

## **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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### **Abstract**

*Financial distress prospect is a key bother to the executives and business partners. It is usually not a selective event and may attack both big and small organizations alike. With the importance of securing financial health of listed companies in Kenya, it is vital to anticipate the likelihood of fiscal distress beforehand and hence the need for prediction and more so applying a reliable model in the prediction. This study 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 (2016 and 2017). Descriptive survey approach was employed 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 was extracted from secondary sources for a period of the two financial years. The information gathered was dissected and synthesized by utilizing illustrative and inferential measurements through use of SPSS Version 22 computer programme. The results revealed that the 20-Share Index firms placed steady outcomes as far as resources were concerned. Also, liquidity, leverage and source of assets were found as key determinants of fiscal strains among NSE recorded firms. The connection between fiscal strains and liquidity and leverage were found to be emphatically related with fiscal strains suggesting that when liquidity and leverage go up, the fiscal strains of firms at NSE also grow. The results inferred that the NSE 20-Share Index firms have moderately low fiscal strains. The study recommended that managers of NSE listed firms 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 ensure that the company focuses on strategically planned projects that will propagate external funding hence facilitating financial performance leading to profitability.*

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

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### **I. INTRODUCTION**

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).

### **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 are 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 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 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 which 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).

### **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.

### **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 being 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.

### **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.

## **II. RESEARCH OBJECTIVES**

- 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.

## **III. 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?

## **IV. LITERATURE REVIEW**

### **Overview of 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.

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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 being 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.

### **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  $F_{DROA}$  equivalents to one if  $DROA > 0$ , generally zero. The collection signal is characterized as ROA short CFO and its marker variable,  $F_{Accrual}$  equivalents 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 equivalents 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 equivalents 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 an 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.

### **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.

### **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 utilize 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.

### **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).

### **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 tototal 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.

### **V. Research Methodology**

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. 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.

The study utilized auxiliary information for the period 2016 to 2017 budgetary years. The information 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. The information gathered was dissected and synthesized by utilizing illustrative and inferential measurements through use of SPSS Version 22 computer programme

### **VI. Research Findings and Discussion**

#### **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 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 492	6974 342	73434 96	8114 349	9057 131	9473 435	9875 321	1159 0713	6743 492	1159 0713	8646 534.9
Shareholders equity (000, Ksh)	1727 4268 2	1747 7914 6	17724 28614	1792 4245 3	1831 6278 5	1853 5162 8	1875 8263 1	1891 3760 2	1727 4268 2	1772 4286 14	3805 5344 2.6
Change in ROA	0.018 3622	0.018 6729	0.0194 619	0.019 8648	0.024 0117	0.025 7020	0.026 0126	0.028 7424	0.018 3622	0.02 8742 4	0.02 2603 813
Operating CFOs	8793 453	1492 0474	15837 548	1692 8715	1651 726	1735 167	1732 933	1834 189	1651 726	1692 8715	7929 275.6
Quality of earnings	4435 7170 00	6994 4870 00	74319 57000	7196 5630 00	7266 1310 00	7122 4704 00	7226 3230 00	7517 3270 00	4435 7170 00	7517 3270 00	6898 8719 25.0

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 2 shows the results obtained.

**Table 2: Financial Leverage of NSE 20-Share Index Firms**

Measures	2016				2017			
	q1	q2	q3	q4	q1	q2	q3	q4
Total Liabilities (000, Ksh)	1945061 14	1944386 34.6	194371 155	194303 676	19423 6196	194168 717	194101 238	194033 758.2
Total assets (000, Ksh)	3672487 96	3686699 03	370091 010	371512 117	37293 3224	374354 331	375775 438	377196 545
EBIT (000, Ksh)	1627114 5	1590515 4	155391 63	151731 72	14807 181	144411 90	140751 99	137092 08
Interest Expense (000, Ksh)	3467409	3529700	359199 0	365428 1	37165 71	377886 2	384115 2	390344 3
Leverage =Debt ratio	0.529630 365	0.527460 365	0.5252 904	0.5231 204	0.5209 504	0.5187 8037	0.5166 1037	0.51444 0365
Times interest earned	4.692594 672	4.523954 672	4.3553 147	4.1866 747	4.0180 347	3.8493 9467	3.6807 5467	3.51211 4672

The results depicted in Table 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 3.

**Table 3: Liquidity Analysis of the 20-Share Index Firms**

Measure		2016				2017			
		q1	q2	q3	q4	q1	q2	q3	q4
Current liabilities	(000, Ksh)	181900	184619	187338	190056	192775	195494	198213	200931
		59	36	13	90	67	44	20	97
Current assets	(000, Ksh)	219164	230196	241229	252262	263295	274328	285360	296393
		20	98	76	54	32	10	88	66
Inventory	(000, Ksh)	866698	897461	928225	958989	989752	102051	105128	108204
		.7	.4	.1	.8	7	0	4	
Liquidity ratio	-Current	1.2048	1.2434	1.2820	1.3206	1.3592	1.3978	1.4364	1.4750
		57	62	67	72	77	82	87	92
Quick ratio		1.1572	1.1949	1.2326	1.2703	1.3080	1.3458	1.3835	1.4212
		1	29	48	67	86	05	24	43

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 shows a summary of net income, shareholder equity, ROA and ROE.

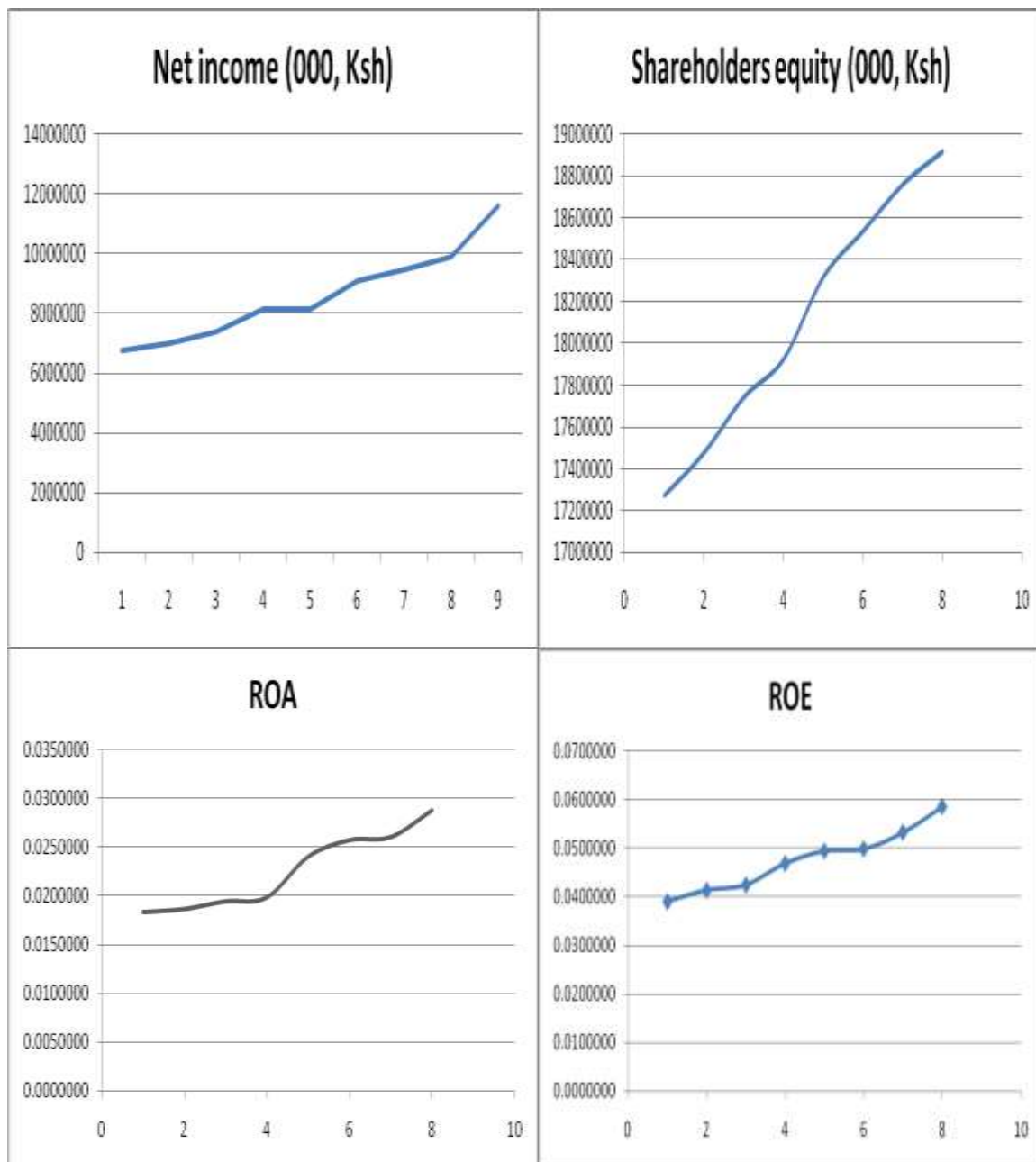
**Table 4: Analysis of Operating Efficiency**

Aspects	2016				2017			
	q1	q2	q3	q4	q1	q2	q3	q4
Net income (000, Ksh)	674349	697434	7343496	811434	905713	947343	987532	115907
	2	2		9	1	5	1	13
Shareholders equity (000, Ksh)	172742	174779	1772428	179242	183162	185351	187582	189137
	682	146	614	453	785	628	631	602
ROA	0.01836	0.01867	0.01946	0.01986	0.02401	0.02570	0.02601	0.02874
	22	29	19	48	17	20	26	24
ROE	0.03903	0.04137	0.04246	0.04690	0.04944	0.04985	0.05328	0.05853
	78	78	85	38	85	33	99	29

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.



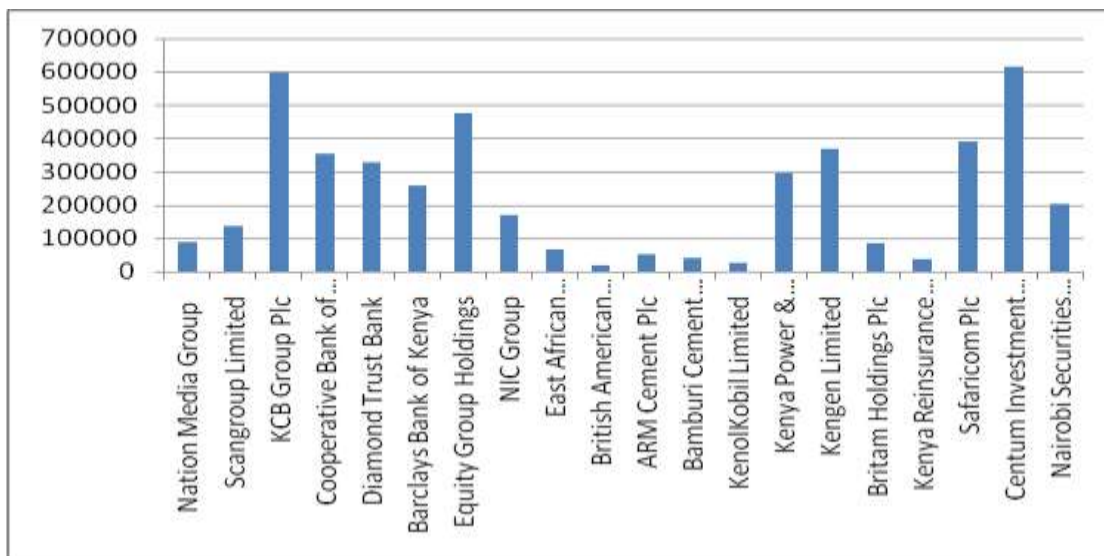
**Figure 1: Trends of Net Income, Shareholders Equity, ROA and ROE**

**Table 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	587410. 7	587476. 4	594049. 4	600622. 4	607195. 4	613768. 4	620341. 4	626914. 4
Min	8718.1	8642.97 1	8567.84 3	8492.71 4	8417.58 6	8342.45 7	8267.32 9	8192.2
Max	6156942	6227377	6297811	6368246	6438681	6509116	6579550	6649985
Standard Deviation	0.0435	0.07158 6	0.09967 2	0.12775 8	0.15584 4	0.18393	0.21201 6	0.24010 2



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 2<sup>nd</sup> 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 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 4.1. 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.

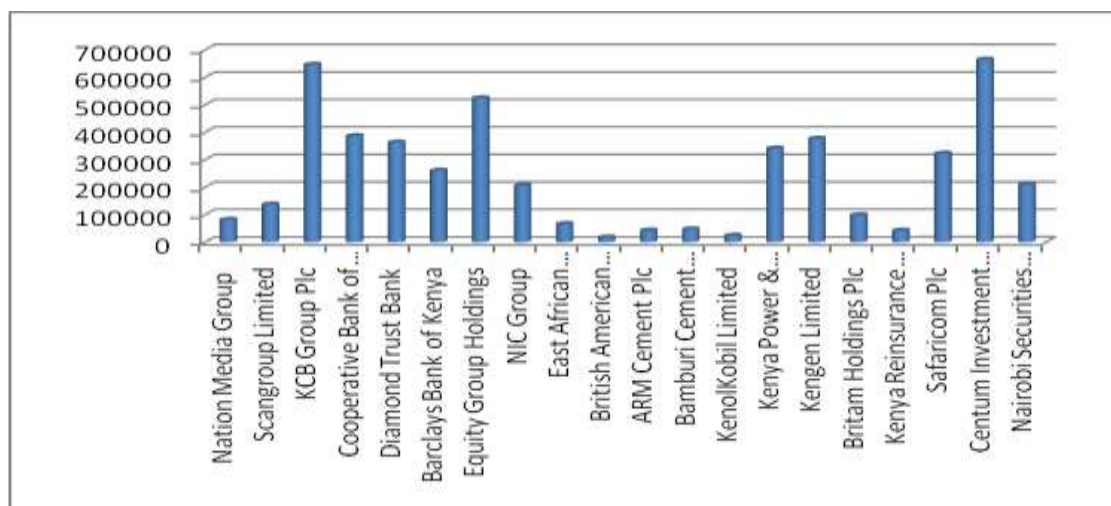


Figure 6: Total Assets Recorded by NSE 20-Share Index Firms in 2017

### 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 6 shows the results obtained.

### Table 6: Bankruptcy Prediction

*Applicability Of Piotroski F-Score Model In Predicting Financial Distress Of Listed Companies At The Nairobi Securities Exchange 20 Share Index, Kenya*

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
<b>ROA</b>	<b>0.01836</b>	<b>0.01867</b>	<b>0.01946</b>	<b>0.01986</b>	<b>0.02401</b>	<b>0.025702</b>	<b>0.02601</b>	<b>0.02874</b>
<b>CFOs</b>	<b>8793453</b>	<b>14920474</b>	<b>15837548</b>	<b>16928715</b>	<b>1651726</b>	<b>1735167</b>	<b>1732933</b>	<b>1834189</b>
<b>ΔROA</b>	<b>0.00029</b>	<b>0.000311</b>	<b>0.000789</b>	<b>0.000403</b>	<b>0.004147</b>	<b>0.0016903</b>	<b>0.000311</b>	<b>0.00273</b>
<b>Accruals</b>	<b>0.005582</b>	<b>0.021798</b>	<b>0.023332</b>	<b>0.025702</b>	<b>-0.019583</b>	<b>-0.021067</b>	<b>-0.021401</b>	<b>-0.02388</b>
Leverage	0.52963	0.52746	0.52529	0.52312	0.52095	0.51878	0.51661	0.51444
<b>ΔLeverage</b>	<b>-0.00217</b>	<b>-0.00217</b>	<b>-0.00217</b>	<b>-0.00217</b>	<b>-0.00217</b>	<b>-0.00217</b>	<b>-0.00217</b>	<b>-0.00217</b>
Liquidity	1.20486	1.24346	1.28207	1.32067	1.35928	1.397882	1.43649	1.47509
<b>ΔLiquidity</b>	<b>0.03861</b>	<b>0.03861</b>	<b>0.03861</b>	<b>0.03861</b>	<b>0.03861</b>	<b>0.038605</b>	<b>0.03861</b>	<b>0.03861</b>
Number of shares	6243874	6293966	6344059	6394152	6444244	6494337	6544430	6594522
<b>ΔNo.Shares</b>	<b>50092.65</b>	<b>50092.65</b>	<b>50092.65</b>	<b>50092.62</b>	<b>50092.68</b>	<b>50092.65</b>	<b>50092.67</b>	<b>50092.64</b>
<b>Δ gross Margin</b>	<b>-36.5991</b>	<b>-365991</b>	<b>-365991</b>	<b>-365991</b>	<b>-365991</b>	<b>-365991</b>	<b>-365991</b>	<b>-365990</b>
Asset Turnover Ratio	0.210264	0.206997	0.203755	0.200538	0.197346	0.1941777	0.191034	0.187913
<b>ΔAsset Turnover Ratio</b>	<b>-0.003271</b>	<b>-0.003267</b>	<b>-0.003242</b>	<b>-0.003217</b>	<b>-0.003192</b>	<b>-0.003168</b>	<b>-0.003144</b>	<b>-0.003121</b>
<b>Aggregate F-SCORE</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>7</b>	<b>6</b>	<b>6</b>	<b>6</b>	<b>6</b>

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 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.

### **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 7 shows the results of the model summary.

**Table 7: Model Summary**

<b>Aspect</b>	<b>Value</b>
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<sup>2</sup>. 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 8: Regression Coefficients**

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.
	B	Std. Error	Beta		
(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 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:

$$Y=4.778+ 0.619 X_1 + 0.755X_2 - 0.879X_3 - 0.712 X_4.....1$$

The results shown in Equation 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.

## VII. CONCLUSIONS

The following conclusions were made by this study:

- i. 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 health 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

- ii. 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 thusly 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.
- iii. 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.

#### **VIII. RECOMMENDATIONS**

The following were the recommendations of this study:

- i. 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.
- ii. There should be 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.
- iii. 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.

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