UNIVERSITY OF NAIROBI

DEPARTMENT OF ACCOUNTING
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THE EFFECTS OF LIQUIDITY LEVEL ON STOCK RETURNS: THE NAIROBI STOCK EXCHANGE EVIDENCE.

A MANAGEMENT RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENTS OF THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION (MBA)-FINANCE.

BY: PHILEMON W. ODONGO

DECLARATION

I hereby declare that this research project is my original work and has not been presented for a degree or any other academic award in any other University.

Signed:.. **Date:** 08/10/08

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This research project has been submitted for examination with my approval as the University supervisor.

Signed:.. **Date:** 20.10.2008

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DEDICATION

To my Dad, Sospeter and Mum, Benta Odongo, who've taught me the true meaning of life. Your selfless love, dedication, sacrifices and encouragement has made me what I am today. To my love, Ebby Mutaka, thank you for being a part of my life.

To my brothers and sisters, may this be an inspiration to all of you to ascend higher in your academic endeavors. May God bless you all.

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Above all I thank the Almighty God for strength, good health and a sound mind and for this far he has brought me. In him I live.

ABSTRACT

Given the evidence in other developed markets that the level of liquidity affects asset returns, a reasonable hypothesis is that the second moment of liquidity should be positively related to asset returns, provided agents care about the risk associated with fluctuations in liquidity. Motivated by this observation, this study analyzes the relation between liquidity and stock returns with specific reference to the Nairobi Stock Exchange (NSE). The period under study was taken from the year 2000 to 2002.

The study set to accept or reject the hypothesis that there is a relationship between liquidity and stock returns, with liquidity proxied by Trading Volume Activity ratio, since information flow into the market is widely unobservable. Stocks quoted at the market are ranked on the basis of their trading activity ratios and two portfolios of bottom six and top six stocks studied for any correlation with their returns.

The study finds that there is no relationship between liquidity and stock returns at a confidence level of 90% and therefore that there is no liquidity premium at the Nairobi Stock Market. This result is in line with Fama's Random Walk Theory which implies that a series of stock price changes at the NSE has no memory. There is therefore a lot of noise at the market.

If the lack of relationship between liquidity and return is a pointer to inefficient pricing of assets at the NSE then the logical policy implication is to identify means of making this market efficient.

TABLE OF CONTENTS

CHAPTER 4: DATA ANALYSIS AND FINDINGS

CHAPTER 5: SUMMARY AND CONCLUSIONS

APPENDICES

CHAPTER ONE

1.0 INTRODUCTION

1.1 BACKGROUND

The role of long-term capital in economic development of a nation cannot be over emphasized. A capital market is crucial for mobilizing domestic and international capital. The reality of a much reduced supply of foreign funds compels the government in many developing countries to pay increased attention to capital market development as a way of improving domestic resource mobilization, enhancing supply of long term capital and encouraging efficient use of existing assets.

Securities markets have a very important role to play in financial liberalization and deepening. They not only provide a means of diversifying risk, but also provide a mechanism for capital allocation and corporate monitoring (Pandey (1995)).
Capital markets enable one to achieve better wealth composition and also permit adjustments to be made in wealth composition with speed and low costs whenever circumstances change. The competition among users of funds, that is, the business, the governments and individuals increase the efficiency with which capital is used.

Stock markets accelerate growth by facilitating the ability to trade ownership of firms without disrupting the production process and allow investors to hold diversified portfolios. Markowitz (1952) showed how an investor could reduce the standard deviation of portfolio returns without reducing return by choosing stocks that do not move exactly together.

In recent years, globalization of capital flows has led to the growing relevance of emerging capital markets The Nairobi stock exchange falls under the emerging markets that are attracting this relevance. The NSE has grown phenomenally due to the not so distant past initiated liberalization process. For instance, between 1995 and 2006, the turnover of shares listed on the NSE increased from 3.34 Million shares to 463 Million. In the same period, the market capitalization increased from 107.2 billion to 626 billion. However, the NSE is still plagued by severe illiquidity with trading being very infrequent and concentrated in only a few stocks.

1.1.1 History and operations of NSE

The stock exchange practice in Kenya can be traced back to 1920's when the country was still a British colony. It was initially set up as an overseas stock exchange in 1953. In the following year (1954), the NSE was constituted as a voluntary association of stockbrokers registered under the societies Act. It operated as an association of stockbrokers with no trading floor until October 1991. The introduction of the trading floor has led to a substantial increase in trading volumes and dramatic upward movement in the various indexes. The Nairobi stock Exchange has been instrumental in enabling the public and private sectors in Kenya, raise large amounts of capital for expansion projects and for the financing of new businesses.

It has also allowed for the participation of foreign investors in a bid to increase the investor base and bring into the country the much-needed foreign investment. This has in effect increased the number of participants in the bourse. The NSE therefore represents the financial market in Kenya. It has 51 registered brokers and about 53 firms listed on the exchange NSE website (2006). It deals in ordinary shares and fixed income securities such as preference shares and treasury bonds. The NSE also has some of its shares cross-listed with other stock exchanges in South Africa, Uganda and Tanzania. Both operational and informational efficiencies are key to ensuring that the NSE fulfils its mandate as the capital markets intermediary for Kenya and the world over.

1.1.2 Market Structure Reforms at Nairobi Stock Exchange

The Structure of the NSE has witnessed tremendous transformation during the last 10 years that has seen its operating environment and trading systems improve as part of measures aimed at improving market transparency and efficiency. Fundamental reform of the market structure was undertaken in the year 2000 that saw the market divided into four independent market classes namely:-

a) The main investments market segment (MIMS)

This is the main quotation market with more stringent listing requirements. The main investment market segment is further divided into four markets namely:

1) Agricultural market segment
2) Commercial and services market segment
3) Finance and investment market segment

4) Industrial and allied market segment

b) The Alternative Investments Market Segment (AIMS)

c) Fixed Income Securities Market Segment (FISMS)

d) Futures and Options Market Segment (FOMS)

1.1.3 The Fiscal incentives at the NSE and the role of the Capital Markets Authority (CMA).

The Capital Market Authority under which the NSE operates enforces maximum disclosure by listed companies and all those seeking a listing on the exchange. CMA has also established a mechanism for monitoring the affairs of stock-broking houses and other players in the market to ensure fair play.

In order to increase participation and liquidity of the NSE, the C. M. A has come up with the following fiscal incentives:-

- No capital gains tax
- Tax concession of 5.0% for newly listed companies for five years post listing, provided the firm lists a minimum of 30% of its fully issued and authorized share capital on the NSE. Therefore newly listed companies pay a corporate tax of 20% compared to 30% for unlisted firms.
- Employee share ownership schemes (ESOPS) enjoy tax exemption on their income. Essentially, ESOPS enjoy the same treatment as collective investment schemes, if they are registered as such with the capital markets authority. Dividends are subject to 5% withholding tax. Interest received from deposits, government debt securities or corporate debt securities is subject to a withholding tax of 15%. Gains arising from sale of shares are exempted from tax. These are the final tax.
- Tax relief of 15% (subject to a maximum of Kshs 3,000) per month on premiums paid for life and education policies of at least 10 years maturity.
- Withholding tax on dividends for Kenyan residents is 5% and 10% for foreigners.
- New and expanded share capital by listed companies or those seeking listing is exempt from stamp duty.
- Transfers of assets to a special purpose vehicle for the purpose of issuing asset backed securities is exempt from stamp duty and value added tax.
- Expenses incurred by companies in having their financial instruments rated by an independent rating agency are tax deductible.

- Registered and approved venture capital funds now enjoy a 10-year tax holiday

In standard asset pricing theory, expected stock returns are related cross-sectionally to returns' sensitivities to state variables with pervasive effects on effects on consumption and investment opportunities. The basic intuition is that a security whose lowest returns tend to accompany unfavorable shifts in quantities affecting an investor's overall welfare must offer additional compensation to the investor for holding that security.

Liquidity appears to be a good candidate for a priced state variable. It is often viewed as important for investments decisions, and recent studies find that fluctuations in various measures of liquidity are correlated across stocks. Liquidity is a broad and elusive concept that generally denotes the ability to trade large quantities quickly, at low cost, without moving the price.

Market microstructure research has made it clear that liquidity providers offer a real service. Buyers and sellers may not arrive in the market simultaneously, creating a role for liquidity providers to transact and hold securities on a temporary basis. Liquidity providers are compensated for their expense and risk exposure via the bid-ask spread. This cost of liquidity may be viewed as an added transaction cost and investors might require a higher expected gross return to compensate for this added cost. When market-wide liquidity is low, the probability of a seller completing a large transaction in a timely manner without making a significant price concession is low relative to times of high market liquidity

Illiquidity as measured by the absence of continuous trading implies that there is an extreme mismatch between the available buyers and sellers at a given point in time. As early as 1968, Demsetz noted the possibility that the available pool of liquidity- motivated traders (who demand immediacy) may not arrive at the same time. The consequent order imbalance can be cleared only if there exist traders who are willing to absorb the excess demand or supply at a price concession, of course. In other words, the traders who want to buy immediately can do so at a higher price and, similarly traders desiring immediate sale have to accept a lower price. At the NSE the traders do not have this facility at this time, since there are neither any pre-arranged dealers for the stocks nor a mechanism for aggregating limit orders.

There is a broad empirical literature that investigates the relationship between liquidity and expected asset returns. Ahimud and Mendelson (1986), Brennan and Subrahmanyam (1996) and Easley, Hvidkjaer, and O'Hara (2002) find a cross-sectional association between expected stock returns and individual stock liquidity- illiquid stocks earn higher future returns than liquid stocks. More recently Pastor and Stambaugh (2003), Acharya and Pedersen (2005), and Sadka (2005) examine the relationship between expected return and exposure to aggregate liquidity risk and find that liquidity risk is a priced factor. In Treasury bond markets there is also a well-documented relationship between bond yield and on-the-run liquidity status. Authors such as Benston and Hagerman (1974) and Glosten and Harris (1988) have used the number of shareholders as proxy for the extent of liquidity traders for a particular stock.

Liquidity is a complex subject. Stated simply, liquidity is the ease of trading a security. It is defined by many academicians as the ability of a market in achieving a high amount of trade without major price effects, that is, with low transactions costs, and this to be whenever asked. Some of its dimensions are volume, immediacy, depth, and resiliency as mentioned by Kyle (1985). One source of illiquidity is exogenous transaction costs such as brokerage fees, order processing costs or transaction taxes. Every time a security is traded, the buyer and /or seller incur a transaction cost; in addition, the buyer anticipates further costs upon a future sale, and so on, throughout the life of the security.

Another source of illiquidity is demand pressure and inventory risk. Demand pressure arises because not all agents are present in the market at all times, which means that if an agent needs to sell a security quickly, then the natural buyers may not be immediately available. As a result, the seller may sell to a market maker who buys in anticipation of being able to later lay off the position. The market maker, being exposed to the risk of price changes while he holds the asset in inventory, must be compensated for this risk-a compensation that imposes a cost on the seller.

Also, trading a security may be costly because the traders on the other side may have private information. For instance, the buyer of a stock may worry that a potential seller has private information that the company is losing money, and the seller may be afraid that the buyer has private information that the company is about to take off. Then, trading with an informed counter party will end up with a loss. In addition to private information about the fundamentals of the security, agents can also have private information about order flow. For example, if a trading desk knows that an investment fund needs to liquidate a large position and that this will depress prices, then the trading desk can sell early at relatively high prices and buy back later at lower prices.

The third source of illiquidity is the difficulty of locating a counter-party who is willing to trade a particular security, or a large quantity of a given security. Further, once a counter-party is located, the agents must negotiate the price in a less than competitive environment since alternative trading partners are not immediately available. This search friction is particularly relevant in over-the-counter markets in which there is no central market place. A searching trader incurs financing costs or opportunity costs as long as his trade is delayed, and further, he may need to give price concessions in the negotiation with the counter-party that he eventually finds. Alternatively, he may trade quickly with a dealer and bear illiquidity cost.

These costs of illiquidity should affect securities prices if investors require compensation for bearing them. In addition, because liquidity varies over time, risk-averse investors may require a compensation for being exposed to liquidity risk. These effects of liquidity on asset prices are important. Investors need to know them in designing their investment strategies. And if liquidity costs and risks affect the required return by investors, they affect corporations' cost of capital and hence, the allocation of the economy's real resources.

The measurement of market liquidity is complex and often subject to measurement problems. Literature has shown that high quality public disclosures (e.g. annual reports, press releases etc) reduce information asymmetry and increase stock market liquidity.

Market liquidity could be measured by both trade-based and order-based measures i.e transaction volume and bid-ask spreads. The bid-ask spread is a measuring of the liquidity degree of firm's securities that was proposed by Demsetz (1968). The bid-ask spread addresses the adverse selection problem that arises from transacting in firms shares in the presence of asymmetrically informed investors. Less information asymmetry implies less adverse selection, which implies in turn a smaller bid-ask spread.

The market microstructure literature suggests that bid-ask spread includes three components: order-processing costs, inventory-holding costs and adverse selection costs. Affleck-Graves et al (2002) find an increase in the adverse selection component of bid-ask spreads on the day of and the day prior to formal earnings announcements, suggesting spread is used as a proxy for both information asymmetry and market liquidity. Increased spreads lower stock market liquidity and exacerbate information asymmetry among informed and uninformed market participants.

Lot size also has an important implication for the liquidity of a stock since it determines the minimum amount of money needed for trading. Too large a lot size would prohibit small investors from entering the market for the stock. Liquidity is related to the number and type of investors following the stock. Small, individual investors are generally thought to be uninformed. noise traders. The introduction of such investors into the market should increase liquidity as more frequent trading results.

The measures of liquidity mentioned above are the finer and better ones. However, these measures require a lot of microstructure data that are not available in the NSE and most stock markets. And even when available, the data do not cover very long periods of time. This study therefore dwells on trading volume as proxy for market liquidity. Trading volume, defined as the number of shares exchanged, might therefore be considered as a first indicator of liquidity.

More researches are lately being done on the Kenyan market trying to establish the relationship between trading volume and stock return. This study adds to this rich research area by examining the effects of liquidity or illiquidity on the stock returns.

1.2 STATEMENT OF THE PROBLEM

Illiquidity reflects the impact of order flow on price-the discount that a seller concedes or the premium that a buyer pays when executing a market order that results from adverse selection costs and inventory costs (Amihud and Mendelson, 1980).

For standard size transactions, the price impact is the bid-ask spread, whereas larger excess demand induces a greater impact on prices (Kraus and Stoll, 1972). Kyle (1985) proposed that because market makers cannot distinguish between order flow that is generated by informed traders and by liquidity (noise), they set prices that are an increasing function of the imbalance in the order flow which may indicate informed trading. This creates a positive relationship between the order flow or transaction volume and price change, commonly called the price impact.

Several scholars have conducted studies to establish if indeed liquidity/illiquidity affects stock returns or prices.
Amihud and Mendelson (1986) and Eleswarapu (1997) found a significant positive effect of quoted bid-ask spreads on stock returns (risk-adjusted). Chalmers and Kadlec (1998) used the amortized effective spread as a measure of liquidity, obtained from quotes and subsequent transactions, and found that it positively affects stock returns.

Brennan and Subrahmanyam (1996) measured stock illiquidity by price impact, measured as the price response to signed order flow (order size) and by the fixed cost of trading, using intra-day continuous data on transactions and quotes. They found that these measures of illiquidity positively affect stock returns.
Pastor and Stambaugh (2003) find that expected stock returns are cross-sectionally related to liquidity risk.

In Treasury bond markets there is also a well-documented relationship between bond yield and on-the-run liquidity status (e.g Roll (1970), Mcculloch (1987), and Krishnamurthy (2002). They conclude bond yield and on-the-run liquidity status are cross-sectionally related.

The fine measures of liquidity/illiquidity used in the above mentioned studies require for their calculation microstructure data on transactions and quotes that are unavailable in most markets around the world for long periods of time, the Nairobi Stock Exchange included.
In contrast, the liquidity measure I intend to use in this study is calculated from weekly data on returns and volume that are readily available over long periods of time from the NSE. Therefore, while it is more course and relatively less accurate, it is readily available for the study of series effects of liquidity.

The motivation for this study derives in part from the earlier literature on the effect of market liquidity/illiquidity on stock returns on widely known exchanges like the New York stock exchange. There however haven't been enough studies on our local NSE focusing squarely on liquidity.

This study therefore seeks to review the theoretical literature that studies the relationship between liquidity and stock prices, and further examine the NSE to ascertain whether there is any relationship between these two variables: stock returns and liquidity/illiquidity.

The key question that this study seeks to address is;

- Does liquidity of a stock affect its share price and hence it's return?

1.3 HYPOTHESES

The following hypotheses have been set which this study will either reject or fail to reject:

H_O : μ=0: There is no relationship between liquidity (as measured by trading volume) and stock prices/returns.

H_A : μ#0: There is a relationship between liquidity and stock prices/returns.

1.4 OBJECTIVE OF THE STUDY

The objective of this study is to determine the role liquidity of a stock plays in influencing its return at a particular period, with focus being on the Nairobi Stock Exchange.

1.5 IMPORTANCE OF THE STUDY

Liquidity has wide ranging effects on financial markets. Theoretically and empirically, liquidity can explain the cross-section of assets with different liquidity, after controlling for other asset's characteristics such as risk, and the time series relationship between liquidity and securities returns.

Liquidity helps explain why certain hard-to-trade securities are relatively cheap, the pricing of stocks and corporate bonds, the return on hedge funds, and the valuation of closed-end funds. It follows therefore that liquidity can help explain a number of puzzles, such as why equities commanding high required returns (the equity premium puzzle), why liquid risk-free treasuries have low required returns (the risk-free rate puzzle), and why small stocks that are typically illiquid earn high returns (the small firm effect).

There are several reasons why it is useful to study the relation between liquidity and stock pricing or returns. First, prior studies have largely focused on the more advanced western capital markets. The association of liquidity with stock returns has not been widely tested in emerging capital markets like the NSE. It is therefore interesting to study whether, in spite of the differences in the market microstructure between developed and emerging capital markets, there exists a liquidity premium in the NSE.

Second, the study of liquidity at the NSE, which is plagued by severe illiquidity problems, is likely to be useful to investors in making their investment decisions. Empirical evidence on the liquidity premium at the NSE is likely to informative for investors who would like to know the potential compensation for investing in the illiquid stocks. In summary therefore, the study will be important in the following ways:

1. **Investment advisors**: Investment advisors have the role of providing appropriate advice to their clients on what stocks to invest in or divest from. This study will provide guidance on how best to advise clients on appropriate stocks to invest in given their investment objectives.

2. **Academia**: The study of the role liquidity plays in influencing stock returns or prices is an area of interest to many financial scholars. My study will go along way in opening further avenues for scholars who want to do more research in this area.

3. **Traders:** Information on liquidity and how it relates to the stock prices will interest a lot of traders especially those who enter the stock market for capital gains purposes. Whether or not liquid assets attract higher returns will inform their investment decisions greatly.

4. **The NSE regulators**: Since liquidity goes to the core of the financial system operations, this study will help provide insight into the liquidity levels of our local market and hopefully spur the Government and other relevant authorities to put into place mechanisms that can increase the deepening of the financial system and increase confidence in the stock market.

5. **Fund Managers:** The study will enlighten the fund managers on the different trading strategies that they can use to derive above average profits and diversify their portfolio to reduce risk.

I believe that this study contributes to a better understanding of a hitherto relatively unresearched emerging market. Given the growing attention on these markets, the findings of this study should be of interest to an international audience as well.

1.6 OVERVIEW OF THE STUDY

This research study is organized as follows:

Chapter 1 gives a background of the study, the problem that the study addresses, hypothesis tested and objective as well as the significance of the study to the various stakeholders.

Chapter 2 reviews the literature surrounding liquidity and its effects on returns plus a brief history of the NSE and what other scholars both in Kenya and around the world have done on this study.

Chapter 3 outlines the research procedures that was adopted in resolving the research problem and specifically addresses the tools that were used in interpreting the data collected on the study.

Chapter 4 discusses the findings of the research as well analysis of the data collected.

Chapter 5 gives a summary of the study conclusions, limitations, recommendations and suggestions for future research.

CHAPTER TWO

2.0 LITERATURE REVIEW

2.1 HISTORICAL STOCK MARKET ANOMALIES

Despite strong evidence that the stock market is highly efficient, there have been scores of studies that have documented long-term historical anomalies in the stock market that seem to contradict the efficient market hypothesis.

While the existence of these anomalies is well accepted, the question of whether investors can exploit them to earn superior returns in the future is subject to debate. Investors evaluating anomalies should keep in mind that although they have existed historically, there is no guarantee they will persist in the future. If they do persist, transactions and hidden costs may prevent out performance in the future. Investors should also consider tax effects in their taxable portfolios when evaluating stock strategies (Amihud and Mendelson 1989).

Researchers that discover anomalies or styles that produce superior returns have two choices: go public and seek recognition for discovering the technique; or use the technique to earn excess returns. It's common for money to flow into strategies that attempt to exploit anomalies and this in turn causes the anomaly to disappear.

Further, even anomalies that do persist may take decades to pay off. Investors evaluating historical data should also consider the potential pitfalls of data mining. When searching large amounts of data, correlations between variables may occur randomly and therefore may have no predictive value. Anomalies that have existed over the longest time frames and have been confirmed to exist in international markets and out of sample periods are particularly persuasive.

2.1.1 Fundamental Anomalies

Value investing is probably the most publicized anomaly and is frequently touted as the best strategy for investing. There is a large body of evidence documenting the fact that historically, investors mistakenly overestimate the prospects of growth companies and underestimate value companies.

Lakonishok, Vishny, and Shleifer (1988) concluded, "Value strategies yield higher returns because these strategies exploit the mistakes of the typical investor and not because these strategies are fundamentally riskier

2.1.2 Technical Anomalies

A question that has been subject to extensive research and debate is whether past prices and charts can be used to predict future prices. "Technical Analysis" is a general term for a number of investing techniques that attempt to forecast securities prices by studying past prices and related statistics. Common techniques include strategies based on relative strength, moving averages, as well as support and resistance.

The majority of researchers, e.g Eugene Fama (1970) that have tested technical trading systems (and the weak-form efficient market hypothesis) have found that prices adjust rapidly to stock market information and that technical analysis techniques are not likely to provide any advantage to investors who use them. However others argue that there is validity to some technical strategies.

2.1.3 Calendar Anomalies

2.1.3.1 The January Effect

Stocks in general and small stocks in particular have historically generated abnormally high returns during the month of January. According to Haugen and Jorion (1989), "The January effect is, perhaps the best-known example of anomalous behavior in security markets throughout the world. The January Effect is particularly intriguing because it doesn't appear to be diminishing despite being well known and publicized for nearly two decades

2.1.3.2 Turn of the Month Effect

Stocks consistently show higher returns on the last day and first four days of the month. Frank Russell Company examined returns of the S&P 500 over a 65 year period and found that U.S. large-cap stocks consistently show higher returns at the turn of the month

2.1.3.3 The Monday Effect

Monday tends to be the worst day to be invested in stocks. The first study documenting a weekend effect was by M. J. Fields in 1931 in the Journal of Business at a time when stocks traded on Saturdays

2.1.4 Other Anomalies

2.1.4.1 The Size Effect

Some studies have shown that small firms (capitalization or assets) tend to outperform. The small stock affect was first documented by Rolf W. Banz in 1986. He divided the stocks on the NYSE into quintiles based on market capitalization. The returns from 1926 to 1980 for the smallest quintile outperformed the other quintiles and other indexes. Others have argued that its not size that matters, its attention and number of analysts that follow the stock.

This anomaly is subject to intense debate over whether an opportunity to generate excess returns actually exists. Other studies show that small capitalization stocks outperform large stocks in the United States as well as in foreign markets. However, others argue that its not reasonable to assume that investors can realize those returns. Professor Jeremy J. Siegel (1985) argues that the period from the end of 1974 through the end of 1983 accounts for the whole out performance of small caps and according to John C. Bogle, since December 1978, small caps and large caps have earned exactly the same returns.

In the context of the volume-return relationship, Blume, Easly and O'Hara (1994) argued that the informativeness of past trading activities for the stock prices is more pronounced for small rather large stocks.

Conrad, Hameed, and Niden (1994) showed that as size decreases, price reversals (continuations) of high volume (low volume) stocks become stronger, resulting in an increase (decrease) in profits from the contrarian strategy.

2.1.4.2 Announcement Based Effects

Price changes tend to persist after initial announcements. Stocks with positive surprises tend to drift upward; those with negative surprises tend to drift downward. Some refer to the likelihood of positive earnings surprises to be followed by several more earnings surprises as the "cockroach" theory because when you find one, there are likely to be more in hiding

2.2 STOCK SPLITS AND LIQUIDITY

The effects of stock splits are puzzling. In theory a stock split is merely an accounting change, which leaves investors no better or worse off than they were before the split. Yet stock splits are a relatively common occurrence. This implies that there must be some benefit either real or perceived, which results from a firm splitting their stock

Survey evidence indicates that managers split their stock to get the stock's price into some optimal trading range (Baker and Gallagher (1980)). Managers believe this will attract small investors, which implies managers believe that splitting their firm's stock has implications for the firm's ownership structure.

Individual shareholders tend to be wealth constrained, and therefore cannot afford to acquire a round lot of a firm's stock if the price is too high. By splitting their stock, firms make their stock more attractive for the individual investor (Lakonishok and Lev (1987), Conroy and Harris (1996)). With the lower post split price, we should observe a lower proportion of institutional ownership and a higher proportion of individual ownership, after the split than before the split.

Brennan and Copeland (1998) in their signaling hypothesis of stock splits argue that managers only split their stock if they are optimistic that the future share price will increase or at the very least not decrease. If a manager believes that the future share price will decrease they many not be willing to split the stock due to the increased cost of trading a lower priced stock or due to their reluctance to split the stock and then have the share price fall below the manager's perceived optimal trading range.

Several studies have found empirical evidence supporting the signaling hypothesis (Ikenberry, Rankine and Stice (1996), McNicholas and Dravid (1990), Lakonishok and Lev (1987)). While managers may not explicitly intend for the split to be a positive signal about the future prospects of the firm, the split still conveys information to the market.

Dennis and Strickland (1998) on their study of the stock split effect on volume find a significant increase in post-split trading volume. They further document that the greatest increase in this volume occurs in firms that have lowest levels of institutional ownership prior to the split. The fact that post-split changes in trading volume are linked to the level of institutional ownership prior to a split may explain the mixed results regarding post split volume that other studies have found.

While some studies show that the liquidity of a stock improves after a split (Muscarella and Vetsuypens (1996), others show that the liquidity of a stock after a split is no greater than stocks that do not split (Lakonishok and Lev (1987)), or that the liquidity of a stock declines after a split (Copeland (1979)).

Dennis and Strickland (1998) also find that the abnormal return at the announcement of a split is positive and is negatively related to the proportion of institutional ownership prior to the split. Several authors (Grinblatt, Masulis and Titman (1984), Muscarella and Vetsypens (1996), Lamoureux and Poon (1987)) have shown that there is a significantly positive abnormal return at the announcement of a stock split.

One theory that can be used to explain this effect is the signaling hypothesis. A split is a signal to the market that the firm's managers are optimistic about the future. Bad firms who falsely signal can incur penalties ranging from increased trading costs to increased scrutiny from the media and brokers.

A second hypothesis that is used to explain the positive abnormal returns relates to the liquidity theory. Under this hypothesis the lower post-split price attracts investors who were reluctant to purchase the stock at the higher pre-split price. Now that more investors are willing to trade the stock, the stock becomes more liquid and investors are willing to pay a premium for this liquidity.

In conclusion therefore, the traditional view of stock splits as cosmetic transactions that simply divide the same pie into more slices is inconsistent with the significant wealth effect of the announcement of a stock split. Economists have responded to this inconsistency by suggesting that the stock splits signal positive private managerial information about the firm. There is also evidence of liquidity gains for firms that split their stock but the liquidity gains are conditional on the level of institutional ownership and liquidity prior to the split.

2.3 STOCK MARKET LIQUIDITY AND FIRM DIVIDEND POLICY

Firms' dividend policies continue to puzzle financial researchers. In their study of stock market liquidity and firm dividend policy, Banerjee and Gatcher (2005) argue that investor demand for stocks paying cash dividends is positively related to the trading friction that investors face when creating homemade dividends. They further hypothesize that the likelihood a firm will pay cash dividends is positively related to investor demand for dividend payments and therefore inversely related to the market liquidity of the firm's stock. They examine the empirical evidence and find strong support for their hypothesis.

In their seminal work, Miller and Modigliani (1961) formally developed the dividend irrelevance hypothesis. In perfect capital markets populated by rational investors, a firm's value is solely a function of the firm's investment opportunities and is independent of the firm's payout policy. One notable assumption of the divided irrelevance proposition is that trading is frictionless. In perfect markets, investors can instantaneously invest or liquidate their investment in any stock without incurring any direct or indirect costs of trading and without changing the price of the underlying security. In markets with no trading friction, rational investors with liquidity needs can create homemade dividends at no cost by selling an appropriate amount of their holdings in the firm.

In markets with trading friction, stocks that pay cash dividends allow investors to satisfy their liquidity needs with little or no trading in the stock and thus enable them to avoid trading friction. As a result, investors with current or anticipated future liquidity needs may have a preference for dividend paying stocks. This preference will be positively related to the level of trading friction so that higher (lower) trading friction will lead to higher (lower) demand for cash dividends. Dong, Robinson, and Veld (2003) present survey evidence that retail investors want dividends partly because their costs of cashing in dividends are lower than the transaction costs involved in selling shares.

While the possibility of a link between stock market liquidity and the dividend policy of the firm dates back to Miller and Modigliani, current literature provides little direct empirical evidence on the issue. Some indirect evidence, however, is available. For example, Long (1978) documents that between 1956 and 1976 the cash dividend class of shares of Citizens Utilities Company on average sold at a premium to the stock dividend class. Subsequent work by Porteba (1986) shows that the two classes of shares trade at similar prices for the 1976-1984 period. The disappearing premium on the cash dividend shares is consistent with an increase in the liquidity of the market in that period.

Banerjee and Gatcher (2005) further address the question of whether dividend policy determines stock market liquidity and not vice versa. They perform their analysis conditional on the past dividend policy of firms while at the same time use historic measure of liquidity rather than a contemporaneous one. They find that past year market liquidity is an important determinant of dividend initiations and of dividend omissions. Less (more) liquid firms that have never paid dividends are more (less) likely to initiate dividend payments. Similarly, less (more) liquid firms that have paid dividends for the past five years are more (less) likely to continue paying in the future. Firms with less liquid markets (characterized by low trading activity, high proportion of zero trading days, and high price impact of order-flow) are more likely to pay dividends. These results persist after controlling for firm characteristics of size, profitability and growth opportunities. Banerjee and Gatcher also present evidence that market liquidity and firm likelihood to pay dividends are negatively related over time. The past four decades are characterized by declining commission rates, declining bid-ask spreads, and a ten-fold increase in market activity-measures frequently used to quantify the liquidity of the stock market. When they apply their 1963-1977 estimates to predict the proportion of dividend payers in more recent years, they find that increased market liquidity explains most of the lower propensity of firms to pay dividends documented by Fama and French (2001). Furthermore, the predictive accuracy of a model that controls for stock market liquidity, versus a model that does not, is more pronounced for firms more likely to pay dividends based on their size, profitability, and growth opportunities (i.e firms with higher ability to pay) and for firms with more liquid stocks.

2.4 INFORMATION ASYMMETRY AND STOCK MARKET LIQUIDITY

Companies might pursue a disclosure strategy in response to perceived illiquidity for their shares in the market. Consequently corporate disclosures aim to improve stock market liquidity. Disclosure literature has shown that high quality public disclosures reduce information asymmetry and increase stock market liquidity.

Bushee and Noe (2000), Leuz and Verrechia (2000) and Welker (1995) argue that market liquidity could be measured by both trade-based and order-based measures.
Heflin et al (2001) suggest that information quality is important for market liquidity. Quality accounting disclosures are considered as means of reducing information asymmetries across traders and increasing the ability of equity traders to effectively execute stock trades when needed and at reasonable costs. They examine 221 American firms from 1989 to 1998 and find that high quality disclosures enhance market liquidity by increasing quoted depth and reducing effective spreads.

Welker (1995) examines the relationship between stock market liquidity and corporate disclosure policy. He finds a negative relationship between disclosure policy and bid-ask spreads, suggesting that the higher the information disclosures, the more the level of bid—ask spreads. This phenomenon is due to the decrease in perceived information asymmetry between market participants. Welker uses the relative bid-ask spread as an appropriate proxy for liquidity.

The same proxy was also used by Healy et al (1991), who found that firms making sustained increases in disclosure quality experience higher stock market liquidity through narrower relative bid-ask spreads.

Leuz and Verracchia (2000) use a sample of 102 German firms included on the German exchange in 1998. They analyze firms that report under the international accounting standards or US-GAAP. They show that companies benefit from reduced spreads and increased transaction volumes and hence from improvement in market liquidity.

Coller and Yohn (1997) used a sample of 278 quarterly earnings forecasts to confirm that managers issue their forecasts to reduce information asymmetries. They notice an increase in spreads the day of and the day after the management forecast release, suggesting that as with formal earnings announcements, specialists temporarily increase spreads as a way of protection from investors with superior processing abilities.

Affleck-Graves et al. (2000) find an increase in the adverse selection component of bid-ask spreads on the day of and the day prior to formal earnings announcements, suggesting spread is used as a proxy for both information asymmetry and market liquidity. Increased spreads lower stock market liquidity and exacerbate information asymmetry among informed and uninformed market participants. According to Krinsky and Lee (1996), adverse selection costs increase because some traders have a superior capacity to estimate firm performance.

2.5 TRADING VOLUME THEORY AND PRIOR EMPIRICAL WORK.

High trading volume is a puzzle in a world where all investors are rational. Indeed, explaining why any trading takes place in a perfectly rational world is difficult.

Grossman (1976) and Milgrom and Stokey (1982) note that an offer to trade indicates to potential counter parties that the trader might have private information. Rational traders refuse to trade under such conditions and trading volume is zero.

Kyle (1985), Admati and Pfleiderer (1988), and Foster and Viswanathan (1990), use liquidity traders to get out of the no-trading trap, but this solution is incomplete. Subrahmanyam (1991) shows that rational liquidity traders trade only baskets of securities, avoiding trades in individual securities.

Black (1986) and Treynor Bagehot (1971) first argued that noise traders offer an exit from the no-trading trap. Black defines noise trading as trading on noise as if it were information, suggesting that such traders manifest their overconfidence by overestimating the value of their information. Models of investor overconfidence and biased self-attribution are also developed by Odean (1998), Daniel, Hirshleifer and Subrahmanyam (1998). These models do not specify an exact time frame for the lead-lag relationship between returns and volume, only that high (low) market-wide returns lead to high (low) volume.

Cognitive errors are one motive for trading according to Black, emotions are another. Shefrin and Statman (1985) model the effect of the emotions of pride and regret on trading. Investors in the Shefrin–Statman model think about stocks within mental accounts, one for each stock. Pride accompanies the realization of paper gains, and regret accompanies the realization of paper losses. Investors hasten to sell winners because they want to experience the pride that accompanies the realization of gains, and hold on to losers because they want to postpone the regret that accompanies the realization of losses.

The desire to sell a security with a paper gain is expressed by trading with other investors without this bias, and thus may affect the pricing equilibrium for that stock. If disposition related selling (for gains) or a resistance to sell (for losses) comprises a material part of total volume, prices will be slow to react to new information. Grinblatt and Han (2002) find that disposition motivated trading is the root cause of the Jegadeesh and Titman (1993) momentum anomaly; positive autocorrelations in returns lasting several months.

Considerable empirical research relates volume to current returns, including Karpoff (1987), Stoll and Whaley (1987), Bessembider and Senguin (1993), and Lo and Wang (2000). However little prior empirical research relates current volume to lagged returns
Statman, Theorley and Vorkink (2004), found that market wide trading volume in the United States of America is related to past market returns. They used a vector autoregressive and impulse-response function methodology to investigate the trading volume implication of the over confidence hypothesis. They found that market wide-trading activity in NYSE/AMEX shares is positively correlated to past shocks in market return, with the turnover response lasting months and perhaps years. They also show that individual security trading activity is even more responsive to past shocks in the market wide-return, which they interpret as evidence of the overconfidence hypothesis.

Lee and Swaminathan (2000) showed that the information content of trading volume is related to market misperceptions of firm's future earnings prospects. Specifically, they provided strong evidence that low (high) volume stocks tend to be under (over) valued by the market. This evidence included past operating and market performance, current valuation multiples and operating performance, and future operating performance and earnings surprises. One implication of their finding is that investor expectations affect not only a stock's return but also its trading activity.

Bhagat and Bhatia (1996) also employed daily data to test the causal relationship between volume and return, finding that return causes volume but not vice versa. This implies that knowledge of trading volume cannot improve short run return forecasts. They found that return volatility precedes trading volume in many cases.

Chordia and Swaminathan (2001) found that trading volume is a significant determinant of lead-lag cross-autocorrelations in stock returns. Specifically, returns of portfolios containing high trading volume lead returns of portfolios comprised of low trading volume stocks, Additional tests established that the source of these lead-lag cross-autocorrelations is the tendency of low volume stock prices to react sluggishly to new information. While non-trading may be a part of the story, the magnitude of the autocorrelations and cross-autocorrelations indicate that non-trading cannot be the sole explanation of their results.

2.6 EMPIRICAL EVIDENCE ON LIQUIDITY AND STOCK RETURNS

The liquidity literature is vast. In this study, the literature of interest is found in studies that link liquidity to securities' required return i.e literature on liquidity and asset prices

Prior literature has focused on several definitions of liquidity. For instance, Lippman and Mc Call (1986) have defined liquidity in terms of the time that it takes to transact. Hasbrouck and Schwartz (1988) characterize a liquid market by its depth, breath and resiliency. Depth refers to the existence of buy and sell orders near the current market price, breadth is the existence of orders in substantial volume and resiliency is the responsiveness to price changes caused by short-term order flow imbalances. Other authors such as Amihud and Mendelson (1986) define liquidity as the observable bid-ask spread.

Bernstein (1987) reviews the various measures of liquidity and points out the pitfalls of using a single measure of liquidity.
Schwartz (1988) states that liquidity differs between assets traded within a market center. Such trading frictions have an impact on the price behavior of a security. Other factors being equal, thinly traded stocks are found to have wider bid-ask spreads and greater short period price volatility. Also, market model beta coefficients are biased downwards. The issue of whether liquidity differences between assets traded within a market center have a substantial effect on asset prices is an important one.

Amihud and Mendelson (1986) model the impact of liquidity on asset pricing. They measure liquidity by the bid-ask spread, which is the cost of immediate execution. Their theoretical model posits, and their empirical results corroborate, that assets with wider percentage spreads yield higher returns on average, and that investors with longer holding periods should select assets with wider spreads.

Amihud and Mendelson (1998) examine the costs and benefits of increasing liquidity. They find that by increasing liquidity, firms reduce their cost of capital and increase their value. They analyze the role of a number of financial management policies and institutional mechanisms in enhancing the secondary market liquidity of firms. The implication of these findings is that there is need to move from the two-dimensional risk return framework to a three-dimensional risk/return/liquidity framework.

Amihud and Mendelson (1986a) studied the effect of having different types of investors with different expected holding periods. They referred to this as the Clientele effect. Some investors expect a greater likelihood of a liquidity shock that will force them to liquidate, or a greater likelihood of arrival of a good investment opportunity that will make them want to liquidate their investment and switch to another. Consequently, each investor considers differently the impact of transaction costs on the return that he requires. Since investors require compensation at least for their expected per-period trading costs, a frequently trading investor requires a higher return than does an infrequently trading one. In equilibrium, liquid assets are held by frequently trading investors while the illiquid assets are held by investors with long-expected holding period.

Eleswarapu and Krishnamurti (1998) study the problem of illiquidity that afflicts the stocks listed on the Bombay Stock Exchange. Trading on a regular basis is concentrated in only a few of the listed firms. They examine this issue by empirically looking at the characteristics of firms leading to differential levels of trading frequency and also, the resultant effect on average returns. Based on the study of a random sample of 250 firms over a five-year period (1987-1993), they find evidence in favor of a liquidity premium for stocks on the Bombay stock exchange. They also find that trading frequency is positively related to number of shareholders and shares outstanding. In addition the ownership structure seems to matter, with concentration in the hands of insiders and government bodies having a deleterious effect on liquidity.

Heston and Sadka (2005) in their paper on seasonal liquidity and stock returns, present a new seasonal pattern in both stock liquidity and stock returns. In particular the pattern in liquidity leads the pattern in returns by one month, which is consistent with market-microstructure theory that illiquid assets earn high subsequent returns. They show seasonality explains an economically and statistically significant magnitude of the cross-sectional variation in expected stock returns. They conclude that seasonality is present in all calendar months and is independent of industry, size and earnings announcement. Seasonality is therefore important to our understanding of liquidity, stock returns and asset pricing.

Pastor and Stambaugh (2002) devise a measure of the price reversal (resiliency) dimension of market-wide liquidity utilizing daily returns over a long period (1962-1999). Controlling for the usual risk factors, they find a positive relationship between stock returns and the covariance of return with their measure of market-wide liquidity.

Porter (2003) in his paper on measuring market liquidity suggests that liquidity has multiple dimensions, which incorporate key elements of volume, time and transaction costs. He further contends that an ideal measure of market-wide liquidity should therefore incorporate elements of depth, breadth and resiliency. He estimates measures of market-wide liquidity along each of these dimensions and finds that each measure's innovations are correlated, that covariance of stock returns and innovations in each measure is priced, and combining the information in each measure improves the precision of estimates of liquidity risk primia. He estimates the liquidity risk premium to be approximately 2-5% per year and show that this premium is distinct from firm size, a security's individual liquidity, and the covariance between changes in a security's individual liquidity and market-wide liquidity. As a byproduct, he also documents that the liquidity risk premium has a strong January seasonal, which is unrelated to firm size.

Avramov, Chordia and Goyal (2004) studied a sample of NYSE-AMEX stocks over the period 1962-2002, to establish if there was any autocorrelations in individual stock returns and liquidity. They document a strong relationship between short-run reversals and stock return illiquidity, even after controlling for trading volume. The largest reversals and the potential contrarian trading strategy profits occur in the high turnover, low liquidity stocks, as the price pressures caused by non-informational demands for immediacy are accommodated. Thus, the high frequency negative autocorrelations are more likely to result in from stresses in the market for liquidity. The contrarian trading strategy profits are smaller than the likely transactions costs because the high turnover, low liquidity stocks face large transaction and market impact costs. They conclude that this lack of profitability and the fact that the overall findings are consistent with rational equilibrium paradigms suggest that the violation of the efficient market hypothesis due to short-term reversals is not so egregious after all.

2.7 STUDIES ON THE NSE

A review of the empirical studies done in Kenya on the effects of liquidity on stock returns/prices reveals that very little work has been done in this area.

Munga (1974) studied the history, organization and role of NSE in the Kenyan Economy. He found the NSE to be characterized by illiquidity and low turnover. Thirty years down the line and many things may have changed at the NSE.

Kangethe (1999) set out to investigate the effect of government ownership on share price volatility of companies quoted at the NSE for the period 1997 to 1998. The specific objective of the study was to establish whether government ownership influences the share price volatility of the companies quoted at the NSE. He found that there was a significant difference in the share stock volatility between the companies in which the government had shareholding, and the market index.

Sifunjo (1999) researched on the causal relationship between exchange rates and stock prices in Kenya. For purposes of his study he used Granger's (1969) model as well as unit Root and co-integration tests. Empirical evidence from his study showed that exchange rates Granger-cause stock prices in Kenya. In particular, he established that there is unidirectional causality from exchange rates to stock prices.

Onsomu (2003) carried out a study to establish whether there existed a relationship between debt and the value of firms quoted at the NSE. In analyzing the data collected she used simple regression analysis. Using T-tests to determine the significance of the prediction variables, she finds that there is significant relationship between debt and the value of the firm.

Kerandi (1993) tested the predictive ability of the dividend valuation model at the NSE. He finds that the models have less predictive ability in the NSE. He collected data in form of share prices, market indices and dividend per share. These were used to predict price for the companies studied. Predicted prices were compared with actual prices and tested for significance of differences. He was interested in confirming whether share prices can be predicted, implying that investors could be interested in correctly priced shares

Mwangi (1997) analyzed price movements for some selected stocks at the NSE. He sought to determine factors that affect share price movements in addition to developing a model that could be used to predict price movements. He concluded that it was not always possible to develop models that accurately predict prices at the NSE because the parameters used in forecasting vary over time due to changes in the underlying earnings' generating process. Mwangi (1997) thus remotely advocated for conditional asset pricing models that reflect time varying risk premiums and risk betas.

Iminza (1997) analyzed the share prices at the NSE, focusing on their relationship with dividend payments. She used correlation analysis to establish whether there is a relationship between changes in prices with changes in dividend payouts. She concludes that dividends have a significant impact on share price. She used chi-square distribution to test for independence of two variables she constructed on share prices 5 days before and after dividend announcement for companies quoted at the NSE.

Nyamute (1998) sought to analyze whether or not macroeconomic factors affect the performance of the NSE. The macroeconomic variables taken into account were inflation, money supply, interest rates and exchange rates. He finds that macroeconomic variables do indeed impact on the performance of the stock prices. This is in line with the rationale for application of multifactor conditional asset pricing models in return or volatility prediction.

Muriithi (2001) sought to establish whether interim dividends could be used to predict final earnings. The study used data from the NSE and was analyzed using regression analysis. He found that there was no relationship between interim dividends and eventual year-end earnings.

Mwangi (1999) studied the NSE to identify the relationship between price earnings and the growth rate of earnings, the dividend payout ratios at the NSE, and the variations in the earnings growth of the companies at the NSE. He arrived at the conclusion that investors can improve their investment portfolio performance if they use P/E ratios as the earnings growth is positively related to P/E.

Ayako (2005) sought to investigate the role of trading volume/ activity in terms of the information it contains about future prices. He precisely was interested in the power of trading volume in predicting the direction of future stock prices. He carried research on 43 firms listed on the NSE and traded over the 5-year period of between 1998 and 2002.
He concludes that there is no relationship between trading volume and stock returns of firms listed at the NSE. He further contends that his finding is in line with Fama's Random walk theory which implies that a series of stock price changes at the NSE do not have memory i.e. the past history of the series cannot be used to predict the future in any meaningful way.

With the increasing automation of the NSE evidenced by the operationalization of the central depository settlement system, the recent introduction of electronic trading to replace the open cry system, the increase in the number of listed companies and the accompanying rise in the Nairobi Stock Market turnover during the recent past, my study intends to further dwell on the liquidity concept by proxying trading volume as a measure of liquidity.

Ayako (2005) suggested one area of further research as being the study of the weekly stock returns as opposed to monthly returns he considered. He suggests the extension of the period to include the recent years when liquidity of the Nairobi Stock market has grown tremendously.

CHAPTER THREE

3.0 RESEARCH METHODOLOGY

3.1 RESEARCH DESIGN

The study will focus on two portfolios of firms: top 6 of those companies which have the highest trading volume activity ratios (the measure of liquidity adopted in this study) for each of the years under study viz, 2000-2002, and bottom 6 of those with the lowest trading volume activity ratios over the same period. One Way ANOVA test will be conducted to compare returns for the companies with high trading volume activity ratios with those with low trading volume activity ratios. If a population is classified into categories with respect to two attributes, ANOVA tests are appropriate to determine whether the two attributes are independent of each other. In this study, the attributes are trading volume activity ratio versus returns.

3.2 POPULATION AND SAMPLE

The population of interest will consist of all companies quoted at the NSE (Appendix 1). The NSE will be ideal for carrying out this study due to the availability, accessibility and reliability of the data. The study will look at all the companies that are listed on the NSE taking into account the fact that not all firms may trade consistently

The sample will be the shares included in the 20 share index. Analysis will be done on 45 companies which were all those that remained listed and traded over the period under review (Jan 2000 to Dec 2002). This number is sufficient to generalize the findings of the study for the entire stock market. The variables to be used in this study are:

1. Trading volume activity ratio as the independent variable
2. Stock returns as the dependent variable

The approach to be used here to measure the degree of variability of the stock returns due to changes in trading volume is similar to the one used by Onsomu (2003) when seeking to establish the relationship between debt financing and the value of firms quoted at the NSE. Trading volume activity ratio is to be taken as the independent variable because technicians believe that volume precedes price, implying that any price changes will be dependent upon the changes in trading volume.

3.3 DATA COLLECTION

The research will rely purely on secondary data obtained from the NSE or other financial intermediaries. Data collection forms (appendix 2) will be used to aid in the retrieval of data for individual companies.

The data will comprise of weekly stock prices and trading volume activity ratio for all the companies to be included in the study for the 2000 to 2002 period i.e just before the 2002 elections. The data series will therefore comprise trading volume activity and stock returns for a total of (52*3) =156 weeks.

3.4 DATA

3.4.1 Weekly Stock Return

For the securities selected for inclusion in the study, their weekly opening and closing share prices and dividend (interim and final) information will be collected and in turn used to compute their returns. Return is the total gain or loss realized on an investment over a period of time (Gitman and Joehnik (2002)). It is measured as the change in value plus any cash distributions during the period, expressed as a percentage of the beginning of period investment value.

Total weekly return of each security will be determined as the sum of capital gains/losses (difference between closing and opening weekly share prices) and dividends. Weekly dividends will be estimated by dividing annual dividends (interim and final) of the shares by total number of weeks in a year, while assuming dividends accrue evenly during the year. The expression for calculating returns earned on any asset over a period t is commonly defined as:

$$R_t = \frac{P_t - P_{t-1} + C_t}{P_{t-1}}$$

Where; $\mathbf{R_t}$ - is the actual or expected stock return for the period t

$\mathbf{P_t}$ - is the price (value) of an asset at time t

P_{t-1} – is the price (value) of an asset at time t-1

C_t – is the cash flow received from the asset investment in the time period t-1 to t.

Weekly return for securities in my study will be calculated as below:

$$R_t = \frac{P_1 - P_0 + D}{P_0}$$

Where; **R_t** - is the actual stock return for the period t

P_0 - is the weekly opening share price

P_1 – is the weekly closing price

D – is the weekly dividend per share

3.4.2 Weekly trading volume activity ratio

Volume represents the total amount of trading activity that have changed in a given commodity market for a single trading day. The greater the amount of trading during a market session the higher will be the trading volume. Daily trading volume may be represented in three different ways:

- The daily number of equity trades
- The daily number of shares traded
- The daily total shilling value of shares traded

This study will consider the daily number of shares traded as the proxy for trading volume. Weekly trading volume will therefore be the total number of shares traded within a particular week. The liquidity measure taken in this study is given as the ratio of total number of shares traded to total number of shares in issue. Variations in trading volume will be assumed to be caused solely by the arrival of new information.

3.5 DATA ANALYSIS

Data analysis will be done in four steps:

Step 1. Trading volume activity ratio assessment

Trading volume activity (TVA) ratio of all securities traded at the NSE will be computed for each of the years 2000-2002, and then ranked from the highest to the lowest. Top 6 securities (highly liquid) will be categorized to form a portfolio and bottom 6 securities (lowly liquid) also categorized to form another portfolio. The TVA ratio will be computed as follows:

$$TVA = \frac{\text{Total number of shares traded}}{\text{Number of shares in issue}}$$

Step 2. Calculation of weekly returns for each security in the portfolios above

Weekly returns will be computed as shown in 3.4.1 above. The tabulation of the results after this step will be as follows:

Table 1: Format for tabulating returns of portfolio 1 (High trading volume activity ratio or high liquidity portfolio)

Week	C_{11} C_{21} C_{31} .... C_{N1}
1	
2	
.	
.	
N	

Where C_{x1}=Returns for company x of portfolio 1

Table 2: Format for tabulating returns of portfolio 2 (Low trading volume activity ratio or low liquidity portfolio)

Week	C_{10} C_{20} C_{30} .... C_{N0}
1	
2	
.	
.	
N	

Where C_{x0}=Returns for company x of portfolio 0

Step 3. Weekly Mean Return differential assessment

Weekly mean returns computed above – for both high and low liquid securities – will then be analyzed and compared to determine if there is any significant statistical mean return differential. The study will not factor in transaction costs effect on the returns of both portfolios. Paired t-test/One Way ANOVA comparison at confidence level of 95% will be used to test for any significant statistical difference in mean return between the two portfolios, and in turn used to accept or reject the null hypothesis set for the study.

Step 4. Regression and Correlation Analysis

Regression analysis measures the pattern of relationship and the closeness of the relationship in absolute terms. Frequently, correlation analysis is used along with regression analysis to measure how well the regression line explains the variations of the dependent variable.

Correlation analysis is used to correlate the changes in stock returns with those of trading volume activity ratio. Correlation measures the degree of association between two variables, which are not necessarily independent.

The regression model is in the form:

$R_t = A+BV_t$ where:

A-Is the intercept of the regression model, which represents the securities return when there is no change in trading volume ratio

B- Is the slope, which represents the degree in which the stock return changes as trading volume activity ratio changes

R_t – Stands for stock returns on day t

V_t – Stands for trading activity ratio on day t

The correlation model used is in the form:

$Corr (R_t, V_t) = Cov ((R_t, V_t) / (SD (R_t) . SD (V_t)$

Where: R_t, (V_t) –Stands for stock return (trading volume) on day t

Cov- Denotes covariance and SD abbreviates Standard deviation

A positive correlation (Corr) will imply that trading volume activity ratio and securities return move in the same direction. A negative correlation will imply that trading activity ratio and returns move in opposite directions.

Step 5: One-Way ANOVA/Paired t-test statistic test

One way ANOVA test will then be used to confirm whether there is significant difference between the average returns for the two portfolios. This is given as below:

$$t = \frac{AR1 - AR0}{\sqrt{\left[\frac{(n_1-1)S_1^2 + (n_0-1)S_0^2}{n_1+n_0-2}\right]\left[\frac{1}{n_1} + \frac{1}{n_0}\right]}}$$

Where:

AR_1 = average returns for portfolio of firms with high liquidity

AR_0 = average returns for portfolio of firms with low liquidity

n_x =number of firms in a given portfolio

S_x = standard deviation for a given portfolio

The computed value of t statistics will then be compared to the computed critical values using two-tailed test to determine whether the set hypothesis for the study should be accepted or rejected. The hypothesis will be tested at the 5% significance level, which we consider sufficient for our confidence in the outcome of the test. We will fail to reject the null hypothesis if the value calculated will be less than or equal the critical value under consideration.

Step 6: F test for differences in variance

The F Statistic will be used to test for significant difference between variance for the two samples. This will be used to establish whether one portfolio is more volatile than the other over the period 2000-2002. This test (at 95% confidence level) should confirm whether the returns for the two portfolios are significantly different hence answer the research objective. The formula for the F statistic is:

$$F = \frac{S_1^2}{S_0^2}$$

Where:

S_x = standard deviation for a given portfolio.

The data was analyzed and presented through the help of Statistical Package for Social Sciences (SPSS).

CHAPTER FOUR

4.0 DATA ANALYSIS AND FINDINGS

This section is a presentation of the detailed data analysis that was carried out and incorporates the findings of the research.

4.1 The Return- Trading Activity Ratio Relationship

Muganda (2002) stated that when masses of numerical information are to be analyzed, some means of summarization must be found which will reveal their major characteristics. Statistical analysis meets this need. The refined data for analysis in this study is found in Appendix 3: Summary data for analysis. The weekly average returns (from week 1 in year 2000 to week 53 in year 2002) for top securities (AvRTop6) and bottom 6 securities (AvRBot6) are indicated as well as average trading volume activity ratios (AvTrtTOP6 for the top 6 securities) and bottom 6 securities (AvTrBOT6). We derive descriptive statistics from the said data as below.

4.1.1 Descriptive Statistics for top 6 Securities

Table 4.1.1

Variable	N	Mean	Median	StDev	Minimum	Maximum
SasiniR	158	-0.664	0.000	3.788	-17.007	13.889
KPLr	158	-0.683	-0.431	8.129	-31.336	40.024
KCBr	158	0.013	0.169	7.299	-26.13	30.512
NMGr	158	0.282	-0.031	4.399	-13.964	18.101
KENAIRr	158	0.059	0.000	3.817	-14.69	16.588
EABLr	158	0.519	0.548	4.129	-19.505	23.113
AvRTop6	**158**	**-0.079**	**-0.281**	**2.902**	**-10.499**	**12.331**

Table 4.1.1 displays the analysis of data being the weekly returns for top 6 securities. N in the table provides information on the number of observations made in a data set, which in our case are 158 weeks returns. The average mean for the top 6 securities returns is -0.079 with the highest mean at 0.519 and the lowest at -0.683.

The average median for the top 6 securities is -0.281 while the dispersion of the data as represented by the standard deviation (StDev above) averages 2.902. The highest dispersion is of KPL returns standing at 8.129 while the lowest is at 3.788.

The average top 6 securities minimum as shown in the table is -10.499 while the maximum average is 12.331.

4.1.2 Descriptive Statistics for bottom 6 Securities

Table 4.1.2

Variable	N	Mean	Median	StDev	Minimum	Maximum
SCBr	158	0.492	0.488	4.128	-15.765	18.779
Totalr	158	0.020	-0.271	6.675	-17.161	37.302
BAMBr	158	0.401	0.078	3.224	-9.543	13.819
Serenar	158	0.175	0.119	1.946	-8.525	8.377
Bbondr	158	-0.367	-0.040	3.857	-18.089	17.425
PORTr	158	0.187	0.000	4.578	-10.319	30.952
AvRBott6	**158**	**0.151**	**0.005**	**1.994**	**-4.894**	**10.693**

The table 4.1.2 above shows the descriptive statistics of the bottom six securities' returns. 158 observations (N) were made in the data set being 158 weeks returns. The average mean for the bottom 6 securities returns is 0.151 with the highest mean at 0.492 and the lowest at ---0.367. The average median for the bottom 6 securities is 0.005 while the dispersion of the data as represented by the standard deviation averages 1.994. The highest dispersion is of Total returns standing at 6.675 while the lowest is at 1.946.

The average bottom 6 securities minimum as shown in the table is -4.894 while the maximum average is 10.693. Calculation of weekly returns can be found in Appendix 4.

4.1.3 Weekly returns analysis

Table 4.1.3 Correlations: AvRTop6, AvRBott6, AvTrTOP6, AvTrBOT6

	AvRTop6	AvRBott6	AvTrTOP6
AvRBott6	0.408 0.000		
AvTrTOP6	0.252 0.001	0.157 0.050	
AvTrBOT6	0.028 0.728	-0.025 0.751	0.070 0.384

```
Cell Contents: Pearson correlation
               P-Value
```

The correlation coefficient can range in value from -1 to +1, and tells you two things about the linear relationships between two variables: Strength and direction of the variables. The larger the absolute value of the coefficient, the stronger the linear relationship between the variables. An absolute value of one indicates a perfect linear relationship and a value of zero indicates the absence of a linear relationship.

The table 4.1.3 above demonstrates the linear relationships or otherwise of four variables: Average return for top 6 securities (AvRTop6), Average return for bottom 6 securities (AvRBott6), Average trading volume activity ratio for top 6 securities (AvTrTop6) and Average trading volume activity ratio for bottom 6 securities (AvTrBot6).

Correlation between average return of bottom 6 stocks and average weekly returns for top 6 stocks is positive at 0.408, given that they are in the same market. At 90% confidence level test, the p-value is 0.000, which is less that the alpha value of 0.100. The correlation is therefore significant. Correlation between AvTrTop6 and AvRTop6 is positive at 0.252 and is statistically significant since the p-value is lower the than the ∞ value of 0.100, giving 0.001. Correlation between AvTrTop6 and AvRBott6 is positive at 0.157 and is also significant since p-value is 0.050. Correlation between AvTrBot6 and AvRTop6 is positive at 0.028 but is not statistically significant since p-value is 0.728 which is higher the alpha value of 0.100. Correlations between AvTrBot6 and AvRBott6 and also between AvTrBot6 and AvTrTop6 are not significant with p-values at 0.751 and 0.384 respectively. The correlation coefficients are -0.025 and 0.070 respectively.

Table 4.1.3.1 Regression Analysis: AvRTop6 versus AvTrTOP6

```
The regression equation is
AvRTop6 = - 0.699 + 0.234 AvTrTOP6

Predictor        Coef      SE Coef         T        P
Constant      -0.6989       0.2943     -2.37    0.019
AvTrTOP6      0.23438      0.07212      3.25    0.001

S = 2.818        R-Sq = 6.3%      R-Sq(adj) = 5.7%

Analysis of Variance

Source            DF          SS          MS         F        P
Regression         1      83.841      83.841     10.56    0.001
Residual Error   156    1238.415       7.939
Total            157    1322.256

Unusual Observations
Obs   AvTrTOP6     AvRTop6         Fit      SE Fit    Residual    St Resid
 15       10.2       0.532       1.680       0.586      -1.148     -0.42 X
 58        1.3       5.919      -0.394       0.244       6.313      2.25R
 71        1.4      -6.755      -0.361       0.240      -6.394     -2.28R
103       11.4      -0.810       1.978       0.671      -2.788     -1.02 X
115       14.2      -0.424       2.625       0.862      -3.049     -1.14 X
118       11.4      -0.347       1.975       0.671      -2.322     -0.85 X
129       21.2       0.020       4.263       1.355      -4.243     -1.72 X
142        9.9       1.112       1.631       0.572      -0.519     -0.19 X
148        0.5       9.059      -0.591       0.274       9.650      3.44R
149        8.4      10.283       1.268       0.471       9.015      3.25R
```

```
150        13.7      5.081       2.512       0.828       2.569       0.95 X
151         9.1    -10.499       1.429       0.515     -11.928      -4.31R
154         8.8      9.482       1.371       0.499       8.111       2.92R
155        14.2     12.331       2.620       0.860       9.711       3.62RX
157         0.2      7.700      -0.657       0.286       8.357       2.98R
158        11.3     10.632       1.957       0.665       8.676       3.17RX

R denotes an observation with a large standardized residual
X denotes an observation whose X value gives it large influence
```

Linear regression investigates and models the linear relationship between a response (Y) and predictor(s) (X). Both the response and predictors are continuous variables.

Table 4.1.3.1 analyses the regression model of average return of top 6 stocks versus their trading volume activity ratio (liquidity). As indicated in the regression equation above, the slope (b1 = 0.234) is the change in Returns when trading volume increases by 1. That is, when trading volume (liquidity) increases by one unit, the Returns increases by 0.234 (23%) units and is positive. The 23% seems very minimal for any meaningful result to be deduced.

The constant (intercept) value (bo = - 0.699) is the predicted value of Returns when the trading volume change is zero. That is, when the trading volume is zero the Return is - 0.699.

In order to determine whether or not the observed relationship between the returns and trading volume activity ratio is statistically significant, we need to identify the coefficient p-values and compare the same with our confidence level of 0.100. From our table above, p equals 0.001 which is less than 0.100 and therefore the association is statistically significant.

The R^2 (R-Sq) and adjusted R^2 (R-Sq (adj) values represent the proportion of variation in the response data explained by the predictor(s). For our data, the predictor (trading volume activity Ratio) explains only 6.3% of variation in the Returns observations. The adjusted R^2 is 5.7%, which is a decrease of 0.6% (6.3% - 5.7%).

Table 4.1.3.2 Regression Analysis: AvRBott6 versus AvTrBOT6

```
The regression equation is
AvRBott6 = 0.206 - 0.127 AvTrBOT6

Predictor         Coef      SE Coef         T        P
Constant        0.2064       0.2355      0.88    0.382
AvTrBOT6       -0.1272       0.4009     -0.32    0.751

S = 2.000       R-Sq = 0.1%      R-Sq(adj) = 0.0%

Analysis of Variance

Source           DF         SS          MS        F        P
Regression        1      0.403       0.403     0.10    0.751
Residual Error  156    623.747       3.998
Total           157    624.150

Unusual Observations
Obs   AvTrBOT6   AvRBott6          Fit       SE Fit    Residual     St Resid
```

8	0.27	4.668	0.172	0.172	4.496	2.26R
10	0.42	-4.112	0.153	0.159	-4.265	-2.14R
24	2.22	0.470	-0.076	0.734	0.546	0.29 X
36	2.21	0.703	-0.075	0.730	0.778	0.42 X
37	1.81	0.111	-0.024	0.574	0.135	0.07 X
78	2.00	-0.262	-0.048	0.648	-0.214	-0.11 X
88	1.56	-4.894	0.008	0.479	-4.902	-2.52RX
92	1.70	0.714	-0.010	0.532	0.724	0.38 X
95	0.16	7.048	0.186	0.193	6.862	3.45R
96	0.13	4.951	0.190	0.200	4.761	2.39R
102	0.22	-4.219	0.178	0.181	-4.398	-2.21R
133	0.10	10.693	0.194	0.208	10.499	5.28R
150	0.64	7.086	0.125	0.179	6.961	3.50R
158	0.33	5.912	0.164	0.164	5.747	2.88R

R denotes an observation with a large standardized residual
X denotes an observation whose X value gives it large influence

Table 4.1.3.2 analyses the regression model of average return of bottom 6 stocks versus their trading volume activity ratio (liquidity). As indicated in the regression equation above, the slope (b1 = -0.127) is the change in Returns when trading volume increases by 1. That is, when trading volume (liquidity) increases by one unit, the Returns increases by -0.127 (13%) units and is negative. The 13% seems very minimal for any meaningful result to be deduced. The constant (intercept) value (bo = 0.206) is the predicted value of Returns when the trading volume change is zero. That is, when the trading volume is zero the Return is 0.206.
From our table above, p equals 0.751 which is more than our alpha value of 0.100 and therefore the association is statistically insignificant. The regression model here collapses in predicting any association. The R^2 (R-Sq) and adjusted R^2 (R-Sq (adj) values represent the proportion of variation in the response data explained by the predictor(s). For our data, the predictor (trading volume activity Ratio) explains only 0.1% of variation in the Returns observations. The adjusted R^2 is 0.0%, hence no relationship between returns and trading volume.

Table 4.1.3.3 One-way ANOVA: AvRTop6, AvRBott6

```
Analysis of Variance
Source      DF        SS        MS        F        P
Factor       1      4.19      4.19     0.68    0.412
Error      314   1946.41      6.20
Total      315   1950.60
                                   Individual 95% CIs for Mean
                                   Based on Pooled StDev
Level        N      Mean     StDev   ------+---------+---------+---------+
AvRTop6    158    -0.079     2.902   (------------*-----------)
AvRBott6   158     0.151     1.994           (------------*-----------)
                                     ------+---------+---------+---------+
Pooled StDev =     2.490                -0.30      0.00      0.30      0.60
```

A one-way analysis of variance (ANOVA) tests the hypothesis that the means of several populations are equal. The method is an extension of the two-sample t-test, specifically for the case where the population variances are assumed to be equal.

At confidence level of 95% used in table 4.1.3.3 above, the alpha value would be 0.050. To test for significance, we look at the p-value which is 0.412. Since the p-value is greater than the alpha value, we conclude that the differences in means of the average top 6 and bottom 6 securities are not statistically significant. The number of observations as represented by N is 158 for both average top 6 returns and average bottom 6 returns while the mean for average bottom 6 securities is higher at 0.151 compared to the mean for average top 6 securities at -0.079. The standard deviations for AvRTop6 and AvRBott6 do not appear to vary enough from each other to be cause for concern (2.902 and 1.994 respectively)

The pooled standard deviation which is an estimate of the common standard deviation for all levels is 2.490.

4.1.4 Trading Volume Activity Ratio analysis

Table 4.1.4.1 Descriptive Statistics: AvrTOP6, AvrBOTT6

Variable	N	N*	Mean	Median	StDev	Minimum	Maximum
AvrTOP6	763	1	2.592	0.911	5.963	0.000	94.793
AvrBOTT6	764	0	0.441	0.208	0.767	0.000	9.552

The table 4.1.4.1 above shows the descriptive statistics of the bottom six securities' returns. 764 observations (N) were made in the data set being the number of trading days within the period of study. The mean for the top 6 securities activity ratio is 2.592 while that for the bottom 6 is 0.441. The median is 0.911 and 0.208 for top and bottom 6 respectively. Standard deviation for top 6 securities is higher than that for bottom 6, standing at 5.963 compared to 0.767 for bottom 6. Maximum activity ratio for top 6 securities is 94.793 with bottom 6 having 9.552 as the maximum. Detailed descriptive statistics for trading volume activity ratio can be found in Appendix 5.

Table 4.1.4.2 Correlations: AvrTOP6, AvrBOTT6

```
Pearson correlation of AvrTOP6 and AvrBOTT6 = 0.019
P-Value = 0.597
```

The table 4.14.2 reveals the correlation between trading volume activity ratio for top 6 securities and bottom 6 securities is positive at 0.019 (1.9%). The p-value is 0.597 which is above the alpha value of 0.100 hence revealing that the association is not statistically significant. Correlations for trading volume activity ratio are found in Appendix 6.

Table 4.1.4.3 One-way ANOVA: AvrTOP6, AvrBOTT6

```
Analysis of Variance
Source      DF        SS         MS        F        P
Factor       1    1766.6     1766.6    97.82    0.000
Error     1525   27540.7       18.1
Total     1526   29307.3
                                     Individual 95% CIs for Mean
                                     Based on Pooled StDev
Level        N      Mean     StDev   --------+---------+---------+-------
AvrTOP6    763     2.592     5.963                              (--*---)
AvrBOTT6   764     0.441     0.767    (---*--)
                                     --------+---------+---------+-------
Pooled StDev =     4.250                     0.80      1.60      2.40
```

At confidence level of 95% used above, the alpha value would be 0.050. To test for significance, we look at the p-value which is 0.000. Since the p-value is lower than the alpha value, we conclude that the differences in means of the average activity ratios for top 6 and bottom 6 securities are statistically significant. The number of observations as represented by N is 764 while the mean for average top 6 securities is higher at 2.592 compared to the mean for average bottom 6 securities at 0.441. The standard deviations for AvrTop6 and AvrBott6 appear to vary enough from each other to be cause for concern (5.963 and 0.767 respectively) The pooled standard deviation which is an estimate of the common standard deviation for all levels is 4.250.

From the above analyses therefore, it is clear that there is no statistical difference in trading volume activity ratios of top 6 securities as compared to activity ratio of bottom 6 securities, leading us to the same results with weekly returns that portrayed no return differentials between top 6 and bottom 6 securities, at confidence levels of 90% and 95%.

CHAPTER FIVE

5.0 SUMMARY AND CONCLUSION

5.1 Summary of Findings

Asset liquidity occupies an important, but elusive, position in the study of asset pricing. Market microstructure research has made it clear that liquidity providers offer a real service. Buyers and sellers may not arrive in the market simultaneously, creating a role for liquidity providers to transact and hold securities on a temporary basis. Liquidity providers are compensated for their expense and risk exposure via the bid/ask spread. This cost of liquidity may be viewed as an added transaction cost and investors might require a higher expected gross return to compensate for this added cost.

A body of literature starting with Amihud and Mendelson (1986) has found that investors demand a premium for less liquid stocks, so that expected returns should be negatively related to the level of liquidity. At the level of individual securities, Brennan and Subrahmanyam (1996), and Datar, Nail, and Radcliffe (1998) have all found a negative relationship between a security's characteristic liquidity and its average gross return. Commonality in characteristic liquidity raises the question of whether shocks to aggregate liquidity comprise a source of non-diversifiable risk that is compensated with expected return.

In this study, we sought to establish if there was a relationship between liquidity of a stock, as measured by its trading volume activity ratio, and its returns. We document negative and significant cross-sectional relations between average stock returns and the level of its liquidity. Based on the findings of this research, there is no relationship between liquidity and stock returns of companies quoted at the Nairobi Stock Exchange. We therefore conclude that there is no evidence of liquidity premium in the Kenyan Stock market.
The research findings imply that prices at the NSE follow a random walk, hence strategies employed to predict stock prices will most likely fail.

A portfolio of top six securities and another portfolio of bottom six securities were analyzed for any correlation in their trading volume activity ratios with their returns. At confidence level of 90%, there was no significant statistical difference in mean returns of the two portfolios, leading us to conclude that the Nairobi stock market is full of noise. The findings do not concur with most of the researches reviewed in chapter two, mainly due to the level of development of the stock markets in these areas which are more advanced.

5.2 Limitations of the study

Carrying out research is not always a bed of roses. The researcher is constantly faced with challenges, which may in one way or another have an impact on the outcome of the research. Limitations of this study first and foremost involved the availability of finer data for purposes of measuring stock liquidity. Whilst more refined measure of liquidity like bid-ask spread as used in studies in developed markets would have provided more accurate results, this study had to use trading volume activity ratio as the proxy for liquidity due to the unavailability of this kind of data at the local exchange

Nairobi Stock Exchange is an emerging market that has low level of trading and still in weak form of efficiency, and the share prices do not readily pick up information as they flow into the market. This was a major impediment for the study as liquidity level is affected.

Preparing the data for analysis was also tedious as it involved making adjustments for stock splits, dividends and bonus issues before arriving at returns for a particular stock.

5.3 Suggested Areas for further Research

For more robust results, one may wish to carry out the same research but extend it over a longer period of time to cover recent times that electronic trading is being adopted at the Nairobi Stock Exchange. Finding out whether the recent adoption of technology at the stock market has allowed for prices to adjust more quickly to news entering the market.

Research on the same area could still be done but with a different measure of liquidity, for instance using high frequency data like bid-ask spreads, which could produce different set of results. Overall, variables related to trading activity play an important role in the cross section of expected returns over and above previously identified effects such as size, book-to-market, and momentum. However this study's findings don't lend themselves to an obvious explanation, so that further investigation of my results would appear to be a reasonable topic for future research.

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APPENDICES

APPENDIX 1: LIST OF ALL COMPANIES QUOTED AT THE NSE

	NAME OF COMPANY
1.	Unilever Tea Kenya Ltd
2.	Kakuzi Ltd
3.	Rea Vipingo Plantations Ltd
4.	Sasini Tea & Coffee Ltd
5.	Car & General (K)
6.	CMC Holdings Ltd
7.	Hutchings Biemer Ltd
8.	Kenya Airways Ltd
9.	Marshalls (E.A)
10.	Nation Media Group
11.	Scangroup Ltd
12.	TPS Eastern Africa (Serena) Ltd
13.	Uchumi Supermarket Ltd
14.	Barclays Bank Ltd
15.	CFC Bank Ltd
16.	Diamond Trust Bank Kenya Ltd
17.	Housing Finance Co. Ltd
18.	ICDC Investment Co. Ltd
19.	Jubilee Insurance Co. Ltd
20.	Kenya Commercial Bank Ltd
21.	National Bank of Kenya Ltd
22.	NIC Bank Ltd
23.	Pan Africa Insurance Co. Ltd
24.	Standard Chartered Bank Ltd
25.	Equity Bank Ltd
26.	Athi River Mining
27.	BOC Kenya Ltd
28.	Bamburi Cement Ltd
29.	British America Tobacco Kenya
30.	Carbacid Investments Ltd
31.	Crown Berger Ltd
32.	Olympia Capital Holdings
33.	E.A Cables
34.	E.A Portland Cement
35.	East African Breweries Ltd
36.	Sameer Africa Ltd
37.	Mumias Sugar Ltd
38.	Kenya Oil Co. Ltd
39.	Total Kenya Ltd
40.	Unga Group Ltd
41.	Kengen Ltd
42.	A. Bauman & Co.
43.	City Trust Ltd
44.	Eagaads Ltd
45.	Express Ltd

46.	Williamson Tea
47.	Limuru Tea
48.	Kenya Orchards
49.	Kapchorua Tea
50.	Std Group

APPENDIX 2: LETTER OF INTRODUCTION

Dear Sir/Madam

RE: Research Information

I am a postgraduate student at the faculty of Commerce, University of Nairobi pursuing my MBA course. As part of the requirements of the course, am undertaking a research project to establish the relationship between liquidity/illiquidity of stocks listed at the NSE and their prices/returns.

To fulfill information requirements for my study, I intend to collect secondary data from your institution. The information requested is needed purely for academic purposes and will be treated in strict confidence, and will not be used for any purpose other than for my research.

I would be most grateful if you would allow me access to all the relevant information pertinent to my research. Any additional information you might consider necessary for this study is most welcome. Thanks in advance for your assistance in accessing the much needed information.

Yours Sincerely,

Odongo, P.W

Supervisor,
Mr. Luther Otieno
Department of Accounting
University of Nairobi.

APPENDIX 3: SUMMARY DATA FOR ANALYSIS

Week	AvRTop6	AvRBott6	AvTrTOP6	AvTrBOT6
200001	-1.71862	0.271	1.19	1.04
200002	0.664946	-0.003	6.31	0.43
200003	0.032925	0.655	1.72	0.8
200004	-2.26378	-0.707	0.57	0.14
200005	-3.05549	0.282	2.1	0.26
200006	-3.30078	0.450	2.49	0.35
200007	1.383238	0.213	1.18	0.36
200008	0.630308	4.668	1.5	0.27
200009	0.079191	1.354	1.37	0.31
200010	-0.40403	-4.112	1.91	0.42
200011	-1.27301	0.177	2.52	0.52
200012	-2.37159	-0.639	1.06	0.49
200013	0.965961	0.536	1.29	0.27
200014	-5.24583	-1.971	1.66	0.26
200015	0.532235	1.790	10.15	0.52
200016	-0.54963	-0.543	0.9	0.24
200017	-0.71688	-0.280	4.72	0.22
200018	2.183223	0.386	5.24	0.24
200019	-0.2689	-0.424	1.56	0.55
200020	-0.29349	0.144	4.34	0.59
200021	-3.8619	0.052	2.81	0.23
200022	-0.74414	-0.593	0.48	0.26
200023	-1.37146	-0.251	2.52	0.63
200024	0.445309	0.470	4.49	2.22
200025	0.493463	1.233	2.2	0.42
200026	-0.24497	0.994	1.12	0.16
200027	-0.35581	3.072	0.93	0.17
200028	-1.0036	1.278	2.95	0.28
200029	-2.77414	-0.513	0.65	0.8
200030	0.051988	0.811	0.56	0.27
200031	-0.18886	-0.666	1.13	0.48
200032	0.8603	2.621	1.8	0.21
200033	0.345562	0.446	1.83	0.49
200034	1.578111	0.290	3.39	0.15
200035	1.803088	0.488	1.45	0.12
200036	-0.65856	0.703	5.27	2.21
200037	-1.56778	0.111	4.33	1.81
200038	1.072251	-0.613	0.69	0.58
200039	0.796028	0.313	2.33	1
200040	-0.01422	0.480	0.77	0.57
200041	-1.53036	1.517	0.61	0.08
200042	0.97602	0.286	0.47	0.11
200043	1.851165	0.347	1.23	0.41
200044	0.5735	-1.287	4.05	0.84
200045	1.561565	-0.548	1.91	0.2
200046	-0.19989	-0.239	1.7	0.2
200047	-0.40071	0.525	0.97	0.46
200048	-0.33305	-0.093	2.68	0.33
200049	-4.06968	-1.667	2.58	1.17
200050	-2.51258	-1.841	0.91	0.21
200051	1.722168	2.792	1.9	0.14
200052	0.996722	0.337	0.27	0.12
200101	-3.42654	-1.313	0.24	0.16

200102	-0.84487	-0.159	1.09	0.12
200103	0.676497	-0.664	1.42	0.39
200104	0.776436	0.754	1.75	0.24
200105	1.903959	-1.350	0.42	0.22
200106	5.919222	0.509	1.3	0.77
200107	-2.35645	0.184	1.09	0.47
200108	4.657114	0.455	1.49	0.49
200109	-0.51322	-1.393	1.81	0.36
200110	-3.68553	-0.320	0.86	0.47
200111	-2.71632	-0.013	1.01	0.56
200112	-1.9829	-0.383	1.18	0.57
200113	-1.22944	-0.453	0.47	0.4
200114	0.361972	0.612	1.76	0.95
200115	-0.91669	-0.243	1.8	0.23
200116	-0.93483	-0.330	1.16	0.45
200117	-1.98293	1.219	1.37	0.36
200118	-1.44239	0.174	2.12	0.45
200119	-6.75504	-0.839	1.44	0.55
200120	-1.77686	-0.326	2.49	0.17
200121	-2.30153	-1.126	1.94	0.34
200122	0.256708	-0.491	1.46	0.25
200123	-1.20145	-0.468	1.55	0.39
200124	1.032906	0.314	1.76	0.2
200125	1.01952	0.549	1.09	0.18
200126	1.590117	-0.262	3.57	2
200127	-1.25462	-1.308	3.34	0.19
200128	-3.20906	0.362	2.5	1.19
200129	2.924813	-0.400	2.18	0.43
200130	2.754682	-1.114	4.32	0.24
200131	-2.25019	0.521	0.66	0.55
200132	-3.70569	-1.215	3.24	0.54
200133	-2.13994	-2.923	0.53	0.37
200134	-0.81463	-2.918	0.9	0.13
200135	-0.14638	-3.102	1.72	0.09
200136	-3.70806	-4.894	2.52	1.56
200137	-2.8182	-3.171	1.11	0.33
200138	-1.22509	-2.097	0.53	0.24
200139	-0.95378	0.230	0.23	1.22
200140	3.293558	0.714	0.64	1.7
200141	3.413578	0.746	0.89	0.38
200142	3.079629	1.702	1.03	0.2
200143	-2.3392	7.048	0.59	0.16
200144	-4.36864	4.951	1.23	0.13
200145	-0.41326	-0.551	1.46	0.26
200146	-3.2482	-1.482	5.03	0.17
200147	-0.57863	0.447	0.52	0.34
200148	-0.8901	-0.022	0.4	0.23
200149	-0.74786	-1.214	3.06	0.29
200150	-0.06415	-4.219	1.74	0.22
200151	-0.81011	-1.723	11.42	0.17
200152	0.113151	-0.490	0.15	0.03
200153	0.655845	0.442	0.09	0.01
200201	2.358026	0.420	0.38	0.11
200202	-0.29693	0.080	0.42	0.36
200203	-2.6901	-0.594	0.68	0.48
200204	0.272881	-0.888	0.61	0.14
200205	-2.67186	-0.681	1.52	0.38

200206	-0.1246	0.172	1.56	0.27
200207	0.54753	0.710	0.5	0.17
200208	1.569442	-2.153	3.27	0.1
200209	0.566791	-1.383	0.84	0.28
200210	-0.42444	-2.605	14.18	0.15
200211	-2.28083	0.013	3.78	0.12
200212	-1.98186	-2.641	1.02	0.25
200213	-0.34701	-0.558	11.41	0.25
200214	1.169788	-0.511	1.09	0.14
200215	-2.15272	-0.854	2.24	0.09
200216	-1.92973	-1.463	1.18	0.15
200217	-1.3021	-0.311	0.95	0.21
200218	-0.93487	-0.217	0.89	0.11
200219	-0.23045	-0.682	2.45	0.24
200220	-3.37217	-2.256	3.12	1.15
200221	-0.71886	1.044	2.8	0.35
200222	1.369964	0.654	1.72	0.51
200223	0.52424	-1.741	1.59	0.82
200224	0.019896	0.963	21.17	0.42
200225	-0.17696	2.629	1.98	0.37
200226	-1.82835	2.938	2.72	0.85
200227	-2.10434	3.420	2.76	0.07
200228	0.170006	10.693	2.93	0.1
200229	-0.12123	0.233	1.27	0.27
200230	-1.26175	-0.597	3.12	0.24
200231	0.24932	-0.434	4.69	0.14
200232	0.536678	0.256	1.58	0.3
200233	-0.56169	-1.390	3.43	0.33
200234	-1.26152	-1.370	1.74	0.36
200235	0.208327	1.706	1.94	0.08
200236	-3.11007	-1.032	5.66	0.35
200237	1.111886	-2.639	9.94	0.27
200238	1.875989	0.570	1.7	1.25
200239	-1.40665	-0.209	1.16	0.27
200240	1.146569	0.484	4.78	1.05
200241	0.735458	1.272	5.6	0.08
200242	1.847979	-1.217	0.5	0.41
200243	9.058699	3.088	0.46	1.13
200244	10.28274	3.670	8.39	0.74
200245	5.080804	7.086	13.7	0.64
200246	-10.4985	-1.413	9.08	0.49
200247	1.503858	-0.162	3.51	0.22
200248	1.468223	2.286	3.39	0.69
200249	9.481538	2.968	8.83	0.51
200250	12.33135	3.376	14.16	0.24
200251	4.502543	1.886	3.56	0.54
200252	7.70006	3.316	0.18	0.16
200253	10.63249	5.912	11.33	0.33

APPENDIX 4: WEEKLY RETURNS FOR ANALYSIS

WeekEnd	Week	SasiniR	KPLr	KCBr	NMGr	KENAIRr	EABLr	AvRTop6	SCBr	Totalr	BAMBr	Serenar	Bbo
31-Dec-99	200001	-9.467	-0.279	3.896	-1.541	-0.255	-2.666	-1.719	1.494	-0.249	0.796	0.062	-0.
7-Jan-00	200002	4.713	0.442	0.531	-2.529	-2.171	3.004	0.665	0.289	0.561	-1.843	-0.185	-0.
14-Jan-00	200003	5.907	0.118	2.203	-3.294	-1.305	-3.431	0.033	1.267	1.240	0.460	0.000	0.
21-Jan-00	200004	-2.789	-0.846	-7.069	-1.469	-1.587	0.178	-2.264	-3.240	-0.061	-0.420	0.000	0.
28-Jan-00	200005	-12.842	0.616	-4.731	-0.864	-2.285	1.773	-3.055	2.291	-1.776	0.651	0.000	0.
4-Feb-00	200006	-2.508	-1.192	-1.915	-0.632	-14.168	0.610	-3.301	8.501	0.312	-0.951	0.310	-5.
11-Feb-00	200007	-1.929	0.293	0.960	-0.877	8.814	1.039	1.383	14.584	5.844	-0.231	-0.309	-18.
18-Feb-00	200008	-2.787	-0.867	0.819	0.398	4.418	1.799	0.630	5.128	22.937	0.501	0.186	-0.
25-Feb-00	200009	0.000	0.208	-0.910	-0.331	-1.269	2.778	0.079	2.000	-6.641	-0.345	0.494	17.
3-Mar-00	200010	1.180	-1.614	-0.591	-0.907	0.571	-1.065	-0.404	-5.429	-17.144	2.230	1.046	2.
10-Mar-00	200011	-2.833	-0.987	-3.663	0.848	2.557	-3.560	-1.273	5.376	0.062	1.354	0.061	-5.
17-Mar-00	200012	-0.343	-1.455	-11.442	-0.952	3.740	-3.777	-2.372	2.724	-0.586	0.223	2.311	-8.
24-Mar-00	200013	1.205	-3.056	7.505	-5.608	1.736	4.014	0.966	1.199	2.856	0.296	3.210	-4.
31-Mar-00	200014	-17.007	-8.168	7.665	-13.964	0.000	0.000	-5.246	0.832	-1.056	-2.067	-8.525	-1.
7-Apr-00	200015	3.074	-1.302	0.100	-0.550	-0.787	2.659	0.532	-0.371	2.410	-1.055	-4.660	-0.
14-Apr-00	200016	3.976	-0.220	-6.177	2.075	1.058	-4.010	-0.550	-5.030	-2.681	0.952	3.501	0.
21-Apr-00	200017	5.163	-0.013	-12.278	1.084	0.785	0.957	-0.717	-4.730	0.031	1.887	5.105	-0.
28-Apr-00	200018	4.727	-6.208	13.590	0.509	1.429	-0.948	2.183	-0.092	0.031	4.519	0.243	-2.
5-May-00	200019	3.125	-7.489	1.964	0.213	-0.384	0.957	-0.269	0.618	0.520	0.319	-2.847	-1.
12-May-00	200020	4.209	-6.647	1.366	-0.506	1.799	-1.983	-0.293	-0.091	-0.335	0.424	-0.062	0.
19-May-00	200021	-0.969	-19.072	-3.041	-0.722	3.535	-2.902	-3.862	-1.162	0.733	0.457	0.811	-0.
26-May-00	200022	1.958	-0.376	-3.100	-0.027	0.976	-3.895	-0.744	-4.425	-0.758	2.241	-0.433	0.
2-Jun-00	200023	-5.120	-0.397	-0.846	-0.081	-1.691	-0.094	-1.371	0.000	0.855	-1.747	0.373	-0.
9-Jun-00	200024	-1.349	0.239	4.711	0.054	-0.983	0.000	0.445	2.653	0.787	0.837	0.000	-1.
16-Jun-00	200025	-0.171	1.491	0.248	0.404	-0.993	1.981	0.493	0.822	2.254	0.346	-0.867	0.
23-Jun-00	200026	0.000	1.077	-3.216	-0.027	-0.877	1.573	-0.245	1.864	2.351	0.723	-0.062	0.
30-Jun-00	200027	-1.199	-0.349	-1.424	0.967	-1.770	1.639	-0.356	4.483	3.704	2.599	0.000	-0.
7-Jul-00	200028	-0.693	0.992	-6.963	0.133	-0.386	0.896	-1.004	0.197	0.194	0.967	1.250	-0.
14-Jul-00	200029	-0.873	-3.023	-3.742	-0.319	-9.044	0.355	-2.774	-0.568	0.028	2.971	-1.235	0.
21-Jul-00	200030	0.704	-0.099	-1.696	-0.160	1.563	0.000	0.052	2.593	0.635	2.757	0.000	-0.
28-Jul-00	200031	-0.350	0.020	-0.757	-0.694	0.559	0.088	-0.189	2.035	0.686	-1.685	2.500	-7.
4-Aug-00	200032	-0.877	-2.484	0.297	-0.860	4.312	4.775	0.860	0.714	4.144	1.555	3.476	5.
11-Aug-00	200033	0.177	-3.647	1.310	-5.287	3.867	5.654	0.346	-0.959	0.314	0.031	0.707	2.
18-Aug-00	200034	0.000	-0.465	3.546	0.200	4.750	1.438	1.578	3.577	-1.775	-0.562	-0.293	0.
25-Aug-00	200035	2.473	-2.783	0.725	6.657	2.328	1.417	1.803	0.081	-2.258	0.094	-0.352	5.
1-Sep-00	200036	-3.448	-0.962	0.160	-3.563	3.473	0.388	-0.659	1.218	-0.054	0.910	0.471	1.
8-Sep-00	200037	-3.036	-0.927	0.120	-6.222	-0.347	1.005	-1.568	0.261	1.523	-0.218	-1.524	0.
15-Sep-00	200038	3.683	-2.205	2.992	0.918	1.045	0.000	1.072	-0.140	0.857	-0.094	-3.810	-0.
22-Sep-00	200039	1.599	-2.255	4.028	-0.587	0.690	1.302	0.796	-0.401	-1.089	1.841	1.423	1.
29-Sep-00	200040	-0.874	-3.565	1.266	0.768	2.169	0.151	-0.014	0.121	-0.134	1.379	-0.549	2.
6-Oct-00	200041	0.000	-13.554	1.618	2.461	0.670	-0.377	-1.530	-0.221	0.484	0.604	1.350	6.
13-Oct-00	200042	0.000	6.819	-1.556	0.400	-0.111	0.303	0.976	0.161	0.401	0.421	0.242	0.
20-Oct-00	200043	0.000	7.274	2.462	-0.028	-0.111	1.511	1.851	0.221	0.693	0.568	-0.242	2.
27-Oct-00	200044	0.705	4.439	1.291	-1.368	-2.892	1.265	0.573	-5.215	0.106	-1.309	0.000	-0.
3-Nov-00	200045	0.701	3.013	0.177	-0.982	-2.062	8.523	1.562	-4.634	0.079	-0.452	0.303	3.
10-Nov-00	200046	1.391	3.038	0.566	2.392	0.351	-8.937	-0.200	-1.220	-0.661	-1.847	0.604	1.
17-Nov-00	200047	0.000	-2.200	-1.090	0.114	1.515	-0.743	-0.401	0.943	-0.106	1.943	-0.240	1.
24-Nov-00	200048	0.000	0.022	-2.310	1.224	1.837	-2.772	-0.333	-0.690	-1.012	0.454	0.481	0.
1-Dec-00	200049	-0.172	-0.270	-17.752	-0.956	-0.338	-4.931	-4.070	-10.464	-0.699	1.506	-0.180	-0.
8-Dec-00	200050	-1.375	-4.127	-8.315	-1.419	0.566	-0.405	-2.513	-6.982	-0.731	0.030	-3.177	0.

15-Dec-00	200051	-1.045	-8.916	20.068	-1.325	0.900	0.651	1.722	18.779	0.218	0.119	-2.291	-0.
22-Dec-00	200052	-0.704	3.487	3.174	-0.467	-1.449	1.940	0.997	5.821	-4.438	0.770	0.760	0.
29-Dec-00	200101	-5.496	0.849	-16.861	-0.704	0.226	1.427	-3.427	-1.819	-6.125	-0.059	0.755	0.
5-Jan-01	200102	0.000	-0.049	-5.293	0.856	1.919	-2.502	-0.845	-4.142	0.212	0.500	0.749	0.
12-Jan-01	200103	0.000	-1.139	0.445	2.488	2.104	0.160	0.676	-5.003	-0.878	0.585	0.867	-0.
19-Jan-01	200104	0.375	1.803	1.576	0.114	-0.651	1.441	0.776	4.884	-0.092	0.990	-1.229	-0.
26-Jan-01	200105	7.664	4.772	-0.533	0.571	-0.655	-0.395	1.904	4.291	-3.670	-0.346	1.430	-9.
2-Feb-01	200106	13.889	18.596	0.292	0.652	0.659	1.426	5.919	-1.094	-6.222	-2.140	0.920	11.
9-Feb-01	200107	-13.720	0.950	-1.603	-0.282	-0.109	0.625	-2.356	5.355	-0.711	-5.526	0.668	1.
16-Feb-01	200108	3.004	0.235	21.333	0.480	0.328	2.562	4.657	10.502	-10.263	-1.314	0.121	4.
23-Feb-01	200109	1.029	-1.585	8.832	-0.647	-10.784	0.076	-0.513	-3.117	-2.698	-6.815	2.170	-0.
2-Mar-01	200110	-5.603	-7.952	-2.468	-0.991	-5.250	0.151	-3.686	1.256	1.171	-3.741	0.354	-0.
9-Mar-01	200111	6.115	-10.302	-7.899	-4.919	1.160	-0.453	-2.716	-1.182	8.568	-0.636	-0.059	-8.
16-Mar-01	200112	-5.424	-2.745	2.873	-5.143	-2.293	0.835	-1.983	-15.765	2.026	-0.427	0.118	9.
23-Mar-01	200113	-2.867	-0.297	0.809	-5.644	-0.130	0.752	-1.229	2.188	1.150	0.000	-0.235	-2.
30-Mar-01	200114	-1.661	-1.068	0.482	-0.806	2.611	2.614	0.362	3.895	3.204	0.000	0.118	-3.
6-Apr-01	200115	-2.439	0.100	2.597	-4.065	1.145	-2.838	-0.917	0.000	-0.634	-0.357	0.000	-0.
13-Apr-01	200116	-3.846	-3.686	4.439	0.494	-1.887	-1.124	-0.935	0.724	-2.351	-1.792	0.118	-2.
20-Apr-01	200117	1.800	-10.310	-1.491	-0.492	-1.026	-0.379	-1.983	1.741	6.226	0.365	-0.059	0.
27-Apr-01	200118	-1.768	-10.682	3.861	-2.295	1.166	1.065	-1.442	1.562	-2.947	1.818	0.176	3.
4-May-01	200119	-1.600	-7.377	-26.130	-6.433	1.536	-0.527	-6.755	-0.169	-1.401	0.000	-0.763	-0.
11-May-01	200120	-0.610	-0.316	-4.785	-3.438	1.135	-2.648	-1.777	0.084	-2.267	0.000	0.532	-0.
18-May-01	200121	-0.613	-0.035	-3.627	-9.680	2.244	-2.098	-2.302	-3.690	-4.432	0.000	0.176	1.
25-May-01	200122	-1.440	-0.845	2.366	-7.396	6.951	1.905	0.257	1.948	-1.993	0.000	0.294	1.
1-Jun-01	200123	-2.505	1.598	-6.355	-2.152	0.570	1.636	-1.201	3.629	-5.139	0.000	-0.176	-1.
8-Jun-01	200124	1.071	0.804	2.299	4.497	-1.247	-1.226	1.033	2.984	-1.949	0.107	0.176	0.
15-Jun-01	200125	-7.839	0.693	3.728	6.782	0.115	2.638	1.020	3.038	4.213	-2.034	-3.864	1.
22-Jun-01	200126	2.529	-0.138	-2.378	9.987	-0.459	0.000	1.590	-2.070	2.098	-2.877	1.644	-0.
29-Jun-01	200127	2.018	-5.586	-4.277	-0.438	0.000	0.756	-1.255	-1.775	2.353	-3.937	1.558	1.
6-Jul-01	200128	-1.099	2.082	0.848	-1.120	-0.461	-19.505	-3.209	0.284	-0.693	6.050	-0.885	-0.
13-Jul-01	200129	-1.778	-1.968	0.729	-3.358	0.810	23.113	2.925	1.640	-3.197	2.319	-1.786	-1.
20-Jul-01	200130	0.905	0.073	12.695	2.846	-2.641	2.650	2.755	-0.199	-6.264	0.216	0.364	-0.
27-Jul-01	200131	-4.036	-1.787	-2.915	0.204	-6.368	1.401	-2.250	0.718	1.256	-1.651	-0.302	0.
3-Aug-01	200132	-3.037	-6.461	-6.870	-2.559	-0.252	-3.055	-3.706	-0.892	0.720	-6.022	-0.606	-0.
10-Aug-01	200133	0.482	-5.240	-6.721	-1.084	-0.126	-0.150	-2.140	-7.797	-4.448	-3.107	-1.645	-0.
17-Aug-01	200134	0.000	-5.572	-0.879	1.686	0.253	-0.376	-0.815	-6.288	-3.658	-0.802	-0.867	-1.
24-Aug-01	200135	0.000	-2.573	-0.355	-0.414	0.126	2.338	-0.146	-1.828	-1.855	-3.515	-1.812	-1.
31-Aug-01	200136	-10.312	-8.652	-3.321	-0.291	-0.630	0.958	-3.708	-2.451	-6.330	-1.466	-4.774	-4.
7-Sep-01	200137	-5.348	2.393	-5.276	-7.972	-0.634	-0.073	-2.818	0.459	-7.649	-0.127	-1.939	0.
14-Sep-01	200138	-7.627	9.202	-0.648	-2.993	-5.357	0.073	-1.225	4.473	-14.431	-1.149	-0.682	-0.
21-Sep-01	200139	0.000	15.158	-0.847	-4.395	-14.690	-0.949	-0.954	0.138	0.831	-2.712	-2.334	-4.
28-Sep-01	200140	-0.917	1.316	0.986	0.978	16.588	0.811	3.294	3.356	1.472	-2.655	1.827	0.
5-Oct-01	200141	-1.235	3.057	7.813	4.697	6.369	-0.219	3.414	2.469	-1.045	-2.727	5.383	0.
12-Oct-01	200142	-0.938	0.111	15.036	3.793	-2.675	3.150	3.080	0.868	1.701	0.935	4.322	2.
19-Oct-01	200143	0.000	-19.259	2.625	11.230	-7.068	-1.563	-2.339	-2.905	18.281	2.685	0.565	-2.
26-Oct-01	200144	0.315	-17.294	-10.384	-1.883	5.775	-2.742	-4.369	-1.396	2.779	-6.583	0.874	3.
2-Nov-01	200145	-4.088	-3.217	-7.877	-1.429	2.929	11.202	-0.413	2.090	-5.123	-2.896	1.114	0.
9-Nov-01	200146	-4.590	5.272	-1.053	-1.450	-2.458	-15.210	-3.248	-0.198	0.500	-9.543	0.551	-1.
16-Nov-01	200147	2.749	4.790	-4.884	-6.053	0.398	-0.472	-0.579	1.610	-0.498	1.703	-0.061	0.
23-Nov-01	200148	-5.017	2.649	0.197	-3.803	0.000	0.632	-0.890	1.802	-0.400	-4.376	1.949	0.
30-Nov-01	200149	-3.873	-1.417	2.037	0.884	0.396	-2.514	-0.748	-0.469	-1.104	0.000	1.673	-4.
7-Dec-01	200150	-2.198	-0.616	2.447	0.323	-1.711	1.370	-0.064	-5.785	-2.234	-2.429	1.234	-12.
14-Dec-01	200151	-0.749	-0.517	0.880	-1.011	-1.874	-1.590	-0.810	-1.365	-1.350	-3.706	0.580	-4.

21-Dec-01	200152	0.000	0.000	1.620	0.418	-0.955	-0.404	0.113	-1.038	0.000	0.000	-1.904	0.
28-Dec-01	200153	0.000	-0.623	1.778	-0.324	2.617	0.487	0.656	2.889	0.105	-2.285	1.941	0.
4-Jan-02	200201	0.755	-1.672	8.373	1.855	2.819	2.018	2.358	7.133	-2.208	0.554	2.020	-6.
11-Jan-02	200202	0.000	-4.729	1.112	0.182	0.783	0.870	-0.297	3.297	-2.151	3.978	-1.244	-3.
18-Jan-02	200203	0.000	-3.179	-11.215	-0.864	-0.648	-0.235	-2.690	1.187	1.593	0.059	-2.635	-3.
25-Jan-02	200204	-1.124	-3.226	5.697	0.871	0.913	-1.494	0.273	2.346	-6.382	-3.529	2.706	-0.
1-Feb-02	200205	-10.227	-3.512	-3.691	1.091	0.388	-0.080	-2.672	-1.818	-2.195	-2.134	1.260	0.
8-Feb-02	200206	2.110	0.864	-2.555	1.439	-2.445	-0.160	-0.125	0.885	0.473	-0.312	0.452	0.
15-Feb-02	200207	-0.826	-1.896	4.682	0.665	-1.979	2.640	0.548	3.571	-0.294	0.000	-0.338	-0.
22-Feb-02	200208	2.917	-0.249	2.504	2.686	0.000	1.559	1.569	-9.264	0.236	0.063	-2.712	-0.
1-Mar-02	200209	2.429	-7.938	-5.701	15.609	-0.538	-0.460	0.567	-1.146	-2.294	0.000	0.116	-0.
8-Mar-02	200210	-1.186	-11.745	-6.416	18.101	-3.383	2.082	-0.424	-0.816	-8.730	0.062	0.232	2.
15-Mar-02	200211	0.000	-8.462	-1.714	-3.518	1.821	-1.813	-2.281	4.720	-3.100	-0.125	0.347	-0.
22-Mar-02	200212	0.000	-15.714	1.878	0.553	1.238	0.154	-1.982	-12.942	-0.953	0.000	-0.807	-1.
29-Mar-02	200213	0.000	-0.499	-0.987	1.489	-2.853	0.768	-0.347	0.902	-2.199	0.000	-0.581	-1.
5-Apr-02	200214	0.000	0.200	2.394	1.021	-0.559	3.963	1.170	1.012	-1.546	0.937	-0.468	-0.
12-Apr-02	200215	0.000	-4.000	-2.208	-0.221	0.844	-7.331	-2.153	-0.839	-0.857	-3.406	0.353	0.
19-Apr-02	200216	0.000	-6.250	-4.183	-1.899	0.279	0.475	-1.930	-0.493	-0.648	-3.718	0.117	-2.
26-Apr-02	200217	0.000	0.000	-5.405	-2.129	-0.278	0.000	-1.302	1.299	1.232	0.200	0.292	-4.
3-May-02	200218	0.000	0.889	-1.832	-2.703	-1.255	-0.709	-0.935	0.210	-4.939	4.585	-0.408	-0.
10-May-02	200219	0.000	0.441	-4.030	0.982	-0.282	1.507	-0.230	0.675	-3.840	-0.508	-0.468	0.
17-May-02	200220	-2.800	-0.987	-19.751	0.302	0.425	2.578	-3.372	1.201	-15.583	2.171	0.235	-1.
24-May-02	200221	-9.053	0.000	-0.775	0.870	3.808	0.838	-0.719	2.169	-17.161	2.500	-0.704	0.
31-May-02	200222	2.715	-0.886	1.953	-0.862	3.940	1.360	1.370	2.972	-2.128	2.012	1.773	-0.
7-Jun-02	200223	7.048	-3.017	-1.149	0.167	-6.536	6.632	0.524	1.020	0.114	0.897	-4.297	-0.
14-Jun-02	200224	2.881	-0.115	-2.810	-0.534	-0.839	1.537	0.020	0.000	0.000	0.711	-2.913	-0.
21-Jun-02	200225	0.000	0.346	1.496	0.067	2.398	-5.368	-0.177	0.473	12.800	0.882	0.000	1.
28-Jun-02	200226	-4.000	-2.874	1.179	-1.543	0.413	-4.145	-1.828	1.796	16.312	0.583	0.000	-1.
5-Jul-02	200227	-7.500	-5.325	0.388	-0.341	0.000	0.152	-2.104	0.336	20.732	1.101	-0.875	-4.
12-Jul-02	200228	1.351	0.000	-0.484	-0.034	-1.783	1.970	0.170	2.868	37.302	13.819	1.892	3.
19-Jul-02	200229	0.000	-2.125	-0.097	0.000	-0.140	1.634	-0.121	1.038	-11.929	11.335	-0.495	1.
26-Jul-02	200230	0.000	-5.492	-0.292	0.034	-0.140	-1.681	-1.262	-1.370	-7.757	7.330	0.000	-1.
2-Aug-02	200231	0.000	-9.324	1.268	15.726	-4.762	-1.413	0.249	-1.287	-1.746	-1.560	1.990	0.
9-Aug-02	200232	0.000	1.341	1.349	-2.422	-0.441	3.394	0.537	3.930	-1.514	-0.642	0.854	-1.
16-Aug-02	200233	1.333	2.206	-1.901	-6.751	-0.591	2.334	-0.562	-3.702	0.267	-4.052	-0.121	-0.
23-Aug-02	200234	0.439	-6.187	-2.907	2.305	-1.932	0.713	-1.262	-5.912	2.667	-4.852	-0.121	0.
30-Aug-02	200235	0.000	-7.822	-2.595	3.618	-1.364	9.413	0.208	0.571	10.390	0.000	-0.727	0.
6-Sep-02	200236	0.000	-0.166	-15.676	2.971	-5.530	-0.259	-3.110	2.141	-0.294	0.567	-3.053	-5.
13-Sep-02	200237	0.000	4.000	1.094	0.535	1.626	-0.584	1.112	0.385	-4.897	-0.704	0.756	-10.
20-Sep-02	200238	-3.493	7.853	9.976	-1.391	-2.080	0.391	1.876	2.642	-0.744	2.931	0.000	0.
27-Sep-02	200239	-0.905	-10.550	3.607	0.810	-0.817	-0.585	-1.407	2.096	-3.375	-3.353	0.500	1.
4-Oct-02	200240	-0.913	2.658	5.802	-3.185	0.165	2.353	1.147	-0.346	0.259	1.568	0.124	1.
11-Oct-02	200241	-0.922	3.236	1.595	0.031	-1.316	1.788	0.735	1.591	-2.323	8.423	0.311	0
18-Oct-02	200242	-0.465	2.194	3.238	3.903	-0.167	2.384	1.848	1.165	-0.925	4.791	0.433	-12
25-Oct-02	200243	0.000	26.840	13.118	11.653	0.167	2.574	9.059	4.565	1.533	4.984	2.836	4
1-Nov-02	200244	-6.075	40.024	22.101	1.669	0.333	3.644	10.283	3.113	11.884	6.552	4.436	-2
8-Nov-02	200245	0.000	31.174	-7.708	1.485	-2.824	8.357	5.081	-2.209	30.340	3.866	7.003	3
15-Nov-02	200246	5.473	-31.336	-13.870	1.669	-10.085	-14.840	-10.499	-0.226	-10.671	2.800	0.429	0
22-Nov-02	200247	5.189	-13.423	3.896	8.788	0.951	3.623	1.504	-1.491	-5.897	6.414	0.000	0
29-Nov-02	200248	0.000	2.215	-7.917	6.871	-0.377	8.017	1.468	4.156	-0.803	6.805	1.496	2
6-Dec-02	200249	0.000	23.835	-2.715	17.941	10.964	6.864	9.482	-1.784	7.505	10.437	0.526	1
13-Dec-02	200250	1.345	28.434	30.512	5.470	4.259	3.969	12.331	0.431	9.995	7.308	0.524	2
20-Dec-02	200251	0.442	7.629	21.026	-1.292	0.163	-0.954	4.503	0.503	0.457	1.767	-1.042	9

27-Dec-02	200252	0.000	9.810	10.071	12.100	7.830	6.389	7.700	4.452	2.227	9.434	0.526	3.
3-Jan-03	200253	2.643	9.798	17.710	7.732	16.188	9.724	10.632	15.290	6.447	5.356	8.377	0.

APPENDIX 5: DESCRIPTIVE STATISTICS: TRADING VOLUME ACTIVITY RATIO

Variable	N	N*	Mean	Median	StDev	Minimum	Maximum
SASITVA	764	0	3.20	0.00	27.20	0.00	553.52
KPLTVA	764	0	3.06	0.18	15.47	0.00	192.72
KCBTVA	763	1	2.76	0.43	10.16	0.00	162.89
NMGTVA	764	0	2.37	0.33	7.29	0.00	100.32
KQTVA	764	0	2.09	0.43	8.63	0.00	153.44
EABLTVA	764	0	2.06	0.23	5.94	0.00	55.53
NICBTVA	764	0	1.35	0.20	6.40	0.00	109.55
GWKTVA	764	0	1.30	0.00	10.97	0.00	228.45
KAKUZTVA	764	0	1.20	0.00	13.06	0.00	314.76
DTKTVA	764	0	1.11	0.00	5.54	0.00	104.61
BBKTVA	764	0	1.01	0.34	2.46	0.00	29.57
FIRETVA	764	0	0.93	0.02	7.18	0.00	103.95
BATTVA	764	0	0.72	0.07	2.37	0.00	35.78
SCBTVA	764	0	0.70	0.26	1.87	0.00	30.73
TOTALTVA	764	0	0.60	0.04	2.30	0.00	29.28
BambTVA	764	0	0.54	0.00	2.89	0.00	55.59
SERATVA	764	0	0.52	0.20	1.10	0.00	15.81
BbondTVA	764	0	0.16	0.00	0.84	0.00	11.20
P0RTTVA	764	0	0.13	0.00	1.49	0.00	29.01

APPENDIX 6: CORRELATIONS: TRADING VOLUME ACTIVITY RATIO

	BambTVA	BATTVA	BBKTVA	BbondTVA	DTKTVA	EABLTVA	FIRETVA	GWKTVA
BATTVA	-0.021							
	0.559							
BBKTVA	-0.021	-0.009						
	0.554	0.813						
BbondTVA	-0.023	-0.007	-0.013					
	0.518	0.844	0.71					
DTKTVA	-0.014	0.042	-0.015	-0.026				
	0.699	0.244	0.67	0.474				
EABLTVA	-0.01	0.106	0.048	-0.015	0.007			
	0.778	0.003	0.189	0.68	0.85			
FIRETVA	0.05	0.014	-0.02	-0.02	-0.02	-0.017		
	0.168	0.699	0.574	0.586	0.579	0.647		
GWKTVA	-0.015	0.003	0.009	0.111	-0.008	0	-0.006	
	0.675	0.939	0.806	0.002	0.829	0.992	0.877	

KAKUZTVA	-0.006	0.121	0.009	-0.009	0.017	0.002	-0.009	0.002
	0.878	0.001	0.806	0.8	0.647	0.947	0.813	0.951
KCBTVA	-0.01	-0.048	0.033	0.124	-0.031	0.009	0.007	-0.006
	0.79	0.19	0.365	0.001	0.391	0.806	0.85	0.877
KQTVA	-0.014	0.009	0.006	-0.001	-0.006	-0.003	0.013	-0.009
	0.697	0.813	0.865	0.985	0.864	0.932	0.723	0.811
KPLTVA	0.015	0.193	-0.015	-0.029	0.057	0.108	-0.007	0.001
	0.674	0	0.673	0.426	0.116	0.003	0.851	0.978
NICBTVA	-0.012	0.01	0.01	0	0.06	-0.007	-0.012	-0.015
	0.747	0.792	0.789	0.993	0.097	0.839	0.75	0.671
NMGTVA	0.102	0.203	0.036	-0.034	-0.017	0.055	-0.028	-0.011
	0.005	0	0.323	0.353	0.634	0.127	0.435	0.754
PORTTVA	-0.015	-0.01	-0.013	0.257	-0.007	-0.024	-0.007	-0.004
	0.687	0.773	0.723	0	0.85	0.507	0.849	0.902
SASITVA	-0.014	-0.026	-0.013	-0.015	0	0.007	-0.004	0.048
	0.699	0.478	0.717	0.682	0.998	0.846	0.918	0.187
SCBTVA	0.02	0.015	0.076	0.001	0.026	0.011	0.013	0.006
	0.577	0.677	0.035	0.98	0.48	0.765	0.728	0.863
SERATVA	-0.016	-0.022	-0.027	0	-0.006	-0.032	-0.032	0.008
	0.661	0.544	0.462	0.998	0.873	0.374	0.382	0.82
TOTALTVA	-0.022	-0.018	-0.017	-0.011	-0.016	0.122	-0.016	-0.017
	0.537	0.612	0.631	0.759	0.653	0.001	0.657	0.636

	KAKUZTVA	KCBTVA	KQTVA	KPLTVA	NICBTVA	NMGTVA	PORTTVA	SASITVA
KCBTVA	-0.015							
	0.673							
KQTVA	-0.017	0.024						
	0.639	0.51						
KPLTVA	0.008	0.061	-0.006					
	0.836	0.094	0.876					
NICBTVA	-0.011	-0.015	0.013	-0.022				
	0.771	0.673	0.727	0.538				
NMGTVA	0.157	-0.031	0.026	-0.005	0.118			
	0	0.395	0.471	0.9	0.001			
PORTTVA	0.004	-0.003	-0.014	-0.007	0	-0.021		
	0.919	0.939	0.707	0.839	0.99	0.558		
SASITVA	-0.01	-0.017	-0.011	-0.001	-0.017	0.004	-0.008	
	0.793	0.646	0.754	0.978	0.648	0.921	0.835	
SCBTVA	-0.001	-0.011	0.127	-0.02	-0.013	0.079	-0.023	-0.013
	0.972	0.752	0	0.582	0.717	0.029	0.524	0.716

SERATVA	0	-0.018	0	-0.039	0.016	-0.036	0.048	0.033
	0.997	0.612	0.995	0.279	0.667	0.322	0.187	0.365
TOTALTVA	0.045	0.032	-0.01	-0.004	0.006	0.048	-0.014	-0.015
	0.211	0.384	0.772	0.919	0.865	0.184	0.694	0.685

	SCBTVA	SERATVA
SERATVA	0.008	
	0.815	
TOTALTVA	-0.02	-0.018
	0.589	0.618

Cell Contents: Pearson correlation
P-Value