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**THE EFFECT OF STOCK MARKET LIQUIDITY ON STOCK RETURNS OF
COMPANIES LISTED ON NAIROBI SECURITIES EXCHANGE**

LILIAN WANGECHI KAHUTHU

066873

**SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE
AWARD OF THE DEGREE OF MASTER OF COMMERCE AT STRATHMORE
UNIVERSITY**

**SCHOOL OF MANAGEMENT AND COMMERCE
STRATHMORE UNIVERSITY
NAIROBI, KENYA**

JUNE, 2017

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LIST OF ABBREVIATIONS AND ACRONYMS

CAPM Capital Asset Pricing Model

CMA Capital Market Authority

GDP Gross Domestic Product

IMF International Monetary Fund

NASDAQ National Association of Securities Dealers Automated Quotations

NSE Nairobi Securities Exchange

NYSE New York Stock Exchange

U.S. United States

ABSTRACT

The main objective of this study was to determine whether stock market liquidity has an effect on stock returns of companies listed at the Nairobi Securities Exchange from 2012 - 2016. This study looks at both the width and depth aspects of liquidity measured by bid-ask spread and turnover rate respectively. The study adopted a quantitative research design with the population of the study consisting of all the 64 firms currently listed at the Nairobi Securities Exchange and the 23 trading participants registered by the CMA. Purposive sampling was adopted and panel regression model was used to analyze data from 50 companies listed on the NSE selected. Descriptive analysis was used to analyze data on perception of market participants on liquidity collected through questionnaires. Empirical findings show that market depth was found to be insignificant to stock returns while market width was found significant. On the other hand, most market participants perceived both market width and depth to be significant to stock returns but only to a moderate extent. Generally, from the inferential analysis liquidity was found to be significant but not the main predictor of stock returns. These findings were further supported by the descriptive analysis on market participants' perception. These findings should be of interest to investment managers and policy makers on decisions regarding stock investments on the NSE.

CHAPTER 1: INTRODUCTION

1.1 Background to the study

Stock return is compensation an investor receives for holding a stock in a particular period. This gain can either be dividends or capital gain. There is abundant theoretical and empirical literature on factors affecting stock returns. Returns can be measured in two ways, the historical rate of return and the expected rate of return. The historical rate of return is the return on an investment over the time period the investment is held (the holding period) while expected return is the return an investor anticipates on an investment in the next period (Reilly & Brown, 2012).

Accumulating empirical evidence shows that the capital asset pricing model (CAPM) developed by Sharpe (1964) and Litner (1965) performed poorly in explaining stock returns. Thereafter, a range of variables have subsequently been identified as having explanatory power for stock returns. For example, Fama and French (1996) included two additional risk factors, book-to-market and size to the CAPM. In asset-pricing theory, it is commonly assumed that all assets are liquid and can be traded quickly. In reality, however, most asset classes which are frequently traded are not perfectly liquid, and investors often incur transaction costs and suffer from possible future price reduction if they want to liquidate their position quickly. This has a strong influence on asset prices and returns as future cash flows are affected by liquidity.

In addition, the ease with which financial instruments such as stocks can be traded is of crucial importance to investors, financial markets as well as listed companies. Consequently, liquidity has been introduced as an explanatory variable for stock returns. Important work on the liquidity-stock returns relationship includes Amihud and Mendelson (1986); Amihud (2002); Pastor and Stambaugh (2003); Liu (2006); Brennan, Chordia, Subrahmanyam and Tong (2012); Sarr and Lybek (2012) and many others. Although there is abundant literature documenting the liquidity-stock returns relationship, results about this relationship are mixed which can be majorly attributed to the different liquidity measures employed by different researchers and different market dynamics and conditions in different markets.

Liquidity refers to the ease of buying or selling. It's also the ability to quickly execute a large trade at the minimum cost and with a low price impact. Liquidity is one of the imperative characteristic of financial market and considerably important for investment plans and financial assets. Liquidity particularly has attracted a lot of attention from traders, policy makers, and academicians (Brennan, Chordia, Subrahmanyam and Tong, 2012).

Empirically, there are three aspects of liquidity that can be investigated; these are (1) depth, (2) width which is also referred as the cost tightness dimension of liquidity and (3) resiliency which is how fast the price recovers after liquidity shocks. Most previous studies have concentrated on one dimension of liquidity; market depth hence this study concentrates on both the depth and width aspects of liquidity. Depth looks more on the leeway immersion of large size order that is the number of shares that can be traded at a given bid ask spread while width concentrates more on the bid ask spread which estimates the difference between the buying price and the selling price of security (Sarr and Lybek, 2012).

Trends in the world market show market participants witnessed the market liquidity on securities drying up as a precursor to the crisis in the real economy due to the 2007/2008 global financial crisis. Among the major markets, the United States securities market seemed to have greatly suffered a deterioration of liquidity from the financial crisis with its market bid-ask spreads increasing from an average of 0.03% to a high of 0.27%. Nevertheless, the US market is still highly liquid in comparison to the other big markets. In Europe the effective spread increased from a low of 0.67% to a high of 3.5% after the crisis while in emerging markets the bid-ask spread of approximately 0.5% increased to a high of 1.5% (International Monetary Fund, 2016a).

Although the markets are recovering from the crisis, market participants are still concerned that the level of liquidity in the market in both the advanced and emerging market economies is still low which has led to liquidity related risks and shocks increasing. The price impact of buys and sells has increased in several markets especially in the European markets even though large trades are not as many as they were before the financial crisis. In 2005 large trades were approximately 25% of total transactions as compared to slightly over 15% in 2015 indicating that buying or selling large amount of securities in the developed markets may still be difficult as

compared to 10 years ago. This is worrying since the market liquidity plays a huge role in ensuring the overall growth of the economy (IMF, 2015).

Due to the liquidity concerns among policy makers, there have been crucial transformations and developments in financial markets in developed and emerging markets over the recent years that have resulted to conflicting effects on the liquidity of stock market. The major changes include implementation of stringent regulations in the financial sector, changes in monetary policies and the implementation of changes in the business models of most banks and other financial institutions as a result of the new strict regulations. These changes have resulted to both positive and negative outcomes on the liquidity in the developing and emerging stock markets (IMF, 2015).

In Kenya, the Nairobi Securities Exchange has experienced periods of high and low returns on shareholders investments since it was constituted in 1954. Among other factors such as the prevailing political environments in the economy, the stock market liquidity has been noted to be one of the major causes of variations in stock returns in the NSE. Even though the NSE is in general considered highly liquid market and more active in terms of trades as compared to most of the other markets in East Africa and the sub-Saharan Africa, the low level of securities market liquidity is still considered a huge challenge facing the Kenyan securities market with decreased level of liquidity specifically experienced in the equity and bonds secondary markets (CMA, 2015).

According to international standards, the Nairobi Securities exchange is smaller in size, has low liquidity levels and high volatility with regards to price and returns. Over the recent years, Kenya's liquidity has been increasing with the bid ask spread decreasing and the trading volumes increasing in the last 10 years (CMA, 2015).

1.2 Problem definition

The 2007/2008 global financial crisis drew attention to the importance of liquidity. Market participants recognize that a drop or, worse, evaporation of liquidity can lead to considerable price decline of asset that cannot be explained by the asset's fundamentals (Florackis,

Kontonikas and Kostakis, 2013). These sentiments were also echoed in the IMF's sustainability report that emphasized the importance of liquidity in any market as very sharp liquidity drops lead to increased volatility as prices tend to overreact or become less informative and less in line with the fundamentals. In extreme conditions liquidity drops may lead to systemic repercussions or markets freeze altogether hence market participants prefer an abundant and stable market liquidity since it translates to less risky transactions and low transaction costs (IMF, 2015).

Despite the huge importance of liquidity, few studies have been done in the Kenyan context to study liquidity and the causal relationship between market liquidity and stock returns at the Nairobi securities exchange with most studies only looking at one dimension of liquidity; market depth. Moreover, none of the previous studies looked at the perception of the market participants on market liquidity. In addition to the sparse literature available, the findings by the researchers were mixed. Ayako (2005) found out that liquidity had no effects on return while Koech (2012) found a very weak correlation between liquidity and return of stocks listed at the NSE. On the other hand Okanga (2014) found that illiquidity was positively significant to illiquidity and excess stock return.

Moreover, NSE has undergone various crucial developments especially in legal and institutional changes which are aligned with global standards. In addition, the Kenyan economy underwent structural breaks during the sample period that are likely to affect liquidity, namely the change of calculating GDP, introduction of more foreign direct investments especially on infrastructure and changes in legislation that have attracted foreign investors to invest more in the market (CMA, 2015).

Due to the great importance market liquidity plays, the knowledge gap on the different dimensions of liquidity and perceptions of market participants on liquidity, the conflicting findings from previous studies and the economic and regulatory changes in the Kenyan market, there is great importance to further analyze the association among the variables of liquidity like bid-ask spreads and the turnover rate on stock returns in the Kenyan context. Therefore, this study seeks to investigate the effect of market liquidity on stock returns of companies listed on the Nairobi Securities Exchange.

1.3 Research objectives

1.3.1 General Objective

To determine the effect of market liquidity on stock returns of companies listed on NSE.

1.3.2 Specific Objectives

- i. To assess the effect of market depth on stock returns of companies listed on NSE.
- ii. To assess the effect of market width on stock returns of companies listed on NSE.
- iii. To determine the market participants' perception on market liquidity of companies listed on the NSE.

1.4 Research Questions

- i. What is the effect of market depth on stock returns of companies listed on NSE?
- ii. What is the effect of the market width of liquidity on stock returns of companies listed on NSE?
- iii. What is the market participants' perception on market liquidity of companies listed on the NSE?

1.5 Scope of the Study

This study was undertaken in companies listed on Nairobi Securities Exchange. The study examines the effect of stock market liquidity on stock returns of companies listed on Nairobi Securities Exchange. The bid ask spread as well as the turnover rate as measures of liquidity were studied. Additionally, questionnaires given to market participants were used to triangulate the inferential findings. This study studied a five year period; 2012-2016 and the data was daily data.

1.6 Significance of the study

1.6.1 Academicians

This study can be used by scholars and researchers as a base for more discussions on the effect of stock market liquidity on stock returns of companies listed on Nairobi Securities Exchange. The study will offer a basis on further improvement of the various theories advanced to explain the relationship of stock market liquidity on stock returns and establish their relevance to an economy like Kenya.

1.6.2 Fund and Investment Mangers

Fund and investment managers may use the findings of this study especially from the first and second objectives to make investments from an informed position on whether to include market liquidity when making trading decisions.

1.6.3 Policy makers

the findings of the study will be important to understanding stock market liquidity risk and its impact on the stock returns in Kenya since the risk of disruptive rapid decreases in liquidity in the market, how to assist mitigate the risk of a liquidity meltdown or reduce their impact if they occur is the main concern about liquidity among policymakers. The study will be important in the formulation of policies with regard to control of stock market liquidity and promotion of investment in the stock market. The study can further be used as a reference to other developing economies in policy formulation on issues pertaining to liquidity and its relationship to stock returns.

CHAPTER 2: LITERATURE REVIEW

2.1 Introduction

This chapter presents market liquidity literature on stock returns related to this study. It gives a summary of previous studies done by different researchers in this field by summarizing the theoretical literature review on both market liquidity and stock returns and an empirical review on studies previously done. The chapter will also include the overview and gaps in literature and conceptual framework.

2.2 Theoretical Review

This section reviews the various theories that have been advanced on market liquidity that informs this study. Three theories will anchor this research due to their predominance in studies related to stock market returns. They include the market microstructure theory, trading costs theory and trading quantity theory .The market microstructure theory is applied to show the market frictions and how liquidity as a market friction relates to stock returns. Trading cost theory is used so as to shed more light on the width aspect of liquidity and how it influences stock returns while the trading quantity theory will give an insight on the depth aspect of liquidity and how it relates to stock returns.

2.2.1 Market Microstructure Theory

In modern finance theory, efficient market hypothesis (EMH) is one of the most important concepts in the relevant literature of market liquidity. According to Fama (1970), all information that is new in the market on any firm, is immediately captured in the share price of the firm suggesting that price changes occur only with new information. According to Markowitz, (1952) an investor's decision is only determined by risk and return. In the real world however, financial markets are more complex and full of frictions such as trades do not arrive simultaneously in the marketplace; and that information is asymmetric.

The different frictions in the market are the basis of the market microstructure theory (Cohen, Maier & Schwartz, 1986).These frictions can be distinguished into two groups: the real frictions,

which are shortfalls in the organization of the market and take up real resources and have an effect on all participants in the market in the same way, while informational friction reallocates wealth between participants in the market making market liquidity an additional factor for market participants to consider when making decisions (Stoll 2000).

Liquidity is a complex concept and several researchers have defined it in different ways. According to Baker (1996) there is a shortage of a specific and widely accepted definition of liquidity available in literature. Wyss (2004) also argues that lack of a specific definition can be due to the several dimensions liquidity has. Literature identifies width, depth and resiliency as the three dimensions of liquidity (Harris, 1990).

Building on the market frictions, depth factors (Ho and Stoll, 1981; Amihud and Mendelson, 1986; Stoll, 2000) which postulate the primary role of market-makers as liquidity providers should be compensated for due to price risk on inventory. Width factors (Easley and O'Hara, 2002; Kyle, 1985; Glosten and Milgrom, 1988) which focus on asymmetric information among market participants and show how market-makers who set the bid-ask spread should also be compensated for due to adverse selection costs.

This theory is relevant to the study as it shows that illiquidity is a form of market friction which reallocates wealth between participants in the market hence investors should consider it when making decisions as it translates to stock returns hence making this study relevant.

2.2.1 Trading cost theory

This theory as originated by Amihud and Mendelson (1986) looks at the trading costs that are a result of trading a stock. Real markets experience frictions which affect the asset prices hence these frictions should be incorporated when determining asset prices. Amihud and Mendelson (1986) in their study on how costs associated with the transaction affect stock prices concluded that stocks with larger bid-ask spreads, had higher returns. In addition, they established that trade associated costs can either increase or decrease as a result to variations in time of transactional costs.

Transaction costs causes the market to be segmented, as short-term investors hold comparably more liquid stocks in comparison to long-term investors. However, even though most investors have the option to avoid stocks with higher costs of transaction Amihud and Mendelson (1986) found that the expected stock return has a positive concave relationship with transaction costs. Additionally, investors who are hold their stocks for longer periods can get a premium as a result of illiquidity that exceeds the expected transaction costs through holding stocks with higher spreads (Amihud, Mendelson and Pedersen, 2005). In Comparison to investors who hold stocks for a long period, investors who hold stocks for shorter periods, are more vulnerable to costs as a result of transacting on a more frequent basis. For long term investors, costs of transaction can be depreciated over the total holding period.

Information asymmetry is also an important factor in influencing transactional costs. In a perfect-market, all market participants are assumed to be similarly informed on the risky asset payoff. However, in practice, different participants have different information due to the fact that market participants are accessible to different information or their abilities to process and transform information from similar sources is different. Being a source of liquidity, the essential feature of Asymmetric information is that trading process involves decisions made by traders who have superior information compared to others. These informed traders, trade when they can make huge profits off the market, buying when they know the stock is undervalued and selling when they know the stock is overvalued (Morck, Bernard and Wayne, 2000).

Moreover some investors are also large in comparison to others in a way that they are able to influence prices in the market, either due to their size or as a result of the advantage of the information they hold. To a market-maker, he always loses with informed traders and bears the costs of such trades; thus, they have to find ways to offset these losses through the uninformed traders. These gains arise from the bid-ask spread. Rational, competitive market-makers set their bid and ask prices accordingly, and more extreme information asymmetries lead to wider bid-ask spreads which shows that the market is less liquid (Ding, Nilsson and Suardi, 2013).

In a perfect market, for all periods, all market participants are present. Hence, a buyer has instantaneous accessibility to all the sellers in the market. However, practically, this is not the

case. Agents incur market participation costs like costs of monitoring movements in the market. In addition to market participation costs, agents incur execution costs per each transaction. Costs associated with the transacting process causes a significant difference between the buying price and the price at which the asset is being sold at. Transaction costs which are associated with trading such as transaction taxes, fees paid to process orders and brokerage fees also affects market liquidity. Costs such as transaction taxes are seen as primitive transaction costs while other types of transaction costs are as a result of other market imperfections (Atkins and Dyl, 2007).

The above costs have a direct effect on the trader's profit with both the buyer and being affected. These costs are a representation of presence of market frictions in the stock markets hence can be seen as a determinant of market illiquidity since it affects the price investors are trading at in the market. Markets with high transaction costs are less liquid as compared to their counterparts with low exogenous transaction costs (Atkins and Dyl, 2007).

The tightness or gap of the bid-ask spread is the most common measure of trading cost as source of illiquidity. It is normally calculated as the difference between the buying price of a stock known as the bid price and its selling price known as the ask price which directly calculates the cost of a small trade execution. The bid-ask spread has two components; one which compensates market-makers for costs of holding inventory, fees associated with processing of orders, and/or monopoly profits. Due to the transitory nature of this component, the effect it has on stock prices is unrelated to the stock's underlying value. The adverse selection component which is the second component of the bid-ask spread is as a result of the possibility of market-makers trading with unidentified informed traders. In a competitive market, market makers have to increase the bid ask spread so as to recover from the losses incurred as a result of informed traders with superior information from uninformed investors (Atkins and Dyl, 2007).

This theory is relevant to the study as it shows how market width as a dimension of liquidity is related to stock returns. The theory gives a theoretical prediction that market width is positively related to stock return which will be the basis of study's hypothesis testing on market width.

2.2.2 Trading Quantity Theory

According to Kato and Loewenstein (1995) there are several problems associated with transaction costs dimension of liquidity. Some of the problems included that in periods with long time spans, costs associated with transacting process are hard to obtain for testing. In addition, Karpoff and Walkling (1988) and Bhushan (1994) noted that the bid-ask spread which is the most used measure for market width appeared to be inaccurate hence the trading quantity theory. Easley and O'Hara (1987) came up with the trading quantity theory which looks at the size of a trade at a particular price. Easley and O'Hara (1987) argued that investors who were informed preferred trading huge amounts of stocks at a particular price. On the other hand, pricing strategies for market makers' depends on the size of the trade; huge trades are traded at less favorable prices for investors.

Hu (1997) tested the trading quantity theory and his findings provided strong evidence which supported the Amihud and Mendelson (1986) transaction cost model and the trading frequency hypothesis. An important source of liquidity under the trading quantity theory is the demand pressure of an asset in the market and is also commonly known as the price impact. Demand pressure describes the possibility of an investor's buying/selling large amounts of stocks in the shortest time possible quickly and without increasing/lowering the price in the market (Sloman and Kelvin, 2007).

In markets with no perfect liquidity, the demand and supply equilibrium is distorted by large orders placed by the huge investors leading to changes in prices; a decrease in prices if the investor is selling and an increase in prices if the investor is buying which is a disadvantage to the investor. The market liquidity level will determine the intensity of the price impact with high liquid markets having lesser price impact. The price impact can also be partly informational. If suddenly an investor decides to buy or sell a large number of stocks, there is a possibility that other investors in the market will perceive it as a sign that investor has crucial information not available to other investors which may cause pressure on the stock price. However, in efficient markets this type of price impact cannot be permanent since prices will readjust due to the demand and supply forces or else result to speculative bubbles (Hubbard and Obrien, 2009).

Demand pressure also results in search friction which is the opportunity costs and financing costs incurred by an investor related to the process of him matching his intended sells or buys to a buyer or seller in the market. The alternative to looking for the buyer or seller is to suffer the losses brought about by the costs associated with selling/buying from a dealer. These expenses include dealer fees and the cost associated with inventory risk which the market dealer requires compensation for (Sloman and Kelvin, 2007).

This type of risk is specifically distinct in the OTC markets. Opportunity costs are brought about by the process of an investor waiting for a counterpart in order to complete a trade. In addition to this, another type of opportunity is generally imposed to the investor as a result to the process of an investor waiting to trade. In case an investor had assessed a stock's value as a result of private information and from his analysis discovers the stock price in the market is undervalued, the time the investor is forced to wait to buy the stock could result in opportunity costs, if the stock price increases during the waiting period. In slightly efficient equity markets, private information reflect in the price quite fast hence it can be rather expensive for an investor waiting to trade on private information (Hubbard and Obrien, 2009).

Demand pressure is closely related to the inventory risk. This occurs when the market is not deep enough resulting in a situation where an investor has no buyer or seller available in the market to enable him complete his trading. Rather than waiting for his counterpart to come to the market, the investor may decide to trade with a market maker at the set bid/ask price. The market maker takes ownership of the inventory in this case the stocks, bearing the risk that there is a possibility that the stock price may change in the future. They expect compensation for the uncertainties associated with holding the inventory hence they quote bids and ask prices that ensure that at least the present value of the future loss the market maker expects is accounted for. Thus, the higher the risk in holding stocks, the more the bid/ask spread; an indication of low liquidity in the market (Fama and MacBeth, 1973).

The most common preferred measure of trading quantity is the trading volume. Trading volume is the amount of traded shares in a particular time interval which can be daily, weekly, and on an annual basis or any other time interval which is appropriate for analysis. It has a time dimension

advantage since the higher the volume the shorter the time needed to trade a specific number of shares. Thus, the values of volume-related measures should be higher in order to indicate high liquidity (Brennan and Subrahmanyam 1996). They further found out that trading volume is an important determinant of the measure of liquidity while Chordia, Subrahmanyam, and Anshuman (2011).

Trading volume was further advanced to the turnover rate which is the ratio of volume traded to the outstanding amount of the stock. Turnover rate is considered a more adequate measure of liquidity than trading volume since it makes it possible to compare between different stocks. For high frequency trading stocks, the immediacy price would be smaller since frequent trading reduces the inventory controlling costs. The higher the turnover rate the quicker the stocks trade with fewer costs from time delays. Thus, theoretically, turnover rate is negatively related to bid-ask spreads and stock returns (Chordia, Subrahmanyam, and Anshuman 2011).

This theory is relevant to the study as it gives an insight on market depth as a dimension of liquidity and how it relates to stock returns. The theory gives a theoretical prediction that market width is negatively related to stock return which will be the basis of study's hypothesis testing on market depth.

2.3 Empirical Review

The empirical literature has been structured according to scope of the studies done under each objective starting with studies done in the developed markets: U.S. and Europe, studies in the emerging markets come next followed by studies in Africa and lastly studies in the Kenyan context. Past empirical studies over the last five decades on the relationship between market liquidity and stock returns have yielded mixed results. A number of researchers support the view that market liquidity affects the expected returns of stocks while other researchers find no significant relationship between the market liquidity of the stocks and their returns.

2.3.1 Market Width and Stock Returns

Amihud and Mendelson (1986) took intuitive and examined the relationship for the very first time on the US stocks. Utilizing the Fama & MacBeth (1973) procedure of forming portfolios and using bid/ask spread as a natural measure of liquidity, they argued assets that are not liquid

could be owned by investors with longer time periods as returns and transaction costs formed an increasing and concave function. They also figured out that increases in the level of liquidity led to decreases in risk-adjusted returns.

Based on the Amihud and Mendelson (1986) model, Eleswarapu and Reinganum (2003) also used the bid – ask spread as their measure of liquidity to examine the behavior of liquidity premium in pricing assets. Using 49 equally – weighted portfolios, they found that liquidity was significant to returns. Moreover, even after spreads had been controlled for, the paper suggested that size effect is significant which differed from Amihud and Mendelson’s results.

Similarly, Akram (2014) also used the bid-ask spread as the proxy on liquidity on his study to elucidate the association among liquidity and stock return. From a two stage regression on the data taken from ten listed firms on the Karachi stock exchange for a seven year period, Akram found a negative relationship between liquidity and stock returns supporting both Amihud and Mendelson (1986) and Eleswarapu and Reinganum (2003) findings.

These findings were further supported by Brennan, Chordia, Subrahmanyam and Tong (2012) who did a study on stocks listed on the NYSE from January 1983 to 2008, December to determine liquidity on sell orders and the cross-section of stock returns. They found out that the illiquidity on buys is less priced as compared to the illiquidity on sells in the cross-section of returns supporting the idea that liquidity pricing is almost entirely as a result of the sell lambdas. In addition, the cost of the illiquidity of the sells is not only significant statistically but also materially economical.

To try and explain why the indirect relationship between liquidity and returns as an aggregate data or at a firm level, Baker and Stein (2004) built a model using NYSE yearly data from 1927 - 1998 and analyzed it using an OLS regression model. To boost liquidity, the model used investors who were not rational; they react less to order flow information. When there were restrictions on short sales, high market liquidity levels showed that the market had been dominated by this irrational traders indicating an over value. They also suggested that increased levels of liquidity in the market suggested the expected returns for the irrational investors would be lower than normal.

On the contrary, Fang et al. (2009) in his study on market liquidity and firm performance argued that market liquidity has a direct effect on the performance of a firm which translates on the stock returns even though they used Zindex a liquidity proxy very similar to the bid ask spread. The pooled regression model used to determine whether there was a relationship between the variables on 1374 companies showed that increases in the liquidity levels led to higher than expected returns.

Hypothesis

$$H_{a1} \geq 0$$

Market width is positively significant to stock returns

2.3.2 Market Depth and Stock Returns

According to Kato and Loewenstein (1995) there are several problems associated with transaction costs dimension of liquidity. Some of the problems included that costs associated with the transaction process are difficult to get for tests that span long horizons. In addition, Karpoff and Walkling (1988) and Bhushan (1994) noted that the bid-ask spread which is the most used measure for market width appeared to be inaccurate. As a result of these factors, most researchers supported the use of volumes traded or turnover rate as the proxy for liquidity.

Using turnover rate as the liquidity proxy on their study to investigate the commonality in the determinants of expected stock returns, Haugen and Baker (1996) reported that the turnover rate was statistically significant negative correlation to returns meaning that stocks with low levels of liquidity had higher returns. Also using volume traded as the measure for liquidity, Brennan et al. (1998) did a study to examine the relationship between expected returns and different company characteristics, market liquidity being one of them, using trading volume as the proxy on the NYSE and NASDAQ stocks and also found that trading volume and the stocks returns were significantly negatively correlated for both stocks, thus showing a link between returns and liquidity.

These findings strongly supported the Amihud and Mendelson (1986) transaction cost model. It was also in line with the trading frequency hypothesis which stated that investors who traded at

low frequencies would prefer assets with higher transaction costs, thus across assets, there is a concave function between turnover rate and returns and over time stock return is an increasing function of the turnover.

This negative relationship survived a number of robustness tests by Chordia, Subrahmanyam, and Anshuman (2001) who also used trading activity that is volume and turnover as their proxies for liquidity in their study on order imbalance, liquidity and market returns done on the S&P500 market index from 1988 – 1998. They found that stock returns and the variability of liquidity was cross-sectional significant. They further reported that the stocks with higher levels of volatility in terms of liquidity had lower returns hence a negative relationship.

Further, Amihud (2002) in his study on Illiquidity and stock returns: cross-section and time-series effects using the absolute stock returns compared to the volume of dollars traded as the measure of illiquidity on stocks traded from 1963 to 1997 in the NYSE, also maintained that the relationship between illiquidity and stock returns is positive by showing that part of the expected excess returns can be written as a function of premium illiquidity. He further showed that the premium stocks of smaller companies were greatly affected by illiquidity as compared to the premium stocks of larger companies.

Using the three-factor model by Fama and French, Chan and Faff (2005) using turnover rate of shares as their proxy to liquidity on 1990 - 1998 Australian market data, investigated the role of liquidity in stock pricing. They added liquidity as their fourth factor through adding return of a portfolio mimicking liquidity and tested the four-factor model using the general method of moments test for over identifying restrictions and reject using the general method of moments test; hence, they found there was enough support their theory to add liquidity as a factor to the three-factor model by Fama and French (1993) showing there is a significant relationship between liquidity and returns.

On the contrary, Chen, Firth and Rui (2001) found a positive relationship between trading volume used as the measure of liquidity and changes in the prices of the stocks in their study on the dynamic relation between stock returns trading volume, and volatility despite the use of similar proxies. They used granger causality tests on trading data from nine markets in the US,

Britain and Europe (New York, London, Tokyo, Paris, Toronto, Milan, Zurich, Amsterdam and Hong Kong) from 1973 – 2000 to check if volumes explained returns or vice versa. They further found that some level of information sourced from the volumes traded contributed to the return process which is contrary with the theory.

These findings were also supported by several studies in the emerging markets that found a positive statistical relationship between market liquidity and expected returns. (Jun et al. 2008) analyzed data from 27 emerging markets from 1992-1999 using both cross-sectional and time series data techniques. They explained that the positive link between liquidity and returns could be explained by the low global integration in most emerging markets. As a result to the poor integration of the emerging markets, absence of liquidity in the markets will not be a source of risk hence the cross-sectional returns will not decrease in less liquid markets.

In Africa, Mpofo (2012) examined the relationship between trading volume and stock returns in the Johannesburg securities exchange in South Africa. Vector autoregressive tests were used to analyze the FTSE/JSE index pricing and trading returns data from July, 1988 to June, 2012. The results presented a significant correlation between volume traded and the absolute value of changes in price. Similarly, Ehiedu (2014) study on the impact of liquidity on profitability using a simple correlation analysis of some selected companies in the Nigeria securities exchange concluded that 75% of the companies indicated that liquidity had a significant positive correlation with profitability.

On the other hand, Makau, Onyuma and Okumu (2015) study had mixed results raising a question on the status of the turnover rate acting as the proxy of liquidity. They studied the impact of cross-border listing on stock liquidity: evidence from East African community in which volume traded and stock turnover rate was used as the liquidity measure. Averages for both the pre- and post- cross-listing trading volume and turnover rate was calculated and later taken through a five percent level paired t test to test for their significance. Although in most of the results the effects of liquidity was not statistically significant, their general conclusions were cross-listing can boost the firm's stock liquidity with the liquidity proxy determining the direction of the effect that is a positive or negative direction.

In the Kenyan context, Ayako (2005) sought to analyze the effect of trading volume/activity in regards to whether it affects the futures prices. His main concern was to determine the level of power volumes traded could predict how future stock prices reacted. His research was on firms listed at NSE for a period of 5 years between 1998 and 2002. Using Anova tests for analysis, he found out that volumes traded was not significantly correlated trading to stock return of companies listed at NSE. He further contends that his findings are in line with Fama Random Walk theory which implies that a series of stock price changes at NSE does not have any memory although contradictory to Amihud and Mendelson theory that liquidity is significant to returns.

On the other hand, Koech (2012) also did a study on the 57 companies listed in the NSE for a five year period from 2007 to 2011. He used a simple regression model to determine the relationship between liquidity and stock returns using turnover rate as his proxy and found out that there was a weak correlation between liquidity and stock returns which he concluded not to be statistically significant. This is contradictory to most of the empirical evidence found by most researchers mostly in the develop markets. He further explains that lack of market efficiency as compared to developed markets might be one of the reasons for the contradictory findings.

Hypothesis

$H_{a2} \leq 0$

Market depth is negatively significant to stock returns

2.5 Summary of the Literature

In the past 30 years, many empirical studies have been done to investigate the dynamic relationships in the stock market liquidity and how it affects profitability, firm performance, and stock returns particularly in the advanced economies such as the United states, United Kingdom, European markets, and Japan; with Fama (1981, 1990), Geske and Roll (1983), and Chen and Ross (1986) being among the pioneer researchers. Most of the studies in the developed economies; Haugen and Baker (1996) Chordia, Subrahmanyam, and Anshuman (2001), Marshall

(2006) found a negative relationship between market liquidity and stock returns although few studies; Chen, Firth and Rui (2001), Fang et al. (2009) found a positive relationship despite using similar liquidity proxies. This negative relationship found in most studies is supported by theory on the relationship between liquidity and stock returns.

There have been fewer studies done in the Latin American, Asian and in the sub-Saharan Africa with contradictory findings. Most of studies focused on the depth aspects with turnover rate being the most popular liquidity proxy. Contrary to most developed markets, most studies in emerging economies; Guy and Birthwood (2008), Balasemi, Mehdi and Mohammadi (2015) being few of the examples showed a positive relationship was found between liquidity and stock returns. Jun e tal (2008) tried to explain that the low and poor global integration in most emerging markets as the main reason for the contradictory findings from theory and most developed markets.

Similarly in the developing African markets, most studies focused on the depth dimension of liquidity and used trading volume and turnover rate as measure of liquidity however found no consistent findings. Mpofu (2012) found that liquidity significantly affected price changes while Makau, Onyuma and Okumu (2015) found that liquidity was not statistically significant. On the other hand chikore, Gachira and Nkomo (2014) found a negative relationship while Ehiedu (2014) found a positive relationship. Most of the findings are contrary to theory which states liquidity is significantly negatively correlated to returns.

2.6 Gaps in the Literature

Although some literature exists on the stock market behavior in Kenya, it is scarce and far in between. Most studies used turnover rate as the liquidity proxy but got conflicting findings in their studies. Ayako (2005) and Odongo (2008) found no significant relationship while Koech (2012) found a weak correlation between liquidity and stock returns. On the other hand, Okanga (2014) found that Illiquidity has a positive effect on excess stock return. The findings could be explained by the different market conditions and developments in the market during the study periods and the different methodology used by the researchers.

From the overview of several studies in developed, emerging and African markets, it is obvious that there is consistency in most developed markets but no mutual pattern in this relationship among the different emerging and African markets. The unique distinction of the level of integration to global economy of each emerging and African markets can be regarded as a possible explanation. Moreover, most studies focused on only the market depth measured by trading volume and the turnover rate ignoring market width proxied by the bid ask spread creating a gap in the literature. Hence it is worth to undertake a study to test the relationship between liquidity and stock return looking at both width and depth dimensions of liquidity in the Kenyan context.

2.7 Conceptual Framework

The framework of this study takes cognizant that market liquidity plays a role in stock prices. The dependent variable in this study is the return on stocks. The independent variable is market liquidity; inventory based factors and information based factors.

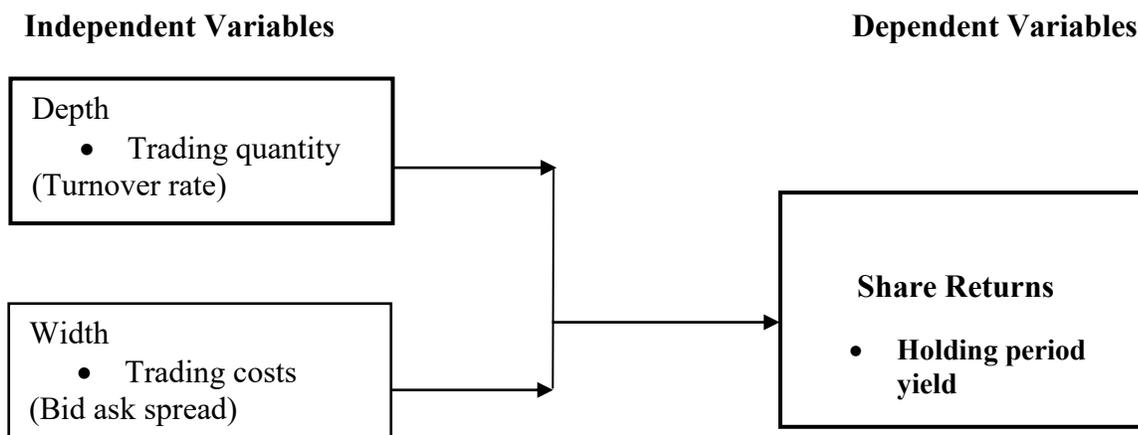


Figure 2.1: Conceptual Framework

Market depth describes the likelihood of an investor buying/selling large amounts of a stock in the market in the shortest time possible and without affecting the price. This can be viewed as the trading quantity at a particular bid-ask price. The main source of trading quantity liquidity is the lack of demand pressure on stocks hence the investor can trade huge volumes of stocks without impacting on the stock price (Sloman and Kelvin, 2007). Market depth has been measured using the turnover rate of the stock traded. A low turnover rate indicates low liquidity in the market

hence investors expect higher returns as a result of their exposure to liquidity risk (Hubbard and Obrien, 2009).

Market width also referred to as the cost tightness of liquidity postulates the primary role of market-makers as liquidity providers and how they should be compensated for adverse selection costs due to trading costs among market participants (Amihud and Mendelson (1986). The main sources of trading costs are the asymmetric information and transaction costs. An essential feature of Asymmetric nature of information as a precursor of illiquidity is that the trading process involves decisions made by traders who have superior information compared to others. Transaction costs on the other hand are costs such as fees charged by brokers, fees related to processing an order and transaction taxes that have a direct impact on the investor's profit (Atkins and Dyl, 2007). This is compensated in the bid ask spread set by the market makers. Larger bid-ask spreads indicate low liquidity in the market hence investors expect higher returns (Ding, Nilsson and Suardi, 2013).

CHAPTER 3: RESEARCH METHODOLOGY

3.1 Introduction

This chapter gives the research methodology used in the study which includes the research philosophy and design, population and sampling, data collection methods, data analysis method, research quality and the ethical considerations.

3.2 Research Philosophy and Design

This research adopted a pragmatic research philosophy. This philosophy only accepts a concept and considers it relevant if it supports action. Pragmatism also incorporates more than one research approach and strategy in the study unlike positivism (Agyeman, 2010). The study is an explanatory research that will adopt a quantitative research design. The study goes beyond description and attempts to explain the reasons for the phenomenon by finding causal relationships among variables.

3.2 Population and sampling

Currently, there are 64 listed firms that are licensed to work and operate in Kenya (NSE, 2015) which served as the population. The study adopted purposive population sampling technique hence the sample of this study comprised of 50 firms listed at the NSE. Data was also collected from trading participants in the NSE. Currently, there are 23 trading participants in the Nairobi Securities Exchange registered with the Capital Markets Authority (CMA, 2015). Due to the small size of the population, the study adopted total population sampling technique hence the sample of this study comprised of all the 23 trading participants.

3.3 Data Collection Methods

Data collected was both primary and secondary data. Questionnaires were used in the primary data collection while secondary data was collected using a data capture sheet for the period from January 2012 to December 2016. In order to capture major factors in the economy that could affect share prices a five year period was used. Data on daily closing values of bid-ask spread, trading volume and daily closing stock prices was obtained from the daily price list at NSE. The daily stock prices were converted to stock returns due to the non-stationary factor in stock prices.

The daily return of stock *i* is defined as the percentage change in prices on day *t*. It was computed using the holding period yield formula.

$$R_{it} = \frac{P_{it} - P_{it-1}}{P_{it-1}} \dots\dots\dots (1)$$

Where P_{it} is the price of the stock *i* on day *t* and P_{it-1} is the price of stock *i* on day *t-1*.

The Bid – ask spread was the difference between the ask price and bid price computed as follows

$$BS_{it} = \frac{PA_{it} - PB_{it}}{P_{it}} \dots\dots\dots (2)$$

Where BS_{it} is the bid-ask spread for stock *i* on day *t*. PA_{it} is the asking price for stock *i* on day *t*; PB_{it} is the bid price for stock *i* on day *t*.

The trading volume was converted to the turnover rate which is measured by the ratio of the number of shares to the number of shares outstanding.

$$TR_{it} = \frac{TV_{it}}{OS_{it}} \dots\dots\dots (3)$$

Where TR_{it} is the turnover rate of stock *i* on day *t*, TV_{it} is the traded volume for stock *i* on day *t* and OS_{it} is the outstanding shares for stock *i* on day *t*.

3.4 Operationalization of the variables

Table 3.1: Operationalization of variables

Variable	Category	Measure	Reference
Market depth	Independent	Turnover rate <u>Vol. traded</u> Shares issued	Haugen and Baker (1996), Chan and Faff (2005)
Market width	Independent	Bid-Ask spread <u>ask - bid price</u>	Amihud and Mendelsen (1986), Brennan and Subrahmanyam (2006)

		Price	
Stock returns	Dependent	HPY $\frac{P_{it} - P_{it-1}}{P_{it-1}}$	Wang (2014)

3.5 Data Analysis

3.5.1 Market Width and Depth

Due to the disintegrated nature of data that was used, this study proposed to use panel data techniques; panel regression for data analysis for both market depth and market width.

$$y_{it} = \alpha + \beta_1 BS_{it} + \beta_2 TR_{it} + u_{it} \dots\dots\dots (4)$$

Where:

y_{it} = Stock returns

$\beta_1 BS_{it}$ = Bid-Ask spread

$\beta_2 TR_{it}$ = Turnover rate

U_{it} = Error term

Previous empirical literature has shown that panel regression model is the most preferred tool among researchers in the analysis of indicators in many performance studies. The panel regression model is also advantageous since its simple, empirically robust and its ability to provide a solution to the problem of bias caused by unobserved heterogeneity, a common problem in the fitting of models with longitudinal data sets. The Hausman test was done to determine the model to be used between the panel fixed effect regression and the panel random effect regression model (Brooks, 2008).

For each entity, the fixed effect regression model recommends different intercept terms which are constant over time. The relationship between the dependent and independent variables is assumed to be the similar both cross-sectional and temporally. (Brooks, 2008).

Hence the previous model equation was expressed as

$$y_{it} = \alpha + \beta_1 BS_{it} + \beta_2 TV_{it} + \mu_{it} + v_{it} : U_{it} = \mu_{it} + v_{it}$$

Just as with fixed effects, random effects intercepts are assumed rise from a common intercept. It can be written as:

$$y_{it} = \alpha + \beta_1 BS_{it} + \beta_2 TV_{it} + \omega_{it}, \omega_{it} = e_i + v_{it}$$

A panel unit root test was done to determine whether the variables are stationary or non-stationary (Brooks, 2008).

3.5.2 Market Participants' Perception

The questionnaires given to the trading participants' in the NSE investigated to what extent liquidity affected their trading decisions, to what extent liquidity affected stock returns and the level of frequency in which lack of liquidity in the stock market has led to losses or decrease in expected stock returns. A likert scale was used to measure the degree of extent of the response Not at all =1, to a slight extent = 2, to a moderate extent = 3, to a greater extent = 4, to an extreme extent =5. The degree of frequency was measured as Never = 1, Rarely = 2, Sometimes = 3, Often = 4, Always = 5.

To analyze the data, the mode of responses was used to give the most occurring response to each question. Findings with a mode score of three and above meant that liquidity was significant while a score of less than three was interpreted as liquidity was not significant. The mean was also used to give the average responses of the market participants.

3.6 Research Quality

The quality of data is a very important in any research which can be determined through the data's internal and external validity and reliability (Lakonishok & Shapiro, 1986). Validity checks whether the tests used measure what they are supposed to measure (Kothari, 2004). This study has adopted a sampling method that ensures most elements being examined have been captured and that the data collected shall be carefully analyzed to give accurate findings and ensure internal validity (Kothari, 2004).

3.7 Ethical Considerations

The study ensured that ethical standards were considered throughout the research process. There was high level of confidentiality with the data collected, true representation of the analyzed data and the final product used for academic purposes only. Plagiarism was avoided and all work borrowed from other scholars was duly acknowledged

CHAPTER FOUR: RESEARCH ANALYSIS AND FINDINGS

4.1 Introduction

This chapter gives the study's descriptive and inferential analysis, findings and interpretation on the effects of stock market liquidity on stock returns on companies listed on the Nairobi securities exchange against the existing theories and previous studies. The chapter has been organized as follows; Section 4.2 gives a summary of the general information while Section 4.3 gives a presentation of the Descriptive Statistics. Inferential analysis is discussed in section 4.4 and a summary of the correlation analysis between the variables done in section 4.5.

4.2 Test of reliability

Chronbach's alpha test was done to determine the internal reliability of the questionnaire.

Table 4.1 Cronbach's alpha test

Cronbach's Alpha	Cronbach's Alpha based on standardized items	No. of items
0.891	0.912	8

From the results above, a cronbach's alpha of 0.891 for 8 items indicate a high internal reliability.

4.3 General Information

To examine the effect of stock market liquidity on stock returns on companies listed on the Nairobi Securities Exchange data was obtained from various sources. The study used both the company specific data from the companies' financial reports and market data from the NSE. Individual stocks were used as the large number of observations brought by the individual stocks gives more power to the tests. Only 50 stocks were examined for over 1400 trading days, from January 1st, 2012 to December 30th, 2016. For a stock to be included in the analysis, it had to be present on the Nairobi Stock Exchange throughout the entire period to ensure consistency in the analysis and avoid unbalanced data and be a first tier ordinary to bring uniformity. Stocks whose

price remained constant throughout the period were dropped from the sample. From the selection, only 50 stocks were viable for the analysis giving a 70.13% response rate.

The effect of market liquidity on stock returns was further investigated through an analysis of data from a questionnaire survey. Two questionnaires were given to each of the 23 trading participants registered by the capital markets authority to get their perception on stock market liquidity and how it affects stock returns. No sampling was done since the total population was small. The research targeted portfolio managers and fund/investment managers of the trading companies. Out of the targeted 46 respondents (23 companies by 2), 26 respondents responded giving a 56.52% response rate.

4.4 Descriptive Statistics

This is a summary of the market liquidity variables and stock returns using data obtained from firm and stock market data. The descriptive statistics was used in profiling the data. Bid ask spread as a measure of cost tightness and turnover rate as a measure of depth were used as the independent variables against stock returns which is the dependent variable. The table below gives the mean, standard deviation, skewness, and kurtosis, minimum and maximum values of the variables above.

Table 4.2: Descriptive Statistics based on Market Width and Depth

summary Statistics							
Variable	Obs	Mean	Std. Dev.	Min	Max	Skewness	Kurtosis
Returns	58910	0.0006	0.0417	-0.8270	7.2149	89.2729	15271.73
Bid Ask	58910	0.0319	0.0365	0.0000	3.2520	18.7895	1341.31
turnover rate	58910	0.0005	0.0049	0.0000	1.0131	15.3160	3016.49

Source: Researcher 2017

The summary statistics give a representation of the time-series averages of the individual stocks for a daily average of 50 NSE stocks over 1400 days from January 1st, 2012 through December

30th, 2016. Returns are daily returns of individual stocks while the turnover rate is the ratio of volume trade to shares issued. The bid-ask is the ratio of daily difference between the bid and ask to share price. Unlike absolute numbers, ratio values were preferred as the possibility of them suffering from extreme values is quite minimal.

On average, the stock return in the Nairobi stock market is 0.06% for the five year period. The results show that during the period there were negative returns with the minimum return being -0.8268. The average turnover ratio was 4.61% with a standard deviation of 3.6% while the bid ask spread on the other hand was 3.18% with a standard deviation of 49.43% for the five year period. The values of both skewness and kurtosis are very high showing that the data may not be asymptotically normally distributed. To further check for normality in the data, Jarque Bera test for normality was done at 5% significance level.

Table 4.2: Skewness/Kurtosis Test for Normality

Variable	Obs	Pr(Skewness)	Pr(Kurtosis)
Returns	58910	0.0000	0.0000
Bid-Ask	58910	0.0000	0.0000
Turnover rate	58910	0.0000	0.0000

(Source: Researcher, 2017)

Since the p value of both skewness and kurtosis is less than 0.05, we rejected the null hypothesis of normality. The data is not normally distributed. Lack of normality in financial data is expected due to the stylized facts of financial data which include non-normality which makes the Ordinary Least Squares model difficult to use hence panel regression model is a preferred method (Brooks, 2008). The assumption of normality is rejected as a result of lack of asymmetry in returns. Returns are negatively skewed as extreme negative returns are more frequent than extreme positive returns. Non-normality is also expected as returns have fatter tails than that expected from a normal distribution (Cont, 2001).

4.5 Inferential Data Analysis

Inferential statistics consists of techniques that enable a researcher to test for causality in relationships. It allows the study to study samples and makes generalizations about the population. In this study, panel data analysis was adopted to explore the casual relationship between liquidity and stock returns. Panel data analysis was chosen since the data has both time series and cross sectional components. Panel data also increases the number of data points in the study, which increases the degrees of freedom which in turn reduces the possibility of collinearity among independent variables. This improves the efficiency of econometric estimates which helps to deal with the problem of unobserved heterogeneity which causes an endogeneity problem that makes the estimated coefficients lack any meaning hence cannot be interpreted (Gujarati, 2003).

Hypotheses in the study were tested using the test of significance approach where the significance of the regression coefficients was tested. Probability values were used to determine the level of significance. For all the inferential statistics, a predetermined 5% level of significance was used for decision making on whether to accept or reject H_0 . If the p-value(s) was less than 5%, we rejected the null hypothesis hence the alternative hypothesis was considered true hence showing significance. Alternatively, if the p value was greater than 5% then we failed to reject the null hypothesis hence the alternative hypothesis was considered not true hence showing lack of significance.

4.5.1 Diagnostic tests

4.5.1.1 Hausman Test

The Hausman test is important in panel analysis as it helps to decide on which estimation method to use. The regression coefficients' estimates are sometimes subject to omitted variable bias - a bias that results from the dependent variable being affected by uncontrolled unknown variables which. Fixed effects regression is the model used to control for omitted variables that differ between cases but are constant over time. On the other hand, if some omitted variables are constant over time but vary between cases or are fixed between cases but vary over time the use of random effects would be more appropriate. (Gujarati, 2003)

Statistically, fixed effects is expected give unvarying results but may not be the most adequate model to run as random effects may give a researcher better P-values as they are a more efficient estimator. Hence, to decide between fixed or random effects, a Hausman test was done. The null hypothesis was the preferred model is random effects vs. the alternative the fixed effects (Gujarati, 2003)

Table 4.4: Hausman Test

	Coefficients	
	Fixed	Random
Bid-Ask	0.0358	0.0302
Turnover Rate	-0.0002	-0.0002

Prob>chi2 = 0.0004

(Source: Researcher, 2017)

Since Prob>chi2 is less than 0.05 (i.e. significant) we reject the null hypothesis of random effects hence the study used fixed effects. This means that although the intercept may differ across the fifty companies, each company's intercept does not vary over time; that is, it is time invariant. In choosing fixed effects, the model assumes that no other factors are affecting the data over the period.

4.5.1.2 Unit root test

The unit root test is important in panel analysis as it helps to determine whether the variables in the study are stationary. Stationarity of variables is important as the data generating process of non-stationary variables cannot be generalized over time. Results from non-stationary data analysis maybe spurious as non-stationary data is unpredictable and difficult to be modeled or forecasted. The regression indicates a relationship between two variables where none exists.

Hence to check whether the variables are non-stationary, a unit root test was done at 5% significance level. The null hypothesis is presence of unit root vs. the alternative stationarity.

Table 4.5: Unit Root Test Results

	Returns		Bid-Ask Spread		Turnover Rate	
	Statistic	P-value	Statistic	P-value	Statistic	P-value
t-bar	-34.281		-23.309		-40.722	
t-tilde - bar	-21.375		-17.944		-20.625	
z- t - tilde - bar	-170.36	0.000	-140.26	0.000	-160.15	0.000

(Source: Researcher, 2017)

Since the p-value is 0.000 which is less than 0.05 we reject the null hypothesis hence there is stationarity. Stationarity in returns is expected as to generate returns, share prices were differenced. Share prices in themselves are non- stationary hence when differenced become stationary. The stationarity in returns makes generalizing findings over time possible. Similarly, Since the p-value of the bid ask spread is 0.000 which is less than 0.05 we reject the null hypothesis hence bid ask spread is stationary. The p-value of the turnover rate is also 0.000 which is less than 0.05 hence we reject the null hypothesis meaning turnover rate is also a stationary variable.

4.5.2 Testing of Hypotheses

4.5.2.1 Market width and Stock returns

The first objective of the study was to assess the effect of the width aspect of market liquidity on stock returns of companies listed on Nairobi Securities Exchange. The bid-ask spread is used as the proxy for the cost tightness aspect of liquidity. The null hypothesis was the effect of cost tightness aspect of market liquidity on stock returns is not significantly positive.

Table 4.6: Regression; Return & Bid-Ask

	Prob > F = 0.000				
Returns	Coef.	Std. Err.	T	p> t	95% Conf.
Bid-Ask	0.0358	0.0049	7.28	0.0000	0.0262
Cons	-0.0006	0.0002	-2.51	0.0120	-0.0010

(Source: Researcher, 2017)

From the above results, the p-value of the bid ask spread is 0.000 which is less than 0.05. This shows significance hence we reject the null hypothesis that the effect of market width on stock returns is not significant. This can be interpreted as the bid ask spread does affect returns positively hence market width is positively significant to stock returns.

4.5.2.2 Depth and stock returns

The second objective of the study was to assess the effect of depth aspect of market liquidity on stock returns of companies listed on Nairobi Securities Exchange. Turnover rate is used as a proxy for the depth aspect of liquidity. The null hypothesis was the effect of depth aspect of market liquidity is not negatively significant to stock returns.

Table 4.7: Regression; Return & Turnover Rate

	Prob > F = 0.5877				
Returns	Coef.	Std. Err.	T	p> t	95% Conf.
Turnover rate	-0.0002	0.0004	-0.54	0.5880	-0.0009
Cons	0.0006	0.0002	3.28	0.0010	0.0002

(Source: Researcher, 2017)

As the above figure shows, turnover on its own is not significant at 5% level of significance as its p-value is 0.5877. This is more than 0.05 hence we fail to reject the null hypothesis that the effect of market depth is not negatively significant on stock returns. This can be interpreted as turnover rate does not affect returns hence market depth is insignificant to stock returns.

However, when a different measure of depth such as volume traded is used, the results changes as shown in table 4.10 below. Turnover is however considered a more adequate liquidity measure than volumes trading with the main reason being turnover makes possible a comparison between different stocks.

Table 4.8: Regression; Return & Volume

	Prob > F = 0.0000				
Returns	Coef.	Std. Err.	T	p> t	95% Conf.
Involume	0.0008	0.0001	7.09	0.0000	0.0006
Cons	-0.0077	0.0012	-6.64	0.0000	-0.0099

Source: Researcher 2017

As the above table shows, when we change the measure of depth to volume traded, depth becomes significant at 5% level of significance as its p-value is 0.000. This is less than 0.05 hence we reject the null hypothesis that the effect of market depth on stock returns is not

significant. This can be interpreted as volumes traded does affect returns hence market depth has an effect on stock returns.

4.5.2.3 Perception of Market Participants

The third objective of the study to investigate the market participants’ perception of liquidity on stock returns of companies listed on the Nairobi Securities Exchange. This was done through offering questionnaire to investment and portfolio managers in the 23 trading participants registered by the CMA. The null hypothesis was market participants do perceive market liquidity not to have an effect on stock returns.

The mode of responses was useful as it gave the most occurring response to each question. These findings were used to triangulate the inferential analysis.

Table 4.9: Summary on Managers’ Perception

	Mode	Mean	Std. Dev
Extent to which market Width affects stock returns	3 (52.74%)	2.64	0.94
Extent to which market Depth affects returns	3 (61.24%)	2.93	1.07
Extent to which market Liquidity affects returns	3 (58.26%)	3.24	0.55

(Source: Researcher, 2017)

On market width, the extent to which managers considered the market width had a mode of 3 showing 52.74% of market participants considered liquidity in their trading decisions to a moderate extent though it had a mean of 2.57. This shows that some market participants strongly considered it as not an important factor when trading. Under market depth the extent to which market participants perceived market depth as a factor to stock returns had a mode of 3 showing 61.24% of the market participants considered it to a moderate extent. On the other hand its mean was 2.85 showing that a few managers considered market depth to a slight extent.

On market liquidity in general, the extent to which managers considered market liquidity in their trading decisions had a mode of 3 and a mean above 3 showing that 58.26% of market participants considered it to a moderate extent. However when specifically asked the extent to which market participants perceived market liquidity affected stock returns the results had a mode of 2 and a mean of 2.28 as shown in appendix v. This can be interpreted as most market participants considered liquidity as a factor but not a significant predictor of stock returns. Although, it should be noted that these are descriptive and not inferential findings.

4.6 Correlation Analysis

The Pearson correlation coefficient “r” measures the nature and strength of the relationship between two variables. A value close to +1 indicates a strong positive relationship whereas a value close to 0 (zero) implies a weak relationship. A value close to -1 indicates a strong negative relationship (Piovani, 2008). The table 4.12 below shows the correlation coefficients among the two liquidity variables along with returns. The correlation was done to help triangulate the regression analysis findings however it is to be noted that correlation does not imply causality.

Table 4.10: Correlation Analysis

	Returns	Bid-Ask	Turnover
Returns	1.0000		
Bid-Ask	0.0264*	1.0000	
Turnover rate	-0.0021	0.0086*	1.0000

(Source: Researcher, 2017)

From the test of the relationship between the different aspects of liquidity and return, the average Pearson correlation on turnover to returns is -0.0021 while bid-ask spread is 0.0264. In addition, the liquidity measures are not highly correlated with each other with the Pearson correlation coefficient being 0.0086 which indicates that one liquidity measure cannot be a substituted with the other.

Bid ask spread has a positive correlation with returns which confirms the theoretical prediction of Brunnermeier and Pedersen (2009) that bid-ask spread is significantly positively correlated to stock return. On the other hand, turnover rate has a negative correlation with stock returns although not significant. This contradicts the theoretical prediction by Chordia, Subrahmanyam, and Anshuman (2011) that turnover rate is significantly negatively correlated to stock return. In general both aspects of liquidity confirm the theoretical prediction that market liquidity has a negative correlation with stock returns.

However, the correlation coefficients were all below 0.1 for the five years of the study which indicates a weak relationship exists between liquidity and return of stock. The correlation analysis supports the regression analysis findings that bid ask spread is significant to returns but the turnover rate is insignificant. The weak correlation supports the perception of market participants who perceived liquidity to affect stock returns to a moderate extent. This can be interpreted as liquidity has little impact on return of stock meaning that there are other factors that influence Return of stock at the NSE other than stock market liquidity.

CHAPTER FIVE: SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter gives a summary on the discussion on findings and the study's conclusion. It also discusses limitations in the study, recommendations and areas for further research.

5.2 Discussion

The objective of the study was to assess the effect of market liquidity on stock returns of companies listed on Nairobi Securities Exchange. Two aspects of liquidity which included market width and market depth were examined. For each dimension of liquidity, a different liquidity measure adopted in previous studies was employed. The bid-ask spread was used to measure the width aspect of liquidity while the turnover rate was used to measure the depth aspect of market liquidity. The study included both descriptive and inferential analysis. The sample consisting of 50 companies listed on the NSE over the five-year period from 2012 to 2016 provides panel data for inferential analysis while the questionnaire data analysis from the 23 trading participants registered by the CMA is used to triangulate the inferential data findings.

Below are discussions on the study's findings in comparison with empirical results in previous studies that adopted the same liquidity proxies: bid-ask spread for market width and turnover rate for market depth. Explanations are given where unpredicted results which contradict theoretical predictions are found.

5.2.1 General Findings

From the study's findings, the average return for the five year period was which is very low in comparison to the mean returns of the NSE in previous periods. Koech (2012) did a study on the NSE from the year 2007 to 2011 and found the average return for the five year period was 2.9% while Okanga (2014) on his study on NSE found a mean return of 1.51% for the period 2009 – 2013.

The decline in mean returns over the years can be explained by the bearish stock market in Kenya the last couple of years. The Nairobi Stock Exchange has been on a bear run since 2015, the pace of decline continued to gather steam in 2016. In a global arena, the skittishness in global financial markets triggered by multiple factors over 2015 and 2016 like worries about rebalancing in China's economy as well Britain's vote to exit from the European Union may have accounted for the dip in the market. Further, on the domestic front the enactment of the Banking Act amendment has really affected stocks returns especially in the banking industry. Government keenness on strengthening the Primary and Secondary markets for Government Securities has also attracted most investors to shift from the stocks markets. (World Bank, 2017)

5.2.2 Market Width

The first objective was to access the effect of the width dimension of liquidity on stock returns. The specific null hypothesis was width dimension of liquidity does not affect stock returns. From the study findings, a positive relationship between the bid-ask spread and stock returns is identified in this study. This finding was further triangulated by trading participants perception based on the questionnaire survey administered to them. 58.74 % of the trading participants agreed that high bid ask spreads sometimes led to losses hence they considered it in their trading decisions which was interpreted as market width had an effect on stock returns to a moderate extent

The findings for bid-ask spread is in line with the hypothesis of this study as per the theoretical predictions by Amihud and Mendelson (1986) under the trading cost theory as well as the predictions existing in most of the literature that bid-ask spread is positively affects stock returns. Theoretically, the higher the bid ask spread the lower the liquidity in the market hence investors require more return for the liquidity risk (Amihud & Mendelson 1986).

The findings are also in line with past studies. Eleswarapu and Reinganum (2003) used the bid – ask spread as their measure for liquidity to investigate the behavior of liquidity premium in asset pricing found that bid ask spread was positively significant to returns. Similarly, Baker and Stein (2004) in their study on the NYSE found that a high bid ask spread led to high returns for investors. Akram (2014) who in his study on the Tehran stock exchange also found a positive

relationship between the bid ask spread and stock returns. Brennan and Subrahmanyam (2006) and Brennan, Chordia, Subrahmanyam and Tong (2012) who in their studies used the bid-ask spread as their liquidity proxy also found that the bid-ask spread was significantly positive to stock returns.

On the contrary, the above findings were contradicted Fang et al. (2009) in their study on market liquidity and firm performance argued that an increase in the spread had a negative effect on the performance of a firm. Similarly Salehi, Talebnia and Ghorbani (2011) also found that market width was negatively significant to stock returns. A decrease in the bid ask spread resulted to an increase in stock returns.

5.2.3 Market Depth

The second objective of the study was to determine the effect of depth aspect of liquidity on stock returns on companies listed on NSE. The specific null hypothesis was depth aspect of liquidity does not affect stock returns. The inferential findings from the study indicated that market depth as measured by turnover rate was insignificant. This finding was not in line with trading participants perception based on the questionnaire survey administered to them. 61.24 % of the trading participants agreed that market depth sometimes led to losses hence they considered it in their trading decisions which was interpreted as market depth had an effect on stock returns to a moderate extent

These findings are contradictory with the hypothesis of this study as per the theoretical predictions by Easley and O'Hara (1987) under the trading quantity theory as well as the predictions existing in most of the literature that turnover rate is negatively significant to stock returns. Theoretically, the lower the turnover rate the lower the liquidity in the market hence investors require more return for the liquidity risk (Easley and O'Hara 1987).

The findings are also contradictory with most previous studies done especially in the developed markets. Using turnover rate as the liquidity proxy on their study to investigate the commonality in the determinants of expected stock returns, Haugen and Baker (2006) found that turnover rate was significant to returns. Similarly, Chordia, Subrahmanyam, and Anshuman (2011) on their

study done on the S&P500 market index found that turnover rate was negatively significant to stock returns. Chan and Faff (2005) in their study on the Australian market also concurred with the theoretical predictions.

The contradiction in the findings can be explained through the difference in market structures in the developed markets and the Kenyan market. Developed markets like US, Canada, Japan have capital markets that are highly developed with high levels of liquidity, more efficient, large market capitalizations, per capita income that is high and meaningful regulatory body as compared to the Kenyan market which is way smaller in size, transactions and per capita income.

In addition, according to Brown, Crocker and Forester (2009), relative liquid markets that is larger markets with large stocks like NYSE can generate momentum from trading of large quantity of stocks which result to changes in price as compared to smaller markets. Moreover, Dichev, Huang and Zhou (2011) state that market efficiency affects the relationship between turnover rate and stock returns as investors in efficient markets sometimes look at the turnover rate as a way of confirming public information hence might lead to price changes unlike in less efficient markets.

Although the findings from this study are contradictory to existing theory and prior studies, they are supported by previous studies done in the Kenyan context. Ayako (2005) sought to analyze the effect of trading activity in regards to whether it affects futures prices and found that trading activity as measured by turnover rate was insignificant to returns. Similarly, Koech (2012) did studies on liquidity on the NSE using turnover rates as his proxy and concluded that turnover rate was not significant to returns.

However, when trading volume; a different measure of depth was used, the results changed and market depth became significant. Turnover is however considered a more adequate measure of liquidity than trading volume since it makes possible a comparison between different stocks (Lesmond 2005).

Findings from trading volume were in line with theoretical predictions. Theoretically, volume traded is a predictor of stock returns. A decrease in volumes traded is a sign of low market

liquidity which in turn should lead to increased returns due to the increase in liquidity risk. The above findings were also in line with the previous studies. Brown, Crocker and forester (2009) in their study found that relative liquid stocks results to a significant relationship between trading volume and stock returns.

5.3 Conclusion

This study examines the casual relationship between stock returns and market liquidity in the Kenyan market. Daily data for 50 listed companies on the NSE over the period from January 2012 to December 2016 was used. This study empirically assesses the importance of the width and depth dimension of liquidity on stock returns. The different liquidity proxies examined in this paper include width aspect based liquidity proxy (bid-ask spread) and the depth based proxy (turnover ratio). For the estimation, the study used panel data tests based on the holding period yield model.

In general, the study aimed at analyzing whether liquidity has an impact on stock returns on the NSE. The inferential findings suggest that liquidity does have an impact on stock returns. These findings were further triangulated by the descriptive data analysis on the questionnaire data analysis where most trading participants agreed that liquidity affected stock returns to a moderate extent. These findings have meaningful significance for portfolio managers. The model suggests a negative causal relationship between liquidity and stock returns. However the outcomes are not consistent with the two liquidity proxies as turnover was found to be insignificant.

This finding has raised a number of issues that could be addressed in future research as it contradicts previous researches carried out that found turnover rate to be significant to stock returns. The model as a whole is also contradictory to previous studies done in most emerging markets who found a positive relationship between liquidity and stock returns. Some studies also done in developed markets like Archarya and Pedersen (2005) also showed a strong positive relationship between market liquidity and stock returns. This study also contradicts some of the past studies done on the Kenyan market. Koech (2012), Ayako (2005) and Odongo (2008) found liquidity was not significant while Okanga (2014) found a positive relationship between liquidity and stock returns. Reasons for the contradiction may vary and can be associated to the different

levels of effectiveness of each liquidity measure, methodology used in analyzing the data and the level of efficiency in the market. The period of analysis may also be a source of difference in findings.

5.4 Recommendations

5.4.1 Fund and Investment managers

This study recommends that fund and investment managers take into consideration the findings in this study as a starting point to further understand liquidity as a factor that influences return of firms. But as concluded in this study, liquidity does not explain major variations in returns of firms listed at the NSE hence managers should take into consideration liquidity as well as other factors that might influence return of firms to a greater extent when undertaking key financial decisions that might affect firm Return.

5.4.2 Policy Makers

Due to the significant relationship that exists between stock returns and market liquidity on the NSE the study recommends and prompts policy makers to implement policies that will enhance market liquidity and promote growth.

5.5 Limitations of the study

The study only concentrated on quoted firms in the NSE and only analyzed data from 50 out of the 64 listed firms (78%) with the rest of the stocks not meeting the criteria of selection. In some sectors, information on the liquidity was missing from the NSE handbook resulting in some sectors not giving a complete analysis. In addition, some respondents were unwilling to fill the questionnaires with only 26 out of 46 questionnaire distributed to the trading participants (56.52%) were filled and returned. The study was also constrained to only two measures of liquidity and as from findings from prior studies, goodness of measures may affect research findings.

5.6 Suggestion for further research

The contradictory findings in this study offer basis of further research. Since turnover is not significant to liquidity and as in many prior studies, the findings are specific to proxies

used, and analysis periods; more research in this area of study can be done to examine different periods with more liquidity measures. Further, the study generalized findings from the market finding as a whole and it raises the question of whether these findings can hold for each segment of the market and therefore a study can be to specifically examine the nature of the relationship in each segment.

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APPENDICES

Appendix 1: Questionnaire

This questionnaire is used to collect data for purely academic purposes. All information will be strictly confidential. (Kindly check the box next to the appropriate response)

Not at all =1, to a slight extent = 2, to a moderate extent = 3, to a greater extent = 4, to an extreme extent =5.

Never = 1, Rarely = 2, Sometimes = 3, Often = 4, Always = 5.

Section 1: Liquidity

1. To what extent do you consider liquidity (the ease of buying and selling securities in a market) as a factor that affects stock returns when trading stocks in the Nairobi Securities Exchange?

- | | |
|---|---|
| <input type="checkbox"/> Not at all | <input type="checkbox"/> To a Slight extent |
| <input type="checkbox"/> To a moderate extent | <input type="checkbox"/> To a great extent |
| <input type="checkbox"/> To an extreme extent | |

2. How frequent has low market liquidity contributed to the fall in expected stock returns?

- | | | | | |
|--------------------------------|---------------------------------|------------------------------------|--------------------------------|---------------------------------|
| <input type="checkbox"/> Never | <input type="checkbox"/> Rarely | <input type="checkbox"/> Sometimes | <input type="checkbox"/> Often | <input type="checkbox"/> Always |
|--------------------------------|---------------------------------|------------------------------------|--------------------------------|---------------------------------|

3. To what extent do you think market liquidity affects stock returns?

- | | |
|---|---|
| <input type="checkbox"/> Not at all | <input type="checkbox"/> To a Slight extent |
| <input type="checkbox"/> To a moderate extent | <input type="checkbox"/> To a great extent |
| <input type="checkbox"/> To an extreme extent | |

4. To what extent do you think that the Nairobi Securities Exchange has adequate market liquidity?

- | | |
|-------------------------------------|---|
| <input type="checkbox"/> Not at all | <input type="checkbox"/> To a Slight extent |
|-------------------------------------|---|

- To a moderate extent
- To an extreme extent

To a great extent

Section 2; Depth Aspect of Liquidity

1. To what extent does the Depth aspect of liquidity (Turnover rate of stocks) affect your decisions when trading stocks in the Nairobi Securities Exchange?

- Not at all
- To a moderate extent
- To an extreme extent
- To a Slight extent
- To a great extent

2. How frequent has inadequate market depth (low turnover rate) in the market contributed to the fall in asset prices of stocks you were holding (Incurred a loss since there was no ease of trading the stock)?

- Never
- Rarely
- Sometimes
- Often
- Always

Section 3: Width Aspect of Liquidity

1. To what extent does the width aspect of liquidity (Bid ask spread) affect your decisions when trading stocks in the Nairobi Securities Exchange?

- Not at all
- To a Slight extent
- To a moderate extent
- To a great extent
- To an extreme extent

2. How frequent has large market width (large bid/asks spreads) in the market contributed to the fall in asset prices of stocks you were holding (Incurred a loss since there was no ease of trading the stock)?

- Never
- Rarely
- Sometimes
- Often
- Always

Thank you for taking the time to fill out this questionnaire. Your input is greatly appreciated.

Appendix II: Listed Companies at the Nairobi Securities Exchange

AGRICULTURAL	AUTOMOBILES AND ACCESSORIES
Eaagads Ltd	Car and General (K)
Kapchorua Tea Co.	Sameer Africa Ltd
Kakuzi	Marshalls (E.A.)
Limuru Tea Co. Ltd	COMMERCIAL AND SERVICES
Rea Vipingo Plantations	Express Ltd
Sasini Ltd	Kenya Airways Ltd
Williamson Tea Kenya	Nation Media Group
BANKING	Standard Group Ltd
Barclays Bank Ltd	TPS Eastern Africa (Serena)
CFC Stanbic Holdings Ltd	Scangroup Ltd
I&M Holdings Ltd	Uchumi Supermarket
Diamond Trust Bank Kenya Ltd	Hutchings Biemer Ltd
HF Group Ltd	Longhorn Publishers
KCB Group Ltd	Atlas Development and Support Services
National Bank of Kenya	Deacons (East Africa)
NIC Bank Ltd	Nairobi Business Ventures Ltd
Standard Chartered Bank	ENERGY AND PETROLEUM
Equity Group Holdings	KenolKobil Ltd
The Co-operative Bank of Kenya	Total Kenya Ltd
CONSTRUCTION AND ALLIED	Kengen Ltd
Athi River Mining	Kenya Power & Lighting Co Ltd
Bamburi Cement Ltd	Umeme Ltd
Crown Berger Ltd	INVESTMENT
E.A.Cables Ltd	Centum Investment Co Ltd
E.A.Portland Cement Ltd	Trans-Century Ltd
MANUFACTURING AND ALLIED	Home Afrika Ltd

B.O.C Kenya Ltd	Kurwitu Ventures
British American Tobacco Kenya	Olympia Capital
Carbacid Investments Ltd	TELECOMMUNICATION AND TECHNOLOGY
East African Breweries Ltd	Safaricom Ltd
Mumias Sugar Co. Ltd	Real Estate Investment Trusts
Unga Group Ltd	Stanlib Fahari I-REIT
Eveready East Africa Ltd	INSURANCE
Kenya Orchards Ltd	Jubilee Holdings Ltd
A.Baumann CO Ltd	Pan Africa Insurance Holdings Ltd
Flame Tree Group Holdings Ltd	Kenya Re-Insurance Corporation Ltd
INVESTMENT SERVICES	Liberty Kenya Holdings Ltd
Nairobi Securities Exchange Ltd	Britam Holdings Ltd
	CIC Insurance Group Ltd

(Source: NSE, 2017)

Appendix III: Companies excluded from the sample

Name of Company
Access Kenya
Atlas Development
CFC Insurance Holdings
City Trust
Deacons (East Africa)
Flame Tree
Home Africa
I&M Holdings
Kurwitu
Nairobi Business Ventures
Nairobi Securities Exchange
Rea Vipingo
Stanlib Fahari Reit
Umeme

(Source: NSE, 2017)

Appendix IV: List of Authorized Trading Participants

	Name of Trading Participant
1	Dyer & Blair Investment Bank Ltd
2	Francis Drummond & Company Limited
3	Ngenye Kariuki & Co. Ltd. (Under Statutory Management)
4	Suntra Investment Bank Ltd
5	Old Mutual Securities Ltd
6	SBG Securities Ltd
7	Kingdom Securities Ltd
8	AIB Capital Ltd
9	ABC Capital Ltd
10	Sterling Capital Ltd
11	Apex Africa Capital Ltd
12	Faida Investment Bank Ltd
13	NIC Securities Limited
14	Standard Investment Bank Ltd
15	Kestrel Capital (EA) Limited
16	African Alliance Securities
17	Renaissance Capital (Kenya) Ltd
18	Genghis Capital Ltd
19	CBA Capital Limited
20	Equity Investment Bank Limited
21	KCB Capital
22	Barclays Financial Services Limited
23	Securities Africa Kenya Limited

(Source: CMA, 2017)

Appendix V: Questionnaire Findings

Statement	Mode	Mean	Std Dev
Market Depth			
To what extent does the Depth affect your			
a) trading decisions	3	2.85	1.11
How frequent has low market depth contributed			
b) to the fall in expected stock returns	3	3	0.77
Market Width			
To what extent does the cost tightness affect your			
a) trading decisions	3	2.57	1.05
How frequent has high cost tightness in the market contributed to the fall in expected stock			
b) returns	3	2.71	1.09
Market Liquidity in general			
To what extent does the market liquidity affect			
a) your trading decisions	3	3.48	1.03
How frequent has low market liquidity			
b) contributed to the fall in expected stock returns	3	3	0.43
To what extent do you think market liquidity			
c) affects stock returns	2	2.28	1.14
To what extent do you think that the NSE has			
d) adequate market liquidity	3	3	0

(Source: Researcher, 2017)