TRADE TRANSPARENCY AND INTERNAL EFFICIENCY OF A STOCK MARKET: A RESEARCH STUDY OF THE NAIROBI STOCK EXCHANGE.

BY

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DECLARATION

Apart from references indicated in the text and the help I have acknowledged, this dissertation is wholly my own work and has never been submitted before to any university or academic institution.

Signature

.....

AINEBYONA JOSEPH

Date

29.08.13.

.....

APPROVAL

This is to certify that the research on **trade transparency and internal efficiency of a stock market** has been under my Supervision and is now ready for submission to the college of applied economic and Management sciences for the award of a degree of Business Administration of Kampala International University.

Signature: .....

DATE: 29/08/13.....

Mr.Ruteganda Michael

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ABSTRACT

The issue of trade transparency has been and is still at the centre of a heated debate among the stake holders of different security markets. The proponents of increased trade transparency argue that it improves on the internal efficiency of a market, whereas opponents of increased transparency argue that it has a detrimental effect on the internal efficiency of a market. This study empirically examined this topic using transaction data from the Nairobi stock exchange before and after an increase in trade transparency. The study finds that Contrary to wide spread beliefs; trade transparency has no effect on the internal efficiency of a market.

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CHAPTER ONE
INTRODUCTION

1.0 Introduction

This chapter contains the market efficiency, history of Nairobi stock exchange market, and history of the case study.

1.1. Market efficiency

Market efficiency can be defined as the extent to which the price of a security reflects all the available information concerning a given security. For a market to perform its primary role of allocation of resources from surplus spending units to deficit spending units, all information should be readily available to all market participants and the information should be quickly discounted into the price of the security. For a market to be efficient, it should be both externally and internally efficient. Whereas external efficiency is concerned with market participants outside of the market making process, internal efficiency is concerned with the internal organization of the market. However, the use of the term market efficiency in the field of finance has been monopolized by writers and researchers concerned with external efficiency to the extent that market efficiency is wrongly assumed to be synonymous to external efficiency. However, it is hard to envisage an efficient market which is only externally efficient with no internal efficiency.

1.2. Internal market efficiency

Internal market efficiency refers to the extent to which a market facilitates continuous exchange of securities between buyers and sellers at a price level which fully reflects the available information, given the cost of providing the service. An internally efficient market should be in position to absorb any temporary excess supply and demand conditions for a given security by providing immediacy. A market derives its internal efficiency from the rules governing the internal activities of a market. Any changes in the rules of a given market tend to have a significant impact on the internal efficiency of that particular market. The rules of the market determine the structure of the market and the level of transparency, which in turn affects the price formation process, risk, costs of transaction and liquidity of the market. The issues to consider in the structure of the market are whether a market is an order driven market or quote driven market, and whether a market runs a continuous trading system or

periodic trading system. The price formation process, risk and costs of transaction differ between quote driven markets and order driven markets.

1.3. Trade transparency

Trade transparency in respect to a security can be defined as the disclosure of information about the trading of that security. Trade transparency can be divided into pre-trade and post-trade transparency. Pre-trade transparency refers to the disclosure of current bid ask quotations, depth, and information about the limit order from the best price. Post-trade transparency is the disclosure of executed trades. Trade transparency has a strong bearing on the functioning of a market, since trade information affects the decisions taken by both the market makers and the investors. Generally the party who has information that other people do not have tends to have a trading advantage. Market makers in respect to a stock exchange are firms or individuals who post the bid and ask prices at which they are ready to trade securities listed on the particular stock exchange. Market makers provide liquidity in the market by standing ready to trade with anyone who comes in the market. In the process of market making they face an inventory risk; the risk of not being able to sell or buy back at favourable prices the securities they have bought or sold. To compensate for the risk they take in buying and selling securities, they earn a profit on the spread between the bid and the ask price. It is argued that market makers in a competitive market compete for order flow in order to gain valuable information. Therefore, they tend to post very competitive bid and ask prices in order to attract large trades which are presumed to contain valuable information. However, it is also argued that with increased transparency, market makers perceive large trades as a liability since they may find it hard to offset the inventory effect of the trade. Hence they are only expected to trade in large quantities at unfavourable prices to the investors, which are reflected through an increase in the bid ask spreads.

1.4. Research background

The Nairobi Securities Exchange (formerly Nairobi Stock Exchange) (NSE) is the principal stock exchange of Kenya. It began in 1954 as an overseas stock exchange while Kenya was still a British colony with permission of the London Stock Exchange. The NSE is a member of the African Stock Exchanges Association. It is Africa's fourth largest stock exchange in terms of trading volumes, and fifth in terms of market capitalization as a percentage of GDP. The Exchange works in cooperation with the Uganda Securities Exchange and the Dar es Salaam Stock Exchange, including the cross listing of various equities.

The Exchange has pre-market sessions from 09:00am to 09:30am and normal trading sessions from 09:30am to 03:00pm on all days of the week except Saturdays, Sundays and holidays declared by the Exchange in advance.

The NSE's offices and trading floor are located at the Nation Centre along Kimathi Street in Nairobi, Kenya. Trading is done through the Electronic Trading System (ETS) which was commissioned in 2006. A Wide Area Network (WAN) platform was implemented in 2007 and this eradicated the need for brokers to send their staff (dealers) to the trading floor to conduct business. Trading is now mainly conducted from the brokers' offices through the WAN. However, brokers under certain circumstances can still conduct trading from the floor of the NSE.

The Nairobi stock exchange is a dealership market where market makers compete for order flow at the exchange. The issue of trade transparency has been at the centre of a heated debate among the various stakeholders of the Nairobi stock exchange. Within just the period between 1986 and 1993, the exchange went through five different transparency regimes. On 1 January 1996, the rules relating to publication of trades were once again changed. Small trades up to 6 (previously 3) times the normal market size were subjected to immediate publication, whereas trades between 6 and 75 times the normal market size were subjected to a delay of only 60 minutes before publication. Market makers were against increased trade disclosure, they argued that this would increase their risk which in turn would affect the liquidity of the market.

1.5. Objective of the study

The objective of this study is to examine the effect of the 1996 trade publication rules change on the internal efficiency of the Nairobi stock exchange. To meet the objective of the study, we focus on the bid ask prices, trading volume and share prices. The reason for focussing on the three aforementioned variables is because any change to them directly affects the internal efficiency of the market.

1.6. Significance of the study

This study is important for two reasons. First, the existing literature has concentrated so much on pre-trade transparency in order driven markets, this study expands on the existing small literature on post trade transparency in dealership markets. Secondly, the outcome of this

study is of relevance to all market participants since market transparency affects all of them in one way or another

1.7. Structure

The study will proceed as follows. In the next chapter, the existing literature on internal market efficiency is reviewed. The third chapter discusses the statistical methods necessary to empirically examine the effect of transparency on the internal efficiency of the market. The empirical findings and there analysis follow in chapter 4 and the finally chapter 5 concludes the study and makes some suggestions for further research.

CHAPTER TWO
LITERATURE REVIEW

2.0 Introduction

The review of the existing literature proceeds as follows. The study starts with looking at what the literature says about the broad topic of internal market efficiency, concentrating on the activities of the market maker in determining prices. It then briefly looks at how different market structures affect the internal efficiency of a market. In the second section, it briefly looks at the theoretical literature on trade transparency and then moves on to the empirical and experimental findings on both post-trade and pre-trade transparency, focusing mainly on post-trade transparency. Finally the 3rd section concludes the review.

2.1. Internal market efficiency

west (1975) defined an internally efficient market as, "A well organized real world securities market" that "should not only establish price levels that are right, in the sense that they fully reflect the available information, but also should provide the types of transaction services buyers and sellers desire at prices as low as possible given the costs of providing these services". He further explained that an efficient market should be in position to "accommodate the temporary excess supply and demand conditions" that arise even when underlying demand and supply are stable.

2.1.1. Market maker and price formation

The key to understanding the internal efficiency of a securities market is to look at the activities of a market maker. As put it by Madhavan (2002), "market makers are a logical starting point for an exploration of the black box within which a security market actually works". He explained that market makers are price setters who at the same time provide "immediacy" at the price of the bid ask spread. To explicitly understand the market maker, we need to look back in time as far as 1971 at the work of Walter Bagehot. Bagehot (1971) explained that a market maker is always faced by three different types of traders: informational traders who trade on the basis of information not known to the market; uninformed traders who trade to satisfy their liquidity needs; and lastly, traders who trade on the basis of information which they assume to be exclusive to themselves, yet it has already been discounted in the price of the security. The market maker always loses in his

transactions with informational traders and always gains in his transactions with uniformed traders. Therefore, a market maker always sets the spread in a way that the profits gained from uninformed traders, are always higher than the losses on informed traders, given the fact that the demand for his services is inversely related to the spread.

Effect of competition, risk and volume of trade on the bid ask spread

However, under an efficient market system, we would not expect the factors which determine the price of providing immediacy to be confined to the type of trader faced by the market maker. We would expect factors like competition, risk, and volume of trade to have a say in the determination of the price of immediacy. The above argument concurs with the findings of Menya and Krishna (1996), Bollen et al. (2004) and Demestz (1968). They found that the spread set by the market maker is inversely influenced by competition among market makers and trading volume; and positively influenced by the risk of the security and the price of the security. Risk in this case refers to the inventory holding risk. Given that risk and return are always proportional, the above findings are consistent with financial theory, in that as the inventory risks increase, the market makers tend to demand for a higher reward (bid ask spread) for taking on higher risks. Looking further into the study of Bollen et al. (2004), in their analysis, they modelled cost of trade (bid ask spread) as encompassing "order processing costs", "adverse selection cost" (possibility of only trading with informed traders), and "inventory costs". They found that the order processing costs have an inverse relationship with the volume of trade. They also observed that inventory costs (risk) are the dominant costs as compared to adverse selection costs in contributing to the cost of trade. The earlier theoretical findings of Copeland and Galai (1983) are consistent with the empirical findings of Menya and Krishna (1996), and Bollen et al. (2004) about the effect of competition and trading volume on the bid ask spread. Copeland and Galai (1983) also brought to light the effect of volatility of an asset in determining the spread. They observed that the volatility of an asset has a positive impact on the bid ask spread.

Turning back to the issue of competition, in order to reinforce the argument of the importance of competition in internal market efficiency, we once again look at the work of west (1975), and Copeland and Galai (1983). They both noted that monopoly in the market making process leads to high transactions costs and also hinders efficiency in the allocation role of the market. Therefore competition among market makers is essential in promoting an internally efficient market.

By reviewing the literature of past researchers who have tried to decode the "black box" within which resources are allocated from surplus spending units to deficit spending units, this study finds that a market maker plays a very crucial role in a security market. It also finds that factors like competition, risk, volume of trade, price volatility, and identity of the traders; can indirectly force the market makers to operate in the best interest of an internally efficient market as long as the right balance is struck among the factors.

2.1.2. Effect of market structure on internal market efficiency

The structure of the market affects the provision of liquidity and cost of trading in that particular market as compared to other markets of different structures. Many studies have been carried out which have shown that some markets are more efficient than others. An empirical study by Frino et al. (2006) on the Italian Bourse shows that a specialist market is more efficient than an auction market. They observed that the bid ask spread reduced and the quoted depth increased when stocks moved from an auction to a specialist market. Huangan and Stall (1996), and Bessembinder and Kaufman (1997) observed that the costs of executing transactions are lower on the New York stock exchange (NYSE), which is more of an auction market as compared to NASDAQ, which is a dealership market. Just like the preceding authors, Masulis and Shivakumar (2002) also compared the NYSE and NASDAQ. They observed that securities on the NYSE have a higher equity capitalisation, lower spreads, and greater trading activity than NASDAQ. However, Masulis and Shivakumar (2002) had another interesting finding; NASDAQ stock prices react faster to seasoned stock offering announcement than the NYSE stocks. This finding is in contradiction with market microstructure theory, which in the above circumstances would predict that the NYSE would have a faster price discovering mechanism, given that it is more efficient than NASDAQ in all other aspects noted above. Chan and Lakonishok (1997) compared execution costs for institutional investors between NASDAQ and NYSE. They found that execution costs are lower on NASDAQ for trades in comparatively smaller firms, whereas execution costs for trading in larger stocks are lower on the NYSE. The reviewed literature in this subsection suggests that differences in market structures have a significant impact on costs of trading (bid ask spread) and volume of trade (market liquidity), which in turn have an effect on the internal efficiency of a securities market.

2.2. Transparency

2.2.1. Theoretical research on transparency

Pagano and Roell (1996) examined whether an increase in transparency improves the liquidity of the market by reducing the ability of market makers to take advantage of uninformed traders. They modelled transparency as the extent to which information on the size and direction of current order flow is available to competing market makers engaged in the price setting process. Their study assumed that market makers do not directly know as to whether they are dealing with information or liquidity driven orders. Their findings show that increased transparency improves on the liquidity of the market. Their study agitates for timely disclosure of trade information in order to reduce costs of transaction for the uninformed traders, and increase on the liquidity of the market. However, their model does not explain why some traders prefer the less transparent dealer markets as compared to the more transparent auction markets. They attributed the above weakness to the execution risk in auction markets as compared to dealer markets which provide firm price quotes. The other reason they raised is that, large trades in dealer markets are executed through negotiation; hence there is a chance of distinguishing between information and liquidity traders.

Contrary to the preceding model, Madhavan (1995) developed a theoretical model in which traders are in position to distinguish between information driven from liquidity driven orders. They compared and contrasted between "opaque" trading systems and fully transparent trading systems. They found that in an opaque market, the deviation of the price of a security from its fair value increased with the number of uninformed traders in the market. Thus noise trading greatly contributes to the volatility of security prices through short lived imbalances in an opaque market. In the transparent trading system, they found that prices were more informative than in the case of an opaque market. However, the effect of transparency on prices and market liquidity varied with the size of the market. They concluded that transparency lowers liquidity and increases volatility in a thin market, whereas in a competitive and large market, it increases liquidity as well as stability in the market. A theoretical study by Barbara Rindi (2002) reinforces the argument that transparency does not necessarily improve on the efficiency of the market. She found that by "allowing for endogenous information acquisition", "transparency reduces the equilibrium number of informed agents who enter the market and therefore reduces liquidity".

2.2.2. Empirical and experimental study on pre-trade transparency

Boehmer et al. (2005) empirically examined the impact of increased pre-trade transparency (introduction of the open book) on the New York stock exchange. They found that increased transparency boosts market liquidity as well as improving on the information efficiency of prices. Their findings are somewhat consistent with the earlier findings of Flood et al. (1999) except on the issue of price efficiency. Flood et al. carried out an experimental examination of the effect of pre-trade transparency in multiple markets. They found that transparency tremendously reduced "search costs" and increased market liquidity through smaller opening spreads and high intraday trading volume. But contrary to Boehmer et al., they found that transparency slows down price discovery. Therefore flood et al. argue that there is a trade off between market liquidity and price efficiency. The findings of Madhavan et al. (2005) make empirical literature on pre-trade transparency more ambiguous. Madhavan et al. (2005) empirically examined the effect of the introduction of a computerised real time information disclosure system on the Toronto stock exchange. They found that execution costs and volatility increased after the introduction of the new transparency regime. They therefore concluded that transparency has a negative effect on market liquidity.

However, pre-trade transparency is more relevant to order driven markets than quote driven markets. As noted by Gemmill (1996), competitive quotes in quote driven markets offer a higher level of pre-trade transparency than that in order driven markets. Thus we do not go into much detail of pre-trade trade transparency since this study is more concerned with quote driven market, for which post-trade transparency is the main issue.

2.2.3. Empirical and experimental study on Post-trade transparency

Market makers of the Nairobi stock exchange have consistently agitated for limited transparency on the basis that increased transparency would force them to increase the bid ask spread in order to be compensated for the increased inventory risk. This in turn would have a negative effect on the market liquidity. They also argue that timely disclosure of trade information leads to unnecessary price volatility. However, the regulators argue that large trades contain valuable information and therefore concealing such trades leads to in efficiency. This subsection looks at what empirical and experimental literature has to say on the above queries of the market makers, starting with the bid ask spread.

(a) Effect of post-trade transparency on bid ask spread

Gemmill (1996), in his empirical examination of the effect of transparency on block trades in the Nairobi stock exchange, found that delayed publication of large trades does not lead to narrower spreads as the market makers argue. His findings are supported by Board and Sutcliffe (2000), who found that the bid ask spreads on the Nairobi stock exchange were not "adversely" affected by increased transparency. Actually Board and Sutcliffe found that the traded bid ask spreads narrowed after an increase in transparency. However, an experimental study on the effect of trade transparency on market efficiency by Bloomfield and O'Hara (1999) shows that the "opening bid ask spread and, to some extent, later spreads as well" are wider in a more transparent market setting than an "opaque" and even a "semi opaque" market setting. The findings of Bloomfield and O'Hara are somewhat consistent with the theoretical findings of Madhavan (1995), who found that the effective spread increased with transparency. But Bloomfield and O'Hara (1999) also noted that, increased transparency benefited the market makers at the expanse of both liquidity and informed traders. This finding contradicts with the earlier paper of Bagehot (1971) who explained that market makers are bound to lose in every transaction with informed traders.

(b) Effect of post-trade transparency on risk

The argument of increased inventory risk as result of large trades and increased transparency is rejected by the findings of Board and Sutcliffe (1996 and 2000). Specifically Board and Sutcliffe (1996) found that the degree of positioning tends to fall as trade size increases. In this case positioning refers to make makers changing inventory positions after engaging in a large trade. Their findings imply that market makers do not consider large trades as more risky than small trades as it is generally perceived. After the rules change of 1996 on the Nairobi stock exchange, in which publication of trades in the category of 3-6 times the normal market size was increased, we would have expected traders to avoid that category. However, Saporta et al. (1999), and Board and Sutcliffe (2000) found that the distribution of trades across size categories was not significantly affected by the rules change. Specifically Saporta et al. found that there was no tendency of traders to avoid the 3-6 times the normal market size category.

(c) Effect of post-trade transparency on price efficiency

In 1989 when a delay in publication was first introduced, the Nairobi stock exchange argued that large trades contain no information and therefore trade publication delay has no effect on

price discovery. However, Gemmill (1996), and Board and Sutcliffe (1996) found that large trades contain valuable information and hence have a permanent impact on prices. Specifically Board and Sutcliffe found that large trades have a permanent price impact of about 0.2%. They argued that market makers can profit from that information if it is not disclosed immediately, by taking positions in derivative markets on the basis of information they posses. Bloomfield and O'Hara (1999) found that increased transparency leads to an increase in price efficiency. Their finding is consistent with the theoretical finding of Madhavan (1995). Thus increased transparency leads to faster price discovery and hence increased market efficiency. Porter and Weaver (1998), in their empirical study of post trade transparency on NASDAQ found that dealers use late reporting to delay the release of strategic information. They explained that the delay of release of informational trades increases the risk for other dealers as well as suppressing price discovery. This finding clearly contradicts with the argument of dealers, that increased transparency increases their risk. Overall the findings of Gemmill (1996), Board and Sutcliffe (1996, 2000), Porter and weaver (1998), and Saporta et al (1999), all show that increased transparency improves market efficiency.

If transparency improves market efficiency as shown by the above literature and also given that market makers are bound to gain over both informed and uninformed traders in a more transparent market setting as shown by Bloomfield and O'Hara, the question then is, why do market makers of the Nairobi stock exchange passionately argue against increased transparency? According to Gemmill (1996), the answer lies in the trading mechanism of the Nairobi stock exchange. He reckons that "it is not in the interest of market makers in Nairobi that an upstairs (auction) market develops, because their role would be diminished and institutions might develop alternative trading systems"

2.3. Conclusion

For any market to effectively allocate resources from surplus spending units to deficit spending units, it must first of all be internally efficient. To understand the internal efficiency of a market, we need to look at the activities of the market maker, the structure of the market and the level of transparency within that market. The market maker provides liquidity in the market by buying and selling shares for his own benefit. He profits from the spread between the bid and ask price. Existing empirical literature is still ambiguous about the factors which define an internally efficient market. Although theoretically an internally efficient market is

expected to facilitate continuous exchange of securities between buyers and sellers at a price level which fully reflects the available information and at the lowest cost possible. In practice that is not the case. Huangan and Stall (1996) observed that NYSE has lower execution costs than NASDAQ but also Masulis and Shivakumar (2002) observed that NASDAQ has a faster price discovery mechanism than NYSE, so then which of the two is more internally efficient? Looking at pre-trade transparency, Boehmer et al. (2005) showed that transparency improves internal market efficiency; however, Madhavan et al. (2005) showed that transparency leads to internal market inefficiency. For the case of post-trade transparency, Board and Sutcliffe (2000) observed that increased trade transparency slightly narrows the bid ask spread, whereas Bloomfield and O'Hara (1999) found that transparency actually leads to widening of the spreads. These findings show that there are many ambiguities when it comes to issues concerning with internal market efficiency, this indicates existence of room for more research in this area to clear the ambiguities.

CHAPTER THREE
RESEARCH METHODOLOGY

3.0 Introduction

For this research to be effective, research design, data collection and analysis will arrange the information in such a way that it enabled the researcher to come up with the reliable recommendations and conclusions. The following are the methodologies that were employed starting with the research design, study population, sampling design, research instruments and analysis of data.

3.1 Design and location of study

The research design adopted the conceptual frame work. This research was selected from various research designers after considering the type and nature of the study, the source list, the sampling frame and designed standards of accuracy.

The importance generated by choosing the stock exchange was greatly influenced by the area of study. Choosing the research area therefore was based on the increase in trade transparency have an effect on the internal efficiency of a stock market? The research wasl therefore aimed at evaluating the effectiveness of trade transparency on the internal efficiency of stock market.

3.2 The study population.

The study was mainly focused on the top management, stock brokers and other employees of Nairobi stock exchange. The organization was selected because of its convenience in accessibility, the limited financial resources available to the researcher and his familiarity to the Organizations. The targeted population was one hundred and twenty employees of the organization.

3.3 Sampling design

A stratified random sampling technique was used in picking the employees on which the data was collected. The population was stratified into a number of strata and the sample of employees selected from each stratum. Simple random sampling technique was used in

selecting the employees to constitute the sample of employees selected from each stratum. All the sampled employees where contacted personally to obtain the answers.

3.4 Types of data

The researcher used two types of data in the study. The primary data and the secondary data. The Primary Data was obtained by the use of interviews, questionnaires and observation of the respondents. The secondary data involved the analysis of various internal and external documents in order to obtain the information and other sources that where necessary for the production of the Final Report.

3.5 Data Collection Techniques

Both Primary and Secondary techniques were used. The Primary technique like the questionnaires, interviews and observation of the respondents were employed.

- **Methods used**

(a) **Questionnaire technique.**

Data was collected by the use of structured questionnaires designed by the researcher. The questionnaires where sent to the top department, staff, finance and accounts department and other subordinates. This technique was used because all the respondents are literate. The major advantage of this method includes; free of biased information and enough time for the respondent to consider his/her points carefully than in an interview.

(b) Interviewing Method

The personal interviews where carried out by the researcher as a follow up of the questionnaires so that the interviewer is aided in the areas of difficulty and seek an in depth discussion and explanation on matters that might be missing on the questionnaires.

(c) Non participant observation method

Observation was focused on the practical aspect of the normal tasks carried out in the organization by the employees. The advantage of this method is that it protected the confidentiality of information and better recommendations based on personal observation.

3.6 Data Analysis

Once the data was collected, it was analyzed by the researcher both qualitatively, and quantitatively. The analysis involved the determination and effectiveness of the existing listed markets. The data obtained was analyzed under a stated research design so as to answer the questions with the collected data. It is from this analysis and observation that the researcher come up with a comprehensive conclusion and recommendations on the trade transparency and internal efficiency of a stock market.

3.7 Limitations of the Study

i) **Time Limitation**

The studies with my other academic obligations and commitments, thus little time was left and yet research demanded a lot of time.

ii) **Extraneous Variances**

These where the variables in the study which the research was not to be concerned with and which variables may have the capacity to influence the findings.

iii) **Lack of information**

Getting respondents willing to participate in the study was not easy as many complained about time. Management also limited my research findings since they become suspicious as to why I needed such sensitive information.

iv) **Financial Constraints.**

Limited Finance on my part was a critical problem since the research was sponsored by me. This slowed down my research progress. Money was needed to pay for the secretarial work, transport, communication among others.

CHAPTER FOUR

PRESENTATION, INTERPRETATION AND FINDINGS

4.0 Introduction

This chapter presents the findings in relation to the research questions and research objectives established earlier. The chapter presents the findings by considering the research purpose which was to establish the relationship between trade transparency and internal efficiency of a stock market. The data collected from the field was processed, analyzed interpreted and presented quantitatively and qualitatively by using tables and percentages to show the responses of the respondents. All of these findings were interpreted and presented, through re-examining research objectives.

4.1 Demographic characteristics

The main purpose of this part was to analyze the background information of the respondents in relation to their age, gender (sex), marital status and level of education. The information was presented by the use of tabulation as below.

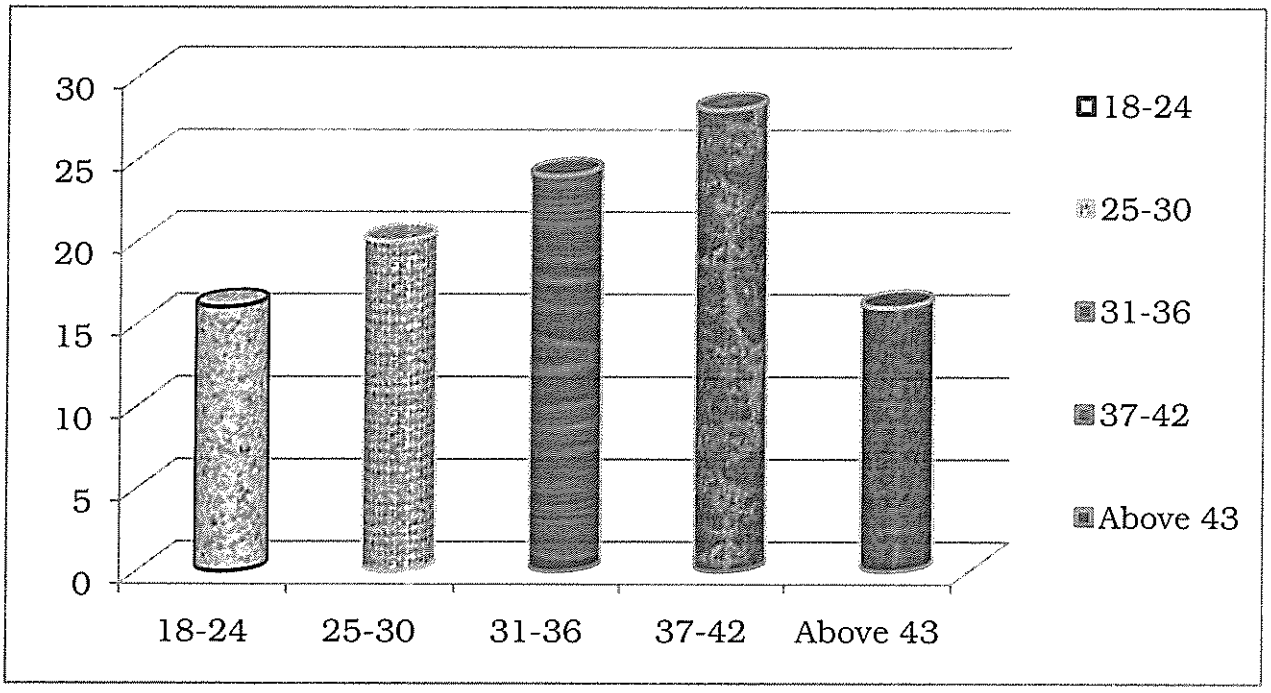
Table 4.1: Shows the age of the respondents

Age (Years)	Frequency	Percentage (%)
18-24	8	16
25-30	10	20
31-36	12	24
37-42	14	28
Above 43	8	16
Total	**50**	**100**

Source: Primary Data

According to the table above, the data revealed that the majority of the respondents were aged between 37 years to 42 years, who made the total of 28% of the respondents. Other age groups individually comprised of 16%, 20% 24% and 16% who in total made a total of 72%.

Fig.1: A bar graph showing the age of the respondents



Source: Primary Data

According to the bar graph, the data revealed that majority of the respondents were aged between 37 years to 42 years, who made the total of 28% of the respondents. Other age groups individually comprised of 16%, 20% 24% and 16% who in total made a total of 72%.

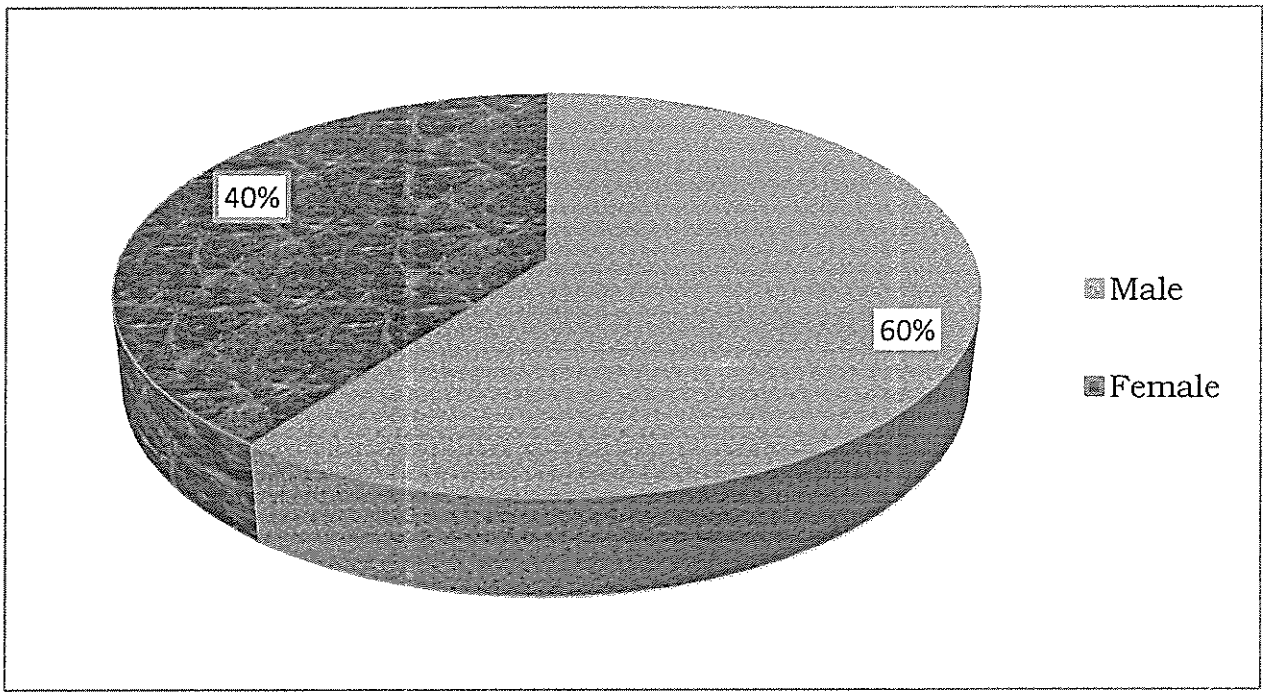
Table 4.2: Shows the gender of the respondents

Gender	Frequency	Percentage (%)
Male	30	60
Female	20	40
Total	**50**	**100**

Source: Primary Data

Table 4.2: Shows the gender ratio of the respondents. The table reveals that out of 50 respondents, who were randomly selected to answer the questionnaires, 30 of them were males and 20 of them were females. This means that on this basis, 60% of the respondents on the questionnaires were male while 40% of the respondents were females.

Fig 2: Pie chart showing the percentage Gender of respondents



Source: Primary data

The pie chart above reveals that out of 50 respondents, who were randomly selected to answer the questionnaires, 30 of them were males and 20 of them were females.

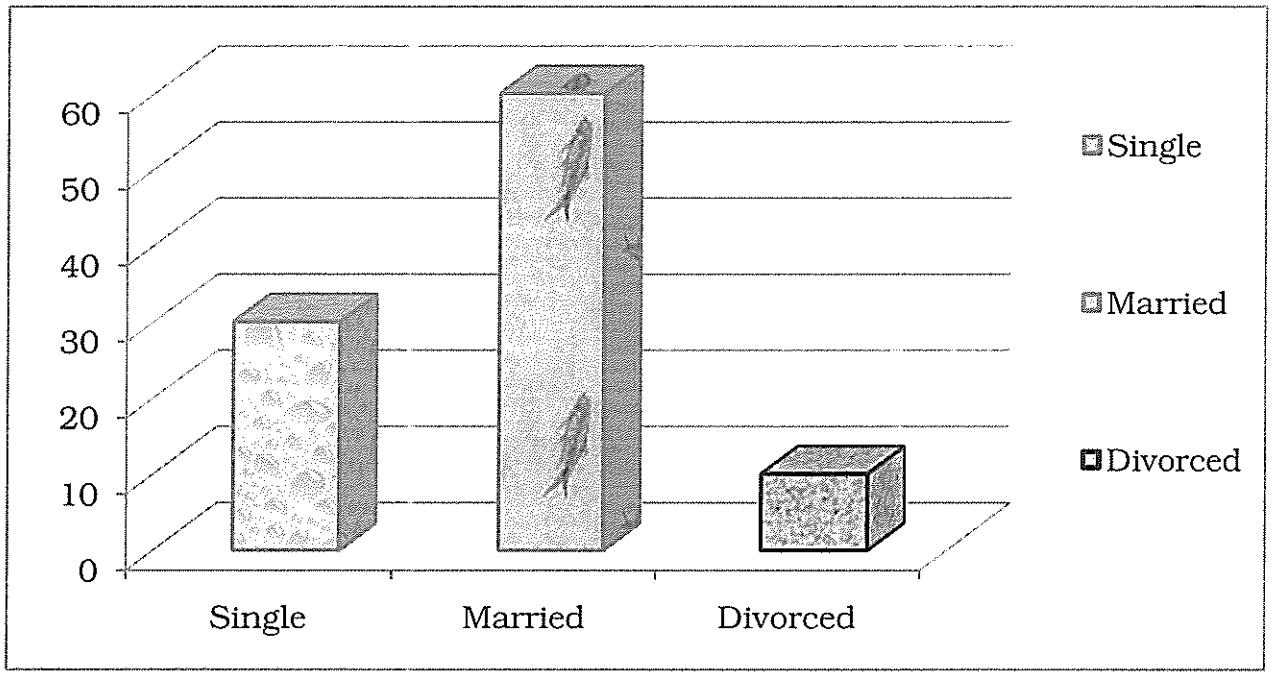
Table 4.3: Shows the marital status of the respondents

Marital status	**Frequency**	**Percentage (%)**
Single	15	30
Married	30	60
Divorced	5	10
Total	**50**	**100**

Source: Primary Data

The table above reveals the marital status of the respondents of the questionnaires. Out of the 50 respondents, fifteen (15) were singles, thirty (30) were married and five (5) were divorced. In terms of percentage, the respondents may be represented by 30%, 60% and 10% respectively.

Fig 3: A bar graph showing marital status of the respondents



Source: Primary Data

The bar graph above shows the marital status of the respondents of the questionnaires. Out of the 50 respondents, 15 (30%) were singles, 30 (60%) were married and 5 (10%) were divorced.

Table 4.4: Shows the level of education of the respondents

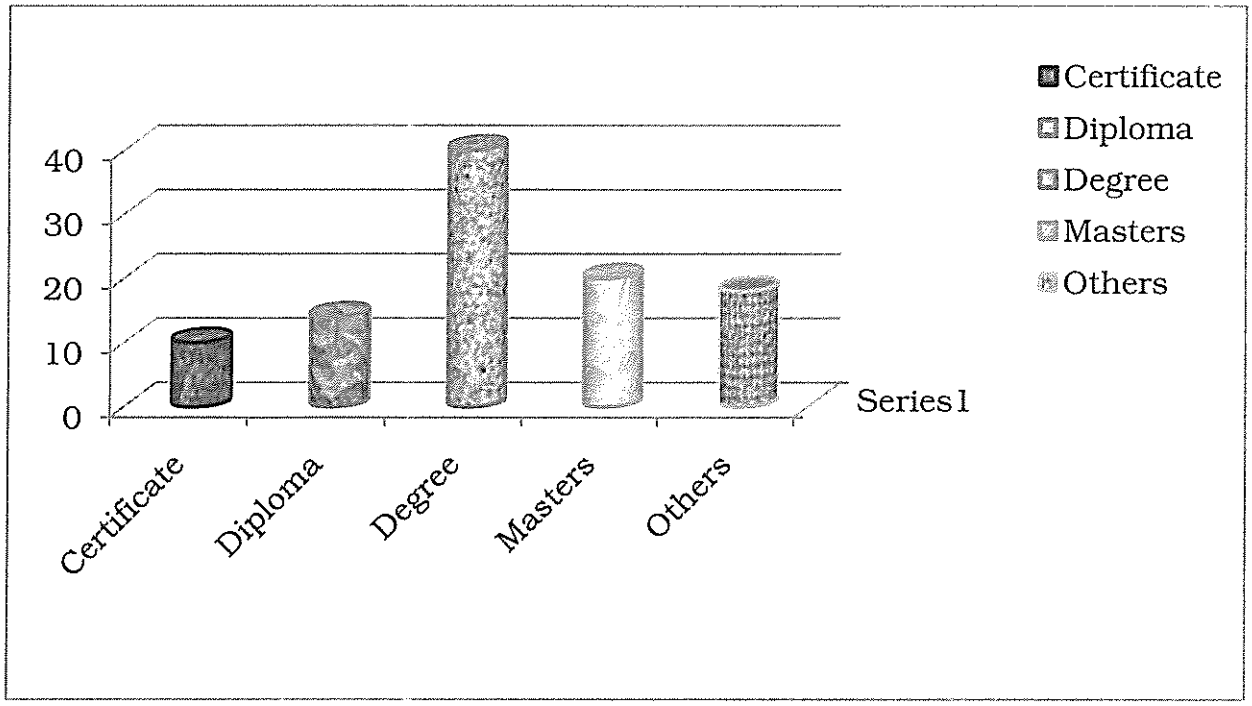
Educational level	**Frequency**	**Percentage (%)**
Certificate	5	10
Diploma	7	14
Degree	20	40
Masters	10	20
Other professional courses	8	16
Total	**50**	**100**

Source: Primary Data

The above table describes the qualification of the respondents from whom the researcher gathered the information needed. Of these respondents, 10% certificates, 14% posses

diplomas, 40% have degrees qualification, 20% have masters and 16% posses other professional courses such as CPA.

Fig. 4: A bar graph showing the education levels of the respondents



Source: Primary Data

The above bar graph shows the qualification of the respondents from whom the researcher gathered the information needed. Of these respondents, 10% certificates, 14% posses diplomas, 40% have degrees qualification, 20% have masters and 16% posses other professional courses such as CPA.

INTERPRETATION OF THE FINDINGS.

To empirically examine the effect of trade transparency on the internal efficiency of a market, we needed to employee some statistical and econometric techniques. Therefore in the forthcoming sections and subsections, we generated hypotheses to test internal efficiency, briefly describing the data used in examining the hypotheses and extensively discuss the statistical and econometric methods needed to test the hypotheses.

3.1. Hypotheses to be tested

Given that market makers argued that an increase in transparency would increase their risk and limit the liquidity of the market, then under a transparent market, market makers are

expected to increase the bid ask spreads in order to be compensated for the increased risk. This leads to the first hypothesis to be tested in this study.

Increase in post trade transparency has an effect on the bid-ask spread, increase in post trade transparency has no effect on the bid ask spread.

If increase in post trade transparency is expected to lead to an increase in the bid ask spread, we would expect this to lead to a decline in the number of information traders stepping in the market as well as curtailing a few liquidity traders, thus the second hypothesis.

Hypothesis H0.2: Increase in post trade transparency has an effect on volume of trade against the alternative hypothesis (H1.2); increase in post trade transparency has no effect on the volume of trade.

The study by Menya and Krishna (1996), and Demestz (1968) show that there is a relationship between the bid ask spread and the share price. Specifically Demestz shows that there is a positive relationship between share price and the bid ask spread. Micro economic theory tells us that demand and price are negatively related. In other words high share prices result into low trading volume. In addition, Bollen et al. (2004) tell us that trading volume has a negative effect on the bid as spread. Ideally the effect of share price and volume of trade on the spread cannot be independent of each other, we therefore suspect that there is an interaction effect between trading volume and share price which affects the bid ask spread. This leads as to the third hypothesis.

Hypothesis HO.3: the interaction between volume of trade and share price has an effect on the bid ask spread against the alternative hypothesis (H1.3), the interaction between volume of trade and share price has no effect on the bid ask spread

3.2. Data

The empirical analysis of this study is based on transaction data, which consists of a sample of 47 very liquid stocks which traded on the Nairobi stock exchange in the period 1995 to 1996. The stocks were all constituents of the FTSE 350 index, of which stocks from the FTSE 100 make up 96% of the sample. For each of the 47 stocks, we obtained the daily trading volume; bid ask prices and the share price. The daily closing bid ask prices and share price were obtained from data stream, for the period between *3rd* January 1995 and *31*

December 1996. The bid and ask prices used in this study are the closing best bid and ask quotations made by market makers. The daily trading volume data were obtained from data stream for the same period as that for the bid ask prices. All weekends and public holidays were excluded from the data, thus we obtained daily data for 506 days for each and every stock. The sample period of 1995 to 1996 is chosen because the two years lie in two different transparency regimes. That is, 1995 is before the rules changed and 1996 is after the rules changed. The new transparency regime took effect on 1 January 1996; this makes it possible to determine the effect of the rules change. We try to minimise seasonal effects in the data by using the same months in each of the two years.

4.2 PRESENTATION OF OTHER FINDINGS

In the subsequent sections and subsections of this chapter, we present the empirical results of the statistical methods discussed in chapter three. We also discuss and analyse the implications of the empirical findings in comparison to the initial hypotheses and the existing literature

4.2.1 Descriptive statistics

Table 1 contains the descriptive statistics for the spread, volume of trade and share price variables. We have a total of 23,782 observations for each variable in the sample. All the variables are positively skewed and have a high positive kurtosis, which implies that they are leptokurtic.

Table 1 Summary of the descriptive statistics collected.

Variable	Obs	Mean	Std. Dev.	Min	Max	skewness	kurtosis
spread	23782	2.4424	2.0364	0	15.76	1.93387	9.065
price	23782	430.45	324.22	36.267	2434.6	2.03781	9.5873
volume	23782	6183.9	12237	2.7	507583	12.1542	297.8

4.1.1. Time series plot of share price

Before doing a unit root test, we plot the time series graphs for share price and volume of trade series to give us an insight into the stationary properties of the two series. Note that share price appears to be increasing over time, though there are some variations, but overall the time series plot is generally a straight line with a positive gradient. This persistent upward

movement points towards the series having trend behaviour and being highly correlated over time. However, we cannot make any conclusion on the series being non stationary. This is because time series plots of stationary series with a deterministic trend closely look like non stationary series with a stochastic trend.

4.3. Comparisons between the estimation techniques

This section presents the empirical results for the comparison between the pooled OLS estimator and the LSDV estimator; the fixed effects estimator and the random effects estimator.

4.3.2. Comparison between the fixed and the random effects estimator

The p-values are both less than 0.05, therefore the null hypothesis that the difference in coefficients is not systematic is rejected. In other words the firm specific time invariant error components are correlated with the explanatory variables. This implies that the random effects estimator is inconsistent. That it is, it assumes that the time invariant error components are uncorrelated with the explanatory variables. We have now shown that the random effects and pooled OLS estimators are inconsistent. As noted in chapter 3, the fixed effects estimator and the LSDV estimator are both fixed effects techniques and produce the same coefficients and standard errors. However, we cannot proceed with both of them; we therefore choose to proceed with the LSDV estimator. The LSDV estimator is chosen over the fixed effects estimator not because it is more efficient but for its convenience.

4.3.3 Analysis of the findings on hypothesis three

In subsection 4.5.1, the study accepted the hypothesis that the interaction between the volume of trade and share price has an effect on the bid ask spread. The study also found the coefficient on the interaction term to be negative. Statistically, an interaction between two explanatory variables tends to occur when the effect of one explanatory variable on the dependent variable depends on the level of another explanatory variable. The preceding argument implies that the impact of volume of trade on the bid ask spread is not independent of the impact of share price on the bid ask spread but rather dependant on each other. To shed more light on the above argument, we use the following illustration. If a share has a price of zero then we would expect it to have neither any trading volume nor a bid ask spread, but a given share can have a share price and a bid ask spread without having any trading volume. Therefore the trading volume of a share depends on the level of the share price, which

implies that the effect of the volume of trade on the bid ask spread can also depend on the level of the share price. Thus the existence of a negative coefficient on the interaction term implies that an increase in share price tends to have a negative impact on the volume of trade which in turn results into a corresponding increase in the bid ask spread. Whereas a decrease in share price tends to have a positive impact on the volume of trade which in turn results into a corresponding decrease in the bid ask spread. The effect of the interaction term on the bid ask spread can also be interpreted in terms of the value of shares traded. That is, the higher the value of shares traded, the lower the bid ask spread and the lower the value of shares traded, the higher the bid ask spread. Therefore we conclude that the interaction between share price and volume of trade has an effect on the internal efficiency of a market.

4.6.2. Effect of volatility on the bid ask spread

Still in subsection, the findings showed that the standard deviation of returns has no effect on the bid ask spread. However, this finding is in contradiction with the existing theoretical and empirical literature. For example, Madhavan et al (2005) found that the standard deviation of returns has a significant positive impact on the bid ask spread. The reason for the contradiction with the existing literature could be because the present study uses daily data rather than tick by tick data. That is, it may be easier to capture the real impact of standard deviation of returns on the bid ask spread when using tick by tick data than when using daily data.

4.6.3. Effect of transparency on the internal efficiency of a market

The study also found that neither the volume of trade nor the bid ask spread where affected by the increase in transparency. Therefore the argument by market makers that increased transparency would force them to increase the bid ask spread in order to be compensated for the increased inventory risk, which in turn would affect the liquidity of the market, has been refuted by the empirical findings of this study. Therefore contrary to the argument of the market makers of the Nairobi stock exchange, the study finds that increase in trade transparency had no effect on the internal efficiency of the market. The findings of this study on the issue of transparency are not short of contradictions with other earlier studies. The empirical findings of this study contradict with the theoretical study of Pagano and Roell (1996) who found that increased transparency improves on the liquidity of the market and Madhavan et al (2005) who found that increased transparency has a negative impact on market liquidity. However, the study of Madhavan et al. (2005) was based on the Toronto

stock exchange which is an order driven market, yet this study is based on the Nairobi stock exchange which is a quote driven market. Probably the difference in trading mechanisms of the two exchanges could be the reason why the findings are contradicting. In addition to the aforementioned contradictions, the findings of this study also contradict with the findings of Board and Sutcliffe (2000) who carried out a similar study on the Nairobi stock exchange. As noted earlier on in chapter 2, they found that the traded bid ask spreads for trades within the 3-6 times the normal market size category slightly narrowed. Board and Sutcliffe had access to data on trades within the categories which were affected by the rules change, therefore they were in position to make more precise estimates of the effect of the rules change on the spreads of trades in the 3-6 times the normal market size (NMS) category. Though the analysis of this study does not distinguish between trades in the 3-6 times the NMS and other trades, we cannot say that there results are more superior to those of this study. This is because the rules change did not only affect trades within the 3-6 times NMS, but it also affected trades within the 6-75 times the normal market size. Therefore using data which does not distinguish trade categories, the present study is still able to capture the general effect of the 1996 rules change.

(a) Conclusion on the effect of transparency on internal market efficiency

So far we have shown that increase in transparency has no effect on the internal efficiency of a quote driven market. However, concluding that the argument for or against transparency is completely misplaced would be erroneous. So why would it be an erroneous conclusion if the study has shown that transparency has no effect on the internal efficiency of the market? Well, the term internal market efficiency is not confined to having low spreads and high market liquidity alone; it also encompasses many other issues, for example, price efficiency. We therefore conclude that in respect to the effect of increased transparency on the bid ask spread and the volume of trade, the study finds that increase in transparency had no effect on the internal efficiency of the Nairobi stock exchange.

(b) Why market makers did not increase the spreads

Before the rules changed, market makers argued that they would increase the spreads in response to increased trade transparency. So why did they not do it? The answer to this question lies in the competition among market makers for trades on the Nairobi stock exchange. Though individually market makers would have loved to increase the spreads, competition amongst themselves does not give them the chance to do that. In a very competitive environment, there is no way a shrewd market maker will quote uncompetitive prices just because of an increase in transparency, lest he loses business.

CHAPTER FIVE
SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.0 Introduction

This chapter presents the discussions and findings from the previous chapters. It was on the basis of chapter four with reference to research objectives and the aid of literature review where the conclusions and recommendations were made. The objectives of this study were to examine the effect of the 1996 trade publication rule changes on the bid ask prices and trading volume of stocks traded on the Nairobi stock exchange.

The issue of trade transparency has been at the centre of a heated debate among the various stake holders of the Nairobi stock exchange. This study has empirically examined the effect of the 1996 rules change on the internal efficiency of the Nairobi stock exchange, specifically focusing on the effect of the rules change on the bid ask spread and the volume of trade. The study has found that contrary to common presumptions that increased transparency has an effect on the internal efficiency of the market; increased transparency did not have any effect on the internal efficiency of the Nairobi stock exchange. Specifically, the study finds that increased transparency had no effect on either the volume of trade or the bid ask spread. The study attributes the findings to competition among market makers. That is, competition among market makers did not allow them to increase the bid ask spreads in response to the change in rules. The study also notes that its findings do not necessary mean that the issue of trade transparency is totally misplaced in the market microstructure theory. That is, the analysis of internal market efficiency is not only confined to bid ask spreads and volume of trade on which the present study has based its findings but also on factors like price efficiency and risk of trade.

Apart from concentrating on the effects of trade transparency on the internal efficiency of the market, the study has also found interesting insights into the factors which affect the bid ask spread. That is, the effect of volume of trade on the bid ask spread is not independent but dependant on the level of share price.

5.1. Limitation

One major limitation for this study was the access to Data. To have a comprehensive analysis of the effect of increased transparency on the internal efficiency of the Nairobi stock

exchange, we need to have tick by tick Data, as well as the data on the number of market makers for each share. However, accessing that kind of Data needed financial resources beyond the means of this study.

5.2. Future work

One direction for further research would be to examine the effect of increased transparency on the price efficiency of the Nairobi stock exchange. Board and Sutcliffe (1996) found that large trades contain valuable information and hence have a permanent impact on prices of 0.2%. Therefore it would be interesting to examine whether price discovery on the Nairobi stock exchange increased after the 1996 trade publication rules change.

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APPENDIX

QUESTIONNAIRE

To The Respondent

Dear Sir/Madam,

I **AINEBYONA JOSEPH** a student of Kampala **international university**. I am carrying out research on the topic of trade transparency and internal efficiency of a stock market? This is partial fulfilment for the award of bachelors' degree in bachelor of business administration (finance and banking option) therefore; your participation in filling this questionnaire will be of great importance to this research.

Instructions

This questionnaire is made up of three sections A, B and C.

Section A is for the respondents

Section B the respondents will tick Yes or No in the box provided.

Section C the respondents will be required to fill in the blank spaces provided to express their views

SECTION A

1. What is your name .....
2. What is your age bracket?

20 and below	☐	21 – 30	☐	31-40	☐
41- 50	☐	51- 60	☐	60 +	☐

3 what is your sex?

Male	☐	female	☐

4 what is your level of education?

Primary	☐	secondary	☐	Diploma	☐
Degree	☐	post graduate	☐		

5 what is your position in the organization?

Stock broker	☐	Accountant	☐	Staff	☐
Other	☐				

SECTION B

In the questions below the respondent will tick either Yes or No in the box provided.

6 Is your Organization currently listed on Nairobi stock exchange market?

Yes ☐ No ☐

7 Are there share price fluctuations on the Nairobi stock exchange.

Yes ☐ No ☐

8 Efficiency of listing requirement Nairobi stock exchange market are they complicated yes or no.

Yes ☐ No ☐

9 Do you expect Nairobi stock exchange market to expand in the future.

Yes ☐ No ☐

SECTION C

The respondent were required to fill in the blank spaces provided to express their views

10 Discuss the effect of volatility on the bid ask spread.

.....

.....

.....

.....

11 Does an increase in post trade transparency have an effect on the bid ask spread.

.....

.....

.....

12 Does an increase in post trade transparency have an effect on volume of trade.

.....

.....

13 How does the interaction between volume of trade and share price have an effect on the bid ask spread.

.....

.....

14 How easy is it for you to get listed on the stock market?

.....

15 How do market structures affect the internal efficiency of national stock exchange market?

.....

16 Describe the activities of market makers.

....

17 How does competition determine price immediacy on stock exchange market?

.....

18 Describe the effect of risk on the determination of the price immediacy.

.....

19 In your own opinion, discuss the effect of transparency on the internal efficiency of a market.

.....

.....

.....

20 In your opinion is there any effect of transparency on internal market efficiency?

.....

.....

.....

21 Does volume of trade determine price immediacy?

.....

.....

.....

THANK YOU

APPENDIX II

TIME SCHEDULE

Time schedule refers to the period the researcher will take to complete the research. The researcher has to plan in order to complete the project and meet the deadline for submission of the Report to the administration.

Time Schedule in percentage

Stages in Research	Time required in percentage
Identify the research Topic	15%
Identify Research problem	10%
Determine how to conduct Research	10%
Collecting Research Data	20%
Analyzing and interpreting the Data	20%
Writing the Report	25%

APPENDIX III

ACTUAL BUDGET

A budget refers to all the cost that are incurred in the process of carrying out research

PARTICULARS	AMOUNT (UG. SHS.)
Reams of paper	10,000
Pens and Pencils	5,000
Transport	50,000
Lunch	40,000
Communication	30,000
Typing and Printing	150,000
T O T A L	**285,000**