Liquidity in the Emerging Markets: The Case of Nairobi Stock Exchange Equities Market

By

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Declaration

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

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Signature ..... Date 12/11/2007

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

Supervisor: Lisiolo Lishenga

Signature ..... Date 12/11/07

Dedication

This research thesis is dedicated to my parents for their sacrifice and undying encouragement and unflinching belief in attaining higher education.

I wish to challenge my siblings to value and pursue higher education.

Acknowledgement

I feel indebted to all those individuals without whom this research project would never have seen the light of the day.

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Finally, to all those who in one way or another, contributed towards my academic and social life as an MBA student, either directly or indirectly, I will forever remain grateful to you all.

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Abstract

The general objective of this study was to assess the changes in liquidity at the NSE during the period between January 2000 and December 2005. The specific objectives were; (i) to determine the liquidity status of the NSE during the years between January 2000 and December 2005, and (ii) to determine whether there was any significant change in liquidity over the period. The null hypothesis of the study was that there had been no significant change in liquidity at the NSE during the period between January 2000 and December 2005.

In order to avoid the pitfalls of one measure of liquidity, it was preferred, in this study, to use three models to study the liquidity of the NSE. The three liquidity measures identified for use in this study were (i) Liquidity Ratio 1 (ii) Liquidity Ratio 2 and (iii) the Flow Ratio. The use of these three measures allowed the study to combine the one-dimension volume-related measures of liquidity with those of one-dimension time-related measures. Analysis of variance (ANOVA) was then carried out to determine whether there was significant change in the liquidity measures over the years selected.

The null hypothesis was rejected for two of the liquidity measures, which were Liquidity Ratio 2 and the Flow Rate. This implied that there has been significant change in liquidity as proxied by both Liquidity Ratio 2 and Flow Rate. Further research is recommended on significant occurrences which might have significant impact on the liquidity of the market. This refers to aspects such as the impact on liquidity of Initial Public Offers (IPO); such as Kengen, Eveready, Access Kenya and Kenya Re, as well as the effect of share splits on the liquidity of the NSE such as those of East African Cables, East African Breweries and the Kenya Commercial Bank.

INTRODUCTION

1.1 Background

The importance of stock markets in the economic growth of any country has been well documented. Capital markets are mechanisms for raising and trading long-term capital and thus represent the long end of the maturity spectrum of financial instruments (Mensah, 2003). Profitable investment require a long-term commitment to capital, which investors are unwilling to commit unless there are mechanisms that allow holders of long-term investments, such as bonds and shares, to sell quickly and cheaply if they need access to their savings or want to rearrange their portfolio. In this process, listed companies enjoy permanent access to capital raised through equity issues. By facilitating profitable investments by companies, liquid markets improve the allocation of capital and enhance prospects for economic growth.

Liquidity

Liquidity is a fundamental concept in finance (Chordia et al., 2003). There is, however, lack of consensus as to what liquidity really means, and, how it should be measured, reported, understood or predicted for a meaningful comparison. There are two general broad concepts of liquidity. The first is monetary liquidity, which is characterised by the availability of cash or near cash in relation to the general demand of goods and financial assets. The trends of monetary liquidity are generally associated with the general state of the economy, economic cycles and consumer confidence. They are usually reflected in the short-term interest rates. The other concept of liquidity is related to the way the transfer of cash and goods or financial securities is performed in the market in relation to trading, price, return, volatility, market depth and the interdependencies between these factors (Ivanchuk, 2004). The focus of this study is on the second concept of liquidity.

A financial asset is perceived as liquid if market participants can quickly sell large amounts of the asset without affecting its price. Liquid financial assets are characterized

by having small transaction costs, easy trading and timely settlement and large trades having only limited impact on market price. Kyle (1985) as reported by Ngugi (2003) describes market liquidity as a slippery and elusive concept especially because it encompasses a number of transactional properties including tightness, depth and resiliency. Glen (1994) defined liquidity narrowly as the ability to buy and sell a particular security with minimal market impact. Amihud and others (1990) observe that illiquidity reflects on the difficulties of converting cash into assets and assets into cash, or the cost of trading assets in the market. Liquidity is also defined broadly as the willingness of stock market participants to engage in trades. Pastor and Robert (2001) defined liquidity as the ability to buy and sell large quantities of an asset quickly and at low cost.

Amihud and Mendelson (1986) argue that liquidity is what markets are all about. Their function is to facilitate the transfer of goods and assets between buyers and sellers, reducing the friction and costs involved in such transactions. Stock market liquidity impacts on the cost of raising capital as it has been found that there exists a relationship between market liquidity and the floatation costs (Butler et al., 2005). When firms access the equities markets, the liquidity of stocks affects the transaction costs.

Despite the importance of liquidity, its considerations in investment have not received anything like the attention paid to risk in the finance literature (Amihud & Mendelson, 1986). Further, few studies have attempted to address the liquidity of emerging markets (Lesmond, 2002). There is paucity of literature concerning the emerging markets of Sub-Saharan Africa as observed by Piesse and Hearn (2006).

Markets in Sub-Sahara Africa, and to a great extent all the emerging markets, have been reported to be illiquid. Several scholars have found these markets to be illiquid. For example, Irving (2005) noted that low liquidity level was a characteristic shared by most African exchanges. Kibuthu (2005) observed that many of the Africa's stock exchanges were small, underdeveloped and illiquid. Low liquidity level has also been noted as one of the impediments to the development of well functioning exchanges within the region.

Piesse and Hearn (2006) observed that, other than the Johannesburg Stock Exchange, Africa's stock markets were small, illiquid and had small number of listing and lacked sophisticated infrastructure and range of tradable instruments. According to the United Nations Development Programme's (UNDP's) Africa Stock Markets Handbook (2003), African markets are typically characterised by relatively small capitalization and liquidity levels.

Emerging markets are characterised by volatile, but substantial returns that can easily exceed 75 percent per annum (Lesmond, 2002). Balancing these lofty returns are liquidity concerns of trading in emerging markets. According to Lesmond (2002), these returns, while substantial, are subject to increased risk and volatility and are significantly reduced by increased illiquidity of trading stocks in emerging markets relative to more developed markets.

Mensah (2003) posits that the key to capturing the economic growth impact of stock markets is thorough the enhancement of liquidity. Levine and Zervos (1998) observed that stock market liquidity, as measured by both the value of stock trading relative to the size of the market and by the value of trading relative to the size of the economy, to be positively and significantly correlated with current and future rates of economic growth, capital accumulation and productivity growth. That is, there exist strong positive connections between the stock market liquidity and faster rates of growth, productivity improvements and capital accumulation.

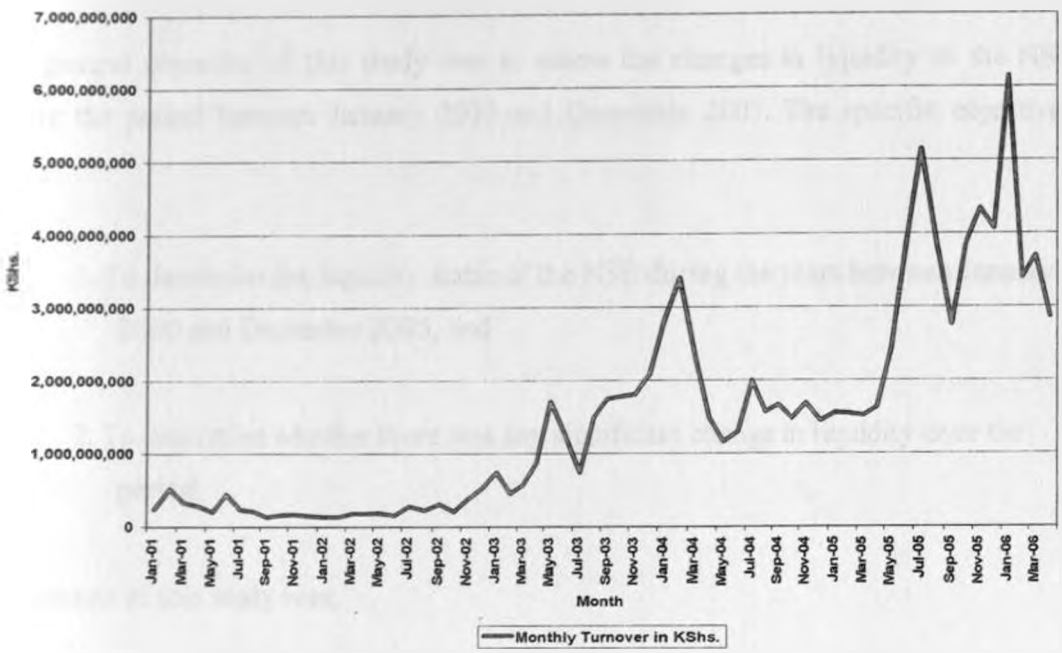
There are sound economic reasons for expanding capital markets in Africa. Consensus does exist to the effect that stock market development is critical prior to economic growth (Hearn & Piesse, 2006). However, the economic benefits of capital markets in Africa can not be fully captured unless the markets are sufficiently liquid. Such liquidity requires, among other factors, a critical mass of listed securities, an investor base and trading system that supports speedy execution and efficient price discovery (Mensah, 2003).

1.2 Research Problem

The liquidity of the Nairobi Stock Exchange (NSE) has not been given due attention by scholars. Only two studies were noted to have looked at the liquidity of the NSE. Ngugi (2003) analysed the response of trading activities and liquidity of the NSE to the implemented institutional and policy reforms during the period between January 1990 and June 2002. Ndung'u (2003) on the other hand set to find out the determinants of liquidity in the NSE during the period between January 1995 and December 2002. Ndung'u (2003) concluded that the NSE was illiquid and exhibited a very small turnover ratio. Though, Ngugi (2003) looked at the liquidity of the market from the microstructure perspective, she noted that the concentration of shares among a few shareholders in one firm and across the market made the market illiquid.

The two studies, however, coincided with a period of relative poor macroeconomic conditions. A review of some of the more obvious parameters of the NSE, such as the monthly turnover, the index, and market capitalization shows that the period since January 2003 has been significantly different to the period between January 2001 and December 2002. There have been significant positive changes in most of the above parameters. For example, the level of turnover, that is, the shilling value of the shares traded, has moved from an average of KShs. 250 million per month in 2001 to an average of KShs. 2 billion per month for the period between January 2003 and April 2006 (see figure 1 on page 5). Changes instituted by the NSE management such as the setting up of the central depository system may have contributed to this, besides several other factors such as the increased public awareness on the benefits of investing in the NSE, the significant reforms instituted in the retirement benefit schemes sector and the growth of the mutual funds as well as the political changes seen in the country. On the other hand, irrational exuberance could be fuelling the prices rise seen in the NSE, with inexperienced investors expecting double-digit returns to continue indefinitely or at least long enough to reap substantial gains.

Figure 1 NSE Monthly Turnover Movement



Source: www.nse.co.ke

The question that now comes to mind is; has the liquidity of the NSE improved? The reason why it is important for us to ask ourselves this question is because growth in the market size does not necessarily imply growth in liquidity. Levine and Zervos (1998), observes that a large stock market is not necessarily a liquid market. A large but inactive market will have large capitalization but small turnover and hence low liquidity. Persuad (2002) on the other hand observes that, the assumption that the bigger a market is, the more liquid it is bound to be, is so prevalent that turnover and liquidity are often seen as synonymous. The two are actually indirectly related. The market may be big in terms of the numbers of players and the amount of stocks and cash being managed and even in turnover but it may be less liquid in terms of the price impact of trading. Markets can be big and yet thin. According to Persuad (2002) liquidity requires diversity. In this regard the NSE could be growing bigger yet thinner.

1.3 Objectives of the Study

The general objective of this study was to assess the changes in liquidity at the NSE during the period between January 2000 and December 2005. The specific objectives were;

1. To determine the liquidity status of the NSE during the years between January 2000 and December 2005, and

2. To determine whether there was any significant change in liquidity over the period.

Hypothesis of this study was;

H_0: There was no significant change in liquidity at the NSE during the period between January 2000 and December 2005.

H_1: There was significant change in liquidity at the NSE during the period between January 2000 and December 2005.

1.4 Importance of the Study

The results of this study will be important to;

- The government, which is in the process of divesting from some of the listed companies in which it owns shares, such as Mumias Sugar Company and National Bank of Kenya, and other parastatals and companies which are yet to be listed such as Safaricom Limited and Telkom Kenya. Empirical evidence shows that the liquidity of the stock market affects the transactional costs of share issue (Butler et al., 2005).

- The investors, as knowledge on the level of liquidity of the market will help in determining the ease of acquiring and disposing investment.
- The shareholders of NSE, by helping them to understand the liquidity situation of the NSE and thus identify ways in which improvements could be achieved.
- The listed companies, since market liquidity affects individual stock prices. And,
- Scholars, by stimulating interest and enhancing the literature on liquidity of the emerging markets especially those in Sub-Saharan Africa.

LITERATURE REVIEW

2.1 Stock Market Liquidity

Liquidity is the lifeblood of financial markets (Von Wyss, 2004). Its adequate provision is critical for the smooth operation of an economy. Its sudden erosion in even a single market segment or in an individual instrument can stimulate disruptions that are transmitted thorough increasingly interdependent and interconnected financial markets worldwide. The viability of a market, therefore, depends on the ability of the trading mechanism to provide market liquidity. When markets are liquid, financial assets are more attractive because investors can transact in them more easily (Mensah, 2003).

According to Agarwal (2003), stock market liquidity plays a key role in economic growth. Although many profitable investments require long run commitment to capital, savers prefer not to relinquish control of their savings for long periods. Liquid equity markets ease this tension by providing assets to savers that are easily liquidated at any time, while simultaneously allowing firms permanent access to capital raised through equity issues.

Burtler et al (2005) argue that liquidity of the market is an important consideration of any company planning to list its shares in a stock market. This is because liquidity of the market affects the transaction costs associated with floating new equity. The more liquid the market is, the easier it is for the investment banks to place the new issue and reduce the intermediation costs, that is, it should be easier to place an equity issue in a liquid market than to place it in an illiquid market. The cost of raising capital is large and investment banking fees often represent the lion's share of the total floatation cost of a new issue (Butler et al., 2005).

Amihud and Mendelson (1987) posit that liquidity is what markets are all about. They argue that the function of a market is to facilitate the transfer of goods and assets between buyers and sellers thus reducing the friction and costs involved in such transactions. They

further argue that the greater the direct costs of searching for compatible trading partner and the greater the variety of items exchanged, the greater the need for a market to facilitate trading, that is, to provide liquidity. Providing the shareholders with a market mechanism to realize the true value of their shareholding was given to be the primary reason why Equity Bank Limited sought to the listed on the NSE (Equity Bank Ltd, 2006).

2.2 Properties of Liquidity

Despite its importance, problems in measuring and monitoring liquidity risk persist. Liquidity is not easily defined and no common definition of liquidity exists. Usually, simple definitions in one sentence like "liquidity in a financial market is the ability to absorb smoothly the flow of buying and selling orders - ..."as in Shen & Starr (2002), are not able to capture the phenomenon "liquidity", because liquidity is not a one-dimensional variable but includes several dimensions (Von Wyss, 2004). The concept of liquidity is multidimensional.

Earlier literature on liquidity focused almost uniquely on the spread. Lee, Mucklow & Ready (1993) stresses the necessity to include the quantity dimension of depth to the price dimension of the spread. Usually the following four aspects or dimensions are distinguished (Von Wyss, 2004):

Trading Time:

This is the ability to execute a transaction immediately at the prevailing price. The waiting time between subsequent trades or the inverse, that is, the number of trades per time unit, are measures for trading time. Mensah (2003) refers to this as immediacy. That is, the speed with which orders can be executed and thus reflects among other things the efficiency of the trading clearing and settlement system.

Moser (2001) notes that a broker bringing a large order to the floor of the market best serves client's interests when the order is executed at an average price no less favorable than the market price when the order was given. Simultaneous arrival of identically sized and offsetting orders – a buy for every sell – is unlikely. A more likely scenario would be that the requisite order matches are dispersed amongst several brokers. "Working the order" may be time consuming and this time denotes the immediacy dimension of market liquidity.

Tightness:

This is the ability to buy and to sell an asset at about the same price at the same time (Von Wyss, 2004). Thomas (2004) refers to tightness as the difference between the buy and sell prices. The Committee on Global Financial System (CGFS) (2001) on the other hand defines tightness as the market's ability to match supply and demand at low cost. Tightness shows in the clearest way the cost associated with transacting or the cost of immediacy. Measures for tightness are the different versions of the spread where spread refers to the difference between the bid and the ask prices (CGFS, 2001).

According to Levine and Zervos (1986), the bid-ask spread is the difference between the bid and ask (offer) prices quoted by a dealer who makes a market in a stock and bridges the time gaps between asynchronous public buy and sell orders. The ask price quoted for a security includes a premium for immediate buying, and the bid price reflects a price concession for immediate sale. The bid-ask spread may thus be viewed as the price the dealer or the market maker demands for providing liquidity services and immediacy of execution. The bid-ask spread as a percentage of the stock price normally exhibits a strong negative correlation with stock attributes that reflect liquidity. That is, the larger the spread, the lower the liquidity (Amihud and Mendelson, 1986).

Depth:

Depth refers to the ability to buy or to sell a certain amount of an asset without influence on the quoted price. CGFS (2001) defines depth as the ability of the market to absorb large trade flows without a significant impact on prices. Thomas (2002) defines depth as the size of a transaction that can be done without affecting the price. Chollete et al (2006) refers to depth as the number of shares that can be traded at a given cost. A sign of illiquidity is an adverse market impact for the investor when trading. Market depth can be measured, aside from the depth itself, by the order ratio, the trading volume or the flow ratio.

Resiliency:

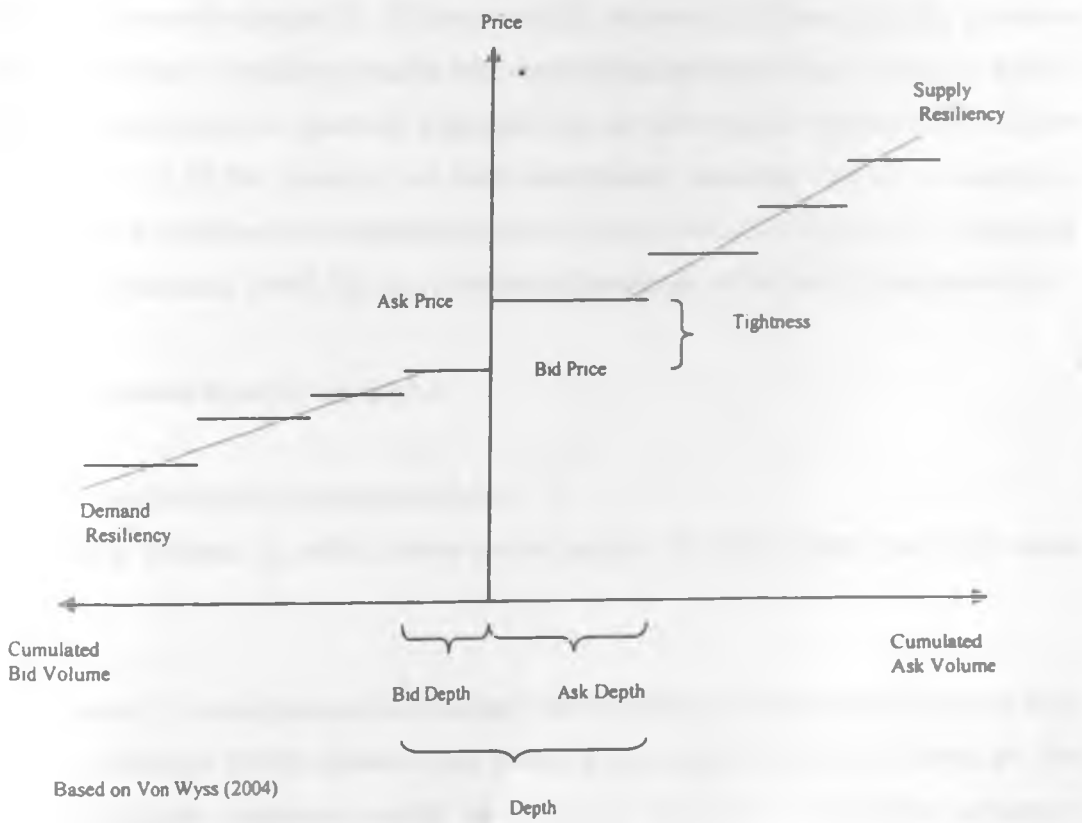
Refers to the ability to buy or to sell a certain amount of an asset with little influence on the quoted price. While the aspect of market depth regards only the volume at the best bid and ask prices, the resiliency dimension takes the elasticity of supply and demand into account (Von Wyss, 2004). This aspect of liquidity can be described by the intraday returns, the variance ratio or the liquidity ratio. Resiliency is a characteristic of the market in which new orders flow quickly to correct order imbalances which tend to move prices away form what is warranted by fundamentals.

Muranga (2001) observed that resiliency is shown by the speed of from the price level which has been brought about by random price changes. Thus convergence speed of bid-ask spread could be interpreted as resilience of the market.

Persaud (2001) identify another dimension which he refers to as diversity. He argues that diversity is another component of market liquidity. This is simply the degree of diversity among market participants in their views and desired trades. Persaud (2001) argues that lack of diversity can lead to liquidity black holes. These are conditions where liquidity dries up and a decline in price brings out more sellers, further exasperating the price move. This is the exact opposite of what would be expected in a regularly functioning

market where a price decline could bring out bargain hunters. Liquidity black holes will often lead to stock market crash.

Figure 2: Different aspects of liquidity



In the above figure, the horizontal axis depicts the bid and the ask volumes on the left and the right sides respectively. These volumes may be different and the sum of the two is a measure of the market depth. On the vertical axis the price is shown. There exist two different prices, that is, (i) the ask price, at which shares are offered, and (ii) the bid price, at which share are demanded. The price of a trade may lie at the bid or at the ask price. Under certain circumstances, it may also lie inside the quote. The difference between the

bid price and the ask price is the measure of tightness. The horizontal dimension is the depth. Elasticities of the supply and demand curve capture the resiliency dimension.

2.3 Liquidity Measures

Liquidity is under-researched because it is hard to measure the price impact of trading without detailed information on who sold what, when and at which price (Persud, 2002). As liquidity is not directly measurable by itself, it is proxied by other measures (Ivanchuk, 2004). Von Wyss (2004) observes that liquidity itself is not observable and therefore has to be proxied by different liquidity measures. Different liquidity measures may even lead to conflicting results when evaluating the liquidity of a financial market. Liquidity measures are generally separated into one-dimensional measures that capture only one side of the liquidity and multi-dimensional measures that try to aggregate difference dimensions, find interdependence between them and construct one aggregate measure (Ivanchuk, 2004). The one dimensional measures can be broadly separated into;

Volume-related liquidity measures

Volume-related liquidity measures include;

1. Trading volume, Q_t, which refers to the number of shares traded per given time interval.

2. Turnover, V_t, which refers to the shilling value of the shares traded within a given time interval. Muranga (2001) observes that turnover and number of shares traded are the simplest liquidity indicators widely used all over the world. These two indicators (turnover and trading volume) suffer from the shortcoming that they neither reflect the state of effective supply and demand nor trade orders which were not executed despite having been explicitly placed in the market. Despite the shortcoming, however, turnover, is still widely used. Hu (1997) used turnover as a measure of liquidity and found out that stocks with higher turnover, hence more liquid, tended to have lower expected return. Hu

(1997) further posits that the choice of turnover instead of other measures, such as spread, is mainly because volume data is more accessible.

3. Depth, D_t refers to the sum of the bid and ask volume in time t. Market depth in time t is therefore given by;

$$D_t = q_t^A + q_t^B \qquad 1.1$$

Where;

q_t^A = ask volume in time t, and

q_t^B = bid volume in time t.

Huberman and Halka (2001) refers to depth as defined above in equation 1.1 as 'quantity depth' whereas Brockman and Chung (2000) refers to the same as 'volume depth.

Time-related liquidity measures

Time-related liquidity measures include;

1. Number of transactions per unit time (N_t). Like trading volume and turn over, number of transactions is also widely used as a measure of liquidity (Von Wyss, 2004). The inverse of this measure may be referred to as the waiting time between trades. The number of transactions and waiting time show the difference of trading taking place in a few large trades or in huge number of small trades. The limitation of the number of transactions and waiting time as measures of liquidity is that, the two are unable to compare liquidity of stocks whose prices differ significantly from each other.

2. Number of orders per unit time (No_t). This measure is similar to the number of transactions but also seeks to take into account the orders which may not have been met.

Spread-related liquidity measures

Spread-related liquid measures include;

1. Absolute spread (S_{abst}). The absolute spread is the difference between the lowest ask price p_t^A and the highest bid price p_t^B . It may be expressed as;

$$S_{abst} = p_t^A - p_t^B \qquad 1.2$$

Chordia, Roll & Subrahmanyan (2001) use this measure in their study of the New York Stock Exchange (NYSE). Eckbo and Norli (2002) used this measure in their study on pervasive liquidity risk. While the bid-ask spread is widely used as a measure of liquidity, it also has shortcomings. Brennan and Subrahmanyan (1995) argue that the bid-ask spread is a noisy measure of liquidity because large trades tend to occur outside the spread while small trades tend to occur inside.

2. Log absolute spread (Log S_{abst}). The absolute spread may be logarithmized to improve its distributional properties. It is used in Hamao and Hasbrouck (1995) because its distribution is closer to a normal distribution than the absolute spread and, therefore, mathematically easier to use. It is expressed as shown below;

$$\text{Log } S_{abst} = \ln(S_{abst}) = \ln(p_t^A - p_t^B) \qquad 1.3$$

Multi-dimensional liquidity measures combine properties of different one-dimensional liquidity measures. This is because no single measure, however, unequivocally measures tightness, immediacy, depth, breadth and resiliency (Mensah, 2003). This study will seek to use three multi-dimensional measures to compare the liquidity of the NSE over the five year period between January 2001 and December 2005. These are further explained under section 3.4.

2.4 The Nairobi Stock Exchange

According to the Nairobi Stock Exchange Limited Market Fact File (2005), the market was established in 1954. The market had 49 listed companies under the equities section as at 31 December 2005 with 40 of them being in the main investment market segment (NSE, 2006). Delivery and settlement is currently done through the central depository and settlement (CDS) system run by the Central Depository and Settlement Corporation. The CDS system became operational in November 2004.

According to Kibuthu (2005) the NSE accounts for 90 percent of stock market activities in the Eastern Africa region and is a reference point in terms of setting standards for other markets in the region.

According to the NSE Market Fact File (2005), the market is divided into three broad categories (i) The main investment market segment (MIMS). The MIMS is the main quotation market. Companies listed under this segment are further categorized in four sectors that describe the nature of their business, namely; agricultural, commercial and services, finance and investment and industrial and allied. (ii) The alternative investment market segment (AIMS). The AIMS provides an alternative method of raising capital to small, medium sized and young companies that find it difficult to meet the more stringent listing requirements of the MIMS. It is geared towards responding to the changing needs of issuers (Kibuthu, 2005). And, (iii) The fixed income securities market segment (FISMS). The FISMS, on the other hand, provides an independent market for fixed income securities such as treasury bonds, corporate bonds, preference shares and debenture stocks, as well as short-term financial instruments such as treasury bills and commercial paper.

The Kenyan government has made several reforms aimed at attracting investment through the NSE. For example, the exchange was opened to foreign investors for the first time in January 1995 albeit with a maximum limit of 20 percent shareholding for institutions and 2.5 percent for individuals. The ceiling on foreign investment was

increased to 40 percent according to Nyamute (1998) as reported by Ndung'u (2003). The government has further removed exchange controls, introduced a favourable tax regime where capital gains are not taxed and no stamp duty is charged upon transfer of shares.

The financial reform process emphasizes the development of the stock market as an alternative source of long-term capital (Ngugi & Njiru, 2005). The period of this study coincides with the period of reform strategy launched by the Capital Markets Authority (CMA) for the fundamental reorganization of Kenya's capital markets (NSE, 2005). These reforms were aimed at responding to the changing needs of the market and the economy as well as further deepening of the capital market. The NSE Fact Book (2005), reports that in the year 2002, CMA approved new NSE Trading and Settlement rules meant to improve management, trading and settlement at the NSE. New foreign investor regulations were also introduced, setting a minimum reserve of 25 percent of the issued share capital for locals while the balance 75 percent being a free float for all classes of investors. The Central Depository and Settlement Corporation (CDSC) was also set up during the same year to operate the Central Depository System (CDS). The change to the CDS system was intended to end the use of physical certificates and thus bring the settlement process to a T+1 basis, (that is, settlement of the transaction occurs on day of transaction plus one day) from the then prevailing level of T+5 (Kibuthu, 2005). These changes have positively affected the microstructure of the NSE and as a result improvement in liquidity is expected. This study will thus be vital in determining whether there has been any significant change in the liquidity of the NSE as well as make recommendation on how further improvements could be achieved.

It is worthwhile for the economy as a whole to invest resources in improving trading system, since securities traded in the market will enjoy greater liquidity and their value will increase correspondingly (Amihud & Mendelson, 1987). A firm's efforts to increase the liquidity of their claims are bounded by the market's trading mechanism. Thus it is incumbent on the exchange authorities to invest in increasing liquidity. To achieve liquidity the market microstructure must be solid (Ngugi, 2003). In this regard,

investment in the improvement of the microstructure infrastructure which will lead to changes in the trading system and strengthened regulatory system is a must.

The government has also shown its willingness to use the NSE to carry out the privatization of various parastatals. The successful Kengen initial public offer and the Kenya Commercial Banks rights issues are good examples. Safaricom Limited and Telkom Kenya are expected to follow. An increase in the number of listed companies is expected to boost liquidity of NSE.

RESEARCH DESIGN AND METHODOLOGY

3.1 Research Design

This study followed a quantitative research design utilizing secondary data. The historical data, in form of descriptive statistics, was obtained from the NSE.

Other sources of data included the Central Bank of Kenya and the Central Bureau of Statistics.

3.2 Population, Sample and Sampling Procedure

The population of the study were all the companies listed at the NSE. The sample for the study was selected to be the 6 years of the period between January 2000 and December 2005. The period was judgementally selected with the guiding principle being that more recent data is more relevant. This also made it possible to examine the data for the three-year period before the historic December 2002 elections and the three-year period after the same elections and compare the liquidity measures.

3.3 Variables Specification

The main variables for this study were;

- Number of shares traded in each month (Q),
- Number of transactions in each month (N),
- Highest share price during each month (P_2),
- Lowest share price during each month (P_1)
- Turnover in Kenya Shilling for each month (V)

All the above variables were obtained directly from the NSE database. Other variables which were computed included;

- Return per month, $r = (P_2 - P_1 / P_1)$
- Waiting time in days, WT = Number of trading days per month / Number of transactions during the month (N)
- Shares traded per transaction = Number of shares traded, Q / Number of transactions, N

The number of trading days per month was assumed to be 20 days.

3.4 Data Analysis Procedure

Though most studies compute liquidity measures utilizing daily data, this study opted to compute the average liquidity measures using monthly data. The use of monthly data was not unusual, for example, Eckbo and Norli (2002) computed liquidity measures in their study on 'Pervasive Liquidity Risk' based on monthly data. The monthly turnover was, for instance, determined as the sum of the daily share turnover in a given month.

In order to avoid the pitfalls of one measure of liquidity, it was preferred, in this study, to use three models to study the liquidity of the NSE. Espinosa and Tapia (2005) used four alternative measure of liquidity in their study on how disclosure affected liquidity of stocks. The argued that use of more than one liquidity measure helps to capture the bi-dimensionality of liquidity. Further, Sun et al. (2006) found out that since each measure had its own shortcomings, using a variety of measures provides a richer picture of stock market liquidity. The three liquidity measures identified for use in this study were (i) Liquidity Ratio 1 (LR1) (ii) Liquidity Ratio 2 (LR2) and (iii) the Flow Ratio (FR). These liquidity measures have been borrowed from Von Wyss (2004). The use of these three measures allowed the study to combine the one-dimension volume-related measures of liquidity with those of one-dimension time-related measures.

Liquidity Ratio 1

This ratio combines turnover and return. That is, the ratio compares the traded volume to the absolute price change during a certain period. The ratio is given as;

$$LR1_t = V_t / |r_t| \qquad 1.4$$

Where;

r_t = the return from period *t-1* to *t* (that is the change in price over the defined time interval divided by price at time *t-1*) for a stock traded in the stock market, and

V_t = the turnover.

The turnover V_t is given by;

$$V_t = \sum p_i q_i \qquad 1.5$$

Where;

p_i = price of stock *i*, and

q_i = number of shares of stock *i* sold

The higher the volume, the more price movement can be absorbed by the market. Therefore, a higher liquidity ratio denotes higher liquidity. If the return in a certain time is zero the liquidity ratio (LR1) is set to zero.

This liquidity ratio is also known as "Amivest Liquidity Ratio" and is widely used to measure liquidity of the NASDAQ (Von Wyss, 2004). Several scholars have used the Amivest liquidity ratio as a proxy for market liquidity. Becker-Blease & Paul (2003) used this liquidity ratio as a proxy for the market depth. Amihud, Mendelson & Lauterback (1997) used the same ratio as a proxy for stock liquidity. The inverse of this ratio is commonly known as the Amihud's illiquidity ratio (Fujimoto, 2003).

In this study, monthly time interval was used due to the ease of availability of the monthly data of the NSE. The monthly liquidity ratio (LR1) was computed based on the

each stock's turnover and the absolute change in price over the specific month. The aggregate LR1 for the NSE for each month was then computed as the average of all the listed stocks' LR1.

Liquidity Ratio 2

Liquidity ratio 2 (LR2) was computed as shown below;

$$LR2_t = \sum|r_i| / N_t \qquad 1.6$$

Where;

- N_t = the number of transactions in time *t*, and
  r_t = the return from period *t-1* to *t* (that is the change in price over the defined time interval divided by price at time *t-1*) for a stock traded in the stock market.

LR2 indicates the average price change of a transaction. While LR1 depends on the absolute price of the stocks, the liquidity ratio 2 overcomes this problem by only using the number of trades in the denominator.

In contrast with LR1, a high liquidity ratio in this case shows low liquidity. If the number of trades for certain time space is zero, the liquidity ratio is forced to zero.

In this study, the LR2 was computed for each month as the ratio of the sum of all individual stocks absolute return for each month and the total number of transactions for the same month.

Flow Ratio

Flow ratio is the ratio of turnover to waiting time. Therefore, it measures whether trading takes place in a few but large transactions or in lots of small trades. The ratio is computed as;

$$FR_t = V_t/WT_t \qquad 1.7$$

$$FR_t = \sum p_i q_i / WT_t \qquad 1.8$$

Where;

p = price

q = quantity

WT_t = waiting time for a specific time space

V_t = the turnover.

Waiting time is defined as the average time between two transactions.

Since waiting time, WT_t , for a specified time space is the inverse of number of transactions per unit of time, N_t , equation 1.7 may be rewritten as;

$$FR_t = V_t N_t = N_t \sum p_i q_i \qquad 1.9$$

Where

N_t = the number of transactions in time *t*,

p_i = price of stock *i*, and

q_i = number of shares of stock *i* sold.

Since liquidity rises with the number of trades and the turnover, a high flow ratio is a sign for high liquidity.

In this study, Flow Ratio per month was computed as the ratio of each month's turnover and the waiting time in days. Each month was assumed to have 20 working days.

For each of the three liquidity measures described above, monthly measures were calculated and a table of six (2000 to 2005) by twelve cells (January to December) formed for each of the three liquidity measures. The annual mean and variance were then computed based on the monthly data for each year.

Analysis of variance (ANOVA) was then carried out to determine whether there was significant change in the liquidity measures of the sampled years. ANOVA procedure is normally used to compare the means across various groups (Levine et al., 2004). The primary interest is comparing the means of the years. This is achieved by analyzing the variances.

Thus the null and the alternative hypotheses of the study are expressed as shown below;

H_0: $\mu_{2000} = \mu_{2001} = \mu_{2002} = \mu_{2003} = \mu_{2004} = \mu_{2005}$ (μ stands for mean)

H_1: Not all μ_j are equal (where j= 2000, 2001, 2002, 2003, 2004 and 2005)

The level of significance, α was set as 0.05. The null hypothesis was rejected if the computed *F*-test statistic was found to be greater than the upper-tail critical value. Where the $F_{critical} = 2.3683$. The *p*-value was also used to make conclusions regarding the null hypothesis. Where the *p*-value was found to be less that the chosen level of significance ($\alpha = 0.05$), then the null hypothesis was rejected.

SPSS software was used to carry out ANOVA.

RESULTS AND DISCUSSIONS

4.1 Liquidity Ratio I

For each of the year under review, Liquidity Ratio I (measured in million shillings per month) was determined for each month and the descriptive statistical measures shown on Table 1 obtained. ANOVA analysis produced the results shown in Table 2.

Table1: Liquidity Ratio 1 Descriptive Statistics

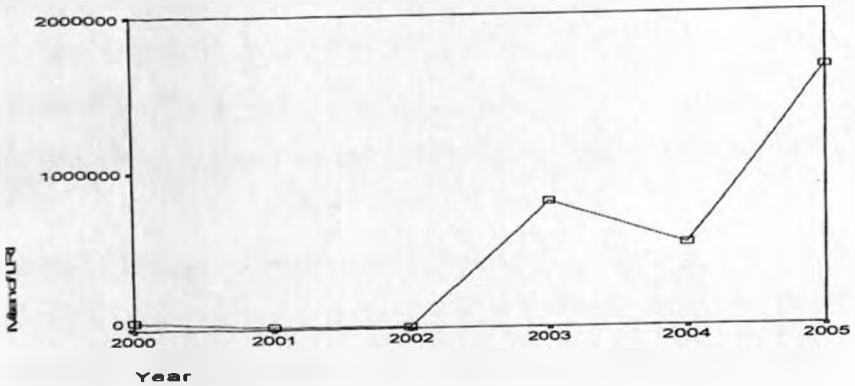
Year	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
2000	12	47,026.58	97,455.12	28,132.87	-14,893.45	108,946.61	4,848.30	352,572.1
2001	12	11,480.67	12,055.19	3,480.03	3,821.17	19,140.17	1,899.32	349,93.70
2002	12	7,970.78	6,889.54	1,988.84	3,593.37	12,348.19	1,691.42	250,38.23
2003	12	801,049.99	2,688,245.18	776,029.54	-906,979.51	2,509,079.49	5,913.71	9,337,140
2004	12	525,798.30	1,446,870.91	417,675.65	-393,499.61	1,445,096.23	18,357.40	5,106,105
2005	12	1,643,271.73	4,243,205.10	1,224,907.80	-1,052,732.16	4,339,275.63	27,822.25	14,976,545
Total	72	506,099.67	2,141,768.46	252,409.83	2,808.76	1,009,390.59	1,691.42	14,976,545

Table 2: Liquidity Ratio 1 ANOVA Analysis Results

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.50E13	5	5.00E12	1.098	.370
Within Groups	30.06E13	66	4.56E12		
Total	32.56E13	71			

Table 2 shows that the F value obtained (1.098) was lower that $F_{critical}$ (2.37), thus the null hypothesis was, therefore, not rejected.

Figure 3: Liquidity Ration 1 Mean Plot



4.2 Liquidity Ratio 2

The descriptive statistics were first obtained and the results are shown on table 3. ANOVA produced the results shown on table 4.

Table 3: Liquidity Ratio 2 Descriptive Statistics

Year	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
2000	12	7.9969	5.8710	1.6948	4.2667	11.7271	.32	19.18
2001	12	17.1940	10.8458	3.1309	10.3029	24.0851	3.09	37.11
2002	12	27.5484	27.0494	7.8085	10.3620	44.7348	3.56	100.77
2003	12	9.6196	7.7343	2.2327	4.7054	14.5337	.03	27.15
2004	12	3.4540	3.6333	1.0488	1.1455	5.7625	.03	11.56
2005	12	2.5619	2.9763	.8592	.6708	4.4530	.02	7.71
Total	72	11.3958	15.0241	1.7706	7.8653	14.9263	.02	100.77

Table 4: Liquidity Ratio 2 ANOVA Analysis Results

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	5404.122	5	1080.824	6.716	.000
Within Groups	10622.148	66	160.942		
Total	16026.270	71			

Table 4 shows that the F value obtained (6.716) was greater than the $F_{critical}$ (2.37), thus the null hypothesis was rejected. The implication was that Liquidity Ratio 2 was at least significantly different in one of the years. In order to determine the year in which the mean Liquidity Ratio 2 was different, a post hoc analysis was conducted using the Tukey HSD (Honestly Significantly Different) and the LSD (Least Significant Difference) techniques. Tables 5 and 6, respectively show the results of the two techniques.

Both post hoc analysis techniques indicated that the mean for the Liquidity Ratio 2 during the year 2002 and to a little extent year 2001 were significantly different from those of the other years. The homogeneous subsets formed as a result are shown in table 7.

Table 5: Liquidity Ratio 2 Multiple Comparisons – Tukey HSD

		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
(I) Year	(J) Year				Lower Bound	Upper Bound
2000	2001	-9.1971	5.1792	.488	-24.3986	6.0044
	2002	-19.5515*	5.1792	.004	-34.7530	-4.3501
	2003	-1.6227	5.1792	1.000	-16.8241	13.5788
	2004	4.5429	5.1792	.951	-10.6585	19.7444
	2005	5.4350	5.1792	.899	-9.7665	20.6365
2001	2000	9.1971	5.1792	.488	-6.0044	24.3986
	2002	-10.3544	5.1792	.354	-25.5559	4.8470
	2003	7.5744	5.1792	.689	-7.6270	22.7759
	2004	13.7400	5.1792	.099	-1.4614	28.9415
	2005	14.6321	5.1792	.066	-.5694	29.8336
2002	2000	19.5515*	5.1792	.004	4.3501	34.7530
	2001	10.3544	5.1792	.354	-4.8470	25.5559
	2003	17.9288*	5.1792	.012	2.7274	33.1303
	2004	24.0944*	5.1792	.000	8.8930	39.2959
	2005	24.9865*	5.1792	.000	9.7851	40.1880
2003	2000	1.6227	5.1792	1.000	-13.5788	16.8241
	2001	-7.5744	5.1792	.689	-22.7759	7.6270
	2002	-17.9288*	5.1792	.012	-33.1303	-2.7274
	2004	6.1656	5.1792	.840	-9.0359	21.3670
	2005	7.0577	5.1792	.749	-8.1438	22.2591
2004	2000	-4.5429	5.1792	.951	-19.7444	10.6585
	2001	-13.7400	5.1792	.099	-28.9415	1.4614
	2002	-24.0944*	5.1792	.000	-39.2959	-8.8930
	2003	-6.1656	5.1792	.840	-21.3670	9.0359
	2005	.8921	5.1792	1.000	-14.3094	16.0935
2005	2000	-5.4350	5.1792	.899	-20.6365	9.7665
	2001	-14.6321	5.1792	.066	-29.8336	.5694
	2002	-24.9865*	5.1792	.000	-40.1880	-9.7851
	2003	-7.0577	5.1792	.749	-22.2591	8.1438
	2004	-.8921	5.1792	1.000	-16.0935	14.3094

*. The mean difference is significant at the .05 level.

Table 6: Liquidity Ratio 2 Multiple Comparisons – LSD

2000	2001	-9.1971	5.1792	.080	-19.5376	1.1434
	2002	-19.5515*	5.1792	.000	-29.8920	-9.2110
	2003	-1.6227	5.1792	.755	-11.9632	8.7178
	2004	4.5429	5.1792	.384	-5.7976	14.8834
	2005	5.4350	5.1792	.298	-4.9055	15.7755
2001	2000	9.1971	5.1792	.080	-1.1434	19.5376
	2002	-10.3544*	5.1792	.050	-20.6949	-1.3900E-02
	2003	7.5744	5.1792	.148	-2.7661	17.9149
	2004	13.7400*	5.1792	.010	3.3995	24.0805
	2005	14.6321*	5.1792	.006	4.2916	24.9726
2002	2000	19.5515*	5.1792	.000	9.2110	29.8920
	2001	10.3544*	5.1792	.050	1.390E-02	20.6949
	2003	17.9288*	5.1792	.001	7.5883	28.2694
	2004	24.0944*	5.1792	.000	13.7539	34.4349
	2005	24.9865*	5.1792	.000	14.6460	35.3270
2003	2000	1.6227	5.1792	.755	-8.7178	11.9632
	2001	-7.5744	5.1792	.148	-17.9149	2.7661
	2002	-17.9288*	5.1792	.001	-28.2694	-7.5883
	2004	6.1656	5.1792	.238	-4.1749	16.5061
	2005	7.0577	5.1792	.178	-3.2828	17.3982
2004	2000	-4.5429	5.1792	.384	-14.8834	5.7976
	2001	-13.7400*	5.1792	.010	-24.0805	-3.3995
	2002	-24.0944*	5.1792	.000	-34.4349	-13.7539
	2003	-6.1656	5.1792	.238	-16.5061	4.1749
	2005	.8921	5.1792	.864	-9.4484	11.2326
2005	2000	-5.4350	5.1792	.298	-15.7755	4.9055
	2001	-14.6321*	5.1792	.006	-24.9726	-4.2916
	2002	-24.9865*	5.1792	.000	-35.3270	-14.6460
	2003	-7.0577	5.1792	.178	-17.3982	3.2828
	2004	-.8921	5.1792	.864	-11.2326	9.4484

* The mean difference is significant at the .05 level.

The Tukey HSD test found fewer significant differences than the LSD test. This is not unexpected as the Tukey HSD test controls the Type I experiment-wise error rate. Based on the outcome of the post hoc analysis, the years were grouped based on the variance and two distinct groups as shown in table 7 were obtained.

Table 7: Homogeneous subsets for Liquidity Ratio 2 based on Tukey HSD[a]

	N	Subset for alpha = .05	
Year		1	2
2005	12	2.5619	
2004	12	3.4540	
2000	12	7.9969	
2003	12	9.6196	
2001	12	17.1940	17.1940
2002	12		27.5484
Sig.		.066	.354

Means for groups in homogeneous subsets are displayed.
a Uses Harmonic Mean Sample Size = 12.000.

Table 7 shows that the years from 2000 to 2005 can be split into two homogeneous groups 1 and 2. Year 2001 can fall in either category; however, year 2002 is significantly different from the other years.

The interpretation of the results is that the average level of liquidity at the NSE in 2001 and 2002, as proxied by Liquidity Ratio 2, was significantly different from the level of liquidity in the years 2000, 2003, 2004, and 2005. This could probably be attributed to the year 2002 elections since that year was found to be significantly different from the other years.

The liquidity of the market has an inverse relationship with Liquidity Ratio 2, thus, the lower the value of Liquidity Ratio 2, the higher the liquidity of the market. The Liquidity Ratio 2 is also inversely related to the number of transactions, thus a further analysis was carried out to determine the effect of the number of transactions on the Liquidity Ratio 2. Figure 5 shows a plot of the number of transaction against time and seems to explain the behaviour of the Liquidity Ratio 2.

Figure 4: Liquidity Ratio 2 Mean Plot

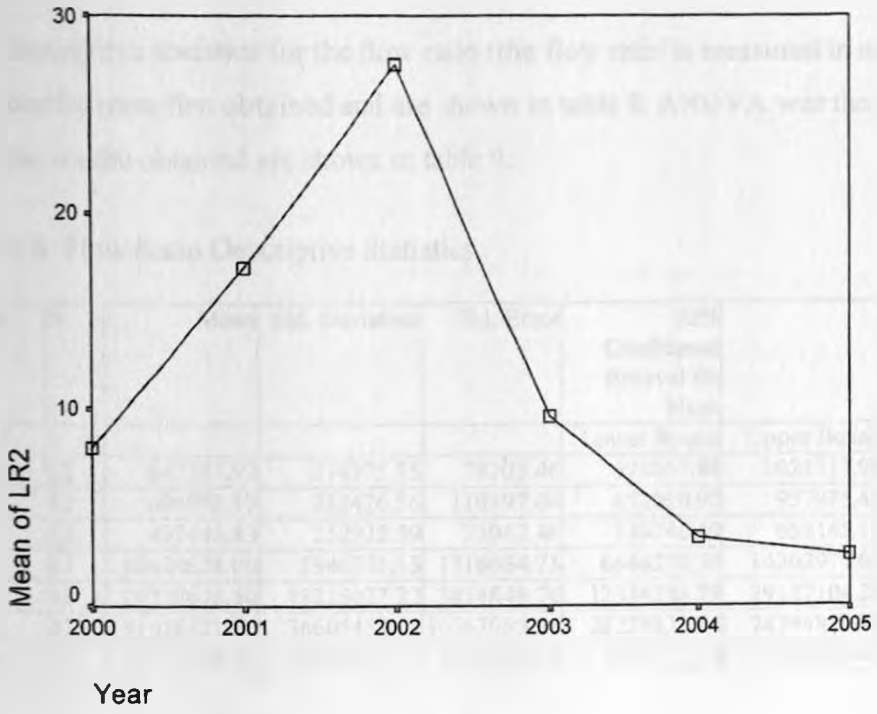
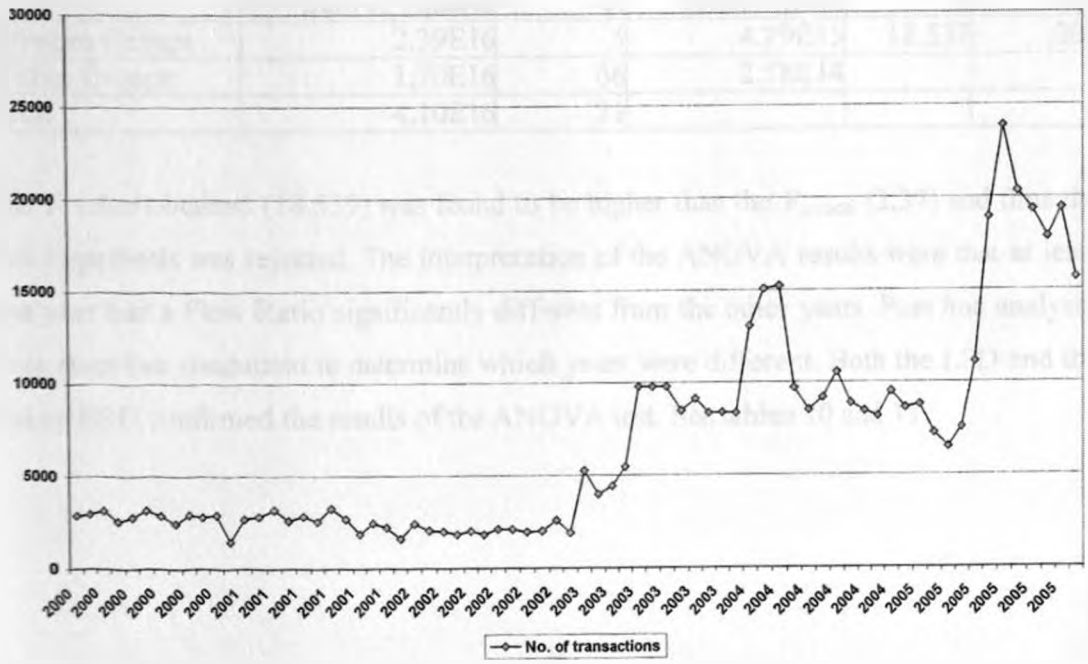


Figure 5: Number of monthly transactions plot



4.3 Flow Ratio

The descriptive statistics for the flow ratio (the flow ratio is measured in million shillings per month) were first obtained and are shown in table 8. ANOVA was then conducted and the results obtained are shown in table 9.

Table 8: Flow Ratio Descriptive Statistics

Year	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum
					Lower Bound	Upper Bound		
2000	12	847387.92	274375.75	79205.46	673057.88	1021717.95	248634	1267824
2001	12	694993.17	382426.56	110397.04	452010.92	937975.41	239443	1466094
2002	12	497445.83	252922.59	73012.46	336746.49	658145.18	282624	1007424
2003	12	10424624.00	5946701.13	1716664.75	6646270.36	14202977.64	1802380	17376350
2004	12	20730676.50	13215027.22	3814849.76	12334248.79	29127104.21	9831420	51197200
2005	12	51486821.25	36605458.17	10567085.56	28228822.74	74744819.76	9819530	1.23E+08
Total	72	14113658.11	24030477.56	2832018.94	8466772.73	19760543.49	239443	1.23E+08

Table 9: Flow Ratio ANOVA Analysis Results

	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	2.39E16	5	4.79E15	18.537	.000
Within Groups	1.70E16	66	2.58E14		
Total	4.10E16	71			

The F value obtained (18.539) was found to be higher than the $F_{critical}$ (2.37) and thus the null hypothesis was rejected. The interpretation of the ANOVA results were that at least one year had a Flow Ratio significantly different from the other years. Post hoc analyses were therefore conducted to determine which years were different. Both the LSD and the Tukey HSD confirmed the results of the ANOVA test. See tables 10 and 11.

Table 10: Flow Ratio Multiple Comparisons using Tukey HSD

		Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
(I) Year	(J) Year				Lower Bound	Upper Bound
2000	2001	152394.75	6562192.36	1.000	-19108457.01	19413246.51
	2002	349942.08	6562192.36	1.000	-18910909.68	19610793.84
	2003	-9577236.08	6562192.36	.691	-28838087.84	9683615.68
	2004	-19883288.58*	6562192.36	.039	-39144140.34	-622436.82
	2005	-50639433.33*	6562192.36	.000	-69900285.09	-31378581.57
2001	2000	-152394.75	6562192.36	1.000	-19413246.51	19108457.01
	2002	197547.33	6562192.36	1.000	-19063304.43	19458399.09
	2003	-9729630.83	6562192.36	.676	-28990482.59	9531220.93
	2004	-20035683.33*	6562192.36	.037	-39296535.09	-774831.57
	2005	-50791828.08*	6562192.36	.000	-70052679.84	-31530976.32
2002	2000	-349942.08	6562192.36	1.000	-19610793.84	18910909.68
	2001	-197547.33	6562192.36	1.000	-19458399.09	19063304.43
	2003	-9927178.17	6562192.36	.657	-29188029.93	9333673.59
	2004	-20233230.67*	6562192.36	.034	-39494082.43	-972378.91
	2005	-50989375.42*	6562192.36	.000	-70250227.18	-31728523.66
2003	2000	9577236.08	6562192.36	.691	-9683615.68	28838087.84
	2001	9729630.83	6562192.36	.676	-9531220.93	28990482.59
	2002	9927178.17	6562192.36	.657	-9333673.59	29188029.93
	2004	-10306052.50	6562192.36	.621	-29566904.26	8954799.26
	2005	-41062197.25*	6562192.36	.000	-60323049.01	-21801345.49
2004	2000	19883288.58*	6562192.36	.039	622436.82	39144140.34
	2001	20035683.33*	6562192.36	.037	774831.57	39296535.09
	2002	20233230.67*	6562192.36	.034	972378.91	39494082.43
	2003	10306052.50	6562192.36	.621	-8954799.26	29566904.26
	2005	-30756144.75*	6562192.36	.000	-50016996.51	-11495292.99
2005	2000	50639433.33*	6562192.36	.000	31378581.57	69900285.09
	2001	50791828.08*	6562192.36	.000	31530976.32	70052679.84
	2002	50989375.42*	6562192.36	.000	31728523.66	70250227.18
	2003	41062197.25*	6562192.36	.000	21801345.49	60323049.01
	2004	30756144.75*	6562192.36	.000	11495292.99	50016996.51

*. The mean difference is significant at the .05 level.

Table 11: Flow Ratio Multiple Comparisons using LSD

2000	2001	152394.75	6562192.36	.982	-12949445.03	13254234.53
	2002	349942.08	6562192.36	.958	-12751897.69	13451781.86
	2003	-9577236.08	6562192.36	.149	-22679075.86	3524603.69
	2004	-19883288.58*	6562192.36	.003	-32985128.36	-6781448.81
	2005	-50639433.33*	6562192.36	.000	-63741273.11	-37537593.56
2001	2000	-152394.75	6562192.36	.982	-13254234.53	12949445.03
	2002	197547.33	6562192.36	.976	-12904292.44	13299387.11
	2003	-9729630.83	6562192.36	.143	-22831470.61	3372208.94
	2004	-20035683.33*	6562192.36	.003	-33137523.11	-6933843.56
	2005	-50791828.08*	6562192.36	.000	-63893667.86	-37689988.31
2002	2000	-349942.08	6562192.36	.958	-13451781.86	12751897.69
	2001	-197547.33	6562192.36	.976	-13299387.11	12904292.44
	2003	-9927178.17	6562192.36	.135	-23029017.94	3174661.61
	2004	-20233230.67*	6562192.36	.003	-33335070.44	-7131390.89
	2005	-50989375.42*	6562192.36	.000	-64091215.19	-37887535.64
2003	2000	9577236.08	6562192.36	.149	-3524603.69	22679075.86
	2001	9729630.83	6562192.36	.143	-3372208.94	22831470.61
	2002	9927178.17	6562192.36	.135	-3174661.61	23029017.94
	2004	-10306052.50	6562192.36	.121	-23407892.28	2795787.28
	2005	-41062197.25*	6562192.36	.000	-54164037.03	-27960357.47
2004	2000	19883288.58*	6562192.36	.003	6781448.81	32985128.36
	2001	20035683.33*	6562192.36	.003	6933843.56	33137523.11
	2002	20233230.67*	6562192.36	.003	7131390.89	33335070.44
	2003	10306052.50	6562192.36	.121	-2795787.28	23407892.28
	2005	-30756144.75*	6562192.36	.000	-43857984.53	-17654304.97
2005	2000	50639433.33*	6562192.36	.000	37537593.56	63741273.11
	2001	50791828.08*	6562192.36	.000	37689988.31	63893667.86
	2002	50989375.42*	6562192.36	.000	37887535.64	64091215.19
	2003	41062197.25*	6562192.36	.000	27960357.47	54164037.03
	2004	30756144.75*	6562192.36	.000	17654304.97	43857984.53

*. The mean difference is significant at the .05 level.

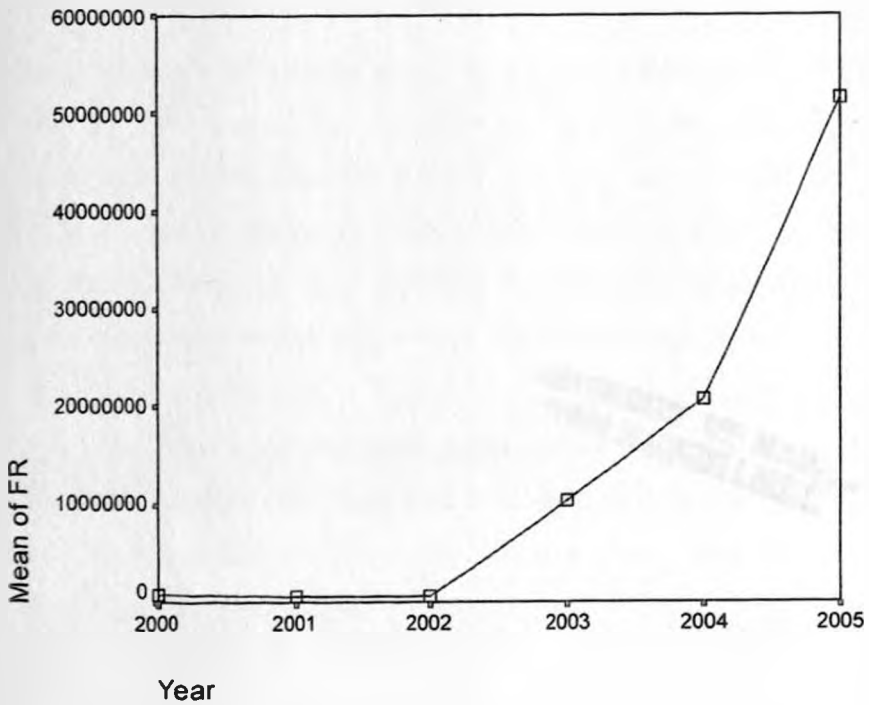
The post hoc analysis produced three groups of homogeneous flow ratio as can be seen in table 12. The mean for the flow ratio during the year 2005 was significantly different from the other years while the years 2003 and 2004 were not significantly different from each other and were therefore classified into one group.

Table 12: Homogeneous Subsets for Flow Ratio Based on Tukey HSD[a]

	N	Subset for alpha = .05		
Year		1	2	3
2002	12	497445.83		
2001	12	694993.17		
2000	12	847387.92		
2003	12	10424624.00	10424624.00	
2004	12		20730676.50	
2005	12			51486821.25
Sig.		.657	.621	1.000

Means for groups in homogeneous subsets are displayed.
a Uses Harmonic Mean Sample Size = 12.000.

Figure 6: Flow Ratio Mean Plot



From the results of the analysis above it is clear that the liquidity of the equities market as proxied by the three liquidity measures has improved over the years. In all the three measures used in this study, year 2005 was found to have the best level of liquidity whereas year 2002 was found to have had the worst level of liquidity. Table 13 shows the three liquidity measures for the two years, that is, 2002 and 2005.

Table 13: Mean Liquidity Measures – 2002 versus 2005

	2002	2005
Liquidity Ratio 1	7,970.78	1,643,271.73
Liquidity Ratio 2	27.54	2.56
Flow Ratio	497,445.83	51,486,821.25

It is therefore clear that the liquidity of the equities market at the NSE has improved and thus the null hypothesis of this study is rejected.

CONCLUSIONS AND RECOMMENDATIONS

5.1 Conclusion

The broad objective of this study was to assess the changes in liquidity of the NSE equities section of the market during the period between January 2000 and December 2005. The specific objectives were to (i) determine the status of the liquidity of the NSE over the period mentioned here, and (ii) determine whether there have been significant changes in the liquidity of the market. The null hypothesis of the study was that no significant change in liquidity had occurred during the period of the study.

Three different measures of liquidity were used to enable the study to capture different aspects of liquidity. This helped in avoiding the shortcomings of one liquidity measure. In general, the liquidity of the NSE equities section of the market was found to have deteriorated from the year 2000 to 2002, when it was at its worst. This was followed by a period of drastic improvement from 2002 to 2005, with year 2005 showing the best level of liquidity.

The null hypothesis was rejected for two of the liquidity measures, which were Liquidity Ratio 2 and the Flow Ratio. This implied that there has been significant change in liquidity as proxied by both Liquidity Ratio 2 and Flow Ratio. Significant improvement in liquidity was noted as shown in table 13 and figures 4, 5 and 6. Improvement in liquidity in a stock exchange is a desirable characteristic and the NSE management should be encouraged to ensure that proper mechanisms are in place to improve the liquidity of the market even further. This can be done by encouraging more listings into the market and share splits of those shares whose prices are out of the reach of the retail investor. The NSE management should also consider educating the general public on the role of the NSE and the investment opportunities available to attract more investors and thus help boost liquidity even further.

5.2 Limitations

This study had several limitations including the lack of availability of data in the form required to enable the computation of other measures of liquidity, such as the depth, which would have helped in the further understanding of the liquidity of the NSE equities market. Also data from other stock markets in the developing countries was not available to enable comparison.

5.3 Recommendations

Further research is recommended on significant occurrences which might have significant impact on the liquidity of the market. This refers to aspects such as:-

- Impact of Initial Public Offers (IPO), such as Kengen, Eveready, Access Kenya and Kenya Re, on the liquidity of the NSE.

- The effect of share splits on the liquidity of the NSE such as those of East African Cables, East African Breweries and Kenya Commercial Bank.

- Liquidity before and after significantly large IPOS such as the Kengen IPO or the upcoming Safaricom IPO. The need for this emanates from the fact that, since its listing, Kengen has on average accounted for around 40 percent of daily turnover (NSE 2006).

- Effect of the general elections on the liquidity of the NSE. From this study, it was observed that liquidity of the NSE equities market was at its worst during the year 2002. It should, therefore, be interesting to check on the impact of the 2007 elections on the NSE.

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