

**APPLICABILITY OF PIOTROSKI F-SCORE MODEL IN PREDICTING
FINANCIAL DISTRESS OF LISTED COMPANIES AT THE NAIROBI
SECURITIES EXCHANGE 20 SHARE INDEX, KENYA**

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**A Research Project Presented to the Institute of Postgraduate Studies of
Kabarak University in Partial Fulfillment of the Requirements for the Award of
the Master of Business Administration (Finance Option),**

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DECLARATION

This research project is a self-generated original write-up which has never been submitted for an academic award in another college or institution of higher learning.

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GMB/NE/0161/01/16

RECOMMENDATIONS

The Institute of Postgraduate Studies:

The thesis entitled “**Applicability of Piotroski F-Score Model in Predicting Financial Distress of Listed Companies at The Nairobi Securities Exchange 20 Share Index, Kenya**” and written by **Christabel Jepkemboi Korir**, is presented to the School of Business and Economics of Kabarak University. Having reviewed this research project, we recommend it be accepted in partial fulfillment of the requirement for the degree in Master of Business Administration (Finance Option)

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DEDICATIONS

This research project is dedicated to my entire family. My parents Mr. and Mrs. Joseph Birir for their selfless parenting and godly upbringing, My husband Mr. Emmanuel Chumba for his challenge disposition without which I could not have embarked on this project. My son Bradley who enthuses me daily and is the reason why life makes a real meaning to me. I challenge him to surpass the benchmark set before them. I wish to let them know that with handwork and trust in the Almighty God they can achieve everything they purpose to achieve.

ABSTRACT

Financial distress prospect is a key bother to the executives and different business partners for quite some time. The impact of financial distress and bankruptcy on firms is hard to the extent of ignoring it is impossible. Financial distress is not a selective event it attacks or can happen both too big organizations and small organizations. With the importance of securing financial health of our listed companies in Kenya is therefore important in anticipating the likelihood of fiscal restraint beforehand thus need for prediction and more so applying a reliable model in the prediction. This report focused on showing the utilization of Piotroski F-score framework in forecasting the economic or monetary depression among publicly quoted organizations particularly the NSE 20 Price Index firms for the period of two financial years that is 2016 and 2017. The study was also centered on Piotroski nine variables namely profitability signals, liquidity and leverage operational efficiency to show their interdependence with financial health /status of a company. The study utilized a descriptive survey approach targeting the NSE 20 Price Index firms which were mainly in service and commercial sector to investigate how elements used by Piotroski can help in determining the financial status of a company. The entire population of 20 firms was involved since this target population is manageable. Data were extracted from secondary sources for a period of the two financial years. The information gathered was dissected and synthesized utilizing illustrative and inferential measurements by applying SPSS as the supporting computer software. The results revealed that the organizations in the NSE and specifically the 20-Share Index firms placed steady outcomes as far as resources. The researcher derived that liquidity, leverage and source of assets are key determinants of fiscal strains among NSE recorded firms. The connection between fiscal strains and liquidity and leverage are emphatically related with fiscal strains suggesting that when liquidity and leverage go up, it will make the fiscal strains of firms at NSE to grow. The results inferred that the NSE 20-Share Index firms have moderately low fiscal strains. The organizations have commonly been effective in their tasks. Working productivity (operational efficiency) contributes more to diminish in fiscal strains of the organizations in the NSE-20-share list, trailed by profitability, while leverage and liquidity contributes the least to fiscal strains of the organizations in the NSE-20-Share Index. The examination prescribes that executives of NSE recorded firms to guarantee that the destinations of an organization are clung to from the underlying phase of advancement lifecycle of the organizations. The investigation prescribes reception of agreeable highlight to engage NSE recorded associations to use a bigger number of financial specialists' subsidizing than obligation and reduction the danger that is characteristic in the expanded usage of obligation. Firms ought to realize their ideal debt limit.

Keywords: Financial distress, NSE, Piotroski model, profitability, liquidity and leverage, operational efficiency.

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LIST OF ABBREVIATIONS

ARM	- Athi River Mining
BSDM	- Balance Sheet Decomposition Measure
CA	- Current Assets
CAGR	- Compound annual growth rate
CAPM	- Capital Asset Pricing Model
CBK	- Central Bank of Kenya
CFO	- Cash Flow from Operations.
CL	- Current liabilities
CMA	- Capital Market Authority
CMC	- Cooper Motor Corporation
DCF	- Discounted Cash Flow
EBITDA	- Earning Before Interest, Taxes, Depreciation and Amortization
EMH	- Efficient Market Hypothesis
FX	- Foreign Exchange
KenGen	- Kenya Electricity Generating Company
KRA	- Kenya Revenue Authority
KShs	- Kenya Shillings
MDA	- Multivariate Discriminant Analysis
Mn	- Million
MVCE	- Market Value of Common Equity
MSCI	- Morgan Stanley Capital International
NI	- Net Income
NIC	- National Investment and Credit
NPLs	- Non-Performing Loans
NSE	- Nairobi Securities Exchange
P/E	- Price-to-Earnings
RETA	- Retained Earnings/ Total Assets
ROA	- Return on Assets
ROE	- Return on Equity
SATA	- Sales to Total Assets
SPSS	- Statistical Package for Social Sciences
TSE	- Tehran Stock Exchange
USA	- United States of America

WCTA - Working Capital / Total Assets

OPERATIONAL DEFINITION OF TERMS

Financial distress	Alludes to a situation in which an organization is unable to cater for, or experiences issues in satisfying, its money related commitments to its loan bosses, normally because of high fixed expenses, illiquid resources or incomes touchy to financial downturns (Hu, 2011). The study adapted the same meaning in carrying out the current research
Financial Performance	This refers to estimating the consequences of firms' arrangements and activities in financial terms. This is the general proportion of a company's general monetary wellbeing over a given timeframe and can be utilized to analyze comparative firms over a similar industry or to think about businesses or divisions in accumulation (Madura & Fox, 2011). The financial execution in this investigation was operationalized with regard to company's ROI, return on resources and value-added among others.
Leverage	This is the proportion of an organization's advance capital (obligation) to the estimation of its customary offers (value) (Tan, 2015). The current study applied the same meaning of the term leverage.
Liquidity	This terms alludes to how much a benefit or security can be immediately purchased or sold in the market without influencing resources cost (Niresh, 2012). The researcher adapted the same meaning in carrying out the study.
Operational efficiency	Refers to the proportion between a yield picked up from the business and a contribution to maintain a business activity (Timothy, Prasada, O'Donnell & Battese, 2005). The current study applied the same meaning of the term operational efficiency.

Profitability

This is how much a business returns are realized or magnitude of monetary benefits (Niresh, 2012). In this study, profitability refers to the net amounts realized after making operational deductions from a company's income

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

At the point when a firm can't meet its commitments on schedule, it is said to be in a condition of monetary strain. Event of occasions, for example, bond default, an overdrawn ledger or non-installment of a favored stock profit, establish the operational meaning of monetary misery. Late history shows that there have been a few corporate disappointments all throughout the world. During these last years, the yearly progression of disappointments of organizations didn't quit developing and this pattern turns out to be increasingly set apart during the times of emergency (Sami, 2013). Aasen (2011) demonstrated that the admonition signs and Z score model can help the board for anticipating corporate issues early enough to dodge budgetary troubles. Piotroski (2000) proposed a lot of nine criteria dependent on basic fiscal report examination to decide with more noteworthy certainty which stocks from a pre-screened universe of high book-to-advertise firms are monetarily solid.

Piotroski's (2000) study was adapted on littler firms in fiscal strain and apparently worked best for short venture time skylines so as to gain by the improved offer cost when the main great income declarations pursue portfolio development. Contingent upon the adequacy of the Piotroski screen to choose monetarily stable firms from a pool of firms on a capital showcase a venture procedure without speculator mental inclinations can be created (Muller, 2009). As per Gharaibeh (2013) anticipating disappointment as right on time as conceivable with sound precision empower firms to make a move to lessen the expenses of insolvency, corporate inability to all partners and contribute towards the business and money related condition strength. As per Muriithi (2013), the best cautioning indications of money related emergencies are intermediaries for the weakness of the banking and corporate division.

Numerous nation heads everywhere throughout the world has expanded worry over corporate administration because of the expansion of detailed instances of cheats, inside exchanging, organization clashes among different enterprises adventure. All out financial emergencies are connected more with outside improvements, and household factors are the principle driving pointers of serious yet contained financial misery. Beam (2011) sets that financial emergencies are especially unsafe for the

economy and hindering for the soundness of money related area. Its monetary weight is just a redistribution of assets inside the economy.

Total compensation additionally can be a proportion of money related strength of an organization. An organization with positive net gain for very a few years is less inclined to turn out to be monetarily bothered and subsequently a negative relationship is normal between net gain and the likelihood money related trouble. Aasen (2011) demonstrated that the admonition signs and Z score model can help the board for anticipating corporate issues early enough to dodge budgetary troubles. The nature of income, as estimated by the degree of accumulations in the profit, is likewise a significant pointer of the money related state of a firm. Higher measure of gatherings shows lower nature of profit and is related with higher likelihood of default. Thus, a positive connection between the accumulations and the likelihood of default is normal.

Ahmad (2006) contended that a sound financial framework requires proper foundation to help productive direct of banking business working condition, administration and administrative system at local just as universal levels so as to diminish bank emergency. Kithinji and Waweru (2007) demonstrated that the overall money related emergency of 2008, which began in the United States, was credited to U.S. banks' extreme hazard taking. Subsequently, so as to control such hazard and cause people to notice the organization issue inside banks, there are articulations made by brokers, national bank authorities, and other related specialists, accentuating the significance of powerful corporate administration in the financial business since 2008 and as of not long ago (Beltratti & Stulz, 2009; Peni & Vahamaa, 2011).

1.1.1 Financial Distress

As per Alareeni and Branson (2013), fiscal strain alludes to firms confronting budgetary imperatives accordingly not having the option to complete their everyday exercises easily. fiscal strain is where an organization can't meet or experiences issues satisfying its monetary commitments to its out of this world due. Agrawal (2015) characterized money related misery as the failure of a firm to fulfill its monetary commitments as and when they fall due. Schmidt (2010) characterizes budgetary trouble as a circumstance that influences the firm under hazy conditions. Senbet and Wang (2012) relate money related misery to a circumstance where the association's

agreement to banks are broken or respected with trouble. A state when an association's business crumbles to the point where it can't meet its money related commitments, the firm is said to have entered the condition of monetary trouble. This is regularly seen at whatever point the company's operational incomes are lower than its budgetary costs. Business firms likewise experience money related misery when they face deficient liquidity to meet their monetary liabilities.

Monetary misery can be exorbitant to a firm just as different partners. The circuitous costs, for example, lost benefits and greater expenses of capital are brought about by a firm because of fiscal strain (Agrawal, 2015). The main sign of misery is typically infringement of obligation agreements combined with the exclusion or decrease of profits. Gep and Kumar (2012) pointed that the possibility of budgetary trouble increments when a firm has high fixed expenses, non-fluid resources, or incomes that are touchy to financial downturns. To Senbet and Wang (2012), monetarily upset organizations are not ready to seek financial protection continuing while monetarily sound organizations petition for financial protection to flee from lawful suites and assessments. The monetary expense of business disappointments is generally huge. An organization is monetarily upset at whatever point its EBITDA is not as much as its advantage costs. Budgetary influence includes the substitution of fixed-cost obligation for proprietor's value in the expectation of expanding value returns.

Senbet and Wang (2012) included that expanding the proportion of obligation to value in an organization's capital structure verifiably makes the organization generally not so much dissolvable but rather more monetarily unsafe than an organization without obligation. As indicated by Natalia (2007), monetary pain expectation has become a basic piece of corporate administration as it enables every one of the partners to break down the organization on the heading its taking. As indicated by Alareeni and Branson (2013), organizations which are in fiscal strain will in general display a decrease in showcase esteem after some time. A concentrate by Capalbo, Grossi, Ianni and Sargiacomo (2010) to research the idea of fiscal strain in Italians Local governments tried to comprehend the idea of monetary trouble and the mentalities of focal government towards bothered Local governments. Capalbo et al., (2010) proposed different methodologies including a manufactured layout of the national administrative structure on monetary pain of Italian Local governments through

dissecting information on the number, measurement, and geological situation of bothered Italian Local governments.

Jonga and Chirisa (2009) saw that it was shocking that the muddled truth of administration in Zimbabwe and the monetary emergency in the nation has rendered the greater part of the chambers un-financially sound to Local and worldwide banks, leaving the acquiring powers by urban gatherings in the hands of focal government to the drawback of quick basic leadership not to mention administration conveyance. The scientist further declared that practically all towns and urban communities in Zimbabwe have been pondering raising adequate incomes for capital and repetitive uses. Ekwubi (2010) researched the issues of the successful use of income accessible to Local government in Nigeria. Budgetary pain can be expensive to a firm just as different partners. While the immediate costs, for example, evaluator's expenses, legitimate charges, the executives charges and different installments, should be caused if the firm is compelled to petition for financial protection, the aberrant costs, for example, lost benefits and greater expenses of capital, are brought about regardless of whether liquidation is maintained a strategic distance from.

Monetary disappointment is a worldwide marvel that happens in creating nations just as created nations, for example, super insolvency procedures documented on Lehman Brothers, Enron, WorldCom, in USA and Europe in the ongoing past. Nearby firms have similarly been influenced by monetary trouble prompting delisting or conclusion like Uchumi market and others have been placed into receivership and others totally shut down (Kariuki, 2012; Kipruto, 2013; Mamo, 2011; Mohamed, 2013). Budgetary trouble is exorbitant in light of the fact that it makes a propensity for firms to accomplish things that are hurtful to obligation holders and non-money related partners, disabling access to credit and raising partner connections. Again money related misery can be expensive if a company's debilitated condition prompts a forceful reaction by contenders taking advantage of the lucky break to pick up piece of the overall industry.

The inspiration for observational research in corporate insolvency forecast is clear – the early discovery of budgetary trouble and the utilization of remedial measures, (for example, corporate administration) are desirable over assurance under chapter 11 law (Aziz and Dar, 2006). On the off chance that it is conceivable to perceive bombing

organizations ahead of time, at that point fitting move can be made to switch the procedure before it is past the point of no return. Natalia (2007) points out that deflecting fiscal strain viably and proficiently is reliant on early location since it permits more opportunity for reaction. The trouble condition of a firm should direct administration and different partners on the fitting rescue procedures.

Fiscal strain is a worldwide issue influencing both created and creating economies. Business firms experience money related misery when they face lacking income to meet their current monetary commitments (Jabeur and Fahmi, 2017). The fall of both enormous and little associations on the planet over has made monetary misery expectation gain ubiquity. Several models are accessible for budgetary pain forecast yet there is no accord with respect to which model is the best indicator. Factual methods have been generally utilized, Artificially Intelligent Master Systems approach is moderately new and hypothetical models are moderately unprecedented. Given the expenses related with budgetary trouble, it is basic to precisely foresee this hazard. This warrants examining elective models that could be valuable in anticipating the hazard fiscal strain and subsequently the selection of Piotroski model in this examination/inquire about (Aziz & Dar, 2006).

1.1.2 Piotroski-Score Model

Piotroski is a model created by an American educator in bookkeeping at Stanford college graduate institute of business called Joseph Piotroski in the year 2000. Piotroski (2000) built up a score to recognize monetarily powerless and solid stocks from an arrangement of high book-to-showcase stocks or worth stocks. He contended that high book-to-advertise firms will in general be monetarily bothered and such isolation could be utilized to improve the presentation of the portfolio. The Piotroski F-score utilizes generally utilized bookkeeping proportions to recognize stocks with high financial quality. Such stocks were appeared by Piotroski (2000) to produce solid abundance returns in the US showcase, and consequent out-of-test examines have confirmed the first findings. As per Krauss, Krüger, and Beerstecher (2015), the intrigue of the F-score as a venture signal is that it is easy to build and straightforward and clarify.

The model targets distinguishing the most advantageous organizations against a bushel of estimation of stocks through applying a lot of nine bookkeeping based stock choice criteria. , Jacobs (2015) gives a brilliant review of 100 irregularities, arranged in 20 gatherings. One of these gatherings is based upon basic investigation, which means unusual returns are created by forming portfolios dependent on data typically contained in fiscal summaries or gave by budgetary experts. Aside from measures identifying with gainfulness, income, influence, liquidity and effectiveness, the score incorporates some exceptional factors, for example, nature of profit and value weakening. The model honors every one of the above budget reports parts one point for each test a stock passes and no point for a stock that misfortunes. The Piotroski's F-score can be critical in anticipating the hazard money related pain.

Piotroski (2000) sets his point of convergence on the ID of winning stocks in a high BM condition. In particular, he devises the F-score, a scoring framework to distinguish organizations showing money related quality in an underestimated, dismissed venture universe with possibly higher hazard because of budgetary misery. Mohr (2012) utilizes the F-score for foreseeing development stock returns for the European market. Scatizzi (2010) and Gray and Carlisle (2013) test slight varieties of the Piotroski screen with comparable high outcomes. Do and Faff (2012), normal commissions add up to 13 premise focuses (bps) in the period from 1989 to 2009 and 8 bps in the period from 2007 to 2009.

1.1.3 Financial Distress and Profitability Signals

The essential objective of contributing is to profit (Crowder, Kazemi, and Shneeweis), at least 2010 explicitly, to accomplish a sensible rate of profitability while simultaneously controlling the danger of loss of head. Observing and breaking down the Operating Cash Flow is a basic for understanding your capacity to pay for conveyances and routine working costs. This is likewise utilized in correlation with all out capital you have been used an examination that uncovers whether your activities are producing adequate money for help of capital ventures you are making to propel your business. The investigation of organization's proportion of working income contrasted with its all out capital utilized gives a more profound understanding into the organization's business' money related wellbeing, enabling you to look/foresee if the organization may turn out to be monetarily bothered or not.

Benefit, as estimated by return on resources (ROA), shows a company's capacity to create supports inside in this manner deciding its capacity to reimburse its obligation commitments. Chai (2011) makes a critical recommendation that in the present dynamic and worldwide aggressive condition, headway is principally because of three significant patterns: concentrated universal challenge, disconnected and testing markets, and grouped and quickly evolving advances. The Capital Asset Pricing Model (CAPM) is as yet used to decide resource valuing, survey the exhibition of oversaw portfolios and for chance assessment (Hirschey and Nofsinger, 2010). In endeavors to take the maturing study of monetary hypothesis to new rich statures of examination, thorough and here and there seriously confining suppositions must be made. According to Richard, Devinney, Yip and Johnson (2009) in deciding the exhibition of firms, there has been a few valuation systems utilized such Return on Equity (ROE), Return on Assets (ROA), Discounted Cash Flow (DCF) and Internal Rate of Return however ROE is the most broadly utilized.

ROE centers around comes back to value holders yet on the off chance that financial specialists are not on the watch, organizations can depend on artificially keep up a solid ROE for some time and conceal the decaying execution. Increment owing debtors use and stock purchase backs subsidized through gathered money can help keep up an organization's ROE despite the fact that operational productivity might be low. The effect of giving ROE a chance to disintegrate is normally moment since it influences the organization's stock execution or worth. The aggregate speculation supporting investigations on execution recommend execution improvement lead to improved capacities and exercises in the associations. Musembi (2012) demonstrates that open area execution has produced a great deal of intrigue world over especially in rising countries and arrangement of compelling and effective administrations to its occupants stays a principle need to governments.

For associations to prosper in very ferocious market relies upon its capacity to redevelop itself through inventive speculations well-coordinated to business system. As per Richard, Devinney, Yip and Johnson (2009), numerous associations have endeavored to oversee authoritative execution utilizing the decent scorecard approach where execution is followed and estimated in various measurements, for example, monetary execution investor return, client care social obligation, corporate citizenship, and representative stewardship. As per Dilley (2008) business

disappointment indications incorporate inward association issues which are portrayed by money related sign coming about because of frail execution prompting chapter 11 lastly to budgetary pain. The firm takes a descending winding pattern because of insufficient asset organization, coming about to a powerless key situating which is confirm by critical drop in deals, poor productivity, and decrease in income and liquidity levels (Crutzen and Van Caillie, 2007).

Liquidity is a proportion of the degree of present or transient resources accessible with the firm. Current resources empower a firm to meet its momentary installment commitments. In this way, higher liquidity prompts lower probability of default and henceforth a negative relationship is normal among liquidity and the likelihood of budgetary trouble. Influence shows the degree of obligation in the capital structure of the firm. Increment in influence is probably going to force more noteworthy imperatives on the association's money related adaptability. Thus, higher measure of obligation prompts expanded danger of defaulting and henceforth a positive relationship is normal among influence and the likelihood of monetary misery. Expanded utilization of outside financing, as estimated by new value offers, may demonstrate failure to produce reserves inside. Thus, a positive relationship is normal between new value offers and the likelihood of default.

Effectiveness is estimated by Asset turnover proportion which shows the manner in which the association's benefits can create deals. At the end of the day, it demonstrates more prominent efficiency from the benefit base. The higher this effectiveness, the lower the likelihood of default and consequently a negative relationship is normal between the benefit turnover proportion and the likelihood of default. As per Brealey (2008), firms with higher benefits are more averse to default on their obligation commitments and subsequently a negative relationship is normal among gainfulness and the likelihood of default. Total compensation additionally can be a proportion of money related strength of an organization. An organization with positive net gain for very a few years is less inclined to turn out to be monetarily bothered and subsequently a negative relationship is normal between net gain and the likelihood money related trouble. The nature of income, as estimated by the degree of accumulations in the profit, is likewise a significant pointer of the money related state of a firm. Higher measure of gatherings shows lower nature of profit and is related

with higher likelihood of default. Thus, a positive connection between the accumulations and the likelihood of default is normal.

In Kenya, recorded firms keep on encountering monetary pain saw by the expansion in delisting of organizations and the position of certain organizations under statutory administration. A few firms have been delisted from the financial exchange which incorporate; Mumias sugar, Eveready, Lonrho East Africa, Pearl cleaners, East African Packaging, Uchumi grocery stores, Kenya Corporative Creameries and CMC Kenya Ltd., among others (Gathecha, 2016). In 2008, the money related emergency demonstrated the shortcomings of practices in hazard the executives in the credit setting and appraisal of hazard at the organization level (Tinoco and Wilson, 2013). The quick advancement of the capital market just as the consolidation of the world economy have amplified the quantity of firms that experience trouble monetarily.

1.1.4 Nairobi Security Exchange

The Nairobi Securities Exchange was shaped in 1954 as a willful association under the Societies Act in the name Nairobi Stock Exchange and was accused of the obligation of building up the protections market and directing exchanging exercises. The NSE is directed by the Capital Markets Authority whose capacity is supervising the undertakings of recorded organizations (NSE, 2015). The Nairobi Securities Exchange organizations are assembled in the accompanying ten areas Agricultural Sector, Automobiles and Accessories, Banking, Commercial and Services, Construction & Allied Sector, Energy and Petroleum, Insurance, Investment, Manufacturing and Allied and Telecommunication and Technology (NSE, 2016).

The NSE has the command to create strategies and rules in order to guarantee productive market tasks. The organizations recorded are relied upon to be monetarily stable in spite of the fact that this may change every now and then. There are such huge numbers of reasons regarding why organizations exchanging at the NSE may endure monetary pain. They incorporate corporate administration issues, the executives issues, credit chance introduction, serious challenge and influence among others (Natalia, 2007; Bowen, Morara and Mureithi, 2009). As substantiated by CMA (2015), Nairobi Securities Exchange (NSE) is the single significant open capital market in the nation. NSE contrasts from those created markets in such qualities on

firm levels as board attributes and size, resource structure, gainfulness, firm size and corporate administration benchmarks.

The NSE recorded firms have recently experienced fumble of obligation financing which has influenced the presentation of different firms (Wakaba, 2014). The NSE 20 offer record is comprised of 20 firms that meet the accompanying key criteria: Must have in any event 20% of its offers cited on the NSE, persistently cited for in any event 3 years, has a base market capitalization of KSh.20 million and ought to in a perfect world be a "blue chip" (NSE, 2018). The NSE 20 offer list had been a casualty of various reactions basically because of its one-sided nature because of putting together the list with respect to just 20 blue chip organizations which as a rule don't speak to precisely the fundamental market position. The relevance of Piotroski F-Score Model in anticipating money related trouble in the NSE recorded firms and explicitly the NSE 20 offer list makes it an interesting setting of this investigation.

1.2 Statement of the Problem

Monetary trouble expectation has gotten extensive consideration of specialists since quite a while. Albeit a few examinations made an endeavor to utilize various factors through bookkeeping proportions, spearheading works have been those of Altman (1968) and Ohlson (1980). Altman (1968) consolidated a lot of five budgetary proportions utilizing Multivariate Discriminant Analysis (MDA) into a hazard estimation score prominently known as the Z-score. The Altman's Z-score was a spearheading endeavor to display the danger of pain in a basic and direct manner. Adeyemi (2012) noticed that absence of satisfactory administration practice is one of the central point prompting budgetary misery as capital has the capacity to ingest misfortunes.

A few considers have in this manner tried these models in various economies including Canada, India and Kenya. Ntoiti (2013) in an investigation of determinants of budgetary misery confronting 175 nearby experts in administration conveyance in Kenya, built up that the reasons for money related pain incorporate monetary administration rehearses, corporate administration rehearses, human asset the board rehearses, data innovation and government guideline. Kalani and Waweru (2007), Otieno (2008), Zeituni, Tina and Keen (2007) likewise have composed on the breakdown of banks in Kenya during the 1980s through to 2006 when the last bank

crumbled. The creators are all in understanding that at the beginning of monetary misery, executives participate in exercises that support loan bosses trying to convince them to ease pressure on the firm and thusly help the firm to settle its budgetary emergency.

NSE recorded firms have been under investigation in the course of the most recent couple of months, with a portion of the issues referred to being blunder. Despite the ubiquity of the different models, there is a need to investigate the helpfulness of another age of models that consider pivotal angles, for example, the nature of income in foreseeing the danger of money related misery and subsequently the explanation of the examination being the materialness of Piotroski model in anticipating monetary pain of recorded organizations in NSE 20 value list.

1.3 Purpose of the Study

The purpose of this study was to analyze the applicability of Piotroski *F*-score model in predicting financial distress of NSE 20 Share Index.

1.4 Objectives of the Study

- i. To evaluate the influence of profitability signals on predicting the financial distress of NSE 20 Share Index.
- i. To analyze the effect of liquidity and leverage on determining financial distress of NSE 20 Share Index.
- ii. To determine how operating efficiency status of a firm can be used to detect financial distress of NSE 20 Share Index.
- iii. To examine the extent to which intervening factors; size of the firm and business risks predict the financial distress of NSE 20 Share Index.

1.5 Research Questions

- i. Do profitability signals predict financial distress of NSE 20 Share Index?
- ii. How does liquidity and leverage predict financial distress of NSE 20 Share Index?
- iii. Does operational efficiency of a company predict the financial distress of NSE 20 Share Index?
- iv. To what extent do the intervening factors; size of the firm and business risks predict the financial distress of NSE 20 Share Index?

1.6 Scope of the Study

This study aimed to find out the applicability of Piotroski *F*-score model in predicting financial distress of listed companies at the Nairobi securities exchange 20price index, Kenya. The researcher will obtain the relevant information for the said independent variables from the Nairobi Securities Exchange and Central Bank of Kenya. Data for the dependent variable will be obtained from the Nairobi Securities Exchange, primary focus being on the NSE 20 Share Index which consists of the 20 listed companies in this share index. These companies include; Nation Media Group, Scangroup Limited, KCB Group Plc, The Cooperative Bank of Kenya Limited, Diamond Trust Bank Limited, Barclays Bank of Kenya Limited, Equity Group Holdings Plc, NIC Group Plc, East African Breweries Limited, British American Tobacco Kenya Limited, ARM Cement Plc, Bamburi Cement Limited, KenolKobil Limited, Kenya Power & Lighting Limited, Kengen Limited, Britam Holdings Plc, Kenya Reinsurance Corporation Limited, Safaricom Plc, Centum Investment Company Plc and Nairobi Securities Exchange Plc.

The study used data from the period 1st Quarter in 2016 to 4th quarter in 2017 which are the periods within which the NSE 20 share index companies were constant. The data of this study being secondary in nature was obtained from the mentioned NSE historical reports, the Central Bank of Kenya and the Kenya National Bureau of Statistics. The study took at least three months from June and September 2019 covering analysis.

1.7 Significance of the Study

The research would be useful to investors in making informed decisions by analyzing the *F*-scores of a company before deciding on which shares to buy and which ones to dispose of. Creditors will be able to predict the financial soundness of companies before lending their assets. Additionally, managers would find the research useful in making timely responses to financial distress to avoid further losses and avert the situation. The study also would be of great importance to regulators mainly CMA who apply the findings in designing and implementing appropriate policies in ensuring an efficient market system. The government agencies such as KRA would use the findings in designing strategies to avoid tax losses which are brought about by financial distress. This research would also form a basis for literature review to

upcoming researchers as the model has never been used before by any scholar especially in Kenyan context.

1.8 Limitations and Delimitations of the Study

The study only concentrated on the relationship between Piotroski F-Score Model and financial distress of 20 Share indices at NSE. As such, accuracy and reliability of the historical data used to generate results for the study is only correct as captured in the data sources as any rounding off is known to greatly affect the outcome of the indices. In addition, if multiple significant events no matter of which type affect a single firm's stock in close succession, issues arise from the overlapping of estimation and event windows.

Specifically, problems of cross-correlation, implying biased estimators, may arise. This potential problem particularly pertains to small sample studies, where flawed results do not become sufficiently 'corrected' by creating mean values over large numbers of observations. Finally, the study limits the area of scope to NSE 20 Share index companies which will limit the usefulness to interested parties in that line only but other listed companies / interested parties in areas such banking industry may not benefit from the studies. Infrequent trading of the firm's stock, or a mismatch of trading days between the stock and the reference market, may lead to problems in deriving the estimation parameters.

The study used NSE 20 share index, which only capture 20 most traded companies in the market, to compute market model parameters for stock return estimation over the study period. The population chosen was due to reporting structure of the companies which is the same as opposed to others such as banking industry. The study used data for the period January 2016 to Dec 2018. It was possible that data for the variables for different time periods would have given slightly differing results especially where business cycles vary from the one in the period under study.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This literature review is undertaken to bring out the gaps and enhance knowledge related to the applicability of Piotroski *F*-score model in predicting financial distress of NSE 20 Share Index. The submissions and thoughts of various authors on the applicability of Piotroski *F*-score model in predicting financial distress are reviewed and discussed. Literature review includes theoretical review, empirical findings, research gaps and conceptual framework.

2.2 Literature Review

Barniv, Hope, Myring and Thomas (2010) have indicated that experts' profit gauges relate adversely or unimportantly to investigators stock proposals in nations with high financial specialist support. The inverse is valid for nations with low financial specialist support. In all nations they found a positive relationship between's profit figures by experts and future income. The association's expense of getting extra capital will normally expand, making it progressively troublesome and costly to raise the truly necessary assets. With an end goal to fulfill momentary commitments, the board may pass on productive longer-term ventures. Rather than inspecting the connections between future returns and specific budgetary sign, Piotroski (2000) amassed the data contained in a variety of execution measures into a general sign that gave a sign of the general nature of an association's money related position. Piotroski (2000) put together his presentation measures with respect to these parts of troubled firms. Besides, the exhibition measures are molded on the way that the organizations that were estimated were monetarily bothered. A sign that demonstrated a weakening in the money related strength of an upset firm may show a declining in the monetary wellbeing of a monetarily stable firm.

Anticipating disappointment as right on time as conceivable with sound precision empower firms to make a move to lessen the expenses of insolvency, corporate inability to all partners and contribute towards the business and money related condition strength. As per Muriithi (2013), the best cautioning indications of money related emergencies are intermediaries for the weakness of the banking and corporate division. Numerous nation heads everywhere throughout the world has expanded worry over corporate administration because of the expansion of detailed instances of

cheats, inside exchanging, organization clashes among different enterprises adventure. All out financial emergencies are connected more with outside improvements, and household factors are the principle driving pointers of serious yet contained financial misery. Beam (2011) sets that financial emergencies are especially unsafe for the economy and hindering for the soundness of money related area. Its monetary weight is just a redistribution of assets inside the economy.

Ahmad (2006) contended that a sound financial framework requires proper foundation to help productive direct of banking business working condition, administration and administrative system at local just as universal levels so as to diminish bank emergency. fiscal strain alludes to firms confronting budgetary imperatives accordingly not having the option to complete their everyday exercises easily. fiscal strain is where an organization can't meet or experiences issues satisfying its monetary commitments to its out of this world due. Agrawal (2015) characterized money related misery as the failure of a firm to fulfill its monetary commitments as and when they fall due. Schmidt (2010) characterizes budgetary trouble as a circumstance that influences the firm under hazy conditions. Senbet and Wang (2012) relate money related misery to a circumstance where the association's agreement to banks are broken or respected with trouble. A state when an association's business crumbles to the point where it can't meet its money related commitments, the firm is said to have entered the condition of monetary trouble. This is regularly seen at whatever point the company's operational incomes are lower than its budgetary costs. Business firms likewise experience money related misery when they face deficient liquidity to meet their monetary liabilities

Monetarily upset organizations are not ready to seek financial protection continuing while monetarily sound organizations petition for financial protection to flee from lawful suites and assessments. The monetary expense of business disappointments is generally huge. An organization is monetarily upset at whatever point its EBITDA is not as much as its advantage costs. Budgetary influence includes the substitution of fixed-cost obligation for proprietor's value in the expectation of expanding value returns. Monetary pain expectation has become a basic piece of corporate administration as it enables every one of the partners to break down the organization on the heading its taking. As indicated by Alareeni and Branson (2013), organizations which are in fiscal strain will in general display decrease in showcase esteem after

some time. A concentrate by Capalbo, Grossi, Ianni and Sargiacomo (2010) to research the idea of fiscal strain in Italian Local governments tried to comprehend the idea of monetary trouble and the mentalities of focal government towards bothered Local governments. Capalbo et al., (2010) proposed different methodologies including a manufactured layout of the national administrative structure on monetary pain of Italian Local governments through dissecting information on the number, measurement, and geological situation of bothered Italian Local governments.

Budgetary trouble is exorbitant in light of the fact that it makes a propensity for firms to accomplish things that are hurtful to obligation holders and non-money related partners, disabling access to credit and raising partner connections. Again money related misery can be expensive if a company's debilitated condition prompts a forceful reaction by contenders taking advantage of the lucky break to pick up piece of the overall industry. Deflecting fiscal strain viably and proficiently is reliant on early location since it permits more opportunity for reaction. The trouble condition of a firm should direct administration and different partners on the fitting rescue procedures. Fiscal strain is a worldwide issue influencing both created and creating economies. Business firms experience money related misery when they face lacking income to meet their current monetary commitments (Jabeur and Fahmi, 2017). The fall of both enormous and little associations on the planet over has made monetary misery expectation gain ubiquity.

Several models are accessible for budgetary pain forecast yet there is no accord with respect to which model is the best indicator. Factual methods have been generally utilized, Artificially Intelligent Master Systems approach is moderately new and hypothetical models are moderately unprecedented. Given the expenses related with budgetary trouble, it is basic to precisely foresee this hazard. This warrants examining elective models that could be valuable in anticipating the hazard fiscal strain and subsequently the selection of Piotroski model in this examination/inquire about. Observing and breaking down the Operating Cash Flow is a basic for understanding your capacity to pay for conveyances and routine working costs. This is likewise utilized in correlation with all out capital you have been used an examination that uncovers whether your activities are producing adequate money for help of capital ventures you are making to propel your business.

The investigation of organization's proportion of working income contrasted with its all out capital utilized gives a more profound understanding into the organization's business' money related wellbeing, enabling you to look/foresee if the organization may turn out to be monetarily bothered or not. Numerous associations have endeavored to oversee authoritative execution utilizing the decent scorecard approach where execution is followed and estimated in various measurements, for example, monetary execution investor return, client care social obligation, corporate citizenship, and representative stewardship. As per Dilley (2008) business disappointment indications incorporate inward association issues which are portrayed by money related sign coming about because of frail execution prompting chapter 11 lastly to budgetary pain. The firm takes a descending winding pattern because of insufficient asset organization, coming about to a powerless key situating which is confirm by critical drop in deals, poor productivity, and decrease in income and liquidity levels

Purnanandam (2005) decides money related pain as far as dissolvability. He builds up a hypothetical model of corporate hazard the executives within the sight of monetary trouble costs. Monetary trouble is viewed as a middle of the road state among dissolvability and in dissolvability. An organization is bothered when it misses intrigue installments or abuses obligation agreements. Tan (2015) analyzed money related pain and firm execution proof from the Asian budgetary emergency. Utilizing an example of 277 firms from eight East Asian economies, the connection between budgetary pain and firm execution during the Asian Financial Crisis of 1997-1998 was tried. This was on the grounds that the emergency gave an exogenous stun, which diminished the endogeneity issues between firm execution and influence. The outcomes from the investigation built up that organizations with low money related influence will in general perform superior to firms with high monetary influence. Moreover, the examination built up that the Asian Financial Crisis of 1997-1998 amplified the negative connection between money related misery and firm execution. High influence firms were found to encounter more terrible execution during an emergency.

Jiming and Weiwei (2011) completed an investigation concentrating on 50 assembling firms recorded in China securities exchange during 2005-2007. The investigation fused money related and non-monetary factors and utilized Logit

relapse model. The autonomous factors utilized were; productivity working limit, income markers, proprietorship fixation and board qualities. The discoveries uncovered that, the model with non-monetary markers demonstrated to be progressively dependable in money related pain expectation and the practicality and since quite a while ago run legitimacy of the blend model was vastly improved in correlation with the model with just budgetary pointers. Be that as it may, the investigation overlooked the large scale monetary factors which contribute essentially, explicitly during business cycle period. Wu, Gaunt and Gray (2011), completed an examination on building up a liquidation model. They chose different elements from Z – score, O – score, Probit, Hazard, and Hillegeist Keating, pack and Lundstedt (2004) models and utilized proportions in money related misery forecast. They likewise included one crisp factor as intermediary for expansion level in an organization.

Odipo and Sitati (2010) led an investigation utilizing Altman's model in chapter 11 expectation at the Nairobi protections trade. The investigation utilized twenty firms recorded somewhere in the range of 1989 and 2008. The examination utilized Altman's model which consolidated, all out resources, held profit, income before intrigue and assessments, book estimation of value, and deals as free factors. The discoveries of the investigation uncovered that Altman's model was seen as relevant with 80% effective expectation. The examination depended on optional information from NSE and CMA. Nonetheless, this investigation was just constrained to budgetary proportions in chapter 11 expectation. In an examination on evaluating corporate money related misery in South Africa, Bothwell (2010) researched to build up a model for insolvency expectation. The investigation utilized 28 organizations and gathered 64 proportions, ordering firms into fizzled and non-bombed firms. The free factors utilized were Times Interest Earned, Cash to Debt and Working Capital to Turnover. The discoveries uncovered that the model effectively characterized about 75% of fizzled and non-bombed firms. The investigation utilized basic arbitrary testing structure and utilized numerous discriminant model technique. This examination anyway depended uniquely on proportions overlooking different elements which add to money related misery.

In an examination directed to test chapter 11 and monetary trouble expectation in the portable Telkom industry in Ghana, Kpodoh (2010) utilized Z score insolvency

forecast model. The examination utilized subjective and quantitative information (altered single case structure) which was gathered utilizing polls gave utilizing overview technique. Optional information was gotten from budget summaries. The discoveries uncovered the quality of Z score in chapter 11 expectation. It likewise affirmed the connection between's corporate administration and corporate disappointment. The examination anyway focused on proportions and corporate administration barring macroeconomic components which influence firm attributes by implication, activating monetary misery on a firm. The discoveries uncovered a negative relationship on new factor with monetary misery. This model demonstrated to be more solid than the past ones, when it was exposed to an example just as outside the example information.

Salehi and Abedini (2009) in their examination, the capacity of monetary proportions for forecast of budgetary trouble of the recorded organizations in Tehran Stock Exchange (TSE) was explored. Thus, the numerous relapse models were utilized and a model was introduced for forecast of money related misery in recorded organizations in TES. The evaluation of the model was finished by using the information of two gatherings. The principal bunch contained 30 organizations which don't have any monetary trouble, and the subsequent gathering, comparatively, contained 30 organizations which have budgetary misery. Noma (2010) tried Piotroski's venture technique in Japan for the period 1986 to 2001 and found that a supported portfolio with high F-score on high book-to-advertise firms produces 17.6 % yearly returns.

2.3. F-Score and Financial Performance

Piotroski (2000) develops a twofold scoring framework, called F-score, got from nine principal signals. The nine sign measure a stock's monetary condition from three viewpoints: productivity, money related influence/liquidity and working proficiency. Total compensation additionally can be a proportion of money related strength of an organization. An organization with positive net gain for very a few years is less inclined to turn out to be monetarily bothered and subsequently a negative relationship is normal between net gain and the likelihood money related trouble. Aasen (2011) demonstrated that the admonition signs and Z score model can help the board for anticipating corporate issues early enough to dodge budgetary troubles. The

nature of income, as estimated by the degree of accumulations in the profit, is likewise a significant pointer of the money related state of a firm.

Higher measure of gatherings shows lower nature of profit and is related with higher likelihood of default. Thus, a positive connection between the accumulations and the likelihood of default is normal. A few contemplates have proposed that organizations with low levels of liquidity are bound to encounter budgetary trouble, since money obliged firms are progressively powerless against exogenous negative stuns to income. Ross et al. (2007) shows that the net revenue is the general measure of an association's proficiency with which it transforms each pushing in deals into net benefit. A basic signal is named either fortunate or unfortunate whereof one is great and zero is awful. Four factors identify with gainfulness, ROA (return on resources), CFO (income from tasks) DROA (change in ROA) and accumulation. ROA is characterized as overall gain before exceptional things isolated by all out resources toward the start of the year. CFO rises to income from activities isolated by absolute resources toward the start of the year.

On the off chance that ROA and CFO are certain Piotroski characterizes the marker variable F_ROA and F_CFO rises to one, else zero. The DROA variable is the present year's ROA subtracted by the earlier year's ROA. The relating pointer variable F_DROA equivalent to one if $DROA > 0$, generally zero. The collection signal is characterized as ROA short CFO and its marker variable, $F_Accrual$ equivalent to one if $CFO > ROA$, else zero. Under budgetary influence/liquidity, he characterizes three factors, DLeverage (change in influence), DLiquid (change in liquidity) and Eq_Offer (issuance of value). The DLeverage variable is the adjustment in the proportion of all out long haul obligation to average all out resources and an expansion in monetary utilized is thought to be awful. The marker variable, $F_DLeverage$, approaches one if money related influence diminishes, generally zero.

DLiquid measures liquidity and equivalent to the adjustment in the present proportion (current resources partitioned by current liabilities) among present and earlier year. An improvement in liquidity is thought to be great, and the marker variable equivalent to one if $F_DLiquid > 0$, else zero. The variable Eq_offer measures if a firm issue normal value. Expecting that giving value is terrible for a high book-to-showcase firm the relating pointer variable F_EQ_Offer rises to zero if the

organization gave value, else one. To catch working productivity, he utilizes the two factors DMargin (change in net edge) and DTurn (change in resource turnover). DMargin is the association's present gross edge proportion (net benefit separated by deals) less the earlier year's gross edge proportion and F_DMargin approaches one if the edge improves, generally zero.

The DTurn is characterized as the adjustment in an association's present resource turnover (current deals scaled by the start of the year resources). On the off chance that the benefit turnover improves the marker variable F_DTurn rises to one, else zero. F-score is the whole of the parallel central sign ($F_SCORE = F_ROA + F_DROA + F_CFO + F_ACCRUAL + F_DMARGIN + F_DTURN + F_DLEVER + F_DLIQUID + F_EQ_OFFER$). Consequently, the composite F-score can go from zero to nine and a firm with a higher F-score is required to have a more grounded money related execution. The speculation methodology depends on choosing firms with high F-scores.

Mohr (2010) tried the adequacy of the F-Score for a Eurozone low BM firm example, somewhere in the range of 1999 and 2010. Mohr finds the F-score can be a viable device for isolating victors and washouts. High F-Score portfolios reliably beat low F-Score portfolios over the whole example period. Rathjens and Schellhove (2011) examine whether Piotroski's F-score can effectively be applied to the U.K advertise. They separate firms into five quantiles as indicated by the BM proportion, and test the viability of Piotroski's F-score in both the top (high BM firm portfolio) and base (low BM firm portfolio) quantiles. They discover Piotroski's F-Score functions admirably when applied to the U.K showcase, just as in the low BM firm example, yet they discover his F-Score doesn't create noteworthy returns in the high BM firm portfolio. Moreover, Rathjens and Schellhove appear there was no reasonable sign for a lessening in unusual returns after the distributing of Piotroski's paper.

Hyde (2013) inspects the F-Score in a worldwide developing business sector setting. The universe is the constituents of the MSCI Emerging Market Index, which comprise of 21 nations, including China. Hyde shows that Piotroski's F-score is profoundly compelling for South Korea, India, South East Asia, China, and South Africa, and the outcome is powerful, in the wake of controlling for firm size, energy, holding period, and worth. The arrival contrast among high and low F-Score portfolios in China is

12.49%. A concentrate by Galdi and Broedel, Lopes (2009) finds that the F-score is viable when applied to the Brazilian financial exchange. Notwithstanding, the arrival is essentially determined by little, low liquidity firms. Attwood (2012) tests the F-Score utilizing Piotroski's unique system and finds that, in South Africa, high F-score firms acquire more significant yields than low F-Score firms, yet the outcome isn't measurably huge. Additionally in South Africa, Pullen (2013) utilizes a quarterly rebalancing system rather than a yearly rebalancing procedure and shows that the F-Score methodology is both financially and factually huge.

2.4 Profitability Signals and Financial Distress

Profit is a basic element for the achievement and future endurance of a firm. Firms put resources into capital undertakings to recover themselves and stay important in the consistently changing business world. They in this way put resources into new items, open new branches, set up industrial facilities, and embrace significant fixes and upkeep and create plans of action that are savvy. The announcement of income is a monetary report delineating measure of cash approaching and active during a specific timeframe. As per Claessens, Stijn, Djankov, and Lang (2000) income condenses the genuine or expected measure of cash coming or leaving the firm over some stretch of time which can be a month, quarter or year. It is an investigation of the planning of money receipts and money payment over a particular timeframe. The incomes don't show whether the business will be productive, however it shows the money position of the business at some random point in time by estimating income against expenses. It likewise records money to and money from working, contributing, and financing exercises, and furthermore the net increment or diminishing in real money for a specific period. It along these lines addresses the inquiries regarding where the cash originated from and where it went to.

As indicated by Stowe et al, (2002), benefit of firms are hierarchical targets of intrigue which go connected at the hip the two have a relationship to one another. A solid income position bring about liquidity of an organization which causes it continue its activity bringing about age of higher benefits and judicious re-speculation of the benefits brings about the development of the firm. Reliable positive income position will encourage higher benefit levels and henceforth abundance money for venture. These destinations are controlled by the vital heading of the organization, the nature of its business, the time of its reality and the impact of the earth around the

organization for instance rivalry, government arrangements, clients, and staff among others. (Sharma and Iselin, 2000) has considered the value of income data in such settings, the aftereffects of which show huge data convenience in income information for evaluating corporate dissolvability.

Mong'o (2010) broke down the effect of income on productivity among business banks in Kenya over a time of five years from 2005-2009. It was explicitly directed to clarify the impact that different parts of incomes have on gainfulness development. The goal of the examination was to set up the causality that exists between the benefit and income. This was incited by the need to unwind the riddle on whether benefits are driven with income or the other way around. This investigation by Mong'o (2010) identifies with the theme of concentrate as the goals of the examination are indistinguishable with similar factors in play. The main distinction is the segment of study where Mong'o (2010) thinks about effect of income on gainfulness among business banks rather than the little and medium undertakings which are non-budgetary foundations.

2.5 Liquidity and Financial Distress

Firm liquidity is the capacity of an advantage for be changed over to money rapidly requiring little to no effort. Fluid resources can be changed over into money rapidly and efficiently (Brealey et.al. 2000). The liquidity of a firm is estimated by its capacity to fulfill its transient ridiculously due. Liquidity alludes to the dissolvability of the association's general monetary position the straightforwardness with which it can cover its tabs. Liquidity decides the capacity of an association to exploit productive ventures. An association that is enough supported is better put to consult for better terms of exchange as most providers would need to manage it. Financing, along these lines, is an essential for accomplishment of associations particularly in a profoundly focused market.

Darn (2011) through an experimental examination of influence, obligation development and firm venture noticed that satisfactory degree of financing and liquidity was emphatically related to productivity. He reasoned that high influence is disadvantageous to the association's degree of venture and constrains the association's development openings. The most widely recognized proportions for estimating liquidity as indicated by Dang (2011) are speedy proportion (current advantages for

current liabilities) and complete resources for absolute liabilities. Since a typical forerunner to monetary pain and insolvency is low or declining liquidity, these proportions are seen as great driving markers of income issues. A few contemplates have proposed that organizations with low levels of liquidity are bound to encounter budgetary trouble, since money obliged firms are progressively powerless against exogenous negative stuns to income.

In the numerous relapses examination that pursues, the specialist utilizes the proportion of current resource for current obligation to intermediary liquidity and expect that it was decidedly identified with the monetary pain. Hypothetically, the reasons for money related trouble are issues of liquidity, which is the failure of current advantages for spread current liabilities: which is the proportion of current proportion. The lower this proportion demonstrates that the firm has lower measure of current assets to cover the present commitment. The firm incapable to meet its present commitment may have high likelihood of monetary trouble. In this manner, liquidity is a significant determinant of money related trouble.

2.6 Operating Efficiency and Financial Distress

Operational efficiency is characterized as the proportion between a yield picked up from the business and a contribution to maintain a business activity (Timothy et al., 2005). While improving operational effectiveness, the yield to include proportion improves. In other manner is characterized as in the case of something can be settled and the level of simplicity with which it tends to be settled. The long haul dissolvability of a firm decides its going concern status along these lines a firm whose long haul dissolvability is in question can't make due over the long haul (Beninga, 2006). All out current liabilities/Total current resources proportion demonstrates the proportionate cases of proprietors and the pariahs against the company's advantages. The intention is to get a thought of the pad accessible to untouchables on the liquidation of the firm. The proportion gives a sign of what segment of the bank's liabilities is secured by its advantages. A low proportion infers that the bank has along dissolvability edge. The proportion ought to never be over 100% on the grounds that that would suggest the bank's liabilities surpass its benefits, rendering it indebted.

A proportion of 1:2 is generally viewed as a palatable proportion, CBK Prudential Guidelines (2010). Hypothetically if the proprietor's advantages are more noteworthy

than that of leasers, the money related position is profoundly dissolvable (Ross, Westerfield and Jordan, 2007). Ross et al. (2007) shows that the net revenue is the general measure of an association's proficiency with which it transforms each pushing in deals into net benefit. Consequently, the creators contend that the proportion will attempt to learn the relationship that exists between an association's complete working salary and all out working cost. As per the creators, this is a generally excellent proportion of the administration's proficiency in overseeing working expenses. With narrowing net premium edges non-premium salary has gotten progressively critical to banks as of late. By taking the absolute working salary which incorporates the bank's overheads and gauging it against the all out working cost, the subsequent proportion is known as the pay/cost proportion, which is likewise a proportion of proficiency. On the off chance that this proportion is high, it will show the bank's capacity to control its general expenses and the bank's productive administration of offers exercises. It will likewise demonstrate the bank's capacity to produce benefits out of assets focused on it. Then again, if low it will demonstrate the decrease in deals because of outside components and show expanded cost of creation over at some point because of elements past the association's control. It will likewise show a decrease in costs because of government controls or other outer elements.

Turetsky and McEwen (2001) clarify the investor's assets as the leftover benefits that a firm will keep up for their prompt utilization or held for the future extension of the business. The creators show proof that before breakdown, numerous banks lessen the dispersion of profits and may even record negative income. The creators show that for a business entity, a profit is assigned as a fixed sum for each offer; accordingly, an investor gets a profit with respect to their shareholding. By partitioning the investors' assets by the all out resources of the bank, you land at a proportion that estimates how well investors' assets have been used. In the event that the assets climb relatively with all out resources (or the other way around) the proportion remains the equivalent. However, on the off chance that the investors' assets are developing more than the absolute resources, at that point the proportion will go up which is attractive (Sharma and Iselin, 2006).

2.7 Intervening Factors and Financial Distress

The intervening factors considered in this examination incorporate foundational dangers and firms' sizes. Dangers radiate from the unsafe business undertaking, for

example, credits or advances while firm size alludes to the all out resources that are held by a given association. A non-performing advance is an advance that isn't winning salary and the full installment of head and intrigue is never again envisioned (Zeituni, Tian and Keen, 2007). As per the creators' NPL is acknowledged when head or intrigue is 90 days or increasingly reprobate, or the development date has passed and installment in full has not been made. The prompt outcome of huge measure of NPLs in the financial framework is bank disappointment. Numerous examines on the reason for bank disappointments find that advantage quality is a factually critical indicator of bankruptcy (Barr and Siems, 2004), and that bombing banking organizations consistently have elevated level of non-performing advances preceding disappointment.

Net credits at the degree of 215 billion Kenya shillings as at December 31st, 2001 represented 51% of absolute net resources of the Kenyan's banking area. Right now, the extent of the NPLs to total credits was 30% (Zeituni, Tian and Keen, 2007). Brigham and Ehrhardt (2005) contend that the NPLs are one of the significant reasons for corporate disappointment. Each NPL in the monetary segment is seen as a front-side identical representation of a debilitated unrewarding firm. Starting here of view, the annihilation of non-performing advances is an essential condition to improve the monetary status. On the off chance that the NPLs are continued existing and ceaselessly turned over, the assets are secured up unfruitful areas; consequently, preventing the monetary develop than dimpairing the financial effectiveness. The specialist along these lines concentrated on the effects of NPLs explicitly at the bank level to experimentally assess how they add to corporate disappointment. The best cautioning indications of money related emergencies are intermediaries for the weakness of the banking and corporate division.

All out financial emergencies are connected more with outer improvement, and residential factors which are the principle driving markers of extreme yet contained financial pain. He includes that most clear pointers that can be utilized to foresee banking emergencies are those that relate straightforwardly to the adequacy of the financial framework. In Japan, monetary emergency has been connected to Non-Performance of Loans (Sultana, 2002). As indicated by this analyst, Japanese still endure under the heaviness of thousands of billions of yen in awful credits coming about because of the breakdown in resource costs 10 years back in the Country's

money related framework. Kithinji and Waweru (2007), then again, contend that few created nations including USA are encountering banking emergency. For instance, Citibank bunch discounted more than \$39 billion in misfortunes (CBK, 2009).

In spite of the issues confronting the worldwide monetary market, Canadian banks have remained moderately steady and the creator's credits this to a mix of administrative order and social mentality among money related establishments. National Bank of Kenya CBK (2013) announced a 4.5 percent decrease in pre-charge benefit in 2012. Non-Performance of Loans can be treated as unfortunate yields or expenses to an advancing bank, which decline the bank execution. The danger of non-execution of credits primarily emerges as the outer financial condition turns out to be more terrible off, for example, financial downturn. In late decades, huge quantities of nations have encountered money related trouble of shifting degrees of seriousness and some have endured rehashed episodes of misery.

2.8 Research Gaps

Anticipating disappointment as right on time as conceivable with sound precision empower firms to make a move to lessen the expenses of insolvency, corporate inability to all partners and contribute towards the business and money related condition strength. As per Muriithi (2013), the best cautioning indications of money related emergencies are intermediaries for the weakness of the banking and corporate division. All out financial emergencies are connected more with outside improvements, and household factors are the principle driving pointers of serious yet contained financial misery. Beam (2011) sets that financial emergencies are especially unsafe for the economy and hindering for the soundness of money related area. Its monetary weight is just a redistribution of assets inside the economy. Ahmad (2006) contended that a sound financial framework requires proper foundation to help productive direct of banking business working condition, administration and administrative system at local just as universal levels so as to diminish bank emergency.

Fiscal strain alludes to firms confronting budgetary imperatives accordingly not having the option to complete their everyday exercises easily. fiscal strain is where an organization can't meet or experiences issues satisfying its monetary commitments to its out of this world due. Agrawal (2015) characterized money related misery as the

failure of a firm to fulfill its monetary commitments as and when they fall due. Schmidt (2010) characterizes budgetary trouble as a circumstance that influences the firm under hazy conditions. Senbet and Wang (2012) relate money related misery to a circumstance where the association's agreement to banks are broken or respected with trouble. A state when an association's business crumbles to the point where it can't meet its money related commitments, the firm is said to have entered the condition of monetary trouble. This is regularly seen at whatever point the company's operational incomes are lower than its budgetary costs. Business firms likewise experience money related misery when they face deficient liquidity to meet their monetary liabilities

Monetarily upset organizations are not ready to seek financial protection continuing while monetarily sound organizations petition for financial protection to flee from lawful suites and assessments. The monetary expense of business disappointments is generally huge. An organization is monetarily upset at whatever point its EBITDA is not as much as its advantage costs. Budgetary influence includes the substitution of fixed-cost obligation for proprietor's value in the expectation of expanding value returns. Monetary pain expectation has become a basic piece of corporate administration as it enables every one of the partners to break down the organization on the heading its taking. As indicated by Alareeni and Branson (2013), organizations which are in fiscal strain will in general display decrease in showcase esteem after some time. A concentrate by Capalbo, Grossi, Ianni and Sargiacomo (2010) to research the idea of fiscal strain in Italians Local governments tried to comprehend the idea of monetary trouble and the mentalities of focal government towards bothered Local governments.

Capalbo et al., (2010) proposed different methodologies including a manufactured layout of the national administrative structure on monetary pain of Italian Local governments through dissecting information on the number, measurement, and geological situation of bothered Italian Local governments. Budgetary trouble is exorbitant in light of the fact that it makes a propensity for firms to accomplish things that are hurtful to obligation holders and non-money related partners, disabling access to credit and raising partner connections. Again money related misery can be expensive if a company's debilitated condition prompts a forceful reaction by contenders taking advantage of the lucky break to pick up piece of the overall industry. Deflecting fiscal strain viably and proficiently is reliant on early location

since it permits more opportunity for reaction. The trouble condition of a firm should direct administration and different partners on the fitting rescue procedures.

Fiscal strain is a worldwide issue influencing both created and creating economies. Business firms experience money related misery when they face lacking income to meet their current monetary commitments (Jabeur and Fahmi, 2017). The fall of both enormous and little associations on the planet over has made monetary misery expectation gain ubiquity. Several models are accessible for budgetary pain forecast yet there is no accord with respect to which model is the best indicator. Factual methods have been generally utilized, Artificially Intelligent Master Systems approach is moderately new and hypothetical models are moderately unprecedented. Given the expenses related with budgetary trouble, it is basic to precisely foresee this hazard. This warrants examining elective models that could be valuable in anticipating the hazard fiscal strain and subsequently the selection of Piotroski model in this examination/inquire about

The investigation of organization's proportion of working income contrasted with its all out capital utilized gives a more profound understanding into the organization's business' money related wellbeing, enabling you to look/foresee if the organization may turn out to be monetarily bothered or not. As per Dilley (2008) business disappointment indications incorporate inward association issues which are portrayed by money related sign coming about because of frail execution prompting chapter 11 lastly to budgetary pain. The firm takes a descending winding pattern because of insufficient asset organization, coming about to a powerless key situating which is confirm by critical drop in deals, poor productivity, and decrease in income and liquidity levels. Worth contribution depends on the perception that stocks evaluated moderately inexpensively in connection to a worth estimation like profit or book esteem will in general yield an arrival premium over the general list returns. These stocks are seen to have low development potential and are out-of-support. Development contributing, then again, depends on shaping arrangement of firms that are accepted to be very nearly fast extension of their activities after some time. These stocks are alluded to as development stocks or fabulousness stocks. Woodley, Jones and Reburn (2011), Attwood (2012), and Van der Merwe (2012), find that the F-Score procedure creates benefit yet this isn't measurably critical.

Thorp (2011) have demonstrated that the Piotroski screen stayed one of the best high BM screens accessible. Aside from being utilized on stock trades of created economies the screen was additionally tried on little capitalization stocks in India by Bhardwaj (2010) who found that six firms passed the Piotroski screen, they all happened to be little tops and the Piotroski portfolio conveyed one-year returns of 259% in examination with that stock trade's little tops return of 188%. The screen was likewise applied on the JSE where by and large two firms for each annum were recognized by methods for Piotroski's screen for portfolio arrangement by Power stocks Research. The examination was accomplished for the period 1994 until 2007. It was discovered that a technique of framing portfolios comprising just of high BM firms that had a F-score of 9 (most grounded sign) yielded compound yearly development rate (CAGR) of 48%. Essentially, portfolios shaped of firms that had a F-score of 8 yielded a CAGR of just 11%.

Having experienced the different examinations both all-inclusive and locally its outstanding that researchers have been utilizing predominantly Altman's model/Z-score in forecast and in any event, approving it anyway no other model has been used to encourage more investigations on monetary misery along these lines the need to ponder the subject however utilizing another model called Piotroski model. This study sought to establish the predictability of monetary strain forecast among firms at the NSE 20-Share Index.

2.9 Theoretical Framework

Theoretical review outlines the suppositions on which the current research is anchored. Theories are used by scholars when performing research studies to form a foundation for the parameters, or boundaries, of a study. This study is founded on both theory and empirical literatures. Additionally, section discusses theories of financial distress. Theories explaining financial distress in corporations include Balance sheet decomposition measure / entropy theory, gambler's ruin theory, efficient market hypothesis and wreckers theory of financial distress.

2.9.1 Balance Sheet Decomposition Measure (BSDM) / Entropy theory

The hypothesis was created by bookkeeping teacher called Lev (1973) and he contended that, single direction of distinguishing firms' monetary misery could be a cautious take a gander at the progressions happening in their asset reports. Following

this technique, the contention would follow along this rule: "like any endeavor, firms would will in general keep up a condition of harmony that guarantees supporting existing firms' structure". In the event that an association's fiscal reports reflect huge changes in their monetary record organization of benefits and liabilities over a sensible timeframe, almost certainly, the organizations are unequipped for keeping up the harmony state. Since these progressions are probably going to get wild in future, one can anticipate money related trouble in these organizations. The hypothesis utilizes both univariate and different discriminant examination.

Univariate investigation utilizes money related proportions and specifically bookkeeping proportions to anticipate monetary trouble while different discriminant examination utilizes more than one bookkeeping proportions. Lev demonstrates that the decay proportions of bombed firms are bigger than those of non-bombed firms and infers that deterioration measure might be conveniently remembered for monetary misery forecast models. On the off chance that critical changes are seen in the piece of the accounting report the firm is probably going to endure budgetary pain (Aziz and Dar, 2006). Stakeholders can utilize monetary decay in helping spot checking the money related strength of an organization. The side effects of monetary pain can be seen well before disappointment. This monetary method of reasoning of firms' probable disappointment is the contention of BSDM or entropy hypothesis.

2.9.2 Gambler's Ruin theory

Gambler's ruin hypothesis was created by Christiaan Huygens (1657). The fundamental thought of this hypothesis relates with the round of a card shark, who plays with a self-assertive whole of cash. Speculator would play with certain probabilities of increase and misfortune. Game would proceed until the card shark loses all his cash. Hypothesis would likewise discuss card shark's definitive ruin and anticipated span of the game. In setting of the association's money related pain, firm would replace a card shark. Firm would keep on working until its total assets goes to zero, point where it would fail. The hypothesis accept that firm has got some given measure of capital in real money, which would continue entering or leaving the firm on arbitrary premise contingent upon association's tasks. The speculator begins with a positive, discretionary, measure of cash where the card shark wins a dollar with likelihood p and loses a dollar with a likelihood $(1-p)$ in every period. The game proceeds until the speculator comes up short on cash (Espen, 1999).

The firm can be thought of as a speculator playing over and over with some likelihood of deficit, proceeding to work until its total assets goes to zero (chapter 11). In setting of the company's money related trouble, firm would replace a card shark. Firm would keep on working until its total assets goes to zero, point where it would fail. The hypothesis accept that firm has got some given measure of capital in real money, which would continue entering or leaving the firm on arbitrary premise contingent upon company's activities. In some random period, the firm would encounter either positive or negative income. Over a run of periods, there is one potential composite likelihood that income will be constantly negative. Such a circumstance would lead the firm to default on some loans, as it has left money. Subsequently, under this methodology, the firm stays dissolvable as long as its total assets is more prominent than zero. These total assets are determined from the liquidation estimation of investors' value.

With an expected introductory measure of money, in some random period, there is a net positive that an association's incomes will be reliably negative over a run of periods, at last prompting chapter 11 (Aziz and Dar, 2006). The significant shortcoming of this hypothesis is that it expects that an organization begins with a specific measure of money. There two principle challenges with this hypothesis while anticipating chapter 11 is that the organization has no entrance to protections markets and the incomes are consequences of free preliminaries and administrative activity can't influence the outcomes (Espen, 1999). In some random period, the firm would encounter either positive or negative income. Over a run of periods, there is one potential composite likelihood that income will be constantly negative. Such a circumstance would lead the firm to bow out of all financial obligations, as it has left money. Thus, under this methodology, the firm stays dissolvable as long as its total assets is more noteworthy than zero. This total assets is determined from the liquidation estimation of investors' value. From the substance the hypothesis is significant in connection to my examination in anticipating monetary misery of organizations as it includes computation of total assets of the organizations from the liquidation estimation of organizations' value and furthermore the observing of working income of an organization.

2.9.3 The Efficient Market Hypothesis

Fama (1970) expressed that the essential job of the capital market is the portion of responsibility for economy's capital stock. Thusly, the market expected to give precise sign to financial specialists to empower the proprietors of the capital stock to adequately circulate their funding to those organizations where they will get ideal profits for their ventures. For these sign to be precise, as it were at the costs of the possession stakes in the different organizations to mirror the genuine financial estimation of those proprietorship stakes, it is necessitated that all accessible data that has a course on the estimations of those proprietorship stakes were considered in the assurance of those costs. This suspicion, where the cost of some random stock successfully speaks to the normal monetary estimation of a possession stake in that firm dependent on known data, is named the proficient market theory (EMH).

The suggestion is that the purchaser and the buyer of a stock have, hypothetically, an equivalent possibility of benefitting from a stock exchange. While the EMH at first delighted in wide scholarly help, its legitimacy was consequently tested (Fama, 1991). Darker (2011) expressed that not many individuals today have faith in the exacting truth of the EMH. Basu (1977) discovered proof of the presence of an EMH abnormality known as the value income (P/E) speculation or worth premium. The value proportion theory places that the P/E proportion might be a marker of future monetary execution; low (high) P/E-proportions may show high (low) future execution of the stock cost because of misrepresented financial specialist negativity (good faith). In the event that this speculation was genuine it is in opposition to the EMH which prevents the probability from securing overabundance returns.

Basu (1977) expressed that as opposed to the developing conviction that openly accessible data is promptly seized in security costs, there appear to be slacks and erosions in the change procedure. Along these lines, proof existed that protections were every so often mispriced. This mispricing made exchange open doors for speculators. Basu (1977) ascribed the worth premium to overstated financial specialist desires dependent on poor or great past execution that has been joyfully extrapolated into what's to come. At the end of the day, he ascribed the worth premium to imperfect financial specialist conduct. A counter contention to clarify the worth premium was proposed by supporters of the neo traditional budgetary structure of balanced desires and aggressive harmony.

2.9.4 Wreckers Theory of Financial Distress

The Wreckers hypothesis of money related trouble exuded from Campbell, Hilscher and Szilagi (2005) and it depends on making one-stride back and attempting to recount to the narrative of benefitting from transport destruction in a totally alternate point of view. The wreckers“ hypothesis of money related trouble looks to clarify the advantages that may step out of monetary misery to partners. It isn't important to trait the negative overabundance returns of troubled firms to wasteful or unreasonable markets. Such negative abundance returns can be demonstrated to be the balance result under productivity in a domain where a subset of members can draw returns (in kind) from bothered organizations (Nyamboga et al., 2014).

The wrecker's hypothesis of monetary misery paints a figment of a firm being hit by a progression of negative stuns, making misfortunes and moving toward a condition of budgetary trouble. With higher influence, instability of offer costs increments regarding private data; a definitive destiny of the firm relies upon issues obscure to the overall population (Nyamboga et al., 2014). The demonstration of pulling back assets from as of now monetarily troubled firms who very despite what might be expected severely need those assets is alluded to as "destroying". The activity can likewise be clarified as the procedure of pre-emptive devastation of an organization before its worth at last falls to an incentive past rescue.

Speculators pull back assets from the firm as private, non-profit benefits. Monetarily upset firms investors will possibly endure opportunity cost if the firm recuperates, be that as it may on the off chance that it defaults on its commitments, the withdrawal of assets is esteemed to be a free wellspring of assets which can be reinvested elsewhere for a worthy return. This demonstration is contrasted with the conventional idea of tearing separated an old ship which is past or too costly to even think about repairing and using its individual parts to put another more current one thus not financially worth (Kalckreuth, 2005).

2.10 Conceptual Framework

Conceptual framework is an analytical tool with several variations and contexts. It is used to make conceptual distinctions and organize ideas. The conceptual framework sets out the relationship between the independent and dependent variables. Strong

conceptual frameworks capture something real and do this in a way that is easy to remember and apply.

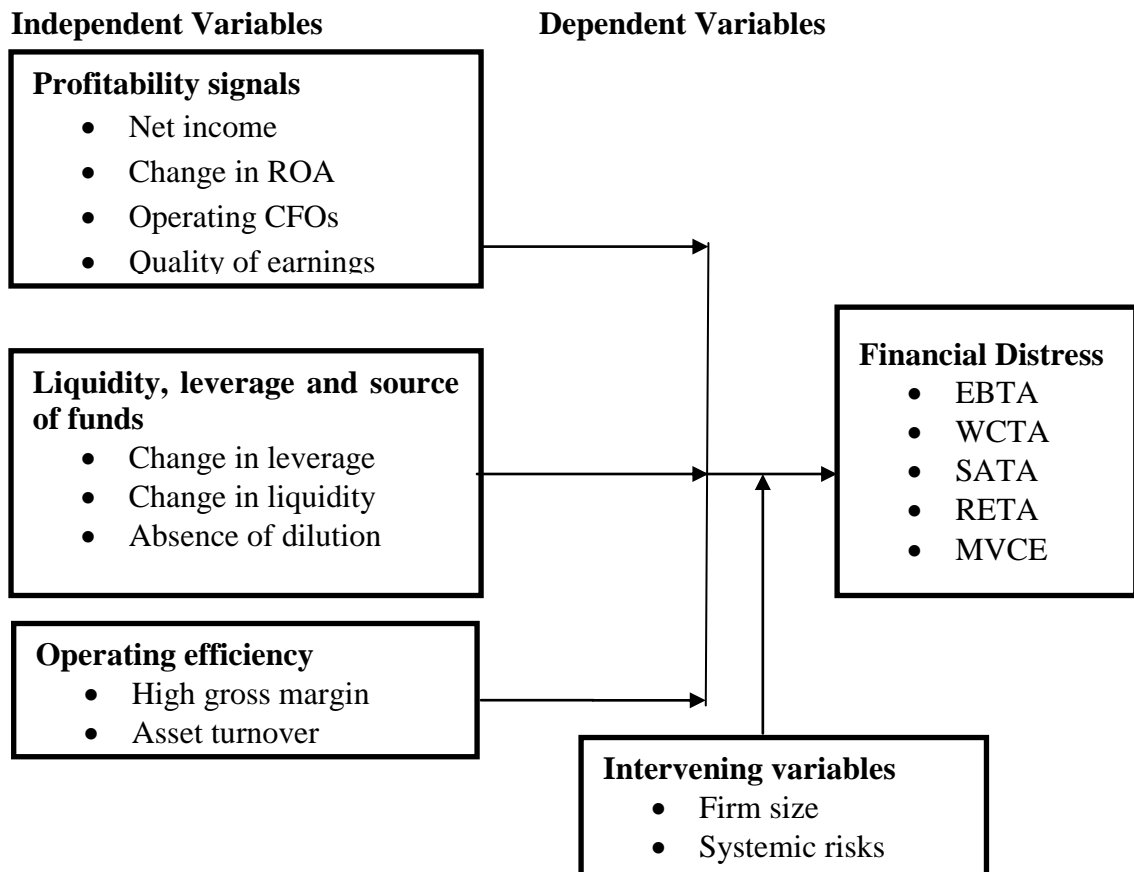


Figure 2.1: Conceptual Framework

Source (Researcher, 2019)

CHAPTER THREE

RESEARCH DESIGN AND METHODOLOGY

3.1 Introduction

This chapter describes the design and methodology that was used in the study. It expounds on the study design, data sources, study area, study population, sample size and sampling techniques, research instruments used, the validity of the instruments, methods of data analysis and presentation of results and the limitation of administration of research tools.

3.2 Research Design

In this research, descriptive/illustrative research configuration was employed since the investigation proposed to assemble quantitative and subjective information that would help address all data about the monetary trouble of organizations recorded in the NSE 20 Price Index. Distinct inquire about was fitting a result of its particular nature and the way that it encourages a general comprehension and elucidation of the issue. It was utilized to acquire data concerning the condition of wonder to depict what exist regarding factors or conditions in a circumstance. As indicated by Cooper and Schindler (2011), an unmistakable research gathers information from individuals from a populace and enables the scientist to get the expressive existing marvels by getting some information about their observations, demeanors, conduct or qualities. The primary focal point of this examination was quantitative. The underlining idea was to choose a few focused on situations where an escalated investigation distinguished the potential options for comprehending the examination inquiries based on the current arrangement applied in the chose contextual analysis. The examination endeavored to portray and characterize a subject, regularly by making a profile of gathering of issues.

3.3 Population of the Study

With regards to this survey, the objective populace was characterized as the totality of firms recorded at the Nairobi Securities Exchange of which the factual properties were assessed. The NSE 20 offer file included the 20 firms inside the NSE 20 offer list as at December 2018. The populaces of enthusiasm of this investigation was budgetary reports of two-year time span somewhere in the range of 2016 and 2017 of 20 enlisted organizations recorded in the NSE 20 Price Index. The explanation with respect to why these organizations are picked is a direct result of the accessibility and

the unwavering quality of the fiscal reports in that they are dependent upon the obligatory review by globally perceived review firms just as controllers.

3.4 Sampling and Sample Size

The sample of the examination incorporated every one of the organizations that structure the NSE 20 offer list. The NSE 20 Share Index was chosen from organizations in the NSE. The quarterly NSE 20 offer record was dissected against comparing money related execution in the time of study. The NSE 20 offer list is most seasoned market record in the market thus gave the fundamental information to the time of study. The period viable was between years 2016 and 2017. This meant two years or eight (8) perceptions which Hajek (2007), recognizes that such a period is huge enough to get hearty information for investigation. This research focused on 20 organizations recorded in the NSE 20 Share Index in Kenya accordingly evaluation was utilized to gather its information. The utilization of statistics is ordinarily utilized as it gives a genuine proportion of the populace. Accordingly, no examining system was important on the grounds that the exploration utilized the whole populace.

3.5 Data Collection Procedure

Mertens (2010) characterize information assortment instrument as a gadget that determines and externalizes the information gathering process, instruments are typically composed and might be offered legitimately to the subject to gather information or may give target depiction of the assortment of specific sorts of information. As indicated by Mugenda and Mugenda (2012), an analyst needs to create instruments with which to gather information. The examination utilized auxiliary information for the period 2016 to 2017 budgetary years. The information utilized was sourced from money related reports, library, organization site, diaries just as productions applicable to the organizations recorded at the NSE 20 Price Index. The analyst utilized optional information for getting important data for the investigation. Board information was utilized in light of the fact that it thinks about the conduct of the example firms after some time and crosswise over space. The optional information was accessible in the NSE records just as the organizations' budgetary reports.

Utilizing an information assortment sheet, the money related misery viewpoints and budgetary execution markers was gathered from the quarterly outcomes assembled by

the 20-share file firms recorded in the NSE. This time arrangement board information incorporated the chose parts of money related misery and budgetary execution of NSE 20 Share Index over the multi-year term. The extra data required for the examination was acquired from optional money related information of the particular organizations. The NSE is a believable source that contains precise auxiliary information for the examination factors.

3.6 Data Analysis

Data analysis is done so as to assess, clean, change and model information with the point of distinguishing and featuring helpful data that can be utilized to help the basic leadership process. Piotroski (2000) created two models to anticipate money related misery on an organization. The principal model uses the total Piotroski's F-score and the subsequent one uses the individual parts that include the score (factors). The total score is a general pointer of the monetary soundness of a firm. Higher scores are relied upon to be connected with lower likelihood of default and thus a negative connection between the score and the likelihood of default is normal. The score incorporates factors identified with gainfulness, income sufficiency, influence, liquidity, resource turnover, nature of profit and value weakening.

Piotroski (2000) contends that monetary trouble is related with declining benefit, income and liquidity and rising degrees of money related influence. Information examinations included the arrangement of gathered information, coding, and orchestrating information so as to process it. The information was handled utilizing windows exceed expectations and SPSS programming. The investigation utilized strategic relapse as an expectation strategy to discover the likelihood of money related trouble for a firm dependent on the total Piotroski's F-score just as individual parts that contain the score. The data was shown by utilization of tables, figures and in writing structure. A strategic relapse investigation was led to assess how well the free factors are essentially identified with money related execution. In a calculated relapse investigation all the autonomous factors were gone into the relapse condition on the double on the grounds that there are no control factors. As indicated by strategic relapse, the likelihood of the occasion happening is given by the accompanying:

$$P(Y) = 1 / (1 + e^{-z}) + \epsilon$$

where

$P(Y)$ = probability of the event Y occurring

z = linear combination of independent variables represented as:

$$\beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \dots + \beta_n X_n$$

β_0 = constant

β_1 , β_2 and β_3 are coefficients

X_1 = Profitability signals

X_2 = Liquidity, leverage and source of funds

X_3 = Operating efficiency

ϵ = error term

3.7 Ethical Considerations

The researcher looked for endorsement from Kabarak University to empower assortment of information after which the proposition was exposed to Ethics and Review Board. Further, the analyst acquired endorsement from the National Commission for Science, Technology and Innovation (NACOSTI) to direct the examination in the chose firms. What's more, the analyst got important approval from Nairobi Securities Exchange and the individual associations to lead this exploration on the chose respondents. To guarantee moral contemplations are guaranteed in the information assortment, the analyst guaranteed that the outcomes acquired from the exploration is dependable and solid. The information gathered was additionally gone into the SPSS information sheet and run for clearness exactness. Steady confirmation of the information assortment process guaranteed consistency and constancy.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.1 Introduction

This section features a presentation, analysis and interpretation of the results and findings. The purpose of the study was to analyze the applicability of Piotroski *F*-score model in predicting financial distress of NSE 20 Share Index. The organized data obtained from the financial reports, library, company website, journals as well as publications relevant to the firms listed at the NSE 20 Price Index was cleaned, sorted and coded prior to the analysis. The coded data was entered in the SPSS software and output obtained in relation to the research objectives which were: to evaluate the influence of profitability signals, liquidity, operating efficiency and leverage on predicting the financial distress of NSE 20 Share Index. Tables and diagrams were used to present the data for easy interpretation by the readers.

4.2 Descriptive Analysis of Financial Distress Predictability

A descriptive analysis of the independent and dependent variables utilized in the study was conducted using the SPSS. In this study, the dependent variable was financial distress and independent variables were profitability signals (Net income, ROA, operating efficiency and quality of earnings), liquidity, leverage and source of funds (change in leverage, change in liquidity and absence of dilution) and operating efficiency (high gross margin and asset turnover). The information analyzed is for the past 2 years (between years 2016 to 2017) making the N for this study to be 8.

Table 4.1: Descriptive Statistics on Profitability signals for years 2016 and 2017

Aspects	2016				2017				Min	Max	Mean
	q1	q2	q3	q4	q1	q2	q3	q4			
Net income (000, Ksh)	6743	6974	7343	8114	905	947	987	115	674	115	864
Shareholders equity (000, Ksh)	492	342	496	349	713	343	532	907	349	907	653
Change in ROA	1	5	1	13	2	13	4.9				
Operating CFOs	1727	1747	1772	1792	183	185	187	189	172	177	380
Quality of earnings	4268	7914	4286	4245	162	351	582	137	742	242	553
	2	6	14	3	785	628	631	602	682	861	442.6
	0.01	0.01	0.019	0.01	0.02	0.02	0.02	0.02	0.01	0.02	0.02
	8362	8672	4619	9864	401	570	601	874	836	874	260
	2	9		8	17	20	26	24	22	24	381
											3
					165	173	173	183	165	169	792
	8793	1492	1583	1692	172	516	293	418	172	287	927
	453	0474	7548	8715	6	7	3	9	6	15	5.6
					726	712	722	751	443	751	689
	4435	6994	7431	7196	613	247	632	732	571	732	887
	7170	4870	9570	5630	100	040	300	700	700	700	192
	00	00	00	00	0	0	0	0	0	0	5.0

Over the eight quarters under investigation, there was a general gradual increase in profitability signals from the first quarter of 2016 to the fourth quarter of 2017. The minimum net income was 6743492, the maximum was 11590713 while the mean score was 8646534.9. The shareholders equity generally increased gradually over the eight quarters. The minimum was 172742682, the maximum value was 1772428614 and the mean score was 380553442.6. This trend was also observed on ROA,

Operating CFOs and quality of earnings. This is an implication that the profitability signals were on an upward trend over the entire period.

Financial leverage was measured by current assets to total assets ratio and total debt to total capital ratio while profitability was observed through both ROA and ROE. Table 4.2 shows the results obtained.

Table 4.2: Financial Leverage of NSE 20-Share Index Firms

Measures	2016				2017			
	q1	q2	q3	q4	q1	q2	q3	q4
Total	194506	194438	19437	19430	1942	19416	19410	19403
Liabilities (000, Ksh)	114	634.6	1155	3676	3619	8717	1238	3758.2
Total assets (000, Ksh)	367248	368669	37009	37151	3729	37435	37577	37719
EBIT (000, Ksh)	162711	159051	15539	15173	1480	14441	14075	13709
Interest Expense (000, Ksh)	346740	352970	35919	36542	3716	37788	38411	39034
Leverage =Debt ratio	0.5296	0.5274	0.525	0.523	0.520	0.518	0.516	0.5144
Times interest earned	4.6925	4.5239	4.355	4.186	4.018	3.849	3.680	3.5121

The results depicted in Table 4.2 reveal that EBIT was highest in 2016 valued at KShs. 162,711M and the lowest was KShs. 137,092M reported in 2017. The average interest expense in 2016 was KShs. 34,674M and KShs. 39,034M in 2017. Times interest earned in 2016 was 4.692594, while in 2017 the figure was 3.512081. The average for leverage (debt ratio) is 0.52963 reported in 2016 and 0.51441 computed in 2017. This is revealing of the moderate levels of leverage among leverages in the companies that are listed at NSE 20-share index. This is an indication that the firms have moderated the debt to asset ratio hence maintain a health financial structure capable to safeguard them from financial distress. The highly leveraged firms have

high debt to equity ratio or high debt to total asset ratio. High leverage leads firms for insolvency due to the urging of current obligation of creditors which either leads for bankruptcy, or bankruptcy leads for liquidation or restructuring or reorganization. Tan (2015) also Tan (2015) established that firms with low financial leverage tend to perform better than firms with high financial leverage. Dang (2011) also concluded that high leverage is disadvantageous to the organization's level of investment and limits the organization's growth opportunities.

The financial liquidity of company's assets is the ability to convert assets into cash in the shortest possible time, at the lowest possible costs and without losing their value. Appropriate resources of liquid elements of the assets, including cash, are the firm's protection against the loss of financial liquidity. Therefore, if an enterprise wants to maintain high level of financial liquidity, it must possess a large share of cash and high liquidity assets and a small share of short-term liabilities. To compute the liquidity (or current ratio), the study collected data on current assets and current liabilities of firm listed in the NSE 20-Share index. The researcher sought to investigate trends in liquidity in NSE 20-Share Index Firms for the eight quarters of year 2016 and 2017. The results are displayed on Table 4.3.

Table 4.3: Liquidity Analysis of the 20-Share Index Firms

Measure	2016				2017			
	q1	q2	q3	q4	q1	q2	q3	q4
Current liabilities (000, Ksh)	18190	18461	18733	19005	19277	19549	19821	20093
Current assets (000, Ksh)	21916	23019	24122	25226	26329	27432	28536	29639
Inventory (000, Ksh)	420	698	976	254	532	810	088	366
Liquidity Current ratio	86669	89746	92822	95898	98975	10205	10512	10820
Quick ratio	8	1.7	5.4	9.1	2.8	17	80	44
	1.204	1.243	1.282	1.320	1.359	1.397	1.436	1.475
	857	462	067	672	277	882	487	092
	1.157	1.194	1.232	1.270	1.308	1.345	1.383	1.421
	21	929	648	367	086	805	524	243

From the findings, it can be noted that the year 2017 recorded the highest value for liquidity (current ratio) as shown by a mean of value of 1.47509 while the year 2016 recorded the lowest value for liquidity as shown by a mean value of 1.204857. In addition, the quick ratio values depict variability in the liquidity during the eight-quarters with the highest value being 1.4212435 in the year 2017 and the lowest 1.157210 in the year 2016. The findings revealed that there has been a significant increase in liquidity over the study period. In accordance with these results, Attwood (2012) pointed that striving to maintain financial liquidity on a high level indicates keeping a large share of current assets, especially cash. This increases the financial liquidity level, and companies which quickly, without any delays, settle their liabilities in cash may expect to obtain some discounts from their suppliers and clients, enjoy greater trust of loan-providers who analyze liquidity before granting loans, and most of all, it diminishes the risk of insolvency. On the other hand, maintaining too big share of current assets may be disadvantageous for the company profitability. This is especially true about the excess cash in relation to expected expenses and this part of products or material inventory which does not participate in the current turnover, and thus do not contribute to generating profit and are only some kind of security for unexpected events, such as sudden boost of demand or problems with supplies.

The study was also interested in analyzing the results in terms of operating efficiency. Operating efficiency is measured using total asset turnover ratio which measures a company's ability to generate sales given its investment in total assets. Efficiency scores obtained for organization can be used to formulate operational strategy to enable a firm meet its business objectives and goals by enhancing allocation of available resources in order to maximize outputs of the firm. Table 4.4 shows a summary of net income, shareholder equity, ROA and ROA.

Table 4.4: Analysis of Operating Efficiency

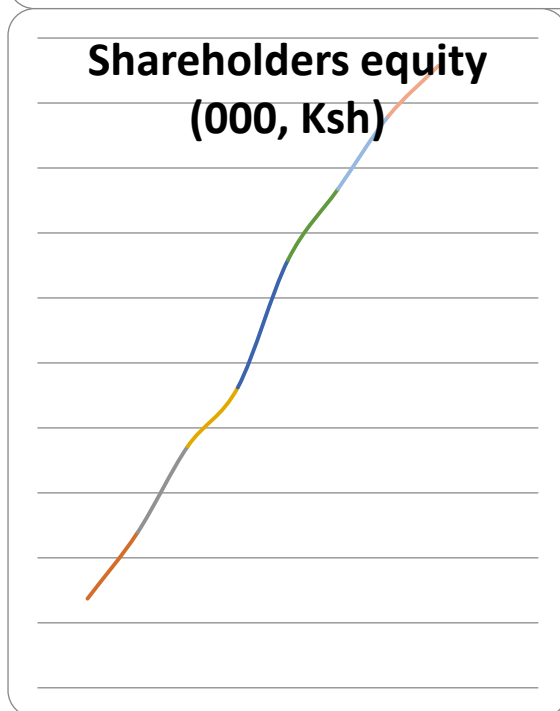
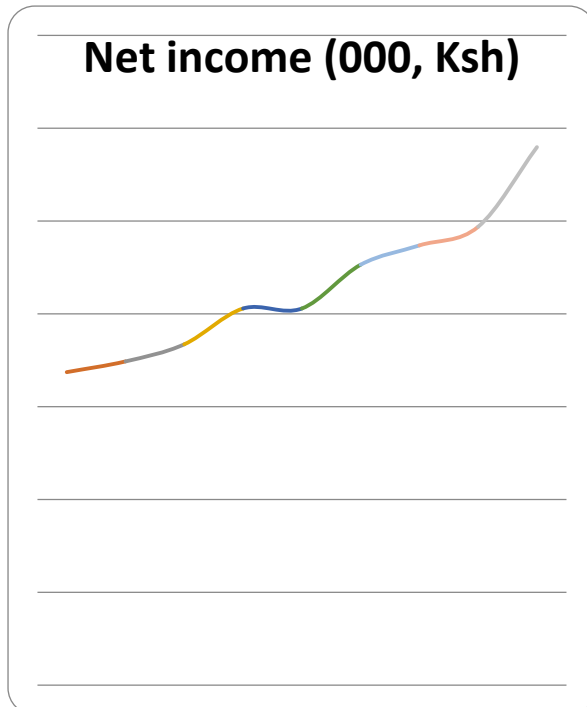
Aspects	2016				2017			
	q1	q2	q3	q4	q1	q2	q3	q4
Net income (000, Ksh)	67434	69743	734349	81143	90571	94734	98753	11590
Shareholders equity (000, Ksh)	17274	17477	177242	17924	18316	18535	18758	18913
ROA	0.018	0.018	0.0194	0.019	0.024	0.025	0.026	0.028
ROE	0.039	0.041	0.0424	0.046	0.049	0.049	0.053	0.058
	0378	3778	685	9038	4485	8533	2899	5329

The net income average for the first quarter of year 2016 was KShs. 6,743.492mn while the net income average for the fourth quarter of year 2017 was KShs. 11,590.713mn. This signifies a general rise in the net incomes reported by the firms in the NSE 20-Share Index. According to Mong'o (2010), a healthy net income position result in liquidity of a company which helps it sustain its operation resulting in generation of higher profits and prudent re-investment of the profits results in the growth of the firm. Consistent positive cash flow position will facilitate higher profit levels and hence excess cash for investment.

During the first quarter of year 2016, the average shareholders' equity was KShs. 172742.68Mn whereas during the fourth quarter of year 2017, the averaged value of shareholders' equity was KShs. 189,137.602Mn. Accordingly, the companies studied were observed to increase the shareholders' equity in quarterly basis. These results are in agreement with Odipo and Sitati (2010) who revealed that as debt increases, shareholders require higher returns since they face higher financial risk. This higher financial risk results from spreading the firm's business risk over a proportionately smaller equity base. Equivalently, shareholders' risk increases as larger amounts of interest are committed to be paid to creditors from the firm's operating cash flows.

In 2016 the average ROA was 0.01836 while in 2017 there was a slight increment to 0.04945. The same trend was seen with regard to ROE where the figures for 2016 were 0.0390378 followed by an increase to 0.0585329 in 2017. These are implications

of a better financial performance among the listed firms which cushions them from financial distress. Jiming and Weiwei (2011) also found that a greater ROA leads to higher profits generated by the company, so that investors will buy more shares of the company increasing its financial health. The contrary is therefore true implying a weakness in ROA as an indication of financial distress.



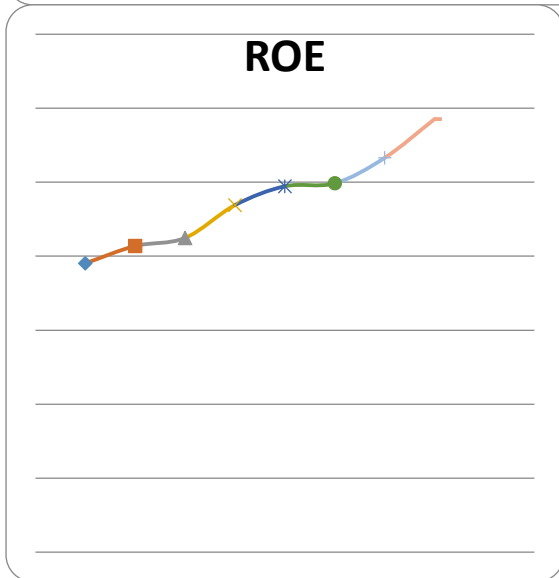
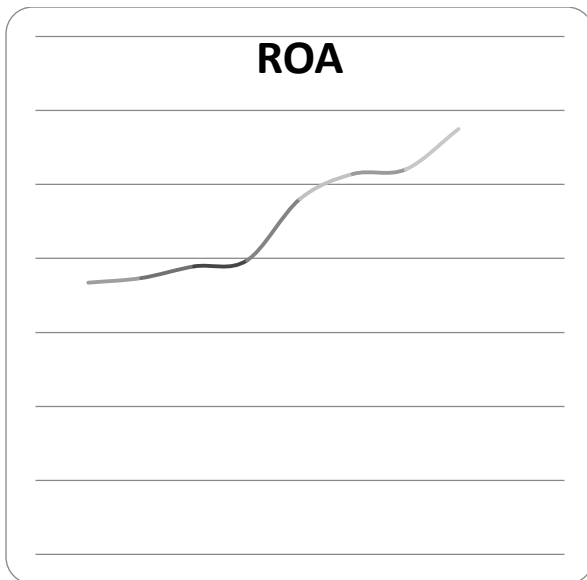


Figure 4.1: Trends of Net Income, Shareholders Equity, ROA and ROE

Table 4.5: Descriptive Statistics on Total Assets for the Periods between 2016-2017

Company Amounts (Kshs. m)	2016				2017			
	Q1	Q2	Q3	Q4	Q1	Q2	Q3	Q4
Mean	5874	5874	5940	6006	6071	6137	6203	6269
	10.7	76.4	49.4	22.4	95.4	68.4	41.4	14.4
Min	8718.	8642.	8567.	8492.	8417.	8342	8267	8192
	1	971	843	714	586	.457	.329	.2
Max	6156	6227	6297	6368	6438	6509	6579	6649
	942	377	811	246	681	116	550	985
Standard Deviation	0.043	0.071	0.099	0.127	0.155	0.18	0.21	0.24
	5	586	672	758	844	393	2016	0102

The average total assets for the NSE 20 Share Index companies were KShs. 587410.69Mn for first quarter of year 2016 and KShs. 626914.4Mn for fourth quarter of year 2017. These were companies that did not have any liquidity problem in the period of 2016 to 2017. The financial reports did not disclose anything that was alarming to indicate any liquidity problems or business losses. From the findings, it can be noted that the 2nd quarter of year 2017 recorded the highest value for Asset quality as shown by a mean of value of 1.1930 while the third quarter of year 2016 recorded the lowest value for asset quality as shown by a mean value of 0.2410. In addition, the values for standard deviation depict variability in the asset quality during the period under investigation with the highest deviation of 0.2683 in the second quarter of year 2017 and the lowest 0.2090 in the first quarter of year 2017. The findings revealed that there has been a general increase in asset quality from the first quarter of 2016 to fourth quarter of 2017. This is in agreement with Aasen (2011) who revealed that changes in the growth of total assets owned by firms has the ability to assist management in predicting corporate problems early enough to avoid financial difficulties. In the same view, Chai (2011) averred that increase in totals assets indicates a firm's ability to generate funds internally thereby determining its ability to repay its debt obligations.

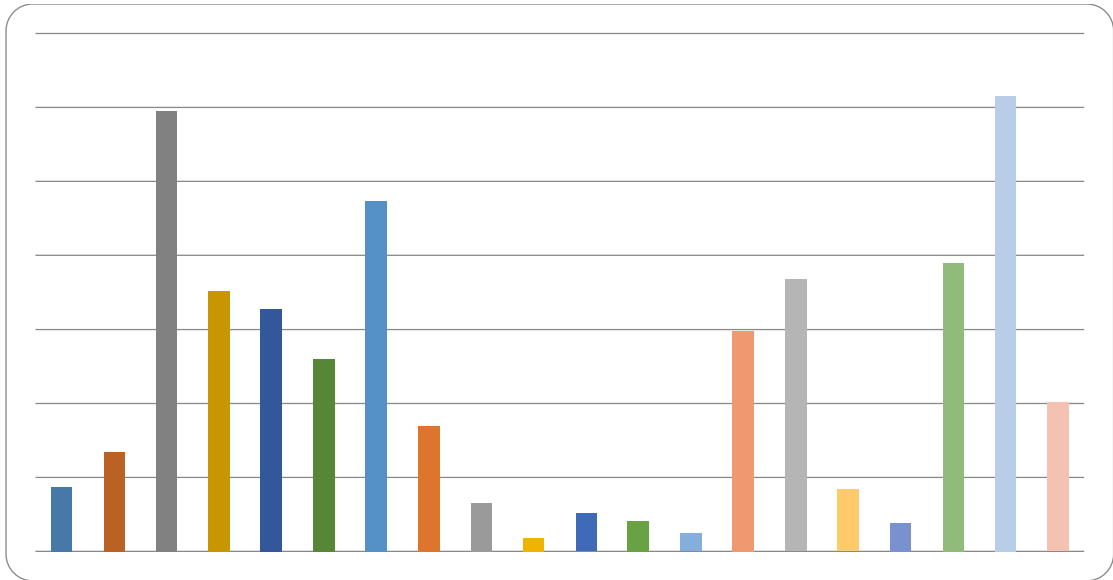
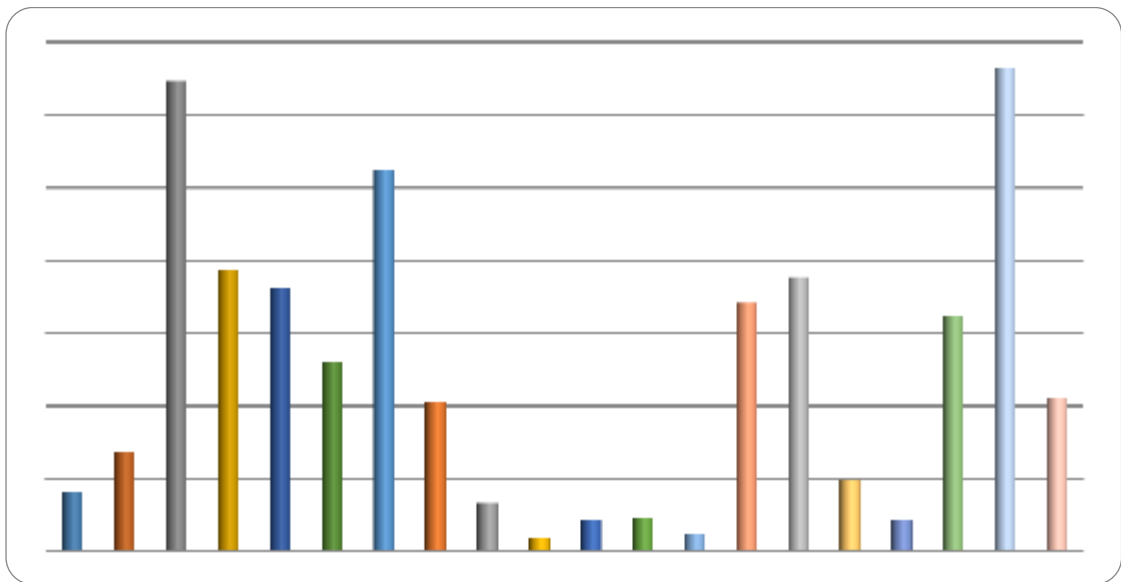


Figure 4.2: Total Assets Recorded by NSE 20-Share Index Firms in 2016

In the year 2016, KCB and Centum recorded the highest amounts of Total Assets while Kenol-Kobil and BAT recorded the lowest amounts of Total assets as shown in Figure 4.2 In the year 2017, the same trend was observed as depicted in Figure 4.2. This is an indication that the companies listed in the NSE and specifically the 20-share index firms posited consistent results in terms of assets. These results are in concurrence with Adeyemi (2012) who showed that in today's dynamic and global competitive environment companies resort to synthetically maintain a strong asset base which is an important indicator of their financial condition.

Figure 4.3: Total Assets Recorded by NSE 20-Share Index Firms in 2017



4.3 Financial Distress Predictability

The study conducted a Piotroski's *F*-score analysis to determine the financial distress (Bankruptcy Prediction) associated with declining profitability, cash flow and liquidity and rising levels of financial leverage. Table 4.6 shows the results obtained.

Table 4.6: Bankruptcy Prediction

Variable	2016				2017			
	q1	q2	q3	q4	q1	q2	q3	q4
Current Assets	21916420	23019698	24122976	25226254	26329532	27432810	28536088	29639369
Current Liabilities	18190059	18461936	18733813	19005690	19277567	19549444	19821320	20093197
Working capital	3726361	4557763	5389164	6220566	7051967	7883369	8714771	9546172
Total assets	3.67E+08	3.69E+08	3.7E+08	3.72E+08	3.73E+08	374354331	3.76E+08	3.77E+08
Retained earnings	58536054	60134442	61732830	63331218	64929606	66527994	68126382	69724767
EBIT	16271145	15905154	15539163	15173172	14807181	14441190	14075199	13709209
Total liabilities	194506114	194438634.6	194371155	194303676	194236196	194168717	194101238	1.94E+08
Sales	38609556	38156772	37703988	37251204	36798420	36345636	35892852	35440067
ROA	0.01836	0.01867	0.01946	0.01986	0.02401	0.025702	0.02601	0.02874
CFOs	8793453	14920474	15837548	16928715	1651726	1735167	1732933	1834189
ΔROA	0.00029	0.000311	0.000789	0.000403	0.004147	0.0016903	0.000311	0.00273
Accruals	0.005582	0.021798	0.023332	0.025702	-0.019583	-0.021067	-0.021401	-0.02388
Leverage	0.52963	0.52746	0.52529	0.52312	0.52095	0.51878	0.51661	0.51444
ΔLeverage	-0.00217	-0.00217	-0.00217	-0.00217	-0.00217	-0.00217	-0.00217	-0.00217
Liquidity	1.20486	1.24346	1.28207	1.32067	1.35928	1.397882	1.43649	1.47509
ΔLiquidity	0.03861	0.03861	0.03861	0.03861	0.03861	0.038605	0.03861	0.03861
Number of shares	6243874	6293966	6344059	6394152	6444244	6494337	6544430	6594522
ΔNo.Shares	50092.65	50092.65	50092.65	50092.62	50092.68	50092.65	50092.67	50092.64
Δ gross Margin	-36.5991	-365991	-365991	-365991	-365991	-365991	-365991	-365990
Asset Turnover Ratio	0.210264	0.206997	0.203755	0.200538	0.197346	0.1941777	0.191034	0.187913
ΔAsset Turnover Ratio	-0.003271	-0.003267	-0.003242	-0.003217	-0.003192	-0.003168	-0.003144	-0.003121
Aggregate F-SCORE	7	7	7	7	6	6	6	6

The various variables for the constitution of the Piotroski model for the distressed firms were analyzed. There was a general increase in current assets, current liabilities, working capital, total assets and retained earnings whereas there was a decrease in EBIT. The findings in table 4.6 indicate the descriptive statistics of the variables in which the aggregate of the F-score value was 7 in 2016 and 6 in 2017. Piotroski Model has high predictive power two years prior to bankruptcy. The mean financial distress was below 9 and above 2 for all the firms suggesting that the NSE 20 Share index firms are relatively approaching financial distress this is in accordance with Piotroski model that says that firms which scores and F score of below 2 are financially distressed while those which score above 8 are generally having good financial health..

Senbet and Wang (2012) relate financial distress to a situation where the firm's contract to creditors are broken or honored with difficulty. A state when a firm's business deteriorates to the point where it cannot meet its financial obligations, the firm is said to have entered the state of financial distress. This is often witnessed whenever the firm's operational cash flows are lower than its financial expenses. From the results, NSE20 firms needs to check more on their operating efficiency which measures that operational efficiency of the firms.

The above findings illustrate F'-score obtained from each company in each sector and the mean score over the period of 2 years (eight quarters). The average F-scores of the firms indicated above show that the firms have generally been distressed in their operations. Hyde (2013) showed that Piotroski's F-score is highly effective for South Korea, India, South East Asia, China, and South Africa, and the result is robust, after controlling for firm size, momentum, holding period, and value. These are indications that financial crises are particularly harmful for the listed firms and detrimental for the health of such firms and the economy at large.

According to Agrawal (2015) financial distress is often witnessed whenever the firm's operational cash flows are lower than its financial expenses. Business firms also experience financial distress when they face insufficient liquidity to meet their financial liabilities. Jacobs (2015) recapped that Piotroski model awards each of the above financial components one point for each test a stock passes and no point for the corporate organizations.

4.4 Inferential Analysis

The study conducted a regression analysis to establish the applicability of Piotroski's model in predicting the financial distress among the NSE 20-share index. The researcher extracted the model summary which portrays the coefficient of determination. Table 4.7 shows the results of the model summary.

Table 4.7: Model Summary

Aspect	Value
Model	1
R	0.872
R Square	0.766
Adjusted R Square	0.751
Std. Error of the Estimate	0.573

Coefficient of determination explains the extent to which changes in the dependent variable can be explained by the change in the independent variables or the percentage of variation in the dependent variable that is explained by all the independent variables. The independent variables that were studied, explain 76.6% of the financial distress of the firms in the NSE-20-share index as represented by the R^2 . This therefore means intervening variables and other factors not studied in this research contribute 23.4% of the financial distress of the firms in the NSE-20-share index.

Table 4.8: Regression Coefficients

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error			
(Constant)	4.778	0.453		10.5475	0.0429
Liquidity	.619	0.145	0.103	4.2690	0.0339
Leverage	.755	0.126	0.054	5.9921	0.0210
Operating efficiency	-.879	0.108	0.029	8.1389	0.0133
Profitability signals	-.712	0.137	0.064	5.1971	0.0264

The coefficients in Table 4.8 answer the regression equation relating the dependent and the independent variables. The table indicates that all the variables had a significance value less than 0.05 thus confirming the significance of the results. Also, from the table, all the variables indicated a positive coefficient indicating a positive relationship between the dependent and independent variables. The analysis gave rise to the following model:

$$Y=4.778+ 0.619 X_1 + 0.755X_2 - 0.879X_3 - 0.712 X_4.....4.1$$

The results shown in Equation 4.1 reveal that, holding the predictor variables constant, the financial distress of the firms in the NSE-20-share index would be 4.778 units. The data findings analyzed also shows that taking all other independent variables at zero, a unit increase in liquidity will lead to a 0.619 increase in financial distress of the firms in the NSE-20-share index, a unit increase in leverage will lead to a 0.755 increase in financial distress of the firms in the NSE-20-share index and a unit increase in operational efficiency will lead to a 0.879 decrease in financial distress of the firms in the NSE-20-share index.

In addition, a unit increase in profitability will lead to a 0.712 decrease in financial distress of the firms in the NSE-20-share index. These results infer that operating efficiency contributes more to decrease in financial distress of the firms in the NSE-20-share index, followed by leverage, then profitability, while liquidity contributes the least to financial distress of the firms in the NSE-20-share index. At 5% level of significance and 95% level of confidence, liquidity had a 0.0339 level of significance, while operating efficiency had a 0.0133 level of significance hence the most significant factor for financial distress of the firms in the NSE-20-share index. The foregoing results imply that liquidity and leverage contribute proportionally to financial distress, while operating efficiency and profitability contribute proportionally and indirectly to financial distress of the firms in the NSE-20-share index. These findings concur with Mohamed (2013) who predicted that financial distress is costly because it creates a tendency for firms to do things that are harmful to debt holders and non-financial stakeholders, impairing access to credit and raising stakeholder relationships.

CHAPTER FIVE

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter sought to address the applicability of Piotroski's model in predicting the financial distress among listed firms in NSE 20-share index over the 8 quarterly periods of years 2016 and 2017. This was done in line with the objectives of the study on evaluating the influence of profitability, analyzing the effect of liquidity and leverage and how operating efficiency of firms can be used to detect financial distress. The data utilized was gathered from the secondary sources where Piotroski's model was employed in predicting the financial distress of the firms. The NSE 20-Share index firms are portrayed as the strongest performers and application of Piotroski's model confirmed the same. The chapter summarizes the findings of the study and makes conclusions upon which recommendations are drawn. The suggestions for further study are also captured as a way of filling the gaps identified in the study. The study pursued four objectives upon which discussions, conclusions and recommendations are aligned to.

5.2 Summary

The study found that the average total assets for the NSE 20 Share Index companies were KShs. 587410.69Mn for year 2016 and KShs. 627526.07Mn for year 2017. The financial reports did not disclose anything that was alarming to indicate any liquidity problems or business losses. The companies studied were observed to increase the shareholders' equity in quarterly basis. The same trend was seen with regard to ROE where the figures for 2016 were 0.0390378 followed by an increase to 0.0494485 in 2017. These are implications of a better financial performance among the listed firms which cushions them from financial distress.

The NSE 20-Share index companies had a moderate level of leverage ranging between 0.514410 and 0.529630. The firms have moderated the debt to asset ratio hence maintain a healthy financial structure capable to safeguard them from financial distress. From the results, there has been a significant increase in liquidity over the study period. Striving to maintain financial liquidity on a high level indicates keeping a large share of current assets, especially cash.

It also noted that the firms operating efficiency was not indicating good performance as indicated by constant reduction of EBIT also the quality of earnings trend observed that by third quarter of 2017 the NSE20 firms are reporting less cashflow compared to Return on assets.

The study also found that the aggregate sum *F-score* value was **7** in 2016 and **6** in 2017. Piotroski Model has high predictive power two years prior to bankruptcy. The mean financial distress was 6.5 for the firms researched on, suggesting that organizations listed at NSE 20-Share Index have a relatively low average financial distress. From the inferential analysis, holding liquidity, leverage, total assets, and operating efficiency constant financial distress will be -17.205, An increment in liquidity practices and financial leverage will cause a decline in financial distress among the NSE listed firms.

The independent variables that were studied, explain 76.6% of the financial distress of the firms in the NSE-20-share index as represented by the R^2 . Holding the predictor variables constant, the financial distress of the firms in the NSE-20-share index would be 4.778 units. A unit increase in liquidity will lead to a 0.619 increase in financial distress, a unit increase in leverage will lead to a 0.755 increase in financial distress, a unit increase in operational efficiency will lead to a 0.879 decrease in financial distress and a unit increase in profitability will lead to a 0.712 decrease in financial distress of the firms in the NSE-20-share index.

5.3 Conclusions

The study deduces that the companies listed in the NSE and specifically the 20-share index firms posited consistent results in terms of assets. There was variability in the asset quality during the period under investigation. The NSE 20-Share index firms have moderated the debt to asset ratio hence maintain a healthy financial structure capable to safeguard them from financial distress. There has been a significant increase in liquidity over the study period. As such, corporate firms experience financial distress when they face insufficient cash flow to meet their current financial obligations

The study deduces that liquidity and leverage are key determinants of financial distress among NSE listed firms. The relationship between financial distress and

liquidity and leverage are positively related with financial distress implying that when liquidity and leverage go up, it will make the financial distress of firms listed at NSE to increase. This imply that the change of liquidity is significant and henceforth have an impact on financial distress of the firms listed at NSE. On the contrary, operating efficiency and profitability signals have negative implications on financial distress among NSE listed firms. This is an indication that increasing operating efficiency and profitability signals produces an opposite (decrease) effect on the financial distress among NSE 20-share index firms.

The study conclude that the firms listed at NSE 20-Share Index have a relatively low average financial distress. The firms have generally been successful in their operations. Operating efficiency contributes more to decrease in financial distress of the firms in the NSE-20-share index, followed by profitability, while leverage and liquidity contributes the least to financial distress of the firms in the NSE-20-share index. As such, predicting failure as early as possible with sound accuracy enable firms to take action to reduce the costs of bankruptcy, corporate failure to all stakeholders and contribute towards the business and financial environment stability.

5.4 Recommendations

5.4.1 Policy Recommendations

The study recommends that managers of NSE listed firms to ensure that the objectives of a company are adhered to from the initial stage of development lifecycle of a company in order to gain a positive reputation from various stakeholders and to ensure that the company focuses on strategically planned projects that will propagate external funding hence facilitating financial performance leading to profitability. In turn, the returns gained might be ploughed back for strengthening the capital reserve structure or paid back as interests.

The study recommends adoption of satisfactory accentuation to empower NSE listed organizations to utilize a larger number of investors' funding than debt and decrease the hazard that is inborn in the increased utilization of debt. At the point when a firm has depleted its funds from shareholders' docket and funds its development of activities by getting, exceptional thought must be taken to guarantee that the advantages financed by the borrowed assets acquire a higher return than the premium the firm is required to pay on the debt. On the off chance that this isn't done, the firm

will disintegrate the reserves so as to pay the debt as the advantages financed won't make enough profits to cover the debt.

Firms should have to know its optimal debt carrying capacity. The knowledge of optimal debt carrying capacity is significantly implication on the decision of the firms. The firm's debt should not be very small nor very large. It should be optimal. There is a calculation for optimal debt ratio for companies. The firms should choose their funding sources painstakingly to abstain from falling into the use hazard trap.

5.4.2 Areas for Further Studies

The study recommends that the study of applicability of Piotroski's model on financial distress should be undertaken further on other firms listed in the NSE which have been faced with various challenges culminating to distress, insolvency and in some cases delisted. Such a study would shed light on the specific firms and specific aspects that need to reinforced to minimize cases of financial distress among the NSE listed firms.

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APPENDICES

Appendix I: Data Collection Sheet

Variable	2016				2017			
Measure	1st Q 16	2 nd Q	3 rd	4 th	1 st Q 17	2 nd Q	3 rd	4 th
Total Assets	3.67E+08	3.69E+08	3.70E+08	3.72E+08	3.73E+08	3.74E+08	3.76E+08	3.77E+08
Working Capital	3726361	4557763	5389164	6220566	7051967	7883369	8714771	9546172
Retained Earnings	58536054	60134442	61732830	63331218	64929606	66527994	68126382	69724767
Earnings before Interest and Taxes	16271145	15905154	15539163	15173172	14807181	14441190	14075199	13709209
Book Value of total Debt	1.95E+08	1.94E+08	1.94E+08	1.94E+08	1.94E+08	1.94E+08	1.94E+08	1.94E+08
Sales	38609556	38156772	37703988	37251204	36798420	36345636	35892852	35440067
Net income	6743492	6974342	7343496	8114349	9057131	9473435	9875321	11590713
Cash flow from operations	8793453	1.5E+07	1.6E+07	1.7E+07	1651726	1735167	1732933	1834189
Asset turnover	0.210264	0.206997	0.203755	0.200538	0.197346	0.194178	0.191034	0.187913
Leverage	0.52963	0.52746	0.52529	0.52312	0.52095	0.51878	0.51661	0.51444
Current ratio	1.20486	1.24346	1.28207	1.32067	1.35928	1.397882	1.43649	1.47509
Number of shares outstanding	6243874	6293966	6344059	6394152	6444244	6494337	6544430	6594522

Appendix IV: List of Listed Companies at the NSE

Agricultural Segment

1. Eaagads Ltd Ord
2. Kapchorua Tea Co. Ltd Ord
3. Kakuzi
4. Limuru Tea Co. Ltd
5. Rea Vipingo Plantations Ltd
6. Sasini Ltd
7. Williamson Tea Kenya Ltd

Automobiles and Accessories

1. Car and General (K) Ltd

Banking Segment

2. Barclays Bank Ltd
3. Stanbic Holdings Plc.
4. I&M Holdings Ltd
5. Diamond Trust Bank Kenya Ltd
6. HF Group Ltd
7. KCB Group Ltd
8. National Bank of Kenya Ltd
9. NIC Group PLC
10. Standard Chartered Bank Ltd
11. Equity Group Holdings
12. The Co-operative Bank of Kenya Ltd
13. BK Group PLC

Commercial and Services

1. Express Ltd
2. Sameer Africa PLC
3. Kenya Airways Ltd
4. Nation Media Group
5. Standard Group Ltd
6. TPS Eastern Africa (Serena) Ltd
7. Scangroup Ltd
8. Uchumi Supermarket Ltd

9. Longhorn Publishers Ltd
10. Deacons (East Africa) Plc
11. Nairobi Business Ventures Ltd

Construction and Allied

1. Athi River Mining
2. Bamburi Cement Ltd
3. Crown Paints Kenya PLC.
4. E.A.Cables Ltd
5. E.A.Portland Cement Ltd

Energy and Petroleum

1. KenolKobil Ltd
2. Total Kenya Ltd
3. KenGen Ltd
4. Kenya Power & Lighting Co Ltd
5. Umeme Ltd

Insurance Segment

1. Jubilee Holdings Ltd
2. Sanlam Kenya PLC
3. Kenya Re-Insurance Corporation Ltd
4. Liberty Kenya Holdings Ltd
5. Britam Holdings Ltd
6. CIC Insurance Group Ltd

Investment Segment

1. Olympia Capital Holdings ltd
2. Centum Investment Co Ltd
3. Home Afrika Ltd
4. Kurwitu Ventures
- 5.

Investment Services

1. Nairobi Securities Exchange Ltd

Manufacturing and Allied

2. B.O.C Kenya Ltd

3. British American Tobacco Kenya
4. Carbacid Investments Ltd
5. East African Breweries Ltd
6. Mumias Sugar Co. Ltd
7. Unga Group Ltd
8. Eveready East Africa Ltd
9. Kenya Orchards Ltd

10. Flame Tree Group Holdings Ltd

Telecommunication and Technology

1. Safaricom PLC

Real Estate Investment Trust

1. Stanlib Fahari I-REIT

Exchange Traded Fund

1. New Gold Issuer (RP) Ltd

Appendix V: NSE 20-Share Index

1. Nation Media Group
2. Scangroup Limited
3. KCB Group Plc
4. The Cooperative Bank of Kenya Limited
5. Diamond Trust Bank Limited
6. Barclays Bank of Kenya Limited
7. Equity Group Holdings Plc
8. NIC Group Plc
9. East African Breweries Limited
10. British American Tobacco Kenya Limited
11. ARM Cement Plc
12. Bamburi Cement Limited
13. KenolKobil Limited
14. Kenya Power & Lighting Limited
15. Kengen Limited
16. Britam Holdings Plc
17. Kenya Reinsurance Corporation Limited
18. Safaricom Plc
19. Centum Investment Company Plc
20. Nairobi Securities Exchange Plc

Appendix VI: Letter of Introduction

KABARAK

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UNIVERSITY

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BOARD OF POSTGRADUATE STUDIES

19th July, 2019

The Director General
National Commission for Science, Technology & Innovation (NACOSTI)
P.O. Box 30623 – 00100
NAIROBI

Dear Sir/Madam,

RE: CHRISTABEL JEPKEMBOI KORIR- REG. NO. GMB/NE/0161/01/16

The above named is a Master's of Business Administration student at Kabarak University in the School of Business and Economics. She is carrying out research entitled "*Applicability of Piotroski-Score Model in Predicting Financial Distress of Listed Companies at the Nairobi Securities Exchange 20 Share Index, Kenya*". She has defended her proposal and has been authorized to proceed with field research.

The information obtained in the course of this research will be used for academic purposes only and will be treated with utmost confidentiality.

Please provide her with a research permit to enable her to undertake her research.

Thank you.

Yours faithfully,

Dr. Betty Jeruto Tikoko
DIRECTOR, POSTGRADUATE STUDIES








Kabarak University Moral Code

As members of Kabarak University family, we purpose at all times and in all places, to set apart in one's heart, Jesus as Lord. (1 Peter 3:15)



Appendix VII: Research Permit

 REPUBLIC OF KENYA	 NATIONAL COMMISSION FOR SCIENCE, TECHNOLOGY & INNOVATION
Ref No: 986970	Date of Issue: 14-August-2019
RESEARCH LICENSE	
	
<p>This is to Certify that Ms. CHRISTABEL KORIR of Kabarak University, has been licensed to conduct research in Baringo, Bomet, Bungoma, Busia, Elgeyo-Marakwet, Embu, Garissa, Homabay, Isiolo, Kakamega, Kericho, Kiambu, Kilifi, Kirinyaga, Kisumu, Kitui, Kwale, Laikipia, Lamu, Machakos, Makueni, Mandera, Marsabit, Meru, Migori, Mombasa, Muranga, Nairobi, Nakuru, Nandi, Narok, Nyamira, Nyandarua on the topic: APPLICABILITY OF PIOTROSKI F-SCORE MODEL IN PREDICTING FINANCIAL DISTRESS OF LISTED COMPANIES AT THE NAIROBI SECURITIES EXCHANGE 20 PRICE INDEX, KENYA for the period ending : 14/August/2020.</p>	
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