FINANCIAL CONSTRAINTS, FIRM SIZE, INDUSTRY GROWTH AND INVESTMENT CASH FLOW SENSITIVITY OF
NON-FINANCIAL FIRMS LISTED AT THE NAIROBI SECURITIES EXCHANGE, KENYA

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DECLARATION

This research thesis is my original work and has not been submitted to any university for any award.

Sign_____   Date <u>AUGUST 25ᴛʜ, 2021</u>

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This is to certify that this research thesis has been submitted with my approval as the university supervisor.
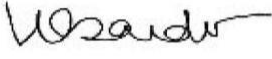
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DEDICATION

This work is dedicated to my wife Beatrice and my children Faith, Ian and Allan for their love, moral support and encouragement that gave me passion to complete this PhD study. Further, I wish to dedicate this study to my mother Marsella Ndune for imparting a virtue of hard work in me.

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LIST OF ABBREVIATIONS AND ACRONYMS

APT   Arbitrage Pricing Theory.

CAPM   Capital Asset Pricing Model

CF   Cash Flows

EMH   Efficiency Market Hypothesis

FC   Financial Constraints

FHP   Fazzari, Hubbard and Peterson

ICFS   Investment Cash Flow Sensitivity

KP   Kaplan and Zingales

MM   Modigliani and Miller

NSE   Nairobi Securities Exchange

OECPD   Organization for Economic Co-operation and Development.

UK   United Kingdom

USA   United States of America

ABSTRACT

Financial constraint has been one of the key challenges facing firm growth in the world. Some of the existing literature in finance presents that FC can be used to measure ICFS while the rest is opposed to this position. This study sought to determine the relationship between financial constraints (Independent Variable, IV) and investment cash flow sensitivity (Dependent Variable, DV) of non-financial firms listed at the NSE for the period 2010-2019. Further, the study assessed the mediating effect of firm size on the relationship between IV and DV. Additionally, this study established the moderating effect of industry growth on the relationship between IV and the DV. Agency Cost, Pecking Order and Trade-off theories provided theoretical basis of this study. The study adopted positivism as the research philosophy while longitudinal survey design was used. The study embraced census survey. The population of the study consisted of 33 non-financial firms trading at the NSE consistently over the period of the study. Secondary panel data was obtained from the NSE data base and Economic Survey reports for 2010-2019. Baron and Kenny technique was used to test the moderating effect of industry growth on the relationship between the firm financial constraints and investment cash flow sensitivity. Diagnostic test for multicollinearity was conducted using VIF and Ordinary least squares model with panel corrected standard errors was used to deal with heteroscedasticity of the error variance. The study concluded a significant financial constraints and ICFS relationship with reference to NSE non-financial firms and further size of the firms and industry growth also showing a relationship that is significant on how financial constraints and ICFS relate. The government should develop fiscal and monetary policies favorable for firms to trade profitably for this reduces over dependence on short term debts. The findings of this study are expected to guide managerial practitioners in the corporate sector to appreciate the integration of the various financing methods in the face of a challenging economic environment, and management of firm core processes in order to support entrepreneurial spirit in the country. Based on the results of this study, the government through Capital Markets Authority (CMA) and other stakeholders in the Kenyan corporate sector should develop appropriate policies in an attempt to organize the debt capital market to enable Kenyan corporate bodies get access to low cost long term debt capital to finance their investments and operations. The study recommends further studies on financial firms to address the puzzle, since there exists literature opposed to these findings.

CHAPTER ONE

INTRODUCTION

1.1 Background to the Study

Investment cash flow sensitivity changes proportionately with the level of a firm's financial constraint as noted in Fazzari, Hubbard and Peterson (1988), Hoshi, Kashyap and Scharfstein (1991) and Agca and Mozumdar (2012). Kaplan and Zingales (1997) however show that ICFS can be high for firms which are financially unconstrained creating a puzzle on the actual relationship between the two variables. Kayo and Kimura (2011) identified firm size as a key determinant of access to external financing, hence determining the extent of its financial constraint. Booth, et al. (2001) and Korajezyk and Levy (2002) show that industry growth affects firms' financing decisions as well as growth opportunities. During expansionary seasons, firms face increased demand for debt to finance new investments, which come up with economic growth. In Okumu (2014), ICFS is a linkage of several interrelated variables, which include financial constraints, firm size and industry growth.

Theories developed over time explain the relationships between ICFS and financial constraints. The agency theory by Jensen and Meckling (1976) is based on the assumption of separation of corporate ownership and control where decision making authority is delegated to the agent including financing and investment decisions. The theory of pecking order postulated by Myers and Majluf (1984) presents a premise that size comes after resources in any given firm and thus self-financing for new projects is given higher preference followed by the debt and then the issuance of shares within the conditions of asymmetric information. The trade-off theory put forward by Jensen (1986) and Myers (1984) argue that firms try to balance benefits and costs when taking

additional financing through debt under optimal financial structure. The theory in its argument puts it that the borrowing behaviour of firms will not exceed the point where the advantage associated to marginal value of the tax strikes a balance with costs of bankruptcy associated to present value. The theory further assumes that when costs and benefits in capital structure debts is balanced then a targeted ratio in the finance for sources in the long term is attained.

Pindado, Requejo, and De la Torre (2011) observed that at global level many firms engage in investments to the point where the wealth to shareholders would be at maximum or even forego investment projects until they are able to acquire enough flow of cash to undertake them in what is referred to as overinvestment and underinvestment respectively. In Kenya, Ngugi (2008) and Ngugi, Amanja & Maana (2009) emphasize that corporate firms are listed at the NSE where they are supposed to raise funds for investments in form of equity and/or bonds. Whereas equity provides very limited source of investment funds, corporate bond financing is poorly embraced by these firms leaving bank loans and overdrafts as the key sources of finance.

Literature reveals that new investments by listed firms in Kenya are mainly financed through bank loans and overdraft facilities, which poses very high financial risks in terms of bankruptcy costs from the view of both the managers and investors. Further, Okumu (2014) proves that firms listed in NSE have high cash flow sensitivities, dependent on size, liquidity and institutional ownership. Elie (2013) argues that manufacturing firms in Sub-Saharan Africa to which Kenya belongs, experience many severe constraints including financial aspects because of the existence of borrowers and lenders information asymmetry. Further, Wale (2014) adds to the argument that

the high investment cash flow sensitivities as witnessed by many African firms arises from constraints in finances.

1.1.1 Financial Constraints of Firms

A firm is financially constrained when its investments are limited to the internal funds generation and being unable to get sufficient external funds (Mulier, Schoors & Merlevede, 2016). Silva and Carreira (2012) define financial constraints as the inability of a firm to raise finances for optimal functions. Furthermore, Lamont et al., (2001) defines financial constraint as a financial friction that makes a firm incapable to fund or cushion investments that are desired. Kaplan and Zingales (1997) define financial constraint to be the wedge existing between costs at both external and internal sources of funds.

Financial constraint occurs when a firm is unable to raise sufficient funds for investments due to constraints in credit and cannot issue bonds but solely depend on loans of a bank and also have inadequate assets (Kaplan and Zingales, 1997). Furthermore, Okumu (2014) posits that the limit to capital access especially from external sources to the extent of restricting on viable investments is what constitutes firms' financial constraints. Listed firms are expected to face less financial constraints as compared to unlisted firms since capital markets enhance capital mobility, hence increasing access to funds. However, the degree of financial constraint is dependent on imperfections on market resulting to asymmetry in information. This is key since information asymmetry is vital in determining costs relating to internal and external levels of financing which is also defined according to how development in capital market exists.

In understanding how financial constraints relate to firm investment behaviour, many researchers have looked at the degree of the relationship and conclusions made. For instance, Bushman, Smith and Zhang (2011) in using Clearys Z_{fc} index gives two financial classification as unconstraint and constraints firms. The firm is financially constrained if high value of Z_{fc} is registered and thus ICFS is minimal. In the literature other possibilities emerge including sensitivities in cash flow investments (Fazzari et al. 2000) as well as constraints index by Kaplan and Zingales (KZ) and the constraints index of Whited and Wu (WW) (Whited & Wu, 2006). This study uses profitability, liquidity and leverage as measures of financial constraints in line with Fazzari, Hubbard and Peterson (1988).

1.1.2 Investment Cash Flow Sensitivity

Fazzari, Hubbard and Peterson (1988) define investment cash flow sensitivity as a coefficient relating to the changes arising from decisions at capital investment and the cash flow generated from firms' internal sources. It is where decisions involving investments rely majorly on cash flow generated internally. The concept of financial constraints and its measurements therefore becomes well understood when ICFS is studied. Firms registering ICFS that is positive experience high costs of capital from external sources as compared to those firms with negative ICFS. The firms in this category are regarded small and also their payments of dividends is low therefore bond rating and tangibility in assets is lower.

According to the existing literature, ICFS has been used in studying financial constraints with some authors posting a positive relation (Agca & Mozumdar, 2012; Hassett & Oliner, 2006; Fazzari, Habbard & Peterson, 1988) while a set other

researchers posit contradictory results (Farre-mensa Ljungqvist, 2013; Hassett & Oliner, 2012; Kaplan & Zingales, 1997). FHP (1988) argued that highly constrained firms exhibit high ICFS as compared with the unconstrained firms.

Fazzari et al. (1998) argument concerning the interpretation of ICFS is that costs are much higher in external financing as opposed to internal sources and this arises mostly due to asymmetries in information (Myers and Majluf, 1984) as well as problems associated to agency relationships (Jensen and Meckling, 1976). Further, the problems of liquidity are also experienced by those firms with negative cash flow sensitivities leading to constraint in normal operations in short term when compared to those firms with positive cash flow sensitivities.

Measurements of ICFS involve controlling opportunities in investments by use of Tobin's q and regress cash flow on investment (Erickson & Whited, 2000). It is further argued that Tobin's q is linked to problems of measurement which in turn affect investment sensitivities on the funds available internally (Alti, 2003). This study applies coefficient of regression of internal cash flows and investment to measure ICFS consistent with Rockimawati (2019).

1.1.3 Firm Size

Firm size is an operational capacity of a company in a given industry within a given period of time (Booth et al., 2001). The decisions considered critical in a given firm depend on the size of that firm in question (Kayo & Kimura, 2011). The theories; trade-off theory and pecking order theory are of the view that size of the firm and leverage are interconnected since firms that are large have low bankruptcy risks and associated costs, have portfolios that are diversified, lower agency costs, lower

monitoring costs and finally less volatile cash flows that enable them to easily access credit (Titman & Wessels, 2012).

The firm is at optimal size when its per unit cost of total production for the output is at the lowest point. Thus the level at which firms may be constrained is determined by their size since accessing financial markets by the firms is dependent on their size especially in external financing perspective (Gertler & Gilchrist, 1994). However, young firms are categorized into small sizes and thus not able to access those external based finances due to higher risks at firm level and little collateral to be trusted for financial advancement in form of credit.

In measuring firm size, growth in sales and asset tangibility are considered in finance literature since assets that are tangible qualify as collateral and sales can be used to show credibility as well as profitability of the firm in question (Gertler & Gilchrist, 1994). The employees number in a given firm and revenue in sales can be used further to measure size of the firm (Orlitzky, 2001). The foregoing study measures size of the firm in terms of growth in sales as well as tangibility of assets, consistent with Rockmawati (2019) and Crisóstomo, Lopez-Iturriaga and Vallelado (2012).

1.1.4 Industry Growth

Haller (2012) defines industry growth as the increase in the industry capacity to producing goods and services under the comparable periods. The growth in industry is key to decisions involving financing and investments. The level at which an industry grows is associated to macroeconomic factors which define operating environment and also dictates the risks of political and social wellbeing including regulations from the government. Industry growth significantly affects the growth of a firm.

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McDougall, et al. (1994) indicates that the attractiveness of a certain market has been compounded by the rate at which growth happens in an industry either through firms that are established or those that are new and small even to the point of being the sole measure of market attractiveness of the Boston Consulting Group's product- portfolio matrix. Industry growth has been used by Yip (1982) as an indicator of disequilibrium, Yip (1982) and Porter (1980) as a condition favorably associated with entry and (Yip, 1982; Porter, 1980) and Sandberg (1986) as an indicator of industry evolution.

Mwega and Ndungu (2004) applied industrial growth in their study. In measuring industrial growth rate, a base year industrial contribution to the GDP is net off the current year industrial contribution to GDP. The resultant differential industrial contribution to GDP is then divided by the base year industrial contribution to GDP. Anaman and Oseiamponsah (2007) measure industry growth in terms of the data series at nominal time to GDP added value within the construction industry in Ghana. This study measures change in firm industry contribution to the national GDP for industry growth rate in line with Muthama, Mbaluka and Kalunda (2013).

1.1.5 Non-Financial Firms Listed at the Nairobi Securities Exchange

The listed firms at NSE play a major role in providing services and commodities to Kenya's population. These firms are also expected to contribute to the national economic growth rate. The sectors underlining those NSE firms are in the categories of investment and finance, services and commercial, agricultural and industrial and allied whereas the bonds in the trading process consist of bonds at corporate level and government level (NSE, 2019). Owido, Onyuma and Owuor (2003) illustrate that the Nairobi Securities Exchange is never in perfect state and thus imperfections exist in

introduction of a wedge between external and internal costs of financing. The information that is imperfect when faced by firms contributes to financial constraint.

Existing literature shows that firms operating in Africa constantly face external financial constraints at different levels (Wale, 2014; Eli, 2014). Studies show that firms listed in NSE are small and face external financial constraints. The argument of Maina and Ishmail (2014) points to the fact that borrowing on the short term basis has become common to firms as majority cannot get funds on the long term basis and also Okumu (2014) posits that institutional ownership coupled with firm sizes as well as liquidity are key players to changes in ICFS especially to NSE listed firms.

Firms quoted at NSE face challenges in raising external funds. This is mainly because of information asymmetry that exit among lenders and the available potential borrowers. Literature shows that those firms are constrained when thinking about external accessing of finance owing to levelling off of debts. This effect of information problem and levelling off of indebtedness puts smaller firms to a disadvantage by the financial institutions either by higher costs of borrowing or by higher guarantees. This has resulted to borrowing from banks by firms listed in NSE instead of raising funds from the capital market which is cheaper than bank loans and overdrafts (Kayo & Kimura, 2011).

1.2 Research Problem

Financial constraints and investment cash flow sensitivity interconnectedness have received much unresolved patterns in corporate finance studies (Fazzari, Hubbard & Peterson, 1988). Studies have had different views on the nature of the relationship between the two variables with some concluding positive whereas others giving contradicting results. Agency theory by Jensen and Meckling (1976) predicts that

when agency problems cause firms' financial constraints, sensitivity in investment expenditure arises causing internal financing to fluctuate and therefore cash flow sensitivity increases substantially. Further, the theory of trade off suggests a relationship that is positive between financial constraints and ICFS (Myers, 1984; Jensen, 1986).

Financial markets in Sub-Saharan Africa, to which NSE belongs, are described as highly imperfect hence characterized with agency problems caused by information asymmetry, transaction costs and contracting costs (Eli, 2014). Firms listed at the NSE raise funds to finance new investments in form of equity and/or bonds (Kayo & Kimura, 2011). Lack of adequate and relevant legal and regulatory framework to enforce financial contracts has led to credit rationing and high collateralization which leads to financial constraints, hence under investment (Wale, 2014).

Furthermore, firms listed in NSE have consistently shunned the bonds market leaving financial banks as the key sources of funds for new investments as noted in Kayo and Kimura (2011) despite the recognition of the stock market as the most pragmatic and effective method of raising capital. While this leads to increased financial risks in terms of bankruptcy and other related distress costs, Kenyan managers imprudently continue financing new investments through bank loans and overdraft facilities at the expense of more profitable long term funds which otherwise increase firm performance and value.

Several studies have been conducted on financial constraints and investment cash flow sensitivities. Deveraux and Schiantarelli (1990) note that literature that investigate effect of financial constraints on investment behavior categorize firms in accordance with characteristics that include; possibility of getting financially

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constrained, size, capital structure and dividend payouts. Gilchrist and Himmelberg (1999) advance that financially constrained firms have the highest sensitivities to cash flows. Kaplan and Zingales (1997) modify the criteria upon which constraints are manifested to those that are not constrained financially, those that are possibly constrained and those that are constrained fully financially. Bond and Cummins (2001) apply the modified classification by Kaplan and Zingales (1997) to conclude that financially constrained firms have lowest sensitivity of corporate investment to cash flow. La Rocca, et al. (2015) vouch for cluster analysis in firm classification. The foregoing studies therefore arrive at no conclusive finding on the exact relationships and measure of financial constraints.

Cleary et al. (2007) have further given emphasis on positive interconnectedness and argued in the study that any inconsistency observed came as a result of lack of proxy that are realistic in financial constraints. The study further most keenly proposes a relationship that is U-shaped in earned revenue that arises from investments as well as interactions of cost effects. The relationship that is non-monotonic was also observed (Hadlock & Pierce, 2010 & Firth et al., 2012) but also relationships that are monotonic were shown by Riaz et al. (2016). It was further illustrated in literature of Bassetto and Kalatzis (2011) that conclusions that are definitive have not yet been arrived at when the concept involving financial constraint is discussed especially in decisions involving investments.

The studies among them Strong and Meyer (1990) as well as Oliner and Rudebusch (1992) concentrated on how and when problems associated with agency are key to investment and cash flow linkages. They give varying observations and contradictory results with Oliner and Rudebusch (1992) implicating that the structure associated to

ownership is key to affecting how the flow of cash and investment relate whereas Strong and Meyer (1990) indicate otherwise by stating that the prices of stocks among those firms that are undertaking investment in terms of spending and also discretionary in flow of cash experience affect performance on a decline form. Further Petersen (1988) gives a narration that the sensitivity in investment is more to the flow of cash for those firms that possess or are perceived to have the highest degree in financial constraints. Also Alti (2003) argues that Tobin's Q problems of measurement are key to investment sensitivity estimate and more so to internal funds availability.

Eli (2014) concluded that firms in the Sub Saharan region experience financial constraints due to strong information asymmetry between lenders and borrowers. In Kenya, limited studies have been conducted on firms' financial constraints. Nkurunziza (2010) concluded that firms that use external financing grow faster than those which don't and most Kenyan firms face financial constraints. Maina and Ishmail (2014) established that most firms over relied on short term debts. Kirui (2014) examines firm access to external financing in NSE and the economic growth in Kenya. The study concluded that a substantial number of firms forego external financing due to a wedge between cost of internal and external financing. Okumu (2014) also established that for firms listed at the NSE, firm size, liquidity and institutional ownership have a definite influence on the levels of ICFS. None of the foregoing studies in Kenya related financial constraints with ICFS and this is one gap that this study intended to fill.

From the foregoing literature it was not clear whether and how financial constraint is related to ICFS. The debate is still unresolved. The mixed findings on the actual

relationships reported in the literature are a clear indication that there is need for caution while measuring and interpreting the cash flow sensitivity as an indication of financial constraints as earlier explained in Harford (1999). Bond and Cummins (2001) present that the fact that the cash flows are used to predict the future profitability or growth in sales means it is in itself limiting. Further, there is no unanimity on how firm size, age and growth rate influence the relationships as noted in Crisóstomo, et al. (2012) and Kadapakkam, et al. (1998).

This is thus crucial and therefore a contribution on the debate that is ongoing by giving an insight discussion on how size of the firm as an intervener and growth in an industry as a moderator influences the way and extent to which financial constraints and ICFS relate specifically at the NSE listed firms by answering the question; how is the financial constraints and ICFS influenced by firm size as well as industry growth?

1.3 Research Objectives

The main objective of this study was to determine the influence of financial constraint, size of the firm and growth in industry on investment cash flow sensitivity of listed firms in Kenya.

The specific objectives were to:

i) Determine the relationship between financial constraints and investment cash flow sensitivity for firms listed at the Nairobi Securities Exchange.

ii) Assess the effect of size of the firm on the relationship between financial constraints and investment cash flow sensitivity of firms listed at the Nairobi Securities Exchange.

iii) Establish the effect of industry growth on the relationship between financial constraints and investment cash flow sensitivity of firms listed at the Nairobi Securities Exchange.

iv) Analyse the joint effect of financial constraints, firm size and industry growth on investment cash flow sensitivity of firms listed at the Nairobi Securities Exchange   .

1.4 Value of the Study

This study discusses various theories. Hence, it contributes to the advancement of ICFS based theory of the firm and capital structure theories like pecking order, agency and trade off. The study provides more insight on the ICFS in Kenya in the context of publicly quoted firms. The policy makers of the organisations in the public and private sectors in Kenya and other countries use the information obtained from this study to make their policies. These policies are applied diligently to improve the firms' performance.

This study is of importance to scholars since it provides an insight on the literature. Further, it points out research gaps which beg for answers from researchers. Managers and decision makers are adequately informed, and enabled to expound their understanding on ICFS, which enhances the performance of corporate firms in shareholders wealth creation. Lastly, the study provides theories that are critical for decision makers and policy makers for consideration.

1.5 Structure of the Thesis

Six chapters are well outlined in this thesis. The first chapter gives an introduction pertaining the study with key conceptual and contextual discussion brought out. Such concepts pertain to key variables; financial constraints, size of the firm together with industry growth as well as ICFS. The context is where the study covers and this entails those non-financial firms listed specifically on NSE in Kenya.

Chapter two is well arranged extensively covering review of literature by first presenting those theories deemed key to study and also extends to review empirical literature based on study variables and the likely influence on ICFS and how variables jointly link to each other, and finally summarizes the perceived gaps that arises within literature identification and discussion with a well representation of variables on a diagram well illustrated.

The information presented in chapter three pertains methodology of the study in question with key sub sections considered including how it was informed under philosophy and the design used. The population and how it was arrived at was also presented and how data derived, coupled with other sections like operationalization and analysis aspects. The fourth chapter dealt with how analysis took place and findings interpreted thereof. The fifth chapter presents hypotheses testing and discussion of findings. Finally, chapter six summarizes key findings together with contributions and limitations of the study and suggestions for further research.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter is dedicated to reviewing theoretical as well as empirical analysis literature. Section 2.2 gives a description and analysis of theoretical views, 2.3 detailed discussions on empirical studies, 2.4 gives a detailed model of concepts as developed through critical analysis of literature and finally the section on 2.5 summarizes and outlines the hypotheses involved there in the study.

2.2 Theoretical Underpinnings of the Study

This study reviews the theories pertinent to financing and decisions of investment in a firm. The interactions of each theory on key concepts of the study have been developed based on key assumptions, critique and importance to the current study. Theories discussed include: Agency, Trade-off and Pecking Order. The agency theory by Jensen and Meckling (1976) informs financial constraints variable with the argument that decisions arising from control and ownership influences the navigation in financial constraints. The theory of pecking order which is postulated by Myers and Majluf (1984) informs firm size with a premise that size comes with resources in any given firm and thus self-financing for new projects is given higher preference followed by the debt and then the issuance of shares within the conditions of asymmetric information. The trade-off theory put forward by Jensen (1986) and also by Myers (1984) informs industry growth through financing with the argument on firms trying to balance benefits and costs when taking additional financing to grow. The proponents of the theories were developed and extensively enhanced by other

researchers based on their findings on theory testing. The discussions on the theories in question are given in the subsections herein.

2.2.1 Agency Theory

The agency theory advanced by Jensen and Meckling (1976) postulates that firm managers are agents of investment and debt management. Therefore, their actions in setting up income diversification avenues influence growth in firm size and subsequently agency conflicts may influence investment cash flows. The theory is key in other functions relating to resolving conflicts like interests underlying opportunities and financial management as well as risks and costs (Eisenhardt, 1989). The theory argues that managerial decisions and behavior influence the levels of investments cash flow sensitivity. This theory is considered to overarch others since it has received much attention and discussion when ownership especially separations where management is key, is the tenet to issues within controls and ownership at corporate level (Fleming, 2005). There is conflict related to how stakeholders and owners referred to as principals and agents who are managers relate and thus directors are key in mitigating such scenarios (Sulong & Mat, 2010).

When managers are part of the share ownership, they will automatically get interest and have incentives in adding more value in firm than shrinking it. This is through performance of day to day activities which increases the availability of information and reducing conflicts which increases investment and substantially reduces cash flow sensitivity. The theory stresses on the need to institute structural mechanisms and systems that check on the behaviour of the agent (Niemi, 2005). This is so because managers are likely to enhance their personal dealings without taking firms performance to priority (Fleming, 2005). This is further revealed when owners do not

have the information required from CEOs; they tend to put their interests on top thus affecting firm performance. The major challenge especially to the principals is coming to terms with any other cooperation associated with agents with the same level minimizing any associated losses of productivity or mitigating behaviors of such move.

The other theory's assumption is that agency costs designed corporate control practices are applied by firms to downplay any arising agency problems. Therefore, good corporate ownership adopted by the firm means the enhancement of shares to managers and also the redistribution of the firm's profit to investors as interest or dividends which minimize the misuse of the same by managers who are likely to engage in the projects that suit their interests. The current study recognises the relevance of agency theory in the relationship between financial constraints and investment cash flow sensitivities. Agency costs and problems cause financial frictions which increase investment cash flow sensitivities. Empirical results prove the relevance of this theory in the foregoing study.

2.2.2 Pecking Order Theory

The theory of pecking order is premised on the resources as priority as opposed to the size of the firm. Further new securities and cost associated to issuance are key than any other consideration and therefore financing at internal level is key to minimize such costs. The borrowing through equity is well regarded to be last resort only when the financing at internal level proves insufficient. Therefore, pecking order is when the companies give preference in terms of own financing, then debt consideration and finally issuance of shares in the effort to finance viable projects that are new in the event of conditions under information that is asymmetric. In the new events, the

theory of pecking order is much designed to fit the economies that are developed which are more so to preference financing reassessment, earnings that are retained as well as equity and finally on the debt that is long term (Myers & Majluf, 1984).

Myers and Majluf (1984) gives an insight that if there is less information to investors as opposed to those inside the firm then the market value associated to equity may be mispriced. In the event that projects that are new need financing the under-pricing of equity might pose a severe damage to the extent that NPV is captured with new investors, hence net loss is exhibited to those shareholders in existence. The positive NPV will thus render the project void and rejected on equal measure. Therefore, the security being not undervalued on the market is key to financing a new project. In the situation of such magnitude therefore the funds generated at internal level gives a priority instead of firms' equity as well as those debts that are not considered too risky.

The firms in the global world are keen to using the funds at internal level to engage in investments as opposed to funds that they borrow (Campello, Graham & Harvey, 2010). The ICFS arises especially when firms rely more on funds generated internally to get future investments done when getting external financing becomes tricky and hard. In a nutshell, some viable investment opportunities may as well be foregone especially by those firms that are constrained financially thus leading to underinvestment.

The Pecking order theory hence gives a snapshot in the study by more so identifying those adverse problems under selection that are likely to arise especially when insiders in the firm (that is owners as well as managers) possess to large extent information that is better on the value of their firm as opposed to information that

capital markets possess (Myers & Majluf, 1984). Selecting of adverse net present value (NPV) which is positive gives a firm an opportunity not to engage in a project considered unprofitable since the cost of financing externally is high and should be avoided at all costs. The cost that is excess makes the external financing inappropriate thus causing constraint on liquidity to particular firms (Himmelberg & Petersen, 1994).

2.2.3 Trade-off Theory

The theory of trade off gives a leeway for any firm to define the structure of their financing options at optimal level by doing cost and benefit balancing when seeking additional debt. The benefits associated to leverage are allowable deductions in tax as far as interest is concerned as well as the improvement in flow of cash (Jensen, 1986). The cost of borrowing can be well defined to either costs associated to bankruptcy or those costs arising when there exists shareholders' conflicted interest.

In the event where the level of leverage is optimal the marginal gain gives a balance to debt cost. There are phases in two folds where maximizing firm value through the increase in funds resulting to the ratio of debt can be presented; the phase under static trade off as well as the phase on dynamic trade off. The point at which a firm limit to borrowing is reached when the advantage of tax on the value of marginal is balanced to the costs of bankruptcy in the present value.

Firms that are keen to the proponents of the theory of trade-off have seen the development in the setting of targets in debt as well as the ratio of the value and then at gradual level moves to hit the target (Myers, 1984). When further determining how the target works, the striking a balance of benefits under shield of tax in using a debt

against the financial distress costs that rises within an increasing leverage use must be adhered to.

The firm that makes profits in most cases borrows less according to the tabulated or rather evidence documented. This thus gives them an upper hand to use the internally sourced funds to run projects that they undertake at a newer level thus their chances to adopt or enter financial distress becomes minimal. Therefore, a contradiction arises since in the theory, when a debt increases, the effect of tax becomes favourable and therefore under the theory of trade off those profits that are high may mean servicing of debt is more and also tax income is more in shielding therefore resulting to debt ratio that is higher.

This theory therefore assumes a target ratio of long term sources of finance by establishing a balance between costs and benefits associated with using debts in capital structure. However, where a firm is facing financial constraint and external financing is unavailable, the theory becomes irrelevant and pecking order theory prevails. The theory supports the proposition that those firms with constrained financials experience more of ICFS when compared to stable financially firms.

2.3 Empirical Review

In this section, the study presents the existing studies that have been conducted on the relationships between the study variables namely financial constraints, ICFS, firm size and industry growth rates.

2.3.1 Financial Constraints and Investment Cash Flow Sensitivity

Since FHP (1988), studies have been occasioned on financial constraints and ICFS in the world over. FHP led a study of ICFS on 500 U.S fabricating firms between 1970 - 1984. These organizations were arranged into two categories: financially constrained as well as financially unconstrained firms. Size and profit pay-out rate were likewise utilized as the bases of categorization. The Proxy for speculation in terms of performance was represented by Tobin's Q in the analysis which presumed that higher firm income is highly dependent on financial performance.

In spite of the fact that this position was supported by numerous resulting studies under documentation including Hoshi, Kashyap and Scharfstein (1991) as well as Fazzari, Hubbard and Peterson (2000) and also Hassett and Oliner (2006) and Agca and Mozumdar (2012), a few different studies including Kaplan and Zingales (1997) and Cummins and also Hasset and Oliner (2012) demonstrate, contrary what might be expected, that there is no connection between the financial constraints and ICFS. Cleary (1999) on the sample of 1317 firms in U.S that have total financial data accessible for 1987-1994 periods on the SEC World Scope Disclosure informational collection. Classification was based on their start of-year index of constraints in finance. Firm characterization is permitted to change each year to mirror the way that money related status changes persistently. The list is resolved utilizing various discriminant investigations, like Altman's Z factor. The study infers that financial

constrained firms have generally lower ICFS when contrasted with less financial constrained ones, in spite of the discoveries of FHP (1988). This finding is in accordance with the discoveries of Kaplan and Zingales (1999).

Almeida and Campello (2001) opine that a key supposition in the investigations on firm financial imperatives is that such limitations make an interpretation of altogether into greater expenses of assets. The methodology presents two kinds of challenges to the exploration on constraints of finance. Principal, it accidentally limits the comprehension about constraints of finance since, by and by, firms regularly face credit proportioning. Furthermore, it involves arguments whether such a methodology can convey unambiguous ramifications for corporate finance or rather investment.

Huang (2002) utilized large example of US organizations that are listed to show that the connection between financial constraints and the ICFS is nonlinear. The author contends that the distinction in findings can be clarified by test determination issues or problems associated to selection. The study shows that when utilizing genuine and actual degree of investment in the relapse study, as in the standard finance literature, the coefficient on income cannot be an exact proportion of financial constraints. The study does not support that the monotonic and positive connection between financial constraints and ICFS is not vigorous in large samples contemplates utilizing detailed schemes of classifications.

Allayanis and Mozumdar (2002) in the vigorous study to analysing the effect of negative flow of cash on ICFS categorized that when firms are in a bad way (bringing about money misfortunes), investments and cash flow may not be in tandem and therefore, the outcomes from Cleary (1999) can be clarified by the negative incomes.

The results by Kaplan and Zingales (1999) then again are clarified by powerful perceptions in the sample considered small.

Brown and Petersen (2009) studied at why ICFS has declined in a sharp way at a given period of time. The author's figure that studies has to a great extent disregarded how rising research and improvement sensitivity and advancements in value markets have affected investment income sensitivity gauges. The investigation shows that for the timeframe 1970 to 2006, sensitivity in relation to flow of cash in investment results to a great extent vanishes for physical venture. Also, ICF remains nearly solid for innovative work. What is more, thirdly, ICFS decreases, however doesn't vanish, for all out sensitivity. The study conclusions are to a great extent clarified by the changing organization of investment and the rising significance of open equity value as a wellspring of assets, especially for firms with relentless negative incomes or flow of cash.

George, Kabir and Qian (2010) gave an overview on how ICFS and financial constraints relate with application of Bombay Stock Exchange for the period 1997-2000. Firms were gathered as those associated to groups of investment and those which were most certainly not. The two Tobins' Q and Euler condition models were utilized in the examination. Further, Tobin's Q is changed in to incorporate those regarded as inside funds availability as an extra determinant of speculation, as utilized in Agca and Mozumdar (2008). The study gives an overview that organizations which have groups to finance investment have lower constraints to finances and low ICFS. The study ignores different elements that may influence ICFS, for example, firm size and financial development.

Chen and Chen (2010) analysed ICFS on 1294 firms in Compustat data set during 1967 - 2009 period. Size and dividend pay-out rates were used to classify firms into their distinct characteristics. Taken together, three tests were performed to provide time series evidence against ICFS as a valid measure of financial constraint. The examination takes note of that in the event that one accepts that money related requirements have not vanished, at that point ICFS can't be a decent proportion of the financial constraints. Bushman, Smith and Zhang (2012) studied 841 firms that traded in US between 1971 and 2006. These firms had a SIC code between 2000 and 3999. They argued that ICFS reflects related investment decisions. Farre-mensa and Ljungqvist (2013) studied 10,112 US firms trading in NYSE in fiscal years 1989-2011 and concluded that financial constraint is not reflected by ICFS.

La Rocca, et al. (2015) investigate the mixed evidence at empirical level on the connection between financial constraints and ICFS by first recognizing that literature recommends that estimating limitation of finances is a long way from direct. The outcomes indicated that the conventional measures used to distinguish financial obliged firms prompted uncertain interpretations. The authors suggest that the group investigation can be utilized to envelop the different single basis approaches set up for estimation of financial requirements.

As clarified in Mulier, Schoors and Merlevede (2016), investment income sensitivities are as a sign of presence of firm level financial requirements. In any case, the literature is yet to explain whether the high sensitivities mirror any of the three prospects. First, an unsatisfied interest for external assets or funding by the firm alluded to as gracefully impact. Secondly, the inclination for internal assets or funding over external assets or funding for an assortment of hidden reasons alluded to as the

interest impact. Or on the other hand thirdly, the way that venture and income are both connected with a precluded variable, for example, investment opportunities. The observational test in further investigations in this point is consequently to unravel these three impacts of the investment financial requirements connections.

Riaz et al. (2016) related (ICFS) and financial constraints in a board data of 288 recorded firms from Pakistan. Utilizing the primary contrast Generalized Method of Moments (GMM) procedure, the investigation results show emphatically critical sensitivity to finance and that ICFS increases progressively with the degree of challenges related to finances. The examination finding also shows that ICFS for constraint clusters are altogether higher comparative with unconstrained groups. To gauge financial requirements, the examination applies three methods to be specific; SA-list, KZ-file and Z-Score. Investment is estimated as in D'Espallier and Guariglia (2012), Firth et al. (2012) and Ding et al. (2013) as change in substantial fixed capital.

Lewellen and Lewellen (2016) explores the investment income sensitivities of U.S. firms from 1971–2009. The outcomes propose that financing limitations and free income issues are significant for investment choices. Investment and income are emphatically connected in the wake of controlling for a company's opportunities, particularly for firms that are the destined to require external funding. The more grounded impact for obliged firms proposes that financing options significantly affect choices in investments. In particular, firms that are well financially constrained, as reflected in constantly negative free income and low benefits, working capital, profits, and value, are the riskiest to financing. Fowowe (2017) examines impacts of access to finances on the development of firms in African nations. Applying access to or affinity to finances as a variable which estimates whether firms are obliged in getting

credit or not, the investigation finds that entrance to fund imperative creates a huge negative impact on firm development. Likewise, firms that are not credit constrained experience quicker development than firms which are credit compelled.

2.3.2 Financial Constraints, Firm Size and Investment Cash Flow Sensitivity

Devereux and Schiantarelli (1990) present that there is substantial literature estimating the possible impact of financial constraints on investment behavior. The studies categorize firms in accordance to their possibility to get financially constrained considering the firm's size, capital structure and dividend payout. These characteristics are used to determine whether the firms are likely to be sensitive to the availability of internal funds often measured in terms of cash flow (Hayashi & Inoue, 1995). The firms categorized as financially constrained have been found to have the highest sensitivities to cash flows and as a result this has been considered to mean that financial constraints are binding (Gilchrist & Himmelberg, 1999). Fazarri et al. (1988) utilized the diminished structure investment model and saw that investment income sensitivities are higher among firms with lower profits while Oliner and Rudebusch (1992) saw the sensitivity as higher among more firms that are young.

Kadapakkam, Kumar and Riddick (1998) analyzed the level of income accessibility to firm interest in six OECD nations. Specifically, the examination concentrated on the degree to which the dependence on internal assets is influenced by firm size, since there is general understanding that firms that are small have limited access to outside capital markets and, consequently, ought to be progressively influenced by the accessibility of internal assets. Therefore, the study finds that the measure of corporate investment is influenced by external assets in all the six nations. Hence, internal financing influences investment of the firm.

In spite of earlier desires, the study finds that investment sensitivity is higher in the huge firm clusters and less to small sizes. The authors therefore derive that the clarifications for these results are grounded in administrative office decisions, and in the more prominent adaptability delighted in by huge firms in timing their investments. In this way, the study puts it that the level of firms' sensitivity to investment can't be deciphered as an exact proportion of its entrance to capital markets as deciphered in Kaplan and Zingales (1997).

Progressive research findings have brought up a few criticisms regarding the previous results associated to in Gilchrist and Himmelberg (1999). Kaplan and Zingales (1997) argues that the order received by the past studies and researchers mistakenly relegated firms. Therefore, they propose the utilization of data in financial reports yearly to classify firms as 'not constrained financially, 'perhaps constrained' and constrained. In view of this arrangement, Bond and Cummins (2001) results demonstrate that those firms that are small, hence financially constrained, have less chances to external financing. This is because most of the small firms are poorly collateralized, have low credit rating and also deemed to be highly opaque hence facing information asymmetry. This makes it difficult for these firms to raise external funds.

Fazarri, Hubbard and Peterson (1988) explain that organizations can be grouped by whether they were probably going to be constrained financially based on their size, dividend pay-out and capital structure. This can be achieved if they are increasingly responsive to internal cash flows generated from profits estimated and in the wake of controlling for investment request as estimated by Tobin's Q proportion.

Soumaya (2012) study examines financial requirements and ICFS. The study further examines the impact of debt, liquidity and firm size on the investment sensitivity among 82 French firms that create the Societe' des Bourses Francaises (SBF) 250 record in the period between 1999 to 2005. It shows that capital sourcing in proportion of firm size has a positive and a noteworthy impact on investment. Likewise, long and medium term debts have negative impact on the investment cash flow sensitivity. Further, the effect of the liquid resources on the investment sensitivity is not clear since the impact of cash stock is sure while the impact of liquid resources is negative.

Li and Li (2017) built up a model for investment sensitivity with firm size and age considered. The examination builds up that bigger and increasingly developed firms are less constrained financially yet, have higher investment cash flow sensitivity. The model gives a quantitative clarification of the positive link between sensitivity and firm size and age in light of the fact that peripheral office cost of capital is lower in the developed firms who ideally utilize higher investment to give more incentives. Conversely, young as well as little firms cannot utilize more powerful incentives because of the higher prompted avoidance of risks.

2.3.3 Financial Constraints, Industry Growth and Investment Cash Flow Sensitivity

Studies have connected growth in industry with financing choices and decisions. Booth et al. (2001), centers on capital structure in nations that are developing and found that growth in industry enhances long-term book-debt ratio as well as total debt ratio. Korajaczyk and Levy (2002) considered capital structure decision and financial related requirements. The study presumed that conditions on finances influence

financing choices and mirror the condition of the economy. Henceforth development in financial systems rate emphatically influences ratio of leverage (Booth et. al., 2001; Korajezyk & Levy, 2002; Gajurel, 2005 and Cook & Tiang, 2007). A few macroeconomic factors, for example, growth in industry and total national output essentially impact on firm's capital structure and choices in investment (Booth et al. 2001).

Muthama, Mbaluka and Kalunda (2013) examined the impact of economic growth on the financing decisions of chosen firms in Kenya. The sample comprised of 39 firms recorded in the NSE for the period between 2004 and 2008. Firms' influence (obligation) proportions were relapsed against industry growth, GDP rate of growth and changes in costs. It was found that the influence of constrained firms differ with GDP. Further, industry growth significantly affects firm financial constraints. This is upheld by Booth et al. (2001), and steady with Rajan and Zingales (1995). Nonetheless, Muthama, Mbaluka and Kalunda (2013) showed no effect of other macroeconomic components like the capital market improvement on structure or capital. The study however does not analyse the effect of other firm specific factors on financing and investing decisions.

2.3.4 Financial Constraints, Firm Size, Industry Growth and Investment Cash Flow Sensitivity

Empirical literature has suggested or indicated relationships between constraints relating to firm finances and ICFS. These include Fazzari, Hubbard and Peterson (1988), Kashyap and Scharfstein (1991), Fazzari, Hubbard and Peterson (2000) and Cummins, Hasset and Oliner (2012). The interconnectedness between size of the firm and ICFS has also been supported by several studies (Oliner & Rudebush, 1992;

Schaller, 1993; Booth et al., 2001 and Bond & Meghir, 1994). Further studies support the interrelationships between economic growth and ICFS (Muthama, Mbaluka & Kalunda, 2013).

Oliveira and Fortunato (2006) utilized an enormous uneven board informational index of Portuguese firms in manufacturing over the period from 1990 to 2001 to look at whether liquidity requirements in business firms influence performance. The investigation applies a GMM framework to gauge a powerful board information model of firm performance to consolidate income as a proportion of liquidity imperatives and constancy of performance.

Gupta and Mahakud (2019) analyzed how financial advancements on investment at corporate level and how financial constraints are interlinked and also how financial improvements influence investment cash flow sensitivities with respect to size, level of requirements to finances and firm affiliations. This shows that funding influences the decisions of the firm, which infers that firms are financially constrained. Additionally, the study sees that financial improvement lessens the ICFS and the impact of financial advancement is progressively noticeable for small size and independent firms. The review concentrates more on different aspects of the study variables without linking the variables altogether in determining how they intertwine to bring about ICFS and therefore leaves a room for more studies to be carried out to fill the gaps identified.

2.4 Summary of Knowledge Gaps

The literature review on the relationship between financial constraints, size of the firm and industry growth on ICFS does not provide a clear causal link between these variables. Hence, this indicates a research gap in the interrelationship among these

variables which was investigated in this study. In summary, the knowledge gap identified is that determinants of ICFS in Kenya have not been studied as argued previously.

The existing literature concerns the developed economies. Further, there have been research methodology differences ranging from the descriptive type to causal type. The question arising is whether use of alternative research methodologies would yield more robust results. The gaps which were identified in the literature were summarized in Table 2.1 below:

Table 2.1: Summary of Literature Review

Author	Focus of Study	Methodology	Findings	Research Gaps	Addressing gaps in Current Study
Fazari, Hubband and Peterson (1988)	Investigate relationship between FC and ICFS in USA	Comparative analysis	There is positive correlation between FC and ICFS	Prior partitioning of firms based of FC in establishing ICFS. Assumes there are no other firm factors that may affect its level of FC	The study incorporates financial leverage, liquidity and profitability in firm partitioning.
Bond and Meghir (1994)	Relationship between Age, Size and ICFS	Euler equation model	Size and age affect firms ICFS	Study did not focuss on the existence of FC in the relationship	Study extends the analysis to include FC, ICFS relationship as influenced by firm size.
Kadapakkam, Kumar and Riddick (1998)	Internal funds relating to size of the firm	Regression analysis	Sensitivity in cash flow investments manifests much in large firms as opposed to small counterparts	Finding is in opposition to contentions that smaller firms have less access to capital markets and are progressively influenced by accessibility of interior assets	Study extends investigation on the effect of size on the FC, ICFS relationship.
Cleary (1999)	Investigating relationship between FC and ICFS in USA	Dividend pay-out policies used as a portioning factor	ICFS becomes more to those firms experiencing's constraints.	Other possible factors that may influence the relationship were not incorporated in the analysis.	The study investigates the moderating effect of industry growth and intervening effect of size and their joint effect thereof on the relationship between FC and ICFS

Author	Focus of Study	Methodology	Findings	Research Gaps	Addressing gaps in Current Study
Almeida and Campello (2001)	Cash flow sensitivity of cash	Comparative study analysis	Studies assume that financial constraints results to higher cost of funding.	The assumption that financial constraints results to higher cost of funding narrows down the understanding about financial constraints	Other than leverage, the study includes liquidity and profitability as measures of financial constraints respectively.
Huang (2002)	Sensitivity concerning flow of cash investment and constraints in finances	Regression analysis	Relationship between study variables is non-linear and sampling and classification schemes may be the cause of variability in findings.	The method for analysis of the non-linear relationship established needs to be explained. The classification schemes can be explained further.	Study considers each firm's levels of financial constraints and thus may not have challenges with classification.
Allayanis and Mozumdar (2002)	Effect of negative CFs on ICFS	Regression analysis	In cases of losses investments responding to flow of cash is limited	The study has not clarified if negative cash flows imply high financial constraints	Study operationalizes financial constraints to include profitability.
Pawlina and Renneboog (2005)	Listed UK firms and the associated ICFS	Regression analysis	Costs of agency brings about sensitivity in investment	Study focus had not related the FC with ICFS. It also did not show how other variables influence the relationship.	Study models the relationship between FC, ICFS as influenced by Size and Industry growth rates.
Oliveira and Fortunato (2006)	Changes associated with growth in firm and how liquidity plays a role	GMM analysis	Firms deemed young and also smaller grow sensitivity in cash flow higher	Study can investigate the exact effect of financial constraints considering firm growth.	Study extends analysis and incorporates industry growth rate
Brown and Petersen (2009)	Investigate sharp decreasing ICFS as time moves	Desk review	There is disappearance of ICFS when physical investment is key and. Declines for total	How does FC explain the decline in ICFS over time?	Study related FC with ICFS and also looks at how size and industry growth rates influence the

Author	Focus of Study	Methodology	Findings	Research Gaps	Addressing gaps in Current Study
			investment.		relationship.
Chen and Chen (2010)	Analysed ICFS	Comparative study analysis	ICFS is a valid measure of FC. Only if FC has been deemed to disappear or else it can't be a good measure	Is ICFS a measure of FC, or FC is a measure of ICFS or FC is a determinant of ICFS.	Study models FC as a determinant of ICFS.
George, Kabir and Qian, (2010)	Examining reliability of ICFS as a measure of FC in India among affiliated and non-affiliated firms' groups	A priori partitioning of firms used in grouping them	ICFS not different for highly constrained firms from lowly constrained firms	-The researchers recommend further studies in different countries other than India. Further, only quantitative firm specific characteristics were used in dividing firms into either constrained or unconstrained.	The study was carried out in Kenya with totally a different economic environment. Quantitative firm characteristics will be applied in the methodology.
Bushman, Smith and Zhang (2011)	Investigating determinants of corporate investment decisions in UK	Regression Analysis	ICFS increases proportionately as Dividend Yield with Firm Age increases but inversely with changes to Cleary's Zfc.	-Firms studied are limited to large manufacturing companies in USA. -Leverage and sales growth rate are not incorporated in the computation of ICFS coefficient.	-Firms studied belong to all industrial sectors publicly quoted in NSE. ICFS coefficients are determined by including leverage and profitability.
Crisóstomo, Lopez-Iturriaga and Vallelado (2012)	Verify existence of FC for investment in Brazil and specific firm size effect on it	Regression analysis	Firms face FC since investments depend on internally generated funds. Size is an important determinant of FC and ICFS.	Finding that ICFS in smaller firms is more than in larger firms is not consistent with other literature.	Study thus investigates the actual effect of size of the FC, ICFS relationship.

Author	Focus of Study	Methodology	Findings	Research Gaps	Addressing gaps in Current Study
Soumaya (2012)	Studies on constraints of finance and sensitivity in cash flow investments are summarized	Desk review	The size associated to firm plays a key role to cash flow and also investment linkage.	Effect of assets in liquidity and how cash flow investment sensitivity not clear	Study extends analysis by measuring financial constraints to include liquidity.
Elie (2013)	Analysis of FC of Manufacturing firms listed at the capital markets in Sub-Saharan Africa	Euler equation of capital accumulation used on firms panel data to measure FC	Firms are highly constrained due to levelling off of debts	The study was limited to manufacturing firms.	-This study incorporated other sectors of economy.
Muthama, Mbaluka and Kalunda (2013)	Macroeconomic factors and how they influence structure of the firm capital structure of Kenya's selected firms	Regression analysis	Leverage of constrained firms varies with macroeconomic factors.	Study can be extended to review the FC and Investment decisions relationships.	Study evaluates FC, ICFS relationship taking into account industrial growth rate.
Okumu (2014)	Measure the effects of capital market imperfections on ICFS of firms listed at the NSE, Kenya	A sample of ten firms in five years	Capital markets imperfections affect the level firms ICFS in Kenya	Firm size and industry growth were not incorporated alongside other factors that influence the relationship	A census of all non-financial firms is taken. Firm size and industry growth also included in the study.
Mwani, Makau and Kosimbei (2014)	To establish structure of the capital relate to Non-financial firms in Kenya performance	Explanatory research design employed on firms panel data	The leverage in finance and performance is negative in terms of their relationship	Firm size and industry growth were not incorporated alongside other factors that influence the relationship	This study incorporated size in terms of firm and growth in industry in finding the interconnectedness between FC and ICFS of listed in Kenya
Sarkhe, Ramadan, Hamid and Mojadam (2015)	The interconnectedness existing among opportunities to grow,	Fixed effects Panel data	Significant association on decisions made on investment and	How does FC explain changes in ICFS	Study related FC with ICFS and further looked at how size and industry

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Author	Focus of Study	Methodology	Findings	Research Gaps	Addressing gaps in Current Study
	financial leverage and decisions on investment		financial leverages		growth rates influence their relationship.
Nadia (2016)	ICFS at corporate level and how changes arise due to financial constraints	Panel data Regression	Decisions of investments for firms constraints are far higher significant to sensitivity	Study can investigate the exact effect of financial constraints considering firm growth.	Study extended analysis and incorporated industry growth rate
Kumar and Ranjani (2018)	How decisions on investment are influenced by FC for firms at manufacturing level as listed in India	SEM estimator Panel data	Affirmed that decisions on investment relating to firms that are standalone exhibit much ICFS when are compared to firms affiliated to groups.	Study focus had not related how other variables influence the relationship.	Study modeled the relationship between FC, ICFS as influenced by Size and Industry growth rates.
Gupta and Mahakud (2019)	The development in finance and ICFS within different levels in financial constraints and affiliations to firms	GMM analysis panel	Constrained firms' leads to less development in an industry causing high sensitivities to cash flow	Prior partitioning of firms based on FC in establishing ICFS. Assumes there are no other firm factors that may affect its level of FC	The study incorporated financial leverage, liquidity and profitability in firm partitioning.

2.5 Conceptual Framework

This section discusses the conceptual framework that offers a suitable theoretical foundation for identifying the relationships that exist among key variables for the study. The discussion was informed by literature reviewed above that supports the need for an integrated model for the study of ICFS. The dependent, independent, intervening and moderating variables are briefly outlined below and depicted by Figure 2.1

The study sought to explain and predict ICFS. In order to achieve this, the concept of ICFS was depicted by the ratio of total investments to total assets. Cash flows, long term investments and proxies for long term investments demand were decomposed into the ICFS ratio through a logistic regression model. In this study therefore, the ICFS comprised the dependent variable.

Literature reviewed showed that ICFS of a firm was influenced either positively or negatively by its financial constraints, which for the purpose of this study is the independent or predictor variable. The concept of financial constraints was also operationalized separately. Leverage, profitability and liquidity are the three indicators used to study this variable.

The effect of the independent variable on ICFS was manifested midway through intervening variables such as asset tangibility and sales. These internal/firm-specific factors comprise firm size, which affects the ICFS of a firm. Capital structure theories emphasize the influence of size on the ICFS. The economic environment, generally the external factors denoted as industry growth in this study, has a strong contingency effect on the ICFS. For the reason of their modifying effect on ICFS, industry growth

was regarded as a moderating variable and the parameter to study this variable was change in industry contribution to gross domestic product.

The proposed conceptual model hypothesized that ICFS is influenced mainly by financial constraints. However, the relationship between these two variables is further influenced by macroeconomic variables (Baum, 2013; Muthama, Mbaluka and Mbaluka, 2013; Gajurel, 2005) as measured by industry growth and firm specific factors (Cekrezi, 2013; Booth, 2001) as measured by size. Hence, there is clear evidence that firm demographics and macroeconomic factors influence financing and investment decisions, both separately and jointly.

Figure 2.1: Conceptual Framework

Moderating Variable

INDUSTRY GROWTH
- Change in Contribution to GDP

H₃ — H_3

Independent Variable

Dependent Variable

FINANCIAL CONSTRAINTS
- Liquidity
- Leverage
- Profitability

INVESTMENT CASH FLOW SENSITIVITY
- $Inv_{it} = \beta_0 + \beta_1 CF_1 + \varepsilon$

H_4

Independent Variable

FIRM SIZE
- Sales
- Tangibility of assets

H_1

Intervening Variable

H_2
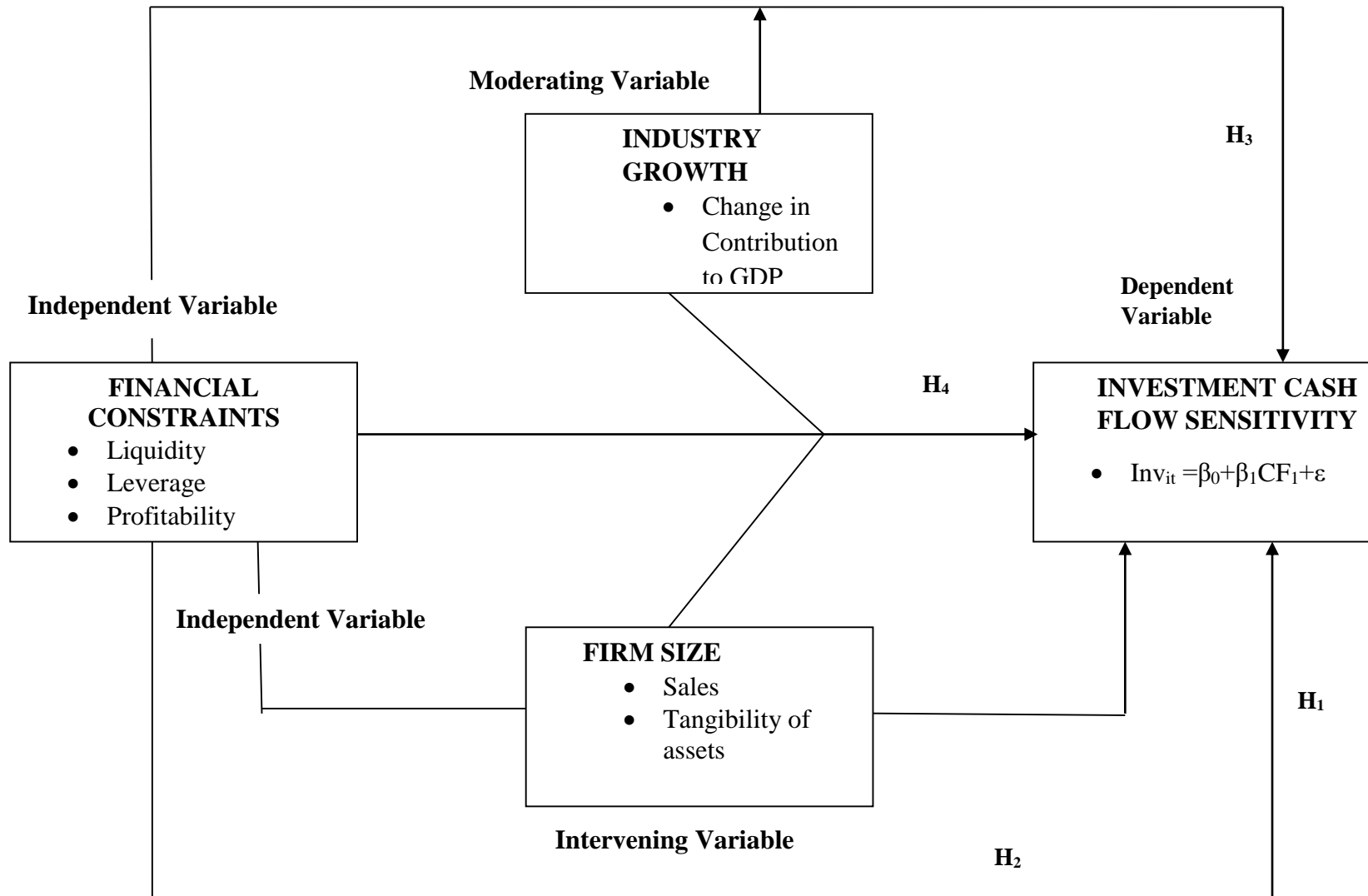
2.6 Research Hypotheses

H_1:   There is no significant relationship between Financial constraints and investment cash flow sensitivity among NSE listed non-financial is not significant.

H_2:   The effect of firm size on financial constraints and investment cash flow sensitivity relationship among NSE listed non-financial firms is not significant.

H_3:   The effect of industry growth on financial constraints and investment cash flow sensitivity relationship among NSE listed non-financial firms is not significant.

H_4:   The joint effect of financial constraints, size of the firm and industry growth on investment cash flow sensitivity of NSE listed non-financial firms is not significant.

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CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter highlights how methodology at hand that was used for this study is presented. It discusses the philosophy concerned, the design that was employed; population targeted highlighting also the methods for data collection and also a section of how variables pertaining to the study were operationalized and finally analytical techniques that were employed.

3.2 Research Philosophy

A philosophical orientation in research is the founding principle on how data about a phenomenon is gathered, analyzed and used. At the heart of research philosophies lies ontology and epistemology. Based on ontology and epistemology two research paradigms namely positivism and interpretivism exist. The philosophy associated with this particular school differentiates the researcher from the subjects as independent and cannot influence each other's outcome or results (Irungu, 2007). The study is based on a positivist philosophy approach. According to Saunders et al, (2007) this kind of philosophy is quantitative as opposed to phenomenology which is basically a qualitative. The positivist orientation is guided on the philosophy a one realism existing though as a result of limitations of humanity it may be known imperfectly and the realism within the context of probability can be discovered by researchers (Ravitch & Riggan, 2012).

Positivism adopts the philosophical stance of the natural sciences which only considers observable and measurable phenomena as knowledge. It seeks facts of

social phenomena with no abstraction or status of subjective of those considered. Positivism favours the use of quantitative perspective to analyse data. The current study was meant to establish possible relationships among the identified variables and aimed to establish the degree of correlation between those variables. It adopted positivism philosophy since it looked at the causes and effects. The study involved hypotheses testing based on the facts obtained from the data collection exercise. The study further favoured positivism since it aimed at investigating theoretical bases and data was collected to reaffirm those theories. Bagire (2012) argues for a positivist paradigm where scientific processes are followed to hypothesize fundamental theories.

3.3 Research Design

This study applied descriptive cross sectional design. In descriptive survey, the characteristics of the variables under investigation were described in detail as per the evolving situation. In descriptive design, the collected information is subjected to a number of tests statistically in order for hypothesis to be allowed in testing. Descriptive design therefore allows researcher to understand the manifestations as they emerge from the responses.

A descriptive cross-sectional survey was applied to establish the influence of financial constraints, firm size and industry growth on investment cash flow sensitivity. In doing so, the study conformed to the positivist philosophy as well as its goal to examine the correlational relationships between variables to realize the research objectives.

Descriptive research is structured and helps to discover associations among different variables within a particular interval of time (Cooper & Schindler, 2015). Cross sectional research design was deployed to expose the link between financial constraints and investment cash flow sensitivity. Surveys involve the systematized collection of data from a sizeable population. This approach supports the use of detailed procedures and exact specification of data sources which allows for the collection of accurate survey data to aid hypotheses testing.

3.4 Population of the Study

The study targeted the listed companies from all sectors of the economy in Kenya, except insurance and banking industries due to their unusual capital structures caused by regulatory and legislative policies. This is because listed firms are normally regulated by the Capital Markets Authority, and hence availability of data is not usually a problem, since they must meet certain disclosure requirements. There were 64 NSE listed companies as at 31st December 2019 (NSE, 2019). Excluding the insurance and banking industries leaves a net population of 48 firms belonging to non-financial sector. All were considered in this survey subject to consistent availability of data throughout the study period.

3.5 Data Collection

This study aimed at using secondary data obtained from the NSE data base. Annual audited financial statements of the targeted population were the key sources of data. This was obtained from the respective firm's website and the NSE hand books and recorded on a data collection sheet. The data on secondary related to the respective firms audited financial statements within periods of performance covering 2010-2019 as shown in appendix 1.

3.6 Operationalization of Research Variables

The section details how operationalization is given meaning especially in the conceptual model and combined various variables as adopted. The variables in this study namely: financial constraints, industry growth, firm size and sensitivity in flow of cash investment were operationalized as shown in the summary on Table 3.1. Financial Constraints was measured by liquidity, leverage and profitability. The dependent variable of the study is ICFS as measured by the regression coefficient of investments and cash flows. These variables were decomposed to extract an index which was taken as an absolute measure of ICFS (ICFS index). Industry growth (Moderating variable) focused on the change in contribution to GDP by sector. Firm size was defined by log of sales volume and tangibility of assets. These parameters relate to the respective firms' performance extracted from final accounts for the years 2010- 2019. The study period was selected to represent the most recent trend of firm performance immediately after global economic bubble in 2007.

3.7 Data Analysis

Analysis of data is where data in large form is reduced through editing. The size deemed manageable and was summarized in excel sheets to give the best techniques involving statistics to bring up understanding of the intended objectives (Cooper and Schindler, 2006). The collected data was first edited to correct errors of omission and commission. Variables were coded to get better efficient results.

The combined methods of the techniques involved or rather used in analysis were executed including the use of statistics on descriptive and further inferential where the understanding of such key characteristics in the firm including size were through descriptive whereas inferential was for testing hypotheses. Research hypotheses were

tested using quantitative techniques. The researcher used multiple regression analysis to analyze the combination of variables. Barron and Kenny (1986) approach was well applied for both mediating and moderating effects and also multivariate regression being used for testing the joint influence (Waller, 2008), as shown on Table 3.2 below. Hypotheses testing was done to check on the level of significance between the given variables.

3.7.1 Financial Constraints and Investment Cash Flow Sensitivity

A model of regression was considered in finding the existing relationship one as follows:

$$Y = \alpha + \beta_1 X_1 + \varepsilon \tag{1}$$

Where: Y is the ICFS, α is the regression constant or intercept, β_1 is the regression coefficients for hypothesis one, X_1 is financial constraints and ε is a random error term.

3.7.2 Financial Constraints, Firm Size and Investment Cash Flow Sensitivity

Regression models were performed to examine these relationships. The models tested hypothesis two as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon \tag{2}$$

Where: Y is the ICFS, α is the regression constant or intercept, β_2 is the regression coefficients for hypothesis two, β_3 is the regression coefficients for hypothesis three, X_1 is the financial constraint, X_2 is the firm size and ε is a random error term.

3.7.3 Financial Constraints, industry Growth and Investment Cash Flow Sensitivity

Stepwise multiple regression models was used to examine these relationships. The model tested hypothesis three as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_3 + \beta_3 (X_1 X_3) + \varepsilon \qquad \textbf{(3)}$$

Where: Y is the ICFS, α is the regression constant or intercept, β_3 is the regression coefficients for hypothesis three, X_1 is the financial constraint, X_3 is the industry growth and ε is a random error term.

3.7.4 Financial Constraints, Firm Size, Economic Growth and Investment Cash Flow Sensitivity

A stepwise multiple regression model was used to examine these relationships. The model tested hypothesis four as follows:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon \qquad \textbf{(4)}$$

Where: Y is the ICFS, α is the regression constant or intercept, β_1 to β_3 is the regression coefficients for hypotheses one to three, X_1 is financial constraints, X_2 is firm size, X_3 is the economic growth and ε is a random error term.

3.8 Diagnostic Tests

The assumptions of the regression analysis are two and they include those that are robust to violations and the other kind consisting of assumptions that are not robust to violations. This research study addressed assumptions of multiple regression that are not robust to violations. The assumptions comprise linearity, reliability of measurements, homoscedasticity and normality.

Diagnostic test for normality, linearity, multicollinearity and homoscedasticity were carried out. The study tested the assumption of a relationship of linear form on dependent and also independent which requires an assumption of linearity of data. Normality test is utilized to decide whether the examination information is normally dispersed. Checking for normality is fundamental in light of the fact that the utilization of inferential insights, for example, regression and correlation investigation depend on the assumption that the information is normally distributed. Multicollinearity was measured using tolerance and the Variance Inflation Factor (VIF). VIF indicates how inflated the difference of the coefficient is, contrast with what it would be if a variable was uncorrelated with some other variable in the model.

Homoscedasticity or rather heteroscedasticity once present enables the error term to differ significantly across the values especially to independent variable (Tabachnick & Fidell, 2007). Heteroskedasticity is the absence of homoscedasticity. Heteroscedasticity portrays a circumstance in which the error term in the connection between the independent variable and dependent variable is not the same over all estimations of the independent variable. If the points are randomly dispersed around the horizontal axis, it means there is no heteroscedasticity and if the points are dispersed from the horizontal axis or mean there is heteroskedasticity. Linearity alludes to a circumstance where increase or decrease in one variable caused a comparing increment or reduction in the other variable as well (Field, 2009). Linear regression was utilized as a part of the examination and linearity is one of its key assumptions. Linearity was tested using scatter plots.

Table 3.1: Operationalization of Study Variables

Variable	Operational Indicators	Measurement	Adapted From
Investment Cash flow Sensitivity (Dependent Variable)	Regression Beta Coefficient	- $Inv_{it} = \beta_0 + \beta_1 CF_{it} + \varepsilon$ - Where: $CF_{it} = \dfrac{(Net\ Income + Depr/Amortization)_{it}}{Book\ Value\ of\ Total\ Assets_{i,\ t-1}}$ $Inv_{it} = \dfrac{(Cash\ invested\ in\ PPE - Cash\ received\ from\ selling\ PPE)_{it}}{Book\ Value\ of\ Total\ Assets_{i,\ t-1}}$	Rokhmawati (2019).
Firm Size (Intervening Variables)	Sales Tangibility of Assets	-Natural logarithm of sales*100 -Non-current assets/Total assets ratio	Crisóstomo, Lopez-Iturriaga and Vallelado (2012)
Industry growth (Moderating variable)	Change in Contribution to GDP	$\dfrac{Contribution\ to\ GDP_{y1} - Contribution\ to\ GDP_{y0}}{Contribution\ to\ GDP_{y0}}$	Muthama, Mbaluka and Kalunda (2013)
Financial Constraints (Independent Variable)	Leverage Liquidity Profitability	Long term debt/Total assets ratio Working Capital Ratio=$\dfrac{Current\ Assets}{Current\ Liabibities}$ Return on Investments Ratio=$\dfrac{Earnings\ after\ Tax}{Debt + Equity}$	Fazzari, Hubbard and Peterson (1988)

Table 3.2: Research Objectives, Hypotheses and Statistical Tests

Research Objectives	Hypothesis	Hypothesis Testing	Model Estimation	Output and Test of Significance
Determine the relationship between financial constraint (FC) and ICFS	**H$_1$:** FC and ICFS relationship among non-financial firms listed at the NSE is not significant	Simple Regression Analysis	$ICFS=\alpha+\beta_1 FC+\varepsilon$ α=Constant β=Beta coefficient ε= Error term	• . R^2 – explanatory power (low, moderate or high) • If p-value ≤ 0.05 reject H$_1$
Assess the effect of firm size on the interconnectedness between FC and ICFS	**H$_2$:** Influence of Firm size on FC and ICFS relationship of NSE listed non-financial firms is not significant.	Hierarchical linear regression analysis	Testing for intervening effect: Step 1: Test the direct relationship between FC and ICFS $ICFS=\alpha+\beta_1 FC+\varepsilon$ Step 2: Test relationship between FC and Firm Size (FS) $FS= \alpha+ \beta_1 FC+ \varepsilon$ Step 3: Regress FS with ICFS $ICFS=\alpha+\beta_1 FS+\varepsilon$ Step 4: Regress Fc and FS on ICFS $ICFS=\alpha+\beta_1 FC+ \beta_2 FS+\varepsilon$ Baron and Kenny (1986) Approach	• . R^2 – explanatory power (low, moderate or high) • If p-value ≤ 0.05 reject H$_2$
Establish the effect of Industry growth on the interconnectedness between FC and ICFS	**H$_3$:** Influence of industry growth on relationship between FC and ICFS of NSE listed non-financial firms is not significant.	Multiple Regression Analysis	Testing for moderating effect: $ICFS= \alpha + \beta_1 FC + \beta_2 IG +\beta_3 FC*IG + \varepsilon$, where IG is Industry Growth	• R^2 – explanatory power (low, moderate or high) • If p-value ≤ 0.05 reject H$_3$

Analyse the joint effect joint effect of Financial Constraint, Size of the Firm and growth in industry on ICFS	**H₄:** The joint effect of FC, firm size and industry growth on ICFS of NSE listed non-financial firms is not significant.	Multiple Regression Analysis	Testing for the Joint Effect: $ICFS=\alpha+\beta_1 FC+\beta_2 FS+\beta_3 IG+\varepsilon$	Any change in R^2 shows the joint effect. -A p value of 0.05 and below is significant.

CHAPTER FOUR

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

The chapter deals with presenting the analysis of findings depending on results from the key objectives formulated and analyzed on the basis of how ICFS is influenced by FC and other factors namely firm size as well as industry growth and thereafter discussions chronologically presented.

4.2 Descriptive Statistics

The study summaries on key variables and how they manifest within the surveyed firms are identified tabulated in terms of maximum and minimum value as well as mean, standard deviation, skewness and also kurtosis to descriptively understand the study data variables namely; ICFS, financial constraints, firm size and industrial growth on NSE non-financial listed firms.

Documented results in Table 4.1 have been well indicated in terms of ICFS having 0.038 as a mean and 0.172 as the deviation from the mean. Further the maximum value gave -0.94 and a minimum of 0.83 in that order. The low standard deviation shows that the ICFS did not exhibit high levels of variability from the mean. The data presents a negative skewness at -1.599 and high levels of peakedness at 11.328. Fazzari, Hubbard and Petersen (2000) opine that ICFS is such an interesting proxy in the assessment of degree of financial constraints faced by a firm. The negative ICFS value implies that the firms have divested to experiencing short term financial difficulties in the midst of increased investment opportunities. The positive ICFS value implies that the firms have acquired additional assets or funding in the period and may be explained by high internal cash flows.

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Table 4.1: Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation	Skewness		Kurtosis	
ICFS	330	-.94	.83	.0381	.17174	-1.599	.134	11.328	.268
Leverage	330	.00	.82	.1948	.18260	1.344	.134	1.443	.268
Liquidity	330	.11	18.76	2.3788	2.72457	3.334	.134	13.128	.268
Profitability	330	-.98	1.16	.0652	.14099	.090	.134	20.339	.268
Size (Ln Sales)	330	14.77	26.08	22.1509	2.13027	-.577	.134	.513	.268
Size (Asset tangibility)	330	.03	.99	.5835	.22687	-.400	.134	-.916	.268
Industry growth	330	-.20	1.21	.1002	.15246	3.808	.134	20.616	.268
Valid N (listwise)	330								

From the findings in table 4.1 above, the mean value of financial leverage was 0.1948 and SD of 0.18260. The values representing minimum as well as maximum for the financial leverage were 0 and 0.82 respectively. This evidence shows that on average, NSE listed non-financial companies are moderately leveraged with a mean of about 20%. The low standard deviation shows that the financial leverage did not exhibit high levels of variability. Data on financial leverage has a positive skewness at 1.344 and a kurtosis level of 1.443.

From the output displayed in table 4.1 above, the mean representing Liquidity variable was 2.378 with SD as 2.724 and minimum values and maximum values of 0.11 and 18.76 respectively. The levels of standard deviation show that the liquidity exhibited some levels of variability. Data on liquidity has a positive skewness at 3.334 and a high level of peakedness with the kurtosis level at 13.128.

As indicated in table 4.1 above, the mean for profitability was 0.0652 and SD of 0.14099. The values of minimum as well as maximum for profitability were -0.98 and 1.16. The measure of profitability was return on assets with a positive mean value indicating the listed non-financial companies were on average profitable. The negative minimum value observed however indicates that some listed companies were operating at a loss. The low standard deviation shows that the levels of profitability amongst the non-financial listed firms did not exhibit high levels of variability. Data on profitability has a positive skewness at 0.090 and a high level of peakedness with the kurtosis level at 20.339.

The output displayed in Table 4.1 above indicates that the average natural log of sales was at 22.509 with SD of 2.1302. The results indicate that the levels of sales were the most varying variable evidenced by values of minimum as well as maximum of 14.77

and 26.08 respectively. The findings infer varying levels of sales performance of the non-financial companies listed at the Nairobi Securities Exchange. It is noted that some companies during this period experienced difficulties in their operations and therefore did not experience high sales levels. This therefore is an indication of relative variability in performance from company to company. Data on the natural log of sales has a negative skewness at -0.577 and a kurtosis level at 0.513.

Table 4.1 above indicates that asset tangibility had a mean of 0.5835 with SD of 0.22687. The observation indicates that on the minimum and maximum values for asset tangibility were 0.03 and 0.99 respectively. The low SD shows that on average, the levels of asset holdings amongst the non-financial listed firms did not exhibit high levels of variability. Data on asset tangibility has a negative skewness at -0.400 and a negative kurtosis level at -0.916.

During the period covered by this study, the average industrial sector growth for the non-financial companies was 0.1002 with a SD of 0.15246. This implies that on average during the period covered by the study, the contribution of the various sectors was about 10.02% to the economy. The minimum and maximum values were -0.20 and 1.21 respectively indication that certain sectors had growth rates of as high as 121% while others experienced negative growth of about 20% in specific time periods. The low levels of SD however infer that industrial growth by sector did not exhibit much variability. Data on industrial growth rate has a positive skewness at 3.808 and a high level of peakedness with the kurtosis level at 20.616.

4.3 Trend Analysis

The section shows and presents the trend analysis of mean value of study variables; ICFS, leverage, Liquidity, Profitability, Size (in sales), Size (in assets tangibility) and

industry growth rate. Prior to diagnostic test, trend analysis was undertaken first which revealed the variations of the study variables within the span of ten years. The outcome of analysis of the time series changes of the variables was presented using graphical models. Trend analysis for ICFS was carried out to determine the general changes. Figure 4.1 below shows the ICFS trend for the 33 non-financial firms listed at the NSE from 2010 to 2019.
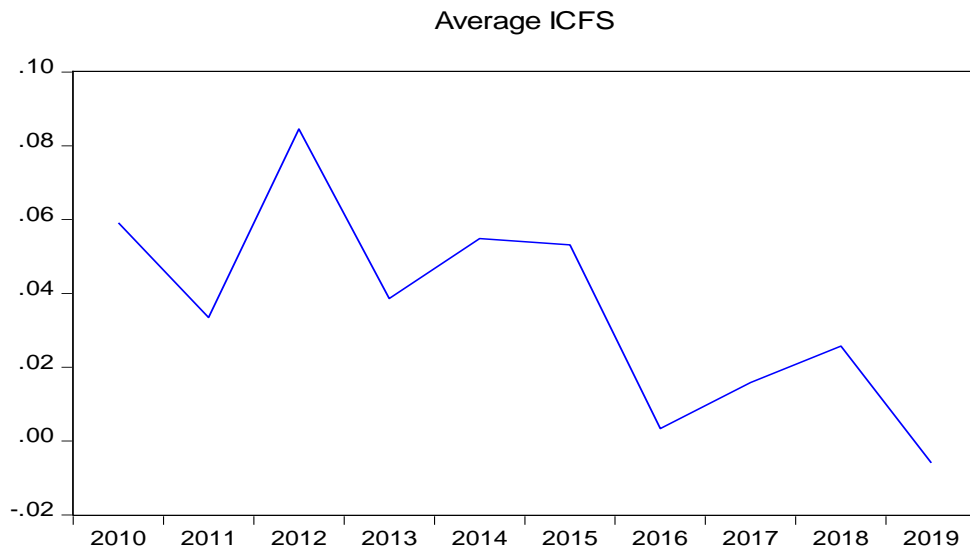
Figure 4.1: Trend of ICFS for the year 2010– 2019

Figure 4.1 above indicate that the mean value of ICFS variable for the firms listed at the NSE had a decreasing trend between year 2010 and 2019 in general. The general trend was made up of short term up and down periodical movements. The trend was uprising in 2011, 2013, 2016 to 2018 after which they wee followed by a drop in subsequent years.
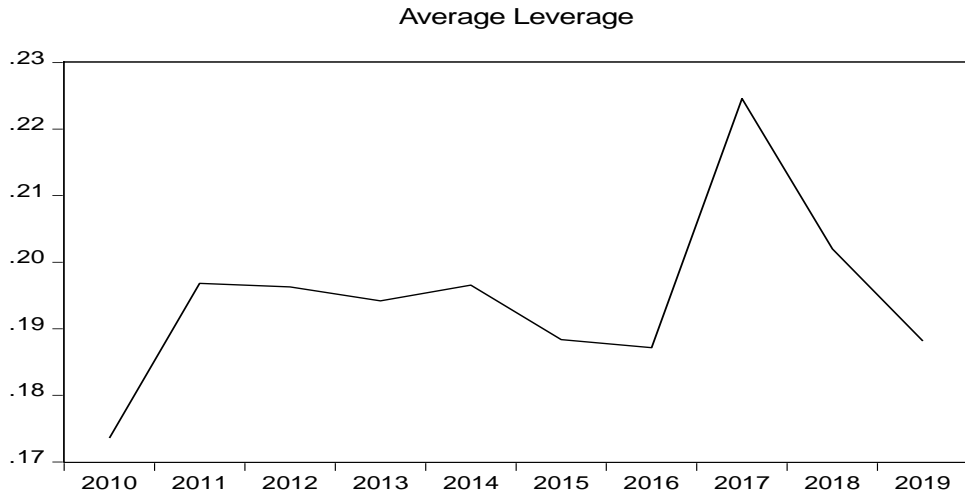
Average Leverage

Figure 4.2: Trend of Leverage for the year 2010 – 2019

Figure 4.2 above indicate value of mean of leverage for the 33 NSE listed non-financial firms had short term minimal up and down periodical movements between year 2010 and 2019. The general trend was made up of short term up in 2011 followed by a near constant trend till 2014 when it slightly declined till 2016. There was a short term up in 2017 that was subsequently followed by a short-term decline.

Average Liquidity
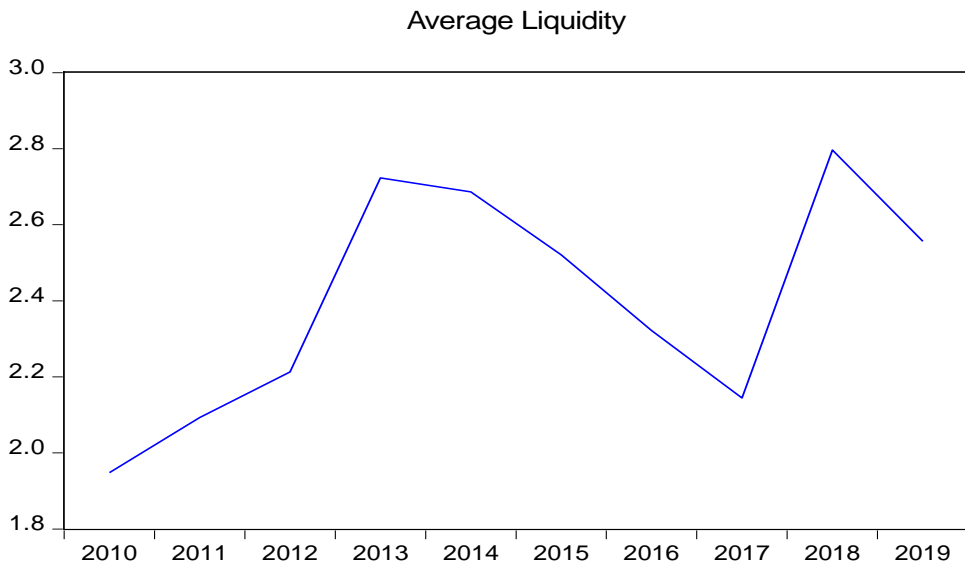
Figure 4.3: Trend of Liquidity for the year 2010 – 2019

As presented in Figure 4.3 above, the mean value of liquidity for the 33 NSE listed non-financial firms had an increasing trend between 2010 and 2019 with short term minimal up and down periodical movements. The general trend was made up of short

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term up between 2010 and 2013 followed by a short term down between 2013 and 2017 and short term up in 2018.

Figure 4.4 below presents that the mean value of profitability for the 33 NSE listed non-financial firms had a generally decreasing trend between 2010 and 2019 with short term minimal up and down periodical movements. The general trend was made up of short term ups in 2012, 2014 and 2017 followed by short term downs in subsequent years.

Average Profitability
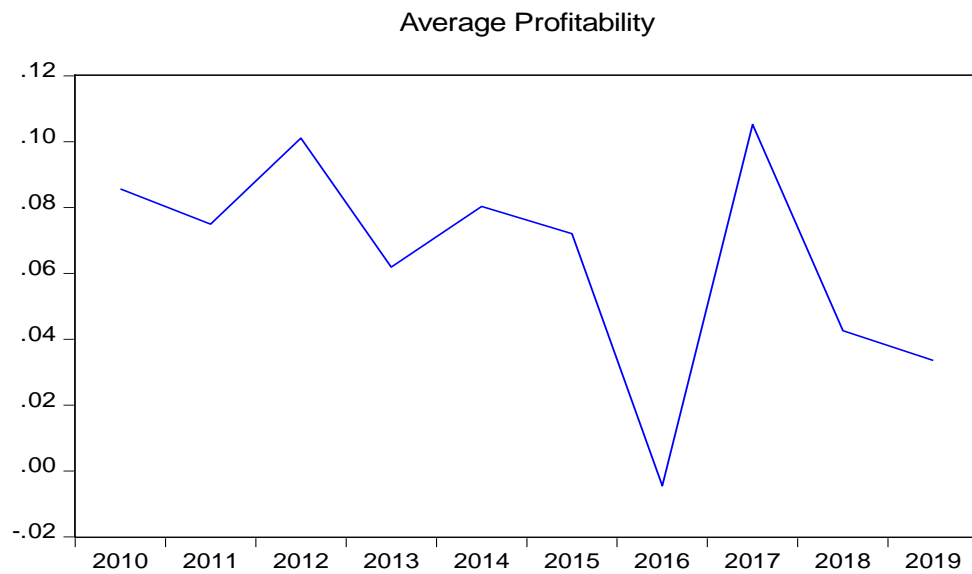
Figure 4.4: Trend of Profitability for the year 2010 – 2019

The 33 NSE listed non-financial firms are from various industrial segments including services and commercial, agricultural, allied and construction, accessories as well as auto mobile and also telecommunication as well as technology. The seven industries exhibited different growth rates whose mean trend are presented in figure 4.5 below.

Average Industry Growth
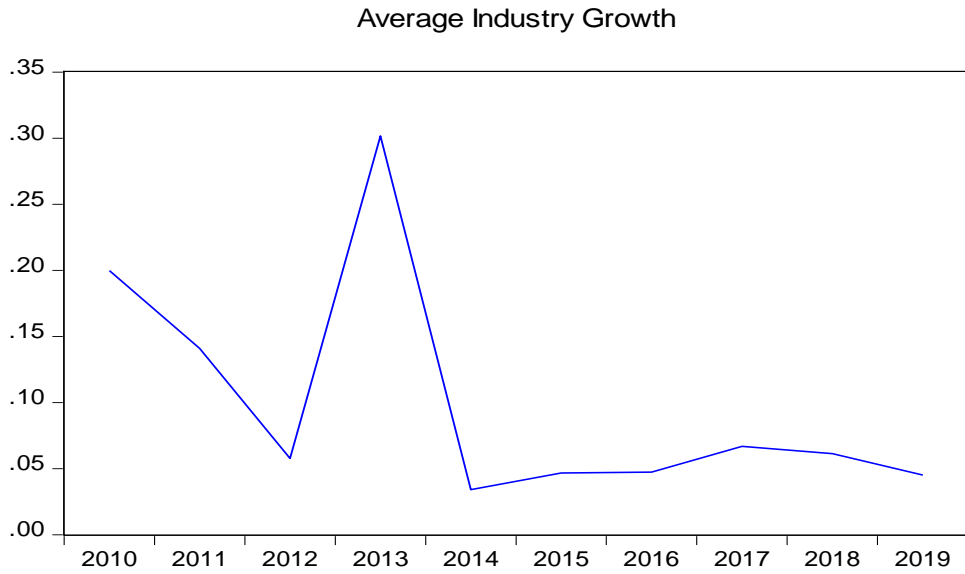
Figure 4.5: Trend of Industry Growth Rate for the Year 2010 – 2019

As presented in figure 4.5 above, the general trend in industry growth rate between 2010 and 2019 has been on a decline. There was a short-term decline between 2010 and 2012 and a short-term increase in 2013 followed by a decline in 2014. Between 2014 and 2019, a short-term increase was followed by a short-term decline.

Average Size (Sales)
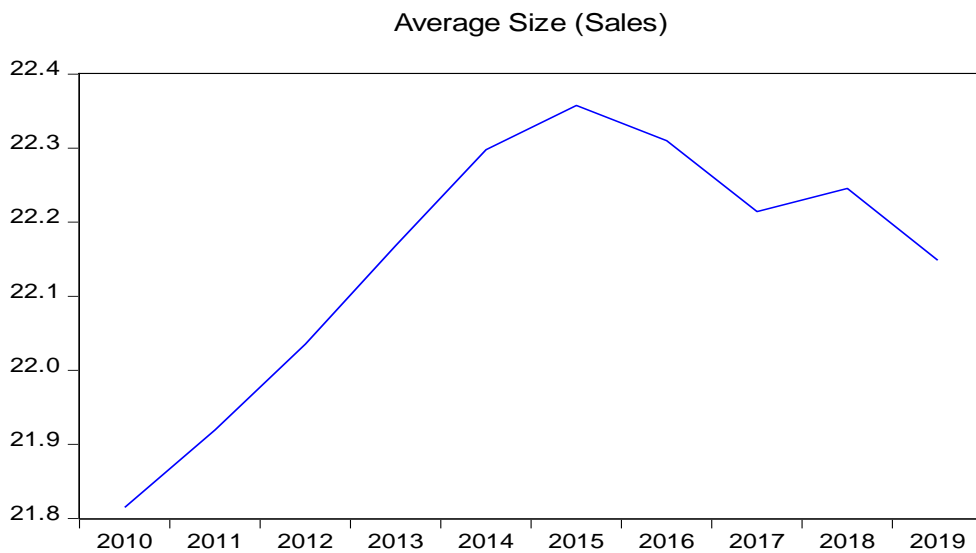
Figure 4.6: Trend of Natural log of Sales for the Year 2010 – 2019

As presented in figure 4.6 above, the general trend in average company sales for the 33 listed non-financial firms was increasing between 2010 and 2015. This has been preceded by periods on slight decline up to 2019.
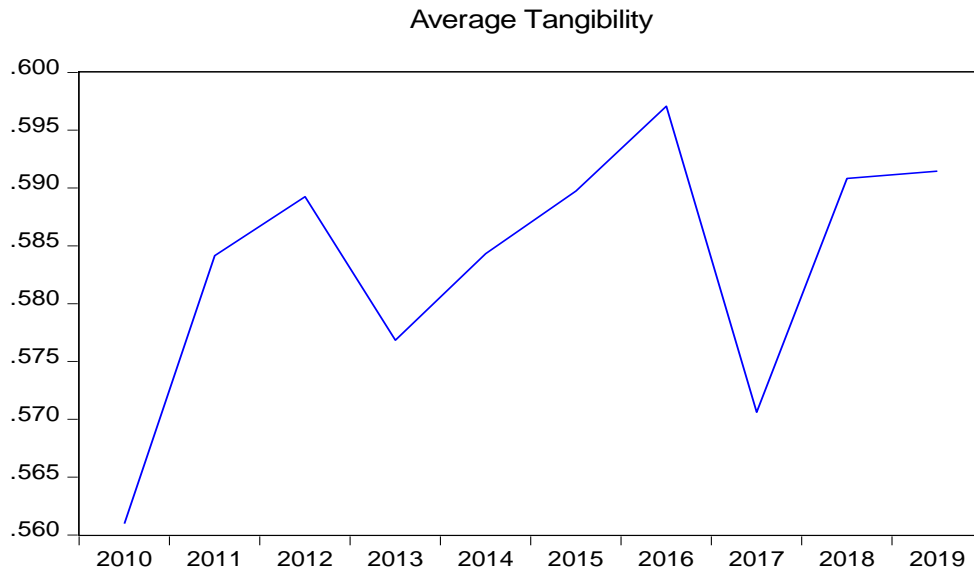
Figure 4.7: Trend of Asset Tangibility for the year 2010 – 2019

Figure 4.7 above presents that on average, asset tangibility for the 33 listed non-financial firms was on a near static trend between 2010 and 2019. There was an increase between 2010 and 2012 then a decline in 2013, then an increase up to 2016 then a decline in 2017. This was followed by an increase up to 2018 and a decline in 2019.

4.4 Diagnostic Tests

In this section are presented the various diagnostic tests conducted to ensure model assumptions as highlighted in chapter three are not violated in order to come up with a suitable model. The results of the following diagnostic tests are presented in the table below test for multi-collinearity, autocorrelation, heteroscedasticity, panel unit root test and Hausman specification tests.

4.4.1 Multicollinearity Tests

Williams, et al. (2013) explains that the presence of high interrelationship of predictor variables translates to multicollinearity problem. In a study scenario where multicollinearity prevails, the condition inflates the error term and the confidence intervals. Belsley, et al. (1980) presents that from this kind of influence, individual predictor coefficients become unstable. This study thus utilized the Variance Inflation Factor (VIF) tests to assess Multicollinearity state and the outcome is as presented in Table 4.2 below:

Table 4.2: Multicollinearity Test Results

Model		Collinearity Statistics	
		Tolerance	VIF
1	Leverage	.684	1.463
	Liquidity	.821	1.218
	Profitability	.886	1.129
	Size (Ln Sales)	.810	1.235
	Size (Asset tangibility)	.708	1.412
	Industry growth	.976	1.024

a. Dependent Variable: ICFS

Field (2009) illustrated that the accepted VIF value that should be observed by the study variables to imply absence of multicollinearity element in the predictor variables is 10, otherwise the outcome is rejected. The results in Table 4.2 above showed that the VIF value for all study variables were as follows; (Leverage = 1.463; Liquidity = 1.218; Profitability = 1.129; Ln Sales = 1.235; Asset tangibility = 1.412; Industry growth = 1.024). Since all the variables had VIF values of less than 10, it is concluded that there was absence of Multicollinearity.

4.4.2 Normality Tests

The Jarque - Bera method was applied to test for normality of the study variables. The results were as presented in table 4.3 below.

Table 4.3: Jarque - Bera Normality Test Results

	ASTANG	ICFS	INDGR	LEV	LIQ	LN_SALE	PROF
Jarque-Bera	20.26758	1846.378	6386.116	123.8761	2881.628	20.96803	5645.715
Probability	0.000040	0.000000	0.000000	0.000000	0.000000	0.000028	0.000000
Sum	191.6576	12.66647	32.99276	64.16302	784.7957	7286.903	21.68468
Sum Sq. Dev.	16.82449	9.687048	7.647097	10.96235	2437.564	1492.477	6.487485
Observations	329	329	329	329	329	329	329

The hypothesis regarded as null is that the values of disturbance are not distributed normally. The p-value which is regarded less compared to threshold of 0.05 within the level of 5% was thus to be rejected. The residual values had p<0.05, hence null hypothesis was rejected.

Further, Normality was tested using PP plots for the study variables. Figure 4.8 below shows the P-P plots for ICFS was off the line of best fit almost becoming asymmetric and having an S - shape with a substantial percentage of the data not normally distributed. Despite this, as explained by Greene (2012), variables that are not normally distributed have no effect in the use of regression analysis.
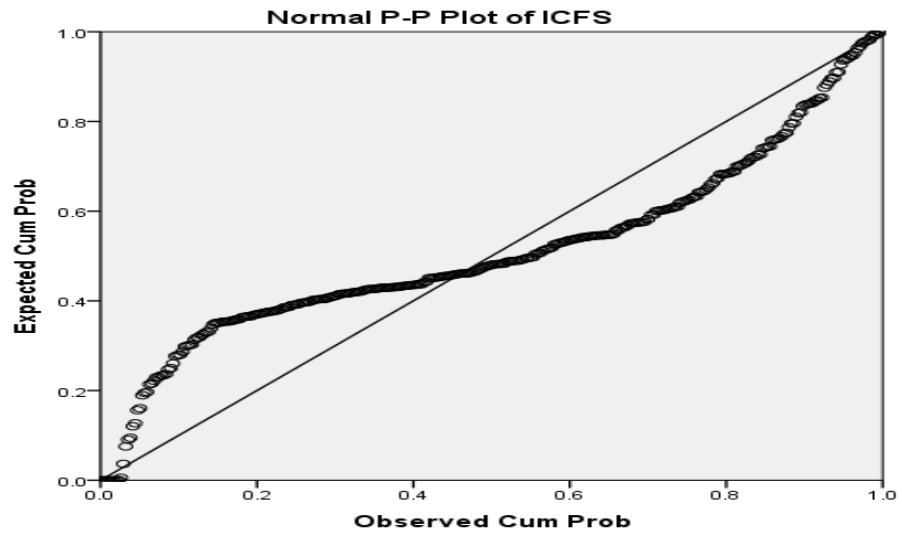
Figure 4.8: Normal P-P Plots of ICFS

Figure 4.9 below shows the P-P plots for leverage was off the line of best fit with a substantial percentage of the data not normally distributed. Despite this, as explained by Greene (2012), variables that are not normally distributed have no effect in the use of regression analysis.
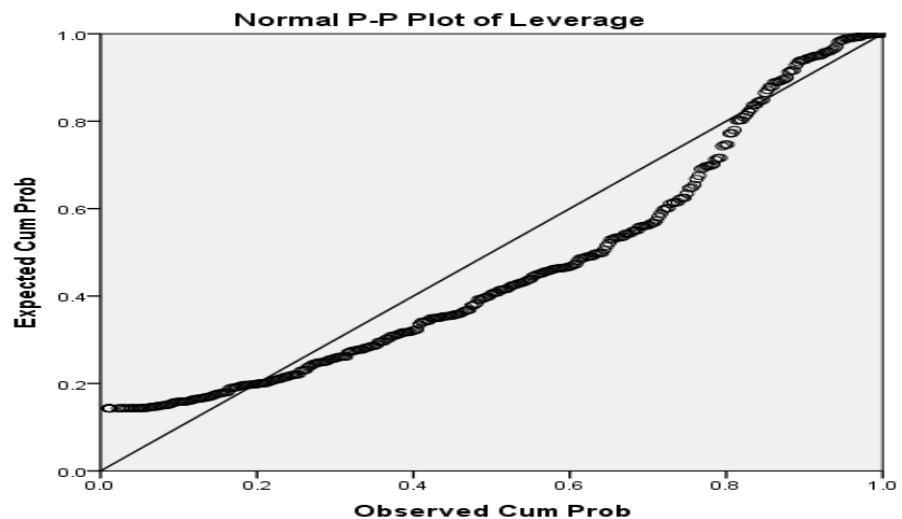
Figure 4.9: Normal P-P Plots of Leverage

Figure 4.10 below shows the P-P plots for liquidity was off the line of best fit with a substantial percentage of the data not normally distributed. Despite this, as explained

by Greene (2012), variables that are not normally distributed have no effect in the use of regression analysis.
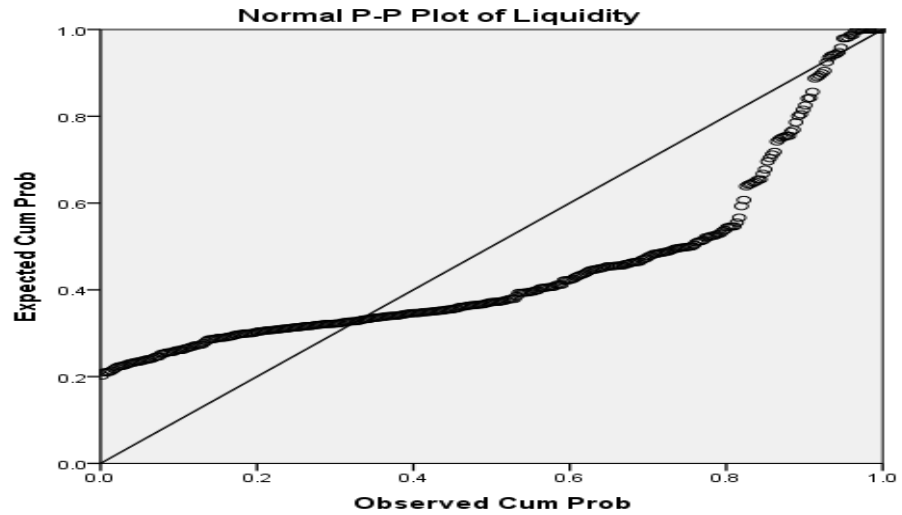
Figure 4.10: Normal P-P Plots of Liquidity

Figure 4.11 below shows the P-P plots for profitability was off the line of best fit almost becoming asymmetric and having an S - shape with a substantial percentage of the data not normally distributed. Despite this, as explained by Greene (2012), variables that are not normally distributed have no effect in the use of regression analysis.
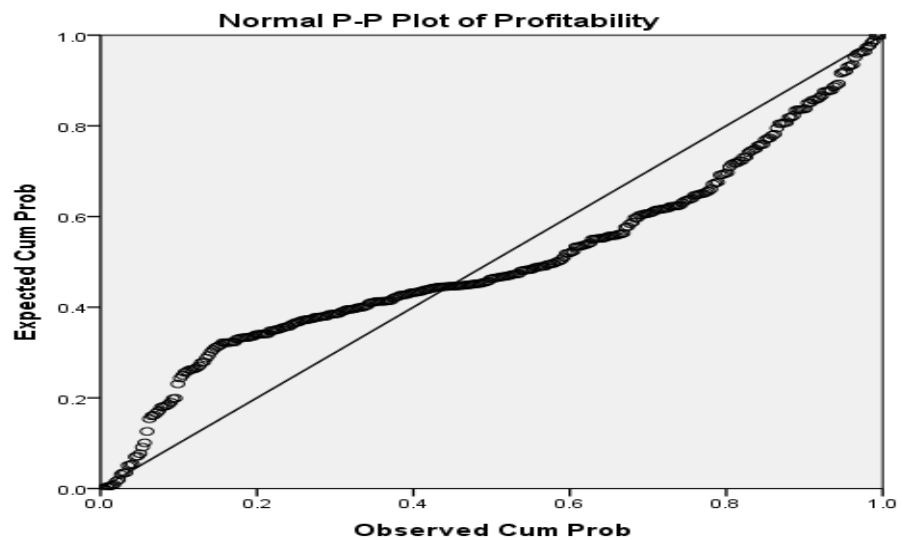
Figure 4.11: Normal P-P Plots of Profitability

Figure 4.12 below shows the P-P plots for natural log of sales was off the line of best fit with nearly equal percentage of the data not normally distributed and another equal percentage on the line of best fit. Despite this, as explained by Greene (2012), variables that are not normally distributed have no effect in the use of regression analysis.

Figure 4.12: Normal P-P Plots of Natural Log of Sales

Figure 4.13 below shows the P-P plots for asset tangibility was off the line of best fit with a substantial percentage of the data not normally distributed. Despite this, as explained by Greene (2012), variables that are not normally distributed have no effect in the use of regression analysis.
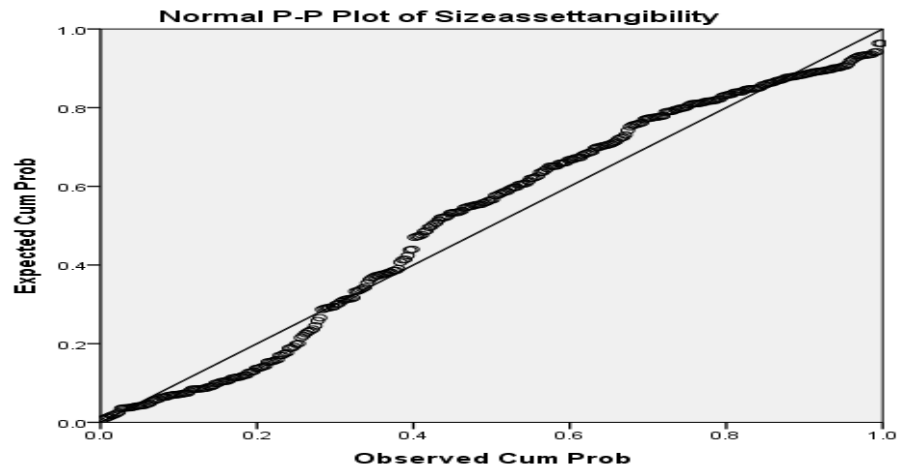
Figure 4.13: Normal P-P Plots of Natural Log of Asset Tangibility
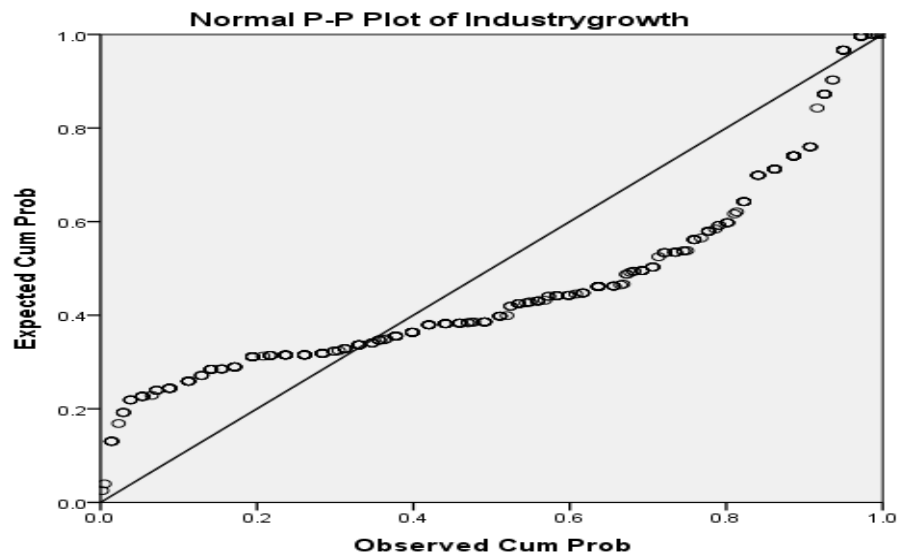
Figure 4.14: Normal P-P Plots of Industry Growth

Figure 4.14 below shows the P-P plots for industry growth was off the line of best fit almost becoming asymmetric and having an S - shape with a substantial percentage of the data not normally distributed. Despite this, as explained by Greene (2012), variables that are not normally distributed have no effect in the use of regression analysis.

4.4.3 Autocorrelation

The Woolridge test is a mechanism used in testing autocorrelation within the data perceived panel. The hypothesis in null form was in the form that autocorrelation for first order was not present. F-test statistic was performed and therefore the findings presented in Table 4.4 below:

Table 4.4: Wooldridge Test for Autocorrelation in Panel Data

H0: no first-order autocorrelation
F(1, 29) = 0.388
Prob > F = 0.5383

Since the probability value of the F-statistics is greater than 5% (p-value=0.5383) we do not reject the null hypothesis of no serial correlation. Therefore there was no problem of potential serial correlation.

4.4.4 Test for Heteroscedasticity

The LR (Likelihood ratio) test was employed by the study to test for panel level heteroscedasticity with output as shown in table 4.5 below.

Table 4.5: LR test for Heteroscedasticity

Coefficients: generalized least squares			
Panels: heteroskedastic			
Corelation: no autocorrelation			
Estimated covariances = 33	Number, of obs	=	330
Estimated autocorelations = 0	Number, of groups	=	33
Estimated coeficients = 6	Time periods'	=	10
Wald chi2 (5)	=	88.49	
Log likelihood = 362.7628	Prob > chi2	=	0.0000

The null hypothesis tested in this case was homoscedasticity of the error variance. Going simply by the significance of chi-square statistic (p-value=0.000, <0.05) in the test below, it supports the hypothesis that IGLS model does have panel-level

heteroscedascity. It is therefore appropriate switch to fitting an OLS model with panel-corrected standard errors to deal with this issue or employ either FE or RE model.

4.4.5 Panel Unit Root Tests

The Panel Unit Root Test was conducted for the panel data variables for unit roots (or stationarity) and ensured the regression results were not spurious. The Levin, Lin, Chu (2002) as well as Harris Tzavalis (1999) together with Breitung (2000 and also Breitung & Das 2005) panels had unit root and thus null hypothesis supported. We used Levin-Lin-Chu (2002) panel unit test since it assumes a common autoregressive parameter for all panel.

Table 4.6: Unit Root Test for Profitability

	Statistic	p-value
Unadjusted t	-12.7214	
Adjusted t*	-9.6651	0.0000

The adjusted Levin–Lin–Chu bias- statistic (t) is -9.6651 as presented in table 4.6 above, thus taken as significant within all the usual level of testing. Thus the hypothesis of null was rejected and stationarity in profitability was concluded.

Table 4.7: Unit Root Test for Sales

	Statistic	p-value
Unadjusted t	-11.7691	
Adjusted t*	-11.0610	0.0000

The adjusted Levin–Lin–Chu bias- statistic (t) is -11.0610 as presented in table 4.7 above, thus taken as significant within the all-usual level of testing. Thus the hypothesis of null was rejected and stationarity in sales was concluded.

Table 4.8: Unit root test for Liquidity

	Statistic	p-value
Unadjusted t	-8.1740	
Adjusted t*	-4.4592	0.0000

The adjusted Levin–Lin–Chu bias- statistic (t) is -4.4592 as presented in table 4.8 above, thus taken as significant within the all-usual level of testing. Thus the hypothesis of null was rejected and stationarity in liquidity was concluded.

Table 4.9: Unit Root Test for Leverage

	Statistic	p-value
Unadjusted t	-7.6e+03	
Adjusted t*	-8.3e+03	0.0000

The adjusted Levin–Lin–Chu bias- statistic (t) is -8.3e+03 as presented in table 4.9 above, thus taken as significant within the all-usual level of testing. Thus the hypothesis of null was rejected and stationary in leverage was concluded.

Table 4.10: Unit Root Test for ICFS

	Statistic	p-value
Unadjusted t	-35.3378	
Adjusted t*	-31.2151	0.0000

The adjusted Levin–Lin–Chu bias- statistic (t) is -31.2151 as presented in table 4.10 above, thus taken as significant within the all-usual level of testing. Thus the hypothesis of null was rejected and stationary in ICFS was concluded.

Table 4.11: Unit Root Test for Asset Tangibility

	Statistic	p-value
Unadjusted t	-18.3821	
Adjusted t*	-15.9330	0.0000

The adjusted Levin–Lin–Chu bias- statistic (t) is -15.9330 as presented in table 4.11 above, thus taken as significant within the all-usual level of testing. Thus the hypothesis of null was rejected and stationarity in asset tangibility was concluded.

4.4.6 Breusch and Pagan Lagrangian Multiplier Test for Random Effects

The effects associated to random and simple OLS are decided majorly by LM test. The LM test hypothesis that is null is that there exists variance across entities which is zero and thus across units exists no difference that is significant that is; there is no effect of panel. Since the probability value of the chi2 is 0% as presented in figure 4.15 below, we reject the null hypothesis and conclude that random effect is appropriate.

Figure 4.15: Breusch and Pagan Lagrangian Multiplier Test

```
Breusch and Pagan Lagrangian multiplier test for random effects

        Tangibility[firmid,t] = Xb + u[firmid] + e[firmid,t]

        Estimated results:
                      |      Var      sd = sqrt(Var)
        --------------+-----------------------------
            Tangibi~y |   .0531745        .230596
                    e |   .0045716       .0676134
                    u |    .02432       .1559487

        Test:   Var(u) = 0
                          chibar2(01) =    447.71
                        Prob > chibar2 =   0.0000
```

4.5 Correlation Analysis

Product Pearson moment coefficient of correlation was applied which measures direction as well as strength associated to how two or more variables can relate. The study developed a correlation matrix to summarize the correlational association between the study variables. The correlation matrix is presented in table 4.12 below:

Table 4.12: Correlation Matrix

	ICFS	Leverage	Liquidity	Profitability	Ln Sales	Asset Tangibility	Industry growth
ICFS	1						
Leverage	.015	1					
Liquidity	.085	-.144[**]	1				
Profitability	.238[**]	-.223[**]	.114[*]	1			
Ln Sales	.165[**]	-.011	-.362[**]	.192[**]	1		
Asset tangibility	.204[**]	.524[**]	-.060	-.093	.046	1	
Industry growth	-.018	.069	-.012	-.049	.009	.149[**]	1

**0.01, level (2,-tailed).
*.0.05, level (2,-tailed).

As presented in Table 4.12 above, there is a weak positive interconnectedness between leverage and ICFS which is not significant at statistical level ($r=0.015$, $p>0.05$). There is also a weak positive interconnectedness between liquidity and ICFS which is not significant at statistical level ($r=0.085$, $p>0.05$) and a weak negative interconnectedness between liquidity and ICFS which is significant at statistical level ($r=0.144$, $p<0.05$). Profitability has significant value but a weak positive interconnectedness with ICFS ($r=0.283$, $p<0.05$) and with liquidity ($r=0.114$, $p<0.05$) respectively. Profitability has a significant but weak negative interconnectedness with leverage ($r=-0.223$, $p<0.05$).

From Table 4.12 above, it is inferred that sales has a weak positive interconnectedness with ICFS which is significant at statistical level ($r=0.165$, $p<0.05$), a weak negative interconnectedness with leverage which is not significant at statistical level ($r=-0.011$, $p>0.05$), a weak negative interconnectedness with liquidity which is significant at statistical level ($r=-0.362$, $p<0.05$) and a weak positive interconnectedness with profitability which is significant at statistical level ($r=0.192$, $p<0.05$). Asset tangibility has a weak positive interconnectedness with ICFS ($r=0.204$, $p<0.05$) and a moderate positive interconnectedness with Leverage ($r=0.524$, $p<0.05$) which are significant at statistical level.

Table 4.12 above presents a weak positive interconnectedness between asset tangibility and growth in industry rate which is significant at statistical level ($r=0.149$, $p<0.05$). There are non-significant at statistical level weak positive interconnectedness between asset tangibility and sales ($r=0.046$, $p>0.05$), growth in industry and leverage ($r=0.069$, $p>0.05$) and growth in industry and sales ($r=0.009$, $p>0.05$). There are non-significant at statistical level and weak negative interconnectedness between asset

tangibility and liquidity (r=-0.060, p>0.05), asset tangibility and profitability (r=-0.093, p>0.05), growth in industry and ICFS (r=-0.018, p>0.05), growth in industry and liquidity (r=-0.012, p>0.05) and growth in industry and profitability (r=-0.049, p>0.05).

4.6 Chapter Summary

This chapter presents the results of the descriptive statistics for ICFS, Leverage, Liquidity, Profitability, Natural log of sales, Asset tangibility and Industrial growth rate. Different descriptive statistics were computed for each of the variables of the study. Diagnostic tests for multicollinearity were conducted using variance inflation factor and was established that all the variables had VIF values of less than 10 leading to the conclusion that there was absence of Multicollinearity.

Jaque – Berra tests for normality confirmed that the residual values had p<0.05 and thus distributed normally. However, upon plotting the data set, the visual presentation of data in the p-p plot, also confirmed non-normally distributed data. This was because the visual expression of the scatter plot of standardized residuals (standard error) against standardized fitted (predicted) were off the line, and highly deviate from the line of best fit. Autocorrelation test confirm that there is no problem of potential serial correlation. Unit root tests confirm that data on Liquidity, Leverage, Profitability, ICFS, Sales and Asset tangibility are all stationary at level one.

Correlation analysis shows statistically significant positive relationships between: Profitability and ICFS, Profitability and Liquidity, Profitability and Leverage, Sales and ICFS, Sales and Profitability, Asset tangibility and ICFS, Asset tangibility and leverage, Asset tangibility and industry growth rate. The correlation matrix presents

statistically significant negative relationships between; liquidity and ICFS, Sales and Liquidity.

Correlation analysis shows non-statistically significant positive relationships between: leverage and ICFS, liquidity and ICFS, asset tangibility and sales, industry growth and leverage, industry growth and sales. It also presents non-statistically significant negative relationships between; Sales and Leverage, Asset tangibility and Liquidity, Asset tangibility and profitability, Industry growth and ICFS, Industry growth and Liquidity and Industry growth and profitability.

CHAPTER FIVE

HYPOTHESES TESTING AND DISCUSSION OF FINDINGS

5.1 Introduction

The chapter focuses on reviewing and presenting hypotheses which were tested and gives detailed interpretations. The study was guided by four specific objectives where four hypotheses were derived. The Four hypotheses and their respective sub hypotheses were tested and interpreted using adjusted coefficient of determination (R^2) and standardized beta coefficients (β) of regression analysis.

5.2 Relationship between Financial Constraints and Investment Cash flow Sensitivity

The first objective was how financial constraints influence ICFS for the firms listed at NSE. The measures used in the case of financial constraints included leverage, profitability and also liquidity while those representing ICFS included the co-efficient derived from rate of increase in property, plant and equipment and internal flow of cash. The analysis was based on regression and it was assessed if leverage, liquidity and profitability have any effect on ICFS ratio of non-financial firms listed at NSE. This was the test of the first hypothesis and its sub hypotheses that are shown herein:

Hypothesis One: The relationship between financial constraints and investment cash flow sensitivities of non financial firms listed in NSE is not significant.

The prediction equation was given as: $Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$

The results of the regression model are presented in Tables 5.1, 5.2 and 5.3 below.

Table 5.1: Model Goodness of Fit for Financial constraint and Investment Cash flow Sensitivity

Model	R	R^2	Adjusted R^2	SE
1	.257[a]	.066	.057	.16673

a. Predictors: (Constant), Profitability, Liquidity, Leverage

The multiple regression model gave Adjusted R^2= 0.057, F (3,329) = 7.686, p<0.05. The results of the regression analysis in Table 5.1 above and 5.2 below shows that 5.7% of variations in ICFS is explained by variations in financial constraints amongst the listed non financial firms. There is therefore statistically significant relationship (p<0.05).

Table 5.2: Model Overall Significance of Financial Constraint and Investment Cash flow Sensitivity.

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	.641	3	.214	7.686	.000[b]
1	Residual	9.062	326	.028		
	Total	9.703	329			

a. DV: ICFS
b. Predictors: (Constant),Profitability, Liquidity, Leverage

The first hypothesis was presented in three sub hypotheses as:

H_{1a}: *Leverage and investment cash flow sensitivity relationship of NSE listed non-financial firms is not significant.*

H_{1b}: *Liquidity and investment cash flow sensitivity relationship of NSE listed non-financial firms is not significant.*

H_{1c}: *Profitability and investment cash flow sensitivity relationship of NSE listed non-financial firms is not significant.*

As presented in Table 5.3 below, the regression Model One shows a positive relationship between leverage and ICFS but not statistically significant (β=0.080, t =1.444, p>0.05) implying that for every unit increase in leverage, there is an expected increase in ICFS by 0.080 units. The findings therefore lead to failing to reject sub hypotheses one (a) (H_{1a}) as there is no significant relationship between leverage and ICFS. Thus, the Regression Model is:

ICFS=-0.006+0.080LEV+0.068LIQ+0.248PRFY+ε

Where LEV is Leverage, LIQ is Liquidity, PRFY is Profitability and ε is the Error Term.

Table 5.3: Model Regression Coefficients of Financial Constraint and Investment Cash flow Sensitivity

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.006	.017		-.369	.713
	Leverage	.075	.052	.080	1.444	.150
	Liquidity	.004	.003	.068	1.254	.211
	Profitability	.302	.067	.248	4.504	.000

a. Dependent Variable: ICFS

As presented in Table 5.3 above, the regression model one shows liquidity and ICFS having positive relationship which is not statistically significant (β=0.068, t =1.254, p>0.05) implying that for every unit increase in liquidity, there is an expected increase in ICFS by 0.068 units. The findings therefore leads to failing to reject sub hypothesis one (b) (H_{1b}) as there is no significant relationship between liquidity and ICFS.

Table 5.3 above presents a statistically significant positive results between profitability and ICFS (β=0.248, t =4.504, p<0.05) implying that for every unit increase in profitability, there is an expected increase in ICFS by 0.248 units. The

findings therefore lead to a conclusion that there is a significant positive relationship between profitability and ICFS amongst the listed non-financial firms resulting to the rejection of sub hypothesis one (c) (H_{1c}).

5.3 The Effect of Size of the Firm on Financial Constraints and Investment Cash Flow Sensitivities Relationship

The number two objective examined how the size of the firm influences financial constraints and ICFS relationship in non-financial firms listed at NSE. This was presented in hypothesis two sub-divided into six sub hypotheses as follows:

Hypothesis Two: The effect of size of the firm on the financial constraints and investment cash flow sensitivity relationship among non-financial firms listed at the NSE is not significant.

H_{2a}:   *The effect of sales on leverage and ICFS relationship in NSE listed non-financial firms is not significant.*

H_{2b}:   *The effect of sales on liquidity and ICFS relationship in NSE listed non-financial firms is not significant.*

H_{2c}:   *The effect of sales on profitability and ICFS relationship in NSE listed non-financial firms is not significant.*

H_{2d}:   *The effect of asset tangibility on leverage and ICFS relationship in NSE listed non-financial firms is not significant.*

H_{2e}:   *The effect of asset tangibility on liquidity and ICFS relationship in NSE listed non financial firms is not significant.*

H_{2f}:   *The effect of asset tangibility on profitability and ICFS relationship in NSE listed non financial firms is not significant.*

The Baron and Kenny (1986) four steps approach was applied. In the first step, the dependent variable was regressed against the independent variable attributes as presented in Tables 5.1, 5.2 and 5.3 below. The regression models in Tables 5.1 and 5.2 above present Adjusted $R^2= 0.057$, F (3,329) = 7.686, p<0.05. The results of the regression analysis therefore shows that 5.7% of variations in investment cashflow sensitivity is explained by variations in financial constraints amongst the listed non financial firms and the results are statistically significant (p<0.05).

The results as presented in Table 5.3 showed liquidity and ICFS relationship to be positive but the insignificance was registered (β=0.068, t =1.254, p>0.05). Further leverage and ICFS relationship also registered positive but statistically non-significant results (β=0.080, t =1.444, p>0.05). Profitability and ICFS relationship registered positive and also significant results (β=0.248, t =4.504, p<0.05).

In the second step, the intervening variable proxied by sales and tangibility of assets were regressed against the independent variable proxied by leverage, liquidity and profitability and the findings are presented in Tables 5.4, 5.5, 5.6, 5.7, 5.8 and 5.9 below:

Table 5.4: Model Goodness of Fit for Financial Constraint and Sales

Model	R	R^2	Adjusted R^2	SE
1	.432[a]	.186	.179	1.93050

a. Predictors: (Constant), Leverage, Liquidity, Profitability

The regression model in Table 5.4 above and 5.5 below presents Adjusted $R^2= 0.179$, F (3,329) = 24.871, p<0.05. The results of the regression analysis therefore shows that 17.9% of variations in firm sales may be explained by variations in financial

constraints amongst the listed non financial firms and the results is statistically significant (p<0.05).

Table 5.5: Model Overall Significance of Financial Constraint and Sales

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	278.069	3	92.690	24.871	.000[b]
1	Residual	1214.950	326	3.727		
	Total	1493.019	329			

a. Dependent Variable: Size Ln Sales
b. Predictors: (Constant), Leverage, Liquidity, Profitability

As presented in Table 5.6 below, there is a negative and statistically significant relationship between firm liqudity and sales (β=-0.390, t=-7.705, P<0.05). There is a positive results between firm profitability and sales which is statistically significant (β=0.233, t=4.537, P<0.05) and the results between leverage and sales is negative and statistically non- significant (β=-0.015, t=-0.295, P>0.05).

Table 5.6: Model Regression Coefficients of Financial Constraint and Sales

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
	(Constant)	22.682	.202		112.111	.000
1	Liquidity	-.305	.040	-.390	-7.705	.000
	Profitability	3.527	.777	.233	4.537	.000
	Leverage	-.178	.603	-.015	-.295	.768

a. Dependent Variable: Size (Sales)

The resultant Regression Model as indicated in Table 5.6 above is thus:

Size(Sales)=22.682-0.390LIQ+0.233PRFY-0.015LEV+ε, meaning that for every unit increase in liquidity, sales decreases by 0.39 units; a unit increase in profitability also

leads to 0.233 units increase in sales and a unit increase in leverage further causes a decrease in sales by 0.015 units.

As presented in Table 5.7 below, 26.9% of variations in asset tangibility is explained by variations in firm financial constraints namely; leverage, liquidity and profitability (adjusted R2 = 0.269).

Table 5.7: Model Goodness of Fit for Financial Constraint and Tangibility of Assets

Model	R	R^2	Adjusted R^2	SE
1	.525[a]	.275	.269	.19400

a. Predictors: (Constant), Leverage, Liquidity, Profitability

Table 5.8 below shows that the regression model is statistically significant in explaining the financial constraints proxied by leverage, liquidity and profitability on one hand and asset tangibility on another hand (F (3,329) = 41.310, p<0.05).

Table 5.8: Model Overall Significance of Financial Constraint and Asset Tangibility

Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	4.664	3	1.555	41.310	.000[b]
1	Residual	12.269	326	.038		
	Total	16.933	329			

a. Dependent Variable: Size asset tangibility
b. Predictors: (Constant), Leverage, Liquidity, Profitability

As presented in Table 5.9 below, there is a statistically significant positive results between leverage and asset tangibility (β=0.531, t=10.905, P<0.05). There are also positive non-significant results between asset tangibility and profitability (β=0.024, t=0.494, P>0.05) as well as positive and non-significant relationship between liquidity and ICFS (β=0.014, t=0.295, P>0.05).

Table 5.9: Model Regression Coefficients of Financial constraint and Asset Tangibility

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.450	.020		22.116	.000
	Liquidity	.001	.004	.014	.295	.768
	Profitability	.039	.078	.024	.494	.621
	Leverage	.660	.061	.531	10.905	.000

a. Dependent Variable: Size asset tangibility

The resultant Regression Model as presented in Table 5.9 above is:

AstTgty=0.450+0.014LIQ+0.024PRFY+0.531LEV+ε

Where AstTgty is Asset Tangibility. This implies that for every unit increase in liquidity, profitability and leverage asset tangibility would increase on average by 0.014 units, 0.024 units and 0.531 respectively.

In the third step, the intervening variables proxied by sales and asset tangibility are regressed against the dependent variable, in this case, ICFS. The findings are as presented in Tables 5.10, 5.11 and 5.12 below:

Table 5.10: Model Goodness of Fit for Size and Investment Cash Flow Sensitivity

Model	R	R^2	Adjusted R^2	SE
1	.257[a]	.066	.060	.16649

a. Predictors: (Constant), Size (asset tangibility), Size (Sales)

The regression model in Table 5.10 above and 5.11 below presents Adjusted R^2= 0.060, $F_{(3,329)} = 11.523$, $p<0.05$. The results of the regression analysis therefore shows that 6.0% of variations in investment cashflow sensitivity may be explained by

variations in size of the listed non financial firms proxied by asset tangibility and sales. The results is statistically significant (p<0.05).

Table 5.11: Model Overall Significance of Size and Investment Cash Flow Sensitivity

Model		Sum of Squares	df	Mean Square	F	Sig.
	Regression	.639	2	.319	11.523	.000[b]
1	Residual	9.064	327	.028		
	Total	9.703	329			

a. Dependent Variable: ICFS
b. Predictors: (Constant), Size (asset tangibility), Size (Sales)

The results in Table 5.12 below indicates that there are statistically significant positive results between ICFS and size proxied by sales (β=0.156, t=2.910, P<0.05) as well as size proxied by tangibility of assets (β=0.197, t=3.679, P<0.05). The resulting predictive regression model is as follows: ICFS=-0.327+0.156Sales+0.197AstTgty+ε.

This implies that a unit increase in sales leads to on average 0.156 unit increase in ICFS. Further, a unit increase in asset tangibility causes approximately 0.197 unit increase in ICFS.

Table 5.12: Model Regression Coefficients of Size and Investment Cash Flow Sensitivity

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	-.327	.098		-3.343	.001
1	Size (Sales)	.013	.004	.156	2.910	.004
	Size (asset tangibility)	.149	.041	.197	3.679	.000

a. Dependent Variable: ICFS

In the fourth step, the interaction term of the independent and intervening variable was regressed against the dependent variable and the results are presented in Tables 5.13, 5.14, 5.15, 5.16, 5.17 and 5.18 below:

Table 5.13: Model Goodness of Fit for Financial Constraints, Sales and Investment Cash Flow Sensitivity

Model	R	R^2	Adjusted R^2	SE
1	.256[a]	.065	.057	.16678

a. Predictors: (Constant), Prof*Sales, Liq*Sales, Lev*Sales

The regression model in Table 5.13 above and 5.14 below presents Adjusted R^2= 0.057, F (3,329) = 7.613, p<0.05. The results of the regression analysis therefore shows that 5.7% of variations in ICFS as explained by variations in the interaction term between financial constraints attributes and sales that proxy size of the listed non financial firms. The interconnectedness is statistically significant (p<0.05).

Table 5.14: Model Overall Significance for Financial Constraints, Sales and Investment Cash Flow Sensitivity

Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	.635	3	.212	7.613	.000[b]
1	Residual	9.068	326	.028		
	Total	9.703	329			

a. DV: ICFS
b. Predictors: (Constant), Prof*Sales, Liq*Sales, Lev*Sales

Table 5.15 below indicates that there are statistically significant positive results between ICFS and the interaction term between leverage and sales (β=0.110, t=1.975, P<0.05). The established statistically significant results lead to rejection of sub hypothesis two (a) (H$_{2a}$).

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The results in Table 5.15 below presents a non-statistically significant positive results between ICFS and the interaction term between liquidity and sales (β=0.079, t=1.445, P>0.05). The finding of a non-statistically significant results leads to acceptance of sub hypothesis two (b) (H₂ᵦ).

Table 5.15: Model Regression Coefficients for Financial Constraints, Sales and Investment Cash Flow Sensitivity

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.015	.018		-.808	.420
	Lev*Sales	.005	.002	.110	1.975	.049
	Liq*Sales	.000	.000	.079	1.445	.150
	Prof*Sales	.013	.003	.239	4.359	.000

a. Dependent Variable: ICFS

The results in Table 5.15 above indicates that there are statistically significant positive results between ICFS and the interaction term between profitability and sales (β=0.239, t=4.359, P<0.05). The established statistically significant results lead to rejection of sub hypothesis two (c) (H₂ᵤ).

The prediction model generated above is as follows:

ICFS=-0.015+0.110LEV*Sales+0.079LIQ*Sales+0.239PRFY*Sales+ε.

This implies that a unit increase in the mediation term between leverage and sales causes increase in ICFS by 0.110 units; a unit increase in the mediation term between liquidity and sales causes increase in ICFS by 0.079 units and a unit increase in the mediation term between profitability and sales causes increase in ICFS by 0.239 units;

Table 5.16: Model Goodness of Fit for Financial Constraints, Asset Tangibility and Investment Cash Flow Sensitivity

Model	R	R^2	Adjusted R^2	SE
1	.376[a]	.141	.133	.15988

a. Predictors: (Constant), Prof*Tang, Liq*Tang, Lev*Tang

The regression model presented in Table 5.16 above and 5.17 below presents Adjusted R^2= 0.133, F (3,329) = 17.863, p<0.05. The results of the regression analysis therefore shows 13.3% of variations in ICFS to be explained by variations in the interaction term between financial constraints attributes and asset tangibility that proxy size for the listed non financial firms. Model One in Table 5.17 below therefore presents a significant relationship between proxies of FC and firm size as measured by asset tangibility (p<0.05).

Table 5.17: Model Overall Significance for Financial Constraints, Asset Tangibility and Investment Cash Flow Sensitivity

Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	1.370	3	.457	17.863	.000[b]
1	Residual	8.333	326	.026		
	Total	9.703	329			

a. Dependent Variable: ICFS
b. Predictors: (Constant), Prof*Tang, Liq*Tang, Lev*Tang

The results in Table 5.18 below indicates that there are statistically significant positive results between ICFS and the interaction term between leverage and asset tangibility (β=0.106, t=2.025, P<0.05). The established statistically significant results lead to rejection of sub hypothesis two (d) (H$_{2d}$).

Table 5.18: Model Regression Coefficients for Financial Constraints, Asset Tangibility and Investment Cash Flow Sensitivity

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.020	.015		-1.361	.174
	Lev*Tang	.126	.062	.106	2.025	.044
	Liq*Tang	.012	.005	.127	2.453	.015
	Prof*Tang	.697	.106	.346	6.570	.000

a. Dependent Variable: ICFS

The results in Table 5.18 above presents a statistically significant positive results between ICFS and the mediation term between liquidity and asset tangibility (β=0.127, t=2.453, P>0.05). The finding of a statistically significant results leads to rejection of sub hypothesis two (e) (H_{2e}).

The results in Table 5.18 above indicates that there are statistically significant positive results between ICFS and the interaction term between profitability and asset tangibility (β=0.346, t=6.570, P<0.05). The established statistically significant results lead to rejection of sub hypothesis two (f) (H_{2f}). The resulting prediction equation from the table above is:

ICFS = -0.020+0.106LEV*AstTgty+0.127LIQ*AstTgty+0.346PRFY*AstTgty+ε.

This means that on average, a unit increase in the mediation term between leverage and asset tangibility leads to an increase in ICFS by 0.106 units. Further, a unit increase in the mediation term between liquidity and asset tangibility leads to an increase in ICFS by 0.127, and also a unit increase in the mediation term between liquidity and asset tangibility leads to an increase in ICFS by 0.127.

5.4 Moderating Effect of Industry Growth Rate on Financial Constraints and Investment Cash Flow Sensitivity Relationship

Objective formulated at the third level concerned the role of industry growth as a moderator on how financial constraints influence ICFS of non-financial firms listed at NSE. Stepwise regression analysis was used to assess if growth in industry rate moderated the financial constraints and ICFS relationship. This was the test of the third hypothesis shown as:

> *Hypothesis Three: The effect of growth of industry on the financial constraints and ICFS relationship of NSE listed non-financial firms is not significant.*

The prediction equation as shown in chapter three was given as:

$$ICFS= \alpha + \beta_1 FC + \beta_2 IG + \beta_3 FC*IG + \varepsilon,$$

Multiple regression on the test of the first sub hypothesis is presented in Tables 5.19, 5.20 and 5.21.

The first sub hypothesis is shown as:

> *H_{3a}: The effect of industry Growth on leverage and ICFS relationship of NSE listed non-financial firms is not significant.*

Table 5.19: Model Goodness of Fit for Leverage, Industry Growth and Investment Cash Flow Sensitivity

Model	R	R^2	Adjusted R^2	SE
1	.033[a]	.011	.008	.17243

a. Predictors: (Constant), Lev *growth in industry, Leverage, Growth in industry

The multiple regression model as presented in Table 5.19 above and Table 5.20 below produced Adjusted $R^2 = 0.008$, $F(3,329) = 0.116$, $p>0.05$. The model therefore infers that 0.8% of variations in ICFS are explained by variations in firm leverage and growth in industry rate. As presented in Table 5.21 below, the results of ICFS and interaction effect between leverage and industry growth is not statistically significant.

Table 5.20: Model Overall Significance of Leverage, Industry Growth and Investment Cash Flow Sensitivity

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	.010	3	.003	.116	.951[b]
	Residual	9.693	326	.030		
	Total	9.703	329			

a. Dependent Variable: ICFS
b. Predictors: (Constant), Leverage, Industry Growth, Lev*IndustryGrowth

As presented in Table 5.21 below, the regression Model One shows negative results between leverage and ICFS which is not statistically significant (β=-0.001, t=-0.014, $p>0.05$) implying that for every unit increase in leverage, there is an expected decrease in ICFS by 0.001 units. There is also a negative result between growth in industry and ICFS which is not statistically significant (β=-0.057, t =-0.520, $p>0.05$) implying that for every unit increase in growth in industry rate, there is an expected decrease in ICFS by 0.057 units.

Table 5.21: Model Regression Coefficients of Leverage, Growth in Industry Rate and Investment Cash Flow Sensitivity

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.041	.017		2.373	.018

Leverage	-.001	.065	-.001	-.014	.989
Industry Growth	-.064	.123	-.057	-.520	.603
Lev*Indgrow	.185	.462	.048	.402	.688

a. Dependent Variable: ICFS

Table 5.21 above presents a positive results between the interaction term of leverage and growth in industry rate on one hand and ICFS on the other hand which is not statistically significant ($\beta=0.048$, t $=0.402$, p>0.05) implying that for every unit increase in the interaction term between levarge and growth in industry rate, there is an expected increase in ICFS by 0.048 units. The findings therefore leads to failing to reject sub hypotheses three (a) (H_{3a}) as there is no significant results between the interaction term of leverage with growth in industry rate and ICFS. The resulting estimation regression model is:

ICFS=0.041-0.001LEV-0.057IndGrw+0.402LEV*IndGrw+ε

Multiple regressions on the test of the second sub hypotheses are presented in Tables 5.22, 5.23 and 5.24. The second sub hypothesis was shown as:

> H_{3b}: *The effect of growth in industry on liquidity and investment cash flow sensitivity relationship of non-financial firms listed at the NSE is not significant.*

Table 5.22: Model Goodness of Fit for Liquidity, Growth in Industry Rate and Investment Cash Flow Sensitivity

Model	R	R^2	Adjusted R^2	SE
1	.093[a]	.009	.000	.17177

a. Predictors: (Constant), Liq*indG, Growth in industry, Liquidity

The multiple regression model as presented in Table 5.23 above and Table 5.24 below produced Adjusted R^2 = 0.000, F (3,329) = 0.954, p>0.05. The model therefore infers that 0.0% of variations in ICFS are explained by variations in firm liquidity and growth in industry rate.

Table 5.23: Model Overall Significance of Liquidity, Growth in Industry Rate and Investment Cash Flow Sensitivity

Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	.084	3	.028	.954	.415[b]
1	Residual	9.619	326	.030		
	Total	9.703	329			

a. Dependent Variable: ICFS
b. Predictors: (Constant), Liq*indG, Industrygrowth, Liquidity

As presented in Table 5.24 below, the regression model one shows a positive results of liquidity on ICFS which is not statistically significant (β=0.111, t =1.610, p>0.05) implying that for every unit increase in liquidity, there is an expected increase in ICFS by 0.111 units. There is also a positive results between growth in industry and ICFS which is not statistically significant (β=0.009, t =0.129, p>0.05) implying that for every unit increase in growth in industry rate, there is an expected increase in ICFS by 0.009 units.

Table 5.24: Model Regression Coefficients of Liquidity, Growth in Industry Rate and Investment Cash Flow Sensitivity

Model	Unstandardized Coefficients		Standardized Coefficients	t	Sig.

		B	Std. Error	Beta		
	(Constant)	.024	.015		1.594	.112
	Liquidity	.007	.004	.111	1.610	.108
1	Growth in industry	.010	.077	.009	.129	.897
	Liq*indG	-.015	.023	-.050	-.634	.527

a. Dependent Variable: ICFS

Table 5.24 above presents a negative results between the interaction term of liquidity and growth in industry rate on one hand and ICFS on the other hand which is not statistically significant (β=-0.050, t =-0.634, p>0.05) implying that for every unit increase in the interaction term between liquidity and growth in industry rate, there is an expected decrease in ICFS by 0.050 units. The findings therefore leads to failing to reject sub hypotheses three (b) (H_{3b}) as there is no significant results between the interaction term of liquidity with growth in industry rate and ICFS. The prediction estimation equation can therefore be stated as: ICFS=0.24+0.011LIQ-0.009IndGrw-0.050LIQ*IndGrw+ε

Multiple regression on the test of the third sub hypotheses is presented in Tables 5.25, 5.26 and 5.27. The third sub hypothesis is shown as:

> H_{3c}: *The effect of growth in industry on profitability and* ICFS *relationship of NSE listed non-financial firms is not significant.*

Table 5.25: Model Goodness of Fit for Profitability, Growth in Industry Rate and Investment Cash Flow Sensitivity

Model	R	R^2	Adjusted R^2	SE
1	.306[a]	.094	.085	.16426

a. Predictors: (Constant), Prof*indG, Growth in industry, Profitability

The multiple regression model as presented in Table 5.25 above and Table 5.26 below produced Adjusted R^2 = 0.085, $F_{(3,329)}$ = 11.210, $p<0.05$. The statistically significant model in explaining the results therefore infers that 8.5% of variations in ICFS are explained by variations in firm profitability and growth in industry rate.

Table 5.26: Model Overall Significance of Profitability, Growth in Industry Rate and Investment Cash Flow Sensitivity

Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	.907	3	.302	11.210	.000[b]
1	Residual	8.796	326	.027		
	Total	9.703	329			

a. Dependent Variable: ICFS
b. Predictors: (Constant), Prof*indG, Industrygrowth, Profitability

As presented in Table 5.27 below, the regression model one shows a positive results between profitability and ICFS which is statistically significant (β=0.131, t=2.164, $p<0.05$) implying that for every unit increase in profitability, there is an expected increase in ICFS by 0.131 units. There is also a negative results between growth in industry and ICFS which is not statistically significant (β=-0.008, t =-0.147, $p>0.05$) implying that for every unit increase in growth in industry rate, there is an expected decrease in ICFS by 0.008 units.

Table 5.27: Model Regression Coefficients of Profitability, Growth in Industry Rate and Investment Cash Flow Sensitivity

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
	(Constant)	.021	.012		1.810	.071
1	Profitability	.159	.074	.131	2.164	.031
	Growth in industry	-.009	.059	-.008	-.147	.883

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Prof*indG	1.343	.369	.220	3.636	.000

a. Dependent Variable: ICFS

Table 5.27 above presents a statistically significant positive results between the interaction term of profitability and growth in industry rate on one hand and ICFS on the other hand ($\beta=0.220$, t=3.636, $p<0.05$) implying that for every unit increase in the interaction term between profitability and growth in industry rate, there is an expected decrease in ICFS by 0.220 units. The findings therefore led to rejection of sub hypotheses three (3) (H_{3c}) as there were significant results between the interaction term of profitability with growth in industry rate and ICFS. The resulting regression model is ICFS=0.021+0.131PRFY-0.008IndGrw+0.22PRFY*IndGrw+ε

5.5 Joint Effect of Financial constraint, Size of the Firm and Growth in Industry Rate on Investment Cash Flow Sensitivity

The fourth and last objective was interested to analysing the joint effect of financial constraints, size of the firm and growth in industry on ICFS of firms in Kenya. Stepwise regression analysis was applied in testing the results hypothesized as:

> *H_4: The joint effect of financial constraints, size of the firm and growth in industry on investment cash flow sensitivity of non-financial firms listed at the NSE is not significant.*

The four multiple regression models were presented in Tables 5.28, Table 5.28 and Table 5.30 below. In Model One, Adjusted $R^2 = 0.057$, $F_{(1,329)} = 19.722$, $p<0.05$ infers that 5.7% of variations in ICFS are explained by variations in firm profitability. The introduction of asset tangibility leads to a change in coefficient of determination by 5.2% and a resultant F change of 0.0%. Model Two, Adjusted $R^2 = 0.103$, $F_{(2,329)} = 18.933$, $p<0.05$ infers that 10.3% of variations in ICFS are explained by

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variations in firm profitability and asset tangibility. The introduction of sales leads to a change in coefficient of determination by 1.1% and a resultant F change of 4.1%. In Model Three, Adjusted $R^2 = 0.112$, $F (3,329) = 4.209$, $p<0.05$ infering that 11.2% of variations in ICFS are explained by variations in firm profitability, asset tangibility and sales.

Table 5.28: Model Goodness of fit for Financial Constraints, Firm Size, Industry Growth Rate and Investment Cash flow Sensitivity

Model	R	R^2	Adjusted R^2	SE	Change Statistics				
					R^2 Change	F Change	df1	df2	Sig. F Change
1	.238[a]	.057	.054	.16705	.057	19.722	1	328	.000
2	.329[b]	.108	.103	.16266	.052	18.933	1	327	.000
3	.346[c]	.120	.112	.16187	.011	4.209	1	326	.041
4	.366[d]	.134	.124	.16077	.015	5.482	1	325	.020

a. Predictors: (Constant), Profitability

b. Predictors: (Constant), Profitability, Size (asset tangibility)

c. Predictors: (Constant), Profitability, Size (asset tangibility), Size (Sales)

d. Predictors: (Constant), Profitability, Size (asset tangibility), Size (Sales), Liquidity

Model Four in Table 5.28 and Table 5.29 introduces liquidity. The introduction of liquidity leads to a change in coefficient of determination by 1.5% and a resultant F change of 2.0%. Further, Model four shows an Adjusted $R^2 = 0.134$, $F_{(4,329)} = 5.482$, $p < 0.05$ which infers that 13.4% of variations in ICFS are explained by variations in firm profitability, asset tangibility, sales and liquidity.

Table 5.29: Model Overall Significance for Financial Constraints, Firm Size, Industry Growth Rate and Investment Cash flow Sensitivity

Model		Sum of Squares	Df	Mean Square	F	Sig.
	Regression	.550	1	.550	19.722	.000[b]
1	Residual	9.153	328	.028		
	Total	9.703	329			
	Regression	1.051	2	.526	19.867	.000[c]
2	Residual	8.652	327	.026		
	Total	9.703	329			
	Regression	1.162	3	.387	14.777	.000[d]
3	Residual	8.542	326	.026		
	Total	9.703	329			
	Regression	1.303	4	.326	12.606	.000[e]
4	Residual	8.400	325	.026		
	Total	9.703	329			

Model One in Table 5.30 below presents a statistically significant positive relationship between profitability and ICFS ($\beta = 0.238$, $t = 4.441$, $P < 0.05$). Model Two presents statistically significant positive relationships between ICFS and profitability ($\beta = 0.259$, $t = 4.946$, $P < 0.05$), and asset tangibility ($\beta = 0.228$, $t = 4.351$, $P < 0.05$).

Table 5.30: Model Regression Coefficients for Financial Constraints, Firm Size, Industry Growth Rate and Investment Cash flow Sensitivity

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	.019	.010		1.894	.059
	Profitability	.290	.065	.238	4.441	.000
2	(Constant)	-.083	.026		-3.262	.001
	Profitability	.316	.064	.259	4.946	.000
	Size (asset tangibility)	.173	.040	.228	4.351	.000
3	(Constant)	-.273	.096		-2.847	.005
	Profitability	.290	.065	.238	4.467	.000
	Size (asset tangibility)	.167	.040	.221	4.229	.000
	Size (Sales)	.009	.004	.109	2.051	.041
4	(Constant)	-.386	.107		-3.616	.000
	Profitability	.259	.066	.213	3.948	.000
	Size (asset tangibility)	.170	.039	.224	4.317	.000
	Size (Sales)	.013	.005	.161	2.817	.005
	Liquidity	.008	.004	.132	2.341	.020

a. Dependent Variable: ICFS

Model Three presents statistically significant positive relationships between ICFS and profitability ($\beta = 0.238$, t = 4.467, P<0.05), asset tangibility ($\beta = 0.221$, t = 4.229, P<0.05) and Sales ($\beta = 0.109$, t = 2.051, P<0.05). Model Four presents statistically significant positive relationships between ICFS and profitability ($\beta = 0.213$, t = 3.948, P<0.05), asset tangibility ($\beta = 0.224$, t = 4.317, P<0.05), Sales ($\beta = 0.161$, t = 2.817, P<0.05) and Liquidity ($\beta = 0.132$, t = 2.341, P<0.05). Since the other attributes of financial constraints namely leverage and industrial growth were not statistically significant, they were excluded from the model in line with Baron and Kenny (1986).

Further, considering that all the other variables have significant joint effect on ICFS then findings led to failing to reject hypothesis four (H4).

The resulting regression model is shown as:

ICFS=0.019+0.259PRFY+0.228AstTGTY+0.238PRFY*AstTGTY+0.109Sales+0.224AstTgty*Sales+0.132LIQ+0.224PRFY*AstTgty*Sales*LIQ+ε

Table 5.31: Summary of Statistical Tests of Hypotheses and Interpretation of Results

Research Objectives	Hypothesis/ Sub Hypothesis	Results	Remarks
Determine the relationship between financial constraint (FC) and ICFS	H_1: Financial constraints and ICFS relationship is not significant		
	H_{1a}: Leverage and ICFS relationship is not significant.	Positive results between leverage and ICFS (β=0.080, t =1.444, p>0.05) though not statistically significant	Sub hypothesis supported; Failed to reject
	H_{1b}: Liquidity and ICFS relationship is not significant.	Positive results between liquidity and ICFS (β=0.068, t =1.254, p>0.05) though not statistically significant	Sub hypothesis supported; Failed to reject
	H_{1c}: Profitability and ICFS relationship is not significant.	A statistically significant positive results between profitability and ICFS (β=0.248, t =4.504, p<0.05)	Sub hypothesis not supported; Rejected.
Assess the effect of size of the firm on the results between FC and ICFS	H_2: Intervening effect of firm size on FC and IFCS relationship is not significant		
	H_{2a}: Intervening effect of sales on leverage and ICFS relationship is not significant	Sales has positive and statistically significant results on the relationship between leverage and ICFS (β=0.110, t=1.975, P<0.05)	Sub hypothesis not supported; Rejected
	H_{2b}: Intervening effect of sales on liquidity and ICFS relationship is not significant.	A statistically non-significant positive results between ICFS and the interaction term between liquidity and sales (β=0.079, t=1.445, P>0.05)	Sub hypothesis Supported; Failed to Reject
	H_{2c}: Intervening effect of sales on profitability and	Sales has positive and statistically significant	Sub hypothesis not supported; Rejected

	ICFS relationship is not significant.	results on the relationship between profitability and ICFS (β=0.239, t=4.359, P<0.05).	
	H₂d: Intervening effect of asset tangibility on leverage and ICFS relationship is not significant	Asset tangibility shows a positive and significant effect on the relationship between leverage and ICFS (β=0.106, t=2.025, P<0.05).	Sub hypothesis not supported; Rejected
	H₂e: Intervening effect of asset tangibility on liquidity and ICFS relationship is not significant	A statistically non-significant positive results of asset tangibility on relationship between liquidity and ICFS (β=0.127, t=2.453, P>0.05).	Sub hypothesis supported; Failed to Reject.
	H₂f: Intervening effect of asset tangibility on profitability and ICFS relationship is not significant	ICFS and the interaction term between profitability and asset tangibility shows significance which is also positively documented (β=0.346, t=6.570, P<0.05).	Sub hypothesis not supported; Rejected
Establish the effect of growth in industry on the results between FC and ICFS	**H₃:** Moderating effect of growth in industry on FC and ICFS relationship is not significant.		
	H₃a: Moderating effect of growth in industry on leverage and ICFS relationship is not significant	A statistically non-significant positive results of the interaction term between leverage and industry growth on ICFS (β=0.048, t =0.402, p>0.05).	Sub hypothesis supported; Failed to Reeject
	H₃b: Moderating effect of growth in industry on liquidity and ICFS relationship is not significant	A statistically non-significant positive results of the interaction term between liquidity and industry growth on ICFS (β=-0.050, t =-0.634, p>0.05)	Sub hypothesis supported; Failed to Reeject
	H₃c: Moderating effect of growth in industry on profitability and ICFS is not significant.	A statistically significant positive results of the interaction term between profitability and industry growth on ICFS (β=0.220, t =3.636, p<0.05).	Sub hypothesis not supported; Rejected

Analyse the joint effect joint effect of Financial Constraint, Size of the Firm and Growth in Industry on ICFS	H₄: Joint effect of FC, Firm Size and industry growth on ICFS is not significant	There was found to be a statistically significant joint effect of FC, Firm Size and Industry Growth on ICFS	Sub hypothesis not supported; Rejected

5.6 Discussion of Findings

The first objective of the study was to determine the results between financial constraint (FC) and ICFS which was hypothesized that the results between financial constraints and ICFS are not significant at statistical level. Financial constraints were proxied by leverage, liquidity and profitability thus leading to three sub hypotheses. The first sub hypothesis presented that the results between leverage and ICFS of NSE listed non-financial firms is not significant at statistical level. Multiple regression analysis results confirmed that there is a positive result which is not significant at statistical level. Since leverage is a proxy for financial constraints in this sub hypothesis, the findings are consistent with arguments of Kaplan and Zingales (1997) and Cummins, Hasset and Oliner (2012) who posit that there are no results between financial constraints and investment cash flow investment. This implies that capital structure decisions especially debt composition for the NSE listed firms is dependent on other factors and not on investment needs.

The second sub hypothesis indicated that the results between leverage and ICFS of NSE listed non-financial firms are not significant at statistical level. Multiple regression analysis results confirm that there is a positive results between liquidity and ICFS which is not significant at statistical level. Since liquidity is a proxy for

financial constraints, the findings are consistent with arguments of Kaplan and Zingales (1997) and Cummins, Hasset and Oliner (2012) who advanced that there is no results between financial constraints and investment cash flow investment. The finding is a departure from Okumu (2014) assertion that liquidity alongside size of the firm and institutional ownership has a definite influence on the ICFS for the firms listed at the NSE. The finding confirms the argument that firm liquidity especially working capital management is influenced by several other factors and not necessarily available investment opportunities.

The third sub hypothesis indicated that the results between profitability and ICFS of non-financial listed firms at NSE are not significant at statistical level. Multiple regression analysis results confirm that there is a significant at statistical level positive results between profitability and ICFS. This finding is consistent with arguments in pecking order theory that internal funds are used to finance future investments and when external funds are hard to obtain, firms over rely on internal cash flows represented in their overall profitability hence exhibiting high investment cash flow investment. Since profitability is a proxy for financial constraints in the foregoing study, the findings are consistent with arguments in Fazzari, Hubbard, and Petersen (1988), Hoshi, Kashyap and Scharfstein (1991), Fazzari, Hubbard and Peterson (2000), Hassett and Oliner (2006) and Agca and Mozumdar (2012) that ICFS is an appropriate measure of financial constraints. The finding implies that managers firms listed at NSE prioritise finding investments from internal reserves mostly because of external cost of debt and possibly market information asymmetries that make external capital costly.

In the second objective, the study sought to assess the effect of size of the firm on the results between financial constraints and ICFS by testing the hypothesis that the effect of size of the firm on the results between financial constraints and ICFS is not significant at statistical level. Size of the firm was proxied by firm sales levels and firm asset tangibility thus leading to six sub hypotheses.

The first and fourth sub hypotheses under the second objective were indicated as; the effect of sales on the results between leverage and ICFS of NSE listed non-financial firms is not significant at statistical level, and the effect of asset tangibility on the results between leverage and ICFS of NSE listed non-financial firms is not significant at statistical level. Applying Baron and Kenny (1986) four steps approach for testing intervention, the regression results establishes a significant at statistical level positive results between ICFS and the interaction term between leverage and sales as well as a significant at statistical level positive results between ICFS and the interaction term between leverage and assets tangibility.

Considering that sales and asset tangibility proxy size while leverage is an indicator of financial constraints, the findings thus confirms the arguments in literature by Fazzari, Hubbard, and Petersen (1988), Oliner and Rudebusch (1992) and Schaller (1993) that the results between financial constraints and ICFS is affected by size. Generally, larger firms in terms of tangible assets and higher sales turnover have ease of access of external capital especially when turnovers are used to assess ability to borrow and when tangible assets are used as collateral for debt finance.

The second and fifth sub hypotheses under the second objective were indicated as; the effect of sales on the results between liquidity and ICFS of NSE listed non-financial firms is not significant at statistical level, and the effect of asset tangibility on the

results between liquidity and ICFS of NSE listed non-financial firms is not significant at statistical level.

Regression results of Baron and Kenny (1986) four steps approach for testing intervention establish that there is a non-significant at statistical level positive results between ICFS and the interaction term between liquidity and sales as well as a non-significant at statistical level positive results between ICFS and the interaction term between liquidity and asset tangibility. The findings are departure from the propositions by Bond and Meghir (1994) that size affect firms ICFS. This finding affirms that firm liquidity decisions vary amongst the firms not on the basis of size but on the basis of management conscious choices.

The third and sixth sub hypotheses under the second objective were indicated as; the effect of sales on the results between profitability and ICFS of NSE listed non-financial firms is not significant at statistical level, and the effect of asset tangibility on the results between profitability and ICFS of NSE listed non-financial firms is not significant at statistical level. Baron and Kenny (1986) four steps approach for testing intervention regression results confirm significant at statistical level positive results between ICFS and the interaction term between profitability and sales as well as the interaction term between profitability and tangibility of assets.

The third objective of this study was to establish the effect of Growth in industry on the results between financial constraints and investment cash flows sensitivity. The third hypothesis postulated was that the effect of growth in industry on the results between financial constraints and investment cash flows sensitivity is not significant at statistical level. The first sub hypothesis in the third objective was indicated as; the effect of growth in industry on the results between leverage and ICFS of NSE listed

non-financial firms is not significant at statistical level. Multiple regression analysis results establish a non-significant at statistical level positive results between the interaction term of leverage and growth in industry rate on one hand and ICFS on the other hand confirming that growth in industry rate does not significantly influence the results.

The finding is not consistent with the propositions of Muthama, Mbaluka and Kalunda (2013), Booth *et al*. (2001) and Rajan and Zingales (1995) that there exists a results between capital structure and external macroeconomic variables. This is an attestation that debt capital decisions of NSE listed firms alongside their investment decisions are explained by managerial conscious choices devoid of macroeconomic trends.

The second sub hypothesis in the third objective was indicated as: the effect of growth in industry on the results between liquidity and ICFS of NSE listed non-financial firms is not significant at statistical level. Multiple regression analysis results presented non-significant at statistical level negative results between the interaction term of liquidity and growth in industry rate on one hand and ICFS on the other hand, leading to the conclusion that growth in industry rate does not significantly influence the results between liquidity and ICFS.

The findings were not consistent with the propositions of Muthama, Mbaluka and Kalunda (2013), Booth *et al*. (2001) and Rajan and Zingales (1995) that there exists a results between capital structure and external macroeconomic variables. This also confirms that working capital decisions of NSE listed firms alongside their investment decisions are explained by managerial conscious choices devoid of macroeconomic trends.

The third sub hypothesis in the third objective was indicated as; the effect of growth in industry on the results between profitability and ICFS of NSE listed non-financial firms is not significant at statistical level. Multiple regression analysis results establishes significant at statistical level positive results between the interaction term of profitability and growth in industry rate on one hand and investment cashflow sensitivity on the other hand leading to the conclusion that growth in industry rate significantly influence the results between profitability and ICFS. The finding is therefore consistent with the propositions of Muthama, Mbaluka and Kalunda (2013), Booth *et al*. (2001) and Rajan and Zingales (1995) on effects of external macroeconomic variables of firm decisions. The finding upholds the position that firm profitability levels are also dependent on the prevailing macro-economic situation.

The fourth objective of the study was to analyse the joint effect joint effect of financial constraint, size of the firm and growth in industry on ICFS. The objective was tested in the hypothesis that the joint effect of financial constraints, growth in industry and size of the firm on ICFS is not significant at statistical level. The study finds that there are no significant at statistical level results between ICFS and leverage as well as growth in industry rate. The findings, especially on non-significance of growth in industry rate is also not consistent with the advancements in Muthama, Mbaluka and Kalunda (2013), Booth *et al*. (2001) and Rajan and Zingales (1995) that there exists results between capital structure and external macroeconomic variables. The findings can be interpreted to be pointing to firm debt equity structures being guided by managerial considerations including agency conflicts, pecking order and information asymmetry and not just macro environment considerations for the investment decisions.

CHAPTER SIX

SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

6.1 Introduction

This chapter is all about summarizing findings in detailed manner and also giving conclusions and further recommendations based on policy issues as well as limitations and research suggested for further undertakings. These are presented relative to the findings of the previous chapter evaluating the influence of financial constraints, size of the firm and growth in industry on ICFS of non-financial listed firms in Kenya.

6.2 Summary of Findings

The study keen interest was on how NSE listed non-financial firms are affected by the interaction involving financial constraints, firm size and industry growth and the ICFS. The results were thus obtained after considering descriptive design as well as longitudinal with 33 companies taken for this study with data spanning from 2010-2019.

The prior objective determined how financial constraints and ICFS relate for firms listed on NSE. The explanatory variables were leverage, liquidity and profitability. Leverage was measured as the ratio of long term debts to total assets, liquidity as the current liabilities and current assets ratio and ROA as the proxy for profitability. Using a multiple regression analysis model, the study established a positive significance at statistical level results between profitability and ICFS. The results involving leverage as well as liquidity did not show significance as far as the association to ICFS is concerned.

The number two objective geared on establishing how financial constraints and ICFS relate and the role played by firm size as an intervener in NSE listed non financial firms. Size was understood through sub variables sales as well as asset tangibility which were through the ratio of Non-current (fixed) assets to total assets. The intervening impact was realized in the study with size having significant effect on how ICFS is affected by financial constraint. Further when sales as well as tangibility in assets are subjected to analysis as individual interveners, the insignificant results are manifested meaning they cannot intervene the relationship on individual basis.

The third objective of the study was to establish the moderating effect of growth in industry on the results between financial constraints and ICFS of non financial firms in Kenya. Growth in industry was the sectoral measure of growth measured as a percentage. To establish the moderating effect, a multiple regression model employed revealed that growth in industry has a significant at statistical level moderating effect on the results between profitability and ICFS of non financial listed firms. However, the effect on the results between liquidity and cash flow sensitivity as well as leverage and cash flow sensitivity is not significant at statistical level.

The fourth objective of the study was to analyze the joint effect of financial constraint, size of the firm and growth in industry on ICFS of firms in Kenya. Using a stepwise regression analysis, the study established that there were significant at statistical level effects of profitability, liquidity, sales and tangibility in asset on ICFS. However, the effect of leverage and growth in industry rate was not significant at statistical level.

6.3 Conclusions

This study concludes that financial constraints as measured by firm's liquidity, leverage and profitability of non financial firms listed at the growth in industry have varied significant effects. Profitability has a significant at statistical level effect on ICFS. Although liquidity and leverage have positive results with the dependent variable, their results are not significant at statistical level. The finding thus confirms that growth in industry listed firms rely on their retained profits as a priority to finance their investment opportunities, which is consistent with pecking order theory.

The study also concludes that size of the firm as measured by sales and tangibility of assets positively affects the results between financial constraints (proxied by leverage and profitability) and sensitivities in flow of cash investment of firms listed at the growth in industry and the results are significant at statistical level. However, the effect of the size of the firm on the results between liquidity and ICFS is not significant at statistical level. In the presence of size of the firm as the intervening variable, measures of the independent variable (leverage and profitability) have a significant effect at statistical level. The findings explain the diversity of the firms listed in growth in industry with respect to size and profitability levels.

The study established that growth in industry as measured by change in industrial contribution to GDP rate has a positive result with the ICFS. Hence, growth in industry enhances investments for companies listed at the Nairobi Securities Exchange, Kenya. There was however no significance registered when industry growth was subjected to determining if financial constraints and ICFS of NSE listed non financial firms relate.

Finally, the joint effect of financial constraint, size of the firm and growth in industry on ICFS of non financial firms listed at the growth in industry, Kenya was significant and thus confirmed.

6.4 Contributions of the Study Findings

The section is key to enabling understanding on how study is geared towards adding value on various disciplines including management benefits, knowledge for future application, theory and policy with respect to ICFS as a result of financial constraints as well as firm size and growth in industry.

6.4.1 Contributions to Knowledge

The study has been key to knowledge generation as occasioned by the findings on financial constraints and ICFS relationship and also role played when industry growth and size were considered in three main ways: the prior consideration is what factors can be authoritatively considered to influencing ICFS. Although various indicators including leverage, liquidity and profitability were used to operationalize financial constraint, results of panel data analysis indicate that firms are relying more on profitability and debt with the pecking order being profitability and leverage/debts.

The studies on ICFS so far had only considered external equity and debt capital, there is no study in the area that had attempted to determine the appropriate indicators of ICFS involving the three components of capital financing, that is liquidity, leverage and profitability and the application of these types of finances and their joint impact on the ICFS of the firm.   The focus of those prior studies was mainly whether financial constraints are an appropriate measure of investment cash flow sensitivity. This study contributes in the study of financial constraints and firm ICFS by

decomposing firm financial constraints into liquidity, leverage and profitability. Leverage and profitability have significant at statistical level effects.

The second contribution of this study is the intervening effect of size of the firm with respect to firm sales and tangibility of assets on the results between financial constraints (leverage and profitability) and firm ICFS. The sensitivity of profitability reveals that the firms listed on NSE finance their new investments mainly from internal profits. This could partly have been caused by past capital structure decisions especially on the impact of the firms borrowing much more than what their cash flows could support. This could perhaps imply that the non financial firms listed on NSE find difficulty in securing debts or finances, hence being constrained financially. All these among other underlying factors require careful analysis if firms have to gain from efficiencies impacting on their investments.

Lastly, this study has helped in reducing the controversy on the results between financial constraints and ICFS by showing that the positive results that is direct and significant is between profitability and ICFS. The direct results between investment cash flow sensitivity and liquidity as well as leverage were positive but not significant at statistical level. The study shows that the direct results between leverage and ICFS and profitability and ICFS are intervened by size in terms of sales and tangibility in asset. The direct results between liquidity and ICFS are however not intervened by size in terms of sales and tangibility of assets. Industrial growth also moderates the results between profitability and ICFS but not the results between ICFS and Leverage as well as liquidity. This can explain why many researchers who have tested the results between financial constraints as a composite variable not split into various sub variables or elements and firm ICFS have found contradictory results with some

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concluding that the results between the variables are positive, negative or not significant at all.

This study has showed that the effect of financial constraints on firm ICFS can best be understood by considering how growth in industry and size of the firm influenced and affected the results between elements of financial constraints and ICFS of firms listed at the Nairobi Securities Exchange.

6.4.2 Contributions to Managerial Policy and Practices

The corporate managers should increase use of internally generated funds especially from profits and debt capital when financing their firm investment and operations in order to maximize the tax shield benefits available to their firms. Based on the results of this study, the government through Capital Markets Authority (CMA) and other stakeholders in the Kenyan corporate sector should develop appropriate policies in an attempt to organize the debt capital market to enable the corporate bodies get access to low cost long term debt capital to finance their investments and operations.

The current study has revealed that Kenyan firms rely more on costly equity finances (profits) instead of debt financing (leverage) locking themselves out of the tax shield benefits meant to enhance the value of the firms listed on NSE. The findings of this study are expected to guide managerial practitioners in the corporate sector to appreciate the integration of the various financing methods in the face of a challenging economic environment, and management of firm core processes in order to support entrepreneur spirit in the country.

The government on the other hand has an obligation to provide stability of the economic environment which provides growth in industry through its fiscal and monetary interventions. This ensures low inflation rate, low tax rate, and high economic growth rate leading to growth in industry, increased operational efficiency hence reduced cost of operation and firm profits increase. This causes the value of the firm to increase through a higher share price arising from higher dividends to shareholders.

6.5 Limitations of the Study

First, this study zeroed down on the size of the firm in terms of sales and tangibility of assets as an intervener. There are other firm characteristics such as age, number of employees and organizational structure which could also come into play as an aspect of competitive advantage likely to influence the results between financial constraints and ICFS.

In addition, by adopting a quantitative approach in which secondary data used, respondents could not express any other views other than those sought by the data collection sheet, hence placing a constraint in getting views from responsible managers. An interview guide would have produced in-depth opinions and perceptions by respondents on the study variables, which would provide further insights into the nature of association between the variables.

Furthermore, the current study focused on investigating the variables in financial setting, without investigating the same in a business to business setting hence providing an opportunity for future research to investigate the same interaction of variables in a business to business setting. Further, due to resource (time and costs) constraints the study used data from NSE listed non financial firms only hence

limiting the level of generalizability of the study results to other financial institutions or even firms which do not belong in the financial services sector.

Additionally, the study presumed existence of linear results between financial constraint, growth in industry, size of the firm and ICFS. There is a possibility of the study variables having a different form of results like curvilinear results that the current study did not explore. Also, there was no focus on the different market segments to which the firms belong due to the fact that the target firms were non financial firms listed on NSE without differentiating between different market segments. Therefore, this study could not bring out the differential effect of financial constraints on investment cash flow sensitivity across market segments. Finally, there was no attempt to enquire into the stability of financial constraints across time and across market segments and how this impacts on ICFS.

6.6 Suggestions for Further Research

This study recommends that other studies should be done to evaluate any other factor deemed key to affect size of NSE listed non financial firms. Additionally, it is also important to evaluate the influence of financial constraint, size of the firm and growth in industry on ICFS on companies not listed on the Nairobi Securities Exchange and draw comparable differences. These studies can further be disaggregated by industry to offer more in-depth insight and should not presume linear results. Other studies on the decisions involving financing to evaluate performance of NSE listed non financial companies. These may be disaggregated by industry for further insight or the study may be regional for example companies in the EAC bloc.

Methodologically, future research is recommended to determine the cause–effect phenomenon of FC and ICFS in order to further understand the power of financial decisions as a finance concept. This is because the current study used descriptive as well as longitudinal study approach which were limiting in as far as ability to detect causal effects of variables is concerned. A cross sectional design in particular would generate evidence on the causal linkages which cannot be obtained in descriptive design.

Additionally, a qualitative research approach could be used to establish the in-depth perceptions and opinions of the management of non-financial firms with regard to financial constraints. Future studies could develop constructs that measure the subjective aspect of financial constraints and use focus groups and in-depth interviews to collect and analyze data on each of these constructs. Contextually, future studies could replicate this research but in financial oriented sectors such as banks or replicate it in other developing countries to determine the universality and significance of the FC – ICFS –association. Such investigations will shed more light into the dynamisms of the financial constraints phenomenon in different sectors and markets.

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APPENDICES

APPENDIX I: DATA COLLECTION FORM

Company name _____

YEAR	FINANCIAL CONSTRAINTS			FIRM SIZE		ECONOMIC GROWTH RATE	ICFS	
	Leverage	Profitability	Liquidity	Sales Growth	Tangibility of Assets	Industry Growth	Investment/ Change in Tangible Assets	Change in Cash flows
2010								
2011								
2012								
2013								
2014								
2015								
2016								
2017								
2018								
2019								

APPENDIX II: LIST OF NSE LISTED NON-FINANCIAL FIRMS

	FEATURES OF NSE EQUITY SECURITIES
	SECURITIES
	AGRICULTURAL
1.	Williamson
2.	The Limuru
3.	Sasini
4.	Kapchorua
5.	Kakuzi
6.	Eaagads
	AUTOMOBILES & ACCESSORIES
7.	Sameer
8.	Marshalls
9.	Car & General
	COMMERCIAL AND SERVICES
10.	Scangroup
11.	Uchumi Supermarket
12.	TPS
13.	Standard Group
14.	Nation Media
15.	Nairobi Business Ventures
16.	Longhorn Publishers
17.	Kenya Airways
18.	Hutchings Biemer
19.	Express Kenya
20.	Atlas African Industries
	CONSTRUCTION & ALLIED
21.	E.A.Portland
22.	E.A.Cables
23.	Crown Paints
24.	Bamburi
25.	ARM
	ENERGY & PETROLEUM
26.	Umeme
27.	Total Kenya
28.	Kenya Power
29.	Kenya Power 4% Pref 20.00
30.	Kenya Power Ltd
31.	KenolKobil
32.	KenGen
	INVESTMENT

33.	Trans-Century
34.	Olympia Capital
35.	Kurwitu
36.	Home Afrika
37.	CIC Insurance
38.	Centum Investment
39.	Britam
	MANUFACTURING & ALLIED
40.	Unga Group
40.	Mumias sugar
41.	Kenya Orchards
42.	Flame Tree Group
43.	Eveready
44.	EABL
45.	Carbacid
46.	BAT
47.	B.O.C
48.	A.Baumann & Co Ltd

Source: Central Bank of Kenya (2014)

		ICFS	Leverage	Liquidity	Size	Tangibility	Industry Growth	Profitability
		$Inv_{it} = \beta_0 + \beta_1 CF_1 + \varepsilon$	LTD/TA	CA/CL	Ln sales	NCA/TA		ROA
2010	Eaagads Ltd	0.084963637	0.211392071	2.344645786	18.08183168	0.783094704	0.185605593	0.107251372
2010	Athi River	0.180082509	0.374383063	1.028259333	22.25354647	0.702158341	0.156003796	0.079128604
2010	Bamburi	0.161190856	0.059188375	1.84383612	24.03625112	0.644302676	0.156003796	0.120928584
2010	Boc Gases	-0.602696654	0.045572543	2.078722354	20.97311519	0.074809616	0.198465068	0.163036608
2010	Car and General	0.054759464	0.07563588	1.294060639	21.82099173	0.334914125	0.113141638	0.078108867
2010	Carbacid	0.073754654	0.121332834	14.23072907	19.77423236	0.549257823	0.198465068	0.137877093
2010	Crown Berger	-0.021442971	0.050794978	1.328232305	21.59435835	0.271698263	0.156003796	0.016284213
2010	EA Cable	0.029190171	0.16036244	1.660164755	22.09173018	0.351622244	0.156003796	0.152043982
2010	EA Portland	0.071132642	0.419605008	2.262660291	22.69796875	0.706642148	0.156003796	0.059145993
2010	EABL	0.081697412	0.068246529	1.977297715	24.20414007	0.472713561	0.198465068	0.27618682
2010	Eveready	0.018125492	0.103621157	1.661153905	21.29688314	0.237917234	0.198465068	0.021305843
2010	Express	0.391272611	0.286969645	0.361854539	20.50383165	0.860384939	0.114777767	-0.032739069
2010	Kakuzi Ltd	0.07014072	0.257649617	1.074523893	21.20588888	0.834982962	0.185605593	0.106259523
2010	Kapchorua	-0.079330345	0.247607575	1.77285368	20.16987538	0.78773046	0.185605593	-0.07105283
2010	Kengen	0.0839432	0.289208394	1.344506409	23.16979334	0.900413269	0.114068441	0.044950793
2010	Kenol	0.119502969	0.017719522	1.295038158	20.06203266	0.238092394	0.198465068	0.004169533
2010	KPLC	0.180129757	0.291119198	1.120810403	24.43486371	0.652998785	0.114068441	0.029506895
2010	Limuru tea	-0.163409779	0.19729987	3.950872405	18.05724011	0.298450887	0.185605593	0.146533968
2010	Mumias Sugar	0.095999881	0.121098836	1.346077333	23.20567779	0.676635328	0.198465068	0.085811855
2010	Rea Vipingo	0.083225488	0.123996608	1.446930236	21.02811987	0.50842298	0.185605593	0.103037199
2010	Safaricom	0.20466767	0.087136228	0.510520557	24.84017731	0.826703282	0.032603158	0.186284427
2010	Sameer Africa	0.023683191	0.041782125	2.545323341	21.83075428	0.328075242	0.113141638	0.049037953
2010	Sasini	0.371683235	0.252751715	2.690299344	21.09866685	0.857010853	0.185605593	0.128843963
2010	Scan Group	0.010203496	0.001080811	2.134638622	21.08574828	0.04789416	0.032603158	0.083962677
2010	Standard	0.096388112	0.313809813	1.36552616	21.75959838	0.57034122	0.032603158	0.106541067

Year	Name							
	Newspapers							
2010	Total	0.001760472	0	1.237104639	24.72709327	0.190214365	0.113141638	0.048454909
2010	TPS Serena	-0.019553877	0.267206865	1.228595272	21.89982726	0.807911362	-0.198129137	0.034227315
2010	Unga Group	0.045392361	0.054486291	1.910401783	22.96936777	0.382911956	0.198465068	0.078475019
2010	Williamson Tea	-0.000863329	0.217913458	2.183461943	20.81433157	0.831663047	0.185605593	-0.027236913
2010	Kenya Airways	-0.016303091	0.477183381	0.284218505	24.82542975	0.715781495	0.113141638	0.058814461
2010	Nation	0.046338405	0.019822624	1.853651802	22.83366084	0.391451493	0.032603158	0.195793736
2010	BAT	0.062847069	0.156234624	0.182449773	23.58180115	0.876239519	0.198465068	0.26211572
2010	Kenya Orchards	0.21337797	0.315813152	0.735294257	16.95902293	0.798959434	0.198465068	-0.008209909
2011	Eaagads Ltd	0.005467948	0.228215688	6.70192	18.60548256	0.838933942	0.179750315	0.04552009
2011	Athi River	0.355065126	0.382865016	1.002678783	22.36125661	0.723027692	0.207830164	0.053189124
2011	Bamburi	0.036123568	0.193915047	2.583535599	24.1242632	0.602235924	0.207830164	0.217052815
2011	Boc Gases	0.465693288	0.043795492	2.640529598	20.97431479	0.511940499	0.026801983	0.077402395
2011	Car and General	0.030588089	0.069008609	1.303342843	22.19340145	0.31751803	0.07818452	0.061667691
2011	Carbacid	0.003600023	0.103341374	10.62535876	20.1306027	0.486255976	0.026801983	0.186269054
2011	Crown Berger	-0.009248887	0.053686224	1.435790002	21.65686865	0.272462248	0.207830164	0.04734877
2011	EA Cable	0.218455379	0.179351211	1.362503248	21.75711238	0.520477458	0.207830164	0.083544122
2011	EA Portland	0.20833987	0.3672417	2.070260224	22.81529988	0.74024797	0.207830164	0.152153435
2011	EABL	0.032694387	0.084611969	2.008115203	24.26154665	0.4713962	0.026801983	0.240262657
2011	Eveready	0.003210474	0.074974541	1.505660992	21.22112354	0.202890329	0.026801983	0.028336968
2011	Express	0.01079291	0.298757352	0.308490284	20.61001651	0.881401347	0.086822023	0.011546866
2011	Kakuzi Ltd	0.011018514	0.210393787	2.033459266	21.45212711	0.784760489	0.179750315	0.13583723
2011	Kapchorua	0.039869087	0.000232888	1.682912897	20.42631292	0.702310419	0.179750315	0.059863144
2011	Kengen	-0.004450053	0.362997237	2.172685307	23.26111181	0.882612305	0.298047276	0.019068499
2011	Kenol	-0.015309124	0.017291843	1.304639664	21.01979621	0.195539262	0.07818452	0.004137272
2011	KPLC	0.159232	0.289617454	0.871562248	24.90085611	0.712071543	0.298047276	0.045649907

2011	Limuru tea	0.021227917	0.137898908	3.836562026	18.32779762	0.224579569	0.179750315	0.318053164
2011	Mumias Sugar	0.159906881	0.210489406	1.356217352	23.19164321	0.707973662	0.026801983	0.09219005
2011	Rea Vipingo	0.057869264	0.151491708	2.239292016	21.03887188	0.644629315	0.179750315	0.105332498
2011	Safaricom	0.138531861	0.052077432	0.489435151	24.97858896	0.809095961	0.101346113	0.114926842
2011	Sameer Africa	-0.026245985	0.038944903	3.425506345	21.91053531	0.30955515	0.07818452	0.052574155
2011	Sasini	0.14162053	0.241184522	2.555499913	21.50354897	0.869844877	0.179750315	0.065767776
2011	Scan Group	0.137185278	0.002954376	2.066117536	21.20817594	0.182983961	0.101346113	0.101991585
2011	Standard Newspapers	0.129864985	0.296798299	1.271258781	21.74133126	0.63987675	0.101346113	0.087678755
2011	Total	0.254361271	0.126172776	1.116066033	24.44440912	0.342003551	0.07818452	0.015306458
2011	TPS Serena	0.030993843	0.277832554	1.540715663	22.1287884	0.782413043	0.660181091	0.054411712
2011	Unga Group	-0.016271913	0.06003765	1.838290139	23.17802586	0.311323553	0.026801983	0.033274753
2011	Williamson Tea	0.007267993	0.204431336	1.867032575	21.12202988	0.766640271	0.179750315	0.028019734
2011	Kenya Airways	0.007406814	0.494868612	0.249042452	24.99755413	0.750957548	0.07818452	-0.054490131
2011	Nation	0.032849492	0.013587122	2.128179044	22.82615531	0.427058609	0.101346113	0.170363946
2011	BAT	-0.938065979	0.470888731	0.436255311	22.05367903	0.990213303	0.026801983	-0.142856271
2011	Kenya Orchards	-0.585714207	0.755417877	1.033842678	16.9251256	0.6715601	0.026801983	-0.038604385
2012	Eaagads Ltd	0.058081899	0.225855963	6.617620253	18.83559441	0.782898015	-0.01411849	0.107825093
2012	Athi River	0.214096868	0.526102695	1.322349982	22.50911957	0.744033393	0.123869931	0.047812607
2012	Bamburi	0.033147181	0.126583799	1.723338692	24.05814534	0.613793311	0.123869931	0.159100462
2012	Boc Gases	0.002453696	0.047732708	2.479791749	20.86769427	0.506433278	0.085477961	0.039279437
2012	Car and General	0.044928142	0.0713046	1.313152354	22.2875637	0.308248691	0.071330142	0.061538613
2012	Carbacid	0.302736604	0.100419531	5.78600619	20.2453639	0.745328886	0.085477961	0.20327927
2012	Crown Berger	-0.002220716	0.039653974	1.492334497	21.81092637	0.249586151	0.123869931	0.046349584
2012	EA Cable	0.194421311	0.193158044	1.283217638	22.00541173	0.602587616	0.123869931	0.040688777
2012	EA Portland	0.016859971	0.373805998	1.585321101	22.9649018	0.758117194	0.123869931	-0.024290793
2012	EABL	0.10855	0.072457703	1.485646491	24.35993932	0.548189464	0.085477961	0.23002085

2012	Eveready	0.020437828	0.083316812	1.411259612	21.21497469	0.193410366	0.085477961	0.00744126
2012	Express	0.009146469	0.299025647	0.324098887	20.28428789	0.865557611	0.055863719	-0.020913498
2012	Kakuzi Ltd	0.052260135	0.194000418	2.073530217	21.47174081	0.752820411	-0.01411849	0.119735313
2012	Kapchorua	0.058076389	0.000177848	1.641037482	20.84557904	0.605236999	-0.01411849	0.092900874
2012	Kengen	0.105543653	0.510593673	4.677173784	23.13405301	0.773005284	0.077370348	0.01362957
2012	Kenol	0.001128672	0.019608227	1.380449502	20.68963495	0.191036803	0.071330142	0.005514667
2012	KPLC	0.128364825	0.408377134	1.047816791	25.01600752	0.755525487	0.077370348	0.046330997
2012	Limuru tea	0.316067086	0.175496668	7.969542694	18.63465438	0.436360191	-0.01411849	0.472758283
2012	Mumias Sugar	-0.029283211	0.222901482	1.998705239	23.47167316	0.645483104	0.085477961	0.085814437
2012	Rea Vipingo	0.122415373	0.164654579	1.342548569	21.08906661	0.656423256	-0.01411849	0.039457744
2012	Safaricom	0.070787042	0.076889134	0.667376257	25.1536144	0.783226462	0.013726243	0.145485155
2012	Sameer Africa	-0.001174214	0.04309412	3.45925413	21.93070114	0.325795424	0.071330142	0.020172164
2012	Sasini	0.100509876	0.225401958	2.365220742	21.55527325	0.865084801	-0.01411849	0.109207421
2012	Scan Group	0.021454208	0.023864741	1.6785569	21.57578746	0.111311153	0.013726243	0.07997884
2012	Standard Newspapers	0.004399577	0.222186933	1.322124186	21.8300599	0.585817604	0.013726243	0.084629159
2012	Total	-0.017173444	0.107849448	1.148103828	25.09532597	0.337806463	0.071330142	0.030162455
2012	TPS Serena	0.344979681	0.232219675	1.408945303	22.21900053	0.804079916	0.079272469	0.043309408
2012	Unga Group	-0.017396069	0.070166771	2.543834515	23.16773705	0.324732743	0.085477961	0.046633771
2012	Williamson Tea	0.073750738	0.170722686	2.034369221	21.72506872	0.63788826	-0.01411849	0.164402953
2012	Kenya Airways	-0.011834077	0.446473663	0.867832847	24.98231943	0.756220739	0.071330142	0.02777664
2012	Nation	0.01687142	0	0.991304688	22.98528932	0.533844142	0.013726243	0.278949404
2012	BAT	0.428519849	0.288997983	4.148564614	22.18962475	0.990622094	0.085477961	0.522579282
2012	Kenya Orchards	0.019195965	0.714981898	1.434018416	16.95940905	0.654808822	0.085477961	0.007138114
2013	Eaagads Ltd	0.091462349	0.208702194	5.943782525	19.03368563	0.755430771	0.379553632	0.202252889
2013	Athi River	0.21777608	0.487102273	0.842347592	22.82507925	0.818520575	0.273756734	0.056078249
2013	Bamburi	-0.008865142	0.126290968	2.620364921	24.30355735	0.601337234	0.273756734	0.174885081
2013	Boc Gases	-0.052938046	0.016216398	1.940064082	20.91005407	0.510083372	0.508639831	0.082895063

2013	Car and General	0.15837651	0.096484527	1.123256862	22.52927431	0.372916194	-0.071096846	0.051904638
2013	Carbacid	0.120007356	0.130416067	4.222794625	20.17177793	0.767749147	0.508639831	0.173676785
2013	Crown Berger	0.06941064	0.041047202	1.463915977	22.07226557	0.291618217	0.273756734	0.058230927
2013	EA Cable	-0.027484502	0.129157594	1.160627717	22.32702063	0.517827244	0.273756734	0.063033844
2013	EA Portland	0.091118746	0.423311552	1.510380782	23.04291845	0.765567937	0.273756734	0.000126895
2013	EABL	0.24802508	0.147143504	1.052309064	24.52759309	0.67170071	0.508639831	0.181327475
2013	Eveready	0.056253858	0.078226151	1.115393871	21.04160829	0.280156381	0.508639831	-0.122661406
2013	Express	-0.695727015	0.26348905	0.336188357	19.92547784	0.820471359	1.209009638	-0.29875975
2013	Kakuzi Ltd	0.057541416	0.18583666	3.345070723	21.58904697	0.692285425	0.379553632	0.168808745
2013	Kapchorua	0.055440284	0.000203613	2.101264899	20.94371456	0.633205388	0.379553632	0.119096066
2013	Kengen	0.189087763	0.498891041	1.735785775	23.38973174	0.878634482	0.055255724	0.012920545
2013	Kenol	-0.007093528	0.033272195	1.224176536	20.74072064	0.126776079	-0.071096846	0.007121002
2013	KPLC	0.209764795	0.379311227	1.249556967	25.01583293	0.709909742	0.055255724	0.034823085
2013	Limuru tea	0.114117192	0.188478472	18.28685985	18.44541238	0.475324458	0.379553632	0.211689901
2013	Mumias Sugar	0.208729906	0.247613489	2.198628756	23.47167316	0.719040644	0.508639831	0.083413098
2013	Rea Vipingo	0.119746673	0.172428498	2.102705321	21.47261186	0.609328277	0.379553632	0.204128036
2013	Safaricom	0.09312971	0.107882576	0.636070997	25.27537514	0.80939492	0.666603541	0.115576835
2013	Sameer Africa	-0.025382395	0.038765904	3.019960032	22.02488046	0.271249968	-0.071096846	0.031022963
2013	Sasini	0.036671424	0.223675117	2.130885189	21.70379892	0.868608175	0.379553632	0.047595193
2013	Scan Group	-0.021223712	0.039744695	2.048290775	22.00343828	0.083787538	-0.00757504	0.107317156
2013	Standard Newspapers	0.08195898	0.188958838	1.077992899	21.87854418	0.633374494	-0.00757504	0.041951657
2013	Total	-0.011417782	0.085816517	1.10251974	25.38283292	0.280105929	-0.071096846	-0.002029538
2013	TPS Serena	0.086031813	0.264221922	1.495038061	22.42180835	0.816101247	0.253537348	0.046900587
2013	Unga Group	-0.003909399	0.060499891	2.52205281	23.30457616	0.284362632	0.508639831	0.077308571
2013	Williamson Tea	0.050863264	0.178048195	3.384917864	21.91260479	0.614308284	0.379553632	0.146597493

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2013	Kenya Airways	-0.003581271	0.423986894	1.063383452	25.17570434	0.70001143	0.071096846	-0.044930978
2013	Nation	0.00712317	0.018488482	2.31344581	23.14326056	0.335877863	-0.00757504	0.222009233
2013	BAT	-0.187413005	0.124893028	11.748631	22.4473924	0.631492367	0.508639831	-0.31157394
2013	Kenya Orchards	-0.043068662	0.799629588	1.743352094	17.10742054	0.689263877	0.508639831	0.01012137
2014	Eaagads Ltd	0.38414179	0.152395719	18.76092715	18.87223396	0.851772721	0.028273098	0.038030473
2014	Athi River	0.082512624	0.494553131	1.22045291	23.1569291	0.705547414	0.113416003	0.046215018
2014	Bamburi	0.149402853	0.120033459	2.348024533	24.34736674	0.617500813	0.113416003	0.113434639
2014	Boc Gases	0.017003319	0.0056115	2.079340021	20.98142898	0.469163583	-0.005574514	0.096301562
2014	Car and General	0.041008869	0.111084762	1.160055292	22.4657526	0.404567778	0.026365511	0.04671995
2014	Carbacid	0.018658437	0.104271826	4.257874619	20.64178785	0.682341555	-0.005574514	0.193404166
2014	Crown Berger	0.010176848	0.020968328	1.535933291	22.21231465	0.296253802	0.113416003	0.059135273
2014	EA Cable	0.101089965	0.126649438	1.197143936	22.18202224	0.51486435	0.113416003	0.083547753
2014	EA Portland	0.082448478	0.495081331	1.12964672	22.87674819	0.817584138	0.113416003	-0.058298606
2014	EABL	0.059319734	0.442497285	0.725876856	24.74004817	0.691175336	-0.005574514	0.211669783
2014	Eveready	-0.007398788	0.091660156	1.259109411	21.0415661	0.238706072	-0.005574514	0.060904001
2014	Express	-0.398523224	0.274069448	0.396219725	19.25318855	0.870894328	0.040455055	0.026285981
2014	Kakuzi Ltd	-0.086358877	0.174833273	8.474507441	21.17101874	0.653533891	0.028273098	0.114414984
2014	Kapchorua	0.110268649	0.000164785	1.646560499	21.06422371	0.616795991	0.028273098	0.039720882
2014	Kengen	-0.003662076	0.47788423	1.485776274	23.49579693	0.863384821	0.135759211	0.017301187
2014	Kenol	0.070839898	0.027463604	0.968413211	21.52277135	0.249166064	0.026365511	0.019228194
2014	KPLC	0.148747223	0.349468963	0.897277513	25.28409145	0.790062121	0.135759211	0.034422185
2014	Limuru tea	0.307349784	0.21015052	12.40979406	18.56920419	0.591398118	0.028273098	0.318208379
2014	Mumias Sugar	0.128111693	0.217852018	1.253590716	23.46685601	0.737683839	-0.005574514	0.073620377
2014	Rea Vipingo	0.043115048	0.166829082	3.409343215	21.66784272	0.629912758	0.028273098	0.160077471

2014	Safaricom	0.070156183	0.100099355	0.563437137	25.39605289	0.826134117	0.025737174	0.10359016
2014	Sameer Africa	-0.033340481	0.038875755	2.833154755	22.09975402	0.215998936	0.026365511	0.055816023
2014	Sasini	-0.045465192	0.214115688	1.8951809	21.74567468	0.875616554	0.028273098	-0.013909367
2014	Scan Group	0.023133561	0.041408536	2.282369995	22.16590154	0.105399573	0.032439653	- 0.086968011
2014	Standard Newspapers	0.008196946	0.155343579	1.115820732	22.00913637	0.643508528	0.032439653	- 0.052350275
2014	Total	-0.006884956	0.025917203	1.301971047	25.50899761	0.292054839	0.026365511	-0.006129118
2014	TPS Serena	0.051682295	0.241522296	1.01188488	22.39923279	0.846465045	0.030731442	0.036605252
2014	Unga Group	0.022321719	0.070681699	2.36026521	23.49440119	0.275397297	0.005574514	- 0.054318398
2014	Williamson Tea	0.150490934	0.176850456	2.405835413	22.00625562	0.662136365	0.028273098	0.118005414
2014	Kenya Airways	0.006173158	0.395869925	0.919052029	25.40444291	0.718036471	0.026365511	0.021438165
2014	Nation	0.054936125	0.011988606	2.441725992	23.23666276	0.313687283	0.032439653	- 0.228517502
2014	BAT	0.268825855	0.133491467	1.1779283	24.14112366	0.530210186	0.005574514	- 0.215523489
2014	Kenya Orchards	-0.01815117	0.816289079	1.728607492	17.20613538	0.685472838	0.005574514	- 0.003553383
2015	Eaagads Ltd	-0.072163359	0.12400888	1.331698379	18.9193022	0.90543297	0.054442947	0.048058195
2015	Athi River	0.131034592	0.485746959	0.889876113	23.3750425	0.779952018	0.060880126	0.046025979
2015	Bamburi	0.009299514	0.128449539	2.681324193	24.24750647	0.627159231	0.060880126	0.085392788
2015	Boc Gases	0.174706704	0.004945515	2.226984381	20.94047341	0.539893198	0.056	0.076957403
2015	Car and General	0.058627994	0.091379323	1.112034076	22.67714713	0.393083462	0.013373681	0.045757184
2015	Carbacid	-0.027715566	0.08689603	10.08924754	20.67495336	0.595325788	0.056	0.215724238
2015	Crown Berger	0.037027481	0.005066146	1.38153733	22.36400705	0.264165145	0.060880126	0.072601525
2015	EA Cable	0.001303812	0.146362199	1.30482268	22.22800168	0.473778154	0.060880126	0.058479439
2015	EA Portland	0.062667386	0.354783276	1.085129349	22.94371442	0.776736748	0.060880126	0.110041879
2015	EABL	0.058685786	0.401581319	0.698808946	24.80185146	0.682473441	0.056	0.118599951
2015	Eveready	-0.019140979	0.108289782	1.540409307	21.07973536	0.272875622	0.056	0.048276089

2015	Express	-0.112993013	0.251439542	0.640242061	19.77521079	0.785238932	0.041284387	0.000477392
2015	Kakuzi Ltd	0.057204718	0.179240428	7.953845945	21.04851461	0.685099809	0.054442947	0.044391686
2015	Kapchorua	0.021376731	0.000166291	2.116629176	21.02598479	0.603874475	0.054442947	0.041220125
2015	Kengen	0.120253725	0.513437372	1.421849007	23.52366396	0.866818398	0.097993753	0.0278266
2015	Kenol	0.021201406	0.025483014	0.934562848	21.37833458	0.310792462	0.013373681	0.019857247
2015	KPLC	0.195346628	0.417807981	0.922605273	25.21088625	0.793528734	0.097993753	0.024566607
2015	Limuru tea	0.043917471	0.21702181	16.86923732	18.46174591	0.595687552	0.054442947	0.083126583
2015	Mumias Sugar	0.002009504	0.201343823	0.838215516	23.32289373	0.741538092	0.056	-0.060886711
2015	Rea Vipingo	0.092756923	0.171906714	4.717088955	21.66721181	0.62791312	0.054442947	0.158168748
2015	Safaricom	0.021688145	0.093127098	0.692957391	25.54586613	0.803222255	0.125235405	0.136119301
2015	Sameer Africa	0.030430802	0.041519297	3.373969143	22.11699276	0.23060079	0.013373681	0.109360889
2015	Sasini	-0.005940561	0.214284073	1.771001396	21.7588794	0.856970296	0.054442947	0.010126498
2015	Scan Group	0.101741937	0.026732583	2.463577469	22.07144132	0.172121055	0.00736285	0.066979184
2015	Standard Newspapers	0.057994393	0.166003265	1.156104417	22.29579243	0.602689978	0.00736285	0.045807083
2015	Total	0.007878453	0.027959603	1.277439443	25.76427573	0.248974425	0.013373681	0.032846754
2015	TPS Serena	0.150940728	0.182384991	1.057500787	22.64626115	0.853766143	-0.046041621	0.04116595
2015	Unga Group	0.086068689	0.077690714	1.842747905	23.48068242	0.298330742	0.056	0.061082657
2015	Williamson Tea	0.067731461	0.177837428	3.634301311	21.97014093	0.665451204	0.054442947	0.106639669
2015	Kenya Airways	0.313694008	0.331274043	0.562695462	25.31697054	0.766838365	0.013373681	-0.064093369
2015	Nation	0.034582963	0.010134729	1.427897574	23.31655593	0.465657196	0.00736285	0.314092557
2015	BAT	0.024785117	0.155010008	1.256156909	24.18637329	0.4985282	0.056	0.219239374
2015	Kenya Orchards	0.00752152	0.79708326	1.926081333	17.66758239	0.67686641	0.056	0.034212923
2016	Eaagads Ltd	-0.088666713	0.106334106	0.869866624	18.85476117	0.925972368	0.043668474	0.050124161
2016	Athi River	-0.665732958	0.349952476	0.946408738	22.92683602	0.788508835	0.130775789	-0.023776413
2016	Bamburi	-0.037325267	0.124515137	2.296838061	24.30759001	0.620770413	0.130775789	0.095216023
2016	Boc Gases	-0.132340718	0.00610089	2.139013834	20.98307222	0.485655474	0.025185549	0.099823068

2016	Car and General	0.050769722	0.13859721	1.199400545	22.83934832	0.383518472	0.054937125	0.034143189
2016	Carbacid	0.094978298	0.087037226	6.296269189	20.53254107	0.612936685	0.025185549	0.193648879
2016	Crown Berger	0.054009874	0.001278286	1.146401323	22.52151437	0.255961227	0.130775789	0.005117039
2016	EA Cable	0.103507246	0.190624344	1.16792903	22.35219594	0.512415622	0.130775789	0.043240912
2016	EA Portland	-0.008872596	0.349974743	0.946408738	22.92683602	0.788495378	0.130775789	-0.024600705
2016	EABL	0.049245074	0.418421227	0.721292249	24.83891804	0.684930297	0.025185549	0.109098944
2016	Eveready	-0.096747834	0.149776842	1.333856958	20.91930948	0.179236326	0.025185549	-0.190944211
2016	Express	0.053506091	0.358056336	0.592640867	18.96899289	0.843022502	0.055644332	-0.161850679
2016	Kakuzi Ltd	0.03356644	0.180249719	6.656962817	21.24794525	0.693817477	0.043668474	0.041531279
2016	Kapchorua	0.027163622	0.000221154	5.101308933	20.89930856	0.677777023	0.043668474	0.065308702
2016	Kengen	0.235923684	0.592711222	1.096618188	23.58110126	0.889568214	0.072599082	0.011296006
2016	Kenol	-0.01308195	0.011948401	0.950248059	20.81573064	0.352376688	0.054937125	0.004563146
2016	KPLC	0.132287537	0.446938488	1.032020548	25.3809973	0.770969027	0.072599082	0.029331939
2016	Limuru tea	0.006698169	0.208369758	8.08321597	17.8662863	0.610138807	0.043668474	-0.977554637
2016	Mumias Sugar	-0.042960035	0.097021757	0.409331736	23.2940376	0.815248987	0.025185549	-0.114865897
2016	Rea Vipingo	0.049411029	0.162686759	6.50498104	21.71672018	0.597794158	0.043668474	0.109558117
2016	Safaricom	0.020648778	0.03790746	0.740186961	25.69773825	0.789589384	0.145483633	0.171005782
2016	Sameer Africa	0.036118963	0.047429196	2.523834463	22.05223453	0.255426724	0.054937125	-0.017350842
2016	Sasini	0.396874808	0.152299626	2.327954155	21.73941892	0.916602929	0.043668474	0.00304235
2016	Scan Group	0.009939323	0.022693589	2.460165959	22.35742797	0.177727079	-0.018011551	0.047084546
2016	Standard Newspapers	0.028657287	0.163531459	1.219207631	22.28826041	0.636491897	-0.018011551	0.053760969
2016	Total	0.010901733	0.036634943	1.490205311	25.86332319	0.316567092	0.054937125	0.043761808
2016	TPS Serena	-0.009602754	0.172902905	0.803815779	22.56970445	0.860270138	-0.167502527	0.017216635
2016	Unga Group	0.008053703	0.132078876	2.271361581	23.55661458	0.339955418	0.025185549	0.063471582
2016	Williamson Tea	0.056244964	0.19384228	8.436226745	21.979476	0.681534219	0.043668474	0.086743606

Year	Company							
201	Kenya Airways	0.167721668	0.381226582	0.464834682	25.38678983	0.800641746	0.054937125	-0.022750358
2016	Nation	0.078336732	0.006560163	1.365070712	23.3148796	0.517709041	-0.018011551	0.27397462
2016	BAT	0.035075929	0.612499395	1.249145854	23.76932676	0.50358193	0.025185549	0.235432232
2016	Kenya Orchards	-0.533445751	0.23592449	1.773765077	17.87702548	0.418404226	0.025185549	-0.503275924
2017	Eaagads Ltd	-0.925618816	0.034509948	0.886232092	18.43525404	0.034509948	0.0534283	0.013776533
2017	Athi River	0.611806931	0.285578488	0.383449064	23.41355497	0.850428264	0.13795666	0.14868352
2017	Bamburi	-0.036854628	0.110183202	2.357077863	24.39194258	0.568570069	0.13795666	0.123507019
2017	Boc Gases	-0.020878896	0	2.063528055	20.89420621	0.460458535	0.035985201	0.064025341
2017	Car and General	0.065053509	0.108048389	1.056207126	23.01874474	0.412932643	0.080190126	0.02367333
2017	Carbacid	-0.208651521	0	2.063528055	20.89420621	0.460458535	0.035985201	0.064025341
2017	Crown Berger	0.05716271	0.046242819	1.10651703	22.63089659	0.274421764	0.13795666	0.007543706
2017	EA Cable	0.166548567	0.247973585	0.933430213	22.03812112	0.648732733	0.13795666	0.022026461
2017	EA Portland	0.32722653	0.239593222	0.838519232	22.85359308	0.863393194	0.13795666	0.310325259
2017	EABL	-0.024053949	0.428083672	1.022477686	24.88869709	0.619192717	0.035985201	0.143037597
2017	Eveready	0.465939874	0.035769168	0.983592966	20.84737195	0.57621563	0.035985201	0.388857981
2017	Express	-0.157733476	0.509628162	1.125558829	18.63458905	0.754013275	0.071956111	-0.135762829
2017	Kakuzi Ltd	-0.109583515	0.15977411	4.344560779	21.66491043	0.490183199	0.0534283	0.104131007
2017	Kapchorua	0.012835064	0.222422008	5.681757017	20.97955244	0.672130792	0.0534283	-0.026103258
2017	Kengen	0.28779668	0.520979797	0.950578292	23.99004088	0.937612402	0.114511642	0.033625269
2017	Kenol	-0.098109161	0.012130733	1.237396476	25.18407981	0.386847796	0.080190126	1.159556918
2017	KPLC	0.134146093	0.619632273	1.448764476	25.39388218	0.757378436	0.114511642	0.027294664
2017	Limuru tea	-0.191528458	0.189229029	5.116472133	18.62259249	0.510164017	0.0534283	-0.073894186
2017	Mumias Sugar	-0.058590789	0.539647725	0.187863474	22.43369901	0.875168653	0.035985201	-0.225776992
2017	Rea Vipingo	-0.020842743	0.155846	9.500876195	21.99530412	0.355826172	0.0534283	0.259862214
2017	Safaricom	0.115238714	0.003126717	0.62445574	25.81924668	0.792360818	0.074099539	0.203054804
2017	Sameer Africa	-0.085099934	0.147929543	4.383213447	21.93638944	0.177555865	0.080190126	-0.004172504
2017	Sasini	-0.269433014	0.078085605	4.926585164	20.65584102	0.817054943	0.0534283	0.053764683

Year	Company						
2017	Scan Group	-0.00235554	0.014898048	2.755744451	22.33717534	0.186997548	0.030204353	0.022079999
2017	Standard Newspapers	-0.08664963	0.178385391	0.955404427	22.2247619	0.587523486	0.030204353	-0.074784661
2017	Total	0.019830216	0.053057246	1.523590272	25.51287196	0.458980149	0.080190126	0.068846016
2017	TPS Serena	-0.013959838	0.24634372	1.040397865	22.54609753	0.853021156	-0.013079231	-0.017742574
2017	Unga Group	0.078146168	0.116970572	2.368517895	23.6530319	0.371211681	0.035985201	0.071711393
2017	Williamson Tea	-0.004364287	0.144896255	3.774926946	14.76732904	0.675628418	0.0534283	-3.05651E-05
2017	Kenya Airways	0.120782367	0.589828796	0.509077381	25.42520877	0.774517612	0.080190126	-0.14139611
2017	Nation	0.066168072	0.016682042	1.09543037	23.23607134	0.567980144	0.030204353	0.228057459
2017	BAT	0.009492732	0.64052708	1.451240118	23.82593058	0.49209471	0.035985201	0.263849322
2017	Kenya Orchards	0.299938704	0.71473456	2.075721572	17.92596322	0.566729974	0.035985201	0.367270403
2018	Eaagads Ltd	0.827605053	0.064259392	5.728404784	18.6518877	0.847097541	0.047022448	0.000626671
2018	Athi River	-0.027326846	0.178309041	0.585169606	23.27457068	0.837722965	0.098417521	-0.062619076
2018	Bamburi	-0.05111367	0.096689618	2.696565427	24.36821953	0.534439244	0.098417521	0.119894146
2018	Boc Gases	-0.024490543	0	2.263514032	20.79718429	0.456076837	0.026887585	0.085744555
2018	Car and General	0.033681642	0.085566209	1.005434669	22.99907442	0.416101248	0.077854816	0.022403046
2018	Carbacid	0.267641497	0.077857256	7.088473561	20.5390557	0.614424253	0.026887585	0.121867707
2018	Crown Berger	0.006254758	0.048764891	1.163538664	22.71763371	0.252476117	0.098417521	0.046140475
2018	EA Cable	-0.015927071	0.221619372	0.671732059	22.01811656	0.704631415	0.098417521	-0.078636205
2018	EA Portland	0.207312733	0.17718622	0.42619848	22.90610477	0.924041416	0.098417521	0.148593821
2018	EABL	0.040781925	0.408731201	0.770708848	24.88717098	0.671816429	0.026887585	0.156367978
2018	Eveready	-0.050601862	0.008170439	0.453799153	20.13143079	0.75383125	0.026887585	-0.190712833
2018	Express	-0.135376164	0.636654034	0.852073893	17.95573255	0.742437658	0.087507533	-0.238026915
2018	Kakuzi Ltd	0.163297332	0.158112525	4.820620482	21.72332218	0.594845458	0.047022448	0.112132486
2018	Kapchorua	-0.039161853	0.162200927	4.258609212	20.91316941	0.58240118	0.047022448	0.04947153
2018	Kengen	0.065844671	0.48009975	1.204857005	24.37676565	0.940322691	0.095475846	0.01836219

2018	Kenol	-0.006520574	0.012902149	1.257618562	25.36277875	0.271240601	0.077854816	0.099712272
2018	KPLC	0.138833277	0.613712866	0.982223554	25.40885969	0.831923605	0.095475846	0.024186699
2018	Limuru tea	-0.040551834	0.161043311	5.858345272	18.45908382	0.457567819	0.047022448	0.010768057
2018	Mumias Sugar	0.255222465	0.330940263	0.180718207	22.56157757	0.927000781	0.026887585	0.055534325
2018	Rea Vipingo	0.030292359	0.144911741	13.87922565	22.131635	0.408548593	0.047022448	0.338493343
2018	Safaricom	0.053373364	0	0.639424461	25.99977206	0.829900041	0.097093399	0.237914842
2018	Sameer Africa	-0.062478672	0.252880472	4.53974084	21.78183014	0.139915408	0.077854816	-0.198154772
2018	Sasini	-0.014884475	0.089592442	5.278194988	21.99600761	0.770315575	0.047022448	0.025747171
2018	Scan Group	0.003163335	0.000345682	2.37790078	22.29916206	0.176046784	0.040188363	0.034136617
2018	Standard Newspapers	0.018809751	0.090616702	2.573119505	22.29506979	0.352993484	0.040188363	0.029159226
2018	Total	0.00175325	0.039420183	1.645403321	25.21258651	0.299300115	0.077854816	0.061745724
2018	TPS Serena	0.00760891	0.316024122	1.639995708	22.59025692	0.801998632	0.132688112	0.007615093
2018	Unga Group	0.017495195	0.105564012	2.298585877	23.66496127	0.367402253	0.026887585	0.055307391
2018	Williamson Tea	-0.025934918	0.126892384	3.119428973	15.03516427	0.6214897	0.047022448	5.40506E-05
2018	Kenya Airways	-0.077682038	0.76132942	0.40434972	25.47821717	0.812454629	0.077854816	-0.165546192
2018	Nation	-0.018467327	0.001743499	1.07271412	23.15026085	0.574758262	0.040188363	0.187667038
2018	BAT	0.013537227	0.181464178	1.413237713	24.32539522	0.515219083	0.026887585	0.228885393
2018	Kenya Orchards	-0.026305706	0.630556926	2.021422109	17.98351567	0.473677828	0.026887585	0.042167631
2019	Eaagads Ltd	0.141397613	0.065795263	12.82947826	18.7587517	0.840118465	0.015716603	0.019621761
2019	Athi River		0.109815022	0.216550494	22.88628226	0.912796994	0.085851166	-0.163460176
2019	Bamburi	0.241806665	0.124356503	1.718676995	24.30606229	0.703874754	0.085851166	0.136982819
2019	Boc Gases	0.003709389	0.000118905	1.953860384	20.69035621	0.458797605	0.001633062	0.037517011
2019	Car and General	0.058451978	0.128347883	0.995137031	22.98868371	0.488062828	0.073527922	0.012688076
2019	Carbacid	0.122592134	0.070970621	6.802337508	20.19458169	0.695173896	0.001633062	0.129508729
2019	Crown Berger	0.008337751	0.050430317	1.190546125	22.71814654	0.225873428	0.085851166	0.039114505
2019	EA Cable	-0.093342243	0.1695089	0.599151049	21.57558791	0.662344864	0.085851166	-0.096272587

2019	EA Portland	-0.011659702	0.000156089	0.314562298	22.65888132	0.928754346	0.085851166	-0.053782949
2019	EABL	0.006065807	0.490419029	1.006863535	24.97528436	0.667979234	0.001633062	0.127719199
2019	Eveready	-0.804321997	0.011450174	2.694802621	19.6413071	0.252108323	0.001633062	0.345786978
2019	Express	-0.051973322	0.736319081	0.597424622	17.73397537	0.730981997	0.061289024	-0.26932474
2019	Kakuzi Ltd	0.056360581	0.140475513	3.902097585	21.79029285	0.581073579	0.015716603	0.103265748
2019	Kapchorua	-0.003647228	0.190631574	3.462781978	20.79464559	0.611534993	0.015716603	-0.01122243
2019	Kengen	0.005898246	0.46114039	1.47509473	24.29110885	0.92142195	0.069230667	0.024011702
2019	Kenol	-0.02627861	0.011245764	1.440384556	25.79034564	0.246117624	0.073527922	0.10227395
2019	KPLC	0.084397769	0.57495024	0.867497444	25.51692411	0.808911233	0.069230667	0.021267561
2019	Limuru tea	-0.061994054	0.132789332	3.55680925	18.20215153	0.464609994	0.015716603	-0.06844803
2019	Mumias Sugar	-0.108499427	0.629317762	0.109292299	21.46126735	0.922780969	0.001633062	-0.28240244
2019	Rea Vipingo	0.017718625	0.174728062	14.19891444	21.98407464	0.441564812	0.015716603	0.203378241
2019	Safaricom	0.030056332	0	0.45269593	26.08401795	0.848775634	0.109797605	0.298400953
2019	Sameer Africa	0.089921842	0.000201019	4.191234248	21.68909883	0.244960045	0.073527922	0.004387064
2019	Sasini	0.008714139	0.089133432	4.240653691	22.15863485	0.773782635	0.015716603	0.023725933
2019	Scan Group	0.033480845	0.000427359	2.281605593	22.13981512	0.206040783	0.037674419	0.034736976
2019	Standard Newspapers	0.025825388	0.054231256	2.014897449	22.26174208	0.366961531	0.037674419	-0.029928123
2019	Total	0.019143028	0.035231031	1.734052147	25.43660458	0.304059719	0.073527922	0.07203535
2019	TPS Serena	0.069751435	0.335613221	1.078772412	22.58084519	0.848648494	0.147183575	0.006831716
2019	Unga Group	0.028057445	0.074269896	1.639207571	23.69515537	0.357254479	0.001633062	-0.003144494
2019	Williamson Tea	-0.023883186	0.119796603	2.376537333	15.04408036	0.639756905	0.015716603	-2.72158E-05
2019	Kenya Airways	-0.063690607	0.819452047	0.375127979	25.38931473	0.816981881	0.073527922	-0.063280053
2019	Nation	-0.000195308	0.003161544	1.01755059	23.08646614	0.611459681	0.037674419	0.164168355
2019	BAT	-0.021965801	0.190430218	1.317980611	24.26328861	0.513340868	0.001633062	0.18735725
2019	Kenya Orchards	0.030609524	0.214595624	1.713226313	18.11539701	0.421009033	0.001633062	0.052962145