CASH FLOW VOLATILITY AND FIRM MARKET VALUE OF COMPANIES LISTED AT THE NAIROBI SECURITIES EXCHANGE

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Cash Flow Volatility and Firm Market Value of Companies Listed at the Nairobi Securities Exchange

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DECLARATION

This thesis is my original work and has not been presented for a degree in any other university.

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This thesis has been submitted for examination with our approval as the University supervisors

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DEDICATION

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ABBREVIATIONS AND ACRONYMS

AGM	Annual General Meeting
AGRIC	Agricultural Sector of the NSE
AMEX	American Stock Exchange
ANOVA	Analysis of Variance
AQ	Accrual Quality
AUTO	Automobile and Allied Sector of the NSE
BSE	Bombay Stock Exchange
CF	Cash flows.
CFRVI	Cash Flow Ratio Volatility Indicator
COMM	Commercial and Allied Sector of the NSE
CONS	Construction Sector of the NSE
CR	Capitalization Ratio
CV	Coefficient of Variation
EAT	Earnings After Tax
EDGAR	Electronic Data Gathering, Analysis and Retrieval
EMH	Efficient Market Hypothesis
ENGY	Energy and Petroleum Sector of the NSE
EPS	Earnings per Share.
EXG	Egyptian Exchange
EY	Earnings Yield
FCAG	Financial Crisis Advisory Group
FCF	Financing Cash Flow
FCFR	Financing Cash Flow Ratio
FCFR	Financing Cash Flow Ratio Volatility
FCFT	Free Cash Flow Theory
FFT	Functional Fixation Theory
GPM	Gross Profit Margin
IAS	International Accounting Standards
IASB	International Accounting Standard Board
ICF	Investing Cash Flow

ICFR	Investing Cash Flow Ratio
ICFRV	Investing Cash Flow Ratio Volatility
IFRS	International Financial Reporting Standards
IMF	Implicit Cash Flow
IMFR	Implicit Cash Flow Ratio
IMFR	Implicit Cash Flow Ratio Volatility
INSU	Insurance Sector of the NSE
INVE	Investment Sector of the NSE
IPO	Initial Public Offer
IVN SER	Energy and Petroleum Sector of the NSE
IVN SER	Telecommunication and Technology Sector of the NSE
LM	Lagrange Multiplier
MANU	Manufacturing and Allied Sector of the NSE
MM	Miller and Modigliani
MPS	Market Price Per Share
NASDAQ	National Association of Securities Dealers Automated Quotations.
NPM	Net Profit Margin
NSE	Nairobi Securities Exchange
NYSE	New York Stock Exchange
OCF	Operating Cash Flow
OCFR	Operating Cash Flow Ratio
OCFRV	Operating Cash Flow Ratio Volatility
REIT	Real Estate Investment Trusts
ROA	Return on Assets
ROCE	Return on Capital Employed
ROE	Return on Equity
ROTA	Return on Total Assets
ROTC	Return on Total Capital
RWT	Random Walk Theory
TA	Total Assets
TELCO	Investment and Service Sector of the NSE
TER	Total Expense Ratio

VIF	Variance Inflation Factor
VRT	Value Relevance Theory
WACC	Weighted Average Cost of Capital

DEFINITION OF OPERATIONAL TERMS

Cash flow Statement it is a statement that explains how a company's cash is generated during a given period and how the cash is used. It provides details about the changes in cash and cash equivalent during that period (IASB, 2018).

Cash flow volatility the fluctuations in cash flows over successive periods arising from variations in sources and uses of cash from operating, investing, financing and implicit activities of an entity (Hadi, Bashir, Abolfazl & Maryam, 2013).

Cash flow it is the net amount of cash and cash equivalents being transferred into and out of a business (IASB, 2018)

Financing Cash flows this is cash flows generated or spent on equity capital or borrowing structure of an entity (IASB, 2018)

Firm Market value this is also called firm market capitalization. It is the value of the firm in the capital market based on the market price of the issued shares and the number of the issued shares. Since the issued shares remain fairly constant for long, the key determinant of firm market value is the price of its shares in the stock market (Brody, Meister & Parry 2012).

Implicit Cash Flows this is cash flow arises from the firm making use of the assets as a factor of production instead of renting it out such that non-cash expenses like depreciation that affect profit do not get to flow outside of the business. The same applies to non-cash incomes (Hadi, Bashir, Abolfazl & Maryam, 2013)

Investing Cash flows	this is cash flows spent on acquisition or generated from disposal of long-term assets and other investment that are not considered to be cash equivalent (IASB, 2018)
Operating Cash flows	this is cash flows generated from the main revenue producing activities of an entity, it will include cash received from customers and cash paid to suppliers (IASB, 2018)
Public Companies	corporations that are listed on a publicly trading stock market like the Nairobi Securities Exchange (NSE, 2015)

ABSTRACT

Market value of a public company is the also called company market capitalization and is a function of share prices in the market and the number of issued shares. The prices of a company depend on investor perception about the value of the company. Numerous factors influence such investor perceptions. It is not clear if cash flow volatility is value relevant for companies listed at the Nairobi Securities Exchange (NSE). This lack of clarity arises from the conflicting theoretical and empirical evidence on the effect of cash flow volatility on market value and this creates a dilemma to investors in equity securities in their buy, hold and sell decision. It is for this reason that the overall objective of this study is to examine the effect of cash flow volatility on market value of public companies in Kenya. The objectives are specifically with respect to operating, investing, financing and implicit cash flows and how they affect firm market value as well as how this effect is moderated by the financial performance of those companies as indicated by Return on Equity (ROE). Market value was measured using the capitalization ratio while the cash flow volatilities were based on the 3-year moving standard deviations of the respective cash flow ratios. The relevant theories that try to explain the interlinkage between cash flow volatility information with share prices and therefore market values are the efficient market hypothesis, the functional fixation theory, the random walk theory, the MM value relevance theory and the free cash flow theory. The research was undertaken as a census quantitative descriptive study based on a census of all the 66 listed companies. From this, 45 had all the relevant data and were used in the analysis. Secondary data was collected from the NSE and annual financial statements of the companies listed at the NSE. The study was based on the positivism philosophy owing to the quantitative nature of the panel data regression analysis that was done over a 12-year period spanning January 2011 through December 2022. Since 3-year moving standard deviations were applied to establish cash flow volatility, the actual number of years reduced to 10 (2011 and 2022 had no center values on the moving basis). This resulted in 450 firm-year observations. Relevant diagnostic tests of normality, heteroscedasticity, collinearity, stationarity, and model specification were done before the hypotheses tests were using P-value and the t-statistic at 95% confidence interval. Based on the fixed effects models both for the bivariate analysis of each of the independent variables and capitalization ratio, the findings revealed that the volatilities of cash flows from operations; investing, and financing activities had a negative effect on firm market value of the companies listed at the NSE. Further, the implicit cash flow volatility had no significant effect of the market valuation of those companies. From the moderating perspective, it was established that ROE had a positive moderating influence on the effect of volatilities of all the categories of cash flows (operating, investing, financing and implicit) on the market values of firms listed at the NSE. The study supports the EMH, Random Walk and MM value relevance theories for operating, investing and financing cash flow volatilities and the functional fixation theory for the implicit cash flow volatility. Since the study finds cash flow volatility to be a priced information risk factor at the NSE, it recommended that more disclosures on information about cash flows should be reported in the financial statements of listed companies in Kenya to aid investors in decision making. Since the study only focused on companies listed at the NSE, it is recommended that further studies on non-listed companies could be

carried out to corroborate findings from this study and bridge the literature gaps left unfilled by this study.

CHAPTER ONE

INTRODUCTION

1.1 Background of the Study

The discussion on the importance of Cash flows (CF) in the firm valuation can be traced back to Lee (1974) who claimed that the earnings are ineffective in firm valuation. According to Lee, earnings are considered to be subject to varying accounting policies and standards and possibly manipulation through accounting rules. On the other hand, CF are not subject to managerial manipulations and they reveal the ability of a firm to survive. They reflect the true wealth of an organization. Habib (2008) in the New Zealand context asserts that both earnings and CF have incremental value relevance over accounting book values. Moreover, regulatory bodies support the notion that CF contain value relevance information in assessing share prices (Charitou, Clubb & Andreou, 2000).

Cash flow volatility (CFV) relate to the fluctuations in cash flows over successive periods arising from variations in sources and uses of cash from operating, investing and financing activities of an entity (Hadi, Bashir, Abolfazl & Maryam, 2013). The volatility is an indication of risk and uncertainty since the fluctuations in cash flows put a limit on the extent firms can plan for their operations and other activities. It may be interesting to establish whether or not cash flow volatility over time is an information risk priced factor in the securities markets and if in need it has any bearing on the market value of the companies listed on securities Exchanges. This dilemma forms the gist of this study to be carried out at the Nairobi securities Exchange (NSE).

Reports on the value relevance of CF and CFV have provided contradicting results from extant literature across the globe. Charitou, Clubb and Andreou (2001) for instance in their study did not find any stock market pricing effect of CF in the UK. This was the conclusion in the absence of the consideration of different contextual factors. Martinez (2003) also did not find any additional information content of CF besides what earnings contains with relation to France, similarly Saeedi and

Ebrahimi (2010) found no significant statistical incremental value relevance of CF in the context of Iran.

Studies often compare and contrast the market pricing effect of earnings and cash flows. Kumar and Krishnan (2008) found that the value relevance of earnings and CF is different based on the company's opportunities for investment and this suggests that the value relevance of earnings and CF could be totally different based on firm specific and economic circumstances. Literature on the 1997 financial crisis suggest that, value relevance of both earnings and the book value declines during the economy-wide exogenous shock (Graham et al., 2000; Davis et al., 2006), there is no evidence on the incremental and relative value relevance of CF and earnings in the context of an economy-wide exogenous shock like the global financial crisis.

1.1.1 Cash Flow Volatility

Cash flow volatility is the fluctuations in cash flows generated by a business over time be they operating, investing, financing or implicit cash flows (Xu et al., 2011). Cash flow volatility leads to default on accrued payables and ultimate bankruptcy and it presents and information risk from the perspective of the financial statement analysts and investors. The ability of an entity to survive over financial periods is a function of the working capital and the identified changes in cash flows be it from operating, investing or financing activities (Xu et al., 2011). Accordingly, cash flow volatility is conceptually expected to have a pricing effect on share prices as looked at from the point of view of risk. The higher the CFV, the greater the information risk and thereby the higher the required rate of return to compensate investors for such risk and vice versa (Xu et al., 2011).

According to Cheng and Hollie (2008), Cash flows are usually based on cash accounting indicating the actual sources and uses of cash from the principal and peripheral activities of a firm. This is unlike earnings which are based on accrual accounting. Cash flows are categorized into cash flows from operations, investing activities, financing activities as well as implicit cash flows. Cheng and Hollie (2008) indicate that cash flows from operations (CFO) are the most significant category of cash flows. This is attributed to the fact that CFO arise from the major income-

producing activities of the firm. They represent the capacity of the company to generate cash from its main activities. What's more, the CFOs fundamentally bolster the dividends and capital capacity of an entity. The volatility in cash flows from operations is likely to depend on a number of factors. These include the inventory cycle of a firm, the credit policy of the firm, the type of business, the market factors, the size of the business, the supply chain conditions and the scale of operations (Chotkunakitti, 2005). Accordingly, a highly unpredictable credit policy coupled by volatility in the supply chain and market forces of demand and supply are likely to result in highly volatile cash flows and vice versa.

The other category of cash flows is those generated from investing activities. According to Higson (2013), investment involves sacrificing the current resources in expectation of the value growth of these resources in the future. Investments signify the cash flow from the purchase of long term assets as well as the acquisition of stock or other securities. It indicates the accumulated changes in the firm's cash position that results from investment gains or losses and changes from amounts spent on investments in capital assets. The investor will first analyze the stocks available in order to determine the best stocks to invest in, buy the stock and hold for some time and later sell when it is profitable for him and this is the most difficult decision that the investor takes. In the three stages the investor need to do some analysis which helps him to estimate the firm's growth aspect and their anticipations fulfillment with the right investment. The firm's financial reports have always played a very important role in providing the information to the investors at each stage of their investment process (Higson, 2013). The volatility in cash flows from investing activities is dependent on the long term investing cycle and the associated short term returns from such including rennet, dividends, interest and the market factors that lead to their fluctuations.

Volatility of cash flows from investing activities if a function of several factors. These include the magnitude of investments, the economic cycles relating to long term, medium term and short term trends, the dividend policies of the firms invested in, the industry of operation, the investment structure and the investing policy of the established business. It also depends on whether the business is capital intensive in

which case dominant assets will be non-current assets or labor intensive in which case investing assets may not be that established (Oluoch, 2014).

The other categories of cash flows that have an ultimate bearing not only on cash flows generated in a period, but also the ensuing volatility in cash flows is the cash flows from financing activities. Financing activities cash flows' refers to the sources and uses of cash flows associated with long term funding activities of an entity. In terms of sources of cash, it focusses on how capital is raised by a company through the capital markets. For the uses of cash, the activities that may be involved in this case may include paying cash dividends, loan and equity redemption and servicing (Farshadfar & Monern, 2013).

With respect with the impacts of cash flows on stock prices of organizations, it is perceptible that past research either; didn't separate cash flows into their three significant parts (working, contributing, and financing cash flows (OCFs, ICFs, and FCFs, individually) or broke the cash flows into these three segments however did not analyze the impacts of all these three components on stock costs of firms exclusively (Waldron& Jordan, 2010; Habib, 2010), in this way leaving research gaps in empirical literature. In such manner, the present study addresses these two gaps in two stages. One, considering every one of the three segments of cash flows; and two contemplating the individual and the consolidated, effects of these parts on the market capitalization of public firms

1.1.2 Firm Market Value

Firm market value is also called firm market capitalization. It is the value of the firm in the capital market based on the market price of the issued shares and the number of the issued shares. Since the issued shares remain fairly constant for long, the key determinant of firm market value is the price of its shares in the stock market (Brody, Meister & Parry, 2012). Forces that increase the price of the shares of a firm like healthy financial performance and stable cash flows serve to enhance the value of the company and vice versa. Information that has an effect on the value of the share prices and therefore the market value of a firm is said to be value-relevant information (Barth, Beaver & Landman, 2001; Oluoch, 2014).

Information is termed as value relevant if it has a predicted association with equity market values (Barth, Beaver & Landman, 2001). If information is value relevant, it will directly influence a firm's market value and therefore value relevance research studies the relationship between the obtained information and equity market values by assuming that these values reflect the investors' aggregated beliefs (Ball & Brown, 2001, Barth *et al.,* 2001). The accounting numbers that affect stock value are said to be value relevant and are considered under value relevance studies (Barth *et al.,* 2001).

According Holthausen and Watts (2001), there are three categories to which studies on value relevance can be placed. The first one is the studies on relative association that assess the variance of stock market values on the obtained information. Secondly incremental association studies that assesses the explanatory power of accounting numbers for returns or values over a long window and define an accounting number with a regression co-efficient significantly different from zero as value relevant. Lastly are the studies of marginal information content that determine suing a short window whether the release of information is related to changes in equity values. These studies may also be referred to as window return studies. In this case information will be termed as value relevant if a change in cash flow will have a direct influence on the securities.

Value relevance can be measured by the statistical relations between information that financial statements present and stock market values or returns (Suadiye, 2012). Veith and Werner (2010) defined value relevance as a proxy for the information content of data of financial accounting and is usually measured as the association between some accounting numbers and market measure(s). Value relevance approach can be used to assess usefulness of accounting information for stockholders. Sing and Meng (2005) further observed that value relevance jointly involves both relevance for investor's decision-making and measurement reliability. However, to examine value relevance, it is significant to determine how accounting information records are reflected in stock prices.

In confirmation, Barth, Bever and Landsman (2001) as well as Keener (2011) and Khanagha (2011) defined value relevance as the association between security market value and accounting amounts. Barth, Bever and Landsman (2001) further stated that value relevance suggests testing whether accounting amounts explain the cross-sectional variation in share prices. For the most part, the valuation models that form the basis for tests in the valuation literature are developed in terms of the level of firm value, (Barth, Bever & Landsman, 2001). Dahmash and Qabajeh (2012) in review the point of value relevance, proposed that the target of research on value relevance is to relate yearly fiscal summary figures to a proportion of firm value and to survey the connection of such data to the assurance of value. This announcement gives a knowledge to the way that the connection between accounting figures and stock price will decide whether investors and financial specialist can rely upon accounting figures in other to settle on dependable speculation choice or a reasonable conjecture into the capital market. An accounting item is deemed value relevant in the event that it influences change in share price, that is, value relevance revolves around the security market value which informs the organizations' value. When an accounting number has a positive effect on share price then it is viewed as value relevant. At the end of the day, they can be depended on to settle on informed investment choices.

1.1.3 Global Perspective of Cash Flows and Firm Market Value

There are numerous equity securities' markets around the globe on the basis of which studies on the value relevance of cash flows have been undertaken with confounding findings. In Jordan, Yazan and Aminul (2017) for instance carried a study to ascertain the effect of cash flow on the share price on Amman Stock Exchange this study finds that OCFs and ICFs changes are positively related to the share prices at that market. In the contrary, the impact of the FCFs on costs of share was not significantly different from zero and therefore had no effect on share prices.

In New Zealand, which is a fairly developed market in terms of financial securities, Koerniadi and Tourani-Rad (2005) investigated the effect of accruals and cash flows anomalies at the New Zealand Stock Market. The study found a huge positive

relationship between the OCFs and future returns of shares of New Zealand firms for the period 1987 to 2003. This implies that in that stock market, operating cash flows are equity market priced factors and are positive predictors of firm share value.

In a cross-country study, Dastgir, Sajadi, and Akhgar (2009) announced that cash flows from operating activities per share have significant, positive relationship with stock return of companies studied. Additionally, between the three cash flow classes, the ICFs clarified the most elevated relative level of the variations in the costs of share (14.9%), trailed by the FCFs (10.9%), lastly the OCFs (10.4%).

From Iran, Mazloom, Azarberahman, and Azarberahman (2013) studied the association between various earnings and cash flow measures of firm performance and stock returns, over a time of nine years starting 2003 to 2011. Regression examination completed on the investigation uncovered that the proportion of net cash flows that come about because of operating activities had a positive huge ($p < .05$), impact on the returns on stock of the companies in Iran. In addition, of the three indicators inspected, operating activities cash flows had the most significant effect on share returns ($R 2 = .191$), flowed by cash flows from the investing activities ($R 2 = .060$) and in conclusion cash flows from the financing activities. ($R 2 = .012$).

In Indonesia, Novianti (2012) carried out a study to establish how changes in cash flows and profits affected stock returns among the public manufacturing companies at the Indonesia stock exchange. This study was conducted over a time scope of two years of 2008 through 2009. Reports from study showed that the FCFs have an inconsequential relationship with the costs of shares of the companies. Contrary to the findings Dastgir, Sajadi, and Akhgar (2009), Novianti (2012) found out that FCFs have no significant influence of the share prices of these companies.

In Nigeria, Olugbenga and Atanda (2014) conducted an examination on the relationship between budgetary bookkeeping information and the market values of 57 recorded financial and non-financial firms in Nigeria between the period 1991 and 2010. The examination uncovered that the OCFs have a critical positive ($p < .05$), impact on the share prices recorded by the Nigerian Stock Exchange firms and that

OCFs alone are responsible for about 72.6% variations in share prices of the tested companies.

In China, Cheng, Zishang, and Johnstone (2013) conducted a study to examine how earnings quality affects the role of earnings and operating cash flows in a firm's valuation. The study contrasted the effect of three representative accrual-based earnings quality measures on the association between earnings, operating cash flows and firm's abnormal stock returns for the period between 1989 to 2008.The study revealed that, both consolidated income and joined cash flows from operations show critical steady informational content. Nonetheless, working cash flows clarify returns more than profit. This is conflicting with the discoveries from Cheng, Liu and Schaefer (1996).

In the United Kingdom comparatively, Mostafa (2016a) discovered both moderate and high income have gradual value relevance beyond both moderate and extraordinary cash flows, moderate cash flows have steady value relevance beyond both moderate profit and that extraordinary cash flows need steady value relevance beyond moderate income. It was anyway noticed that outrageous cash flows have gradual value relevance beyond extraordinary income. The outcomes recommend that profit and cash flows have steady value relevance. At the point when income are moderate and cash flows are outrageous, cash flows don't have steady value relevance.

In Australia and in the context of a worldwide financial crisis, Khokan, Rahman and Abu (2013) found that CFOs are value relevant relative to income and book value of companies. In addition, they find that profits are better than CFOs in estimating changes in share prices in the Australian market during the worldwide financial crisis. Along these lines income is considered better than CFO for predicting or forecasting share prices in Autralia. The finding about the predominance of profit over the CFOs is consistent with earlier findings in the same nation which were conducted during a financial crises that the forecast value of income has not declined in the Australian market (Brimble & Hodgson, 2007; Goodwin & Ahmed, 2006; Habib, 2010).

In Egypt, Mostafa (2016b) concluded that income has value relevance, however earnings changes are significantly more successful than earnings levels in explaining security returns. The outcomes propose that adjustments in income are to a great extent perpetual thus profit pursue near an arbitrary walk model. He additionally sees that cash flows from operations are not effective in clarifying stock returns. This is contrary to his finding in the examination conducted in the United Kingdom in Mostafa (2016a). The reason proposed for the distinction in discoveries is that cash flows in Egypt are unstable and not persevering and subsequently the market doesn't depend on them. This examination was done in Egypt covering 52 firms.

From the findings around the globe presented in this sub-section, empirical literature provides contradicting conclusions as to whether cash flows and cash flow volatility are value relevant. In addition, empirical literature only focuses on the effect of operating cash flow changes, effect of investing cash flow changes or the effect of financing changes independently and in most cases lack to conclude on the effect of the overall effect. Consequently, a gap in empirical literature.

1.1.4 Contextual Perspective of Cash Flows and Firm Market Value

In the Kenyan context, there is also substantial evidence to show that some studies have taken place, for instance Momanyi, Bichanga and Nyagau (2017) revealed in their study that, changes in operating cash flow have a direct correlation with the firm’s value. This is an indication that operating cash flow has an effect that is significant statistically on financial performance of a company. This implies that firms with more operating cash flows are in a position to generate higher profits since they can effectively pay their short-term obligations on demand or over a short notice. In relation to investing cash flows, it was also revealed that increase in investing cash flows will also translate to a rise in the value of the company. The study also revealed that financing cash flows is the most value relevant element of the three objectives in the study. Similarly, Oyieko, Nyang’au and Wafula (2018) in their study demonstrated that investing cash flows changes and changes in operating cash flows is a key predictor of a firm’s value.

Okelo (2013) did a study to examine the relationship between cash flow and profitability. He used a descriptive study using primary data that was obtained from individual firms sampled for the study, the data was panel organized and analysis done using fixed effect regression model for obtaining coefficient of the variables. The study established that there was a positive relationship between cash flow and profitability of the firms. This can be compared to Ojede (2014) conducted a study to find out the effect of free cash flow on the profitability of listed companies on the NSE. The study used a descriptive survey and had a target population of 61 companies listed at the NSE as at June 2014. The study sampled 30 companies. The study used regression model for data analysis and the study established a negative, relationship between free cash flows and profitability of the listed companies. This means that a unit increase on the independent variable (free cash flows) used in the study resulted into a corresponding one unit decrease of dependent variable profitability of the company, meaning that the relationship between free cash flow and profitability is inverse for listed firms in the NSE.

Wanjiru and Oluoch (2016) conducted a study to examine the effect of management of cash flow on the market returns of listed construction firms in Kenya. The study employed the modified capital asset pricing model to regress the construction firms equal weighted annual portfolio returns on the market excess returns over risk free rate of return as the first variable and cash flow ratio as an indicator for management of cash flow. The independent variables: cash flow from operating activities, cash flow from financing activities, cash flow from financing activities and free cash flows were regressed against market return and the variables were found to explain 42.6% of variation on stock returns. The returns of the public construction companies were found to be highly correlated with average market returns whose proxy was NSE 20 share returns.

1.1.5 Companies Listed at the Nairobi Securities Exchange

There are sixty-six listed companies at the Nairobi Securities Exchange as at December 2020 (NSE, 2020). The companies are classified into three market segments namely; the Main Investment Market Segment, Alternative Segment and

the Fixed Income Market Segment. The Main Investment Market Segment is the main quotation market while the Alternative Segment provides alternative methods for raising capital to small, medium sized and young companies while the Fixed Income Market Segment provides an independent market for fixed income securities such as treasury bonds and corporate bonds. The segments are then classified into agricultural, commercial and service, automobiles and accessories, telecommunication and technology, banking, insurance, investment, manufacturing and allied, energy and petroleum, construction and allied, reals estate trust and exchange traded fund (NSE, 2020). The listed firms use the NSE platform to raise capital for expansion of their operations.

The Nairobi Securities Exchange 20 share Index NSE20 is a major stock market index that tracks performance of 20 best performing listed companies on the NSE. The companies are selected based on a weighted market performance for a 12-month period based on market capitalization, number of shares traded, turnover and number of deals. The capital market Authority is the government regulatory authority responsible for licensing and regulating the capital market in Kenya. It also approves offers and listing of securities traded at the NSE. The performance of large companies is tracked using the NSE 20 (NSE, 2020).

1.2 Statement of the Problem

According to Okumu (2024) companies at the Nairobi Securities Exchange have been experiencing fluctuations in their market valuations with quite a good number experiencing a big fall in market valuations from being value stocks to mere penny stocks. This has led to investors exiting the Nairobi Securities Exchange in large numbers and this is attributed to share price fluctuations. This makes the investors anxious about their capital. This is a serious problem since Miller and Modigliani (1961) assert that the primary goal of investors is shareholder wealth maximization. This is an objective that can only be realized if the firm value of listed companies is maximized. Accordingly, firm market value is a critical metric for gauging the extent to which shareholders are realizing their goal of maximizing value.

Market value of a public company is the also called company market capitalization and is a function of share prices in the market and the number of issued shares. The prices of a company depend on investor perception about the value of the company. Firm market value is critical in determining the investment value of equity securities in a company. Despite this, companies at NSE have been experiencing fluctuations in their market valuations. It is not clear the role volatility in cash flows have played in this observed phenomenon. Whereas numerous factors have been shown to influence investor perceptions and thereby the value premium they place on a listed company and its equity securities, it is not clear if cash flow volatility is value relevant for companies listed at the Nairobi Securities Exchange (NSE). This lack of clarity arises from the conflicting theoretical and empirical evidence on the effect of cash flow volatility on market value and this creates a dilemma to investors in equity securities in their buy, hold and sell decisions.

Conceptually, value relevance of fundamental information varies for the various kinds of financial information ranging from income statement, statement of financial position, cash flow statement and other financial disclosures. It is however not determined how financial performance of a firm moderates this value relevance information. It is critical to establish if volatility in cash flows of a firm is a market equity security pricing risk information. According to Khanagha (2011) financial information usefulness depends basically on the relevance of the information published for the users. Generally financial and other information is considered to be value relevant when it has certain characteristics that would reduce the asymmetry of information between the users, would help the users to evaluate the potential effect of past, present and future transactions on future cash flows (predictive value) or to confirm or correct prior evaluations (confirmatory value) as well as if its use alters the user's decision. Any investor or analyst will always place a lot of weight on the explicit and implicit information provided in the financial statement to make economic decisions. This is mainly because such statements are prepared in accordance with specified rules and regulations which are developed by accounting bodies. Corporate disclosure, discussion of corporate performance, reports in the financial press and analysis reports all have an impact on the stock prices Kothari *et*

al. (2013). However, these sources of information have varying value relevance implications.

Mostafa (2016b), asserts that the difference in reporting, economic differences and the extent of market development will have an effect on the value relevance of financial and other information. From the background provided, it is clear that the Nairobi Securities Exchange operates in a different regulatory environment. In this case the studies undertaken in other countries or securities markets would not be applied in the Kenyan context and hence due to the unique Kenyan capital market orientation there exist a research gap with regards to the effect of the volatility in cash flows on market value of the companies listed at the NSE.

There is conflicting literature on predicting the stock prices using variables such as earnings, operating cash flows, financing cash flows and investing cash flows. Mostafa (2016b), Khokan, Mollik and Rahman (2013) reported in comparison to cash flows earnings are more value relevant and that changes in earnings are more successful than cash flows in explaining security returns. On the contrary, Christian and Jones (2014) showed that cash flows changes are value relevant while Cheng, Zishang and Johnstone (2013) in their study demonstrated that both combined cash flows and combined earnings showed significant incremental informational context. Although the ability to predict future cash flows is a useful tool in making investment decisions, the existing literature provides conflicting and inconclusive evidence on the comparative predictive ability. Additionally, from the literature most of the studies have been conducted on the developed economies hence leaving the developing economies in a state of uncertainty. This therefore creates the need for research in Kenya.

Theoretically the MM value relevance theory of Miller and Modigliani (1961) and the functional fixation theory of Sloan (1996) seem to suggest cash flow volatility have no value relevance. Efficient market hypothesis and the random walk theory point towards a positive effect. It is not clear what theory is supported for companies listed at the Nairobi securities exchange and this calls for such an empirical study.

1.3 Research Objectives

The objectives of the study are categorized into two. These are the general objective and the specific objectives of the study. These are specified in subsections 1.3.1 and 1.3.2 respectively.

1.3.1 General Objective

The general objective of the study was to evaluate the effect of cash flow volatility on market value of public companies in Kenya

1.3.2 Specific Objectives

The specific objectives of the study are specified as:

1. To assess the effect of operating cash flow volatility on market value of companies listed at the Nairobi Securities Exchange in Kenya.
2. To evaluate the effect of investing cash flow volatility on market value of companies listed at the Nairobi Securities Exchange in Kenya.
3. To ascertain the effect of financing cash flow volatility on market value of companies listed at the Nairobi Securities Exchange in Kenya.
4. To determine the effect of implicit cash flow volatility on market value of companies listed at the Nairobi Securities Exchange in Kenya.
5. To establish the moderating influence of financial performance on the effect of cash flow volatility on market value of companies listed at the Nairobi Securities Exchange in Kenya.

1.4 Research Hypothesis

The hypotheses of the study are specified as:

$\mathbf{H_{01}}$: Operating cash flow volatility has no significant effect on market value of companies listed at the Nairobi Securities Exchange in Kenya

$\mathbf{H_{02}}$: Investing cash flow volatility has no significant effect on the market value of companies listed at the Nairobi Securities Exchange in Kenya

$\mathbf{H_{03}}$: Financing cash flow volatility has no significant effect on market value of companies listed at the Nairobi Securities Exchange in Kenya

$\mathbf{H_{04}}$: Implicit cash flow volatility has no significant effect on the market value of companies listed at the Nairobi Securities Exchange in Kenya.

$\mathbf{H_{05}}$: There is no significant moderating influence of financial performance on the effect of cash flow volatility on market value of companies listed at the Nairobi Securities Exchange in Kenya

1.5 Significance of the Study

The extent of market development, the difference in reporting and economic differences will affect the accounting information value relevance. The study avails evidence on the value relevance of volatility of cash flows of public listed companies in Kenya based on the country's unique economic, structural and legal and market operational distinctive factors.

1.5.1 Theoretical Significance

The study outlines the applicability of the various investment theories that is Efficient Market Hypothesis Fama (1970) which asserts that stock prices reflects all the information available and hence such information is value relevant, Random Walk Theory (1973) postulates that stock prices follow a random walk and therefore impossible to outperform the market unless one takes an additional risk hence information is value irreverent, Functional Fixation Theory proposed by Sloan (1996) and is based on investors psychology and behavioural biases that make focus on cash flows value irrelevant. Miller-Modigliani Theorem – Value relevance Theory (1961) that proposes that the value of a firm does depend on the earning power of the firm which can be closely correlated with cash flows. The study also confirms the conflicting assertion of the theories that is whether an investor can forecast a firm's future value by analyzing the company's past cash flow changes and the resulting change in value of a company. The study also helps establish whether the way in which a firm finance its operation and investments have an effect on its value.

The findings of the study confirm the value relevance theory of Miller and Modigliani (1961) with respect to the volatility of operating, investing and financing cash flows of companies listed at the Nairobi Securities exchange. This is because it finds out that cash flow patterns as reflected in cash flow volatility have a negative influence on the market value of companies listed at the NSE. On the flipside, the study also supports the functional fixation theory when it comes to the volatility of implicit cash flows given that it finds that such volatility is value irrelevant and they are not priced at the NSE. Intuitively, this indicates that investors at NSE focus on more relevant earnings data (given that ROE is found to have a positive influence of firm market value) and ignore the hidden data like the volatility of implicit cash flows which is a figure that is not reported in the financial statements.

That the volatility of cash flows from operations, investing activities and financing activities is found to be value relevant and with a negative influence of firm market capitalization indicates that the study also confirms that efficient market hypothesis is relevant for the NSE. Given that cash flow volatility is risk information that ultimately gets reflected in share prices and firm market value confirms that investors use available fundamental information to make investment decisions and thereby affect security prices. Negative information (like volatility of cash flows in this study) has a negative influence on firm value and vice versa.

1.5.2 Empirical Significance

The study contributes to the existing literature both local and global context. Since earnings are prone to manipulation by means of accrual components, the validity and merit of earnings as compared with cash flows as performance and value signal is a fundamental question under accrual accounting. Volatility of cash flows and changes and the debt used to finance the various activities of firm in order to generate the cash flows have different magnitude on the value of the company. The financial performance of a company moderates the correlation between cash flow volatility and the value of a company.

In this study, new knowledge has emerged which is different from the existing studies that have hitherto focused on the effect of cash flows on firm market value

(Akadeagre, Kwame &Opoku, 2015; .Altuntas et al., 2017; Fitri, Erlina, & Situmeang, 2023; Kipngetich, Tenai, & Kimwolo, 2021; Loncan & Caldeira, 2014; Momanyi et al., 2017; Mutende et al., 2017 among others). This study adds onto the empirical knowledge by focusing on volatility of the cash flows instead of the mere cash flows. It helps show that volatility in operating, investing and financing cash flows is a priced information risk factor, at least at the Nairobi Securities Exchange.

Apart from finding information on the value relevance of the volatility in cash flows at the NSE, the study further provides empirical evidence on how the effect of the volatility in cash flows is moderated by the financial performance of companies at that bourse. The findings from the study that financial performance as indicated by return on equity ROE) has a positive moderating effect is a new addition on existing empirical literature given that extant literature has focused on other moderating influences particularly firm size to the complete exclusion of financial performance.

1.5.3 Significance to Various Stakeholders

Findings from the study are likely to be of great importance to the stakeholders in the NSE (financial advisers and analysts, investment managers and stock brokers). To investors and financial analysts who always place a lot of weight on the information provided in the financial statement to make economic decisions, the findings that the volatilities in operating, financing and investing cash flows have a negative influence on share prices and firm value is likely to make them take this into consideration during various investing decisions in the NSE listed companies. In this respect, the findings are likely to help investors to make investment decisions in relation to cash flows in the predicting of firm value especially in the Kenyan capital markets.

To the Kenyan institutional and regulatory regime is unique from any other such that conclusion on the value relevance of cash flow volatility in the Kenyan capital markets is likely to provide new knowledge likely to impact corporate financing decisions within the Kenyan distinctive regulatory and institutional environment. The idea that Kenya has adopted the International Financial Reporting (IFRS) framework provides a basis for making comparison on the findings with the existing empirical

results and lays a basis for making conclusions based on the reporting environment as opposed to the reporting standards.

1.6 Scope of the Study

The study determined changes in cash flow value relevance security pricing of all the quoted firms listed at the Nairobi Securities Exchange over a twelve year period starting from January 2011 to December 2022. The period coincides with when electronic trading was implemented at the NSE thus is bound to provide very accurate trading and price data.

The listed firms as at December 2022 were sixty-six (NSE, 2022). From the existing literature the generally accepted way in such a research is that, the research should first identify the firm that qualify for the study. With this in line, this study was done on sixty-six publicly listed companies in Kenya as at December 2022. The reason why the research will focus on the public companies is the fact that such companies are required to follow strict disclosure requirements by the capital markets regulator. It is this disclosure requirement that provide adequate data necessary for this study. The number of firms and the period that the study was involved is adequate to satisfy the data requirement for satisfactory analysis and in addition, the period is enough to observe the cash flow changes. More importantly is that the period for which data about the relevant trading data for return evaluation and the security prices are available.

In terms of theoretical scope, this study was guided by efficient market hypothesis, functional fixation theory, Random walk theory and Modigliani and Miller theorem (value relevance theory). The study was limited to the effect of volatility in operating cash flows on market value among listed firms in Kenya, effect of volatility in investing cash flows on market value among listed firms in Kenya, volatility in financing cash flows on market value among listed firms in Kenya, volatility in implicit cash flows on market value among listed firms in Kenya and the moderating effect of financial performance on the effect of volatility in cash flow on market value among listed firms in Kenya. The reason of selecting this area was because extant literature on the value relevance of cash flow volatility broadly supports the

argument that there is conflict on the literature on value relevance of cash flow changes.

1.7 Limitations of the Study

Just like it happens with all academic researches, this study was characterized by a number of limitations. Firstly, is the limitation with respect to scope. This study was focused on the companies listed at the Nairobi Securities Exchange because of the market price information required in determining firm market value which is the dependent variable of the study. Accordingly, the findings are generalizable for listed companies that are similar to the NSE listed companies. The study accordingly excluded non listed companies and this may limit the generalizability of the findings to such non-listed companies.

Secondly, there was a conceptual limitation in that whereas there are numerous factors that may moderate the relationship between market value of firms and the volatilities in their cash flows this study focused solely on financial performance as measured by return on equity. This implies that it is still not clear how such factors as firm size, firm age, corporate governance and the like moderates this reported effect of cash flow volatility on firm value. In addition, it is still not clear if different measures of financial performance like return on assets (ROA) and return on capital employed (ROCE) could lead to results that contradict the findings in this study that financial performance has a positive moderating influence on the effect of cash flow volatility on firm value of companies listed at the Nairobi Securities Exchange.

Thirdly, is the geographical limitation. The study focused on companies that operate in Kenya and therefore subject to the Kenya regulatory regime. It is possible that the nature of earnings and cash flow patterns as well as firm size could be affected by the geographical limitations. Accordingly, the study did not include companies from other countries in the East African region like Uganda, Tanzania, Rwanda, Ethiopia, Burundi and Congo. A more versatile study could have considered companies in these jurisdictions.

Fourthly, the study was done over a study period of twelve years (2011 to 2022) which reduced to 450 firm-year observations once the 3-year moving standard deviation was used to determine cash flow volatility. Whereas the period is long enough to factor in the economic cycles of depression, growth, boom and decline, a longer period of say 20 years or longer could better capture these economic aspects although it is possible that there would be more changes because he longer the period, the more likely that more regulatory interventions would be increased and vice versa.

Financial performance can be looked at from a statement of financial position perspective through return ratios as well as from an income statement perspective through margin ratios such as gross profit margin (GPM) and Net profit margin (NPM). This study adopted the balance approach in indicating financial performance since it adopted return on equity as the indicator of financial performance. The limitation in this respect is that the study did not consider the income statement perspective of financial performance yet it is possible that if that approach is used different outcomes could be realized with respect to the effect of financial performance on market value of firms listed at the NSE as well as how that performance moderates the effect of cash flow volatility on market values of those firms.

Lastly, the study used market capitalization ratio as the indicator of firm market valuation. It is possible that the choice of this proxy for the independent variable could influence the outcome registered in the results. A different measure of the same like the natural logarithm of capitalization or even Tobin's Q could possibly provide a different outcome of results.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

The chapter covers the theoretical and empirical literature as well as the conceptual framework. The literature review is instrumental to bring out the empirical, conceptual and theoretical literature gaps that form the statement of the problem of this study. The conceptual literature evaluation is based on the variable conceptualizations surrounding four independent variables (operating cash flow volatility; investing cash flows volatility; financing cash flows volatility and implicit cash flows volatility. It also appraises the moderating variable of the study being financial performance as well as the independent variable of the study being the market valuation of publicly listed companies. The evaluation of theoretical literature is based on five theories being the functional fixation theory of Sloan (1996); the efficient market hypothesis of Fama (1970); the random walk theory of Burton (1973); the value relevance theory of Miller and Modigliani (1961) and the free cash flow theory of Jensen (1986). As for the empirical literature review, extant studies from around the world, Africa and from Kenya are appraised.

2.2 Theoretical Framework

Theoretical definition and conceptualization are as diverse as the number of scholars conducting the research. According to Gay and Weaver (2011), a theory is a collection of structured relationship or laws that entail a logical description of a discipline. Theoretical literature is a lens that enables the researcher to view a phenomenon in a wider scope (Blumberg, Cooper & Schindler, 2011). Theoretical literature review refers to a detailed and systematic analysis of theory to establish what concepts, construct and phenomena exist, the relationship between them, to establish to what extent the theory has been tested and therefore come up with new hypothesis (Kennedy, 2007). The section focuses on the theories that try to explain the background that the historical development of the variables of the study. This study is based on the theories that are explained in the following subsections.

2.2.1 Efficient Market Hypothesis

The theory can be traced back to Fama (1970). In an efficient capital market, security prices reflect fully the information available in a rapid unbiased manner and hence provide unbiased estimates of the security's underlying value. Accordingly, neither the technical nor fundamental analysis can produce risk-adjusted excess returns consistently. According to Efficient market hypothesis (EMH), stocks will always trade at their fair value on the stock exchange making it impossible for the investors to either purchase undervalued stocks or sell stock whose prices are inflated. It then becomes difficult to outperform the overall market through market selection or expert selection but the only way an investor can gain higher returns is through purchasing riskier investment.

According to Nichols and Wahlen (2010), market efficiency is the autonomy of the information that values duplicate as well as the scale by which capital market respond swiftly to new value-relevant data. The markets efficiency assertion does not rest on the assumption that the capital market is all-seeing neither does it assume that prices are revelatory but rests more on the scope which indicates the amount of information and how quickly the market prices respond and achieve new equilibrium levels. Markets which are very effective in terms of accounting earnings numbers would respond in a swift manner when new earnings-related data is availed (Nichols & Wahlen, 2010)

According to Fama (1970) the market efficiency can either be strong, the semi-strong form or weak form. Strong form efficiency is the highest level of efficiency and captures all information considered relevant to the security's value this will include not only the public and historical information but also private and confidential information accessed by some investors. In this case the investor cannot beat the market as the excess demand for share will drive the price up to the level supported by their private information. At this point they will not have incentives to continue buying hence they will withdraw from the market and the prices of securities will stabilize. The semi-strong form of efficiency is less stringent and it is considered to be efficient only if all available public information

that is relevant is quickly reflected in the price of the market. As for the weak form of efficiency it only reflects the historical information on stock prices. In this case the historical data analysis will not permit investors to obtain abnormal returns (Fama, 1991).

Although this theorization forms a strong theoretical argument, the theory assumes that all the investors are rational and therefore value investment rationally and they rely on earning information to make their decisions. Whereas this would be very true, the theory ignores the fact that some investors are often noise traders whose most decision are uniformed and possibly irrational. There is also the possibility of a tendency of investors to under-react or over-react to news (Barber & Odean, 2000) and asymmetrical judgments about the causes of previous profits and losses. Moreover, numerous alleged anomalies have been detected in patterns of historical share prices and the best known are the January effect the mean reversion and the small firm. EMH states that an investor cannot make excess return out of stale information. While it is not difficult to define stale information, the calculation of an excess return depends on an accurate assessment of the risk associated with holding a security. Regardless of the work done in this area since 1970s, there is still no single universally accepted or objectively verifiable measure of risk in the context of investment holdings.

The theory is rooted in classical financial economics that is founded in investor rationality. Rational investors are those who wish to maximize utility of wealth for every level of risk or minimize risk for every level of return from investment (Fakhry, 2016). An efficient market is one that is based on market dynamics of competition both from the supply side and the demand side of the market such that fundamental value information is quickly taken into account by the market participants to move prices to an equilibrium level that reflects all the available information about the concerned security. Most single factor and multiple factor asset pricing models have predominantly been derived from the assumption of market efficiency (Fakhry, 2016).

From the standpoint of this study, it is expected that any fundamental information from a company, industry or indeed the entire market should be priced by a business. It is therefore expected that the volatility of cash flows of a business should be a market priced information risk factor given that the higher the volatility, the greater the investment risk faced b the investors and this should lead to a decline in prices and vice versa. Fama (1970) expects that for a weak form efficient market, all historical information like changes in cash flows should be reflected in the stock prices. That Gichaiya et al. (2018) have established NSE to be efficient at least in the weak form indicates that it should be able to price the volatility of cash flows and that such should be moderated by the financial performance of the said corporate entities.

Huijian, Helen and William (2013) undertook a study on the efficient market hypothesis from 44 global financial market indexes which was aimed at establishing the causal relationship between the cross-country and cross-market historical levels of global financial markets and their current market levels. The study tested the casual relations among 44 indexes from global financial markets in a 30-day window and explore the significant influence of lagged information. The results of the causality and relevant regressions showed the existence of the persistent and cyclical impacts of global markets' historical levels on their current performance.

Despite is wide application in market microstructure in general and financial markets in particular especially in the fundamental pricing of securities, the efficient market hypothesis has been critiqued on a number of fronts. Firstly, as noted by (Fakhry, 2016), the theory fails to take into account the behavioral and psychological biases as well and decision heuristics the often rely on while making investment decisions. These may sometimes make investors to deviate from the rationality expectation of the theory which reduces the efficacy of the model in predicting firm market value. In any case, it assumes that investors have perfect information and that they diligently rely on that information when making investing decisions. This may fail to work in some financial markets where there is a great deal of information asymmetry and potential insider trading. This again reduces the

applicability of the model in markets that have high incidences of information and market friction. Lastly, the theory has failed to explain the existence of market anomalies such as fundamental anomalies and calendar anomalies like the January effect which have not dissipated in some financial markets despite the ability oof investors to exploit them to obtain superior returns from the markets over a long period of time.

2.2.2 Functional Fixation Theory

Whereas the foregoing efficient market hypothesis of Fama (1970) was rooted in market information symmetry and investor rationality, the functional fixation theory is based on behavioural biases exhibited by market participants and is therefore rooted in behavioural finance. Functional fixation theory was proposed by Sloan (1996) and is based on investor psychology and behavioural biases. The theory presupposes that investors do not take into account all the information while analysing financial statements and only fixate on the readily available earnings and similar data without making an effort to analyse the hidden information in such data. A regular user of financial information may focus on the profit figure and ignore the hidden information behind the reported numbers (Sloan, 1996).

The theory indicates that investors are mostly naive and they fail to interpret the true cash flow implications of the earnings data reported in the financial statements and only concentrate on the actual reported earnings when making investment decisions (Sloan, 1996). They may therefore not really understand the true earnings quality and cash flows of the information they read. The implication of this is that the value relevance of earnings data does not actually depend on earnings quality and cash flows but on the investors' fixation on the actual reported earnings numbers.

In the context of this study, the theory implies that if most of the investors in the market are naive uninformed investors who scarcely pay any attention to cash flows in general and the volatility in cash flows in particular, the obvious result is that cash flow volatility would become value irrelevant and that it will not be an information priced factor by the security markets. This is because with functional

fixation, the investors would bias their attention to earnings at the expense of other value relevant information including the cash flows (Oluoch, Namusonge & Onyango, 2015). With this hindsight, it is expected that cash flow volatility should no have any effect on share prices and therefore, should have no effect on market capitalization of publicly listed companies. This of course would be the reverse for markets where majority of the analysts are well informed and where noise trading is kept to the bare minimum.

The actual earnings numbers act to distract investors from carefully analysing its quality such that the share prices do not reflect the true earnings quality and cash flows behind the reported raw data of the net profit and dividend pay-out. Investors do not analyse the accrual component of the reported earnings and the trends that emerge from the reported earnings (Sloan, 1996). Whereas this theory puts emphasis on the effect of naïve investors on investment, it fails to account for the effect of informed investors who may in fact provide the largest composition of the investing public. It also does not provide the exact way by which earnings quality affects share prices. That it is based on investor irrationality makes it difficult to analyse the value relevance of earnings quality data.

The theory is based on a number of assumptions. Firstly, investors and users of financial statements do not undertake a careful analysis to unearth the real implication of information provided in financial statements. Their lazy approach to evaluating financial information gives them a less than true meaning of the reported information. It is only after investing they discover the forecast fundamental value is different from the actual and they regret their decision and get surprised (Sloan, 1996). The theory also assumes that investors are psychologically predisposed to looking out at some information, a behaviour Sloan (1996) identifies as functional fixation. It is this bias that makes them to ignore the rest of the information that they consider to be value-irrelevant while in actual sense it is value relevant for securities listed at the NSE.

Quite a number of studies have tried to evaluate this theory and its implication on investment decisions in financial markets. Cheng, Roulstone and Van Buskirk

(2021) examined how the order of presentation of information during the announcement of earnings by corporate entities influences investor reactions to the announcements. They check if there is any relationship between earlier disclosure of earnings and the hitherto positive or negative information and the responses of investors to that when compared to later disclosures and discussion of earnings information during the pronouncements. In their findings, functional fixation on earnings is discovered given that they find that there is a positive influence on prioritization of earnings information and the investors' responses to that information on earnings. They conclude that the arrangement of information in a disclosure statement influences how investors react to that information and in turn how they make varying buy, hold or sell decisions for the securities concerned.

Hirshleifer, Lim and Teoh (2011) had shown that there is overreaction and under reaction by investors to the various components of earnings information. In their model, they argued that investors pay limited attention to reported earnings information and this scant attention explain the subsequent over and under reactions of the components of the earnings information that culminates in a profit anomaly and post-announcement of earnings' drift. In their analysis, ignoring information relating to the components of profits leads to not only the accrual anomaly but also the cash flow anomaly.

Alali, Siregar and Anandarajan (2018) used derivative financial instruments to evaluate the functional fixation postulation. They studied the pre data and post data analysis of financial information of financial derivatives in the financial statements. They relied on the feasible generalized least squares approach for their data analysis. According to their findings, the disclosure of the notional derivative information in the appended to the notes to financial statements has a less pronounced effect than when the same is substantively reported in the body of the financial statements. The implication is that users of financial statements functionally fixate on the main financial statements and pay less attention to the notes that are appended to the financial statements.

Functional fixation model of Sloan (1996) just like most of the behavioral finance-based theories is often critiqued on the basis of the fact that it fails to take into account the valuation fundamentals that have hitherto been the cornerstone of classical valuation models. It for instance ignores the quantitative aspects of fundamental information and also the information patterns and distribution. It overlooks the critical role played by informed market players and plays up the role of naïve investors yet in the sufficiently efficient markets in the strong form order of Fama (1970), it may turn out that noise traders and uninformed naïve players play only a nominal role, if any. The model also fails to recognize the incremental role of the standardization of financial reporting where international Financial Reporting Standards are increasingly forcing firms to reveal more information that that in the traditional financial statements.

2.2.3 Random Walk Theory

This theory was advanced by Malkiel Burton in 1973 and it asserts that the price changes of security have same distribution and are independent of each other, consequently, the past movement or trend of prices of security or market cannot be used to predict its future movement. This means that securities take an unpredictable and random path. The theory asserts that unless one takes on additional risk, it is impossible to outperform the broader market (Burton, 1973). The arrival of information in the market does not have any predictable pattern and is fuzzy in nature. The information could arrive from the listed firm, the industry in which the firm operates or indeed the entire economy. Accordingly, since information is random, security prices also take a random walk (Burton, 1973).

According to the theory, the prevailing security prices at any given time are unrelated to the past security prices or future ones and are perfectly independent given that the arrival time of the fundamental pricing information is unpredictable and without any pattern (Spitzer, 2013). Each individual price in a time series of prices of the securities in this respect provides the best fundamental or intrinsic valuation of that security. In this respect price deviations from the fundamental value or the intrinsic value are perfectly random in nature. Random walk theory therefore does not

anticipate any systematic or enduring security pricing patterns because the numerous rational investors in the market that are well informed will soon recognize such patterns and their arbitrage behaviour to profit from such systematic patterns would ensure that they quickly dissipate away from the market (Spitzer, 2013).

Although the assertion of this theory would be true, the theory has some limitations in that the stock market consists of a larger number of investors and the quantity of time each investor spends in the market is not the same, hence it is possible for trends to emerge in the securities prices in the short run and an investor can outperform the market by strategically buying shares when the price is low and selling shares when the price is high within a span of short of time. It is also argued that because the security prices are affected by a very large number of factors, it may be impossible to determine the pattern or trend followed by the price of that security, but just because a pattern cannot be clearly identified it does not mean that a trend does not exist.

Godwin (2010) conducted a study in Nigeria Securities Exchange on applicability of the random walk theory and showed that the Nigerian securities market is efficient in the weak form and hence follows a random walk process. Accordingly, all information conveyed in the past patterns of share price is confiscated into the current price stock prices. Similarly, Kedar and Faniband (2017) in their study on the Random Walk Theory in Bombay Stock Exchange (BSE) argue that the share prices of companies do not make any pattern or trends but move randomly. This implies that historical prices are in no way useful to predict future prices. They concluded that the price movement on BSE occur by chance and therefore, Random Walk theory holds in the BSE.

From the findings of Githiga (2007) who conducted a study on the Random Walk Theory on share prices at the Nairobi Security Exchange, the share prices fluctuate randomly and this implies that the volatility of the prices of stock market significantly differ across periods. The empirical results of this study confirm the findings that price changes are independent and random (Nyambogi, 2005; Kalui, 2004; Mwangi, 1997; Karandi, 1993). This was evidence as the observation from the

studies failed to prove any significant existence on correlation between the prices of shares and their lagged observation.

2.2.4 MM Value Relevance Theory

This theory was pioneered Miller and Modigliani (1961) and it indicates that the expected future cash flow patterns and not the historical ones affect the current price of equity securities of the relevant firm under consideration. According to the theory, the observed price of a share in the stock market is a direct reflection of the projected cash flows from the operations of the business. It asserts that the share price of a company is accordingly equivalent to the discounted value of the expected future cash flows per share from the operations of that business. In line with the other MM theories, this theory assert that value is a function of investment decisions and the resultant expected cash flow patterns and is independent of capital structure and dividend decisions when taxes are held as constant.

In this respect, the share prices reflect the future accounting cash flows of the firm and to a great extent the volatility is those cash flows. This indicates that future cash flows and their expected volatility are value relevant but historical cash flows and their volatility are not. In essence, the association between prices and therefore stock returns on one hand and the earnings on the other hand is dependent on how security prices project the future cash flows (Miller & Modigliani, 1961).

According to this theory, there is a direct relationship between the accuracy with which stock prices incorporate future benefits and the returns-earnings relationship. The higher the accuracy, the stronger the returns-earnings relationship and vice versa. Accordingly, the classical valuation theory of Miller and Modigliani (1961) indicates that the returns-earnings correlation is dependent on both the quality of earnings and cash flows but also to the quality of stock prices. In a summary, whereas the earnings quality in different countries may be similar, their value relevance may vary depending on the accuracy of pricing in the respective markets. This conclusion fits well with the expectations of efficient market hypothesis of Fama (1970).

In classical finance theory, cash flows are usually considered to be suitable in valuation as opposed to profits. Shim (2022) indicates that cash flows are preferable to profits in valuation and investment decision making. This is because firstly, cash flows are not subject manipulation unlike profits that are subjected to accounting rules and principles for which managers have a discretion to determine. Besides, Shim (2022) provides that cash flows are preferable to profits because they are subject to risk and uncertainty evaluation. That this study deals with cash flow volatility means that it is better dealt with using cash flows as opposed to profits. Lastly, Sim (2022) indicates that cash flows are more relevant for valuation as opposed to profits given that cash flows are subject to long term valuation and thereby time value of money. Profits are on the other hand short term in nature based on accounting financial periods.

Classical valuation theory is likely to be interrelated with both the random walk theory of Burton (1973) and the efficient market hypothesis of Fama (1970). This is because both of these theories related to market pricing of fundamental information just the same way the value relevance theory relates to the kind of information that is priced at the securities' markets. Whereas the former theories are concerned with the arrival time of pertinent information be it cash flow information, cash flow volatility information or any other kind of information. MM value relevance theory on the other hand is exclusively concerned with how cash flow information is instrumental in valuation of securities in stock markets. The role of volatility of cash flows is implied in the explicit cash flow patterns.

Some studies have supported the MM value relevance theory of Miller and Modigliani (1961). Bepari, Raman and Taher (2013) for instance undertook a study to evaluate the value relevance of cash flows from operating activities on an incremental basis given the book value of the firms and their earnings. The findings indicated that cash flows from operating activities are value-relevant in respect to increases in book to value ratios as well as earnings. It is however noteworthy that further findings from the study could erode the value relevance supposition since they revealed that the value relevance of the cash flows from operating activities was more pronounced before the global financial crises of the 2008-2009 period but its

relevance declined post the financial crisis period. This may indicate a dissipating influence of cash flows on valuation following a period of financial crisis.

In addition to the Bepari et al. (2013), Burke and Wieland (2017) evaluated the value relevance of cash flows from operating activities of financial institutions narrowing down on banks. Here the cash flows were found to have a positive influence on market value of banks. This is because the findings revealed that for banking activities, cash flows from operating activities are value relevant they had appositive effect on share prices and thereby the market valuation of the banks. This implies that just like for non-financial institutions, the classical MM value relevance model of Miller and Modigliani (1961) can also be used in the market valuation of financial institutions in general ad banks in particular despite their being heavily regulated by central banking authorities all over the world.

Whereas the value relevance theory of Miller and Modigliani (1961) has been very useful in developing security valuation models that are based on cash flows, it can be critiqued on a number of issues. Firstly, it relies on quantitative information particularly cash flow information and the discount rates in the markets (which also implies the risk levels in the financial markets), it ignores qualitative information especially psychological and behavioural biases which often play a role in influencing the decisions of investors in the securities' markets. It in addition requires that the prevailing discounting rates be known, yet this are known to vary depending on the risk attitude of the investors such that risk-averse investors require very high discounting rates while risk-takers need lower discounting rates.

2.2.5 Free Cash Flow Theory

Free cash flow theory was propounded by Jensen (1986). According to this theory, firms generating cash in excess of that which is required to fund positive NPV projects face greater agency problems and the free cash flows exacerbates the conflict of interest between shareholders and firms' managers. One implication from Jensen (1986) theory is that firms with high levels of free cash flows are more likely to initiate takeovers and investment that are value decreasing. Firm managers with excess cash flow will be pressured to pay the excess cash to investors as

opposed to re-investing in less profitable opportunities. The increase of shareholder pay-out causes the stock price to be pushed upwards. If firms retain the excess cash the decreasing marginal utility of the investments available will cause the returns and the cost price to decrease this reduction of stock price in a business with free cash flows makes the business a potential takeover target. This is due to more profitable uses of cash outside the firm; this cash should be returned to shareholders to be invested in those more profitable opportunities. The free cash flow theory was advanced and researched by Jensen (1986) in a bid to explain the relationship between free cash flows and the role of debt in organization.

The argument is that the managers are driven by their agency problem to make less than optimal investing decisions when they have excess cash at their disposal. Instead of exploiting this excess cash to benefit the shareholders through identifying extra profitable investing opportunities, they share out this cash to investors in form of dividends to protect their managerial positions. The net effect of this is that if the investors are income oriented as opposed to growth oriented, they are bound to view the stocks of the high dividend payout positively and bid its stock upwards. The upward drift leads to higher market valuations albeit with lowered growth prospects. In a nutshell, the higher the free cash flows, the greater the stock price and thereby the higher the market valuation of the companies.

According to Jager (2019) free cash flow represents the cash a company generate after accounting for cash outflows to support operations and maintains its capital asset. Unlike earnings or net income, FCF is a measure of profitability that excludes the non-cash expenses of the income statement and includes spending on equipment and assets as well as changes in working capital from the statement of financial position. Interest payments are excluded from the generally accepted definition of FCF. Investment bankers and analysist who need to evaluate a company’s expected performance with different capital structures will use variation of FCF like FCF for the firm and FCF to equity, which are adjusted for income payments and borrowing.

In line with Ali, Ormal, and Ahmad (2018), FCF is the net cash that a firm earns after deducting developmental cost and then added in research and development expenditure and finally investment expenditure are to be deducted from that, more over over-investment is one of the alternate uses of FCF and with the information obtained we are able to allocate in six respective categories and this simply can be considered as re-characterization of the statement of cash flow where the cash generated by the firm must be equal to the cash used. FCF is considered to be cash in excess of what is required to fund all the firm's projects having positive NPV where as such CFs is supposed to be paid to the shareholders if the firm wishes to remain efficient for a long time.

The concept of FCF denotes cash available after financing profitable ventures and can be calculated as net operating income minus capital expenditure minus cost of inventory minus paid out dividends. FCF enable firms to pursue investment that could potentially add value to the shareholders. Without these funds, it is difficult to create new products and services, acquire new projects, pay out dividends and pay debts. FCF may a show a better perspective of the firm's ability to create profits because earnings could be misrepresented by the accountant, it is however difficult to misquote FCF.

Some studies have been carried out to evaluate the authenticity of the free cash flow theory of Jensen (1986) in explaining corporate decisions and ultimately a firm's market value. Heung and Jiang (2016) for instance carried out a study to find out if free cash flows had any effect on excess security return synchronicity. The findings of the study indicated that when firms have free cash flows are of the low growth category, experience a high level of security return synchronicity than when the firms are from the high growth portfolio. The firms additionally involved themselves with earnings manipulations and management that lowered the quality of their financial disclosures.

In a different study, Al-Zararee and Al-Azzawi (2014) carried out a study to evaluate the effect of free cash flows on the security prices and therefore market value of pharmaceutical firms listed at the at the Amman Stock Exchange in Jordan.

Consistent with the agency theory of Jensen (1986), the findings of the study indicated that free cash flows had a positive influence on the market capitalization of the listed firms and that the higher the free cash flows the greater the market value. This implied that managers of pharmaceutical firms in Amman did not exploit free cash flows at their disposal at the expense of outside investors and that they used them to the benefit of all the stakeholders in those firms.

Just like the rest of the theories used in this study, the free cash flow theory has some shortcomings. Firstly, it is not an exclusive valuation theory but is a derivative of investing and dividend policies. In this case, its explanatory power in terms of value relevance of cash flows and their volatility is limited. In addition, the theory is based on a case where there is information asymmetry between the insiders and the outside investors. Accordingly, when put in a strong form efficient market of Fama (1970) where insider trading does not yield any return premium, the theory would fail to explain the valuation effect of the free cash flows of a firm.

2.3 Conceptual Framework

According to Kothari (2019), a conceptual framework in the context of research is a schematic representation of the anticipated relationships among the various variables of a study. In this study where the objective was to establish how cash flow volatility affects firm market value of firms listed at the NSE and how financial performance moderates this relationship, the conceptualization is indicted in Figure 2.1.

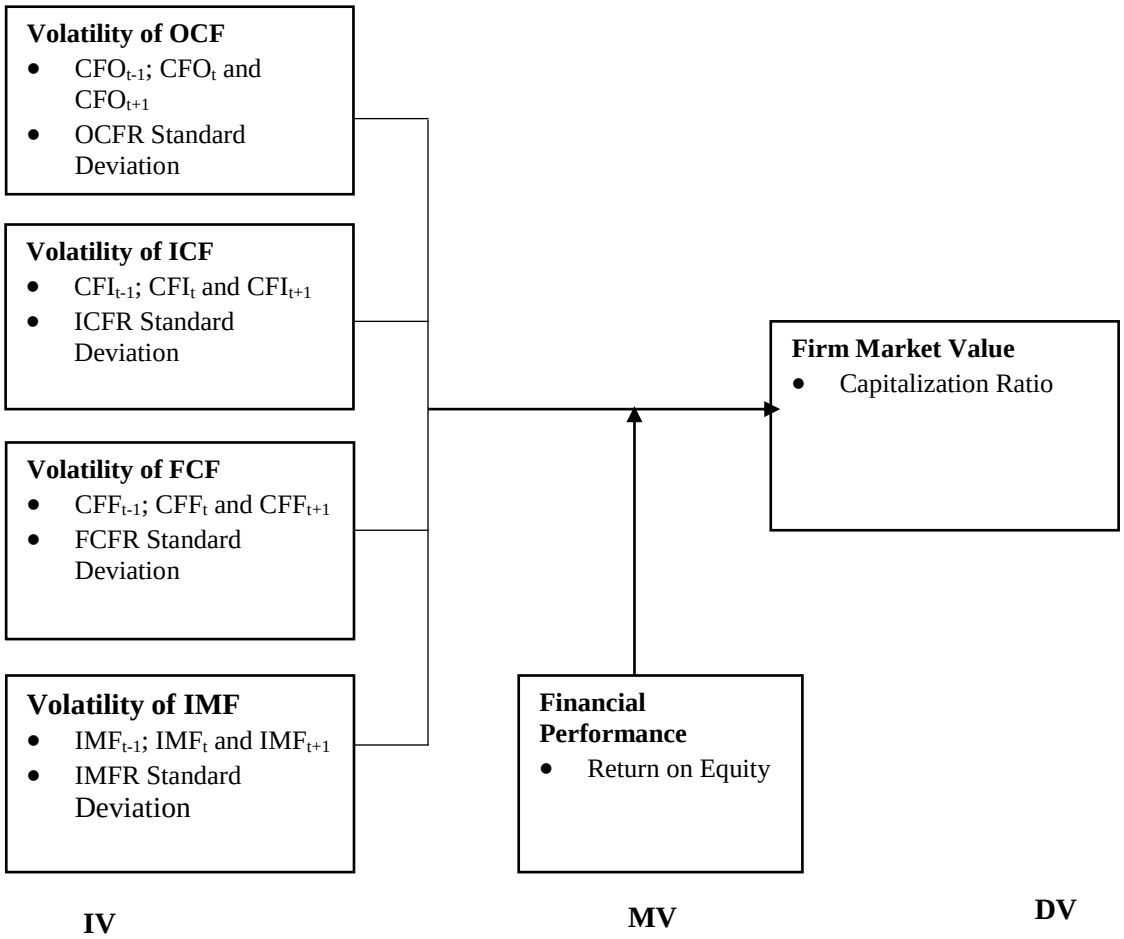

Figure 2.1: Conceptual Framework

The cash flow volatility is divided into four categories that is volatility of cash flows from operating activities; volatility of cash flows from investing activities; volatility of cash flows from financing activities; and volatility of implicit cash flows.

2.3.1 Volatility of Cash Flows from Operating Activities

According to Khanji and Siam (2015) operating activities are the core transactions that keep a business running and they include incoming revenue from the sales of goods or services and most kind of payments. Operating transactions are not considered cash flow until the cash is actually received or paid (Attar & Hussein,

2013). When goods and services are paid for prior to the period in which the benefit is matched to revenue and this results to deferred or prepaid expenses while on the other hand goods and services are received and used by a firm before they are paid for and this results to accrued expenses or payables (Habib, 2010). Operating activities Cash flows are in general the effects of cash transactions and other events relating to trading or operating. Net cash flow from operating activities represents net decrease or increase in cash that result from operations of the business.

Volatility of the cash flow from operating activities is likely to be caused by the changes that occur in such cash flows as commissions, receipts from sale of goods and services, fee, payment for suppliers, cash flows arising from sale or purchase of securities held for trading purposes, for financial institutions it constitutes advances and loans made by such institutions. An increase in operating activities cash flows in one period will be caused by increase in accounts payable, decrease in accounts receivables, decrease in inventory, and well as decrease in interest and depreciation on equipment (Hadi, Bashir, Abolfazl & Maryam, 2013).

Business entities follow International Financial Reporting Standards (IFRS) and International Accounting Standards (IAS) according to which they must report cash flows from operations at the end of every financial period in line with the accounting principle of periodicity. The cash flows are said to be volatile if they are fluctuating from one period to another. The fluctuations can be measured using statistical measures of volatility such as standard deviation or variance (Black, 2023). This approach of using statistical measures of risk have been employed in a number of studies. Jayaraman (2008) while trying to compare earnings volatility with cash flow volatility used a 5-point moving standard deviation to establish volatility of cash flows from operating activities. In China Memon, Chen, Tauni and Ali (2018) tried to establish the impact of cash flow volatility on firm leverage. These was for Chinese listed firms to measure cash flow volatility, Memon et al. (2018) used five-year rolling standard deviation of the cash flows from operations

More extant literature reveals that moving or rolling standard deviation of cash flows and its metrics are a popular indicator of cash flow volatility. In Pakistan, Ashfaq

(2018) measured standard deviation of cash flows on a 4-year rolling basis to measure the volatility of cash flows. The higher the standard deviation, the greater the volatility and vice versa. In the United States of America, Cox (2020) used a 3-year rolling standard deviations of cash flows to establish the volatility in cash flows. The odd number of years reflected the ease of centering the rolling values of standard deviations. Chow (2022), unlike Cox (2020) used a 5-year rolling frequency to establish the volatility in cash flows and other earnings' metrics. But just like Cox (2020), Chow (2022) used an odd number of years to centre the rolling standard deviations.

2.3.2 Volatility of Cash Flows from Investing Activities

According to Khanji and Siam (2015) cash flow from investing activities is cash flows from activities resulting from the acquisition and disposal of long-term assets and other investments excluding cash equivalent. Such activities reflect the expenditure in resources that will help the firm in generating future income and cash flows. These include: cash payment for acquisition of fixed assets, equity and debt securities of other firms and their receipts on disposal and receipts of interest from the payment of advances and loans made to other properties (Mostafa, 2016). Decrease in cash flow from investing activities is likely to be caused by a purchase of asset that can be land, building, equipment or marketable security or a loan made to suppliers while an increase will be caused by the disposal of an asset, interest received from an investment made in other firms by the company (Motlagh, 2013).

Volatility in cash flows from investing activities is caused by business forces that affect changes in cash flows relating to investments. This could be volatility in royalties, rent, dividends and interest from investments of a business due to changes in economic performance through cycles of boom, decline, depression and recovery all of which affect investments differently. This could also have an impact of the capital outlay needed for non-current assets needed in operations of an entity (Motlagh, 2013). The cash flows from investing activities are said to be volatile when they exhibit a high degree of fluctuations from one financial period to another.

Just like has been done when measuring the volatility of cash flows from operating activities by various scholars, statistical measures of variation and risk are used in depicting the volatility of the cash flows from investing activities. The commonly used statistical measures are rolling variance and rolling standard deviations (Memon et al., 2018). In Italy, Santosuosso (2015) sought to establish how cash flow volatility influences creditors and the financing of debt. To measure volatility, the study relied on rolling or moving standard deviations but went further and divided by the means in order to obtain tolling coefficients of variations.

2.3.3 Volatility of Cash Flows from Financing Activities

Financing activities consists of transactions affecting a company's shareholders' equity and liabilities. It mainly involves how a company obtains capital and increase its stock value. Changes in Cash flow from financing activities will result from changes in size and composition of borrowings and equity capital of enterprises which include: cash proceeds from issuing shares and other equity instruments, cash repayments of amounts borrowed and cash proceeds from issuing loans, notes, bonds, mortgages and other short or long-term borrowings (Motlagh, 2013).

Volatility in cash flows from financing activities is caused by business forces that affect changes in cash flows relating to long term capital especially debt and equity. This could be volatility in dividends due on share capital interest due on long term loans as well as from changes in the capital markets environment with respect to terms of loans, effect of government borrowing in the market, variations in demand for and supply of financial assets and the potential arising from cross boarder financing activities (Motlagh, 2013).

The capital structure and dividend of a firm and the changes therein is likely to affect the volatility cash flows from financing activities. Stable capital structures that correspond with stable dividend policies are likely to result in financing cash flows that are seldom volatile (Hillier et al., 2019). This is because sourcing of finance from capital markets is likely to be limited and with a stable capital structure, interest, lease costs as well as dividends over successive financial periods are likely to remain at relatively the same levels (Hillier et al., 2019).

To measure the volatility of the cash flows from financing activities, similar approaches to those used in evaluating cash flows from investing activities are cash flows from financing activities are used. This often involves computing a rolling indicator of volatility like variance or standard deviation (Memon et al., 2018). Using Indian Micro, small and medium size enterprises, Altaf et al (2021) sought to establish how cash flow volatility affects the capital structure of those firms over a period of 12 years spanning 2006 to 2017. They measured cash flow volatility using the rolling standard deviation of cash flow ratios.

2.3.4 Volatility of Implicit Cash Flows

Implicit cash flows occur when a firm uses its resources and do not require cash outflow from the business. This cash flows arises from the firm making use of the assets as a factor of production instead of renting it out. Although such cash flows assist in the process of making decision regarding the replacement of any asset, these cash flows are not incurred in monetary terms and only an estimate for these can be prepared. Implicit cash may include will include gains and losses from disposal of fixed assets, decrease in interest and depreciation on equipment (Hadi, Bashir, Abolfazl & Maryam, 2013).

When own resources are used, particularly long-term assets, accounting practice is that their cost should be periodically allocated to the useful financial periods through such measures as depreciation, amortization and depletion. The resultant depreciation, amortization and depletion expenses are taken as regular expenses to be expensed in the profit and loss account yet in real sense, they are non-cash in nature and this means that the associated expenses have an implicit cash flow element. The implied cash flow is that whereas expensing these items reduces annual profit, in actual sense, the money associated with these expenses never leaves the business. The same would be true for the related non cash incomes. Taken together, these provide the implicit cash flows of the business (Hillier et al., 2019).

Unlike the cash flows from operating, investing and financing activities that are explicitly reported in the statement of cash flows of a business, the implicit cash flows are implied from the non-cash incomes and expenses that are reported in the

profit and loss account of a business. This implies that these kind f cash flows are very sensitive to the financial reporting policies adopted by business entities. In essence policies surrounding depreciation, amortization, depletion and recognition of non-cash incomes and their changes thereof have a significant effect on the expected volatilities of the implicit cash flows ((Hillier et al., 2019).

Following the trend established for the volatilities in cash flows from operations, investing activities and financing activities, rolling standard deviations are likely to be the best statistical indicators of the implicit cash flow risk (Memon et al., 2018). This approach to measuring risk has been adopted by numerous researchers (Altaf et al., 2021; Memon et al., 2018; Santosuosso, 2015). Most of the researchers adopt an odd number to be used for determining the rolling centeredness. This could be 3 years, 5 years or even 7 years depending on the number of firm-year observations.

2.3.5 Financial Performance

According to Samuel (1989) financial performance is the heart of the managerial function of an organization. Analysis of corporate performance is mainly concerned with the development of a modeling methodology to help in the past performance diagnosis and hence provide a framework for evaluating the effect of changes in operating parameters as a guide for future planning (Ghosh & Subrata, 2016). Financial performance is a measure of how well a firm can use assets from its primary mode of business to generate revenues and expand its operations (Ojede, 2014).

According to Oluoch (2014), financial performance ca be looked at from two perspectives. These are the income statement perspective and the statement of financial position perspective. From the income statement perspective, financial performance is usually measured using profit margins being the profit as a percentage of sales. The common margin performance indicators are gross profit margin, operating profit margin and et profit margin (Oluoch, 2014). From a statement of financial position point of view, Oluoch (2014) points out that financial performance is measured by comparing profit to assets, liabilities or capital as reflected in the statement of financial position. In this respect, these are called return

ratios. The most return indicators of financial performance include return on assets; return on equity; return on investment; return on capital employed and on shareholders' fund. Return on assets and return on equity are considered the most popular indicators of financial performance in extant literature (Athanase, 2015).

Mugenda and Mugenda (2012), defines moderating variable as variable that has an effect on the relationship between the independent and dependent variable, but is not related to or affected by the independent variable. The moderating variable in this research is financial performance. The key determinant on the amount of dividend policy for the shareholders is the amount of profit reported. Higher profits will increase dividends and stock prices as the market's response. In the case of public companies, corporate value is reflected in its share price. Higher stock price translates to higher corporate value Husnan (2012). Previous research has shown the influence of financial performance on firm value for instance, Fallatah and Dickins (2012) carried a study that analyzed the effect of firm performance on firm value and used ROE and ROA as the measures of firm performance. The finding indicated that the firm's performance had influence on firm value.

Wahyu (2013) in his study the influence of financial performance on firm value concluded that there is a great influence of financial performance on the firm's value. In the study, ROI ROE and ROA were the measures for financial performance. Jauhar (2014) also conducted a similar study and used ROA and ROE as measures for financial performance. The finding showed that financial performance had a significant positive influence on firm value. Marius *et al* (2015) conducted a study on the influence of financial performance on corporate value. The study used ROA, ROE and NPM as the measures for financial performance. Based on the firms that were used in the study, the findings showed that in large companies with many assets, financial performance had a significant positive influence on firm value based on this financial performance has been choice as the moderating variable between the independent variable and the dependent variable.

Abbasi and Malik (2015) studied the moderating effect of firm financial performance under the focus of the fundamentals analysis on the security price volatility by

studying the secondary data gathered from 50 firms listed in Karachi security Exchange. Before application of the regression analysis, the unit root test, variance inflationary factor was applied to check the stationary of the data and to resolve the problem of multi-co-linearity if exist. The finding was that change in financial performance has significant effect on the security price volatility.

Agala *et al.* (2017) sought to find out the influence of firm size on the relationship between free cash flows and firm financial performance from all firms listed at the NSE for the period 2006 to 2015. Panel data regression analysis was employed, along with a positivists approach. The study results reveal that average reliability score for the variables was 0.745, thereby showing that the research instrument was deemed good as supported by Bonett and Wright (2014). The study concluded that firm size exhibited a statistically significant negative moderating effect on the relationship between free cash flow and firm performance. This study attempts to examine whether or not, financial performance significantly moderates the relationship between changes in cash flow and firm value.

2.3.6 Firm Market Value

According to Brody, Meister & Parry (1012), firm market value is a representation of the market value of assets owned by a firm and it describes the ability of the owners of the business to prosper. It is also called firm market capitalization and is the product of the outstanding shares and the market price of a company's shares. According to the theory of agency, managers are the representatives of the owners of the business and are responsible for optimally maximizing the firm's value which forms the core objective of any company. Firm value is an indicator used to assess the performance of a company. Investors also perceive a company through its firm value, and this is related to the stock price.

According to Ftouhi, Ayed and Zemzem (2010), the high share price will make the value of the firm high. Bhabra (2017) defines firm value as the price that is paid by the wealthy buyer when a company is sold or as the objective value from the public and the orientation of company's survival. From this information firm value can then

be seen as the investor's perception towards a firm's level of success which normally is associated with share price and it's usually shown by price to book value.

Miller and Modigliani (1961) opined that firm value is determined by company's asset earnings power. It implies therefore that, when the impact of asset earnings power is positive, the company is doing well, and its asset turnover will be more efficient, and this results in high profit. Firm value may be measured from two perspectives: from the point of view market returns that reflect the changes in prices of shares and also from the perfective of the price in terms of the outstanding number of shares.

The value of a firm on a stock market solely depends on the trading price of the shares and the outstanding number of shares. Given that the number of shares tend to be stable over an elongated period of time, then this implies that market capitalisation largely depends on the market price per share. Information that is likely to influence the demand for and supply of security pricing information is likely to have the greatest effect of the security prices. In line with Fama (1970), investors react to arrival of new information in the market about the company by revising the short or long positions in the security which in turn helps move the existing share prices to a new equilibrium (Fama, 1970). The speed of incorporation of new information into the demand and supply dynamics depend on the level of efficiency exhibited by the target market. Fama (1970) categories the efficiency levels as weak form, semi strong form and strong form with the speed ranging from historical, to pertinent to instantaneous respectively.

2.4 Empirical Literature Review

Empirical literature review is important in unveiling existing empirical and methodological gaps. In this context these gaps relate to the effect of cash flow volatility on firm market value for companies listed on stock markets and how that effect is moderated by financial performance. Existing studies on the cash flow volatility value relevance are discussed in the following subsections. They indicate the relevant literature gap, prevailing strength and weaknesses in this study.

2.4.1 Volatility of Operating Cash flows and Firm Market Value

Numerous studies have been undertaken to establish the value relevance of operating cash flow volatility. Using stocks from the Standard and Poor's 500 companies, Pae, Bae and Lee (2018) investigated idiosyncratic volatility and how it is affected by cash flow volatility. The study run for a period of 27 years running from 1990 to 2016. Here the idiosyncratic stock volatility is an indicator of changes in returns which has an implication on market value of the companies in that index. Consistent with the observed associations from other regulatory regimes, the findings show that cash flow volatility negatively affects firm value by being positively associated with idiosyncratic return volatility. This is in line with the realization that cash flow volatility is a market priced risk factor.

In Pakistan, Ashfaq (2018) investigated the impact of cash flow volatility on stock returns of companies listed at the Karachi Stock Exchange. The study covered a period of 12 years from 2005 through 2016. The study used a 4-year rolling standard deviation to establish the level of cash flow volatility. The study decomposed cash flow volatility into two components. These were systematic cash flow volatility and idiosyncratic cash flow volatility. A random sample of 80 non-financial firms was used in the study. The panel Hausman specification tests led the study to settle on the fixed effects multiple linear pane regression model. The findings from that study revealed that historical cash flow volatilities had a negative influence on stock returns and that the higher the level of cash flow volatility, the lower the stock returns and vice versa. The negative effect of cash flow volatility remained significant and robust even after controlling for numerous pricing factors. These included the size factor; the market illiquidity factor; the value factor; as well as the earnings yield factor that represents firm growth.

Using a cross section of 21 developed markets, Palkar (2017) sought to establish how cash flow volatility affected market returns in the context of financial constraints. The study identifies two categories of companies which are the financially constrained companies and the financially non-constrained companies. The study also takes into account various country specific market pricing factors in order to

compute risk-adjusted return coefficients. These factors include the momentum factor; the size factor; the book to market factor as well as the market factor. The study involved taking a long position in the low cash flow volatility portfolio and taking a short position in the high cash flow volatility stocks. The findings revealed that there is a return premium on this strategy in more than 75% of the countries for the overall markets and 70% for the financially constrained markets.

In Jordan, Abdelrahim et al. (2023) sought out to establish among other accounting variables, how cash flows from operating activities affect the market value of shares of companies listed at the Amman Stock Exchange. The study covered a period of five years between 2014 and 2018. The study relied on pooled multiple linear regression analysis to test the hypotheses at 95% confidence interval. The null hypothesis that cash flows from operations (and by implication their inter-period changes thereof) were value irrelevant was rejected as the results showed that cash flows from operating activities had a positive value for the companies listed at that Stock market. This could be in supportive of the value relevance theory of Miller and Modigliani (1961) because it implies that cash flow information is a positive market pricing effect and that the resultant volatility should equally influence the share prices of the companies listed at the Amman Stock Market.

Bepari, Raman and Taher (2013) undertook a study to evaluate the value relevance of cash flows from operating activities on an incremental basis given the book value of the firms and their earnings. The study was done on a comparative basis to compare the pre-financial crisis era and the financial crisis era of 2008 and 2009. The study was based on Australian firms. The method of analysis was the Ohlson model with the hypotheses tests based on the coefficient of determination as well as the Vuong Z statistic. It was rooted in the positivist philosophy of research as opposed to the phenomenology one. The findings indicated that cash flows from operating activities are value-relevant in respect to increases in book to value ratios as well as earnings. The findings further revealed that the value relevance of the cash flows from operating activities was more pronounced before the global financial crises of the 2008-2009 period but its relevance declined post the financial crisis period.

Burke and Wieland (2017) sought to establish if cash flows from operating activities of banking operations are value relevant. This was particularly useful given that some scholars hold the opinion that earnings information is more critical than cash flow information for banks given that they are highly regulated and that their cash flow position is heavily influenced by regulatory actions. Just like the Bepari et al. (2013) study, Burke and Wieland relied on the Ohlson valuation model and undertook their study over a period of 11 years that covered 2004 through 2014. The findings revealed that for banking activities, cash flows from operating activities are value relevant since the null hypothesis that they have no influence on share prices was rejected with the conclusion that they had appositive effect on share prices and thereby the market valuation of banks. In addition, the Burke and Wieland (2017) study found out that the value relevance of the operating cash flows is varied depending on the credit risk, profitability and the capital adequacy of the banks.

Christian and Jones (2014) assess the operating cash flows value relevance in consideration of potential weaknesses in earnings quality in the environment of a merger. The samples are selected from firms identified in securities data corporation's mergers and acquisition database. The initial samples consist of 4,468 mergers which was reduced to 417 based on the availability and payment method of the information necessary to calculate earnings per share (EPS) and the operating cash flows (OCF) for the acquiring firm before the merger and for the combined firm which must been available. The study applies a cross sectional regression model for the combined sample of all merged firms. The findings indicate that earnings response coefficient for the merged firms is insignificant in the year of that the merger is executed but becomes huge in years after the merger. Results additionally show that the coefficient of working cash flows is huge in the time of the merger, and this suggests cash flows from tasks in the time of merger give steady data content. After the merger operating cash flow still provides data past that in earnings. Lastly, the study finds that, cash flows from operating activities give steady data that is value relevant beyond earnings. The study suggests that earnings may not be a sufficient measure of the valuation of the merged firms in the merging year and that financial statements users seek other measures, such as operating cash flow to compensate the

deficiencies of earnings during a merger. Moreover, these results establish the contextual value-relevance of operating cash flows for firms involved in a merger.

In Norway, Voroshina and Martinsen (2022) investigated the effect of operating cash flows, among other accounting values, on market value of companies listed at the Oslo Stock Exchange. The study had a time scope of sixteen years that covered 2005 all the way to 2020. They investigated the study by evaluating the period operating cash flow information as well as changes in those operating cash flows over time. Panel data regression analysis was used in the study whereas the explanatory power of the single period and the change in period cash flows on market value was based on the coefficient of determination. The findings indicated that operating cash flows was value relevant for the Norwegian firms and that it has a positive effect on share prices and therefore both share returns and market value. Interestingly and contrary to the Sloan (1996) functional fixation theory, operating cash flows were found to be more value relevant than the earnings numbers.

Cheng, Zishang, and Johnstone (2013) use stock returns for the period 1989 to 2008 for monthly returns data obtained from AMEX, NYSE and NASDAQ to examine the supplemental role of operating cash flows in explaining returns on stock. They use the correlation between returns on stock and earnings as a benchmark against which they compare and analyze the effect of various earnings quality measures on the role of operating cash flows and earning in explaining returns variations. The qualifying firms in the sample are those that have at least 30 monthly returns in the 60 month estimated period and the resulting sample is 31,866 firms- year observation for the AQ measure and 54,272 firm-year observation for the abnormal accruals measure. The sample is first arrived at by eliminating companies in the financial industries and utility companies. Other firm-year observations are eliminated due to lack missing earnings or cash flow data from the current and prior year and changes in the fiscal year. The first measure the earnings quality is the standard deviation of the residual from the regression of change in working capital on lead lag and current cash flows, changes in scale and gross property plan and equipment. The study applies cross-sectional linear regression models to examine the value relevance of cash flows from operations and earnings with respect to annual abnormal security return. They

employ both change and level specifications to characterize the unexpected components of cash flows from operations and earnings. According to the study, both combined cash flows from operations and earnings show significant incremental informational content. However, earnings do not explain returns more than operating cash flows explain returns this is different from Dechow and Dichev (2002) and Cheng *et al.* (1996).

Mostafa (2016) conducted a study in Egypt on value relevance of cash flows, book values and earnings. The sample of the study comprised of listed Egyptian firms incorporated into the EGX 30 file from 2003 to 2009. A list of 72 firms was created which met the accompanying criteria: the organizations ought to have bookkeeping or offer costs information for in any event one year over the time of the investigation (2002-2008), the firm ought to have corporate activities information for figuring stock restores, the revealing cash must be Egyptian pound and that organizations ought not have a place with a money related segment. In the wake of forcing these four criteria, the example size dense in to 52 firms. The outcome was the documentation of 312 firm year observation over the period. This is on the grounds that the investigation starts with the 2003 financial year because of changes in accounting items as independent variable. In addition, firms that are rarely exchanged and firms that have number of exchanging days under 120 days during the year are also eliminated, resulting to a firm-year observation of 52 firms' sample. The study utilizes statistical relationship between accounting information and capital markets value that is: the relationship between annual returns and earnings; the association between accruals and cash flows, and annual return and the association between earnings and book value of equity and stock market prices. The conclusion of the study was that earnings have value relevance and earning changes are significantly more successful than cash flow in explaining security return. Also is that cash flows from operations are not successful in explaining stock returns. This result suggests that cash flows are not value relevant. This is attributed to the fact that cash flows in Egypt are very volatile and not persistent so the market does not rely on them. Thirdly, the individual earnings and book values are strongly associated with stock prices, however jointly earnings are significantly associated with stock prices, but book values do not appear to be economically significant.

Akadeagre, Kwame and Opoku (2015) conducted a study on comparative predictive abilities of earnings and operating cash flows on future cash flows in Ghana using panel data from listed companies on the Ghana Stock Exchange from 2002 to 2012. For consistency reasons, those firms without published financial statement within the period of analysis were removed from the analysis. The research used ordinary Least Squares to estimate the likely influence of the three-lags of operating cash flows and earnings ratios on future operating cash flows of the listed firms. To eliminate the effect of size and heteroscedasticity, the variables were scaled by the average total assets of the firms. The conclusion of the study is that that historical earnings and operating cash flows are significant in forecasting future cash flows, however historical earnings are superior on predicting ability on the future cash flows from operations as compared to operating cash flows. Operating cash flows therefore has lesser predictive ability on future operating cash flows. Also, it was established that investors who intend to predict future operating cash flows on their investments by depending on the three years ago earnings, two years ago earnings and a year ago earnings would make some gains in terms of precision than those using only one year past operating cash flows to forecast their future operating cash flow in a Ghanaian economy.

Thanyaluk (2010) assesses the value relevance of operating cash flow and earnings by evaluating other recorded literature. The study was conducted in Thailand the study uses listed companies in Thailand from 1995 to 2004. The data is obtained from Global vantage database. The sample is then congregated into three periods- pre-crisis, financial crisis and post crisis. Observations falling in the top or bottom 1 percent of each variables in each year are excluded to reduce the effect of outliers. The restrictions resulted in the final sample of 140 firms- year observations during the pre-crisis, while during the crisis 195 observations were used and 1,058 observations were used during the post-crisis periods. In explaining the relative ability of cash flows and earnings in explaining returns on stock a regression model is applied. The study uses descriptive statistics and the variables exhibit patterns which are similar to prior research. The observation is that the returns are more volatile than earnings and cash flows, this is observed through higher standard deviations. Farther the mean and median of stock returns are negative during the pre-

crisis and crisis periods, but become positive after the crisis. The results show a decline in earnings from the pre-crisis to post-crisis periods. However, the mean of cash flows increases during the financial crisis, but slightly declines after the crisis. Further analysis indicates that during the pre-crisis period, the explanatory of cash flows on stock returns is very low as indicated by the low explanatory power. However, cash flows can better explain stock returns during the crisis and post-crisis. Moreover, the coefficient of cash flows becomes statistically significant in the period after the financial crisis.

The results suggest that financial statement users tend to use more cash flow information to explain stock returns, especially during the period of financial crisis, supporting the forecast. The coefficients of cash flows and earnings indicate an improvement and are significant statistically in every sub-period. Both cash flows and earnings have incremental value relevance when the two variables are included simultaneously. In conclusion the study finds out that earnings are the important measure of firm performance and used by investors to make investing decision. The management discretion to opportunistically manage earnings and the accrual may make earnings become a less reliable measure, especially during the financial crisis. Users of financial statements are less many financial statement users turn to use cash flow information because cash flows are not subject to management discretion. During the pre-crisis, the ability of cash flows to explain stock returns is very low but increases over the periods. The overall findings suggest that financial statement users tend to use more cash flow information in making investing decisions.

Khokan, Mollik, and Rahman (2013) conducted a study in Australia on the earnings and cash flows value relevance during the global financial crisis. This study was aimed at assessing the cash flow from operations (CFO) incremental value relevance provided with book value and earnings. Also, the study focused on the earnings and CFO and changes relative value relevance therein between 2008 -2009 pre-crisis period and global financial crisis. Financial accounting data and market value data is collected from Data stream database. The sample period included 2004 to 2009. The initial sample consisted of 9,615 firm-year observation but remain with the appropriate sample, after excluding financial, negative earnings' firms, non-June

year firms, the final sample composed of 4,885 firm-year observation comprising of 599, 694, 765,911, 940 and 976 firm-year observation for the year 2004, 2005, 2006, 2007, 2008 and 2009 respectively. The study applies a regression model in data analysis. The study findings suggest that CFO has incremental value relevance to book value and earnings. Moreover, earnings are superior to CFO in explaining variations in share prices in the Australian market during both the pre-crisis period and global financial crisis. The superiority of earnings over CFO is consistent with Australian evidence during the normal economic condition that the earnings longitudinal value relevance has declined in the Australian market (Brimble & Hodgson, 2007; Goodwin & Ahmed 2006) and the conclusion of Habib (2010) that earnings contain the most value relevance information. This is also consistent with Choi, Kim, and Lee (2011) who find negative coefficient for CFO during the 1997 Asian financial crisis. The decrease in value relevance of CFO may be a noisy measure of a company financial performance during the financial crisis.

2.4.2 Volatility of Investing Cash flows and Firm Market Value

Yazan and Aminul (2017) conducted a study to determine the effect of cash flow on the prices of stocks recorded on Amman stock exchange. The discoveries from the investigation demonstrated that ICFs have a negative impact on the prices of portion of the organizations. Correspondingly, Hama (2014) led an examination to decide the idea of the connection between the ICFs, OCFs and FCFs joined and separately, and stock returns of insurance agencies cited on Damascus protections trade showcase. One of the discoveries showed a negative relationship between the profits on stock and ICFs. In spite of the discoveries of Dastgir, Sajadi and Akhgar (2010) who explored the connection between components of income statement and cash flow statement and stock returns of 65 listed firms at Tunisia securities market between the period 2003 to 2005. On one of the examination discoveries, the ICFs explains the relatively highest percentage of variations in the stock prices. This is like Ninth, Etale and Bingilar (2016) discoveries, who did examination on the cash stream sway on the prices of stock in the financial business in Nigeria between the period 2005 and 2014. The researcher adopted the market price per share as a proxy for stock

price. The findings of the study revealed that ICFs, OCFs and FCFs have a significant positive effect on the share prices of the sampled banks.

Dastgir, Sajadi and Akhgar (2010) find in their study, that cash flow from investing activities have significant positive relationship with stock returns of the sampled Iranian companies. The findings are similar to those of Novianti (2012) who led an investigation because of changes in cash flows and bookkeeping benefit to returns on stock of assembling firms cited on the Indonesian protections trade and uncovered that the ICFs of the inspected organizations have a positive noteworthy relationship with the profits on stock.

Mazloom, Azarberahman and Azarberahman (2013) studied relationship of profits on stock of firms in Iran between the period 2003 and 2005. One of the significant findings was that ICFs had moderate relationship with the stock prices when contrasted with OCFs and FCFs.

Foerster, Tsagarelis and Wang (2017) tried to establish whether or not cash flows and their volatility are an accurate predictor of equity security returns when compared to profit prediction. They classified the ash flows using the two approaches to the cash flow statement i.e., the direct method of cash flows and the indirect method of cash flows. They further categorized cash flows in to 10 decile groups. The findings revealed that the cash flows from operations determined using the direct method of cash flows had a higher forecast value of stock returns when compared to the cash flows determined using the indirect method. The findings further revealed that when it came to cash flow deciles the one that had the highest cash flows performed better than those that fell in the lowest cash flow decile. The performance was by more that10 percentage points. The findings remained robust when considered against various risk factors and investment environments. These included industry sectors, size, momentum, market and value factors.

Using banks in Indonesia, Zacky (2021) sought to establish how cash flow volatility among other factors influenced stock prices, equity security returns and therefore market value of those commercial banks. The study used a period of 10 years that ran from 2010 to 2019. The study utilized a sample that comprised fifteen of the banks

that had the highest market capitalization. Secondary data was utilized in the study and the study was rooted in quantitative design as founded in the positivist philosophy of research. The study used panel data regression analysis that yielded 100 firm year observations and tested the hypotheses at the 95% confidence interval and 0.05 level of significance. The findings revealed that cash flow volatility has a negative influence on the equity security returns of those banks in Indonesia. This supports the value relevance theory of Miller and Modigliani (1961).

In the United States of America, USA, Cox (2020) carried out a study to find out how the volatility of the cash flows before an initial public offering (IPO) related to the market value of securities when compared to effect on value of the volatility of the cash flows after an initial public offering. This was in a bid to test if cash flow uncertainty is a priced factor in the primary market where the initial public offers are listed. The study period lasted 16 years running from 1996 to 2011. Firm market valuation was based on the Tobin Q's indicator of value for the 695 initial public offers that were realized during the study period on the basis of the Electronic Data Gathering, Analysis and Retrieval (EDGAR) database. The study used a 3-year rolling standard deviations of cash flows. The findings revealed that firms that had high pre-IPO volatilities of cash flows had equally high post IPO market values of those securities in the secondary market after the primary listing. In addition, the study showed that underpricing of IPO securities is related with the cash flow volatility before the issue of those securities in the primary securities market.

2.4.3 Volatility of Financing Cash Flows and Firm Market Value

Novianti (2012) conducted an investigation to assess the impact of changes in parts of cash stream and accounting profits on returns on stock of assembling organizations recorded on the Indonesian stock. The investigation included 64 assembling organizations which were chosen following a purposive examining approach. The consequences of the numerous direct relapse examination indicated that cash flows from financing activities have inconsequential effect on the profits on stock. This was like the findings of Yazan and Aminul (2017) who reasoned that the impact of FCFs on the offer prices was negligible. In actuality Dastgir, Sajadi and

Akhgar (2010) in their investigation uncovered that financing activities' cash flows have noteworthy positive association with stock returns of the inspected Iranian organizations.

Mazloom, Azarberahman and Azarberahman (2013) completed an investigation on the relationship between different earnings and cash streams of firm and stock returns. The examination includes all organizations recorded in the Tehran securities exchange and its period was nine years with several cash flow and earning measure of the firm's performance. The investigation applied both simple and multiple regression models and uncovered that cash stream from financing activities had the least informative intensity of the stock returns and this is in accordance with Novianti (2012) who deduce in his examination that FCFs have insignificant association with the share prices of the assembling firms recorded in the Indonesia stock market. Essentially, Fifth and Hanza (2014) in their examination found that relations between the returns on stock and the FCFs is insignificant. Khanji and Siam (2015) inspected the impact of cash flows on the stock prices of 12 Jordanian business banks recorded on Amman stock exchange advertise during the period 2010-2013. Statistical analysis revealed that there is no statistically significant impact of FCFs on share prices of the considered firms.

Mostafa and Gary (2014) did an examination to establish which free cash stream is the most value relevant. The investigation test incorporated all companies recorded in COMPUSTAT for a 23-year time frame beginning 1988 to 2010. The investigation disposed of the considerable number of firms' that had missing variables and remained with a sample of 115,940 observation. Since the model applicable uses the changes from year to year, observations from the year 1988 represent the changes from 1987 to 1988 data. The researcher distinguishes the accompanying free cash flows: FCF1 which is given with cash from operating activities less capital consumption required to keep up gainful limit, FCF2 which is given with cash stream from operating activities less capital use, FCF3 which is given with cash stream from operating activities less cash stream from contributing exercises, FCF4 which is given with cash stream from operating activities less capital use required to keep up profitable limit less favored stock profits, FCF5 which is

given with cash stream from operating activities less capital use less preferred stock profits, FCF6 which is given with cash stream from operating activities less cash stream from financing activities less preferred stock profits, FCF7 which is given with cash stream from operating activities less capital expenditure required to maintain productive capacity less total dividends keep up beneficial limit less all out profits, FCF8 which is given with cash stream from operating activities less capital use less absolute profits and FCF9 which is given by cash flow from operating activities less cash flow from investing activities less total dividends.

According to Mostafa and Gary (2014), FCF aside from FCF2, FCF5 and FCF8 had a positive relationship with changes in stock prices changes in stock cost between the present year and the finish of the following financial at 5% centrality level. The control variables, stock value changes between the present year and the finish of the following monetary year was decidedly connected with changes in all out deals per share, changes in book value per share, changes in earnings per share, common logarithm of all out deals and regular logarithm of all out resources and these affiliations were measurably critical at the 5 % level. Moreover, changes in complete deals per share, changes in earnings per share and change in profits per share over the current monetary year were connected with all meanings of FCF though logarithm of all out deals and common logarithm of all out resources were factually critical with a portion of the FCF particulars recommending that these factors would be fitting control.

In the United States of America, Rai (2022) sought to find out how numerous cash flow metrics impacted share price returns in the context of varying volatility environments. The study had a time scope of 20 years that spanned 2002 to 2021 and it relied on the US equity data for public companies. Besides checking on the forecast value of the individual cash flow metrics, the study also investigated the predictive power of the changes in those cash flows over time, which in the context of the current study is synonymous with volatility in cash flows. The study further compared the relationship among these variables in two operating environments: the pre-financial crises environment and the post financial crisis environment of year 2008 and beyond. Increases in cash flows had a positive influence on increases

equity market share returns. Interestingly, this increase in return was by a greater margin compared to the magnitude of the increase in cash flows in the pre-financial crisis era. The effect became less pronounced in the financial crisis high volatility environment.

In Thailand, Saengchote and Charoenpanich (2020) focused on establishing how the uncertainty in cash flows affected the pricing of Initial Public Offers (IPOs) of Real Estate Investment Trusts (REIT) at the Bangkok Stock Exchange. This was rooted on the established trend that REIT initial public offers were priced better that the equity IPOs in Thailand and other international markets that had been identified by Saengchote et al. (2020). Numerous factors including the uncertainty in the period before the IPO had been floated as the cause and this study purposed to establish if post issue uncertainty was also a determining factor. The findings from the study revealed that REITs that had income guarantees were less undervalued than those that did not. Income guarantees therefore served to reduce the market systematic risk and thereby leading to this valuation effect.

Cho (2022) went out to establish the effect of the volatility in earnings and related components on the delay in adjustments in stock prices. The study presupposes that investors become more confused and unsure of their investing strategies when earnings, cash flows are other earnings components information are more volatile than when they are less volatile. In the postulation of Cho (2022), there is bound to be delay by customer interpretation of earnings and other related data when it is opaque and volatile with respect to determining demand for and supply of securities and thereby market prices than when the values are transparent and less volatile. The study relied on 5-year standard deviation of earnings, cash flows and other earnings components in establishing their volatility. The study findings indicate that cash flow volatility negatively influence the security market price responsiveness to information. The higher the volatility of cash flows and other earnings components, the longer the delays in the market reaction the value relevant market pricing information.

2.4.4. Volatility of Implicit Cash Flows and Firm Market Value

Heung and Jiang (2016) carried out a study to find out if free cash flows had any effect on excess security return synchronicity. They carried out the study by dichotomizing firms into low-growth and high growth companies. The findings of the study indicated that when firms have free cash flows are of the low growth category, then they tend to experience a high level of security return synchronicity than when the firms are from the high growth portfolio. Consistent with the agency problem of the excess cash flows, the study also found out that the low growth firms additionally involved themselves with earnings manipulations and management that lowered the quality of their financial disclosures. It therefore indicates that managers and other insiders exploit free cash flows by increasing financial reporting opaqueness at the expense of the investors not privy to privileged insider information.

Al-Zararee and Al-Azzawi (2014) carried out a study to evaluate the effect of free cash flows on the security prices and therefore market value of firms. The study relied on pharmaceutical firms in Jordan as listed on the Amman Stock Exchange. The study was based on a 7-year period that run from January 2004 to December 2010. Analysis was undertaken using panel data regression model and the hypotheses were tested at the 95% confidence interval. Contrary to the agency theory of Jensen (1986), the findings of the study indicated that free cash flows had a positive influence on the market capitalization of the listed firms and that the higher the free cash flows the greater the market value.

In Vietnam, Hong and Hung (2022) went out to find out how cash flow volatility impacts the structure of debt when this is considered in the context of a pandemic in this case COVID. The study was carried out over a period of 12 years that spanned from 2009 to 2020. Following capital structure theory where cost of debt is cheaper than cost of equity, it can be assumed that highly levered companies are more valuable than less levered companies. In their analysis, Hong and Hung (2022) used the general least square method of regression alongside percentile regression. The findings indicated that cash flow volatility negatively impacts the debt structures of

companies in Vietnam. The higher the volatility, the less the use of debt and therefore the lower the implicit value and vice versa. The findings however reversed when the same is considered in the context of the COVID pandemic. This is because after factoring in the pandemic, the effect reversed from negative to positive. The findings also revealed an inverse relationship between the debt structure percentile and the cash flow volatility.

Using evidence from companies listed in African countries' stock markets, Vengesai and Kwenda (2018) sought to establish how the volatility in cash flows affected the investment behaviour of participating firms in those bourses. The model of analysis in the study was panel data regression model of the dynamic nature combined with the generalized moments of coefficient determination. The study was focused on non-financial firms only given the regulated nature of financial firms. This yielded a sample of 815 non-financial firms in the African stock exchanges. To measure volatility in cash flows, the study relied on two distinct approaches. Firstly, was the exponentially weighted moving standard deviation which was a future oriented measure. Secondly was the coefficient of variation (CV) that focused on not only on the levels of cash flows, but also their implied volatility. The findings from the study revealed that the volatility in cash flows had a negative effect on investment such that the higher the volatility the lower the levels of investment for companies listed in African stock markets (this implicitly indicates that the higher the cash flow volatility, the lower the market value of those companies). The study places a big emphasis on cash flows and their corresponding volatilities as information pricing factors and market value determinants for companies listed in Africa.

In Jordan, Shubita (2023) evaluated how the volatility in cash flows affected leverage of publicly listed non-financial firms in that country. In the context of the current study, leverage and capital structure have implications on market value given that the higher the proportion of debt, the lower the cost of capital and therefore the higher the value of a company and ice versa. The study was carried over a period of 12 years starting in 2009 and ending in the year 2020. The study relied on panel data analysis such that it had a sample of 72 firms. These were shareholder-oriented firms that were non-financial in nature. The financial companies were excluded on account

of the high level of regulations imposed on financial firms in Jordan. From the findings of the study, Shubita (2023) revealed that the volatility of cash flows had a positive effect on gearing and the effect was statistically significant. The implication was that companies that had high standard deviations in cash flows over specified periods had higher usage of leverage and vice versa. In this context, cash flow volatility is not only a capital structure determinant but is also by implication a determinant of firm value of publicly listed companies in that country.

2.4.5. Financial Performance and Firm Market Value

Studies that relate financial performance, earnings and similar information to firm stock market returns and values are often called value relevance studies. Value relevance studies evaluate the impact of financial statement information on stock prices and firm value (Keener, 2011). Kalui (2004) as well as functional fixation theory of Sloan (1996) point to the fact that investors are usually fixated on financial performance and earnings information while making buy, hold or sell decision of securities in the markets. It is therefore possible that the relationship between cash flow information in general and cash flow volatility in particular will be moderated by the financial performance of the reporting entity. Several studies have been carried out in this respect as is discussed in the paragraphs that follow.

Čupić, Todorović and Benković (2023) sought to establish how earnings and cash flows affect stock prices and stock returns among companies in a transition market using Serbia as the case of focus. They further tried to find out how regulatory changes affect the value relevance of those financial numbers. They focused on companies listed at the Belgrade Stock Exchange and carried out on a 14-year period that ran from 2005 to 2018. The methodology revolved around the use of a differenced regression model at 95% confidence interval. From this comparative analysis, it was established that earnings have a higher effect on share prices and market value than cash flows. This seems to focus on the functional fixation theory of Sloan (1996) where it is implied that earnings have a higher bearing on the decisions of investors than cash flows. The findings also indicated that the implementation of more accounting regulations improves the value relevance of earnings and cash flow information, at least in the Serbian capital markets.

In India, Bashir, Bansal and Kumar (2021) sought to establish if earnings among other variables were value relevant in terms of influencing share prices (and thereby share returns of firms listed at the Bombay Stoc Exchange. The time scope of the study was 10 years covering March 2009 to March 2018 that resulted in7,280 firm-year observations. The study used panel data regression to test the null hypothesis that earnings were value irrelevant. The study rejected the null hypothesis and showed that earnings were value relevant in the positive direction and they positively influenced market returns in the Indian institutional set-up. This means that in India, earnings are a positively priced market information factor. The findings are in line with the functional fixation theory of Sloan (1996) as well as the Miller and Modigliani (1961) value relevance theory.

Still in India, Vishnani, Deva and Misra (2023) undertook to find out if comprehensive income had any impact on the stock market value. The study was done on a sample of non-financial firms in India that totaled 367. The time scope was 5 years spanning 2016 through 2020. The period was chosen because it coincided with the time of the adoption of the International Financial Reporting Standards that dictated on how comprehensive income and other comprehensive income should be reported in the financial statements. Analysis was done using regression analysis at 95% confidence interval. The findings are consistent with the functional fixation theory of Sloan (1996) and show that both earnings after tax and total comprehensive income had a positive influence of the market value of the study companies.

Fuad and Mohd-Saleh (2008) carried out a study to establish the influence of free cash flow agency problem on earnings' value relevance. They had not that managers in companies that exhibited high free cash flows and which had low opportunities for growth had been shown to prefer investing in low value opportunities with either low positive net present values and in most cases less than unit profitability indices and cover their indiscretion using discretionary accruals property of earnings. The findings showed that profits and earnings had a positive influence on the values of stock prices at stock markets. In line with the expectations of the agency problem, the findings also revealed that the ability of earnings to predict share prices and firm market value was compromised when the firms had excess free cash flows that implied greater agency problems.

In Pakistan, Janjua, Aksar and Zafar (2022) tried to establish if earnings' figures among other accounting effect had any significant effect on the market value (and share returns) of publicly listed in that country. The study relied on non-financial companies for a period of 11 years than spanned 2006 through 2016. The sample size of the study was 170 firms. The study deployed the used of panel data multiple linear regression model to test the specified hypotheses with market value being based on the holding period model of market returns. Besides checking n the explicit value relevance of earnings data, they also assessed the value relevance of the changes in the earnings data. Their findings are two-fold. Firstly, the study indicates that periodic earnings have a positive effect of holding period share returns and are therefore value relevant. Secondly, the findings further revealed that in Pakistan, for the non-financial firms, changes in earnings are increasingly getting value relevant and that investors are increasingly focusing on the implications of the changes in earnings while making their investing decisions.

Panagiotis and Dimitrios (2009) carried out a study in Greece whose main aim was to determine the value relevance of financial statements and their impact on the stock prices. The study consisted of 101 companies all listed in the Athens stock exchange with full annual data of reported earnings and stock prices, accruals, sales assets, total debt, inventories and working capital for the period 1995-2004. The study employed the ratios of total debt to total assets, inventory to sales, net profit to total assets, working capital to total assets, sales to total assets and net profit to sales. The study results showed that the ratios of net profit to total assets and sales to total asset affect returns on stock positively while ratios of working capital to total assets and net profit to sales have a negative impact on returns on stock.

Olubukola *et al.* (2016) did a study which sought to examine the value relevance of financial statement and share prices in Nigeria. The study analyzed audited financial statements of selected listed banks covering the period 2010 to 2014 and a total of 15 listed banks were selected based on the availability of data. The study employed fixed effects panel data method of analysis technique. The findings of the study showed that a significant positive relationship exist between earnings per share and last day share price. This indicated that EPS have a stronger ability to explain the variation in share prices relative to book value per share. The study also revealed that

there is a negative significant relationship exists between book value per share and the last day stock price of the firms listed on the Nigerian stock exchange.

In Jordan, Abdelrahim et al. (2023) sought out to establish among other accounting variables, how earnings affect the market value of shares of companies listed at the Amman Stock Exchange. The study covered a period of five years between 2014 and 2018. The study relied on pooled multiple linear regression analysis to test the hypotheses at 95% confidence interval. The null hypothesis that earnings were value irrelevant was rejected as the results showed that earnings had a positive value for the companies listed at that Stock market. This could be in supportive of the functional fixation supposition of Sloan (1996) because it implies that investors at the Amman Stock Market are fixated at earnings information when making investing decisions, hence the positive effect on the market values of those companies.

In Norway, Voroshina and Martinsen (2022) investigated the effect of earnings, among other accounting values, on market value of companies listed at the Oslo Stock Exchange. The study had a time scope of sixteen years that covered 2005 all the way to 2020. They investigated the study by evaluating the period earnings information as well as changes in earnings information over time. Panel data regression analysis was used in the study whereas the explanatory power of the single period and the change in period earnings information on market value was based on the coefficient of determination. The findings indicated that net income information is value relevant for the Norwegian firms and that it has a positive effect on share prices and therefore both share returns and market value. In addition, they found an increase in value relevance on the basis of the changes in earnings over time. The findings are consistent with those found from other countries where earnings were found to be value relevant (Abdelrahim et al., 2023 in Jordan; Bashir, Bansal & Kumar, 2021 in India; Čupić, Todorović &Benković (2023) in Serbia; Olubukola et al., 2016 in Nigeria; among others).

2.5 Critique of Existing Literature

The reviewed literature has contributed immensely to the development and understanding of financial information and its value relevance in the stock markets.

Despite this contribution, more still needs to be done given the overriding limitations of the extant studies. Al Zararee and Al-Azzawi (2014) for instance sought to determine the relation between free cash stream to market and value estimations of pharmaceutical area firms of Jordan. The examination utilized board information covering the year 2004 to 2010. Thus, the investigation uncovered that free cash stream to value impacts the stock market. The investigation by Al Zararee and Al-Azzawi (2014) showed that free cash stream to value affects the stock market of pharmaceutical segment firms of Jordan however neglected to sum up that the examination discoveries could be applied to firms in different parts. Extra the investigation just inspected the impact of free cash stream changes available worth however did not think about different components of cash stream, for example, the financing cash stream, contributing cash stream just as working cash flows.

Some studies have had the analysis focusing on the direct relationship between financial accounting numbers especially earnings values and stock prices. In this category includes Novianti (2012) who did an examination to analyze the impact of cash stream changes on stock returns of manufacturing organizations recorded on the Indonesian ; Khokan, Mollik, and Rahman (2013) who carried a study in Australia to look at on value relevance of earnings and cash flow during the worldwide financial crisis of 2008; Mostafa (2016) who conducted a study in Egypt on value relevance of cash flows, book values and earnings as well as Cheng, Zishang, and Johnstone (2013) who use stock returns to examine the supplemental role of operating cash flows in explaining returns on stock. All these studies fail to take into account the moderating effect of financial performance of the companies under investigation.

Further, the extant literature has focused on the value relevance of cash flows without examining the volatility in such cash flows. In this category falls studies such as Thanyaluk (2010); Khokan, Mollik, and Rahman (2013) as well as Christian and Jones (2014). Whereas these studies provide useful input as to the relevance of cash flows as a pricing factor, they fail to take to account the importance of volatility in the cash flows yet it is expected that volatility in cash flows provide an information risk factor that should be taken into consideration as an equity security pricing information factor.

2.6 Research Gaps

Contextual gap is evidenced by inconclusive studies on the effect of volatility of cash flow on market value of firms listed in the Nairobi Securities Exchange. Similarly, studies on a single sector of the companies listed in the Nairobi Securities Exchange or effect of single elements of cash flow in isolation leaving the other sectors and explored. Okelo (2013) for instance studied the relationship between profitability and cash flow, Ojede (2014) studies the effect of free cash flow on the profitability of companies listed in the while Wanjiru and Oluoch (2016) conducted a study on the effect of cash flow management on the market returns of public construction companies in Kenya.

Empirically, most studies are fixated on the value relevance of earnings and cash flow numbers but failed to take into account the value relevance of the cash flow volatility information. Panagiotis and Dimitrios (2009) for instance carried out a study in Greece whose main aim was to determine the value relevance of financial statements and their impact on the stock prices. The study consisted of 101 companies all listed in the Athens stock exchange with full annual data of reported earnings and stock prices, accruals, sales assets, total debt, inventories and working capital for the period 1995-2004.

Even where cash flows are considered, a gap in the existing literature is that the studies seldom has considered the influence of combined cash flow elements (financing cash flow, operating cash flow, investing cash flow and free cash flow). In all cases, the moderating effect of firm characteristics especially the financial performance of the firms is not considered. This study seeks to address this contextual gap.

The review of theoretical literature has shown that the conducted studies did not adopt efficient market hypothesis, functional fixation theory, random walk theory, mm value irrelevance theory and free cash flow theory in explaining the effect of cash flow changes on market value of public companies in Kenya hence this study seeks to address this. The study further identified methodological gaps since from literature no study has been done by surveying all the public companies in Kenya in

addition most empirical studies on value relevance have either employed moderated regression analysis simple regression or moderated regression analysis. The study will use multiple regression analysis.

2.7. Summary

Emerging from the literature review are various theoretical, conceptual and empirical conclusions. From the theoretical perspective, it is concluded that five theories are paramount in explaining how the volatility in cash flows is a priced risked factor that is useful in valuation of public companies on stock markets. These are the free cash flow theory of Jensen (1986); the random walk theory of Burton (1973); the efficient market hypothesis of Fama (1970); the value relevance theory of Miller and Modgilliani (1961) and the functional fixation theory of Sloan (1996). Key to note from these theories is that while the first four are market based rational oriented theories, the last one is a behavioural biased theory that places less emphasis on the rationality of the investors and takes to account behavioural biases bound to be experienced when analyzing financial information for investment decision making which affects the market valuation of companies.

From a conceptual angle, the emerging conclusion from the literature is that cash flows and their pricing effect can be looked at from two levels. The reported cash flows and the volatility in the reported cash flows over time. Whereas the reported cash flows are self-evident from the financial statements, the volatility in these cash flows can be only evaluation over an elongated time interval by relying on statistical tools that measure dispersion. The most common of these are standard deviation of cash flows and the variance in cash flows. These tools are applicable to all categories of cash flows being operating, investing, financing and implicit cash flows.

From the empirical and contextual point of view, the overriding conclusion is that extant literature has exclusively focused on the value relevance of accounting numbers including earnings, profits and cash flows. The studies have yet to relate the volatility in those numbers especially the volatility in cash flows to the pricing of securities yet volatility in information is a risk factor that should be considered in valuation of securities. In addition, contextual and global studies have yet to factor

into account the moderating effect of financial performance. Literature seems to be biased in testing the moderating effect of common firm characteristics like firm size and firm age.

CHAPTER THREE.

RESEARCH METHODOLOGY

3.1. Introduction

The fundamental aim of this chapter is to provide the basis for the research method that was be used to explore the effect of cash flows changes on the firm's value of publicly listed firms in Kenya. It explores the research design, target population, sample and sampling methods and the techniques for testing the hypothesis identified in Chapter one. The chapter is based on the philosophy of the study and provides the confidence intervals for the panel data regression models used in the study. It not only indicates the variables of the study but also the measurement approaches for all the six variables used in the study.

3.2 Research Philosophy

This study adopted a positivism research philosophy which adheres to the view that truth is only learnt through science. It also deals with highly structured, large samples and quantifiable data which is analyzed through statistical analysis. The philosophy was used to show causes among the study variables through testing the hypothesis with a view of rejecting or verifying the relationship. It was assumed that there was a causal relationship between cash flow volatility and firm value for companies listed at the Nairobi Securities Exchange and that financial performance significantly moderated this association.

The research philosophy contains important assumptions about the way the world is viewed. These assumptions reinforce the researcher's strategy and the methods chosen as part of the strategy. The philosophy was mainly be influenced by the view of the relationship between knowledge and the process by which it is developed (Kibati, 2015). The philosophy stands for controllability, objectivity, measurability, predictability and construct rules and laws of human behavior (Uddin & Hamiduzzaman, 2011). In this case, the research philosophy was applied to determine the relationship between cash flow volatility and firm value for public

companies in Kenya. This was be achieved through the use of quantitative and statistical models to validate the study's hypothesis.

The positivist approach to this study was deemed appropriate for a number of reasons. Firstly, the scientific approach to research is followed in the study by first identifying the extant research gaps. These were then translated into research objectives and study hypotheses. It is on the basis of these objectives that secondary data was collected to test the specified hypotheses through panel data regression analysis. Comparative analysis was done with respect to the findings from the study and other related studies from around the globe.

Apart from following the scientific approach, this study squarely falls in the positivist realm because it relies on quantitative data that is collected from secondary sources. According to Gujarati (2022), quantitative data analysis makes a study to fall in the positivist philosophy. The secondary data used in this study relates to cash flows from operating activities, cash flows from investing activities, cash flows from financing activities, implicit cash flows, earnings after tax, shareholders' equity, market prices of shares for listed companies at NSE and the number of outstanding shares for those companies.

In addition, the study qualifies to use the positivist philosophy given the way the analysis of data is done and the way the tests of hypotheses are conducted. In this case, panel data regression analysis is conducted at both the bivariate linear and multivariate linear regression levels. That the tests of hypotheses are based on the 95% confidence interval on the basis of the t-statistic and p-values makes the study adopt the positivist stance.

Lastly, the study aimed to establish the causal relationship between cash flow volatility and the market value of firms listed at the Nairobi Securities Exchange. Gujarati (2022) observes that when directional relationships among variables need to be established, the objectives are best served when a positivism philosophy is adopted as opposed to when a phenomenological approach which mostly applies to qualitative approach to research.

3.3 Research Design

The study adopted quantitative causal descriptive research design. This is because the data to be obtained for analysis was quantitative in nature. The quantitative research design was used to develop a model that was used for testing the hypothesis of the study. The design fits this study because it entails using quantitative data from corporate financial statements, which fits within the objectives research philosophy. The quantitative data that applies to the study includes market capitalization (as measured by the firm market capitalization ratio), financial performance (as measured by return on equity) and the volatilities in the various cash flows - operating, financing, investing and implicit (as measured by the respective cash flow ratio volatilities).

The design also emphasizes the measurement and analysis of the causal relationship between variables by manipulating data through sophisticated quantitative approaches that include bivariate panel regression analysis and multivariate panel regression statistical analysis. Aburaya (2012) indicates that when such an approach is used, the research design is best indicated as quantitative research design. The design is partly described as causal because it relies on regression analysis which by its very nature as per Black (2023) assumes that the independent variables have a causal effect of the dependent variable. In this study, these are cash flow volatilities and firm market value respectively.

The approach enhances research reliability through greater objectivity and hence increasing the representativeness and generalizability of findings (Aburaya, 2012). Quantitative causal descriptive research design was used to describe how the independent variables: operating cash flows volatility, investing cash flows volatility, financing cash flows volatility and implicit cash flows volatility affect the firm value. To achieve the general objectives a census study was carried out on the sixty-six publicly listed companies in Kenya. It is however noteworthy that only 45 companies met the data requirements for inclusion in this study leading to 450 firm-year observations over the 12-year study period.

3.4 Target Population

Kothari (2019) identifies a research population to the global sum of all the possible study units for a specified phenomenon. He indicates that when the population is very large, sampling is required to identify a representation of the population Probabilistic methods of sampling are preferred in that case (Kothari, 2008). The study is designed to assess the effect of volatility of cash flow on the value of the firm of all the listed firms in the Nairobi Securities Exchange which are sixty-six as at December 2022. From the accounting point of view, for the purpose of reporting, a firm year is taken as a period of 12 consecutive months (Oluoch, 2014). If all the sixty-six firms happen to have maintained cash flow statements for the entire accounting period consistently the population of the study was 1,660 firm year observation for all the public firms quoted at the Nairobi Securities Exchange over the period (January 2011 to December 2022).

The annual observations are undertaken because the companies at the NSE publish annual financial statements to fulfil the requirement that they must have annual reports to be placed before their annual general meetings (AGM) as per the companies Act of 2015. Since the NSE has been observed to be weak efficient, historical data is critical at establishing the pricing effect of the cash flows. The listed firms are preferred because they are voluntarily and mandatorily obliged to disclose specific information.

The firms were drawn from the following segments of the Nairobi Securities Exchange: Agricultural sector (seven firms), Automobiles and Accessories Sector (one firm), Banking Sector (twelve firms), Commercial and Services Sector (thirteen firms), Construction and Allied Sector (five firms), Energy and Petroleum Sector (five firms), Insurance Sector (six firms), Investment Sector (six firms), Manufacturing and Allied sector (eight firms) and the Telecommunication and Technology sector (three firms). The details of the names and sectors of these firms are provided in Appendix I.

Table 3.1 Population of Public Companies Listed at the NSE

Sector	No. of Firms	Percentage of Firms.
Agricultural	7	10.6
Automobiles and Accessories	1	1.5
Banking	12	18.2
Commercial and Services	13	19.7
Construction and Allied	5	7.6
Energy and Petroleum	5	7.6
Insurance	6	9.1
Investment	6	9.1
Manufacturing and Allied	8	12
Telecommunication and Technology	3	4.6
Population of the firms	66	100

Source: NSE (2022)

3.5 Sample and Sampling Design

According to Kothari (2008) sampling is required when the population is so large that it is practically impossible to carry out a census study. In such a case, an appropriate sampling method is utilized to identify representative members of the population to be used in testing the hypotheses. In this study, the population was only 66 companies which Kothari (2019) and Black (2023) consider to be a small population. Accordingly, a census study was used in this study which sought to find out the effect of cash flow volatility on the market value of all the companies listed at the NSE. Due to data deficiencies, twenty one of the 66 firms did not have all the data items. They were therefore excluded from the analysis leaving only 45 firms that had all the required data for the study.

3.6 Data and Data Collection

The study utilized secondary data obtained from the financial statements of listed firms in the NSE and data from NSE. It further used market trading data from the Nairobi Securities Exchange. The data in the financial statements were captured in a data collection sheet Appendix II developed for this purpose. Secondary data relating to cash flows which were used in computing cash flow volatility were collected from financial statements with respect to cash flows from operating activities, cash flows from investing activities, cash flows from financing activities and implicit cash flows.

All these data are available from the statement of cash flows both for the annual financial reports and the annual financial statements of these companies quoted at the NSE. The Determination of implicit cash flows required the combined use of the income statement and the statement of cash flows. Table 3.2 provides the data used in the study and the respective various sources of the data.

Table 3.2: Data and Data Sources

Variable	Measure	Data Required	Source
▪ Firm Market Value	CR	▪ NSE share prices ▪ Outstanding shares	▪ NSE ▪ Statement of Financial Position
▪ Operating Cash Flow Ratio Volatility	OCFRV	▪ Operating Cash Flows	▪ Cash flow Statement
▪ Investing Cash Flow Ratio Volatility	ICFRV	▪ Financing Cash Flows	▪ Cash flow Statement
▪ Financing Cash Flow Ratio Volatility	FCFRV	▪ Investing Cash Flows	▪ Cash flow Statement
▪ Implicit Cash Flow Ratio Volatility	IMFRV	▪ Implicit Cash Flows	▪ Cash flow Statement ▪ Income Statement
▪ Financial Performance	ROE	▪ EBIT ▪Shareholders' Equity	▪ Income Statement ▪ Statement of Financial Position ▪ Firm Annual Report

Data on financial performance was also annual net profit collected form the final financial statements. The study uses return on equity (ROE) as the indicator of financial performance. This needs earnings after tax (EAT) and shareholders' equity information. Earnings after tax is a figure obtained from the statement of comprehensive income while shareholders equity is obtained from the statement of financial position. This information is published in the annual reports of the listed companies. The companies that do not meet this reporting requirement were excluded from the study.

Data for determining firm value was collected from the annual stock prices from the Nairobi Securities Exchange at the end of every financial period for all the 12 years that qualified for this study. In addition, more data was obtained from the annual reports when establishing the total number of outstanding shares issued by these companies. The data was annual for the period between January 2011 and December 2022.The period coincides with when electronic trading was implemented at the NSE thus is bound to provide very accurate trading and price data.

3.7 Data Processing and Analysis

This subsection provides the approaches by which data in the study was analyzed not only for descriptive purposes but also with respect to the tests of hypotheses. In between these two are diagnostic tests that were carried out in order to ensure that the panel data regression model used in the study provided the best linear unbiased estimators as recommended by Kothari (2008). The various aspects of data processing and analysis are provided in the subsections below.

3.7.1 Model Specification

A panel data regression model was used to draw inference from the secondary data collected. Kothari (2008) as well as Gujarati (2022) suggest that when a phenomenon has both time series and cross-sectional variations, then it is better to use panel data analytical models. The independent variables for this model were: operating cash flows' volatility; investing cash flows' volatility; financing cash flows' volatility and implicit cash flows' volatility. The volatility was measured as 3-point moving

standard deviation of the respective cash flow ratios. The dependent variable is company market value taken as company market capitalization ratio i.e., the ratio of firm market capitalization to the total market capitalization.

The primary model used in the study is specified as:

$$CR_{i,t} = \beta_0 + \beta_1 \delta OCFR_{i,t} + \beta_2 \delta ICFR_{i,t} + \beta_3 \delta FCFR_{i,t} + \beta_4 \delta IMFR_{i,t} + e \quad ---------(1)$$

Since the three-year moving standard deviation (δ) was used in stablishing the volatility of cash flows, the model is modified to appear as follows:

$$CR_{i,t} = \beta_0 + \beta_1 OCFRV_{i,t} + \beta_2 ICFRV_{i,t} + \beta_3 FCFRV_{i,t} + \beta_4 IMFRV_{i,t} + e \quad ---------(2)$$

Where;

$\beta_1, \beta_2, \beta_3, \beta_4$ Represents the specific beta coefficient;

$\delta OCFR$ $(OCFRV)$ represents the volatility of cash flow changes from operating activities;

$\delta ICFR$ (ICFRV) Represents the volatility of cash flow from investing activities;

$\delta FCFR$ (FCFRV) Represents the volatility of cash flow changes from financing activities;

$\delta IMFR\ (IMFRV)$ Represents the volatility of implicit cash flows;

e Represents the error term in the model;

β_0 represents the constant, while

CR represents the value of the firm which is the capitalization ratio of the value determined as the ratio of a firm market capitalization to the sum total of the entire market capitalization of all the firms listed at the Nairobi Securities Exchange (NSE).

The above regression model was used to show the influence between the independent and the dependent variables. The model helped understand to what extent the dependent variable changes when any of the four independent variable is altered while holding the other independent variables constant.

The study also employed a moderating variable which was taken as the financial performance of the firms listed at the NSE for each of the 12 qualifying financial periods. The analytical moderating variable model was specified follows.

$$\boldsymbol{CR_{i,t} = \beta_0 + \beta_i CFRVI_{i,t} + \beta_5 Z_{i,t} + Z_{i,t}(\beta_i CFRVI_{i,t}) + e} \quad ------(3)$$

In this case CFRVI is the cash flow ratio volatility indicator which are standard deviations of cash flows from operating, investing, financing and implicit items respectively.

3.7.2 Variable Operationalization

This sub-section presents a summary of variables used in the models. The section operationalizes the dependent variables, independent variables and the moderating variable. This is shown in the Table 3.3.

The volatility in cash flows is measured using a 3-year moving standard deviation of the cash flow ratios for operating, investing, financing and implicit cash flows. Santosuosso (2015) indicates that rolling or moving indicators of variability in general and standard deviation in particular is the best way of measuring variability n financial variables for panel data like is the case in this study. In line with Chow (2022) who used a five year rolling standard deviation and Cox (2020) who used a 3 year rolling standard deviation as an indicator in the volatility of cash flows, this study uses a three year moving standard deviation on the various ratios indicating the four types of cash flows used. These are the operating cash flow ratio, the investing cash flow ratio, the financing cash flow ratio and the implicit cash flow ratio.

Table 3.3: Study Variables

Variable.	Data.	Measure.
Volatility of Cash Flows from Operating Activities.	• OCF_{t-1} • OCF_t • OCF_{t+1}	Three point moving standard deviation of annual OCFR. $\delta OCFR = \sqrt{\frac{1}{n}\sum_{t=1}^{3}(OCFR_i - EOCFR)^2}$
Volatility of Cash flows from Investing Activities.	• ICF_{t-1} • ICF_t • ICF_{t+1}	Three point moving standard deviation of annual ICFR. $\delta ICFR = \sqrt{\frac{1}{n}\sum_{t=1}^{3}(ICFR_i - EICFR_i)^2}$
Volatility of Cash flows from Financing activities.	• FCF_{t-1} • FCF_t • FCF_{t+1}	Three point moving standard deviation of FCFR. $\delta FCFR = \sqrt{\frac{1}{n}\sum_{t=1}^{3}(FCFR_i - EFCRR_i)^2}$
Volatility of Implicit Cash Flows	• IMF_{t-1} • IMF_t • IMF_{t+1}	Three point moving standard deviation of annual IMFR. Deprec + Disposal Gains - Disposal Losses $\delta IMFR = \sqrt{\frac{1}{n}\sum_{t=1}^{3}(IMFR_i - EIMFR_i)^2}$
Financial Performance	• EAT • Total equity	• ROE $\frac{EAT}{Shareholders'Equity}$
Firm Value.	• Share prices. • Outstanding Shares	Capitalization Ratio $CR = \frac{Firm\ Market\ Capitalization}{Total\ Market\ Capitalization}$

Key		
	t	Current financial period.
	t +1	Subsequent financial period
	t -1	Previous financial period.

3.7.3 Model Diagnostic Tests

Before data analysis is done the following diagnostic tests were undertaken. Testing of assumption is an important task for the researcher utilizing multiple panel linear regression. Serious violation can result in biased estimates of the precision of regression coefficient and untrustworthy confidence interval and significance test (Williams, Grajales & Kurkiewicz, 2013)

3.7.3.1 Normality Test

Normality test ensures that the data conforms to normal distribution characteristics of the population. To check for normality, descriptive statistics were be used, that is Kurtosis and Skewness of the data distribution. In addition to the distribution statistics of Skewness and Kurtosis, a Shapiro-Wilk test was used. It is a test based on the residuals of the least square regression model. For normal distribution the Shapiro-Wilk P-value is expected to be more than 0.05 at the 95% confidence interval (Thadewald & Buning, 2007). If the value is less than 0.05, then the data is considered to be non-normal and measures such as log-transformation are undertaken to normalize the data (Thadewald & Buning, 2007).

3.7.3.2 Multicollinearity Test

The existence of a strong correlation between independent variables is called collinearity or multicollinearity (Gujarati, 2022). This leads to a less than best linear estimator of the regression coefficients. To test for multicollinearity, Variance Inflation Factor (VIF) and Tolerance were used in the study. This is in addition to correlation analysis of the coefficients among the independent variables. According to Gujarati (2022), when VIF and Tolerance are between 1 and 4, the problem of multicollinearity is not statistically significant and the closer the values are to 1, the better in terms of absence of multicollinearity.

VIF and Tolerance tests were aimed at ensuring that there is isolation in the relationship between the dependent variable and each independent variable of this study. Multicollinearity is a regression problem that arises from interrelation between

the independent variables in a model. To test this the variance inflation factor and tolerance are usually applied. They are reciprocals of each other (Gujarati, 2022). The Gretl statistical program was used in the computation f VIF and Tolerance for the variance inflation factor for each independent variables as well as the moderating variable being OCFRV, ICFRV, FCFRV, IMFRV and ROE.

VIF and Tolerance were instrumental in determining how much the variance of an estimated regression coefficient increases if the predictors were correlated. The Variance Inflation Factor indicator should be close to 1.0 if no multicollinearity exists between the variables (Gujarati, 2022). If the variance inflation indicator is greater than 1.0, the predictor may be moderately correlated but still below the multicollinearity threshold as to lead to an cause for concern. The rule of thumb is that if the variance inflation indicator is above 5.0 would suggest a multicollinearity problem while that of 10 would invalidate the regression model (Gujarat, 2022).

3.7.3.3 Heteroscedasticity Test

For panel regression model to be used, the variables must not only be normally distributed, but the error term must also have a constant variance. When the variance in the error term is constant, this is called homoscedasticity (Gujarati, 2022). When the variance of the error term is non-uniform, it is called heteroscedasticity and it leads to less than efficient estimations of the regression coefficients (White, 2010). Accordingly, testing for heteroscedasticity is a post estimation diagnostic test and non-existence of heteroscedasticity indicates that confidence levels and test statistics are not biased.

According to White (2010) heteroscedasticity is a problem in econometrics that tends to have consequences on the ordinary least square estimators. Although the ordinary least square estimator remains unbiased, the estimated standard errors are wrong and a result the confidence interval and hypothesis test cannot be relied on. If the residuals have a constant variance, they are said to be homoscedastic that is the variance for each error term is constant and independent of the explanatory variables.

The study used Breuch-Pagan Lagrange Multiplier (LM). The rule of the thumb is the LM coefficient is compared with the significance level of 0.05 at the 95% confidence interval. The null hypothesis of presence of heteroscedasticity is rejected if the LM coefficient has a p-value of greater than 0.05 whereupon it is concluded that the error term has a constant variance and is therefore homoscedastic. It explains whether the error variance is affected by any of the regressors', their squares or cross product (White, 2010).

3.7.3.4 Autocorrelation Test

Autocorrelation is also called serial dependence or serial correlation. This is a situation in which there is a time dependence among the variables and when there is a correlation of a time series with its own future and past values. This is the case when there is correlation between members of a series of numbers arranged in time (Gujarati, 2022). Presence of serial correlation leads to less than efficient estimations of the regression coefficients.

Serial correlation arises from the time correlation of the error terms among the variables and exaggerates the significance of the predictor when indeed they are not (White, 2010). Durbin Watson d-test was used to detect autocorrelation on the residual on regression analysis. White (2010) suggests that when the d-value is close to 2, then a researcher can be confident that serial correlation is not a serious problem among the study variables.

3.7.3.5 Hausman Model Specification Test

In a panel set of data, it is critical to determine the best model to use in the regression analysis. Hausman model specification test helps to decide between the random effects and fixed effects specification of the long run model (Nakamura & Nakamura, 2015). The test has a null hypothesis that regressors and individual heterogeneity are strictly exogenous. Based on the assumption of the random and fixed effects model on the distribution and behavior of individual specific effects, the null hypothesis implies consistency of fixed effects specification over random effects specification and vice versa. The P-value of the F-ratio is weighed against the

significance value of 0.05 and is less than 0.05, fixed effects as opposed to rando effects are assumed and vice versa (Nakamura & Nakamura, 2015).

3.7.3.6 Granger Causality Test

Granger causality is a statistical hypothesis test that determines if one time series may be used to predict another. It was carried out in the study to evaluate whether the variables under study could be used to predict each other or not. The variables in the model were tested to see if there was bidirectional or unidirectional causal relationship between them (Vaidya, 2021)

3.7.3.7 Co-integration Test

Co-integration is an estimate of the statistical property of variables expressed in terms of time series. (Ariemba, Mboya and Kamau (2015). If there is a stationary linear combination of non-stationary random variables, the variables in a model are said to be co-integrated. The purpose of co-integration test is to see if despite the fact that some of the variables are non-stationary separately, their linear combination is stationary. The rule of the thumb is that if two or more series are non-stationary on their own, but a linear combination of the time series is stationary, the series are said to be co-integrated (Hakim, 2014)

3.7.4 Descriptive Statistics

The study used descriptive statistics to summarize the quantitative data collected. According to Black (2023), there are three categories of descriptive statistics. These are measures of central tendency; measures of dispersion and measures of distribution. With respect to central tendency the study used the mean and median of the study variables i.e., OCFRV, ICFRV, FCFRV, IMFRV, ROE and CR. With regard to descriptive measures of dispersion, the emphasis was placed on standard deviation. To have a composite measure between the two so as to check the level of relative dispersion, coefficient of variation (CV) was used. CV is a ratio of standard deviation to the mean of a variable (Black, 2023). For descriptive distribution measures, Skewness and Kurtosis were used in the study. Skewness measures the

degree of distortion in the symmetry of a data distribution around the mean. Skewed data is less than Gaussian and does not well represent the bell shape (Black, 2023). Normally distributed data must be symmetrical. Kurtosis indicates the tailedness of a data distribution and shows the frequency of occurrence of outliers in a set of data distribution (2023). A frequent occurrence of outliers in a set of data makes it to be less than normal distribution.

3.7.5 Test of Hypotheses

Five hypotheses were specified in chapter one relating to the null supposition that the volatility in operating, investing, financing and implicit cash flows had no significant effect on the market value of firms listed at the NSE and that financial performance of those firms does not significantly moderate this effect. Tests of these hypotheses testing was conducted at the 95% confidence interval. The testing was done not only for the bivariate effect of the independent and moderating variables on CR but also for the multivariate joint direct and moderating effects.

Each hypothesis was tested independently as well as jointly to determine whether to fail to reject or reject the null hypothesis. A panel data regression model was used to draw statistical inference from the quantitative data collected. The coefficients of the variables from the panel regression analysis were tested for their statistical significance using t-statistics and P-values at 95% confidence interval. If P-value is less than 0.05, the study rejects the null hypothesis whereas if P-value is greater than 0.05, the null hypothesis fails to be rejected. Ther than p-value, t-test was also used in the testing of the hypothesis for a 2-tail tail test at 449 degrees of freedom for the bivariate analysis and 446 degrees of freedom for the multivariate analysis as well as 442 degrees of freedom for the moderated multivariate panel regression analysis. This was based on the study's 450 firm year observations.

The goodness of fit of the model was tested using F-statistics. R-square statistics also called the coefficient of determination was used to determine the significance of independent variables on the dependent variable. To supplement regression analysis, the study also carried out correlation analysis to indicate the degree and direction of association among the variables.

CHAPTER FOUR

RESEARCH FINDINGS AND DISCUSSION

4.1. Introduction

In this chapter the methodology outlined in Chapter Three is followed in order to come up with results which are then analyzed and interrogated on the basis of existing extant literature. As a precursor to inferential analysis, descriptive findings from data analysis are presented. These relate to measures of central tendency (mean); dispersion (standard deviation, variance and range); distribution (kurtosis and skewness) as well as a composite measure that relates to both central tendency and dispersion (coefficient of variation). This is done not only for the raw cash flows but most importantly for the volatility in cash flows on a three-year moving average of standard deviation basis.

After the descriptive analysis comes inferential analysis that is preceded by model diagnostic tests for checking the suitability of the panel model used in the analysis. This applies for both bivariate analysis and the multivariate analysis that is done. It concludes with testing the same for the moderated evaluation of the effect of cash flow volatility on market value of listed firms at the NSE over 2011 to 2022 period using financial performance as depicted by return on assets as the moderating variable. The findings firm panel regression analysis gives the t-values and the f-values that are used in hypothesis testing.

4.2. Descriptive Statistical Findings

This subsection provides the descriptive statistical findings on the raw cash flows, cash flow volatility and return on equity and market capitalization. The findings are both cross sectional and time series as provided in the following subsections.

4.2.1 Segmental and Overall Descriptive Analytical Findings

The study found it necessary to identify the unique characteristics of each of the sectors listed at the NSE in terms of cash flows, cash flow volatility, market values

and financial performance as indicated by return on assets. The descriptive findings for each of the variables is identified in the tables that follow. The first to be presented is the descriptive statistics with respect to market value of each of the eleven sectors (Agriculture; Automobile; Banking; Commercial and Services; Construction; Energy; Insurance; Investment; Investment Services; Manufacturing and Telecommunications). Market value was measured as the firm market capitalization ratio taken as the ratio of the firm market capitalization to the total market capitalization of the NSE. The measures on central tendency, dispersion, distribution and relative attributes are shown in table 4.1.

Table 4.1: Segmental Market Capitalization Ratio Segmental Descriptive Statistics

Statistic	*AGRIC*	*AUTO*	*BANK*	*COMM*	*CONS*	*ENERGY*	*INSU*	*INVE*	*INV SER*	*MANU*	*TELCO*
Mean	0.181	0.1038	0.2944	0.1131	0.1748	0.2786	0.1003	0.1215	0.1061	0.1302	0.1728
Median	0.1928	0.0443	0.2137	0.0860	0.0391	0.0985	0.0622	0.0383	0.1919	0.0511	0.0484
Std Dev	2.3380	0.1285	0.4275	0.4513	0.2407	0.3921	0.3274	0.2003	0.6340	0.1907	0.2862
Variance	5.4661	0.0165	0.1828	0.2036	0.0580	0.1538	0.1072	0.0401	0.4020	0.0364	0.0819
CV	12.942	1.2383	1.4519	3.9884	1.3774	1.4077	3.2632	1.6487	5.9741	1.4650	1.6559
Kurtosis	3.8189	3.3749	3.4109	3.6839	0.4231	-1.3423	3.0307	3.8059	3.6239	3.0234	1.6322
Skewness	0.2951	0.0050	0.3910	-0.428	0.1624	0.4753	-0.418	0.4105	-0.830	0.8268	0.9744
Range	20.3802	0.4406	2.9617	4.2401	1.1424	1.1438	1.9008	1.0044	2.4577	0.9176	1.4944
Sigf	0.5494	0.0817	0.1447	0.0979	0.0566	0.2492	0.0951	0.0382	0.4028	0.0493	0.0968

With respect to dispersion, variance and standard deviation are used. The investment segment has the highest volatility with a standard deviation of 0.6340 for the capitalization ratio. The least volatility is observed in the Automobile sector. As far as central tendency is concerned, the mean and median are used. The largest sector is the banking sector with a mean of 0.29944 while the agricultural sector has the least average capitalization ratio. This is line with the fact that the banking sector has the most companies in the listed category being nine banks and are the best performing as confirmed by Mudanya and Muturi (2018). Kurtosis and skewness are used to indicate the distribution aspects of the data. For all the sectors, the measures of kurtosis and skewness fall in the normal distribution range as recommended by Black

(2023) who states that normal kurtosis values lie between approximately -3 and +3 while the skewness one fall within a range of -1 and +1. The mean values are further indicated in FIGURE 4.1 The figure illustrates the relative size of each of the sectors with most of the eleven sectors being of average size with the exception of the Agricultural sector that is relatively small and the Banking, Energy and manufacturing segments that comparatively large.

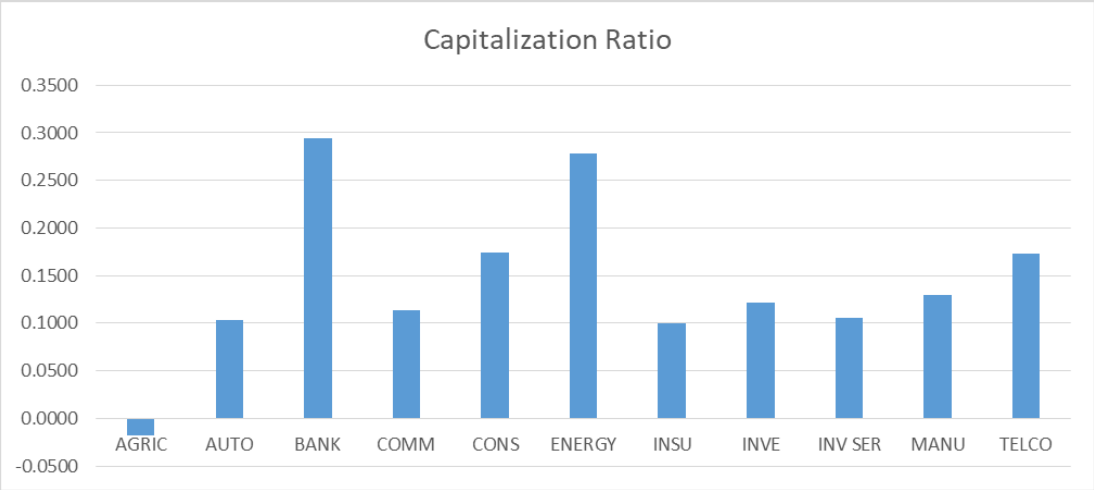

Figure 4.1: Sectoral Panel Means of Capitalization Ratio

Lastly, coefficient of variation is used as a composite measure of both central tendency and dispersion. The agricultural segment posts the highest relative volatility as indicated by CV. This is possibly because of its small size.

The volatilities of cash flows were obtained from the operating cash flows ratio; investing cash flow ratio; financing cash flow ratio and implicit cash flow ratio as indicated in tables 4.3, 4.4 4.5, 4.6, 4.7, 4.8, 4.9 and 4.10 respectively.

Table 4.2: Overall NSE Market Capitalization Ratio Descriptive Statistics

Firm Market Capitalization Ratio	
Mean	0.13361
Median	0.07599
Standard Deviation	0.92778
Sample Variance	0.86077
Kurtosis	3.52571
Skewness	-1.726131
Range	24.60403
Confidence Level (95.0%)	0.07843

Just as was the case for the market capitalization ratio, the values are described using central tendency (mean and median); dispersion (variance and standard deviation) and distribution (Kurtosis and Skewness). On a comparative basis, coefficient of variation relates their respective standard deviations to the means.

Table 4.3: Operating Cash Flow Ratio Segmental Descriptive Statistics

Statistic	*AGRIC*	AUTO	BANK	COMM	CONS	ENGY	*INSU*	*INVE*	*INV SER*	*MANU*	*TELCO*
Mean	0.2087	0.1845	0.1676	0.0922	0.2879	0.1159	0.1173	0.0519	0.2455	0.1556	0.2786
Median	0.1351	0.1764	0.1163	0.05	0.0853	0.0696	0.06	0.065	0.1832	0.1178	0.0985
Std Dev	0.1968	0.1067	0.1592	0.1586	0.6856	0.1627	0.1875	0.3228	0.1995	0.1408	0.3921
CV	0.9430	0.5783	0.9499	1.7202	2.3814	1.4038	1.5985	6.2197	0.8126	0.9049	1.4074
Variance	0.0387	0.0114	0.0253	0.0252	0.47	0.0265	0.0352	0.1042	0.0398	0.0198	0.1538
Kurtosis	1.6749	-0.827	3.0923	3.5102	3.3045	2.7884	3.0884	3.2113	-0.534	3.5367	-1.3423
Skewness	0.3296	0.2639	0.909	0.6735	0.3723	0.1176	1.5226	-1.41	0.895	1.0756	0.4753
Range	0.8745	0.3173	0.867	1.0332	4.3061	0.7649	1.0075	1.8177	0.5943	0.7893	1.1438
Sigf	0.0508	0.0678	0.0304	0.0344	0.1771	0.0551	0.0545	0.1092	0.1268	0.0331	0.2492

In table 4.3, the sectoral values of the operating cash flows are indicated. With respect to the mean of the cash flows as indicated by the cash flow ratio (the ratio of operating cash flows to total assets), the Construction Segment provides the highest

mean of 0.2879 followed with the Telecommunications at 0.2786. The least ratio is reported with a mean of the investment segment at 0.0519. The parameters of skewness and kurtosis lie within the normal range as suggested by Black (2023). The sectoral means are indicated in figure 4.2

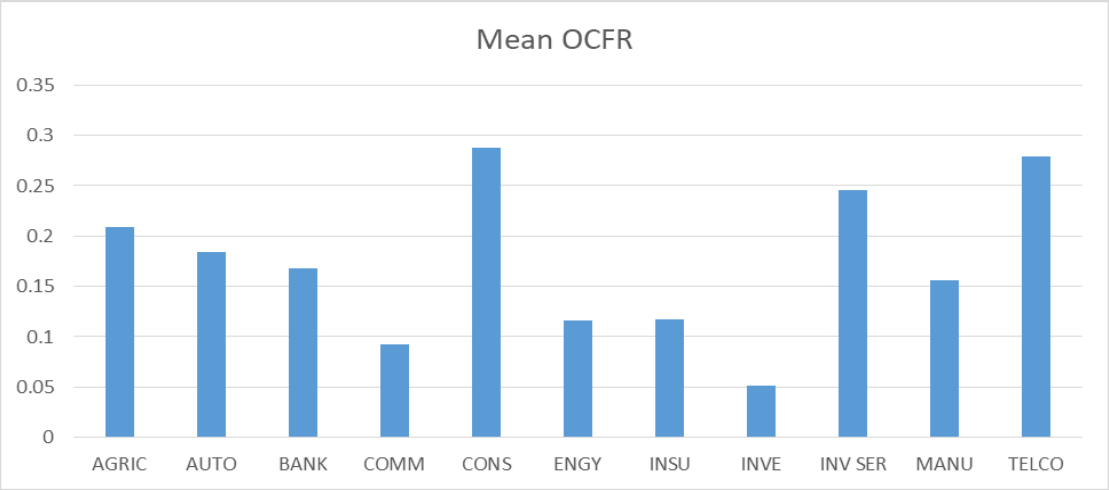

Figure 4.2: Sectoral Panel Means of Operating Cash Flow Ratio

The figure 4.2 illustrates the dominance of the construction and Telecommunications segments in as far as the generation of operating cash flows is concerned relative to the total asset base. This confirms the situation in Kenya where companies in the Telecommunications Segment have been the most profitable over the study period. Combining both the measures of central tendency (mean) and dispersion (standard deviation into one figure, the CV, the investment services segment is shown to have the most volatile OCFR with a CV of 6.2197 while the Automobile segment has the least volatile OCFR with a CV of 0.5783.

The analysis was done to combine all the qualifying sectors f the NSE. The resulting descriptive statistics over the twelve year period for all the 45 companies at the NSE are indicated in table 4.4.

Table 4.4: Overall NSE Operating Cash Flow Ratio Descriptive Statistics

Operating Cash Flow Ratio (OCFR)	
Mean	0.15899
Median	0.11447
Standard Deviation	0.29188
Sample Variance	0.08519
Kurtosis	2.91114
Skewness	0.79235
Range	5.42851
Confidence Level (95.0%)	0.02467

Table 4.5 and figure 4.3 relate to the descriptive statistics of the investing cash flow ratio indicated as the ratio of cash flows generated from investing activities to the total assets.

Table 4.5: Investing Cash Flow Ratio Segmental Descriptive Statistics

Statistic	*AGRIC*	*AUTO*	*BANK*	*COMM*	*CONS*	*ENGY*	*INSU*	*INVE*	*INV SER*	*MANU*	*TELCO*
Mean	0.0865	0.1277	0.7254	0.1673	0.1326	0.1027	0.0393	0.1034	0.1503	0.1234	0.0499
Std Error	0.0128	0.022	0.6346	0.0269	0.039	0.0451	0.0129	0.0167	0.0681	0.0158	0.1016
Median	0.0543	0.0833	0.0607	0.0886	0.0975	0.0644	0.0381	0.0775	0.0624	0.0939	0.0894
Std Dev	0.0991	0.1321	2.1985	0.247	0.3023	0.2708	0.0891	0.173	0.2358	0.1342	0.3519
Variance	0.0098	0.0174	4.8333	0.061	0.0914	0.0733	0.0079	0.0299	0.0556	0.018	0.1238
CV	1.1457	1.0345	3.0307	1.4764	2.2798	2.6368	2.2672	1.6731	1.5689	1.0875	7.0521
Kurtosis	3.859	3.0446	4.8548	4.7726	3.6814	4.3193	3.7392	4.0985	3.5964	4.664	3.0108
Skewness	1.4342	1.2708	0.4361	0.9789	-1.292	0.3932	1.1557	1.8959	1.0008	0.1837	-0.8866
Range	0.6183	0.6344	7.7754	1.5128	2.3816	1.9347	0.7212	1.8055	0.8732	0.6607	1.579
Sigf	0.0256	0.0447	1.3968	0.0536	0.0781	0.0916	0.0259	0.033	0.1498	0.0315	0.2236

As derived from figure 4.3, the relative mean size of the ICFR of the banking sector is relatively larger than the rest of the sectors. This is possibly because commercial banks are involved in investing in a variety of assets both government and private sector instruments in the money and capital markets as aptly described by Abdikadir (2017).

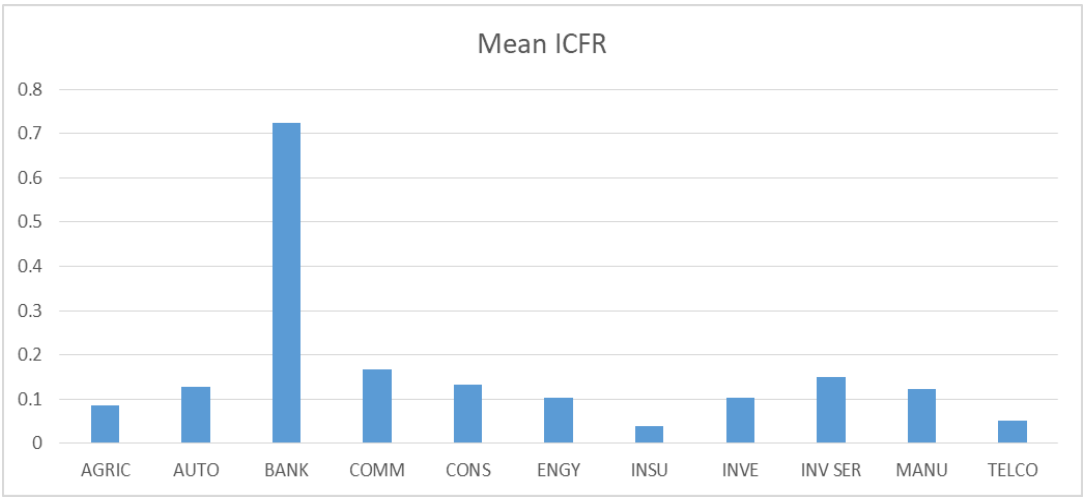

Figure 4.3: Sectoral Panel Means of Investing Cash Flow Ratio

From the table 4.5, the skewness and Kurtosis values lie within the normal distribution limits suggested by Black (2023). With respect to central tendency and dispersion the means of ICFR identified in table 4.3 are related with the standard deviations indicated in the same table to arrive at coefficients of variations (CV) for the various of the 11 segments of companies listed at the NSE. The Banking and Telecommunications segments have the most volatile ICFR while Automobile and Manufacturing segments post the least volatile ICFR as indicated by the CV.

Table 4.6: Overall NSE Investing Cash Flow Ratio Descriptive Statistics

	Investing Cash Flow Ratio (ICFR)
Mean	0.12693
Median	0.07376
Standard Deviation	0.38349
Sample Variance	0.14707
Kurtosis	2.81566
Skewness	1.37933
Range	9.34926
Confidence Level (95.0%)	0.03242

Figure 4.4 as well as table 4.7 relate to the descriptive properties of financing cash flow ratio which is computed as the ratio of net cash flows from financing activities to the total assets of the respective companies in each of the 11 segments of the NSE.

Table 4.7: Financing Cash Flow Ratio Segmental Descriptive Statistics

Statistic	*AGRIC*	*AUTO*	*BANK*	*COMM*	*CONS*	*ENGY*	*INSU*	*INVE*	*INV SER*	*MANU*	*TELCO*
Mean	0.1225	0.0815	0.1067	0.1384	0.1724	0.1728	0.1003	0.2944	0.1061	-0.518	0.2785
Median	0.0788	0.0504	0.0819	0.0744	0.0372	0.0484	0.0622	0.2137	0.1919	0.1928	0.0985
Std Dev	0.1186	0.2018	0.0993	0.184	0.2436	0.2862	0.3274	0.4275	0.634	2.338	0.3921
Variance	0.0141	0.0407	0.0099	0.0338	0.0593	0.0819	0.1072	0.1828	0.402	5.4661	0.1538
CV	0.9682	2.4761	0.9306	1.3295	1.4130	1.6563	3.2642	1.4521	5.9755	-4.514	1.4079
Kurtosis	2.3521	2.3724	3.9041	3.2841	1.642	1.6322	4.0307	3.4109	4.6239	5.8189	-1.3423
Skewness	1.7309	1.1442	3.5587	1.9767	1.2472	0.9744	-1.418	1.391	-1.83	-1.295	0.4753
Range	0.492	0.7917	0.8242	0.864	1.1424	1.4944	1.9008	2.9617	2.4577	20.38	1.1438
Sigf	0.0306	0.1282	0.0189	0.0399	0.0629	0.0968	0.0951	0.1447	0.4028	0.5494	0.2492

The FCFR seems to follow the same pattern as the ICFR given that figure 4.4 have similar characteristics as the figure 4.3 with the observation that the banking sector dwarfs all the rest of the sectors in terms of the mean FCFR

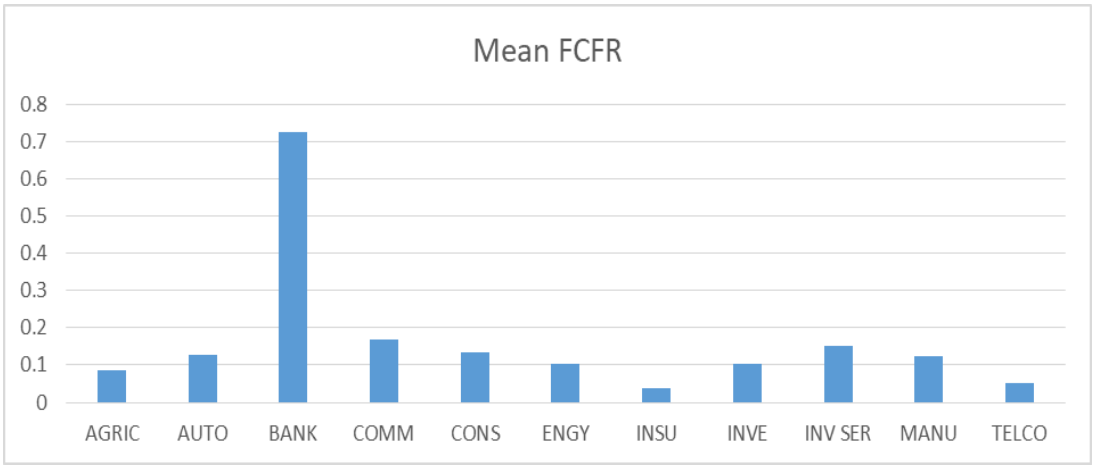

Figure 4.4: Sectoral Panel Means of Financing Cash Flow Ratio

The table 4.7 confirm that the distribution properties of FCFR are approximately normal with all the kurtosis values falling in the approximate range of -3 to +3 as suggested by Black (2023) and all the skewness values falling within the -1 to +1

approximate range. Just as with the cases of CR, OCFR and ICFR, the dispersion (standard deviation) and central tendency (mean) are combined into a relative measure (CV). The resultant values range from a high of 5.9755 for the Investments services to the lowest of 0.9306 for the banking sector.

Table 4.8: Overall NSE Financing Cash Flow Ratio Descriptive Statistics

Financing Cash Flow Ratio (FCFR)	
Mean	0.13155
Median	0.08204
Standard Deviation	0.14646
Sample Variance	0.02145
Kurtosis	4.96297
Skewness	2.17951
Range	1.10371
Confidence Level (95.0%)	0.01238

The last category of cash flows that was considered was the Implicit cash flows as indicated by the implicit cash flow ratio (IMFR) whose descriptive statistical properties are indicated in table 4.9 as well as figure 4.5.

Table 4.9: Implicit Cash Flow Ratio Segmental Descriptive Statistics

Statistic	*AGRIC*	AUTO	BANK	COMM	CONS	ENGY	*INSU*	*INVE*	*INV SER*	*MANU*	*TELCO*
Mean	0.1459	0.0602	0.0659	0.0315	0.0654	0.1538	0.1181	0.1065	0.0779	0.035	0.0878
Median	0.089	0.0617	0.0598	0.0362	0.0365	0.1047	0.0453	0.0654	0.033	0.0229	0.0207
Std Dev	0.155	0.0448	0.131	0.3341	0.1294	0.1717	0.2006	0.1404	0.1215	0.1105	0.1616
CV	1.0624	0.7442	1.9879	10.6063	1.9786	1.1164	1.6986	1.3183	1.5597	3.1571	1.8405
Variance	0.024	0.002	0.0171	0.1116	0.0167	0.0295	0.0402	0.0197	0.0148	0.0122	0.0261
Kurtosis	1.5599	-1.435	3.0279	4.8886	4.8082	2.1501	3.3406	3.9123	3.7376	4.6105	2.6887
Skewness	1.2821	-0.04	-1.098	-0.848	0.5846	1.0836	1.2353	0.7537	0.4326	0.8157	0.4904
Range	0.7632	0.1307	0.8941	3.5189	0.9244	0.8519	1.1026	0.75	0.4557	0.978	0.562
Sigf	0.04	0.0284	0.025	0.0725	0.034	0.0581	0.0582	0.0475	0.0772	0.026	0.1027

With respect to dispersion, variance and standard deviation are used. The Insurance segment has the highest volatility with a standard deviation of 0.2006 IMFR. The least volatility is observed in the Automobile sector with a standard deviation of 0.0448. As far as central tendency is concerned, the mean and median are used. The largest sector is the Energy sector with a mean of 0.1538 while the Commercial and Services sector has the least average IMFR. For all the sectors, the measures of kurtosis and skewness fall in the normal distribution range as recommended by Black (2023) who states that normal kurtosis values lie between approximately -3 and +3 while the skewness one fall within a range of -1 and +1. The mean values are further indicated in figure 4.5. In line with the procedure established for evaluating both central tendency and dispersion, a composite value as represented by coefficient of variation of IMFR is used. As observed from table 4.9, the CV values range from the lowest value of 0.7442 for the Automobile sector to a highest value of 10.6063 for the Commercial and Services sector of the NSE.

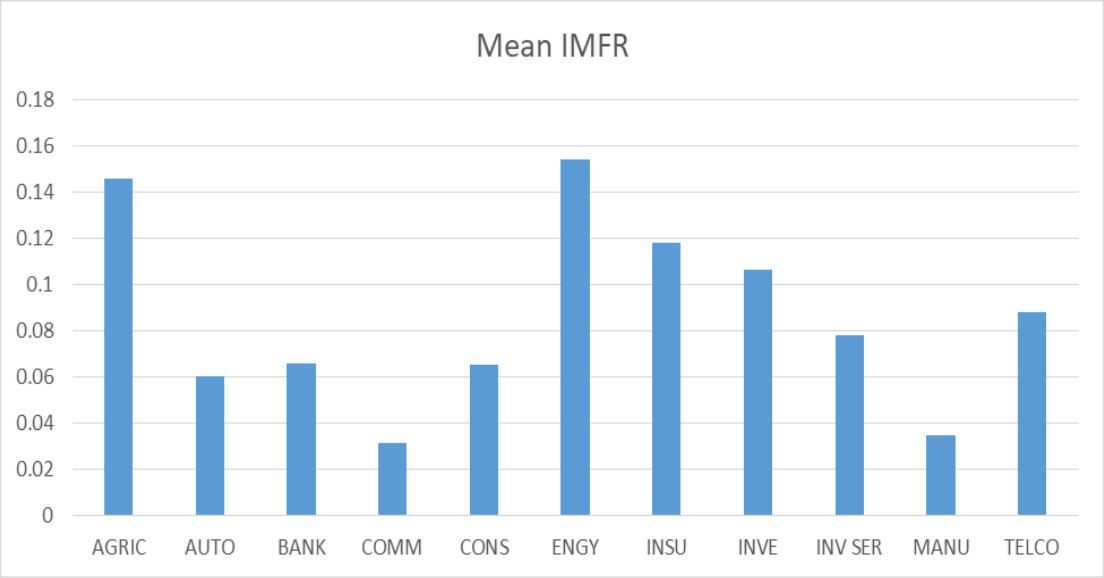

Figure 4.5: Sectoral Panel Means of Implicit Cash Flow Ratio

The descriptive statistics indicating the overall central tendency, dispersion and distribution attributes of the implicit cash flows as measured by the implicit cash flow ratio are depicted in table 4.10. According to the findings, the mean of ICFR was 0.07909 while the standard deviation was 0.18952. This translated to a

coefficient of variation of 2.396257. This indicates a volatile level of implicit cash flows which could be attributed to the variations in accounting policies among the firms listed at the NSE which determines the reported non-cash items like depreciation, amortization and depletion

Table 4.10: Overall NSE Implicit Cash Flow Ratio Descriptive Statistics

Mean	0.07909
Median	0.04836
Standard Deviation	0.18952
Sample Variance	0.03592
Kurtosis	77.81922
Skewness	-4.51335
Range	3.51894
Confidence Level (95.0%)	0.01602

The moderating variable of the study was firm financial performance as indicated by ROE. This was established for all the 45 qualifying firms at the NSE over the 2011 to 2022 period. The ROE for each of the segments was then established with the descriptive statistics being indicated in table 4.11 as well as figure 4.6.

Table 4.11: Return on Equity Segmental Descriptive Statistics

Statistic	*AGRIC*	*AUTO*	*BANK*	*COMM*	*CONS*	*ENGY*	*INSU*	*INVE*	*INV SER*	*MANU*	*TELCO*
Mean	0.1167	0.062	0.1115	0.1366	0.091	0.0992	0.1188	0.0923	0.0425	0.0632	0.117
Median	0.0514	0.023	0.041	0.0408	0.0251	0.0313	0.0365	0.0257	0.0289	0.0315	0.024
Std Dev	0.2112	0.168	0.3741	0.2353	0.1911	0.1861	0.2099	0.1987	0.0747	0.1583	0.4707
Variance	0.0446	0.0282	0.1399	0.0554	0.0365	0.0346	0.0441	0.0395	0.0056	0.0251	0.2216
CV	1.8098	2.7097	3.3552	1.7225	2.1000	1.8760	1.7668	2.1528	1.7576	2.5047	4.0231
Kurtosis	2.8805	0.3421	2.7968	4.101	2.1478	3.9605	3.4954	3.6967	3.2156	3.4193	2.0652
Skewness	0.6603	0.6593	-0.377	1.0515	0.5089	1.4793	1.4852	0.9282	0.5385	0.7511	-0.1807
Range	1.0322	0.6043	4.4121	1.151	0.9441	1.1863	1.0539	0.9439	0.3238	1.0124	1.8402
Sigf	0.0546	0.1068	0.0714	0.0511	0.0494	0.063	0.0609	0.0672	0.0475	0.0372	0.2991

From a segmental perspective, the market segments with the highest returns on equity (ROE) was Commercial and services with a rate of 13.66%, followed by Insurance at 11.88% and Telecommunications at 11.7%. The least mean ROE were presented by the Investment segment at 4.25%, the Automobile segment at 6.2% and the manufacturing sector at 6.32%. The respective values are indicated in figure 4.6.

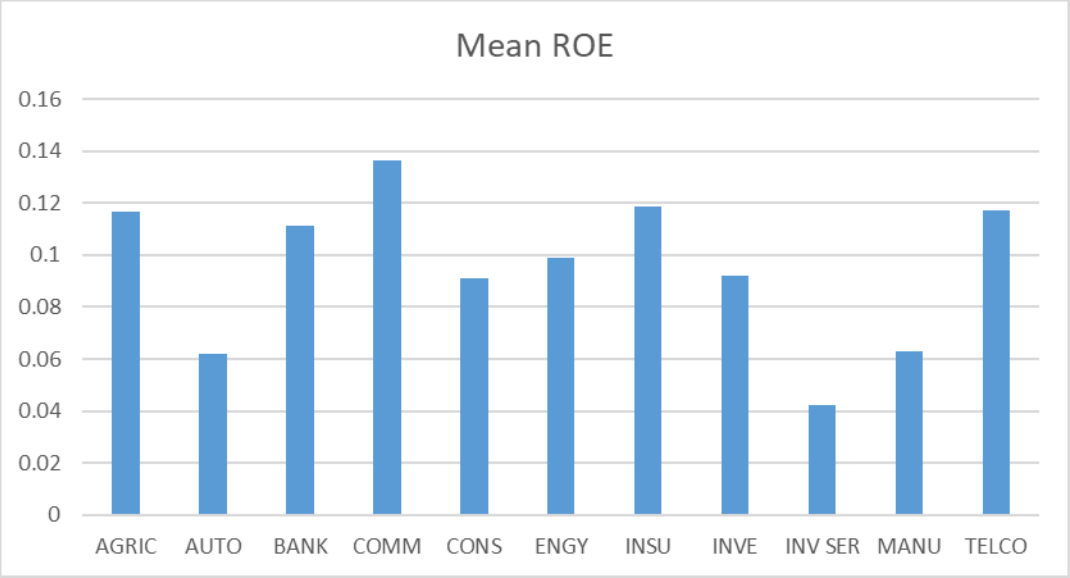

Figure 4.6: Sectoral Panel Means of ROE

Kurtosis and skewness values from 4.11 reflect that the statistics fall within the acceptable range for consideration as normal distribution. This is likely because the data covers a long period of time over multiple segments providing 540 firm year observations. In line with what was done for the rest of the variables, coefficient of variation was used to relate the mean of ROE (a measure of central tendency) to the standard deviation of ROE (a measure of dispersion). The findings from table 4.11 show that the CV ranges from the lowest of 1.7225 for the Commercial and Services segment of NSE to the highest of 4.0231 for the Telecommunications Segment. The spread in the CV for ROE is not as wide as that reported for CR, OCFR, ICFR, FCFR and the IMFR.

Table 4.12: Overall NSE ROE Descriptive Statistics

Mean	0.10098
Median	0.03442
Standard Deviation	0.25124
Sample Variance	0.06312
Kurtosis	30.62482
Skewness	-0.80179
Range	4.41213
Confidence Level(95.0%)	0.02124

4.2.2 Time Series Descriptive Statistical Findings

Descriptive analysis of the data was also done of the various indicators of cash flows, market value and financial performance. The objective was to identify the trends in the variables over time for the 12 years that inform the study and applies to the annual means of the variables. The findings are indicated in table 4.13 and discussed in each of the subsequent figures 4.7 to figure 4.12.

Table 4.13: Time Series Descriptive Statistics

	Cap. Ratio	Mean OCFR	Mean ICFR	Mean FCFR	Mean IMFR	Mean ROE
2011	0.2465	0.1214	0.2926	0.1016	0.0453	0.2200
2012	0.0514	0.1056	0.0761	0.0850	0.1806	0.1926
2013	0.1217	0.1007	0.0942	0.0879	0.1465	0.1538
2014	0.1074	0.1614	0.1088	0.0781	-0.0371	0.1237
2015	0.3446	0.2282	0.1164	0.1216	0.0160	0.2224
2016	0.1319	0.1799	0.1208	0.0982	0.0759	0.2195
2017	0.1554	0.1023	0.1036	0.0894	0.0966	0.1659
2018	0.0087	0.0892	0.0907	0.0828	0.0632	0.1301
2019	0.2342	0.0924	0.1541	0.0885	0.1154	0.1667
2020	0.1044	0.2490	0.0376	0.3446	0.1383	0.1319
2021	0.2217	0.1956	0.1623	0.1544	0.0005	0.1376
2022	0.2463	0.2822	0.1659	0.2465	0.1080	0.1656

The first variable to be discussed is the mean of market capitalization over time. The capitalization is indicated by the capitalization ratio of the 45 qualifying sample companies. The series values are indicated in figure 4.7. The trend analysis shows that there was a bit of an enhanced volatility with the highest value of capitalization ratio being registered in the year 2015 and the lowest being recorded in the year the year 2019. The rest of the CR values for the overall market oscillate between these two extreme values. This is consistent with the market developments at the Nairobi Securities Exchange. There has been fluctuating levels in prices over the study period. This is expected as Black (2023) indicates that in a time series data, there is expected to be various categories of volatility. These are identified as trend values, cyclical variations, seasonal variations, short term volatilities as well as catastrophic and unexpected variations.

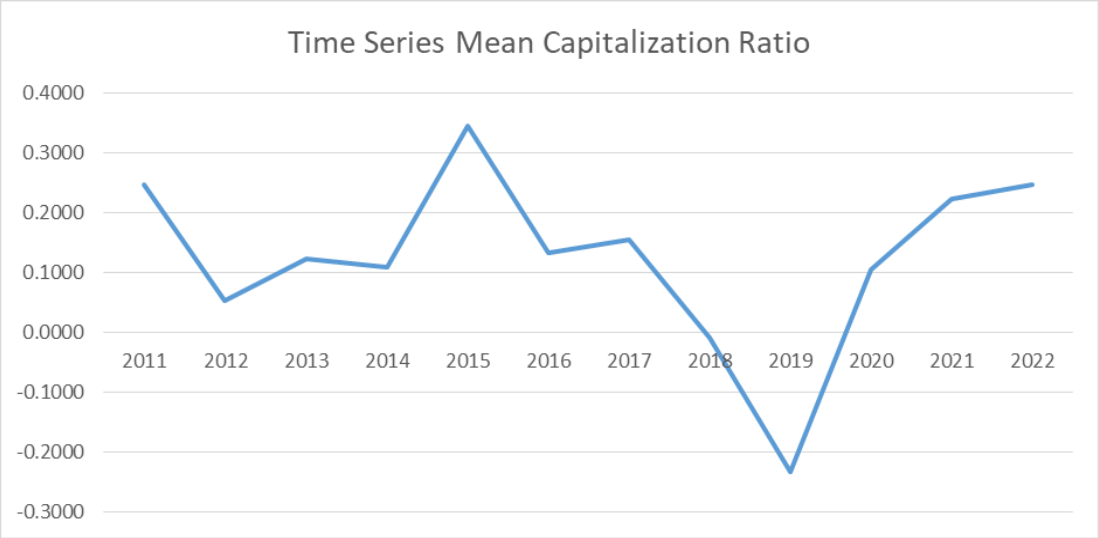

Figure 4.7: Time Series Trends of the Mean CR

The fluctuations in CR observed in CR as indicated in table 4.7 are also consistent with efficient market hypothesis of Fama (1970) and the random walk theory of Burton (1973) both of which predict fluctuations in market prices and therefore market values due to the random fashion in which market pricing information arrives at stock markets in general and in this particular case, the Nairobi Securities Exchange.

Trend analysis was also done for the operating cash flow ratio which was used in computing cash flow volatility ratio. The results are indicated in figure 4.8.

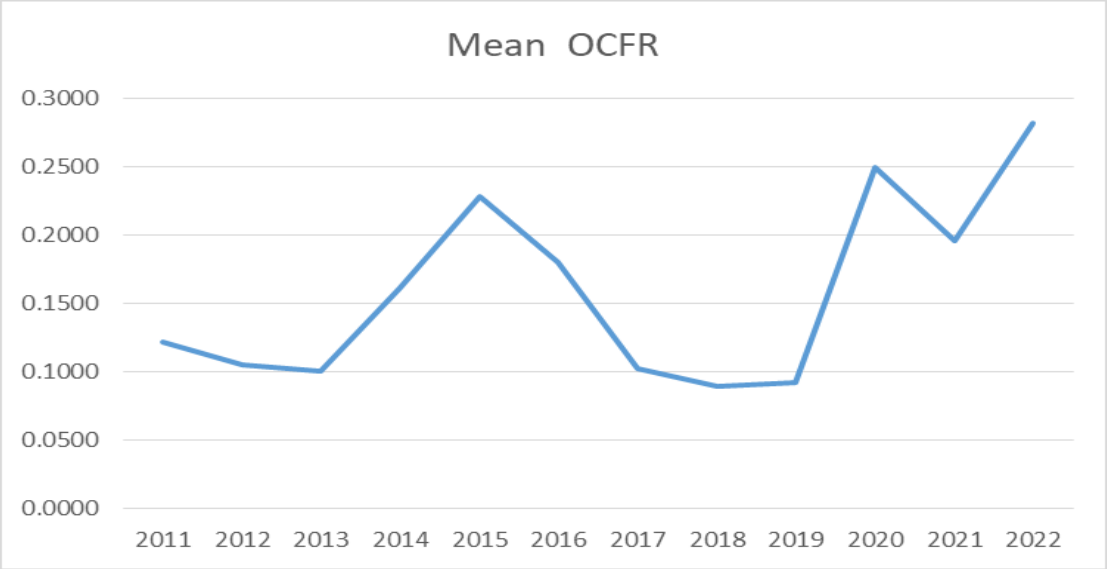

Figure 4.8: Time Series Trends of the Mean OCFR

Just like for the case of capitalization ratio, the figure 4.8 shows that there was marked volatility in OCFR. This again could be attributed to the elongated nature of the study period that covered a span of 12 years from January 2011 to December 2022. Over longer periods, Black (2023) suggests that time series data is expected to reflect trend, cyclical, seasonal, irregular and catastrophic variations.

The other indicator variable for which trend analysis was analyzed is investing cash flow ratio. The trend diagram is presented in figure 4.9.

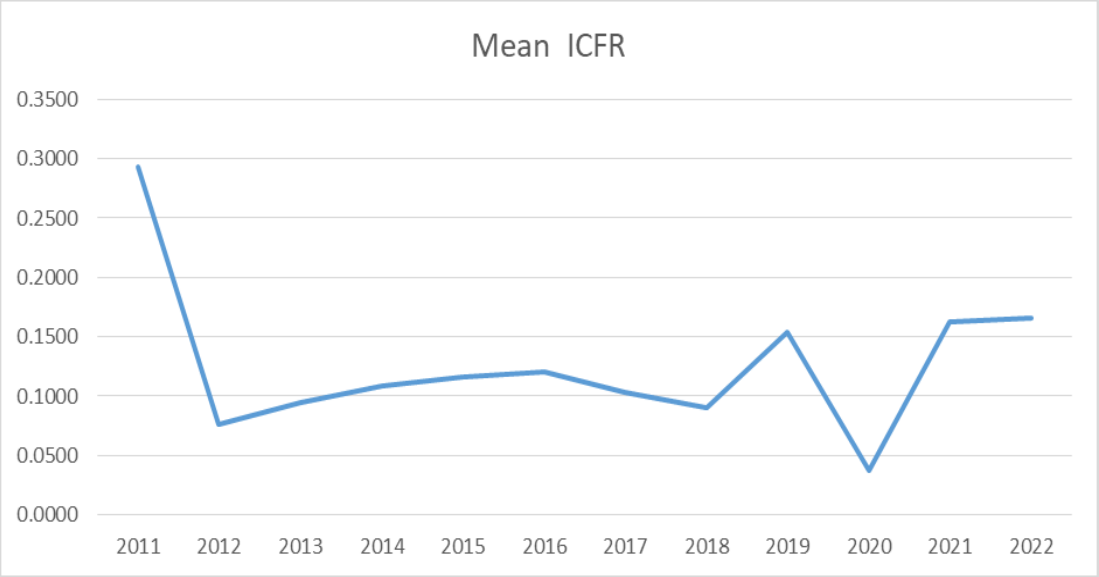

Figure 4.9: Time Series Trends of the Mean ICFR

The trends implied in figure 4.9 shows that outside of the years 2011 to 2012 and 2018 to 2021, the ICFR was relatively stable. This is confirmed by the range of the figures indicated in Table 4.13. The stability in the investing cash flow ratios could be attributed to the fact that firms listed at the Nairobi Securities Exchange possibly rely on investments in stable securities like the government treasury bills and government treasury bonds. This is consistent with the findings of Harunani (2020) who established that companies at the Nairobi Securities Exchange have a heavy level of investment government debt instruments both long term and short term.

Financing cash flow ratio was the other indicator of cash flows for which trend evaluation was done in this study as indicated in the figures shown in table 4.13 as well as the trend line that is established in figure 4.10.

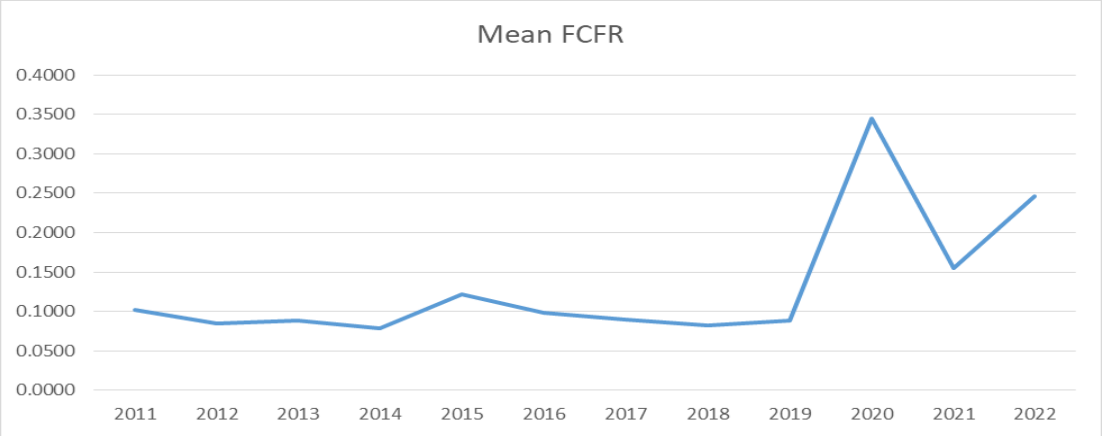

Figure 4.10: Time Series Trends of the Mean FCFR

The trend line indicated in figure 4.10 show that outside of the last four years of the study (2019 to 2022) the FCFR is relatively stable. This could be attributed to the fact that companies tend to have stable capital structures over an elongated period of time given that ordinary share capital and debt are often relatively stable over long periods of time (Hillier, Ross, Westerfield & Jordan, 2019).

With respect to the trend values of the implicit cash flows, the trend line is provided in figure 4.11.

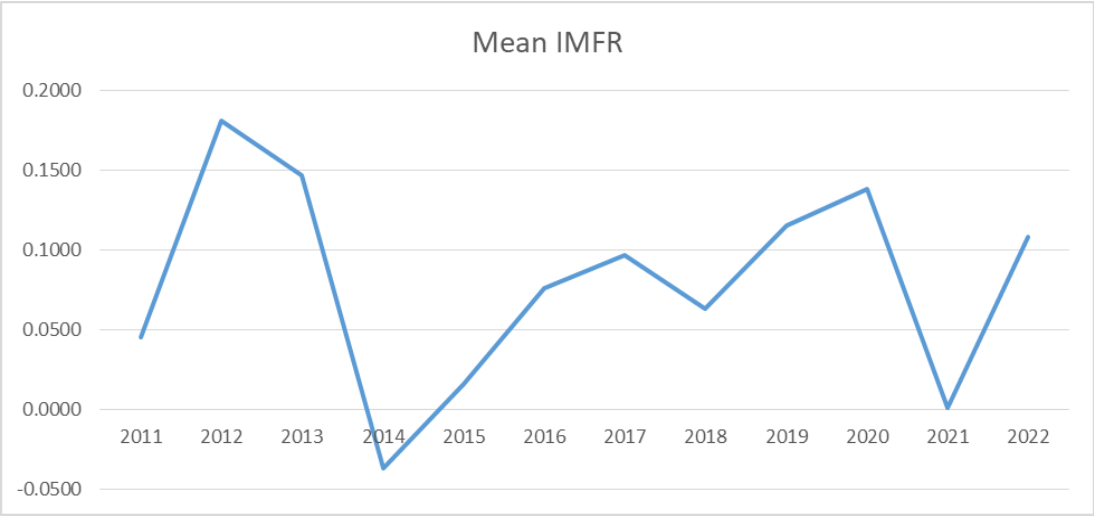

Figure 4.11: Time Series Trends of the Mean IMFR

Unlike the trend values for financing cash flow ratio, the trend line for IMFR shows a quite some volatile values of the 2011 to 2022 study period. The lowest values are registered in 2014 while the highest values are recorded in the year 2012. The rest of the IMFR values fluctuate between these two extreme values. This could be attributed to the act that implicit cash flows are affected by the accounting policies of the reporting firms. Since they involve non-cash incomes and expenses like depreciation, amortization and depletion, it is possible that that different accounting policies adopted by the 45 firms used in the study influenced the overall mean values over time. This is in line with Oluoch (2014) who suggests that accounting policies with respect to depreciation, amortization and depletion vary from straight line, reducing balance, sum of years digits, to productivity. These affect implicit cash flows in varying ways.

The moderating variable of the study was financial performance as measured by return on equity (ROE). The trend values for return on equity are indicated in table 4.13 and figure 4.12.

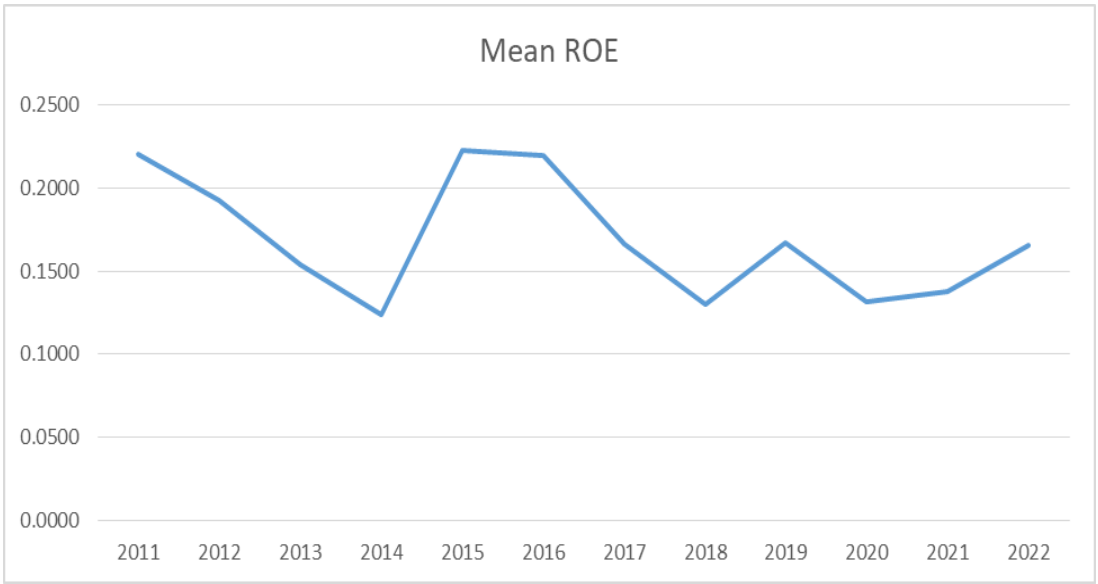

Figure 4.12: Time Series Trends of the Mean ROE

The trends indicated in figure 4.12 shows an enhanced level of volatility over the 12-year period spanning January 2011 to December 2022. This enhanced level of volatility could be attributed to the fact that the study period is long enough to ensure that trend, cyclical, seasonal, irregular and catastrophic variations can be established. This is in line with the fact that companies at NSE have exhibited quite a high level of profitability as confirmed by Harunani (2020). In any case, there are 11 segments of the NSE each of which have different performance levels and this is reflected in the volatility indicated in the ROE trend curve in figure 4.12.

4.2.3 Descriptive Statistics Cash Flow Volatility

Cash flow volatility is used as the generic indicator of the independent variables of the study, the specific ones being operating cash flow volatility; investing cash flow volatility; financing cash flow volatility and implicit cash flow volatility. Just like their parent measures of operating, investing, financing and implicit cash flows, this subsection provides the descriptive statistics for these measures for each of the 11 segments of the NSE and then again for the overall values of the entire market over the 450 qualifying firm year observations. Although originally set at 540 firm year observations, computation of 3-year moving standard deviations for volatility automatically eliminates 2011 and 2022 (the first and last years in the study). The segmental descriptive statistics for cash flow volatility are shown in tables 4.14, 4.15, 4.16 and 4.17 while the overall statistics for the entire market are revealed in table 4.18.

With respect to the volatilities of cash flows in the each of the 11 segments listed at the NSE, the first of the measures is segmental operating cash flow ratio volatility as shown in table 4.14a.

Table 4.14a. Segmental Operating Cash Flow Ratio Volatility Descriptive Statistics

OCFRV	*AGRIC*	AUTO	BANK	COMM	CONS	ENGY	*INSU*	*INVE*	*INV SER*	*MANU*	*TELCO*
Mean	0.1437	0.0717	0.1098	0.0774	0.2844	0.0897	0.0922	0.1620	0.1480	0.0763	0.1472
Median	0.1114	0.0639	0.0808	0.0564	0.2684	0.0695	0.0867	0.1589	0.1509	0.0666	0.1304
Std Dev	0.1224	0.0477	0.1028	0.0755	0.5551	0.0735	0.0949	0.2340	0.0875	0.0785	0.2012
Sample Var	0.0150	0.0023	0.0106	0.0057	0.3081	0.0054	0.0090	0.0547	0.0077	0.0062	0.0405
CV	0.8520	0.6651	0.9360	0.9754	1.9520	0.8192	1.0290	1.4443	0.5917	1.0297	1.3661
Kurtosis	0.9027	-0.890	0.6636	1.0970	3.2176	-1.208	1.6734	2.0392	-1.9826	3.9065	-0.6133
Skewness	1.1995	0.0822	1.2411	2.6712	2.7856	0.5296	1.5475	1.8269	-0.0729	1.6691	1.1663
Range	0.4698	0.1431	0.4135	0.4757	2.4225	0.2289	0.3645	0.7507	0.2168	0.3950	0.4910
Sigf	0.0348	0.0341	0.0215	0.0180	0.1578	0.0274	0.0303	0.0874	0.0626	0.0203	0.1439

The findings from table 4.14a reveal that the highest mean volatilities of operating cash flows as represented by the 3 year rolling standard deviation of the operating cash flow ratio is the construction industry which reports a mean of 0.2844 followed by the Investments Sector with a mean of 0.1480. The least volatile are the Automobiles and Manufacturing segments as indicated in figure 4.13.

Table 4.14b: Overall NSE Operating Cash Flow Ratio Volatility Descriptive Statistics

NSE OCFRV	
Mean	0.124875
Median	0.064467
Standard Deviation	0.220596
Sample Variance	0.048663
CV	1.766535
Kurtosis	3.297580
Skewness	2.459029
Range	2.425840
Confidence Level (95.0%)	0.020437

The findings indicate an overall mean of 0.124875 and a standard deviation of 0.220596. This translates to a coefficient of variation of 0.220596 indicating a low level of variability in the volatility of the cash flows emanating from operating activities for firms listed at the Nairobi Securities Exchange. This data is also reflected in figure 4.13.

The other measure of central tendency is the median and table 4.14a indicates that the mean and median values of OCFRV are close to each other for all the 11 segments of the NSE an indicator of normal distribution over the 450 firm year and 110 segment-year observations. This can be confirmed from checking the Kurtosis and Skewness values all of which range in the -3 to +3 and -1 to +1 respectively, confirmation the approximate Gaussian distribution of OCFRV around the respective segmental means over the reported standard deviations. As far as the measures of dispersion are conserved, variance as converted to standard deviation was used.

For common size evaluation, a relative measure called coefficient of variation that related the standard deviation to the mean was used. The results in table 4.14b show that the most volatile OCFRV is reported in the construction sector while the least is exhibited the Investment Services segment. This may be attributed the idiosyncratic industry factors in the respective segments of the NSE.

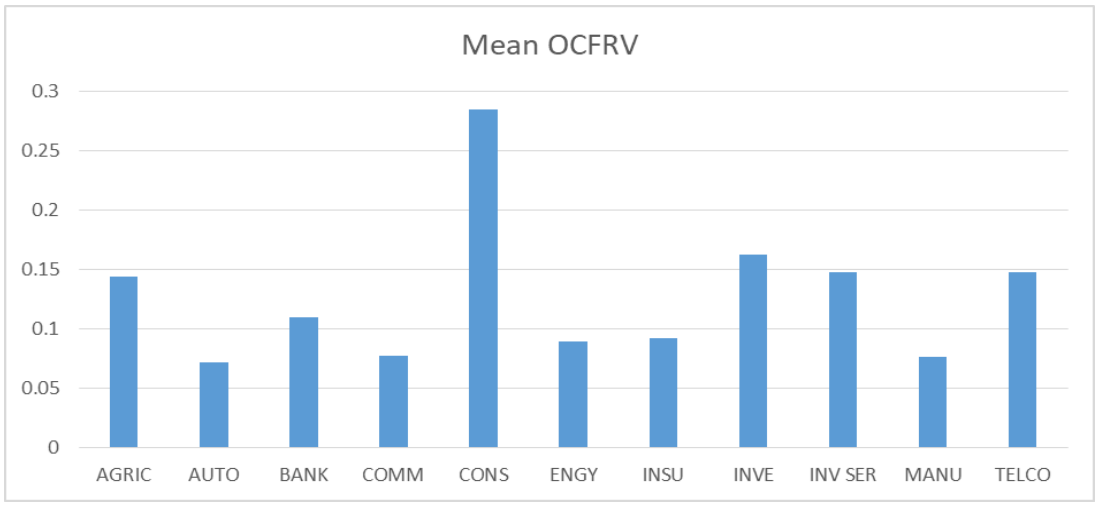

Figure 4.13: Sectoral Panel Means of OCFRV

The second independent variable in the study is investing cash flows volatility as measured by the investing cash flow ratio volatility. The central tendency, dispersion and distribution descriptive statistical findings for all the 11 segments of the NSE over the study period are reported in table 4.15. The comparative segmental mean values of ICFRV are indicated in figure 4.14

Table 4.15: Segmental Investing Cash Flow Ratio Volatility Descriptive Statistics

ICFRV	*AGRIC*	AUTO	BANK	COMM	CONS	ENGY	*INSU*	*INVE*	*INV SER*	*MANU*	*TELCO*
Mean	0.0588	0.5578	0.0754	0.1278	0.1769	0.1832	0.0629	0.0896	0.1343	0.0875	0.2411
Median	0.0348	0.0538	0.0556	0.0755	0.1025	0.0434	0.0379	0.0458	0.0571	0.0398	0.0396
Std Dev	0.0578	1.3610	0.1001	0.1308	0.2220	0.2525	0.0759	0.0896	0.1774	0.0959	0.3434
Sample Var	0.0033	1.8524	0.0100	0.0171	0.0493	0.0637	0.0058	0.0080	0.0315	0.0092	0.1179
CV	0.9826	2.4402	1.3278	1.0232	1.2549	1.3783	1.2063	1.0003	1.3208	1.0954	1.4243
Kurtosis	2.0679	9.7448	47.0001	2.3434	7.9000	1.9826	2.6207	3.0777	1.3133	0.2578	-0.8239
Skewness	1.5443	3.1083	6.0588	1.6724	2.8121	1.6893	1.9373	1.8065	1.7191	1.3399	1.1209
Range	0.2356	4.3893	0.8766	0.5454	0.9629	0.8233	0.2779	0.3382	0.4698	0.3117	0.7912
Sigf	0.0164	0.9736	0.0210	0.0312	0.0631	0.0943	0.0243	0.0335	0.1269	0.0248	0.2457

The figure 4.15 clearly illustrates the mean of ICFRV falls within a range of 0.0588 for the Agricultural sector to 0.5578 for the Automobile segment of the NSE. The median values fall within the range of 0.0348 and 0.5380 for these respective sectors. Moving to the measures of dispersion, the standard deviation as coverted from the variance, the least value for standard deviation is recorded by the Agricultural Segment (0.0578) while the highest is registered by the Automobile Segment (1.3610). The overall descriptive statistics for all the companies listed at the NSE over the study period wth respect to te volatility of the cash flows from investing activities are reflected in table 4.15b.

Table 4.15b: Overall NSE Investing Cash Flow Ratio Volatility Descriptive Statistics

	ICFRV
Mean	0.11741
Median	0.10539
Standard Deviation	0.25168
Sample Variance	0.06334
CV	2.14368
Kurtosis	1.42461
Skewness	1.76077
Range	4.41187
Count	450
Confidence Level (95.0%)	0.02332

The other measure of central tendency is the median and table 4.15b indicates that the mean and median values of OCFRV are close to each other for all the segments of the NSE an indicator of normal distribution over the 450 firm year and 110 segment-year observations. This can be confirmed from checking the Kurtosis and Skewness values all of which range in the -3 to +3 and -1 to +1 respectively, confirmation the approximate Gaussian distribution of OCFRV around the respective segmental means over the reported standard deviations. As far as the measures of dispersion are conserved, variance as converted to standard deviation was used.

For common size evaluation, a relative measure called coefficient of variation that related the standard deviation to the mean was used. The results in table 4.15 show that the most volatile OCFRV is reported in the construction sector while the least is exhibited the Investment Services segment. This may be attributed the idiosyncratic industry factors in the respective segments of the NSE.

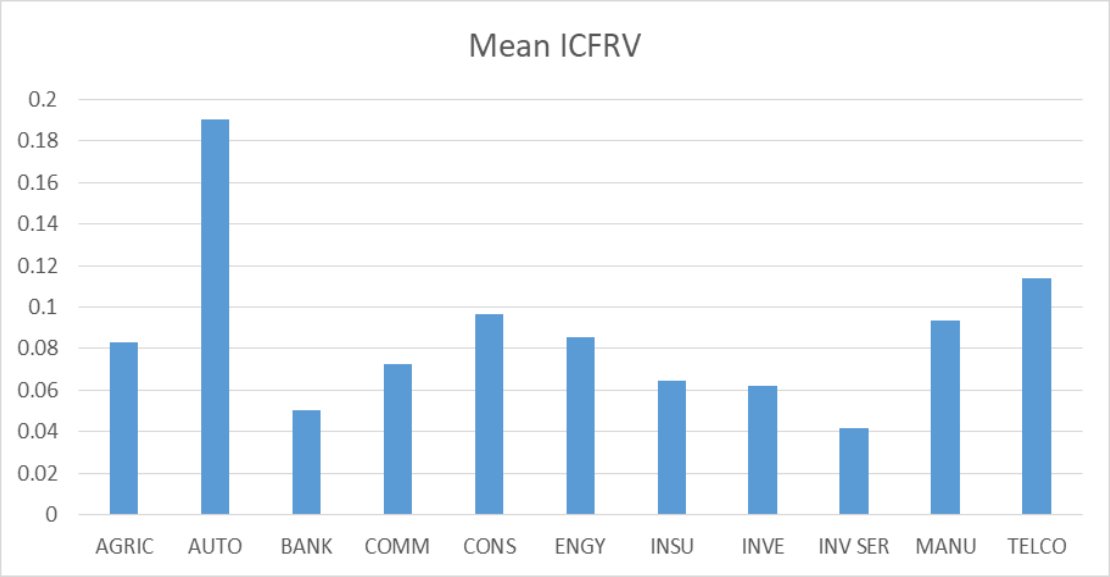

Figure 4.14: Sectoral Panel Means of ICFRV

The Kurtosis and Skewness measures of distribution fall within the accepted range for normality for each of the 11 segments of the NSE. Coefficient of variation is used to gause the reative dispersion by comparing standard deviation to the respective mean hence providing relative volatility. Just like for the raw indicators of central tendency and dispersion, the most volatile sement of the NSE in terms of ICFRV is the Automobile segment with a CV of 2.4402 while the least volatile is the Agricultural Segment with a CV of 0.9826.

The penultimate independent variable for whose descriptive analysis of segmental volatility was the financing cash flow volatility as indicated by financing cash flow ratio volatility (FCFRV). The findings are reported in table 4.16.

Table 4.16: Segmental Financing Cash Flow Ratio Volatility Descriptive Statistics

FCFRV	*AGRIC*	AUTO	BANK	COMM	CONS	ENGY	*INSU*	*INVE*	*INV SER*	*MANU*	*TELCO*
Mean	0.0828	0.1901	0.0504	0.0728	0.0966	0.0855	0.0643	0.0622	0.0417	0.0937	0.1136
Median	0.0982	0.1734	0.0527	0.0626	0.0856	0.0876	0.0608	0.0690	0.0495	0.0870	0.1080
Std Dev	0.0751	0.1517	0.0705	0.1170	0.1287	0.1032	0.0762	0.1030	0.0568	0.1261	0.1180
Sample Var	0.0056	0.0230	0.0050	0.0137	0.0166	0.0106	0.0058	0.0106	0.0032	0.0159	0.0139
CV	0.9069	0.7980	1.3993	1.6069	1.3330	1.2068	1.1844	1.6552	1.3605	1.3455	1.0388
Kurtosis	-0.407	-1.185	9.7664	2.4863	-1.032	-0.577	-0.224	2.7315	-1.2137	1.2288	-1.0249
Skewness	0.9747	0.4996	2.9497	1.8383	0.9402	1.0785	1.1300	1.9204	1.0283	1.4099	1.0081
Range	0.2590	0.4097	0.3707	0.4484	0.3362	0.2943	0.2549	0.3452	0.1240	0.4719	0.2938
Sigf	0.0213	0.1085	0.0148	0.0279	0.0366	0.0385	0.0244	0.0385	0.0406	0.0326	0.0844

The central tendency measures are indicated by the mean and the median. The variations in the mean FCFRV are indicated in figure 4.15 and also reflected in table 4.16b for the overall market position in as far as the volatility of cash flows from operating activities for firms listed at the NSE is concerned.

Table 4.16b: Overall NSE Financing Cash Flow Ratio Volatility Descriptive Statistics

	NSE FCFRV
Mean	0.086700
Median	0.084945
Std Dev	0.102391
Sample Var	0.011264
CV	1.257755
Kurtosis	0.959036
Skewness	1.343427
Range	0.328009
Sigf	0.042555

The overall descriptive statics indicate that the mean FCFRV for companies listed at the NSE is 0.086700 while the standard deviation is 0.102391. This translates into a coefficient of variation of 1.257755. This indicates that the volatility in financing cash flows is less enhanced than the one reported for the operating cash flows (1.766535) and the investing cash flows (2.14368). But similar to the volatility in the operating and the financing cash flows, the measures of skewness and kurtosis indicate that the financing cash flow ratio volatility is normally distributed since the data falls in the parameters prescribed by Gujarati (2022).

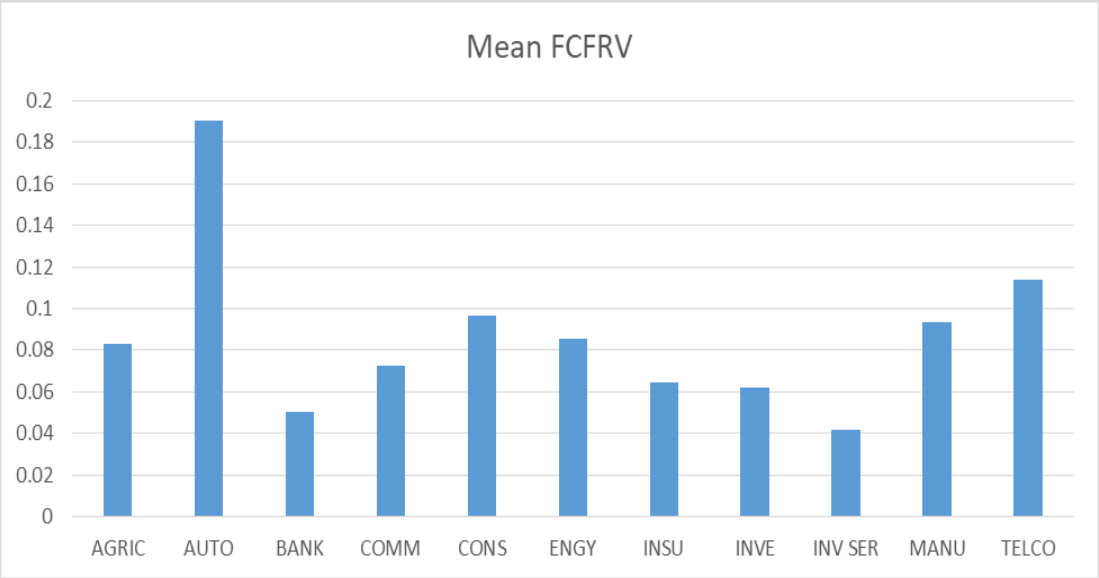

Figure 4.15: Sectoral Panel Means of FCFRV

The findings from table 4.16a reveal that the highest mean volatilities of operating cash flows as represented by the financing cash flow ratio is the Automobile industry which reports a mean of 0.1901 followed by the Telecommunications Sector with a mean of 0.1136. The least volatile are the Banking and Investments Services segments as indicated in figure 4.15. The other measure of central tendency is the median and table 4.16 indicates that the mean and median values of FCFRV are close to each other for all the 11 segments of the NSE an indicator of normal distribution over the 450 firm year and 110 segment-year observations. This can be confirmed from checking the Kurtosis and Skewness values all of which range in the -3 to +3 and -1 to +1 respectively, confirmation the approximate Gaussian distribution of

FCFRV around the respective segmental means over the reported standard deviations. As far as the measures of dispersion are conserved, variance as converted to standard deviation was used. For common size evaluation, the coefficient of variation is used shows that the Commercial and Services Segment of the NSE reported the highest CV of 1.6069 followed by the Banking Segment with 1.3993. On the other extreme end, the Automobile Segment with a CV of 0.7980 and the Agricultural segment with a CV of 0.9069 reported the two lowest relative volatilities of FCFRV out of the 11 segments of the NSE.

The last independent variable in the study is implicit cash flow volatility as measured by the implicit cash flow ratio volatility (IMFRV). The central tendency, dispersion and distribution descriptive statistical findings for all the 11 segments of the NSE over the study period are reported in table 4.17. The comparative segmental mean values of IMFRV are indicated in figure 4.16

Table 4.17: Segmental Implicit Cash Flow Ratio Volatility Descriptive Statistics

IMFRV	*AGRIC*	AUTO	BANK	COMM	CONS	ENGY	*INSU*	*INVE*	*INV SER*	*MANU*	*TELCO*
Mean	0.0963	0.0405	0.1059	0.1399	0.0812	0.1364	0.1401	0.0892	0.0968	0.0763	0.1605
Median	0.0774	0.0399	0.0875	0.1412	0.0738	0.1310	0.1023	0.0666	0.0626	0.0582	0.1894
Std Dev	0.1047	0.0141	0.0811	0.3047	0.0816	0.0878	0.1523	0.0748	0.0920	0.0885	0.0961
Sample Var	0.0110	0.0002	0.0066	0.0928	0.0067	0.0077	0.0232	0.0056	0.0085	0.0078	0.0092
CV	1.0869	0.3476	0.7655	2.1772	1.0049	0.6433	1.0871	0.8390	0.9503	1.1607	0.5989
Kurtosis	0.8389	1.3188	2.0506	15.5308	0.2869	2.6657	0.0032	6.0357	-1.0366	9.0709	-1.3957
Skewness	1.4197	-0.102	1.3771	3.9352	1.1802	1.3855	1.2073	2.0783	0.8443	2.8589	-0.3890
Range	0.3595	0.0528	0.3741	1.6105	0.3028	0.3828	0.5118	0.3620	0.2450	0.4213	0.2572
Sigf	0.0297	0.0101	0.0170	0.0727	0.0232	0.0328	0.0487	0.0279	0.0658	0.0229	0.0688

The figure 4.16 clearly llustrates the mean of IMFRV falls within a range of 0.0405 for the Automobile sector to 0.1605 for the Telecomminications segment of the NSE. The median values fall within the range of 0.0399 and 0.1894 for these respective sectors. Moving to the measures of dispersion, the standard deviation as coverted from the variance, the least value for standard deviation is recorded by the Automobile Segment (0.0141) while the highest is registered by the Commercial and

Services Segment (0.3047). The overall descriptive statistuical findings are indicated in table 4.17b

Table 4.17b: Overall NSE Implicit Cash Flow Ratio Volatility Descriptive Statistics

NSE IMFRV	
Mean	0.093336
Median	0.081718
Std Dev	0.099082
Sample Var	0.0156
CV	0.910736
Kurtosis	2.973045
Skewness	1.31
Range	0.408818
Sigf	0.035164

The findings in table 4.17b indicate that the mean of IMFRV is 0.093336 while the standard deviation of the same is 0.099082. This translates into a CV equivalent to 0.910736. Among all the independnet variables, the CV attribted to IMFRV is the lowest meaning that on average, implicit cash flows portray the least fluctuactations among the companies listed at the NSE. These parameters are also indicated in figure 4.16.

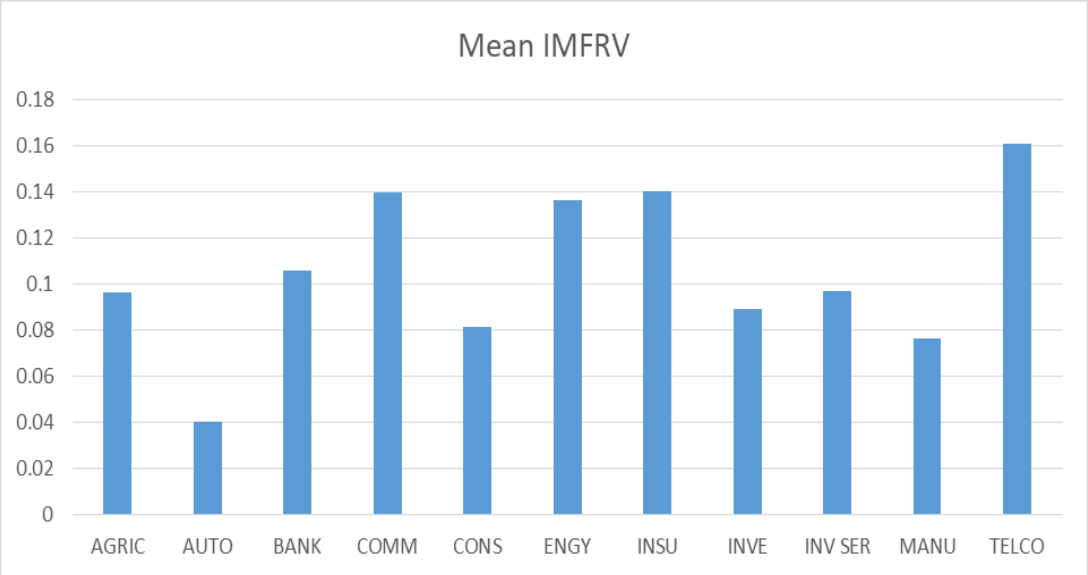

Figure 4.16: Sectoral Panel Means of IMFRV

The Kurtosis and Skewness measures of distribution fall within the accepted range for normality for each of the 11 segments of the NSE. Coefficient of variation is used to gause the reative dispersion by comparing standard deviation to the respective mean hence providing relative volatility. Just like for the raw indicators of central tendency and dispersion, the most volatile sement of the NSE in terms of IMFRV is the Commercial and Services Segment with a CV of 2.1772 while the least volatile is the Automobile Segment with a CV of 0.3476.

Apart from the segmental analysis, descriptive statistical analysis was also done on an overall basis for all the qualifying 45 firms in the study. The independent variables of the study were operating cash flow volatility; investing cash flow volatility; financing cash flow volatility and implicit cash flow volatility. The overall twelve-year and 45-firm volatility descriptive statistics for these variables as measured by the cash flow ratio volatility are indicated in table 4.18.

The first independent variable relates to the volatility in the operating cash flows of listed companies at the NSE as indicated by operating cash flow ratio volatility (OCFRV). Table 4.18 indicates that the mean value of this three-year moving standard deviation of the variable is 0.12488. Besides the mean, the other indicator of central tendency for the variables used in the study is the median. This shows a value

of 0.11447 which is very close to the mean value portraying an element of normal distribution. This can be confirmed by the evaluation of both Kurtosis and Skewness that have respective values of 3.29758 and 1.45903 that approximate Gaussian distribution.

Table 4.18: Overall NSE Cash Flow Ratio Volatility Descriptive Statistics

	OCFRV	ICFRV	FCFRV	IMFRV
Mean	0.12488	0.11733	0.07706	0.10695
Median	0.11447	0.10386	0.07454	0.09829
Standard Deviation	0.22060	0.25171	0.10434	0.14992
Sample Variance	0.04866	0.06336	0.01089	0.02248
Coefficient of Variation	1.76650	2.14532	1.35401	1.40178
Kurtosis	3.29758	1.34799	1.81486	3.82312
Skewness	1.45903	1.05741	1.62767	1.71860
Range	2.42584	4.41187	0.47240	1.61060
Confidence Level (95.0%)	0.02044	0.02332	0.00967	0.01389

To evaluate the indicator of dispersion, a composite measure that combines standard deviation and mean is used in the study. Table 4.18 provides a coefficient of variation (CV) of the OCFRV as 1.76650. This shows that operating cash flows are the second most volatile cash flows besides the investing cash flows. This could be attributed to the fact that operations are the life blood of any business and that any changes in the operating environment is likely to have great impact on the cash flows from operations. In line with Grinn, Tausch and Korotayev (2016), a long period of analysis (in this case, 12 years), is bound to have high volatilities in economic parameters as indicated by trends, cyclical variations, seasonal variations, random variations as well as catastrophic changes.

The second independent variable of the study was the volatility in the investing cash flows of companies listed at the NSE. For the 12 qualifying years (leading to 10 years of 3-point moving standard deviation) and the 45 qualifying firms, the

descriptive statistics of the 450 firm-year observations for investing cash flow ratio volatility -ICFRV (the indicator of the investing cash flow volatility) are displayed in table 4.18. The indicators of central tendency being the mean and the standard deviation showed values of 0.11733 and 0.10386. Although the mean is slightly higher than the median, the Kurtosis and Skewness measures of distribution reveal values of 1.34799 and 1.05741 indicating that the data is approximately normally distributed. The variable registered the highest volatility level among the cash flow ratios posting a standard deviation of 0.25171 and a coefficient of variation of 2.14532. This may be a pointer that the investing cash flows of firms listed at the NSE experience a relatively higher level of uncertainty compared to the other types of cash flows.

The second last independent variable relates to the volatility in the financing cash flows of listed companies at the NSE as indicated by financing cash flow ratio volatility (FCFRV). Table 4.18 indicates that the mean value of this three-year moving standard deviation of the variable is 0.07706. This is the lowest mean volatility among all the cash flow ratio volatility values. This may be due to stable dividend policies and capital structures of companies at the NSE as suggested by Aduda and Kimathi (2011). The findings also report a median value of 0.0.07454 for FCFRV showing a marginal skewness to the left. Checking Kurtosis and skewness however confirms that the skewness falls within the acceptable range of normality. This is because the respective skewness and kurtosis values for the volatility indicator are 1.62767 and 1.81486 which in line with Black (2023) implies that the distribution approximates Gaussian distribution. Table 4.18 provides a coefficient of variation (CV) of the FCFRV as 1.35401. This shows the lowest level of mean volatility as a ratio of the average of the FCFRV which falls in line with the findings reflected by Aduda and Kimathi (2011)

The ultimate independent variable of the study was the volatility in the implicit cash flows of companies listed at the NSE. For the 450 firm-year observations for implicit cash flow ratio volatility -IMFRV (the indicator of the implicit cash flow volatility) are displayed in table 4.18. The indicators of central tendency being the mean and the standard deviation showed values of 0.10695 and 0.09829. Although the mean is

marginally higher than the median, the Kurtosis and Skewness measures of distribution reveal values of 3.82312 and 1.71860 indicating that the data is approximately normally distributed they fall in the ranges asserted by Black (2023). The variable registered the second lowest volatility level among the cash flow ratios posting a standard deviation of 0.14992 and a coefficient of variation of 1.40178. This may be a pointer that the implicit cash flows of firms listed at the NSE experience a relatively low to moderate level of uncertainty compared to the other types of cash flows of firms listed at that bourse.

4.3 Inter-Sectoral Differences in Variables

Cash flow volatility is a risk factor for businesses and if it should be priced by capital markets and thereby influence firm market value in the stock market. In this study it was critical to establish if the variables for each of the 10 qualifying segments of the NSE have market values, cash flow volatilities and financial performance that were independent of each other on a time series and cross-sectional basis. To undertake this, Sectoral analysis of variances (ANOVA) based on F-test was undertaken. The null hypotheses in this case are that the each of the variables were not significantly different from those in the rest of the 11 segments. The findings are provided in this sub-section.

The first variable to be examined was the firm value as indicated by the capitalization ratio being the ratio of a firm's market capitalization to the market capitalization. For segmental purposes, the capitalization ratios of the firms making up each segment were summed up to form the segmental capitalization ratio. It was then tested to check if the various segments had significantly different sizes over the ten over the qualifying study period. The ANOVA findings are indicated in Table 4.19.

Table 4.19: Capitalization Ratio Inter-Sectoral ANOVA

Source of Variation	*SS*	*Df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	0.380159	10	0.04752	3.531905	0.001492	1.927679
Within Groups	1.089813	99	0.013454			
Total	1.469972	109				

The findings reveal that the critical F-value at 0.05 level of significance was 1.927679 while the study F for the 11 segments was 3.531905. In line with Black (2023), when the data F is greater than the critical F, it suggests that the groups of data under evaluation are significantly different from each other. Accordingly, the null hypothesis that the 11 segments of the NSE have similar sizes as measured by capitalization ratio is rejected and it is concluded that they are of varying sizes hence size is a viable independent variable for analysis. This is a critical conclusion given that Duy and Phuoc (2016) agree with Banz (1981) before them on the existence of a size effect where smaller capitalization firms on average out-perform large capitalization firms at least in terms of risk adjusted market returns.

The second variable that was tested to check if each of the various segments of the NSE had unique volatilities was the fluctuations in the cash flows from operations as measured by the operating cash flows ratio volatility computed on a 3-year moving standard deviation basis. The ANOVA findings are indicated in Table 4.20. The findings in the table are significant given that the P-value of 0.007822 is less than the critical value 0f 0.05 at the 95% confidence interval.

The null hypothesis that there are no remarkable differences in the level of volatilities in the cash flows from operations of the various segments of the NSE is rejected given that the computed F value of 2.841685 is greater than the critical F value of 1.927679. The conclusion is that each of the 10 segments of the NSE is unique with respect to the generation of cash flows from operations and OCFRV becomes a dependent variable worth pursuing.

Table 4.20: OCFRV Inter-Sectoral ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	0.340509	10	0.042564	2.841685	0.007822	1.927679
Within Groups	1.213243	99	0.014978			
Total	1.553752	109				

This is crucial because Babenko et al. (2016) had confirmed that cash flow shocks and volatility are a market priced risk factor. They should therefore be able to influence market share prices and therefore firm market capitalization given that firm capitalization is the product of firm stock market price per share and the total number of outstanding shares for the firm.

The second dependent variable that was evaluated in terms of whether each of the 11 segments of the NSE had unique attributes was the volatilities in the cash flows from investing activities. This was indicated by the investing cash flow ratio volatility as measured on a 3-year standard deviation basis. The ANOVA findings are reflected in Table 4.21.

Table 4.21: ICFRV Inter-Sectoral ANOVA

Source of Variation	*SS*	*df*	*MS*	*F*	*P-value*	*F crit*
Between Groups	0.091277	10	0.01141	3.166657	0.003586	1.927679
Within Groups	0.291846	99	0.003603			
Total	0.383123	109				

The results in Table 4.21 reveal that the computed P-value is 0.003586.basis. This indicates that the values are statistically significant given that this output value is less than the critical value of 0.05 at 95% confidence interval. Black (2023) suggests that the values become statistically significant when the computed P-value is less than the significance value given the specified confidence interval. With this conclusion, it is

now logical to compare the computed F against the critical F values which are 3.166657 and 1.927679 respectively. In line with Black (2023) assertion as to when various groups have idiosyncratic characteristics, it is hereby concluded that he notion of the volatilities of the various segments have homogenous volatilities of investing cash flows is rejected. The volatilities of cash flows from investing activities as indicated by the investing cash flow ratio volatility (ICFRV) is separately unique. Cash flow shocks being a stock market priced factor as concluded by Babenko et al. (2016) makes ICFRV a viable study independent variable for this study.

Apart from evaluating the segmental idiosyncratic attributes of cash flows from operating activities and those from investing activities, the third independent variable that was considered was the volatility of the cash flows from financing activities. This was measured by the financing cash flow ratio volatility (FCFRV) as measured on a 3-year moving standard deviation of the cash flows from operating activities as a ratio of the total sum of cash flows of the firms listed at the NSE. Again, ANOVA was used to check if the ten sets of FCFRV reflecting the 11 segments of the NSE over the study period were significantly different from one another. The findings are reported in Table 4.22.

Table 4.22: FCFRV Inter-Sectoral ANOVA

Source of Variation	***SS***	***df***	***MS***	***F***	***P-value***	***F crit***
Between Groups	0.07538	10	0.009423	2.321962	0.026882	1.927679
Within Groups	0.328699	99	0.004058			
Total	0.40408	109				

The first step is to check if the values are statistically significant. This in line with Black (2023) is done by checking the output p-value against the critical P-value at the analysis confidence interval and conclude that the variables are statistically significant if the computed p-value is less than the critical P-value. It is this conclusion that is arrived at in table 4.22 for FCRRV given that the output P-value of

0.026882 is less than 0.05 which is the critical P-value at the 95% confidence interval under which this study is done.

The null hypothesis in line with FCFRV for the various segments of the NSE was that there is no significant difference among the fluctuations of the cash flows from financing activities for the NSE segments and that FCFRV is homogenous for all the trading segments. This hypothesis was rejected given that the output F of 2.321962 is greater than the critical F of 1.927679. As Black (2023) suggests, the groups of variables exhibit varying attributes amongst themselves when the inter-group F ratio is greater than the critical value. This is a crucial finding for the NSE given that it can be compared with the findings of Yuliarti and Diyani (2018) had shown that financing cash flows had a significant effect of stock returns thereby stock prices and market capitalization for the Indonesian stock market. Their finding was however restricted to the pharmaceutical companies only that formed their study focus.

The last independent variable of this study was the volatilities in the implicit cash flows as measured by the 3-year moving standard deviation in the implicit cash flow ratio This provided the measure of IMFRV which is the implicit cash flow ratio volatility. The initial goal was to establish if the various segments of the NSE had heterogenous IMFRV. The null postulation was that the IMFRV of the various segments was homogenous and that that idiosyncratic aspects of IMFRV for the NSE segments are not there. Using ANOVA t test this postulation, the findings are shown in table 4.23.

Table 4.23: IMFRV Inter-Sectoral ANOVA

Source of Variation	***SS***	***df***	***MS***	***F***	***P-value***	***F crit***
Between Groups	0.101694	10	0.012712	3.212422	0.003213	1.927679
Within Groups	0.320521	99	0.003957			
Total	0.422215	109				

The initial task is to check if the output in table 4.23 reflect statistically significant values at 0.05 level of significance which was adopted for this study. This as suggested by Black (2023) is done by comparing the output P-value against the established significance value and establish the values as statistically significant when the computed P-value is less than that level of significance. From Table 4.23, this comes out to be the case since the output P-value of 0.003213 is less than 0.05 critical P-value at the 95% confidence interval. Having established this, the null hypothesis of the homogeneity of segmental IMFRV is tested by comparing the critical F against the output F. The null hypothesis is rejected with the conclusion that each of the segments of NSE has unique variations in fluctuations in implicit cash flows given that the computed F is greater than the critical F, the values that are 3.21242 and 1.927679 respectively. This is consistent with the intuitive expectations given that various types of institutions have varying operating models and as Nguyen and Nguyen (2020) established, the cash flow patterns of banks and other financial institutions have unique patterns when weighed against the cash flow patterns of non-financial institutions, particularly in Vietnam where the study was undertaken.

Outside of the capitalization ratio that measured the dependent variable of the study and the four independent variables of the study (OCFRV; CFRV; FCFRV and IMFRV), the intersectoral properties of financial performance of the companies listed in the various segments of the NSE was tested. This was based on Return on Equity (ROE) which represented the moderating variable used in this study. Just like for the preceding variables, it was necessary to check if the ROE values were unique for each of the various segments. ANOVA was used for this testing and the findings are indicated in Table 4.24.

Table 4.24: ROE Inter-Sectoral ANOVA

Source of Variation	***SS***	***df***	***MS***	***F***	***P-value***	***F crit***
Between Groups	0.516973	10	0.064622	2.168958	0.038422	1.927679
Within Groups	2.413302	99	0.029794			
Total	2.930275	109				

The output P-value in Table 4.24 is 0.038422. Since this study is done at 95% confidence interval, the critical P-value is 0.05. Following the assertion of Black (2023) that values are statistically significant when the output P-value is less than the critical P-value, the conclusion arrived at in this study is that the inter-segmental ROE for companies listed in the various segments of the NSE have unique patterns for each of the segments at least over the study period covered in this research. Having established the statistical significance of the differences in ROE for the various segments, the critical F of 1.927679 as indicated in table 4.24 was compared with the output F value of 2.168958. The result clearly points to the heterogeneity of the segmental ROEs given that the output F is greater than the critical F. This finding is confirmed by a multitude of studies that have related various variables to financial performance of firms listed at NSE (Mudanya & Muturi, 2018; Mutende et al., 2017; Momanyi et al., 2017; Aduda & Kimathi, 2011; among others). In fact Momanyi et al. (2017) demonstrated that cash flows have a positive effect on financial performance as measured by ROE of the firms listed at the NSE.

4.4 Correlation Analysis

Black (2023) reveals that correlation is an indicator of the degree of association among two or more variables and suggests that Pearson's coefficient of correlation is useful in measuring this associative relationship. He points out that the correlation coefficient varies from -1 when there is a perfect inverse relationship among the variables to +1 when there is a perfect positive direct relationship among the variables. Values closer to these two extremes exhibit strong negative and positive correlation respectively while values closer to zero exhibit weak corresponding correlation. Moderate correlation arises when the values are close to -0.5 and +0.5 for negative and positive degree of association respectively (Black, 2023).

For these study, six variables were considered. The dependent variable was the market value of companies listed at the Nairobi Securities exchange as measured by the capitalization ratio (CR). The independent variables were the volatilities of cash flows from operations, investing activities, financing activities and implicit cash flows. These were indicated by the volatility in the respective ratios measured by

standard deviation on a 3year moving basis. The moderator variable was the financial performance of the listed companies at the NSE as measured by Return on Equity (ROE). Correlation analysis was undertaken on these variables. The findings are provided in table 4.25.

Table 4.25: Correlational Analytical Statistical Findings

Variable	*CR*	*OCFRV*	*ICFRV*	*FCFRV*	*IMFRV*	*ROE*
CR	1					
OCFRV	-0.427837	1				
ICFRV	-0.235994	0.052035	1			
FCFRV	-0.183503	-0.128130	0.102943	1		
IMFRV	-0.097934	0.011097	0.019124	-0.067680	1	
ROE	0.496392	-0.098739	-0.013393	-0.220612	0.015438	1

The values in in Table 4.25 are statistically significant at 95% confidence interval. The first correlation association as indicated by the Pearson's coefficient of correlation is that between firm market value and the volatility of cash flows from operating activities. The findings from table 4.25 reveal that the correlation between CR and OCFRV is -0.427837. These indicates that there is a moderate negative correlation between the market value of a firm at NSE and the level of volatility in its cash flows from operating activities. The implication is that when the volatility of the operating cash flows is relatively high, the market value of the affected firm will correspondingly be relatively low and vice versa.

The negative correlation finding is in agreement with the findings of Huang (2009) who relying on standard deviations as has been done in this study showed that cash flow volatility is negatively associated with returns on a cross-sectional basis. The study related this phenomenon to other well established market effects like the size effect, the momentum effect and the value effect and showed that the effect could last for as long as five years. Though comparable, the difference with this study is that it divided the data into volatility deciles and made the comparisons. It also used

a different set of measurements for cash flows being the cash flow to sales ratio and the cash flow to book equity.

Table 4.25 also provides the findings as to the correlation between capitalization ratio and investing cash flow ratio volatility. This indicates that there is a weak negative correlation given that the Pearson's coefficient of correlation is indicated as -0.235994. This indicates that as volatility in investing cash flow increases, the value of a company is expected to reduce via reduced share prices at the Nairobi Securities Exchange. This finding seems to support the efficient market hypothesis of Fama (1970) which predicts that information whether positive or negative should end up being priced by the securities markets and therefore affect firm market capitalization. In this instance, volatility in investing cash flows is an indicator of risk which is negative news leading to the reduction in share prices and thereby the capitalization of the firms listed at the NSE.

The other finding from Table 4.25 is the correlation between the volatility of cash flows from financing activities as indicated by the FCFRV with firm market value as indicated by the capitalization ratio. Just like for the preceding case, there was a weak negative correlation between these two variables because the Pearson Coefficient of Correlation is-0.183503. The implication is that in a weak way, when the volatility of cash flows from financing activities increases, here is expected to be a weak decline in share prices of firms listed at the NSE and thereby a weak decline in the market value as indicated by firm market capitalization.

The establishment of a weak correlation between the volatility in financing cash flows and the market firm of the NSE listed firms could be explained in relation to the functional fixation theory of Sloan (1996) according to which, investors pay little attention to subtle financial information and instead focus their analytical attention on specific financial data like the net profit. In line with this argument, it is possible that investors at NSE focus on the analysis of the profits and losses of firms and possibly do not make much effort to evaluate other pricing risk factors, like in this case the volatility of cash flows from financing activities.

The last independent variable of the study was the volatility of the implicit cash flows that arise when taking into account non-cash items like depreciation. When correlation analysis was done to evaluate the degree of association between the implicit cash flow ratio volatility and the capitalization ratio, the table 4.25 reveals that there is a very weak, almost zero correlation between the two with a Pearson's correlation coefficient value of -0.097934. The implication of this finding is that a change in the volatility of implicit cash flows is associated with a very small reduction change in share prices of the companies listed at the NSE and therefore a very small reduction in the firm capitalization of those firms.

This weak correlation finding of the association between CR and IMFRV could also be explained in terms of the Sloan (1996) functional fixation theory in which investors are less discerning when evaluating financial statement information and that their behavioral and psychological biases are likely to make them to focus on readily obvious information like profitability while ignoring hidden information that can only be obtained through further analysis like implicit cash flows in general and the volatility of such cash flows in particular. This is intuitive because such information in not explicitly reported and more efforts is needed on the part of investor and financial analysts to make it available.

The moderator variable used in the study was financial performance as measured by return on equity (ROE). A correlation between this variable and firm market value as measured by firm capitalization ratio provided a Pearson's correlation coefficient of 0.496392. This is interpreted to mean that there is a moderate positive association between financial performance and firm value. In essence, as the financial performance of the firms listed at the NSE improves, so do the share prices and thereby the firm value as measured by firm market capitalization.

The finding of a positive correlation between firm value and financial performance of firms listed at the NSE is in agreement with what Ratri and Dewi (2017) had found for 60 companies listed in the Jakarta Islamic Index over the 2012 to 2014 period. In that market, just like at the NSE, good financial performance is associated with improved firm value and vice versa. This similarity in the findings could be

attributed to the fact that both bourses are located in developing and emerging companies and the sample sizes were almost similar. It is however noteworthy that in this study, ROE is used as an indicator of the moderation effect while in the Ratri and Dewi study, ROE was used as an outright independent variable.

The finding of a positive correlation between financial performance and firm value of companies listed at the NSE is in contradiction with that of Harahap (2020) who evaluated Cable Companies in Indonesia as listed on the Indonesia Stock Exchange. The findings from Harahap (2020) had revealed that Return on Equity had a negative effect on firm value and that high returns were associated with depressed market values. This contradiction could be unique to the 4 cable companies that were evaluated given that Efficient market hypothesis of Fama (1970) predicts that positive information should have a positive effect on share prices and thereby improve a firm's market value.

The findings that there is a positive correlation between the market value and financial performance of firms listed at the NSE is however in agreement with the expectations of the Miller and Modigliani (1961) value relevance theory which expects profitability to be positive associated with future cash flows and thereby firm market value. The findings also support the theoretical expectation of Fama (1970) is the famous efficient market hypothesis. Since the NSE has been found to be efficient in the weak form, the historical financial performance information is expected to boost share prices when there is an improvement in such performance. High share prices imply high market value as measured by the firm market capitalization.

4.5 Test for Normality

The first diagnostic test was establishing if the data reflected normal distribution. Shapiro-Wilk test was used in this case in addition the distribution measures of Skewness and Kurtosis that have been discussed under descriptive statistical findings in section 4.2. Gujarati (2022) suggests that the Shapiro-Wilk p-value should be compared with the level of significance, in this study 0.05, and the null hypothesis of non-normality be discarded if the out-value probability is greater than this critical

value. The SW findings for the six variables used in this study are provided in Table 4.26.

Table 4.26: Shapiro-Wilk SM Test for Normality

Variable	Sigf**	SW	P-Value
CR	0.05	0.912710	0.131210
OCFRV	0.05	1.907810	0.220814
ICFRV	0.05	2.832164	0.064321
FCFRV	0.05	3.296032	0.059273
IMFRV	0.05	1.824331	0.064996
ROE	0.05	1.367201	0.734001
Observations	450	-	-

The first variable tested for normality was the dependent variable of the study which was market value and, in this study, market value was measured using capitalization ratio (CR). The Shapiro-Wilk SW value for CR is 0.9127 while the corresponding p-value is 0.1312. Following Gujarati (2022), the indication is that size data over the study period for the 450 firm year observations is normally distributed since the p-value of 0.13 is greater than the significance value of 0.05 at the 95% confidence interval.

The second variable tested for normality was the first independent variable of the study which was the volatility in the cash flows from operations and, in this study, this was measured using Operating Cash flow Raio Volatility (OCFRVC). The Shapiro-Wilk SW value for OCFRV from table 4.26 is 1.9078 while the corresponding p-value is 0.2208. The null hypotheses that the operating cash flow ratio volatility data is not normally distributed is therefore rejected since the output p-value is greater than the significant P-value of 0.05. This is in line with the suggestion by Gujarati (2022) when dealing with such data.

The SW value for the second independent variable is 2.8322. This variable in this study is the volatility of the cash flows from investing activities whose proxy is ICFRV (investing cash flow ratio volatility). That the P-value of ICFRV of 0.06432 is greater than the significant value of 0.05 implies that the data in respect with ICFRV is normally distributed. This could be attributed to the large number of observations and the law of large numbers as suggested by Black (2023).

The second last independent variable is the volatility experienced in the cash flows from financing activities of companies listed at the Nairobi Securities Exchange. This variable was measured by FCFRV which is the financing cash flow ratio volatility measured by a 3-year moving standard deviation of the financing cash flow ratios. The SW for FCFRV is 3.2960 while the output p-value for this variable s 0.05927. It is concluded in line with Gujarati (2022) that FCFRV data over the 450 firm-year observations is normally distributed given that the output -value is greater than the significance value of 0.05.

The last independent variable of this study was implicit cash flow ratio volatility for the 45 qualifying companies listed at the Nairobi Securities Exchange over the 10 qualifying financial periods (from the 12-year study period because of the 3-year moving standard deviations, the 2011 and 2022 did not meet the moving period criterion). The SW for IMFRV is 1.82433 while the output p-value for this variable s 0.065. It is concluded in line with Gujarati (2022) that IMFRV data over the 450 firm-year observations is normally distributed given that the output -value is greater than the significance value of 0.05.

The study also had a moderating variable. In this case it was the financial performance of companies listed at the NSE as measured by Return on Equity (ROE). The null hypothesis for this value was that ROE for companies listed at the NSE is not normally distributed. This was checked against the Shapiro-Wilk test for normality and the findings from table 4.26 indicate that the SW from the data was 1.3672. This when evaluated from the Gujarati (2022) perspective shows that there is normal distribution in this data given that the output P-value of 0.7340 is greater than the critical P-value of 0.05 at the 95% confidence interval suggested for this study.

For bi-variate analysis, the rest of the diagnostic tests in terms of model specification, Autocorrelation, Homoscedasticity and model stability are discussed for each of the bivariate relationships since unlike normality, they are model specific. This is done in section 4.6. In the subsequent section for multiple panel regression, the same is also replicated.

4.6 Granger-Causality Testing

Outside of multiple correlation, Granger-causality test was also carried out for all the six variables of the study: operating cash flow volatility; investing cash flow volatility; financing cash flow volatility; implicit cash flow volatility; return on equity and market value as indicated by capitalization ratio. The findings are indicated in table 4.27. The findings in Table 4.27 agree with the correlation analysis findings indicated in table 4.25 which had indicated that ROE had the most strong positive correlation with market value as indicated by the capitalization ration and that all the independent variables of the study had a negative correlation with capitalization ratio, the indicator of market value.

Table 4.27: Granger-causality Diagnostic Tests

Null Hypothesis	Obs	F-Statistic	Prob.
∆OCFRV does not Granger Cause ∆ICFRV	450	0.53731	0.58901
∆ICFRV does not Granger Cause ∆OCFRV		0.30934	0.73591
∆OCFRV does not Granger Cause ∆FCFRV	450	0.42856	0.65200
∆FCFRV does not Granger Cause ∆OCFRV		0.69312	0.50113
∆OCFRV does not Granger Cause ∆IMFRV	450	0.37363	0.69104
∆IMFRV does not Granger Cause ∆OCFRV		1.44542	0.09123
∆OCFRV does not Granger Cause ∆ROE	450	4.67941	0.01583**
∆ROE does not Granger Cause ∆OCFRV		1.46921	0.22581
∆ICFRV does not Granger Cause ∆FCFRV	450	1.04149	0.38061
∆FCFRV does not Granger Cause ∆ICFRV		2.2320	0.11863
∆ICFRV does not Granger Cause ∆IMFRV	450	3.48119	0,06244
∆IMFRV does not Granger Cause ∆ICFRV		2.11678	0.16001
∆ICFRV does not Granger Cause ∆ROE	450	4.73349	0.02772**
∆ROE does not Granger Cause ∆ICFRV		0.88966	0.43442
∆FCFRV does not Granger Cause ∆IMFRV	450	3.40036	0.06494
∆IMFRV does not Granger Cause ∆FCFRV		2.11027	0.16083
∆FCFRV does not Granger Cause ∆ROE	450	0.37364	0.04232*
∆ROE does not Granger Cause ∆FCFRV		2.02412	0.19864
∆IMFRV does not Granger Cause ∆ROE	450	3.65490	0.05951
∆ROE does not Granger Cause ∆MFRV		3.15129	0.07663
∆OCFRV does not Granger Cause ∆CR	450	4.46308	0.00000***
∆CR does not Granger Cause ∆OCFRV		0.30194	0.71329
∆ICFRV does not Granger Cause ∆CR	450	5.00348	0.02673**
∆CR does not Granger Cause ∆ICFRV		0.78094	0.17953
∆FCFRV does not Granger Cause ∆CR	450	3.46582	0.04229*
∆CR does not Granger Cause ∆FCFRV		0.63024	0.81374

ΔIMFRV does not Granger Cause ΔCR	450	2.47448	0.11229
ΔCR does not Granger Cause ΔIMFRV		088966	0.43441
ΔROE does not Granger Cause ΔCR	450	14.61313	0.00000***
ΔCR does not Granger Cause ΔROE		0.37365	0.09139

Checking the findings in Table 4.27, there is no Granger causality among each of the independent variables given that all their test F statistics are statistically insignificant at the 95% confidence interval as indicated by their respective values all of which are below above 0,.05, the level of significance. The relationship changes when the relationship between the independent variables is considered alongside the moderating variable which is financial performance as indicated by return on equity.

Focusing on the moderating variable ROE, the findings in table 4.27 indicate that operating cash flow volatility Granger-causes the changes in financial performance given that the F value has a p-value of 0.01583 which is less than the statistical significance value of 0.05. The same applies to investing cash flow volatility and financing cashflow volatility where ICFRV and FCFRV have p-values of 0.02772 and 0.04232 both of which are less than 0.05. The Granger-causality however changes when the last independent variable (implicit cash flow volatility) is considered against financial performance. This is because, the results in table 4.27 indicate that the p-value for IMFRV is 0.05951 which is grater than the significance value of 0.05 which reveals that implicit cash flows do not Granger-cause the changes in financial performance as indicated by return on equity. This is in line with the Functional fixation theory of Sloan (1996) which presupposes that readily observable information like operating, investing and financing cash flows have a big impact on performance unlike hidden yet useful information like implicit cash flows arising from such aspects of operations like depreciation, amortization and depletion.

With respect to the relationship between the independent variables (operating, investing, financing and implicit cash flow volatilities) and the dependent variable (market value as indicated by the capitalization ratio), the Granger-causality test results in table 4.27 seem to agree with the multiple correlation results in table 4.25.

This is because all the Granger-causality null hypotheses are rejected for all the variables except the implicit cash flow volatility as indicated by the implicit cash flow volatility ratio. The findings reveal that the p-values for OCFRV, ICFRV and FCFRV are 0.00000, 0.02673 and 0.04229 all of which are statistically significant leading to the rejection of the null hypotheses that they do no Granger-cause market value of listed companies at the NSE with the conclusion that the volatilities in operating, investing and financing cash flows Granger-cause the variability in the market capitalization of those companies listed at the Nairobi Securities Exchange. This is in line with the functional fixation theory of Sloan (1996) which insists that readily discernible information like the operating, investing and financing cash flows attract keen attention of participants in stock markets leading it to be easily priced into stock prices than the implied information that is not readily observable.

The findings in table 4.27 also considered the Granger-causality association of the moderating variable (financial performance as indicated by return on equity – ROE) with the dependent variable (market value as indicated by the company stock market capitalization ratio). The output value of the F-statistic of 14.61313 has a p-value of 0.00000 which leads to the rejection of the null hypothesis that financial performance (ROE) does not Granger-cause the changes in market value (capitalization ratio -CR) of the companies listed at the Nairobi Securities Exchange. There is therefore a strong causal association in one direction of the changes in financial performance on one hand and stock market values of the companies on the other. This again supports the functional fixation theory of Sloan (1996) which presupposes that readily discernible information like financial performance (ROE) has a tremendous effect on stock market prices and therefore stock market performance as indicated by the capitalization ratio.

4.7 Cointegration Testing

According to Pedroni (2004), co-integration is used to check the presence or absence of long term relationships among variables. Pedroni (2004) indicates that if the residual values of a panel regression results contain a unit root, then there is no co-integration in the data relationships. In this study, the Pedroni (2004) residual co-

integration test was used in testing for co-integration and lag time series causality of the OCFRV, ICFRV, FCVRV, ROE and the market value of the companies listed at the time series. In line with the Pedroni (2004) hypothesizing, the number of lags do not matter and co-integration is assumed for at least one of the lags. The findings of the tests are presented in table 4.28.

Table 4.28: Pedroni Residual Cointegration Test

1. Within Dimension	**Statistic**	**Weighted Stat**	**Prob Stat**	**Pro. Weighted Stat**
Panel v-Statistic	8.93	2.70	0.00	0.0034
Panel rho-Statistic	2.27	1.76	0.98	0.96
Panel PP-Statistic	0.92	0.02	0.82	0.50
Panel ADF-Statistic	0.08	-0.86	0.53	0.19
2. Between-Dimension	Statistic		Prob	
Group Rho-Statistic	2.95		0.99	
Group PP-statistic	1.18		0.88	
Group ADF-Statistic	-0.70		0.23	

With respect to cointegration, the null hypothesis for the study was that the residual values of the multiple linear regression equation had a unit root. The findings in table 4.28 have led to the rejection of that null hypothesis with the conclusion that there is no unit roots and that therefore the data indicates a clear non-spurious causal association between operating, investing, financing and implicit cash flows on one hand and the market value of companies listed at the NSE as indicated by their capitalization ratios on the other. This in line with Pedroni (2004) indicates that the panel multiple linear regression equation used in this study for inferential analysis is suitable for analysis given that the variables are not spuriously related. The findings are consistent with the conclusion arrived at that the data with respect to OCFRV, ICFRV, FCFRV, IMFRV, ROE and CR were found to be stationery in nature. With

this finding it is therefore concluded that multiple linear panel data regression is applicable to the data in this study and is sufficient for testing the hypotheses presented in the study.

4.8 Bivariate Analytical Findings

The analysis relating the effect of the various volatilities on cash flows on market value of the firms listed at the NSE was first done at the bivariate level before the evaluation was done at the multivariate level. The diagnostic findings of the bivariate models and the resultant panel regression output are presented and discussed in this section.

4.8.1 Bivariate Effect of Operating Cash Flow Volatility on Firm Market Value

The first independent variable of the study was the volatility of cash flows from operations as indicated by the Operating Cash flow ratio volatility (OCFRV) as measured by a 3-year moving standard deviation. The effect of this variable on firm value was undertaken using panel regression for the 45 qualifying firms over the 10 qualifying financial periods that provided 450 firm-year observations.

Table 4.29: Bivariate Panel Diagnostics of OCFRV on Capitalization Ratio

Diagnostic Assumption	Test	Statistic	Significance
Model Specification	Hausman Chi Square Test	0.999853	0.000000
Coefficient of Determination	R-Square	0.183044	**
Model Stability	F-Ratio	2.452701	0.000020
Heteroscedasticity	Breuch-Pagan	0.354961	0.551318
Autocorrelation	Durbin-Watson	2.18267	≃2
Observations	450	-	-

Before undertaking the panel regression analysis, model diagnostic tests were conducted. This is in addition to the normality test findings indicated in section 4.5. The model diagnostic test findings from the study are reported in table 4.29.

The first test involved checking if the data should be analyzed using the fixed effects or the random effects panel regression analysis. This is in line with Gujarati (2022). The assumption made was that the random effects model is most suitable for the panel regression. The Hausman tests provided a chi square value of 0.999853 with a P-value of 0.000000. Since the P-value is less than the significance value of 0.05 at 95% confidence interval, the null hypothesizing as to the suitability of the random effects model was rejected and thereby the fixed effects model was utilized in the analysis with findings provided in table 4.30.

The stability of the fixed effects model was then tested in line with the suggestion of Black (2023) and this was based on the F-ratio and its related p-value. The analysis can only go on if the model is stable over the 12-year period over which the study is conducted. The findings in table 4.29 reveal an F-value of 2.452701. The corresponding p-value was determined to be 0.000020. This value is less than the critical value of 0.05 hence the model was found to be stable and suitable for the analysis.

The Table 4.29 also provides for the test of heteroscedasticity. According to Gujarati (2022), regression analysis only provides reliable data is the error term is homoscedastic. This is the case when the variance in the error term is approximately constant. The rule of the thumb when the Breuch-Pagan Lagrange Multiplier (LM) is used is that the data error term is homoscedastic as the LM has a P-value that is greater than the level of critical significance level, which in this case is 0.05 at the 95% confidence interval. The LM value for the panel model of CR on OCFRV provides an LM value 0.355. The null hypothesis that the data is not homoscedastic is rejected given that the P-value of 0.5513 is greater than 0.05.

In the bivariate panel regression modeling of CR on OCFRV, autocorrelation was also tested. This was based on the Durbin-Watson d-statistic. The findings in table 4.29 for this value is 2.183044. Gujarati (2022) suggests that the data is unlikely to

have serious problems of serial correlation of the d-value is close to 2. In the output above, 2.18 is not significantly different from 2 and therefore the logical conclusion is that the data does not have serious problems of autocorrelation and that the fixed effects regression model found suitable for analysis can be applied in this regression.

From the table 4.29, coefficient of determination is also provided as measured by the R-Square value. This is an indicator of the explanatory power of the independent variable (OCFRV) with respect to the changes in the dependent variable (CR). The R-Square value is 0.183044. This indicates that OCFRV explains 18.3% of the changes reported in the CR and the volatility of the cash flows from operating activities can be used to explain 18.30% of the market values of the companies listed at the NSE.

Having done the diagnostic tests, the bivariate regression of CR on OCRFV was conducted and the findings are reported in Tale 4.30.

Table 4.30: Bivariate Panel Regression Output of OCFRV on Firm Market Value

Fixed-*effects Included 45 cross-sectional units Time-series length = 10 (450 Observations) Dependent variable: CR*

	Coefficient	***Std. Error***	***t-ratio***	***p-value***
Const	0.0701276	0.0453043	1.548	0.12235
OCFRV	-0.1084551	0.0109148	-9.937	<0.00001 ***

The findings from table 4.30 reveal that at the bivariate level, OCFRV has a negative effect on CR. This is because the output regression reveals that the OCFRV regression coefficient is -0.10846 with a corresponding t value of -9.937. Since the output t falls in the rejection region of the t-distribution because it is higher in absolute terms than the critical t value of -1.965261 for 449 degrees of freedom and 95% confidence interval. The null hypothesis that operating cash flow volatility has

no effect of firm market valuation is rejected with the finding that it instead has a negative effect and that the higher the volatility of cash flows from operating activities, the lower the share market prices and therefore the lower the value of that company listed at the NSE.

This indicates that OCFRV is a priced risk factor and in line with the classical risk-return trade off, it is expected that the higher the risk, the higher the discounting rate and thereby the lower the value and vice versa. The findings can be compared with the P-value and in this case for table 4.30, the P-value is 0.00001 is less than the critical value of 0.05. The finding is in agreement with the Miller and Modigliani value relevance theory where cash flow patterns have an effect on firm valuation. It however is in contradiction with the functional fixation theory of Sloan (1996) which emphasizes on the fact that financial analysis focus on profitability data and ignore further analysis into trends like cash flow volatility. This then would mean OCFRV is not expected to affect firm value.

Besides the comparison with existing theories, the negative effect of OCFRV on CR was also compared with studies from other findings of a similar nature. When compared with Huang (2009) the findings are of a similar nature and in agreement with this study given that Huang (2009) revealed that cash flow volatility has a negative effect on returns. Thought comparable, the difference with this study is that capitalization ratio is used in this research while Huang (2009) used market returns of stock market listed firms.

The finding of a negative effect of cash flows on value was also reported by Altuntas et al. (2017) who had evaluated the effect of cash flow volatility among publicly traded life assurance companies. These were global life insurers in the SNL database over the period 2002 to 2012. Whereas the study is instrumental, it considers multiple regulatory environments as opposed to the current study that is based solely on listed companies in at the NSE in Kenya.

4.8.2 Bivariate Effect of Investing Cash Flow Volatility on Firm Market Value

The second bivariate relationship that was evaluated in this study was the effect of Investing cash flow Volatility as measured by ICFRV (Investing cash flow ratio volatility) on the market value of companies listed at the NSE. As a precursor to carrying out the analysis, diagnostic tests were carried out to show model suitability for analyzing the bivariate interrelationship. The findings are indicated in table 4.31

Table 4.31: Bivariate Panel Diagnostics of Firm Market Value on ICFRV

Diagnostic Assumption	Test	Statistic	Significance
Model Specification	Hausman Chi Square Test	0.214725	0.016431
Coefficient of Determination	R-Square	0.055693	**
Model Stability	F-Ratio	3.429287	<0.000000
Heteroscedasticity	Breuch-Pagan	0.354078	0.551814
Autocorrelation	Durbin-Watson	2.179138	≃2
Observations	450	-	-

The study first set to establish if the data should be analyzed using the fixed effects or the random effects panel regression model of analysis since Gujarati (2022) recommends that Random or fixed effects must be established first before the suitable analytical model is chosen. The assumption made was that the random effects model is most suitable for the panel regression. The Hausman tests provided a chi square value of 0.214725 with a P-value of 0.016431. Since the P-value is less than the significance value of 0.05 at 95% confidence interval, the null hypothesizing as to the suitability of the random effects model was rejected and thereby the fixed effects model was utilized in the analysis with findings provided in table 4.32.

The solidity of the fixed effects model was subsequently evaluated in line with the suggestion of Black (2023) was done using the F-ratio and its related p-value. The analysis can only go on if the model is stable over the 12-year period over which the

study is conducted. The findings in table 4.31 reveal an F-value of 3.429287. The corresponding p-value was determined to be 0.00000. This value is less than the critical value of 0.05 hence the model was found to be stable and suitable for the analysis.

Homoscedasticity was also tested and the findings are indicated in Table 4.31. The study assumes that the error term must not be heteroscedastic for panel analysis to be undertaken (Gujarati, 2022). The rule of the thumb when the Breuch-Pagan Lagrange Multiplier (LM) is used is that the data error term is homoscedastic is the LM has a P-value that is greater than the level of critical significance level, which in this case is 0.05 at the 95% confidence interval. The LM value for the panel model of CR on ICFRV provides an LM value 0.354078. The null hypothesis that the data is not homoscedastic is rejected given that the P-value of 0.5513 is greater than 0.05. This means that the error term I the regression of CR on ICFRV is not heteroscedastic.

Serial correlation is the situation where variables are correlated on time. In line with Gujarati (2022) the problem of serial correlation must be controlled for before the analysis is undertaken on the panel regression model. According to Gujarati (2022), serial correlation also called autocorrelation can be measured using the Durban-Watson d-test. The hypothesis that the data has a serious problem of autocorrelation is rejected given that the output d-value of 2.179138 is close to 2 and hence it is assumed that ICFRV does not have a serious problem of serial correlation and it can be used for further analysis using the fixed effects panel regression model.

The table 4.31 also provides the value for coefficient of determination which is indicated by the R-square value of 0.055693. This shows the explanatory power of ICFRV in explaining the changes in the market value of firms listed at the NSE. In this instance, the conclusion is that 5.57% of the changes in ICFRV explain the changes in market value of the NSE firms as indicated by their capitalization ratios. After completing the diagnostic tests, the bivariate panel regression of CR on ICFRV was done using the fixed effects model and the findings are indicated in table 4.32.

From a bivariate perspective, the null hypothesis was that the volatility in the cash flows from investing activities as indicated by the investing cash flows ratio

volatility (ICFRV) does not affect firm value of listed companies at the NSE as shown by Capitalization ratio (CR). In this respect, the idea was to check if the coefficient of ICFRV s not significantly different from zero in line with the advice provided by Black (2023).

Table 4.32: Bivariate Panel Regression Output of Firm Market Value on ICFRV

Fixed-effects Included 45 cross-sectional units Time-series length = 10 (450 Observations) Dependent variable: CR

	Coefficient	***Std. Error***	***t-ratio***	***p-value***
Const	0.005840	0.0373836	0.156	0.87593
ICFRV	-0.115293	0.0101412	-11.369	<0.00001 ***

The findings in table 4.32 indicate that the coefficient of ICFRV is -0.115293 and that the -value is less than 0.00001 which is a low value compared to the critical p-value of 0.05 at the 95% confidence interval. Accordingly, the null hypothesis is rejected and it is revealed that ICFRV has a negative effect on the firm stock exchange market values as shown by CR. This is confirmed by the T-value of -11.369 which is higher than the critical t-value of 1.965261 at the 0.05 level of significance and 449 degrees of freedom.

The conclusion indicates that volatility in cash flows from investing activities is a priced risk factor for companies listed at the NSE and that an enhanced level of volatility as indicated by the standard deviation in the ICFR would lead to a reduction in share prices and thereby a reduction in the market value of the affected companies. This finding seems to agree with the theoretical expectation of the Miller and Modigliani (1961) on value in the MM value relevance theory where cash flow patterns and therefore cash flow volatility by extension affect firm value. But just like for the first independent variable, ICFRV is a value arrived at after a deeper evaluation of financial statements beyond the surface and that such information

influences market value seems to suggest that the finding is in contradiction with the functional fixation theory of Sloan (1996).

The findings in table 4.32 can be compared and contrasted with findings from other similar studies. They for instance contradict those of Tangngisalu (2020) who found that for the Indonesian Stock Exchange, cash flows have a positive effect on the value of Banks listed at that exchange. This result could be contradictory possibly because Tangngisalu (2020) focused on a narrow set of companies which were commercial banks yet the current study focuses on all qualifying firms at the NSE. The other factor that could have contributed to the difference is that Tangngisalu (2020) relies on cash flows in their raw form while this study is focused on volatility in cash flows which essentially converts cash flows into a risk factor. Further, Tangngisalu (2020) considered a very short period of three years that resulted in 99 firm year observations unlike this study that uses 12 years in the evaluation.

Another study that has contradicting findings with those established here is that by Chi and Su (2017) who carried out a study to establish the dynamics of performance volatility and firm valuation. They established a positive effect of cash flow volatility on valuation metrics. Unlike Tangngisalu (2020), this study relied on volatility of cash flows and it tends to contradict the expected risk-return trade-off matrix expectations and therefore seems to assume that cash flow risk is a positive predictor of firm value. This could be attributed to the unique nature of the data used in the study given that the efficient market hypothesis of Fama (1970) would indicate that there be a negative association between firm value and cashflow volatility.

The findings in table 4.32 are in agreement with those of Shahid (2018) who showed that for non-financial firms listed at the Pakistan Stock Exchange, cash flow volatility has a negative effect on firm value. Shadid (2018) was a study carried out over a 15-year period that spanned January 2003 to December 2017. The similarity with the findings in the current study agree with the theoretical expectation of the MM value relevance theory of Miller and Modigliani (1961) that cash flow volatility is a market risk priced factor.

4.8.3 Bivariate Effect of Financing Cash Flow Volatility on Firm Market Value

The third bivariate interrelationship that was studied in this research was the effect of the volatility in cash flows from financing activities on the market value of the firms listed at the NSE over the 2011 to 2022 financial period. In this instance, the volatility in the cash flows from financing activities was indicated by the financing cash flow ratio volatility as measured by the 3 -year standard deviation of the investing cash flow ratio. For running the panel regression analysis, additional diagnostic tests to normality tests carried out in section 4.5 were done. The findings are indicated in table 4.33.

Table 4.33: Bivariate Panel Diagnostics of Firm Market Value on FCFRV

Diagnostic Assumption	Test	Statistic	Significance
Model Specification	Hausman Chi Square Test	0.885591	0.020703
Coefficient of Determination	R-Square	0.033673	**
Model Stability	F-Ratio	5.017715	2.39e-08
Heteroscedasticity	Breuch-Pagan LM	0.357157	0.550089
Autocorrelation	Durbin-Watson	2.18835	≃2
Observations	450	-	-

Hausman Chi Square test was used in testing model specification with respect as to whether to use the fixed effects or the random effects model. The null hypothesis in this regard is that fixed effects model is not suitable for the bivariate panel data regression of firm market value on the volatility of cash flows from financing activities of firms listed at the Nairobi Securities Exchange. The Hauman Chi value of 0.885591 had a significance p-value of 0.020703. That the P-value from the output is less than the critical p-value of 0.05 at the 95% confidence interval implies that as per Gujarati (2022), the null hypothesis is rejected and it is concluded that the fixed effects model is suitable in running the panel regression analysis.

The coefficient of determination from table 4.33 is 0.033673. This has the implication that 3.37% of the changes in the market value of companies at the NSE is explained by changes in the volatility of the cash flows from their financing activities as measured by FCFRV. This implies that the rest of the variations in market value can be attributed to other factors outside of the volatility in the cash flows from financing activities. The small percentage could be due to very stable capital structures of firms listed at the NSE hence providing minimal fluctuations the cash flows arising from those changes.

The stability of the established fixed effects model over the study period was tested using the F-ratio. The findings in Table 4.33 indicates that the F-value from the model that panel regresses CR on FCFRV is 5.01772 which has a corresponding p-value that is less than 0.00000. In line with Black (2023), since the P-value is less than the critical value at the 95% confidence interval, the model is stable and is suitable for running over the study period.

Homoscedasticity is another assumption that needs to be upheld for the panel data regression analysis to be undertaken. In this study, the Breuch-Pagan Lagrange Multiplier (LM) was used in detecting if the error term in the bivariate regression had a constant variance. The LM value from the study is 0.357157. To reject the null hypothesis of heteroscedasticity in the output must be higher than the significance level of 0.05. This is indeed the case here given that the p-value of 0.55009 is higher than 0.05 hence the data is perfectly homoscedastic.

Autocorrelation is a phenomenon that arises when the data is serially correlated over the study period (Gujarati, 2022). For the panel regression data to apply, the data needs to be uncorrelated serially and this is usually tested using the Durbin-Watson d-statistic which confirms absence of a serious problem of autocorrelation when it is close to 2. The finding in table 4.33 reveals that the d-value is 2.1884 which is very close to 2. In this regard the data is concluded to be serially uncorrelated and fit for further panel regression analysis for the 450 firm year observations that this study entails. Having undertaken the model diagnostic tests, the regression was done and the findings are provided in table 4.34.

Table 4.34: Bivariate Panel Regression Output of Firm Market Value on FCFRV

Fixed-effects Included 45 cross-sectional units Time-series length = 10 (450 Observations) Dependent variable: CR

	Coefficient	***Std. Error***	***t-ratio***	***p-value***
const	0.120979	0.104262	1.160	0.24653
FCFRV	-0.111382	0.0120174	-9.268	<0.00001 ***

Consistent with the findings for OCFRV and ICFRV, the study findings in table 4.34 reveal that there is also a negative association between firm market value as indicated by the capitalization ratio with the volatility in cash flows from operating activities as indicated by the operating cash flow ratio volatility. This is because the statistically significant coefficient of FCFRV is a negative value of -0.111382. It is established to be statistically significant because the t-value from regression of -9.268 is greater than the critical value at 95% confidence interval and 449 degrees of freedom of 1.965261 for a 2-tailed t-test. The negative effect is confirmed by the output p-value of 0.00001 which is way below the critical p-value of 0.05 at the specified confidence interval of 95%.

The implication is that the volatility in cash flows from financing activities is a security pricing factor for the companies listed at the NSE and that enhanced volatility indicates higher cash flow risk which in turn depress share prices leading to a low market valuation of the firms. The opposite is also true for reduced fluctuation of the cash flows from the financing activities of those firms. This finding perfectly fits in the value relevance theory of Miller and Modigliani (1961 which expected cash flow patterns including the related fluctuations to be instrumental in establishing firm value through the effect on share prices. The findings however defy the functional fixation theory of Sloan (1996) because they imply that investors at the NSE evaluate financial statement patterns beyond the self-evident financial performance information.

The study confirms the findings of Njuguna et al. (2022b) which showed that at the NSE, cash flow volatility has a negative effect on 36 non-financial firms listed at that bourse over the period 2002 to 2019. That study was however limited to the non-financial firms only and ignored the financial firms listed in the investment, Banking, and Insurance segments of the NSE. This result is expected because the studies target the same stock market albeit for a different set of companies and study period.

Contrary to the findings in this study, Loncan and Caldeira (2014) had shown that for Brazilian companies, investors have a positive view of cash holdings and that cash holdings are positively priced by the stock markets in Brazil. This points to a level of risk-averse attitude among those investors. The seeming contradiction from the findings of Loncan and Caldeira (2014) with those from this study could be because he pricing effect was determined for cash holdings as opposed to the fluctuations in the holdings of that cash. Further, a distinction was not made for the four distinct set of cash flows i.e. cash flows from operations, cash flows from investing activities, cash flows from financing activities and implicit cash flows.

4.8.4 Bivariate Effect of Implicit Cash Flow Volatility on Firm Market Value

The second last bivariate analysis that was undertaken was to establish the effect of the volatility in the implicit cash flows of companies listed at the Nairobi Securities Exchange to the market value of those companies at the stock market. Implied cash flows arise from the use of non-current assets and the related non-cashflow items like depreciation, amortization and depletion which although they are taken as expenses, no cash flows out from them and hence they are an indirect and implied source of cash flows (Hadi et al., 2013).

The related diagnostic findings for the model that relates volatility in the implicit cash flows to firm value as measured by the capitalization ratio are provided in table 4.35.

Table 4.35: Bivariate Panel Diagnostics of Firm Market Value on IMFRV

Diagnostic Assumption	Test	Statistic	Significance
Model Specification	Hausman Chi Square Test	0.885591	0.020703
Coefficient of Determination	R-Square	0.009591	**
Model Stability	F-Ratio	8.113304	2.06e-05
Heteroscedasticity	Breuch-Pagan LM	0.372163	0.541827
Autocorrelation	Durbin-Watson	2.18048	≃2
Observations	450	-	-

The P-value for the Hausman model specification test is 0.0207 against the chi square value of 0.8856. The implication of this finding is that the fixed effects model is suitable for the bivariate panel regression analysis of CR on IMFRV (Implicit cash flow ratio volatility) in line with Gujarati (2022). This is in agreement with the foregoing independent variables.

The explanatory power of the model is very low given that the R-square value is only 0.009591 indicating that only about 1% of the changes in the market value as indicated by CR of companies listed at the NSE are as a result if the changes on the volatility of the implicit cash flows of those companies. This can be confirmed by the findings in table 4.36 that show that IMFRV has no significant effect on CR of the companies listed at the NSE.

With respect to model stability, the F ratio of 8.113304 has a p-value of 0.0000206 which is lower than the significant value of 0.05. Accordingly, the fixed effects regression model alluded to in the foregoing paragraph is table for analysis over the 450 firm-year observations that form the sample for this study. This is line with the suggestions of Black (2023) about the stability of panel data models.

The stability in the variance of the error term otherwise referred to as homoscedasticity was measured using the Breuch-Pagan LM test. The findings from

table 4.35 indicate that the output LM is 0.372163 and that it has a p-value of 0.5418. This value is greater than the critical value of 0.05 at 95% confidence interval and it is therefore clear that the data is devoid of statistically significant heteroscedasticity going by the rule of the thumb articulated by Gujarati (2022).

Autocorrelation was also tested for the model variables particularly IMFRV and he findings in table 4.35 show that the Durbin Watson-D value of 2.18048 is closer to the critical value of 2. In line with Gujarati (2022) when the d-value is close to 2, the data is devoid of serious problems f serial correlation and is therefore conducive for panel data regression analysis. This is the conclusion that can be dawn for the data indicated in table 4.35 for serial correlation.

Having fulfilled the model requirements for data analysis using panel regression, the regression of CR on IMFRV was run for the 450 firm year observations and the findings are sown in Table 4.36

Table 4.36: Bivariate Panel Regression Output of Firm Market Value on IMFRV

Fixed-*effects Included 45 cross-sectional units Time-series length = 10 (450 Observations) Dependent variable: CR*

	Coefficient	***Std. Error***	***t-ratio***	***p-value***
const	0.109249	0.0114935	9.505	<0.00001 ***
IMFRV	-0.0678577	0.0654619	-1.037	0.30048

Whereas the findings in table 4.36 allude to a negative effect of IMFRV on CR, a careful analysis shows that the effect is not statistically significant. This is because whereas the coefficient of IMFRV has a negative value of -0.067858, the t -value of -1.037 is less than the critical value of 1.965261 at 449 degrees of freedom and 95% confidence interval. Accordingly, the t-value falls in the fail to reject region of the student t-distribution. In this respect, the null hypothesis that the volatility in the

implicit cash flows has no significant effect on the firm market value of the companies listed at the NSE fails to be rejected with the conclusion that it has zero effect on that market value. This conclusion is confirmed by the p-value of 0.30048 which is higher than the significant level of 0.05. Accordingly, market valuation of publicly traded firms at NSE is in no way affected by the IMFRV and that IMFRV is not a priced risk factor at the NSE.

The findings seem to be in tandem of the functional fixation theory of Sloan (1996) because the theory expects investors to be focused on readily available information like profitability when making investing decisions and to be oblivious of data that requires further analysis like the volatility of financial statements. In this argument, hidden information like the implicit cash flows and its volatility is not expected to be priced by the financial markets if a majority of the investors are affected by the functional fixation biases. It is however noteworthy that the findings contradict the efficient market hypothesis of Fama (1970) which expects all pertinent information to be reflected in share prices and therefore firm market value. The findings are also contradictory to the MM value relevance theory of Miller and Modigliani (1961) that expects cash flow patterns to influence firm value.

From an empirical perspective, the findings from tale 4.36 can be compared and contrasted with other extant studies from around the globe. Al-Zararee and Al-Azzawi (2014) for instance evaluated how free cash flows affect firm market value for Pharmaceutical companies in Jordan over the period 2004 to 2010.Contrary to the findings in the current study, Al-Zararee and Al-Azzawi (2014) found out that free cash flows are a positive determinant of firm market value. It is noteworthy however that the study relied on free cash flows as opposed to implicit cash flows. They study also never made an attempt to evaluate the volatility in the cash flows for the target companies.

One study that is in agreement with the findings reported in table 4.36 is that by Fitri, Erlina and Situmeang (2023) which showed that cash flows and liquidity do not have any significant effect on the value of mining firms in Indonesia. The theoretical and

empirical arguments advanced in terms of functional fixation theory could also apply to these firms.

4.8.5 Bivariate Effect of Financial Performance on Firm Market Value

Financial performance was used as a moderator variable in this study. For the purposes of comparison however, a panel bivariate analysis of the effect of financial performance on market value as measured by ROE and CR respectively was done as well. The findings are reported first for the diagnostic tests and then for the actual regression output results. The model diagnostic tests are presented in table 4.37.

The first test result in table 4.37 relates to model specification with respect to whether the model should conform to random effects or fixed effects panel regression analysis. The testing on the 450 firm year observations was based on the Hausman model specification test. The output provides a Hausman value of 15.012. The null hypothesis of absence of fixed effects was tested by checking the significant value. As Gujarati (2022) suggests, this null hypothesis is rejected when the P-value is less than the critical value at the provided confidence interval in this case 0.05. Since 0.000159 is less than 0.05, the fixed effects are assumed and therefore the relevant model used in the analysis is the fixed effects panel regression model.

Table 4.37: Bivariate Panel Diagnostics of Firm Market Value on ROE

Diagnostic Assumption	Test	Statistic	Significance
Model Specification	Hausman Chi Square Test	15.012601	0.000159
Coefficient of Determination	R-Square	0.246405	***
Model Stability	F-Ratio	3.113861	<0.000000
Heteroscedasticity	Breuch-Pagan LM	0.327585	0.567085
Autocorrelation	Durbin-Watson	2.179631	≃2
Observations	450	-	-

The output provides the highest coefficient of determination among the various variables studied this far. This is because the R-square value of 0.246405 is higher than for the various bivariate relationships of CR against OCFRV, ICFRV, FCFRV and IMFRV respectively. The implication is that ROE, the proxy for financial performance, explains 24.6% of the changes in the market value of the firms at the NSE while the remaining 75.5% of the changes are explained by factors outside of financial performance.

The model stability over the study period was checked using the F-ratio. The output F-value as seen from Table 4.37 was 3.113861. This is posted against a p-value of less than 0.000000. The implication in line with Black (2023) is that the model is stable given that the p-value is less than 0.05 at the 95% confidence interval chosen for the study. Accordingly, the fixed effects model was adopted for the bivariate evaluation of the effect of ROE on CR.

Lagrange Multiplier of Breuch-Pagan test was used in evaluating the possibility that the random error term is heteroscedastic and that it has a non-uniform variance over the study duration and cross sections. In line with Gujarati (2022), the error term is heteroscedastic is the P-value of the LM is less than 0.05, the critical significance value. The findings of the results in table 4.35 suggest otherwise since the P-value is 0.567085 and that it is greater than 0.05 indicates that the data is homoscedastic.

Lastly, serial correlation was tested to check for autocorrelation in the ROE data. This involved using the Durbin-Watson d-test. The null hypothesis was that the data is serially dependent. The findings in table 4.35 confirm that the data is not serially dependent given that the output d-value of 2.179631 is close to 2 and Gujarati (2022) explains that when that is the case, the is no serious case of autocorrelation. Having confirmed this, the fixed effects regression model of CR on ROE was run and the findings are presented in Table 4.38

Table 4.38: Bivariate Panel Regression Output of Firm Market Value on ROE

Fixed-*effects Included 45 cross-sectional units Time-series length = 10 (450 Observations) Dependent variable: CR*

	Coefficient	***Std. Error***	***t-ratio***	***p-value***	
const	0.042530	0.039378	1.080	0.28070	
ROE	0.114292	0.009914	11.528	<0.00001	***

The null hypothesis being tested from the output in Table 4.38 is that financial performance as measured by return on equity (ROE) has no significant effect on market value (as measured by the capitalization ratio) of firms listed at the Nairobi Securities Exchange. The null hypothesis was rejected given the finding in Table 4.38 because the coefficient of ROE comes out a statistically significant positive number. Following the suggestion of Black (2023), statistical significance can be tested using the t-value or the P-value. By the measure of the t-test, the output t is a positive value of 11.528. This when compared with the critical t-distribution value of 1.965261 at the 0.05 level of significance for a two-tail test indicates that the regression t is higher than the critical t. This indicates that ROE has a positive effect on firm market valuation of the companies listed at the NSE. A confirmation of this conclusion is derived from the P-value. Lack (2023) suggests that the null hypothesis should be rejected when the computed P-value is less than the critical P-value at the identified confidence interval. Given that this study was set at the 95% confidence interval, the significance level is 0.05 and this is higher than the output P-value of 0.00001 identified in table 4.38. It is concluded that the higher the ROE the greater the firm valuation at NSE.

Using the theories that formed the basis of this study it can e concluded that this finding supports the MM value relevance theory of Miller and Modigliani (1961); the random walk theory of Burton (1973); the functional fixation theory of Sloan (1996) as well as the efficient market hypothesis of Fama (1970). It is in agreement with MM value relevance theory because ROE reflects cash flow patterns which the

theory identifies to be pricing factors of publicly traded firms. It also supports the random walk theory because it can be argued that profitability information reflected by the ROE arrives in the market place in a random manner and thereby randomly impacts share prices and consequently the firm valuation at the bourse. With respect to functional fixation theory, it is an established psychological bias that investors focus on readily available data like profitability and use it to make investing decisions (Sloan, 1996). Lastly, the finding is in support of the efficient market hypothesis give that for efficient markets even in the weak form), historical information like that contained in ROE data is adjusted into share prices and consequently used in influencing the market value of firms listed at stock markets (Fama, 1970).

The findings in table 4.36 can be compared and contrasted with existing empirical evidence. The findings of Bahraini et al. (2021) show that for the food and beverage industry, ROE has a positive effect of public firms in Indonesia. Accordingly, in that country just like at the NSE, financial performance is a positively priced factor and a positive determinant of firm value. Similar findings were reported by Ayuba et al. (2019) in Nigeria who focused on the 27 insurance companies at the Nigeria Stock Exchange). They reported that ROE has a positive influence on Tobin's Q which was used as a proxy of firm market value. This points towards the robustness of financial performance as a determinant of firm value given that it seems to cut through a variety of industries as seen in the current study (10 segments of the NSE) and Ayuba et al. (2019) for insurance sector as well as Bahraini et al. (2021) for the food and beverage sector.

4.9 Moderated Bivariate Panel Regression Analytical Findings

The last objective of this study involved determining the moderating influence of financial performance as measured by return of equity (ROE) on the effect of cash flow volatility on market value of firms listed at the Nairobi Securities Exchange (NSE). This moderation was tested at both the univariate level and the multivariate level. The findings for the Bivariate moderating influence of ROE on how the

individual volatilities affect cash firm value are presented and discussed in this section.

Table 4.39 presents findings on how financial performance moderates the bivariate relationship between operating cash flow volatility and firm market value of the firms listed at the NSE. In the findings, financial performance is indicated by return on equity while operating cash flow volatility is indicated by the 3-year moving standard deviation of the operating cash flow ratio.

Table 4.39: ROE Moderation of Bivariate Effect of OCFRV on Firm Market Value

Fixed-*effects Included 45 cross-sectional units Time-series length = 10 (450 Observations) Dependent variable: CR*

R-Square:0.226175

	Coefficient	***Std. Error***	***t-ratio***	***p-value***
Const	0.0753526	0.0403521	1.867	0.06250 *
OCFRV	-0.329833	0.0610588	-5.402	<0.00001***
OCFRV* ROE	0.0769192	0.00800511	9.609	<0.00001***

The table 4.39 confirms that operating cash flow volatility as measured by the OCFRV is a negatively priced information factor at the NSE since it provides a negative coefficient -0.329833. This indicates that at the NSE, the higher the volatility of cash flows from operating activities, the lower the capitalization ratio and therefore the lower the value of the firm. This is true because the t value of -5.402 falls in the rejection region for the two-tail test and this s confirmed by the p-value of less than 0.00001 which is less than the critical value of 0.05 at the 95% confidence interval used for this study.

With respect to the moderated panel regression output, the coefficient of determination as provided in Table 4.39 is 0.226175 which as per Black (2023) can

be interpreted to mean that 22.62% of the changes in the capitalization ratio (the indicator of firm market value) can be explained by the moderated function of both OCFRV and the joint effect of OCFRV and ROE. This is an improvement on the unmoderated function which provided results that showed and R-square value of 0.183044 as indicated in Table 4.30 which showed that OCFRV explained only 18.3% of the changes in the capitalization ratio. Adding the moderator improves the explanatory power by 4.31 percentage points.

The findings in table 4.39 provide the evidence that financial performance has a positive moderating effect on the effect of operating cash flow volatility on firm market value of companies listed at the NSE. This is because the moderator coefficient of 0.0769192 is a positive value that is statistically significant at 95% confidence internal. The t-value of 9.609 falls in the rejection region of the two-tail student t-distribution which leads to the rejection of the null hypothesis that financial performance as measured by ROE has no significant influence on the effect of operating cash flow volatility on the market value of firms listed at the Nairobi Securities Exchange. This is confirmed by the P-value of 0.00001 which is less than the significant value of 0.05. Theoretically, Sloan (1996) has postulated that financial performance like other financial statement obvious metrics, are fixated upon by investors in their investment decision making and this is perhaps while OCFRV is a risk factor, better financial performance positively moderates it and the findings from this study reveal.

The finding of the positive moderating influence of financial performance on firm market value can be corroborated by other existing studies. Mucktaruddin et al. (2019) for instance found out that firm financial performance had a positive moderating influence on the effect of corporate governance and corporate social responsibility on firm market value for companies listed at the Indonesian Stock Exchange. Just like in the current study, initial results before moderation had indicated that company social responsibility negatively affected firm stock exchange market value.

The other variable for which the study aimed to check if its effect on market value for the firms listed at the NSE was moderated by financial performance was the volatility of the cash flows from investing activities. The findings are reflected in table 4.40. The output in this table indicates an R-square value of 0.116849. This implies that both the investing cash flow volatility and financial performance as measured by return on equity jointly explained 11.68% of the variations in the market value as indicated by the capitalization ratio. This can be compared with the unmoderated results that had been reflected in table 4.31. They had indicated an R-square value of 0.055693. This indicates an explanatory power of 5.57% for ICFRV without ROE as a moderator. The implication is that introducing ROE as the moderator improved the explanatory power by 6.11 percentage points.

Table 4.40: ROE Moderation of Bivariate Effect of ICFRV on Firm Market Value

Fixed-*effects Included 45 cross-sectional units Time-series length = 10 (450 Observations) Dependent variable: CR*

R-Square:0.116849

	Coefficient	***Std. Error***	***t-ratio***	***p-value***
Const	0.000275231	0.0333685	0.008	0.99342
ICFRV	-0.254972	0.114320	-2.230	0.02622 **
ICFRV* ROE	0.0897881	0.00730126	12.298	<0.00001***

The initial effect of the volatility of investing cash flows on firm value was a negative effect. This is because the coefficient of ICFRV in table 4.40 is -0.254972 which confirms that negative coefficient that had been reported in table 4.32 for the unmoderated effect. The value is statistically significant because the p-value of 0.02622 is less than the significant value of 0.05. This is also confirmed by the t value of -2.230 which falls in the rejection region for a 2-tail student t-distribution

test. The idea was to check if this effect was significantly moderated by financial performance.

The findings from table 4.10 show that financial performance as measured by return on equity has a positive moderating influence on the univariate effect of investing cash flow volatility on firm market value for the companies listed at the NSE. This is because the coefficient of the moderator variable is positive with a value of 0.08979 and it is statistically significant because the t-value of 12.298 is greater than the critical value of 2.000 and the p-value of 0.00001 is less than the significance value of 0.05. In this respect, the null hypothesis that financial performance has no significant moderating influence on the effect of the volatility of cash flows from investing activities on firm market value for the NSE listed companies is rejected with the conclusion that the moderating influence is positive.

The finding indicates that financial performance is not only a value relevant information factor for publicly listed companies, but it has a significant moderating influence on the relationship between various other pricing information factors and firm market values. In line with the efficient market hypothesis of Fama (1970) financial performance information is reflected in share prices and consequently affect market capitalization and firm market returns for the public companies. The prominent role financial performance information plays also seems to be supported by the functional fixation theory of Sloan (1996) and the random walk theory of Burton (1973).

The finding that financial performance positively moderates the relationship between investing cash flow volatility and market values of firms listed at NSE is in line with similar studies that have found financial performance to be not only a priced information actor at stock markets, but only a significant moderator when other pricing factors are related to market valuation. Osazuwa and Che-Ahmad (2016) for instance studied to establish the moderating effect of profitability on how efficiency affected the firm market value of companies in Malaysa. The study revealed that profitability is a market priced information factor and that it has a positive moderating influence on how efficiency impacts firm market valuation.

The penultimate moderating relationship that this study sought to establish is how the effect of the volatility of cash flows from financing activities on market value is moderated by financial performance of those companies as listed at the Nairobi Securities Exchange. The findings are revealed in table 4.41.

Table 4.41: ROE Moderation of Bivariate Effect of FCFRV on Firm Market Value

Fixed-*effects Included 45 cross-sectional units Time-series length = 10 (450 Observations) Dependent variable: CR*

R-Square: 0.0672487

	Coefficient	***Std. Error***	***t-ratio***	***p-value***
Const	-0.111827	0.281046	-0.398	0.69090
FCFRV	-0.239186	0.120655	-1.982	0.04805 **
FCFRV* ROE	0.111653	0.00823126	13.564	<0.00001***

An examination of the findings reveals that just like was the case for both OCFRV and ICFRV, financial performance has a positive moderating influence on the hitherto determined negative pricing effect of the volatility of cash flows from financing activities. Before moderation, table 4.34 had indicated that there is an inverse relationship between capitalization ratio and FCFRV. This is confirmed in table 4.41 where it is shown that the coefficient of the FCFRV is a negative value of -0.239186 and it is statistically significant given that the P-value of 0.04805 is less than the significance value of 0.05 and that the corresponding t-value of -1.982 falls in the rejection region for 448 degrees of freedom at 95% confidence interval.

When the R-Square value in table 4.41 that includes the moderator variable is compared with the R-square value in Table 4.33 that evaluates the effect of FCFRV in the absence of the moderator, the resultant values are 0.0672487 and 0.033673 respectively. Introduction of financial performance in the panel regression equation

therefore boosts the explanatory power from 3.37% to 6.72% which are 3.35 percentage points, almost double the original explanatory power. The null hypothesis that financial performance has no significant influence on the pricing effect of the volatility of cashflows from financing activities is therefore rejected and it is concluded that return on equity is a positive moderator in the inverse relationship. The positive moderating effect is confirmed by the statistically positive significant of the moderating variable coefficient of 0.111653 which has a t-value of 13.564 is greater than the critical value of approximately 2. In addition, the corresponding p-value of 0.00001 makes this study follow the Black (2023) criteria that when the p-value is less that the significant value, in this case 0.05, the null hypothesis should be rejected.

Theoretically, the finding of the positive moderating influence on the association between volatility of cash flows from financing activities and the firm market value of the listed companies at the NSE is plausible with respect to the efficient market hypothesis of Fama (1970) given that the arrival of new information is updated by the security market through security prices. More fundamentally, the finding fits very well with the behavioral theory of Sloan (1996) that predicts that the behavioral biases and decision heuristics of investors make them to focus more on earnings and financial performance making this metric to have a huge pricing effect, whether directly or indirectly through moderation, on security prices and firm market values.

The findings are also consistent with extant literature that has confirmed that financial performance is a powerful moderating factor when pricing factors are weighed against market value and similar other market evaluation criterion. Looked at from the reverse-causality approach, Sial, Chunmei, Khan and Nguyen (2018) used earnings management instead of actual earnings and financial performance to check how the moderated the effect of corporate social responsibility on firm value among firms in China (listed on both Shenzhen Stock Exchange and Shanghai Stock Exchange). Earnings management has a negative connotation and should therefore have a negative effect on firm value. Consistent with expectation, earnings management had a negative moderating influence of the interrelationship between corporate social responsibility and firm market performance.

The last bivariate relationship for which the study aimed to check if financial performance moderates it was the effect if the volatility f implicit cash flows on the market value of the companies that are quoted on the Nairobi Securities Exchange. The findings from this study in that regard are reported in table 4.42.

Table 4.42: ROE Moderation of Bivariate Effect of IMFRV on Firm Market Value

Fixed-effects Included 45 cross-sectional units Time-series length = 10 (450 Observations) Dependent variable: CR
R-Square:0.04838

	Coefficient	***Std. Error***	***t-ratio***	***p-value***
Const	0.1825830	0.25118800	0.727	0.46768
IMFRV	-0.0747684	0.03889570	1.922	0.05521 *
IMFRV* ROE	0.0759597	0.00744550	13.564	<0.00001***

The study had null-hypothesized that financial performance is indicated by return on equity did not significantly moderate the relationship between implicit cash flow volatility and firm market value as measured by the capitalization ratio. It is noteworthy that the bivariate relationship between the two as reported in table 4.36 was found not to be statistically significant and the bivariate regression -square value of 0.0096 was identified as very miniscule. Comparing those results with the findings in table 4.42, the combined influence shows that IMFRV is still statistically insignificant given that the t-value from the panel regression at 0.05 level of significance is still greater than the significance level of 0.05. It is however observed that the new coefficient of determination is 0.04838 implying that introducing the moderator improves the explanatory power from 1% to 4.8% and moves the significance level of IMFRV to almost 0.05. It is therefore concluded that ROE has a positive moderating influence on the effect of IMFRV on CR. This is especially true because the t-value lies in the rejection region and the p-value is significantly less than 0.05.

4.10 Multivariate Analytical Findings

In addition to the bivariate analysis done in section 4.8 and 4.9 this study also employed multivariate panel data regression to assess the joint influence of OCFRV, ICFRV, FCFRV and IMFRV on market value of companies listed at the NSE as indicated by their capitalization ratios. In addition, the moderating influence of financial performance as indicated by ROE on the established effect of these variables on CR was also established. The findings are reported in this section.

4.10.1 Multivariate Diagnostic Tests

In addition to the tests of normality provided in section 4.5, this section provides further tests that are required in order to use a multiple linear panel data regression analysis for the four dependent variables used in the study. The first diagnostic test n that sense is multicollinearity. Gujarati (2022) suggests that panel regression results for a multiple linear model would not be reliable if the independent variables of the study are significantly correlated. Tolerance and Variance Inflation Factor (VIF) are used in testing for collinearity and the findings from the study for the four independent variables are provided in Table 4.43.

Table 4.43: Test for Multicollinearity

	VIF	Tolerance
OCFRV	1.048	0.9542
ICFRV	1.052	0.9506
FCFRV	1.012	0.9881
IMCFV	1.011	0.9891

Gujarati (2022) indicates that the minimum value possible for VIF is 1.0000 and that Tolerance is the reciprocal of VIF. The closer VIF and Tolerance are to 1, the less likely that multicollinearity is a problem. Values in excess of 5 and approaching 10 for VIF are a pointer towards the problem of multicollinearity. Surveying the

findings in table 4.43 indicates that the VIF values are 1.048; 1.052; 1.012 and 1.011 for OCFRV, ICFRV, FCFRV and IMFRV respectively. All these values are close to 1 and following Gujarati (2022) it is concluded that there is no statistically significant problem of multicollinearity among the study independent variables. The same conclusion is arrived at when tolerance is used because all the tolerance values are equally close to 1.

To ensure the multiple linear panel regression model is applicable, further tests for homoscedasticity, autocorrelation and model stability are provided in table 4.44. The model specification testing as to whether to deploy the random effects or the fixed effects model was tested using the Hausman specification test. The null hypothesis is that there are no fixed effects and that the fixed effects model is not suitable for analysis due to the random effects in the data. Gujarati (2022) suggests that when the p-values are small, this hypothesis should be rejected and the fixed effects model adopted for analysis. The findings in table 4.44 provide a Hausman P-value of 0.001103. In this respect the value is less than the significance value of 0.05 hence the null hypothesis is rejected and it is concluded that the fixed effects panel regression model is the most suitable for the multivariate analysis of the effect of cash flow volatility on firm market value of companies listed at the NSE.

Table 4.44: Multivariate Panel Diagnostics of Firm Market Value on Cash Flow Volatility

Diagnostic Assumption	Test	Statistic	Significance
Model Specification	Hausman Chi Square Test	0.972146	0.001103
Coefficient of Determination	R-Square	0.451704	**
Model Stability	F-Ratio	3.939460	0.001620
Heteroscedasticity	Breuch-Pagan LM	0.281020	0.596033
Autocorrelation	Durbin-Watson	2.132241	≃2
Observations	450	-	-

The coefficient of determination as measured by R-square emerging from the output in table 4.44 is 0.451704. This implies that the joint explanatory power of the changes in market valuations of firms listed at the NSE as a result of the changes in the volatilities of the operating, investing, financing and implicit cash flows is 45.17%. On the flipside, 54.83% of the changes in CR, the indicator of market valuation is attributable to other factors outside the variables specified in this study. This is an improvement of the explanatory power of the individual variables in the separate bivariate analysis done in section 4.8 given that OCFRV, ICFRV, FCFRV and IMFRV had separable coefficients of determination of 18.3%, 5.57%, 3.37% and 1% respectively.

The stability of the multivariate panel regression model was tested using the F-ratio and the findings in table 4.44 provide an F-value of 3.93946 with a corresponding p-value of 0.00162. Black (2023) recommends that the model be held as stable when the P-value is less than the significance value at the chosen confidence interval. The model is accordingly held to be stable for the 450 firm-year observations of this study given that the P-value is less than 0.05.

The error term needs to have a constant variable in order for the multivariate panel regression model to yield the best linear unbiased estimators of the dependent variable (Gujarati, 2023). In this respect, Breuch-Pagan Lagrange Multiplier (LM) is used to evaluate the absence of heteroscedasticity. In line with Gujarati (2022), the conclusion of homoscedasticity is arrived at when the LM has a p-value greater than the significance level at the chosen confidence interval. This is the case of the multivariate model used here given that the LM value of 0.281020 in table 4.44 has a p-value of 0.596033 which is greater than the significance level of 0.05.

Serial correlation as was proved in section 4.8 is not a problem for the model. This is again confirmed in the multivariate set-up in table 4.44 because the Durbin-Watson d-statistic used in testing for the autocorrelation is a value that is 2.132241. This value is close to 2 and in line with Gujarati (2022) it is concluded that there is no statistically significant problem of autocorrelation and that the multivariate model can be applied to test how cash flow volatilities influence firm value for the

companies listed at the NSE. Having duly diagnostically tested the model, the multivariate regression findings are reported in the section that follows.

4.10.2 Multivariate Panel Regression Output

The objectives of this study were to evaluate the effect of the volatility of cash flows from operating activities; cash flows from investing activities; cash flows from financing activities and implicit cash flows on the firm market value of companies listed at the Nairobi securities exchange. The study period was 12 years from January 2011 to December 2022 but because volatility was computed using standard deviations of the respective cash flow ratios on a 3-year moving basis, the final sample covered the year 2012 to 2021. For the 45 qualifying firms, this led to 450 firm year observations. The panel data regression output based on the foxed effects model is presented in table 4.45. it is on the basis of this output that the hypotheses presented in chapter 1 are tested at 95% confidence interval.

Table 4.45: Multivariate Panel Regression Output of Market Value on Cash Volatility

Fixed-*effects Included 45 cross-sectional units Time-series length = 10 (450 Observations) Dependent variable: CR*

	Coefficient	***Std. Error***	***t-ratio***	***p-value***
const	0.112752	0.0192468	0.242	0.80891
OCFRV	-0.114213	0.0137969	-8.278	<0.00001 ***
ICFRV	-0.161516	0.0493256	-3.274	0.00113 ***
FCFRV	-0.063257	0.0300468	-2.105	0.03573**
IMFRV	0.004657	0.0670506	1.682	0.09323 *

The findings in the table 4.45 are used in testing the various hypotheses established in section 1.4 of this document. The moderating effect of financial performance as indicated by return on equity (ROE) are discussed in the section that follows this one.

4.10.3 Effect of Operating Cash Flow Volatility on Firm Market Value

The first objective of this study was to establish the effect of the volatility in the cash flows from operating activities on the stock market value of firms listed at the Nairobi Securities Exchange. Accordingly, the null hypothesis stated for that objective was that the volatility of cash flows from operating activities (as measured by the operating cash flow ratio volatility - OCFRV) has no significant effect on the firm market value (as measured by the capitalization ratio - CR) of firms listed at the NSE. Black (2023) recommends that to test for such a null hypothesis, one has to evaluate the statistical significance of the resultant coefficient from the panel regression output.

The results from Table 4.45 indicate that the coefficient of OCFRV is -0.114213. The coefficient is statistically significant because the output t of -8.278 is falls in the student t-distribution rejection region for a two tall test because it is higher than the critical value of t at 446 degrees of freedom and 95% confidence interval of 1.966. This implies that the negative coefficient of OFCFRV is statistically significant and therefore the null hypothesis is rejected with the conclusion that the volatility in cash flows from operating activities has a negative effect on the firm market value of the companies listed at the Nairobi Securities Exchange. This negative effect is confirmed by the P-value which Black (2023) says must be less than the critical P-value for the effect to be significant. In this case the p value of less than 0.00001 is less than the significant value of 0.05 at the 95% confidence interval.

The findings are in tandem with what was established at the bivariate analysis level where it had been established that OFRV is a negative predictor of firm market value of NSE companies as indicated by the capitalization ratios of those companies. That the higher the volatility in the operating cash flows, the lower the share price at the NSE and thereby the lower the market value of the respective firms. The opposite would be true for less levels of volatility in the cash flows from operating activities. It can be concluded that OCFRV is a firm risk factor that is negatively priced by the stock market.

The finding is intuitive give that volatility by is very definition refers to the fluctuations in cash flows and that the higher the fluctuations, the higher the risk. High risk firms require higher returns for investors, otherwise they would reduce demand for the affected stocks (Khokan, Mollik & Rahman, 2013). This gels well into the existing value relevance theoretical models like that postulated by Miller and Modigliani (1961) in which values of firms on stock markets are influenced by cash flow patterns which in the context of the above findings, OCFRV is an indicator of the time series cash flow patterns for the firms listed at the NSE over the 450 firm year observations. It also seems to agree with efficient market hypothesis given that Fama (1970) suggests than for an efficient market, all historical, current and pertinent information should be reflected in share prices and thereby affect firm share prices in the market and ultimately the firm market valuation. Gichaiya et al. (2018) had confirmed that NSE is an efficient market at least in the weak form.

Again intuitively, the findings that OCFRV is a negative predictor of firm market value of the companies listed at the NSE seems to go against the functional fixation theory which seems to imply that only obvious information reported in financial statements attract the attention of investors who fixate on it at the expense of hidden information. That OCFRV is not readily available information that requires deep analysis of financial statements means that functional fixation theory of Sloan (1996) was not expecting such information to be priced by the securities' markets. That it is prized at the NSE brings out this theoretical contradiction.

Christian and Jones (2014) had earlier established that operating cash flows are value relevant for firms undergoing mergers and acquisitions. This contradicts Cheng et al. (2013) who while relying on AMEX, NYSE and NASDAQ companies in the USA had found out the operating cash flows are value irrelevant. While these two studies specified here are critical, it is noteworthy that they focused on cash flows from operations as opposed to the volatility of the cash flows from operating activities.

In Kenya, Kipng'etich, Tenai and Kimwolo (2021) who had evaluated the effect of operating cash flows on stock returns found out that operating cash flows are a positive predictor of stock returns, at least for the 29 non-financial firms over the

2007 to 2019 period and are therefore a priced information factor and are value relevant at the NSE. Whereas the finding may seem contradictory to the findings in table 4.45, the reason could be that Kipng'etich et al. (2021) focused on raw cash flows from operations which may not be a risk factor while this study deals with volatility of the cash flows which is a market prized risk factor in the negative direction. Ninth, Etale and Bingilar (2016) and had earlier shown that for the commercial banks listed at the Nigeria stock Exchange, cash flows from operations have a positive effect on share prices such that the higher the value of cash flows, the higher the share prices of those banks and vice versa.

4.10.4 Effect of Investing Cash Flow Volatility on Firm Market Value

The second objective of the study was to find out if the volatility of cash flows from investing activities are value relevant by influencing the market value of firms listed at the Nairobi Securities Exchange. This resulted in the null hypothesis that the volatility of cash flows from investing activities as measured by the investing cash flow ratio volatility are value irrelevant and that it has no significant influence on the stock exchange market values of the listed companies.

The findings from hypothesis testing are identified in table 4.45. The coefficient of ICFRV from that table 4.45 is -0.161516. The idea here is to check if this negative coefficient value is statistically significant. This is done by comparing the regression t-value with the critical t-value. Black (2023) indicates that the null hypothesis f there being a zero effect must be rejected when the output t-value is greater than the critical t value in the student t-distribution. Checking from table 4.45, it is seen that the output t-value is -2.105. Based on Black (2023), the null hypothesis that the volatility of investing cash flows is value irrelevant is rejected with the realization that in deed such volatility has a negative effect on the market value of firms listed at the NSE. This fact is confirmed using the P-value which again needs to be less than the critical value. The output P-value of 0.00113 is indeed less than the significance value of 0.05 at the 95% confidence interval under which this study is done.

Having confirmed that the volatility in the cash flows from investing activities is a negative pricing effect of firm values listed at the NSE, it is critical to assess how this

relates to existing theoretical literature. The fact that it is a priced information risk factor indicates that the results support the postulation of Miller and Modigliani (1961) who in their theorization indicated that cash flow patterns affect value of firms. That there is volatility in investing cash flows is an indicator of fluctuations as indicated by the standard deviation trend. The findings therefore agree with the MM value relevance theory. This is also rue with the efficient market hypothesis which predicts pricing of financial and other information. Volatility of investing cash flows is therefore information that emerging from listed firms that is incorporated into share prices thereby leading to changes in market prices (high volatility leads to depressed prices and thereby low market value.

On the contradicting side is the intuitive conclusion that the findings that ICFRV is a priced information risk factor seems to go against the expectation of the functional fixation hypothesis of Sloan (1996). This is because Sloan (1996) presupposes that most investors and users of financial information are naïve and shallow in their evaluation of available financial information such that they are fixated and focused on bottom line information like profit as after tax and dividend payout. This implies their decisions are made with scant attention if any, to volatility in cash flows from investing activities. That it became a priced factor implies a seeming contravention of the functional fixation theory. Of course, in support of the results would be the efficient market hypothesis of Fama (1970) that expects all pertinent information to be priced by the efficient stock markets including NSE given that Gichaiya et al. (2018) have confirmed that NSE is an efficient market at least in the weak form.

From an empirical point of view, there are numerous studies that have been done to establish of cash flows from investing activities in general and their volatility in particular are a priced information factor for companies listed in the stock markets. Muina and Lamas (2012) showed that for United Kingdom (UK) companies, cash flows have a positive effect on investments. Yazan and Aminul (2017) also found out that at the Amman Stock Exchange, investing cash flows have a negative effect on the market share prices of companies on that market. Whereas the study may seem in agreement with the findings in table 4.39, closer scrutiny reveals that whereas table 4.45 results are concerned with the volatility in the cash flows from investing

activities, the findings from Yazan and Aminul (2017) deal with absolute cash flows from investing activities. Unlike Yazan and Aminul (2017), Ninth, Etale and Bingilar (2016) had earlier provided evidence that at the Nigeria Stock Exchange, investing cash flows have a positive effect on share prices of commercial banks and therefore are a positive pricing effect for those banks in Nigeria.

From a different perspective, the findings seem to agree with those of Wang, Lee and Wu (2023) who studied the effect of cash flow uncertainty on the possibility of equity security market price cash. Using evidence from a cross section of twenty nations, they find that the higher the cash flow uncertainty the greater the potential for prices to fall face cash flow uncertainty just as has been established in the current study, has a negative effect on prices and is therefore inversely related to stock market firm valuation. The results are similar to those arrived at in table 4.45 given that they study several industries, regions and segments, just like the various industries in the various segments of the NSE have been evaluated in the current study.

4.10.5 Effect of Financing Cash Flow Volatility on Firm Market Value

The second las independent variable tested in the study was the volatility of cash flows from financing activities of firms listed at the NSE. The null hypothesis in respect of this variable was that cash flows from financing activities as measured by the 3-year moving standard deviation of the financing cash flow ratio has no significant effect on the market valuation of firms listed at the Nairobi securities exchange. The findings in the verification of this supposition are indicated in table 4.45.

The panel regression coefficient output for FCFRV is specified as -0.063257. To test the null hypothesis specified in the foregoing paragraph, the study follows the suggestion of Black (2023) that the regression output t-value for the coefficient be compared to the critical t value from the student t-distribution at the specified degrees of freedom and confidence interval and the hypothesis be rejected if the output t is greater than the critical t. Using a two-tail test at 95% confidence interval and 446 degrees of freedom, the standard t is specified as 1.96 which is less the

output t of -2.105 in absolute terms. Accordingly, the null hypothesis is rejected with the confirmation that FCFRV has a negative effect on CR. The fact that the volatility in cash flows from financing activities has a negative effect on share prices and thereby market valuation of companies listed at the NSE is confirmed by the output P-Value of 0.03573 which is less than the significance value of 0.05 at the 95% confidence interval. Accordingly, the volatility in cash flows from financing activities is a negatively priced information risk factor at the NSE.

Just like for the volatilities in cash flows from operating and investing activities, the finding seems to agree with the Miller and Modigliani (1961) value relevance theory which postulates that cash flow patterns affect firm value. Volatility alludes to unpredictable patterns which should lead to unpredictable fluctuations in firm valuations. The only caution that needs to be taken to account is that the MM value relevance theory alludes to future cash flows while this study uses historical volatilities in cash flows. That is however not no limiting given that the estimations in future cash flows relies in understanding historical cash flow patterns with the assumption that the patterns can be extrapolated into the future and convincingly argued by Miller and Modigliani (1961).

The other theory that seems to be supported by the findings from this study is the efficient market hypothesis of Fama (1970) which suggests that all available information should be priced by securities in the stock markets. Gichaiya et al. (2018) had confirmed that NSE is efficient in the weak form and that historical volatilities in cash flows from financing activities negatively influences share prices and thereby market valuation is a confirmation that EMH of Fama (1970) works at NSE in the context of fluctuations in cash flows in general and those from financing activities in particular. On the contradicting side in the Sloan's (1996) functional fixation theory. According to Sloan (1996), investors focus most of their attention on readily published and easy to evaluate information and give scant attention, if any, on implicit information that requires deeper analytical efforts to discern. From this logic, the fact that FCFRV requires extra analytical efforts to compute, analyze and interpret means that it is unlikely to be factored in by investors as they make their

decisions. That it has been found to have a negative pricing effect at the NSE is therefore confounding.

Several extant studies and their findings can be compared with the findings that have been reported in table 4.45 with respect to FCFRV and its effect on firm value. Soet, Muturi and Oluoch (2018) for instance had evaluated how the management of cash flows from financing activities affects returns for mutual funds in Kenya. Whereas the study seems to be in agreement with the findings in the current study where financing cash flow volatility has a negative effect on value, the difference is that Soet et al. (2018) relied on profitability measures of performance and value as opposed to market based performance measures like firm capitalization ratio like the one used in this study.

In the United States of America (USA), Altuntas et al. (217) evaluated a sample of publicly listed life assurance firms with respect to how cash flow volatility affected the market values of those firms. Their bivariate and multivariate analysis both revealed that cash flow volatility has a negative effect on insurance firm value. This indicates that cash flow volatility is a powerful pricing variable given that results from an economically advanced market like the USA are in agreement with those in a developing one like Kenya. The Altuntas et al. (2017) however focused on only life assurance companies and also used overall cash flows as opposed to disaggregated volatilities of financing, investing, operating and implicit cash flows.

In China, Laghari et al. (2023) evaluate how changes in cash flows and their measures affects listed non-manufacturing firms in that country. The findings can be compared with the ones from this study given that Laghari et al. (2023) found out that reduction in cash flow measures increases the financial companies at least based in the 20288 firms that formed the sample, and more so for the firms that had low levels of leverage. It is noteworthy however that unlike the findings in table 4.45 of this study that relied on market performance as indicated by capitalization ratio, Laghari et al. (2023) instead relied on accounting financial performance.

4.10.6 Effect of Implicit Cash Flow Volatility on Firm Market Value

The last independent variable was the volatility of implicit cash flows and the objective that related to this variable was to find out if implicit cash flow ratio volatility (IMFRV) had and pronounced effect on firm valuation as indicated by capitalization ratio of the firms listed at the Nairobi Securities Exchange. The null hypothesis was that IMFRV had no significant effect on CR. The findings are reported in table 4.45. The coefficient of IMFRV is reported as -0.004657. To test the null hypothesis, the t-ratio of this coefficient is compared with the critical t-ratio at 95% confidence and 446 degrees of freedom. That the output t-ratio of -1.682 is less than the critical t of 1.966 in absolute terms means that the value lies within the failure to reject region. Accordingly, the study fails to reject the null hypothesis and concludes that the volatility in implicit cash flows has no significant effect on the firm valuation at the NSE and that the pricing coefficient is not significantly different from zero. This conclusion is supported by the P-value of 0.09323 which is greater than the critical value of 0.05 at the 95% confidence interval. Variations in the implicit cash flows is therefore not expected to influence the market prices and hence values of the companies listed at the Nairobi Securities Exchange.

The conclusion seems to be subtly in support of the functional fixation theory of Sloan (1996). This is because the theory does not expect non-explicit information implied in the financial statements and other corporate reports to affect the share prices on the stock market. This is because the theory assumes that volatility in cash flows from implicit information cannot be read from financial statements because it needs to be computed for listed companies based on varying measures like the standard deviation of the inter-period cash flows. That leaves only the explicitly reported values like net profit and earnings per share (EPS) to influence share prices. It is this conclusion that is arrived at when this study finds IMFRV not to affect CR as an indicator of firm valuation of firms listed at the NSE.

The findings as to the zero effect of IMFRV on CR can be compared and contrasted with the existing evidence from studies that have been done before the current one. The findings are in agreement with that of Launtu (2021) who found that cash flows

have little impact on value of manufacturing firms in Indonesia. The seeming similarity with the current findings falls short when it is considered that Launtu (2021) used general cash flows as opposed to the volatility in implicit cash flows of those manufacturing firms.

4.11 Moderating Influence of Financial Performance

The last objective involved the determination of the moderating influence of financial performance as measured by return on equity on the effect of cash flow volatility on the firm market value of the companies listed at the Nairobi Securities Exchange. The findings are presented in this section both for diagnostic testing and the overall moderating influence of ROE.

With respect to model diagnostic testing, the available tests relate to model specification and model stability, and homoscedasticity given that the rest of the diagnostic tests have been conducted in the foregoing sections and they do not change when the moderating effect is introduced. The diagnostic test findings are indicated in Table 4.46

Table 4.46: Multivariate Moderated Panel Diagnostics Tests

Diagnostic Assumption	Test	Statistic	Significance
Model Specification	Hausman Chi Square Test	3.796081	<0.000001
Coefficient of Determination	R-Square	0.571510	***
Model Stability	F-Ratio	4.942491	0.001110
Heteroscedasticity	Breuch-Pagan LM	0.687082	0.921074
Observations	450	-	-

With respect to model specification, table 4.46 provides the square test value for Hausman model specification as 3.796. By the recommendation of Gujarati (2022) this is weighed against the P-value which is less than 0.000001. Give that the P-value

is less than the critical level of 0.05 at 95% confidence interval, it is concluded that the analysis is better off being analyzed using the fixed effects of panel regression analysis.

The coefficient of determination indicates the explanatory power of the independent variables. In the table 4.46, the R-square value is 0.57151. This signifies that the changes in the independent variables after moderation explain 57.15% of the changes in the market valuation of the companies listed at the Nairobi Securities Exchange. This is an improvement on the values before moderation because the multivariate unmoderated R-square provided an R-square of 0.451704 which an explanatory power of 45.17% of the changes in capitalization ratio, the indicator of firm market valuation. This signifies an improvement in the explanatory by 12 percentage points. Hence on the overall, ROE significantly moderates the effect of cash flow volatility on the firm market value of companies listed at the NSE. The individual moderating influences are explained in the section that follows this one.

The multivariate ROE-moderated model of the effect of cash flow volatility on the market valuation of companies listed at the NSE is seen to be relatively stable reading from the output F-ratio values provided in table 4.46. This is because the F-ratio of 4.942491 has a P-value of 0.001110 and Black (2023) suggests that when the P value is less than the critical at the specified level of significance, then the model is cross sectional and on a time basis stable. The fixed effects multivariate regression model was therefore adopted in the assessment of the moderated influence of ROE on the effect of cash flow volatility on the firm market value of companies listed at the NSE over the 450 firm-year observations used in this study.

The last of the diagnostic tests was the test for heteroscedasticity. The assumption is that panel regression analysis is only suitable if the regression error term is constant in what is referred to as homoscedasticity (Gujarati, 2022). This is usually the case when the P-value of the Breuch-Pagan LM coefficient is greater than the critical value of P. From table 4.46, the LM value of 0.687082 has a P-value that is greater than 0.05. It is therefore concluded that the error term is homoscedastic and the data does not suffer from any serious problem of heteroscedasticity.

Having confirmed the compliance of the model to the expectations for a best unbiased linear estimator for the coefficients of the regression model of the moderated influence of ROE on the effect of cash flow volatility on the firm market valuation of companies listed at the NSE, the last procedure involved determining the regression output and testing the moderation coefficients and their statistical significance. The findings are provided in table 4.47.

The findings from the unmoderated effect of cash flow volatility on firm value of firms listed at the NSE is confirmed since table 4.47 indicates that OCFRV, ICFRV, FCFRV all have a negative effect on the firm values as measured by the capitalization ratio while IMFRV has no effect on the market valuation of those companies. This conclusion is arrived at from the coefficients of these variables and their respective values. All the coefficients are negative. The P-values for OCFRV, ICFRV and FCFRV are all less than 0.05 pointing towards statistical significance. That of IMFRV is greater than 0.05 which indicates that whereas the coefficient is negative, it is statistically insignificant hence it is not significantly different from zero. It has no pricing effect on CR.

The moderation effect is provided from the coefficients of the moderated variables, their nature and their statistical significance based on the t-ratio and the P-value. The findings are also indicated in table 4.47. The first analysis relates to how financial performance as measured by return on equity (ROE) moderates the effect of operating cash flow volatility on firm market valuation. The findings in Table 4.47 provides a coefficient of the moderated variable as 0.350591. The P-value of this coefficient is 0.00001 which is less than the critical p-value of 0.05. This indicates that ROE significantly moderates the effect of operating cash flow volatility on the firm value for the companies listed at the Nairobi Securities Exchange. Given that the observed effect of volatility in the operating cash flows on firm market value was negative, this implies that the negative effect of operating cash flow volatility can be reduced if the affected firm has a good financial performance as reflected by the return on equity metric.

The finding of positive moderating influence of ROE on the effect of OCFRV on CR seems to agree with the efficient market hypothesis of Fama (1970) because in lie with that theory, any information be it historical, public or pertinent information must be priced by the security markets. Financial performance is pertinent information and given that NSE has been confirmed to be efficient at least in the weak for by Gachaiya et al. (2018), the findings of this moderating effect confirm it. The fact that financial performance is a metric that is closely followed by investors, the finding of this moderating effect also supports the expectation of functional fixation theory of Sloan (1996) which expects the focus on earnings data by investors to greatly influence market pricing and valuation of securities.

Table 4.47: ROE Moderation of Effect Cash Flow Volatility on Firm Market Value

Fixed-*effects Included 45 cross-sectional units Time-series length = 10 (450 Observations) Dependent variable: CR*

	Coefficient	***Std. Error***	***t-ratio***	***p-value***
Const	0.0183027	0.0450519	0.406	0.68472
OCFRV	-0.113972	0.0138676	8.219	<0.00001 ****
ICFRV	-0.154005	0.0504347	-3.054	0.00237 ***
FCFRV	-0.10498	0.0357047	-2.940	0.00342 ***
IMFRV	-0.0379274	0.074129	-0.512	0.60911
ROE*OCFRV	0.350591	0.042563	8.237	<0.00001***
ROE *ICFRV	0.239772	0.047612	5.036	<0.00001***
ROE *FCFRV	0.206214	0.084652	2.436	<0.00001***
ROE *IMFRV	0.194760	0.068217	2.855	0.00016***

The second variable for which return on equity was used to assess how it moderated its effect on market firm valuation was the volatility in the cash flows from investing activities of the firms listed at the Nairobi Securities Exchange. The findings from

Table 4.47 shows that the coefficient of the ROE*ICFRV is 0.239772. To test if this positive moderating influence is significant, the t test is used. The regression t-value is 5.036. This is greater than the critical t-value in the student t distribution of 2. In this respect, the null hypothesis that ROE has no significant moderating influence on the effect of investing cash flow volatility of firm values of companies listed at the NSE is rejected. This is confirmed by the p-value of less than 0.00001 which is less than the critical value of 0.05. It is therefore concluded that financial performance as indicated by return on equity has a positive moderating influence on how investing cash flow volatility affects firm market values of the firms listed ta the Nairobi Securities Exchange.

The findings are in line with the theoretical expectation of the functional fixation theory of Sloan (1996) which emphasizes that the readily discernable data in financial statements is what investors focus on while making their investment decisions in equity and other securities. This explains why financial performance, a common focus of investors, has a great positive moderating influence on the effect of investing cash flow volatility on the firm market valuation for the firms listed at the Nairobi Securities Exchange. That it is a priced factor is also in line with the efficient market hypothesis of Fama (1970) which expects all pertinent and historical information to be reflected in share prices and thereby affect firm market value.

The second last analysis relates to how financial performance as measured by return on equity (ROE) moderates the effect of financing cash flow volatility on firm market valuation. The findings in Table 4.47 provides a coefficient of the moderated variable as 0.206214. The P-value of this coefficient is less than 0.00001 which is less than the critical p-value of 0.05. This indicates that ROE significantly moderates the effect of financing cash flow volatility on the firm value for the companies listed at the Nairobi Securities Exchange. Given that the observed effect of volatility in the financing cash flows on firm market value was negative, this implies that the negative effect of financing cash flow volatility can be reduced if the affected firm has a good financial performance as reflected by the return on equity metric.

The finding of positive moderating influence of ROE on the effect of FCFRV on CR seems to agree with the efficient market hypothesis of Fama (1970) because in lie with that theory, any information be it historical, public or pertinent information must be priced by the security markets. Financial performance is pertinent information and given that NSE has been confirmed to be efficient at least in the weak for by Gachaiya et al. (2018), the findings of this moderating effect confirm it. The fact that financial performance is a metric that is closely followed by investors, the finding of this moderating effect also supports the expectation of functional fixation theory of Sloan (1996) which expects the focus on earnings data by investors to greatly influence market pricing and valuation of securities.

Ultimately, the study also evaluated the moderating influence of financial performance as based on return on assets on the effect of implicit cash flows on firm market value of companies listed at the NSE. It is noteworthy that the unmoderated result had failed to reject the null hypothesis with the conclusion that implicit cash flows had no significant effect on the market value of NSE listed companies. Again, here the null hypothesis is that ROE has no significant moderating influence on the effect of implicit cash flow volatility on the firm value of the NSE listed companies. Checking from table 4.41, the coefficient of ROE*IMFRV is a positive value of 0.19476. The corresponding t-value is 2.855 which is higher than the cut-off t-value of 2.000 at 95% confidence interval. In addition, the P-value of 0.00016 is less than the critical value of 0.05. The conclusion is that the null hypothesis is rejected with the confirmation that financial performance has a positive moderating influence on the effect of implicit cash flows on the firm market capitalization of the companies listed at the Nairobi Securities Exchange.

Just like for the foregoing volatilities in cash flows from operating, investing and financing activities, the finding of a positive moderating influence is in line with the efficient market hypothesis of Fama (1970) which expects any material fundamental information to be incorporated in share prices at the stock market and thereby have an influence on firm value given that capitalization is a product of the number of outstanding shares and the prevailing market prices of those shares. It also fully supports the functional fixation theory of Sloan (1996) because it seems that the

explicit manner in which financial performance information is reported by listed companies have a great influence on the decisions made by investors at the stock market given that the functional fixation theory presupposes that investors pay close attention to explicit information as opposed to the not so readily available implicit information.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 Introduction

This provides the final chapter of this study. It provides a summary of the empirical, theoretical, conceptual and methodological gaps identified and filled as well as those yet to be filled and gives the conclusion arising from the tests of hypotheses done in Chapter four. Drawing from the conclusions, the chapter also provides policy recommendations as well as suggestions for further research drawing from the limitations of the study.

5.2 Summary

This summary provides the issues covered in the foregoing four chapters of this study. In the first chapter was presented not only the statement of the problem but also the research objectives and the scope of the study. The research problem arose from the fact that it was hitherto not clear how the volatilities of operating, investing, financing and implicit cash flows affected the market valuation of firms listed at the Nairobi Securities Exchange. It also was not clear how financial performance of those companies moderated the effect of such volatility on firm value. Accordingly, the study ended up with four objectives that sought to establish how individually and jointly the four volatilities in cash flows (operating, investing, financing and implicit) affected firm value. The volatility was measured using a 3-year moving standard deviation in the cash flow ratios. The fifth objective related to establishing how financial performance (measured by ROE) moderated the relationship between cash flow volatility and the market valuation of the firms listed at the NSE. To achieve the study objectives, the study used a scope of twelve years (2011 to 2022) that fell to 450 firm year observations given that only 45 firms had all the required data available for the study. The chapter also provided limitations of the study which helped provide suggestions for further research as indicated in section 5.5 of this chapter.

In chapter two was presented the literature review. This was split into theoretical literature, conceptual literature and empirical literature reviews. With respect to theoretical literature, the study presented theories that try to explain how cash flow volatility affects firm market values. Five theories were presented. These are the efficient market hypothesis (EMH) of Fama (1970); the functional fixation theory (FFT) of Sloan (1996); the Random Walk Theory (RWT) of Burton (1973); the MM value relevance theory (VRT) of Miller and Modigliani (1961) and the Free cash flow theory (FCFT) of Jensen (1986). Whereas the value relevance theory, the random walk theory and the efficient market hypothesis predicted that cash flow volatility being an information risk indicator would have a negative influence on the market value of firms listed at the NSE, the functional fixation theory on the other hand expected that volatility of cash flows information is hidden information that investors would scarcely notice and thereby expected it to have no influence of the market value of those companies.

With respect to conceptualization, chapter two presented the conceptual framework with operating cash flow ratio (OCFR), investing cash flow ratio (ICFR), financing cash flow ratio (FCFR) and implicit cash flow ratio (IMFR) serving as indicators of cash flows and their three-year standard deviations being used as indicators of cash flow volatility. Accordingly, cash flow volatility as fashioned as an information risk factor since standard deviation is an indicator of volatility and risk. For the indication of market value, the conceptualization used the firm market capitalization ratio provided as the firm capitalization to the total capitalization of all firms at the NSE. This was done to ensure that all the variables of the study were measured in terms of ratios. Lastly, there was also a moderating variable which was the financial performance of companies listed at the NSE. In that respect, financial performance was measured using return on equity (ROE).

Still in chapter two, there was a review of empirical literature that relates cash flows and their volatilities to financial performance in general and market value of public companies in particular. Emerging from the review was the conclusion that the existing findings are confounding with how cash flow volatility affects firm value. A good number of studies showed that the effect of cash flow volatility on firm market

value is negative (e.g., Choi, Kim, & Lee , 2011; Njuguna et al., 2022b; Huang, 2009; Altuntas et al., 2017; Shahid, 2018; Laghari et al., 2023; Wang, Lee & Wu, 2023 among others). Others indicated that there is no effect of cash flow volatility on value of listed firms (e.g., Mostafa, 2016; Fitri, Erlina & Situmeang, 2023; Launtu, 2021; among others). Lastly, there were studies that revealed that there is a significant positive effect of cash flow volatility on firm valuation of publicly trading companies (e.g., Cheng, Zishang, & Johnstone, 2013; Yazan, 2017; Tangngisalu, 2020; Chi & Su, 2017; Loncan & Caldeira, 2014; Al-Zararee & Al-Azzawi, 2014; Muina & Lamas, 2012 among others). Most studies like that of Ratri and Dewi (2017); Ayuba et al. (2019);and Bahraini et al. (2021) also arrived at the conclusion that financial performance is a positive predictor of firm market value although some like that of Harahap (2020) established that financial performance is negatively priced by stock markets.

In chapter three was presented the methodology used in the study. The study was based on a census of all companies listed at the NSE although only 45 companies had all the data required for the analysis. This resulted in 450 firm-year observations covering the year 2011 to 2022 (after identifying volatility using 3-year standard deviations, 2011 and 2022 were not centered although they influenced the standard deviations for 2012 and 2021 respectively). Panel data regression analysis was identified as the most suitable for analysis given that the data had both time series (2011 to 2022) and cross sectional (45 companies) attributes.

There were six variables used in this study. Four of them were independent variables. These were operating cash flows volatility, investing cash flows volatility, financing cash flows volatility and implicit cash flows volatility. The fifth variable was financial performance which was a moderating variable while the last variable was firm market value which was the study's dependent variable. The independent variables were measured using a three-year standard deviation of the respective cash flows ratios. The cash flow ratios were identified as the ratio of the respective cash flows for each of the 12 years to the total cash flows generated. Financial performance was based on a statement of financial position measure called return on equity (ROE). Lastly, firm market value was measured using the firm capitalization

ratio (CR) being the ratio of a firms market capitalization to the capitalization of the entire market at each of the financial year ends.

Data that was used in the study was secondary data. This was oriented on the research philosophy that was positivism which dictated that quantitative data be used in the study. Cash flow information was collected from the statement of cash flows reported in the annal reports of the companies listed at the Nairobi Securities Exchange. Earnings after tax information and equity information both used in determining the return on equity were collected from the income statement and the statement of financial position respectively. Data on share prices and market capitalization ratios that were used in determining firm capitalization ratios were collected from the Nairobi Securities Exchange database.

The findings of the study are presented in chapter four. These were both descriptive findings that indicated the central tendency, dispersion and distribution aspects of the data of the companies. The analysis was done on a segmental basis for the 11 segments listed at the NSE as well as for the overall market. The data on all the variables of the study were found to be normally distributed based on Kurtosis and Skewness measures of distribution. Trend analysis for all the variables over the study variables was also done. This involved plotting the trend lines over the study period. The trend lines indicate that capitalization ratio, operating cash flow ratio, implicit cash flow ratio and return on equity had quite volatile values of the study period. Investing cash flow ratio and financing cash flow ratios on the other hand had relatively stable values owing to the investing and financing policies adopted by companies listed at the Nairobi Securities Exchange.

The indicators of volatility in cash flow ratios were the three-year moving standard deviations of the respective category of cash flows. Segmental cross-sectional analysis was done to show how each of the segments of the NSE fared for the cash flow volatility ratios. With respect to operating cash flow ratio volatility (OCFRV), the cross-sectional comparisons indicated that the construction segment had the highest volatility while the Automobile and Accessories segment had the least levels of volatility. With respective to investing cash flow ratio volatility (ICFRV), the

automobiles segment is the most volatile while investment services segment portrayed the least volatility. It is also shown that in as far as financing cash flow ratio volatility (FCFRV) is concerned, the most volatile segment of the NSE is the Automobiles segment and just like for ICFRV Investment Services segment provided the lowest level of volatility. The last proxy of the independent variables was implicit cash flow ratio volatility (IMFRV). Descriptive analysis revealed that the Automobile segment reflected the least level of volatility while the Telecommunications segment portrayed the highest level of volatility.

Intersegment analysis in the differences in the study variables was undertaken based on ANOVA F-test. The findings showed that in as far as the 11 segments of the NSE are concerned, all of them were idiosyncratic and distinctly different with respect to all the variables of the study. It was indicated that capitalization ratios (firm sizes), operating cash flow ratio volatilities, investing cash flow ratio volatilities, financing cash flow ratio volatilities and returns on equity (financial performance) were all distinctly different for each of the segments. This implies that the approach by which NSE has used to segment listed companies reflects their unique attributes.

Correlation analysis was also done for the study variables to establish how the various independent and moderating variables of the study are correlated with the dependent variable being firm market value as indicated by the firm capitalization ratio. It was realized from the study that the volatilities in cash flows from operations, investing activities, financing activities and implicit cash flows are all negatively correlated with firm market size. It should however be noted that the correlation ranged from moderate (for operating cash flow ratio volatility) to very weak almost zero (for implicit cash flow ratio volatility). On the flipside, financial performance as measured by return on equity had a moderate positive correlation with firm value as indicated by the firm market capitalization ratio.

To analyze the data, panel regression analysis was used to establish the variable coefficients for testing the hypotheses stated in chapter one. By use of Hausman model specification tests, it was established that he most suitable model for analysis was the fixed effects model. This was consistent with the stability of the variables

over the 12-year study period. Other model diagnostic tests that were undertaken to ensure best linear unbiased estimators of the study coefficients were established included tests for normality, multicollinearity, serial correlation and heteroscedasticity.

Tests of hypotheses were done at two levels. These were the bivariate levels and the multi variate levels. At the bivariate level, panel regression analysis involved regressing firm market value as measured by the capitalization ratio on each of at the various variables including the moderating variable that was indicated by return in equity. At both of the two levels the results are consistent and indicate that the volatilities of cash flows from operating activities, investing activities and financing activities of firms listed at the NSE all have a negative effect on firm values. This was consistent with the value relevance theory of Miller and Modigliani (1961); the random walk theory of Burton (1973) and the efficient market hypothesis of Fama (1970). Consistent with the functional fixation theory of Sloan (1996), it was however established that the volatility in implicit cash flows has no significant bearing on the market value of the companies listed at the Nairobi Securities Exchange. In the bivariate and segmental analysis of the effect of financial performance on firm market value, it was established that financial performance as measured by return on equity (ROE) has a positive effect on financial performance of the listed companies at the Nairobi Securities Exchange.

The last objective was meant to test if financial performance had any significant moderating influence on the effect of the volatility in cash flows on the market value of the firms listed at the Nairobi securities exchange. The findings indicated that financial performance had a positive moderating influence on how all the study independent variables (operating cash flow volatility, investing cash flow volatility, financing cash flow volatility and implicit cash flow volatility) affect firm market value as indicated by the firm market capitalization ratio.

5.3 Conclusion

In this section are provided the conclusion arrived at from the study findings. They relate to both descriptive information as well as inferential finding both at the direct

level and the moderating level for both bivariate analysis and multivariate panel data regression evaluation. Firstly, with respect to volatilities in cash flows, it is concluded that there are varying levels of volatilities in cash flows for the various segments of the Nairobi Securities Exchange. The highest and lowest volatility levels are summarized in table 5.1.

Table 5.1: Levels of Cash Flow Volatility at the NSE

Variable	Highest Volatility	Lowest Volatility
Operating cash flow ratio Volatility	Construction Segment	Automobiles Segment
Investing cash flow ratio Volatility	Automobiles Segment	Investment Services
Financing cash flow ratio Volatility	Automobiles Segment	Investment Services
Implicit cash flow ratio Volatility	Telecoms Segment	Automobiles Segment

Secondly, it is concluded that each of the segments of the NSE have varying idiosyncratic attributes. This is because based on analysis of variances and F-tests, it was established that the patterns of capitalization ratios, operating cash flow ratios, investing cash flow ratios, financing cash flow ratios, implicit cash flow ratios as well as return on equity were significantly different from each other for all the 11 segments of the NSE.

Thirdly, it is concluded that there are varying levels of volatilities in cash flow patterns, financial performance and firm sizes of companies listed at the Nairobi Securities Exchange (NSE). The least volatile indicators of firm fundamentals were the levels of changes in financing cashflows and investing cash flows of the NSE firm. The rest of the study variables (operating cash flows, implicit cash flows, financial performance and firm size) were quite volatile.

Fourthly, it is concluded that the bivariate evaluation of the effect of cash flow volatility on firm market value and the multivariate analysis of the same yield the same results. This implies that the individual variables have individual strong influence on the direction of the effect of cash flow volatility on firm market value. It is therefore concluded that OCFRV, ICFRV and FCFRV all have a negative pricing effect on shares of firms listed at the NSE as is consistent with the efficient market hypothesis of Fama (1970) and value relevance theory of Miller and Modigliani (1961).

Fifthly, it is concluded that financial performance as measured by return on equity has a positive effect on the market value of companies listed at the Nairobi Securities Exchange. This implies that financial performance is an information priced factor at the NSE and that high performance firms are expected to have high market values compared to their low financial performance values. This implies that investors at the NSE identify financial performance to be an important metric when they make their buy, hold or sell decisions for the securities they hold or intent to hold in the firms at the NSE.

Lastly and with respect to the objectives of the study and the related tests of hypotheses, the conclusions arrived at in the study are provided in table 5.2. The summary is based on the four objectives that were set for the study in chapter one and the resultant tests of hypotheses undertaken in chapter four. With respect to the summary provided in table 5.2, several conclusions are arrived at. The first objective was set to establish if the volatility in the cash flows that emanate from operating activities of firms listed at the NSE had any significant influence on the market values of those firms. The conclusion arrived at is that the volatility in operating cash flows has a negative effect on the market valuation of the NSE firms. This reveals that volatility in operating cash flows is a market price information risk factor that the higher the volatility of the cash flows the lower the share prices and thereby the lower the firm market values.

The second objective was set to establish if the volatility in the cash flows that get derived from investing activities of firms listed at the NSE had any significant

influence on the market values of those firms. The conclusion arrived at is that the volatility in investing cash flows has a negative effect on the market valuation of the NSE firms. This reveals that volatility in investing cash flows is a market price information risk factor that the higher the volatility of the cash flows the lower the share prices and thereby the lower the firm market values.

Table 5.2: Conclusions on Objectives of the Study

Objective	Conclusion
To assess the effect of operating cash flow volatility on market value of companies listed at the Nairobi Securities Exchange in Kenya.	Negative effect
To evaluate the effect of investing cash flow volatility on market value of companies listed at the Nairobi Securities Exchange in Kenya.	Negative effect
To ascertain the effect of financing cash flow volatility on market value of companies listed at the Nairobi Securities Exchange in Kenya.	Negative effect
To determine the effect of implicit cash flow volatility on market value of companies listed at the Nairobi Securities Exchange in Kenya.	Zero effect
To establish the moderating influence of financial performance on the effect of cash flow volatility on market value of companies listed at the Nairobi Securities Exchange in Kenya	Positive moderating effect for all the variables

The third objective was set to establish if the volatility in the cash flows that get derived from financing activities of firms listed at the NSE had any significant influence on the market values of those firms. The conclusion arrived at is that the volatility in financing cash flows has a negative effect on the market valuation of the NSE firms. This reveals that volatility in financing cash flows is a market price

information risk factor that the higher the volatility of the cash flows the lower the share prices and thereby the lower the firm market values.

The last objective related to the moderating influence on the effect of cash flow volatility on market value of the firms listed at the Nairobi Securities Exchange. The conclusion arrived at is that financial performance as measured by return on equity (ROE) has a positive moderating influence on the relationship between volatilities in cash flows of firms listed at the NSE and the market valuation of those firms. What this indicates is that financial performance is not only a positively oriented pricing factor but it is also a positive moderator on how cash flow volatilities negate firm value. Firms can reduce the negative effect of cash flow volatility on firm value by boosting their financial performance.

5.4 Recommendations

The recommendations in this study arise from the findings established from the research. Firstly, the study found out that the volatilities in cash flows from operating, investing and financing activities had a negative pricing influence for the companies listed at the Nairobi Securities Exchange. The implication is that unlike what the functional fixation theory of Sloan (1996) suggests, the investors at the NSE analyze financial information beyond what is reported in the earnings data. It is therefore recommended that the annual report should include cash flow ratios in the additional information reported in the notes to the financial statements. In the existing reporting norms, companies usually report earnings per share and dividend per share in the financial statements. It is recommended operating, investing and financing cash flow ratios be added as part of the reported ratios to provide investors with more information for making their investment decisions for companies listed at the NSE.

The study also found out that cash flow volatility is a pricing market risk factor that influenced share prices and thereby market valuations of companies listed at the Nairobi Securities Exchange. It is therefore recommended that market information at the end of the year should also be reported in financial statements. Useful information that could help users of financial statements to relate financial statement

information with stock market information could be end of the year earnings yield - EY (which is the ratio of earnings per share – EPS to market price per share – MPS). The annual report could also report on the end of the year market price per share with comparative MPS of the previous financial periods as is currently done with the statement of financial position, the statement of comprehensive income, the statement of cash flows as well as the statement of changes in equity position.

The study found out that the volatility in cash flows from operating, investing and financing activities negatively affect the market value of companies listed at the NSE. It is therefore noted that companies could reduce the negative impact on their values ensuring that cash flow streams are not very volatile. It is therefore suggested that corporate governance and management efforts of companies listed at the NSE should be directed in stabilizing cash flow streams. Such efforts could focus stable terms of trade with customers as well as stabilized cash flow cycles used in management of liquidity. These should improve the accruals quality of earnings such that the reported earnings have a very high correlation with the resultant cash flows.

True to the expectations of the functional fixation theory of Sloan (1996), the study not only found out that financial performance affects the market value of companies listed at the NSE, but also that it moderates the effect of cash flow volatility on market value of companies listed at the Nairobi securities Exchange. This implies that information on financial performance is very critical to users of financial statements. Accordingly, it is recommended that there should be more disclosures in the annual report besides earnings per share. This could include return on equity, return on assets and even return total assets.

5.5 Areas for Further Research

Recommendations for further studies are derived from the limitations of this study. The first limitation was that focused on the companies listed at the Nairobi Securities Exchange because of the market price information required in determining firm market value which is the dependent variable of the study. Accordingly, the findings are generalizable for listed companies that are similar to the NSE listed companies. The study accordingly excluded non listed companies and this may limit the

generalizability of the findings to such non-listed companies. It is therefore recommended that a similar study be carried out for companies that are non-listed and measure market valuation based on market value proxies.

There was also a conceptual limitation in that whereas there are numerous factors that may moderate the relationship between market value of firms and the volatilities in their cash flows this study focused solely on financial performance as measured by return on equity. This implies that it is still not clear how such factors as firm size, firm age, corporate governance and the like moderates this reported effect of cash flow volatility on firm value. It is therefore suggested that a similar study be carried out but using different moderating variables like as firm size, firm age or corporate governance.

In addition, it is still not clear if different measures of financial performance like return on assets (ROA) and return on capital employed (ROCE) could lead to results that contradict the findings in this study that financial performance has a positive moderating influence on the effect of cash flow volatility on firm value of companies listed at the Nairobi Securities Exchange. Accordingly, it is suggested that a similar study be carried out with the use of a different measure of financial performance other that Return on equity. Other possible measures could be return on total assets (ROTA), return on capital employed (ROCE) or return on total capital (ROTC).

Further this study was limited in geographical scope. The study focused on companies that operate in Kenya and therefore subject to the Kenya regulatory regime. It is possible that the nature of earnings and cash flow patterns as well as firm size could be affected by the geographical limitations. Accordingly, it is suggested that a similar study be carried out in other countries in the East African region like Uganda, Tanzania, Rwanda, Ethiopia, Burundi and Congo. Corroborative studies could also be carried out in other developing countries as well as developed stock markets.

In addition, the study was done over a study period of twelve years (2011 to 2022) which reduced to 450 firm-year observations once the 3-year moving standard deviation was used to determine cash flow volatility. It is therefore suggested that a

longer period say 20 years be used to evaluate if the findings would come to the same conclusion as arrived at in this study.

Financial performance can be looked at from a statement of financial position perspective through return ratios as well as from an income statement perspective through margin ratios such as gross profit margin (GPM) and Net profit margin (NPM). This study adopted the balance approach in indicating financial performance since it adopted return on equity (ROE) as the indicator of financial performance. It is therefore suggested that a similar study could be carried out for companies listed at the Nairobi Securities Exchange using income statement measures of financial performance. A good indicator of overall performance from this perspective would be net profit margin (NPM) or the total expense ratio (TER) which is the inverse of the NPM.

Lastly, the study used market capitalization ratio as the indicator of firm market valuation. It is possible that the choice of this proxy for the independent variable could influence the outcome registered in the results. It is therefore suggested that a similar study be carried out sing a different indicator of market size. Other possible indicators of size or market value that could be used include the natural logarithm of capitalization and even Tobin's Q.

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APPENDICES

Appendix I: Sampling Frame

Source: Nairobi Securities Exchange (2022)

Agricultural sector.

Eaagads Ltd.X
Kapchorua Tea Co. LtdX
Kakuzi.X
Limuru Tea Co. Ltd.
Rea Vipingo Plantations Ltd.
Sasini Ltd.
Williamson Tea Kenya Ltd.

Automobiles and Accessories Sector.

Car and General (k) Ltd

Banking Sector.

Barclays Bank Ltd.
Stanbic Holdings Plc.
I&M Holdings Ltd.
Diamond Trust Bank Kenya Ltd.
HF Group Ltd.
KCB Group Ltd.
National Bank of Kenya Ltd.
NIC Group PLC.
Standard Chartered Bank Ltd.
Equity Group Holdings.
The Co-operative Bank of Kenya Ltd.
BK Group

Commercial and Services Sector

Express Kenya.
Sammer Africa PLC.
Kenya Airways Ltd.
Nation Media Group.
Standard Group Ltd.
TPS Eastern Africa (Serena)
WPP Scangroup Ltd.
Uchumi Supermarket Ltd.
Longhorn Publishers Ltd.
Atlas African Industries.
Deacons (East Africa) Plc.
Nairobi Business ventures.
Eveready EA

Construction and Allied Sector.

Athi River Mining.
Bamburi Cement Ltd.
Crown Paints Kenya PLC.
E.A Cables Ltd.
E.A Portland Cement Ltd.

Energy and Petroleum Sector.

KenolKobil Ltd.
Total Kenya Ltd.
KenGen Ltd.
Kenya Power & Lighting Co.
Umeme Ltd.

Insurance Sector

Jubilee Holdings Ltd.
Sanlam Kenya PLC.
Kenya Re-Insurance Corporation Ltd.
Liberty Kenya Holdings Ltd.
Britam Holdings Ltd.
CIC Insurance Group Ltd.

Investment Sector

Olympia Capital Holdings Ltd.
Centum Investment Co Ltd.
Trans-Century Ltd.
Home Afrika Ltd.
Kurwitu Ventures Ltd.
Nairobi Securities Exchange.

Manufacturing and Allied

B.O.C Kenya
British American Tobacco Kenya
Carbacid Investment
East African Breweries
Flame Tree Group Holdings
Kenya Orchards
Mumias Sugar Company
Unga Group

Telecommunication and Technology

Safaricom Ltd
Stanlib Fahari
Barclays New Gold ETF

Appendix II: Data collection sheet

Year	Cash flow from Operating activities.	Cash flow from Investing activities.	Cash flow from Financing activities.	Non-cash expenses	Issued Shares.	Market price per share	Earnings after Tax
2011							
2012							
2013							
2014							
2015							
2016							
2017							
2018							
2019							
2020							
2021							
2022							