4.3.11 indicates the classification percentage of 82.9% which is high for any model to be accepted as functional model.

Lastly table 4.3.7 has given out the general Z-score model from this study that can be used to group and predict manufacturing firm financial positions. Therefore, this model generated from this study can be used to discriminate corporate financial performance of manufacturing firms listed at the NSE.

The General MDA Z-Score Model will be as follows:

$$Z = 0.295 + 1.418WcTa - 1.063ReTa + 1.313EbiTa + 0.274MvBv - 0.511SaTa$$

From the above function the Z-Score will be obtained by putting the obtained raw variables value from the financial reports for every variable on the equation.

The discussions emanating from the tables lead to the assertion that the firms can be assessed financial using the MDA model. This shows that the Altman's Z-score model is appropriate to assess corporate financial performance. This finding supports the study by Mbijiwe,(2005) who concluded that the Z score model is suitable for discriminating the good and bad cardholders of Barclaycard. The results are also

consistent with the findings of Awino,(2016) whose findings showed that the MDA Model is appropriate tool in financial performance prediction of commercial bank and manufacturing firms in Kenya.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

The chapter gives a summary of the study findings, conclusions and concludes with the study recommendations.

5.2 Summary of Findings

This study was conducted with the objective of Altman's Model effectiveness in assessing corporate financial performance in manufacturing firms listed at the NSE. Financial distress occurs because of economic performance, decrease in performance and the poor management of organizations. The study used the qualitative data mined from the audited financial reports obtained from the NSE for the last five years. The study was a census study because of the small number of manufacturing firm's listed which was only eight (8) firms as at June 2017. The study used the Altman's MDA model for analysis employing the SPSS program for that analysis.

The study found out the Model is effective with classification percentage of 82.9%. The study has established that there was a change in the working capital of the some manufacturing companies listed at NSE from the year 2013 to 2017 affecting their financial performance. This indicated that the companies started experiencing reduction in the working capital due to financial difficulties leading to a reduction in the profitability of the company. The Altman's model has been used and proved not only by this study but by other researchers because of its simplicity and objectivity is selecting the best discriminant variable.

5.3 Conclusions

The MDA model is an exceptionally down to earth instrument that can be utilized to predict corporate financial performance and evaluate the bankruptcy of organizations and also keeping up and checking of organizations being hazard overseen. The MDA model is objective in that it selects and put into use the variable that best discriminate among the classes and those with same characteristic within the class. Organization liquidations are an everyday event and frequently investors miss out. The Altman model can effectively be used to assess the corporate financial performance in the manufacturing industry in Kenya. Besides, this model could be utilized by speculators while considering about putting resources into a firm to find out the condition of the firm's financial position

5.4 Limitations of the Study

This study was based on the manufacturing firms only. Maybe if the study would have included all the firms listed at NSE could have been more conclusive. The data used was quantitative data that is prone to manipulation. But as it's known the corporate financial performance is also influence by non-quantifiable circumstances including poor management and high competition in the market for a corporation's products. This study was limited to the data for only five years but if the period was to be increase the study would have been more conclusive. The access to information for data collection is not straight forward, even the published financial reports keep changing when the new report is published because you find that the last year financial report is restated with the confirmation of the auditor and the management. Another limitation of this study is that it only focused on one statistical model (MDA) for assessment of corporate financial performance. However, comparative analysis financial performance levels.

5.5 Recommendations

The Altman's MDA model is the best a suitable discriminant model to separate items into groups either to good and bad, female and male, finished and unfinished, completed and uncompleted etc. Although it may not be the only model to assess the financial performance of firms, the researcher recommends use of other models to determine the financial performance of firms but recommend this MDA model for financial performance classification.

This examination highly prescribes to the potential financial investors in organizations to utilize the Altman MDA model as an appraisal technique. The outcomes could bring up specific issues about the condition of a company and could eventually result in a speculation contributing or obtaining a firm that is gainful and managed effectively since declining Z-score esteems delineates a collapsing firm.

The study recommends that the Altman MDA model should be used by the government to evaluate the manufacturing firms financial prediction to avoid firm failure and to save public funds for the interest of the State towards the achievement of Vision 2030 and the current government big four agendas manufacturing and industrialization include.

5.6 Areas for Further Research

Further exploration of Altman's MDA Model is needed, especially the need for different coefficients to check if it will yield the same results as the Altman's coefficient so as to refine this potentially useful tool to develop a collection of tools useful in discrimination of cases and prediction..

Further research should be undertaken on Altman MDA model and ZETA Model for failure prediction to forecast the success or failure of the company and give a

comparison to the Altman MDA model and ZETA analysis model so as affirm its usage and encourage their use by industry professionals.

Many other factors may have influenced the performance of firms, factors that cannot be measured or quantified e.g. staff morale, boardroom wrangles, and occupational health etc. It would be interesting if a similar study was conducted in concomitance with this to ascertain the findings. This would expand the scope of the literature on firm performance.

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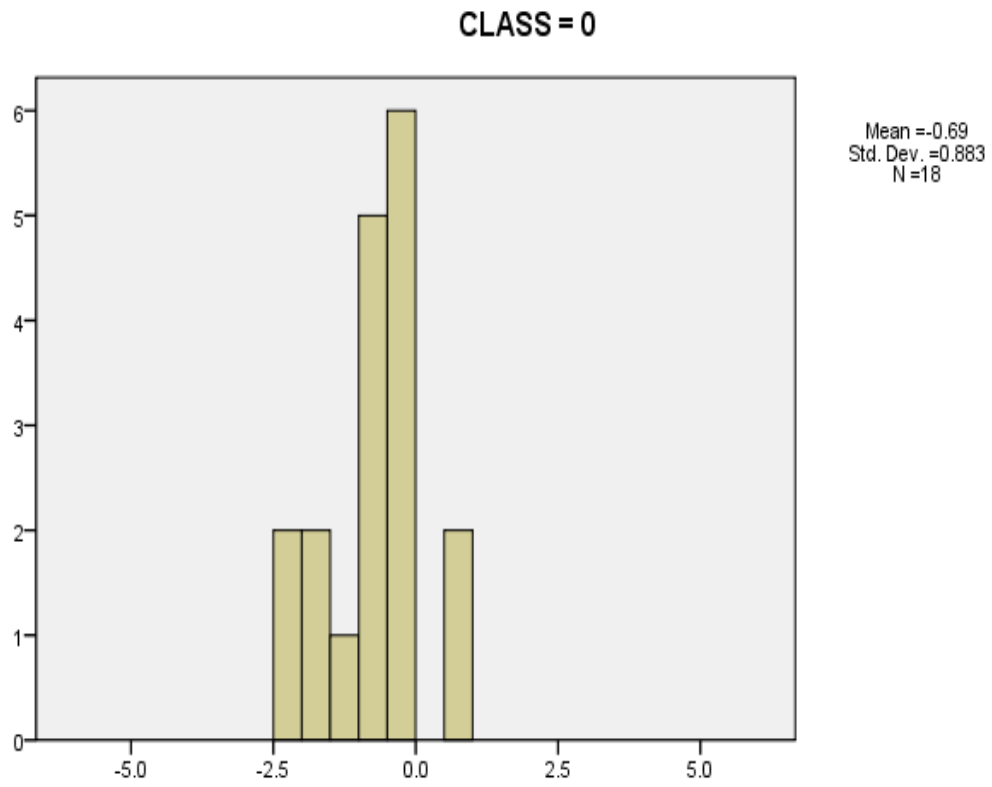
APPENDICES

Appendix 1: LIST OF MANUFACTURING COMPANIES LISTED AT NSE

| No | Company Name | Data Period |
|----|------------------------------------|-------------|
| 1 | B.O.C Kenya Ltd | 2012-2017 |
| 2 | British American Tobacco Kenya Ltd | 2012-2017 |
| 3 | Carbacid Investments Ltd | 2012-2017 |
| 4 | East African Breweries Ltd | 2012-2017 |
| 5 | East African Breweries Ltd | 2012-2017 |
| 6 | Unga Group Ltd | 2012-2017 |
| 7 | Eveready East Africa Ltd | 2012-2017 |
| 8 | Mumias Sugar Co. Ltd | 2012-2017 |
| 9 | Flame Tree Group Holdings Ltd | 2012-2017 |

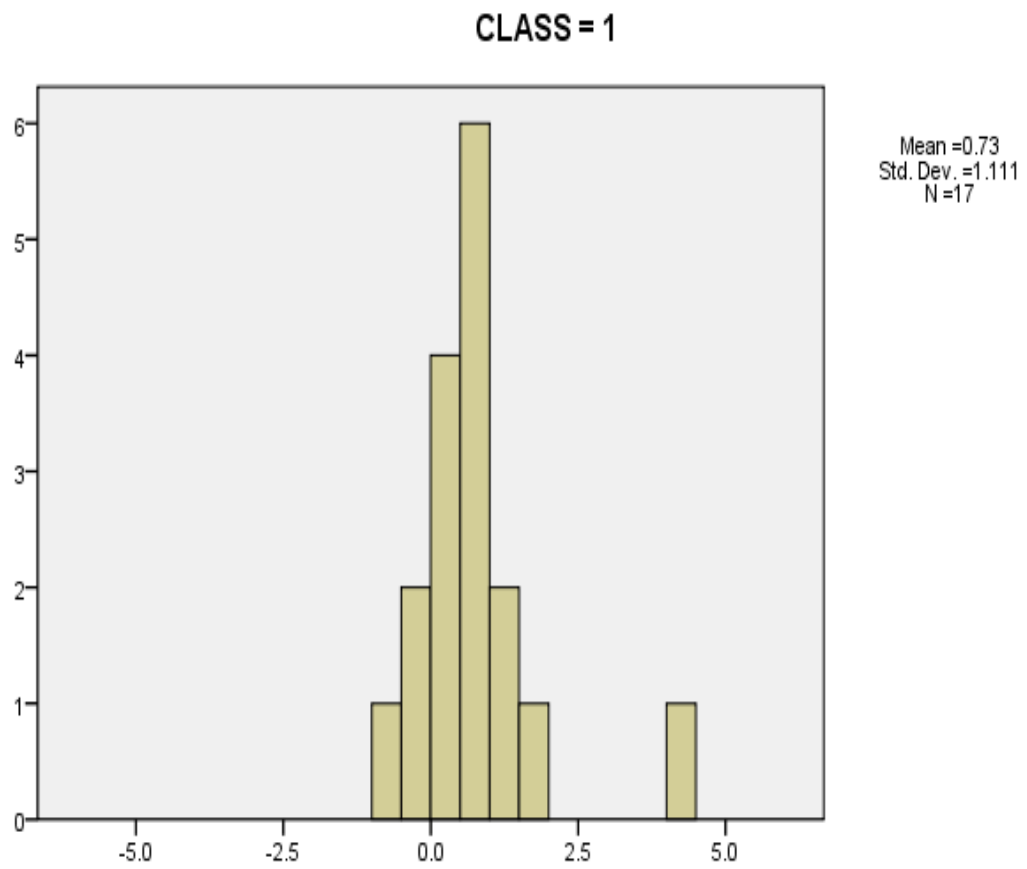
Appendix 2: Canonical Graph

Canonical Discriminant Function 1



Appendix 3: Canonical Graph

Canonical Discriminant Function 1



Appendix 4: CASEWISE STATISTICS

| | | Highest Group | | Second Highest Group | |
|----------|----|---------------|--|----------------------|--------------|
| | | P(G=g D=d) | Squared Mahalanobis Distance to Centroid | Group | P(G=g D=d) |
| Original | 1 | 1.000 | 11.327 | 0 | .000 |
| | 2 | .852 | .119 | 0 | .148 |
| | 3 | .741 | .000 | 0 | .259 |
| | 4 | .741 | .000 | 0 | .259 |
| | 5 | .758 | .003 | 0 | .242 |
| | 6 | .953 | .763 | 0 | .047 |
| | 7 | .671 | .024 | 0 | .329 |
| | 8 | .571 | .513 | 1 | .429 |
| | 9 | .844 | .100 | 0 | .156 |
| | 10 | .536 | .682 | 1 | .464 |
| | 11 | .659 | .169 | 1 | .341 |
| | 12 | .693 | .010 | 0 | .307 |
| | 13 | .589 | .116 | 0 | .411 |
| | 14 | .679 | .018 | 0 | .321 |
| | 15 | .610 | .086 | 0 | .390 |
| | 16 | .722 | .022 | 1 | .278 |
| | 17 | .518 | .251 | 0 | .482 |

| | | | | |
|----|------|-------|---|------|
| 18 | .581 | .467 | 1 | .419 |
| 19 | .661 | .031 | 0 | .339 |
| 20 | .729 | .013 | 1 | .271 |
| 21 | .789 | .045 | 1 | .211 |
| 22 | .744 | .002 | 1 | .256 |
| 23 | .633 | .257 | 1 | .367 |
| 24 | .626 | .284 | 1 | .374 |
| 25 | .714 | .003 | 0 | .286 |
| 26 | .732 | .010 | 1 | .268 |
| 27 | .604 | .370 | 1 | .396 |
| 28 | .804 | .096 | 1 | .196 |
| 29 | .822 | .197 | 1 | .178 |
| 30 | .559 | .566 | 1 | .441 |
| 31 | .885 | 1.332 | 1 | .115 |
| 32 | .569 | .521 | 1 | .431 |
| 33 | .879 | 1.125 | 1 | .121 |
| 34 | .918 | 4.009 | 1 | .082 |
| 35 | .914 | 3.355 | 1 | .086 |
| | | | | |