A SURVEY OF STOCK INDICATORS USED BY STOCKBROKERS, INVESTMENT BANKS AND MUTUAL FUNDS AT THE NAIROBI STOCK EXCHANGE (NSE)

SUBMITTED BY

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D61/P/9018/04

A RESEARCH PROJECT SUBMITTED IN PARTIAL FULFILMENT FOR THE AWARD OF MASTERS DEGREE IN BUSINESS ADMINISTRATION (MBA) OF THE UNIVERSITY OF NAIROBI, SCHOOL OF BUSINESS

SEPTEMBER 2007

DECLARATION

This MBA research project is my original work and has not been submitted for presentation at the University of Nairobi or any other institution of higher learning

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

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DEDICATION

I dedicate this study to my parents who despite having little formal education worked hard to ensure their children got good education. Your support and encouragement has been unequivocal at all times. To you I say thank you very much, and may God bless you abundantly.

ACKNOWLEDGEMENT

This study would not have been possible without the encouragement, support, criticism and assistance of my family, friends, MBA colleagues, lecturers and my supervisor.

First, my appreciation goes to my family for their support, assistance and understanding, which served as an encouragement during this study.

Second, my appreciation goes to my supervisor Mr. Luther Otieno Odhiambo for the advice, suggestions, criticism and encouragement during the study. Their significance cannot be over emphasized.

My gratitude goes to Martin Karani and Pius Ng'ang'a for their invaluable assistance and suggestions that served to enrich this study.

My thanks go to my MBA colleagues Peter Chege, Grace Misyili, Regina Ngyema, Kathleen Chepkemboi, George Omuya, Elizabeth Lwali, Rebecca Nekesa, Joan Karuga, Jacob Munyi and Norman Shitote. The discussions, brainstorming sessions and cooperation we shared through out the MBA program were special. I enjoyed your company at all times which I found fruitful and fulfilling. To you all I say thank you so much, and may God bless you abundantly.

Finally, I thank all organizations that responded to the questionnaire during the fieldwork.

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ACRONYMS AND ABBREVIATIONS

ADR	American Depository Receipts
AMEX	American Stock Exchange
CMA	Capital Markets Authority
LTD	Limited
NASDAQ	National Association of Securities Dealers Automatic Quotation System
NSE	Nairobi Stock exchange
NYSE	New York stock exchange
STD	Standard
S&P 500	Standards and Poor's 500 Index
US$	United States Dollar

ABSTRACT

Traders and investors use stock indicators to make investment decisions. The stock indicators used by these players at the Nairobi Stock Exchange (NSE) are not known yet. This study determines the nature and extent of usage of stock indicators by Stockbrokers, Investment Banks and Mutual Funds at the NSE. Additionally, it determines the influence of the profile of a firm on the choice of stock indicators used at the NSE. This study is necessary because it takes the first step in determining the cross-sectional relationship between stock indicators and stock prices at the NSE. Additionally, no such study has been done at the NSE.

A linkert scale was used to collect data on the profile and usage of stock indicators from the population of study that was comprised of 13 Stockbrokers, 5 Investment Banks and 6 Mutual Funds trading in the NSE during the years 2000 to 2006. Seventeen out of 24 firms in the population responded to the questionnaire representing a response rate of 71%. Mean, standard deviation, skewness, kurtosis and the Pearson's chi-square goodness of fit tests were performed on the data collected.

The analysis showed that Price Averages were the mostly used stock indicators while market indicators like the Coppock Indicator were among the stock indicators not used at all. The results of the chi-square test showed that the profile of the firm does not influence the choice of stock indicators used at the NSE.

The policy implications of this study are the role the NSE & other interested parties should play in regulation of Stockbrokers, Investment Banks and Mutual Funds. The study provides an outline for developing guidelines to enhance the efficiency and effectiveness of the players and the NSE. The policy implications may be generalizable to emerging markets in Africa that are small in size and with nil or limited international integration.

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CHAPTER 1

1.0 INTRODUCTION

The chapter considers the background of the study, statement of the problem, research objective, importance and assumptions of the study.

1.1 Background of the Study

The stock market is one of the most closely observed economic and development phenomenon the world over. Traders and investors make buy, sell and hold decisions in the stock market with the sole objective of increasing their current wealth. The World Bank classifies the NSE like other markets in developing countries, as an emerging capital market.

Rational investors make investment decisions based on their risk return trade-off. They invest in assets they believe guarantee them a fair return based on the degree of underlying risk undertaken. Traders, investors and investment advisors use diverse investment styles in making investment decisions, one of them being Technical Analysis. Technical Analysis is the study of past price movement in an attempt to forecast the future movement of a stock. Technicians are referred to as chartists, since their primary tool is a chart of past price movements.

In employing technical analysis, traders and investors use stock indicators to make investment decisions through their Stockbrokers and Investment Banks. Mutual Funds also use stock indicators in making investment decisions. Stock indicators are divided into four main types i.e. Trend indicators, Volume indicators, Momentum indicators and Volatility indicators. Trend indicators e.g. Moving Averages attempt to provide an objective measure of the direction of a trend. Volume indicators are used to confirm the strength of trends while volatility indicators are used to confirm price behavior. Momentum indicators measure the speed at which price is changing.

The ideas of Charles Dow, the first editor of the Wall Street Journal, form the basis of technical analysis today. Dow created the Industrial Average, of top blue chip stocks, and a second average of top railroad stocks (now the Transport Average). He believed that the behavior of the averages reflected the hopes and fears of the entire market. The behavior patterns that he observed apply to markets throughout the world. Investments advisors and stockbrokers are thus able to develop investment strategies to suit a wide range of investors, from short-term swing trades to buy and hold plays. On the other hand, Fundamental Analysis is the study of the future earnings of assets through appraisal of the market, industry and company of the target stock.

A collective investment scheme is a way of investing money with other people to participate in a wider range of investments than may be feasible for an individual investor and to share the costs of doing so. A mutual fund is a form of a collective investment that pools money from many investors and invests their money in stocks, bonds, short-term

money market instruments, and/or other securities. In a mutual fund, the fund manager who is also known as the portfolio manager, trades the fund's underlying securities, realizing capital gains or losses, and collects the dividend or interest income. The investment proceeds are then passed along to the individual investors. The value of a share of the mutual fund, known as the net asset value per share (NAV), is calculated daily based on the total value of the fund divided by the number of shares currently issued and outstanding. On the other hand, Stockbrokers and Investment Banks are firms licensed by the NSE to buy-and-sell securities on behalf of their clients at the exchange. Thus, they are members of the Nairobi Stock Exchange (NSE). Their income is mainly from commissions from buying and selling securities on behalf of their clients.

1.1.1 Technical Indicators

A technical indicator is a series of data points that are derived by applying a formula to the price data of a security. Price data includes any combination of the open, high, low or close over a period of time. Some indicators may use only the closing prices, while others incorporate volume and open interest into their formulas. A series of data points over a period of time is required to create valid reference points to enable analysis. Indicators present a specific aspect of price, volume or momentum actions that are smoothed over time. These are generally plotted on a daily basis using the data in a specific range of periods.

No indicator is bulletproof. Indicators serve three broad functions: to alert, to confirm and to predict. An indicator can act as an alert to study price action a little more closely. If

momentum is waning, it may be a signal to watch for a break of support. Or, if there is a large positive divergence building, it may serve as an alert to watch for a resistance breakout. Indicators can also be used to confirm other technical analysis tools. If there is a breakout on the price chart, a corresponding moving average crossover could serve to confirm the breakout. Or, if a stock breaks support, a corresponding low in the On-Balance-Volume (OBV) could serve to confirm the weakness. Finally, investors and traders use indicators to predict the direction of future prices and make the Buy/Sell decisions.

Stock indicators may be applied to individual securities or the market. When they are applied to the market they are referred to as Market Indicators. Indicators may also be divided into leading and lagging indicators. Leading indicators are designed to lead price movements. Most represent a form of price momentum over a fixed look-back period, which is the number of periods used to calculate the indicator. Lagging indicators follow the price action and are commonly referred to as trend-following indicators. Rarely, if ever, will these indicators lead the price of a security. Trend-following indicators work best when markets or securities develop strong trends. They are designed to get traders in and keep them in as long as the trend is intact. As such, these indicators are not effective in trading or sideways markets.

An indicator that fluctuates above and below a centerline or between set levels as its value changes over time is referred to as an oscillator. Oscillators can remain at extreme levels (overbought or oversold) for extended periods, but they cannot trend for a sustained period. There are many different types of oscillators and some belong to more than one category. The breakdown of oscillator types begins with two types: centered oscillators, which

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fluctuate above and below a center point or line, and banded oscillators that fluctuate between overbought and oversold extremes. Generally, centered oscillators are best suited for analyzing the strength or weakness, or direction, of momentum behind a security's move, while banded oscillators are best suited for identifying overbought and oversold levels. The Chaikin Money Flow (CMF) and Rate of Change (ROC) are examples of centered oscillators that fluctuate above and below zero. Banded oscillators fluctuate above and below two bands that signify extreme price levels. The lower band represents oversold readings and the upper band represents overbought readings. These set bands are based on the oscillator and change little from security to security; allowing the users to easily identify overbought and oversold conditions. The Relative strength Index (RSI) and the Stochastic Oscillator are two examples of banded oscillators.

1.1.2 Market Indicators

Market indicators are any indicators used to assess the overall market conditions and detect overbought and oversold levels in the market. They can include economic indicators such as interest rates, or sentiment indicators like bullish percent index. Broader averages such as the S&P 500 and the NASDAQ Composite Index are also examples of market indicators that inform investors what the market is doing at any given moment or over a period of time. Market indicators meet the demand for measures of stock performance. They quantify movements in stock prices and act as a standard in evaluating the returns on money invested in the stock market. Stock market indices as aggregate measures are an instrument to meet information requirements of investors by characterizing the development of global markets and specified market segments, Odera (2002).

Nelson (1903) described market cycles in three movements. He believed that Markets fluctuate in more than one time frame at the same time and have three well-defined movements, which fit into each other. The first is the daily variation due to local causes and the balance of buying and selling at that particular time. The secondary movement covers a period ranging from ten days to sixty days, averaging probably between thirty and forty days. The third move is the great swing covering from four to six years referred to as the primary movement. The primary movement has three phases: the Bull market, the Bear market and the Secondary movements with the market

- Bull markets are broad upward movements of the market that may last several years, interrupted by secondary reactions. Bull markets commence with reviving confidence as business conditions improve and prices rise as the market responds to improved earnings. Rampant speculation dominates the market and price advances are based on hopes and expectations rather than actual results.
- Bear markets are long declines interrupted by secondary rallies. These movements are referred to as the primary trend. Bear markets start with abandonment of the hopes and expectations that sustained inflated prices. Prices decline in response to disappointing earnings. Distress selling follows as speculators attempt to close out their positions and securities are sold without regard to their true value.
- Secondary movements normally retrace from one-third to two thirds of the primary trend since the previous secondary movement.

1.1.3 The Challenge of Indicators

For technical indicators, there is a trade-off between sensitivity and consistency. In an ideal world, investors desire an indicator that is sensitive to price movements, gives early signals and has few false signals (whipsaws). Increasing sensitivity by reducing the number of periods will provide early signals, but the number of false signals will increase. Decreasing sensitivity by increasing the number of periods will decrease the number of false signals, but the signals will lag and this will skew the reward-to-risk ratio. The longer a moving average is, the slower it will react and fewer signals will be generated. As the moving average is shortened, it becomes faster and more volatile, increasing the number of false signals.

The same holds true for the various momentum indicators. A 14 period Relative Strength Index (RSI) will generate fewer signals than a 5 period RSI. The 5 period RSI will be much more sensitive and have more overbought and oversold readings. It is up to each investor to select a time frame that suits his or her trading style and objectives.

1.1.4 Overview of the Nairobi Stock Exchange (NSE)

The World Bank categorizes the NSE as a frontier and an emerging market. Small size, low activity, lack of international integration and a few intermediaries characterize an emerging market as opposed to a developed market. A frontier market refers to a relatively small and liquid market even by the standards of emerging markets (ASE 1997). The NSE was originally set up in 1953 as a regional stock exchange for Kenya, Uganda, Tanganyika and Zanzibar. Each of these member countries set up their own stock exchanges after attaining

independence. Consequently, the NSE was transformed into a solely Kenya stock exchange and thereby stopped servicing the other countries.

At end of December 2006, 44 companies were listed in the Nairobi Stock Exchange. Additionally, there were 14 licensed Stockbrokers, 5 licensed Investment Banks and 6 Mutual Funds. The licensed member firms of the NSE are licensed to buy and sell securities listed in the market on behalf of their clients. Market capitalization was approximately US$ 11 million. The exchange has three market tiers namely: Main Investments Market Segments (MIMS), Alternative Market Segment (AMS) and the Fixed Income Securities Segment (FISS). The MIMS is comprised of four segments namely: Industrial and Allied; Agriculture; Commercial and Services and Finance and Investment Segment. (www.nse.co.ke)

1.2 Research Study

1.2.1 Statement of the Problem

Benton E. Gup (1973) examined the contemporaneous relationship between stock price and stock market indicators. The results confirmed the existence of a statistically significant relationship between technical indicators and stock prices. Biggs (1966), Smith and Mayor (1968), examined the short interest ratio and found little support for the short interest theory. McDonald and Barron (1973) found gross short interest is not a useful indicator of stock prices. Kaish (1969) and Kewley and Stevenson (1967) examined the odd lot ratio

and failed to find support for the odd-lot theory. Branch (1976) concluded that stock market indicators posses forecasting ability that may get tenuous in subsequent periods due to increasing attention given to them.

The NSE has witnessed increased levels of trading during the last few years as shown by the increase in trading volume and market capitalization. Recent initial public offers by Ken Gen, ScanAd and Eveready and the Seasonal Equity Offering (SEO) by Mumias Sugar Company have seen many investors flock to the NSE to buy and sell assets in an effort to cash in on the high liquidity in the market. Equity trading volume increased from US$ 214 million in 2003 to US$ 1.4 billion 2006 representing over 6 times growth over the three year period. The increase in trading volume may have been caused by a plethora of factors among them the bullish NSE.

Invariably, investors make buy and sell decisions via Stockbrokers, Investment Banks and Mutual Funds licensed by the NSE. Investors issue various orders from market orders, limit orders, stop orders and stop limit orders to stockbrokers in making buy and sell decisions. It is not infrequent for investors to pool resources by forming groups and generating monthly savings, which they submit to these firms to make investment decisions on their behalf. In such circumstances, the firms are obligated to act on a 'best efforts' basis to maximize the investors' wealth.

The contrary findings by various researchers on the relationship between stock prices and stock indicators proffer confusing information to traders and investors on which stock

market indicators to employ in predicting stock prices. The contrary research findings and the obligations of the Stockbrokers, Investment Banks and Mutual Funds propose the raison d'ētre for this study. Additionally, the motivation for this study is being supported by the growth in trading levels in the NSE. The study primarily seeks to determine the nature and extent of usage of stock indicators by Stockbrokers, Investment Banks and Mutual Funds at the NSE. Secondly, it seeks to determine whether the profile e.g. nature and type of clientele of a Stockbroker, Investment Bank or Mutual Fund influence the choice of stock indicators at the NSE. The research questions are 'What is the nature and extent of usage of stock indicators by Stockbrokers, Investment Banks and Mutual Funds at the NSE?' Secondly 'Does the profile of a Stockbroker, Investment Bank or Mutual Fund influence the choice of stock indicators at the NSE'? The study seeks to answer these questions.

1.2.2 Objectives of the Study

- To determine the nature and extent of usage of stock indicators by Stockbrokers, Investment Banks and Mutual Funds at the NSE
- To determine whether the profile e.g. the nature and type of clientele of a Stockbroker, Investment Bank or Mutual Fund influence the choice of stock indicators used at the NSE

1.2.3 Importance of the Study

Importance of the study is two fold: -

- To assist investors, investment advisors and corporate managers to learn, appreciate and understand common stock indicators used by Stockbrokers, Investment Banks and Mutual Funds at the NSE.
- To assist scholars keen on studying stock indicators used at the NSE.
- To assist in understanding the usage of stock indicators in emerging markets in Africa that are small in size, with few intermediaries and have nil or limited international integration.

1.2.4 Assumptions of the Study

- There is no explosive 'bubble type' behaviour where asset prices deviate significantly from their past price movements thereby distorting chart movements
- The market (NSE) is not efficient and thus traders and investors continually search for under valued assets to buy and over valued assets to sell.

1.3 Overview of the Report

This paper is organized follows. The chapter one considers the background of the study, statement of the problem, research objective, importance and assumptions of the study. Chapter 2 considers the literature review comprising the predictive power of stock indicators, the predictive content of some leading economic indicators, filter rules and stock market trading and factors influencing choice of stock indicators. Chapter 3 considers the research setting, population of study, data specification, data collection and data

analysis techniques. Chapter 4 considers data analysis, interpretation of findings and discussions of the study. Chapter 5 considers the summary, conclusions, recommendations and limitations of the study, policy implications and suggestions for further research.

CHAPTER 2

2.0 LITERATURE REVIEW

The chapter examines the predictive power of stock indicators, the predictive content of some leading economic indicators, filter rules and stock market trading and factors influencing choice of stock indicators.

2.1 The Predictive Power of Stock Indicators

Various writers and analysts have claimed that quite a number of stock indicators have predictive content. Popular stock market lore and numerous books and articles support the worth of 'technical analysis'. On the other hand, the extent that stock prices follow a random walk, technical indicators would seem to be of no value. The two positions can be reconciled to a degree by realizing that a variable can follow a random walk with respect to its own sequence and still be successfully predicted by some other variables, Gup (1973).

In its narrow form, technical analysis seeks to forecast the direction of price movements of individual securities from past price movements. A broader type of technical analysis concentrates on the prediction of general market movements and trends relying on a broader set of information. Various market indicators are said to offer signals useful in forecasting future prices. One type seeks to measure investor sentiment through what might be called mood variables. A second type of indicator is more closely related to fundamental factors affecting future supply and demand for securities. Both types of indicators,

however, are designed to be used in predicting future market movements rather than movements for individual stock prices.

This is to be contrasted with fundamental analysis, which is concerned with predicting future prices of individual securities by analyzing the underlying factors related to the firm's future profitability. The division into mood and fundamental indicators is somewhat arbitrary, Branch (1976). Mood indicators include total odd-lot ratio, short selling by floor traders, the composite price earnings ratio and the Barron's confidence index.

In an efficient market, technical analysis does not lead to greater than average profits in the stock market, Dennis (1973). The efficient capital market theory is enhanced by technical analysis continuing to perform a task that has no social value, (at least in the eyes of efficient capital market theorists) Emery (1973). Fundamental indicators include specialist short selling, secondary distributions, mutual fund cash positions, the Treasury bill rate, the rate of growth of money supply and the inflation rate.

Typically, studies of technical stock market indicators examine the relationship between one indicator (e.g. the short interest ratio) and stock prices. Biggs (1966), Smith and Mayor (1968), examined the short interest ratio and found little support for the short interest theory. Furthermore, McDonald and Barron (1973) found that short sellers on balance earned either negative or very low positive returns. Thus, it appears that gross short interest is not a useful indicator of stock prices. Studies by Kaish (1969) and Kewley and Stevenson (1967) examined the odd lot ratio and failed to find support for the odd-lot

theory. A major weakness of these studies is a failure to recognize that traders and investors use more than one indicator in their technical analysis. Researchers have attempted to overcome this anomaly by examining the simultaneous relationship between various stock market indicators and stock prices.

Gup (1973) examined the contemporaneous relationship between stock price and the odd-lot ratio, mutual funds cash ratio and the short interest ratio during the 1955-1970 period. In the study, stock prices were measured by the Standard and Poor's 500 stock index; the index that provides a broad and heterogeneous gauge of stock market activity. The results of the multiple regression analysis confirmed that there is a statistically significant relationship between technical indicators and stock prices. This finding is contrary to the previously discussed studies of Kaish and Biggs et al (1966-1969). Nevertheless, the study shows that the three stock market indicators are also influenced by the behaviour of stock prices and thus may be of some, but limited aid in predicting changes in stock prices.

Branch (1976) examined the relationship between stock prices and ten stock market indicators during the period 1960-1974. The independent variables were grouped into four categories i.e. mood variables, informed opinion variables, potential demand variables and economic policy variables. The mood variables include total odd-lot short ratio (TOLSR), floor traders' short sales as a percentage of total short sales, earnings ratio of Standard and Poor's 500 index and Barron's confidence index. Informed opinion variables include specialist short sales as a percentage of total short sales and secondary stock sales as a percentage of total stock sales. The potential demand variable was the mutual fund cash

position as a percentage of total stock sales. Economic policy variables include the 90-day Treasury bill rate, the monthly percentage change in monetary supply and the monthly percentage change in consumer price index. The stock price was measured by using the percentage change of both the Dow Jones and Standard and Poor's 500 index with almost identical results. Since the received theory is not consistent on the predictive length of the forecaster, several alternative lengths were considered. Percentage changes over one, three, six, nine and twelve months were used. This gives the indexes a chance to reveal their value over several different adjustment periods.

The study concluded that the most successful indicators are cash position of mutual funds and the Treasury bill rate. Other indicators with forecasting ability include confidence index, TOLSR, specialist short sales, secondary distributions and the inflation rate. The stability of a relationship involving these last mentioned variables, however, is subject to some doubt. In particular, it may well be that indicators with forecasting ability in an earlier time period may be losing their value.

This result would be expected to follow from increasing attention given to the indicators. An indicator that works well in one period may thereby attract attention to make it useless in a later period.

2.2 The Predictive Content of Some Leading Economic Indicators

Some recent works dealing with the subject of investment in common stocks have made cautious reference to the potential of some published, leading economic time series as

inputs to stock price forecasting models. However, no prominent reports of systematic empirical research of the predictive usefulness of such series have appeared in the literature.

The specific time series of interest are those, which are continuously compiled and published by the National Bureau of Economic Research (NBER) as its "1966 Shortlist" of leading indicators of general business activity. The 12 economic time series titles on the shortlist are: - (1) average work week, production, manufacturing; (2) initial claims, unemployed insurance (inverted); (3) new orders, durable goods industries; (4) contracts, orders, plant and equipment; (5) index of net business formation; (6) new building permits, private housing units; (7) change in book value, manufacturing and trade investment; (8) corporate profits after taxes, quarterly; (9) ratio, price to unit labour cost, manufacturing; (10) stock prices, 500 common stocks; (11) industrial materials prices; (12) change in consumer installment and debt, Heathcotte and Apilado (1974).

Heathcotte and Apilado (1974) investigated a mechanical stock trading rule, which attempts to exploit the implications for market short-run action contained in the leading indicators of business cycles found on the NBER 1966 short list. They noted that, in approaching peaks of business cycles, turns in all of the other leading indicators on the list except corporate profits occur before turns in the standard and Poor's common stock index. Virtually the opposite is true relative to cyclical troughs, i.e. they nearly all lag the index. They generalize therefore, that turns in composite or diffusion indices constructed of the leading indicators might provide profitable signals to take appropriate positions (long or

short) in the standard and Poor's 500 stocks. They devised trading rules accordingly, modified by various sizes of filters, which attempt to trigger investment action only when changes in the index of interest are pertinent or substantive. Relative to the usual buy-and hold standard, they find no systematic advantage to such trading rules. However, retrospective selection of best filter sizes applied to the diffusion indices for each time sub period tested frequently produces superior results.

The chain of causation between each of the eleven leading indicators on the short list on one-hand and stock prices on the other is not clear and, depending on the indicator, is probably tenuous. No successful theory comes to mind, for example, which directly relates unemployment insurance claims or change in consumer installation debt to the future behaviour of stock prices.

The fact that subject indicators generally lead cyclical peaks but mostly lag cyclical troughs leads to a possibly serious lag in investment action being taken after a market trough, Simonson (1974). His conclusions are in agreement with those of Branch (1976) and Gup (1973) whose studies confirmed the existence of a statistically significant relationship between technical indicators and stock prices. However, their results are contrary to the previously discussed studies of Kaish (1969) and Kewley and Stevenson (1967). Their studies exemplify a lack of relationship between stock market indicators and stock prices.

2.3 Filter Rules and Stock Market Trading

In recent literature, there has been a considerable interest in the theory of random walks in stock market prices. The basic hypothesis of the theory is that successive price changes in individual securities are independent random variables. Independence implies that past history of a series of changes cannot be used to predict future prices in any 'meaningful' way. What constitutes 'meaningful' prediction depends on the purpose for which the data is being examined.

Invariably, an investor wants to know whether the history of prices can be used to increase expected gains. A statistician on the other hand is interested in whether the degree of dependence in successive changes is sufficient to account for some particular property of the distribution of price changes. In a random walk market, with either zero or positive drift no mechanical trading rule applied to an individual security would consistently outperform a policy of simply buying and holding the security. Thus, the investor must choose between the random-walk model and a more complicated model, which assumes the existence of an excessive degree of either persistence (positive dependence) or reaction (negative dependence) in successive price changes. The investor should accept the theory of random walks as the better model if the actual degree of dependence cannot be used to produce greater expected profits than a buy-and-hold policy. Although independence of successive price changes implies that the history of a price series cannot be used to increase expected gains, the reverse is not true. It is possible to construct models where successive price changes are dependent, yet the dependencies are not a form that can be used to increase expected profits, Fama and Blume (1966).

Under fairly general conditions, in a market that fully 'discounts' all available information, prices will follow a 'martingale', which may have or may not have the independence property of a pure random walk. The 'martingale' property implies that only the expected values of future prices will be independent of the values of past prices; however, the distributions of future prices may very well depend on values of past prices.

In a martingale, though the prices may be dependent, the dependence cannot be used by the trader to increase his expected profits. A random walk is a martingale, but a martingale is not necessarily a random walk. Empirical work on stock market prices is usually concerned with the theory of random walks because most of it was done before the importance of the martingale model was established. In practice, it is probably impossible to distinguish a series that follows a martingale with some dependence from a series that follows a random walk, Mandelbrot and Samuelson (1965-1966).

Previously, the independence assumption of the random-walk model has been tested primarily with standard statistical tools and the results have tended to uphold. Cootner (1962), Fama (1965), Kendall (1953) and Moore (1962) studied serial correlation coefficients for successive daily, weekly and monthly price changes in the NYSE. They found them to be extremely close to zero-evidence against 'important' dependence in price changes. The spectral analysis techniques of Granger and Morgenstern (1963) and Godfrey (1964) also lend support to the independence assumption of the random walk model.

Not all published empirical tests of independence have employed standard statistical models, notably the work of Alexander (1961-4). Alexander's filter technique is a mechanical trading rule, which attempts to identify movements in stock prices. An x percent filter is defined as follows: If the daily closing price of a particular security moves up at least x percent, buy and hold the security until price moves down at least x percent from a subsequent high, at which simultaneously sell and go short. The short position is maintained until the daily closing price rises at least x percent above a subsequent low at which time one covers and buys. Moves less than x percent in either direction are ignored. Alexander formulated the filter technique to test the belief, widely held among market professionals that prices adjust gradually to new information. The professional analysts operate in the belief that there exists certain trend generating facts, knowable today that will guide a speculator to profit if only he can read them correctly. These facts are assumed to generate trends rather than instantaneous jumps because most of those trading in speculative markets have imperfect knowledge of these facts, and the future price trend will result from a gradual spread of awareness of these facts throughout the market, Alexander (1961).

Alexander tested filters ranging from 5% to 50% to series of daily closing 'prices' for two indexes, Dow-Jones from 1897 to 1929 and S&P 500 from 1929 to 1959. He reported that filters of different sizes yielded substantial profits significantly greater than those of a simple buy and hold policy. He concluded that the independence assumption of the random walk model was not up-held by his data. However, Mandelbrot (1963) pointed out that Alexander's computations incorporated biases, which led to serious overstatement of the

filters. In each transaction, Alexander assumed that his hypocritical trader could always buy at a price exactly equal to the low plus x percent and sell at high minus x percent. However due to frequency of large price jumps, the purchase price will often be somewhat higher than the low plus x percent, while the sale price will often be below the high minus x percent. In his later works Alexander (1964), he reworked his earlier results to take account of this source of bias. In the corrected tests the profitability of the filter technique was drastically reduced.

Fama and Blume (1966) applied Alexander's filter technique to series of daily closing prices for each of the individual securities of the Dow-Jones Industrial average during the period January 1956 to September 1962. Twenty-four different filters ranging from 0.5 percent to 50 percent were simulated. In applying the filter technique, the data was used to determine whether the first position taken would be long or short. With an x percent filter, an initial position is taken as soon as there is an up-move or down-move (which ever comes first) where the total price change is equal to or greater than x percent. The position is assumed to be taken on the first day for which the price change equals or exceeds the x percent limit. The test results show that returns from the buy-and-hold policy are greater than those from the filter technique whether transaction costs (e.g. brokerage fees, commissions) are taken into account or not. This result supports the conclusion that the filter technique cannot be used to increase the expected profits of the investor who must pay the usual brokerage commissions. This result is inconsistent with some of Alexander's work. When commissions are omitted, Alexander finds that the filter technique is typically superior to a buy-and-hold policy.

The difference between Alexander's results and those of Fama and Blume (1964) is due to two main reasons. First, a bias in Alexander's computations caused by omitting dividends from calculations which tends to overstate the actual profitability of the filter technique relative to buy-and-hold policy. The bias arises because using common price indices makes it impossible to adjust properly for dividends. Second, the difference may be due to 'dependence' in successive changes in a price index, even though successive price changes in the individual securities of the index are independent. This spurious dependence in index changes arises from a lack of synchronization in the trading of individual securities. The reasoning is as: - follows: suppose there is a market factor, which affects the behaviour of all securities. When there is a change in the market factor, the prices of individual securities have implicitly changed. All securities will not trade at precisely the time of change in the market factor; thus for some securities the effect of change on reported prices will only be recognized later.

The test results show evidence of persistence or positive dependence in very small movements of stock prices (up to 1.5 percent) and negative dependence in intermediate price movements. The average returns per security on long positions are greater than average returns from buy-and-hold. For the same filer sizes the losses on short positions are smaller than the gains from buy-and-hold. The returns on both long and short positions, however, fall dramatically as the filter size is increased and vice-versa.

2.4 Factors Influencing the Choice of Stock Indicators

Invariably, traders and investors choose stock indicators that best forecast future stock prices in making investment decisions. No single indicator can be relied upon consistently. Rather a combination of numerous indicators might provide a cumulative or broad confirmation of future market behaviour, Heathcotte and Apilado (1974). Broadly, information contained collectively in numerous indicators may be unavailable in indicators taken one at a time. In choosing stock indicators, traders and investors need not consistently rely on a few due to attenuation of their forecasting capability over time.

In choosing stock indicators that best predict future stock prices, traders and investors need to choose stock indicators that bear directly on the stock market. These might include the categories of (1) financial markets conditions such as the rate of change in the money supply, the corporate bond rate, and the confidence index; (2) fundamental factors such as analyst forecasts for the economy or individual industries, and capital spending surveys; (3) demand factors such as changes in common stock holdings among major institutions; (4) psychological factors such as the university of Michigan's consumer sentiment index and indicators which account for the degree of political or international stability, Simonson(1974).

CHAPTER 3

3.0 RESEARCH METHODOLOGY

The chapter considers the research setting, population of study, data specification, data collection and data analysis techniques.

3.1 Study on Stock Indicators and Stock Trading

This study has two objectives. The primary aim is to determine the nature and extent of usage of stock indicators by Stockbrokers, Investment Banks and Mutual Funds at the NSE. The secondary objective is to determine whether the profile of a Stockbroker, Investment Bank or Mutual Fund influence the choice of stock indicators used at the NSE.

Thus, this study is a fundamental, primary and survey research. It seeks to make a contribution to the existing body of knowledge on stock market trading and utilizes primary data from firms trading in the NSE i.e. Stockbrokers, Investment Banks and Mutual Funds. A survey study allows the researcher to understand the nature and complexity of the process that is taking place and answer the 'how' and 'why' questions, Mugenda and Mugenda (2003).

3.2 Research Setting

The study will be conducted in Nairobi as the Stockbrokers, Investment Banks and Mutual Funds trading in the NSE operate from the city and other towns in Kenya.

3.3 Population of Study

This study is based on all Stockbrokers, Investment Banks and Mutual Funds trading in the NSE during the years 2000 to 2006. Thus, the population of interest is 24 firms comprised of 13 stockbrokers, 5 Investment Banks and 6 Mutual Funds. In February 2007, one stock broking firm Messrs Francis Thuo and Partners Limited collapsed with millions of investors' money. The firm has at the present been placed under statutory management (www.nse.co.ke).

The sampling frame is the population of interest and is shown in appendix 3. Stockbrokers, Investment Banks and Mutual Funds are under obligation to observe NSE and Capital Markets Authority (CMA) regulations. The Capital Markets Authority is established by an Act of Parliament to promote, regulate and facilitate the development of an orderly, fair and efficient Capital Market in Kenya (www.cma.or.ke)

3.4 Sample Size

The research study is a survey of stock indicators used by Stockbrokers, Investment Banks and Mutual Funds at the NSE. Thus, the entire the population of interest comprised of 24 firms will be studied. Messrs Francis Thuo and Partners, which is currently under receivership, will not form part of this study.

3.5 Data Collection

The study will primarily employ primary data. A semi-structured questionnaire will be employed to congregate the required data. In addition relevant secondary source websites for the NSE and CMA will be used. Content analysis of the websites will serve to enhance

reliability, representativeness and validity of information collected.

3.5.1 The Research Instrument

Data of interest will be collected using a semi-structured questionnaire to be filled in the presence of the researcher to support clarifications/explanations where necessary. An introductory letter and the questionnaire are shown in appendix 1 and 2 respectively. It is a self-administered questionnaire and the drop and pick method of data collection will be employed where circumstances do not favour the presence of the researcher, in order to encourage responses.

The questionnaire consists of both closed and open-ended questions presented in two sections.

Section A: Provides information on the profile of the study unit e.g. nature and type of clientele, nature of business and size of the unit.

Section B: Comprise questions aimed at obtaining data about the nature and extent of usage of stock indicators by Stockbrokers, Investment banks and Mutual Funds at the NSE.

3.6 Data Specification

The study will collect data on the profile of the study units. The data variables comprise the nature and type of clientele, duration of service, nature of business, market(s) of operation, size of the business, and staff strength among other variables.

Linkert scale numbers will be used to obtain information about the nature and extent of usage of stock indicators by Stockbrokers, Investment banks and Mutual Funds at the NSE. This approach is considerably appropriate for checking the quality of data and to give an

accurate representation of how the various variables are distributed. Rating scales provide an appropriate measure for perceptions, attitudes, values and behaviour. They rate and rank the subjective and intangible components in research, Mugenda and Mugenda (2006).

3.7 Data Analysis

Mean, standard deviation, skewness and kurtosis will be computed to analyse data on the extent of usage of stock indicators.

Mean

The mean usage of each stock indicator ($\bar{x}$) will be computed using the formula below: -

$$\bar{x} = \frac{1}{n}\sum_{i=1}^{n} x_i = \frac{1}{n}(x_1 + \cdots + x_n).$$

Where:

n is the number of study units

X_i is the extent of usage of a stock indicator for unit i

Standard Deviation

The standard deviation will be used to identify stock indicators with the highest usage volatility. The standard deviation of each stock indicator will be computed using the formula below: -

$$s = \sqrt{\frac{1}{N}\sum_{i=1}^{N}(x_i - \bar{x})^2}$$

Where:

n is the number of study units

X_i is the extent of usage of a stock indicator for unit i

$\bar{x}$ is the mean usage of the stock indicator for unit i.

Skewness

Skewness is a measure of the asymmetry of a distribution. The normal distribution is symmetric and has a skewness value of zero. A distribution with a significant positive skewness has a long right tail. A distribution with a significant negative skewness has a long left tail. As a rough guide, skewness value more than twice its standard error is taken to indicate a departure from symmetry. The standard deviation of each stock indicator (Sk) will be computed using the Karl Pearson coefficient of Skewness shown below: -

Sk = 3(mean - median) / Standard Deviation = 3(X –Me) / S

Kurtosis

Kurtosis is a parameter that describes the shape of a random variable's probability density function (PDF). It is thus is a measure of the extent to which observations cluster around a central point. The kurtosis of each stock indicator denoted *kurt* (*X*) would be computed using the formula below: -

$$kurt(X) = \frac{E[(X-\mu)^4]}{\sigma^4}$$

Where: -

μ and σ are the mean and standard deviation of X

X is the extent of usage of a stock indicator

A normal random variable has a kurtosis of 3 irrespective of its mean or standard deviation. If a random variable's kurtosis is greater than 3, it is said to be leptokurtic. If its kurtosis is less than 3, it is said to be platykurtic. Leptokurtosis is associated with Probability Density Functions (PDFs) that are simultaneously "peaked" and have "fat tails." Platykurtosis is

associated with PDFs that are simultaneously less peaked and have thinner tails. They are said to have "shoulders."

Pearson's Chi-Square Test (χ^2)

To determine whether the profile of a Stockbroker, Investment Bank or Mutual Fund influence the choice of stock indicators used at the NSE, a chi-square goodness of fit test will be employed. A test of goodness of fit establishes whether or not an observed frequency distribution differs from a theoretical distribution.

The profile test variables are the nature of clientele, business type, duration of service, client size and market(s) of operation.

The chi-square test is defined for the following hypothesis: -

H_0: The profile of a Stockbroker, Investment Bank or Mutual Fund influence the choice of stock indicators used at the NSE

H_a: The profile of a Stockbroker, Investment Bank or Mutual Fund does not influence the choice of stock indicators used at the NSE

The test statistic is computed as follows: -

$$\chi^2 = \sum_{i=1}^{n} \frac{(O_i - E_i)^2}{E_i}$$

where

O_i = an observed frequency of the stock indicator;

E_i = an expected (theoretical) frequency of the stock indicator, asserted by the null hypothesis. The expected frequency is calculated by the formula below: -

$E_i = N(F(Y_u) - F(Y_l))$, Where F is the cumulative distribution function for the distribution being tested, Y_u is the upper limit for stock indicator i, Y_l is the lower limit for stock indicator i, and N is the sample size.

The null hypothesis is rejected if: -

$$\chi^2 > \chi^2_{(\alpha,k-c)}$$

Where $\chi^2_{(\alpha,k-c)}$ is the chi-square percent point function with k - c degrees of freedom and a significance level α.

K = the number of non-empty cells

C = the number of estimated parameters

Asymptotic Significance will be computed for the test statistic. It is the estimated probability of obtaining a chi-square value greater than or equal to the test statistic. A low significance value suggests that the data does not follow a specified distribution leading to not accepting the null hypothesis. The converse is true.

CHAPTER 4

4.0 DATA ANALYSIS, INTERPRETATION OF FINDINGS AND DISCUSSIONS

This chapter considers data analysis, interpretation of findings and discussions of the study. During the study, 17 out of 24 firms responded to the questionnaire representing a response rate of 71%. The firms that responded to the questionnaire are listed in appendix 4.

4.1 Results of the Extent of Usage of Stock Indicators at the NSE

The mean, standard deviation, skewness and kurtosis on the extent of usage of stock indicators are summarized in table 4.1.2 below. The interpretation criteria for the test results are summarized in table 4.1.1 below.

Table 4.1.1: Summary of the Interpretation Criteria on the Extent of Usage of Stock Indicators at the NSE

	Extent of usage (Mean Usage)	Description of the Extent of Usage
1	1.0 - 1.99	Not at all
2	2.0 – 2.99	Rarely used
3	3.0 – 3.99	Slightly used
4	4.0 – 4.99	Fairly used
5	5.0	Mostly used

The mean represents the level of agreement among respondents while the standard deviation represents the level of concurrence among the respondents or deviation from the mean. Skewness represents the distribution of the responses. The skewness of a normal

distribution is zero, and any symmetric data has skewness near zero. A distribution, or data set, is symmetric if it looks the same to the left and right of the center point, the center point being the mean. Negative skeweness means most responses were distributed to the left of the mean while positive skeweness means most responses were distributed to the right. Kurtosis is a measure of whether the data is peaked or flat relative to a normal distribution. That is, data sets with high kurtosis tend to have a distinct peak near the mean, decline rather rapidly, and have heavy tails. Data sets with low kurtosis tend to have a flat top near the mean rather than a sharp peak. Positive kurtosis indicates a "peaked" distribution and negative kurtosis indicates a "flat" distribution. In this study, kurtosis describes the distribution of the responses. Positive kurtosis means the responses are peaked near the mean while a negative kurtosis means responses were not peaked near the mean.

Price Averages are the mostly used stock indicators at the NSE. They have a standard deviation of zero implying all respondents concurred to mostly using them. They have zero skeweness and kurtosis implying they are distributed and peaked at the mean.

The stock indicators fairly used by Stockbrokers, Investment Banks and Mutual Funds at the NSE are Price Comparisons; Closing Price Compared to Previous Closing Price; Volume Only; Inflation Rate; Comparison of Closing Price and Volume; Moving Average Closing Price and Price Differential. They have low standard deviations implying a high degree of concurrence among respondents. These indicators have negative skewness and positive kurtosis implying they were distributed to the left of the mean and are peaked near the mean.

Price compared to Moving Average is the stock indicator slightly used at the NSE. It has a relatively low level of standard deviation implying a relatively high level of concurrence amongst respondents. It has negative skewness and positive kurtosis implying it is distributed to the left of the mean and peaked near the mean.

The stock indicators that rarely used at the NSE are the Directional System, Closing Price to Range, Compare Closing Price, Range and Volume, Moving Average Oscillator, Range Compared to previous Range and Based on Daily Range (High – Low). They have low standard deviation, low positive skewness and low negative kurtosis. This implies a high level of concurrence amongst respondents. The responses were distributed to the right of the mean and are not peaked near the mean.

The stock indicators that are not used at all at the NSE are the Coppock Indicator, Range Relative to Absolute Price Movement, Bullish Percentage Index, McClellan Oscillator, McClellan Summation Index, High/Low Compared to Moving Average, Closing Price Compared to Moving Average and Stop Reverse System. They have a relatively high standard deviation implying a relatively medium to low level of concurrence amongst respondents. They have positive skewness implying they are distributed to the right of the mean. They have positive kurtosis except for the McClellan Summation Index and the Range Relative to Absolute Price Movement. This implies that except for the two indicators with negative kurtosis the rest are peaked near the mean. The two stock indicators with negative kurtosis are not peaked near the mean.

Table 4.1.2: Results of the Extent of Usage of Stock Indicators at the NSE

Description	Mean	Std. Deviation	Skewness		Kurtosis	
	Statistic	Statistic	Statistic	Std. Error	Statistic	Std. Error
Moving Average closing Price	4.40	1.218	-1.983	.398	2.629	.778
Moving Average Oscillator	2.51	1.222	.838	.398	-.128	.778
Moving Average overbought/oversold	1.94	1.162	1.549	.398	2.090	.778
Directional system	2.06	1.282	1.309	.398	.907	.778
Stop & Reverse system	1.54	.919	1.799	.398	2.445	.778
Closing price to Moving Average	1.91	1.040	.679	.398	-.887	.778
Price Averages	5.00	.000	.	.	.	.
Price comparison	4.97	.169	-5.916	.398	35.000	.778
Closing Price compared to previous Closing Price	4.86	.550	-4.591	.398	22.688	.778
Closing Price to Range	2.91	1.314	.414	.398	-.948	.778
Closing Price Relative to high/Low	1.49	.562	.586	.398	-.695	.778
High/Low compared to Moving Average	1.43	.739	1.419	.398	.464	.778
Range compared to previous Range	2.26	1.291	.705	.398	-.730	.778
Range relative to absolute price movement	1.74	.780	.496	.398	-1.160	.778
Volume only	4.80	.759	-4.345	.398	19.893	.778
Compares Closing Price and Volume	4.74	.886	-3.491	.398	11.654	.778
Compares Closing Price, Range and Volume	2.8000	1.30158	.394	.398	-.699	.778
Compares Range and Volume	2.00	1.000	.561	.398	-.828	.778
Based on daily Range (High-Low)	2.46	1.421	.548	.398	-1.082	.778
Price compared to Moving Average	3.69	1.694	-.629	.398	-1.477	.778
Coppock Indicator	1.74	1.336	1.680	.398	1.374	.778
Negative Volume Index	1.69	1.345	1.769	.398	1.577	.778
Positive Volume Index	1.69	1.345	1.769	.398	1.577	.778
Price Differential	4.23	1.477	-1.523	.398	.554	.778
Inflation Rate	4.86	.550	-4.591	.398	22.688	.778
Bullish Percentage Index	1.7143	1.40527	1.893	.398	2.019	.778
McClellan Oscillator	1.94	1.454	1.322	.398	.330	.778
McClellan Summation Index	1.86	.912	.297	.398	-1.781	.778

4.2 Results of the Profile of a Firm as an Influence on the Choice of Stock Indicators used at the NSE

Results of the chi-square goodness of fit test employed to determine whether the profile of a Stockbroker, Investment Bank or Mutual Fund influence the choice of stock indicators used at the NSE are summarized in table 4.2.2 below. The level of significance for the test is 5% or the confidence limit for the test results is 95%. The interpretation criteria for the test results are summarized in table 4.2.1 below.

Table 4.2.1: Summary of the Interpretation Criteria on the Profile of a Firm as an Influence on the Choice of Stock Indicators used at the NSE

	Extent of usage (Mean Usage)	Description of the values of asymptotic significance
1	0.00 - 0.20	Low value
2	0.21 – 0.49	Medium value
3	0.50 – 1.00	High value

The Asymptotic Significance is the estimated probability of obtaining a chi-square value greater than or equal to the test statistic. The chi-square value is the test statistic.

The test results show very low levels of asymptotic significance of below 0.1 implying the probability of obtaining a chi-square value greater than or equal to the test statistic is less than 10%. This means that the probability of occurrence of the null hypothesis is less than 10% or put in another way the possibility of occurence of the alternate hypothesis is greater than 90%. Thus the alternate hypothesis is accepted and the null hypothesis not accepted. Thus, the profile e.g. the nature and type of clientele of a Stockbroker, Investment Bank or Mutual Fund does not influence the choice of stock indicators at the NSE.

Table 4.2.2: Results of the profile of a firm as an influence on the choice of stock indicators used at the NSE

Description	Test	Business Type	Duration of service	Nature of clientele	Client size	Market of operation
Moving Average closing price	Chi-Square	7.396	151.830	90.604	90.604	90.604
	Asymp. Sig.	.007	.000	.000	.000	.000
Moving Average Oscillator	Chi-Square	5.786	79.000	48.286	48.286	48.286
	Asymp. Sig.	.016	.000	.000	.000	.000
Moving Average overbought/oversold	Chi-Square	2.951	54.780	37.098	37.098	37.098
	Asymp. Sig.	.086	.000	.000	.000	.000
Directional Movement	Chi-Square	3.596	48.553	39.340	39.340	39.340
	Asymp. Sig.	.058	.000	.000	.000	.000
Stop Reverse system	Chi-Square)	2.941	36.941	30.118	30.118	30.118
	Asymp. Sig.	.086	.000	.000	.000	.000
Closing Price compared to Moving Average	Chi-Square	3.930	63.674	39.093	39.093	39.093
	Asymp. Sig.	.047	.000	.000	.000	.000
Price Averages	Chi-Square	11.172	127.517	96.862	96.862	96.862
	Asymp. Sig.	.001	.000	.000	.000	.000
Price Comparison	Chi-Square	14.126	137.664	103.538	103.538	103.538
	Asymp. Sig.	.000	.000	.000	.000	.000
Closing Price compared to previous closing price	Chi-Square	14.617	144.226	107.139	107.139	107.139
	Asymp. Sig.	.000	.000	.000	.000	.000
Closing price relative to Range	Chi-Square	11.571	82.952	59.063	59.063	59.063
	Asymp. Sig.	.001	.000	.000	.000	.000
Closing price relative to High/Low	Chi-Square	5.765	46.118	30.118	30.118	30.118
	Asymp. Sig.	.016	.000	.000	.000	.000
High/Low compared to Moving Average	Chi-Square	5.452	40.323	27.129	27.129	27.129
	Asymp. Sig.	.020	.000	.000	.000	.000
Range relative to previous Range	Chi-Square	3.314	74.235	43.314	43.314	43.314
	Asymp. Sig.	.069	.000	.000	.000	.000
Range relative to absolute price movement	Chi-Square	7.410	50.923	35.103	35.103	35.103
	Asymp. Sig.	.006	.000	.000	.000	.000
Volume only	Chi-Square	12.115	150.283	101.319	101.319	101.319
	Asymp. Sig	.001	.000	.000	.000	.000
Compares closing price and volume	Chi-Square	12.333	131.838	103.144	103.144	103.144
	Asymp. Sig.	.000	.000	.000	.000	.000
Compares closing price, Range and Volume	Chi-Square	15.754	62.197	57.066	57.066	57.066
	Asymp. Sig.	.000	.000	.000	.000	.000
Compares Range and Volume	Chi-Square	3.449	60.776	41.327	41.327	41.327
	Asymp. Sig.	.063	.000	.000	.000	.000
Based on Daily Range (High-Low)	Chi-Square	5.070	86.000	53.070	53.070	53.070
	Asymp. Sig.	.024	.000	.000	.000	.000
Price compared to Moving Average	Chi-Square	17.610	82.341	63.220	63.220	63.220
	Asymp. Sig.	.000	.000	.000	.000	.000
Coppock indicator	Chi-Square	17.610	82.341	63.220	63.220	63.220

Description	Test	Business Type	Duration of service	Nature of clientele	Client size	Market of operation
	Asymp. Sig.	.000	.000	.000	.000	.000
Negative volume index	Chi-Square	5.444	50.000	32.111	32.111	32.111
	Asymp. Sig.	.020	.000	.000	.000	.000
Positive volume index	Chi-Square	5.444	50.000	32.111	32.111	32.111
	Asymp. Sig.	.020	.000	.000	.000	.000
Price Differential	Chi-Square	11.449	128.991	103.037	103.037	103.037
	Asymp. Sig.	.001	.000	.000	.000	.000
Inflation Rate	Chi-Square	16.078	139.426	107.139	107.139	107.139
	Asymp. Sig.	.000	.000	.000	.000	.000
Bullish percentage index	Chi-Square	3.457	43.257	31.114	31.114	31.114
	Asymp. Sig.	.063	.000	.000	.000	.000
McClellan Oscillator	Chi-Square	4.568	51.946	33.108	33.108	33.108
	Asymp. Sig.	.033	.000	.000	.000	.000
McClellan summation index	Chi-Square	6.429	48.057	31.114	31.114	31.114
	Asymp. Sig.	011	.000	.000	.000	.000

CHAPTER 5

5.0 SUMMARY, CONCLUSIONS, RECOMMENDATIONS AND LIMITATIONS OF THE STUDY, POLICY IMPLICATIONS AND SUGGESTIONS FOR FURTHER RESEARCH

The chapter considers the summary, conclusions, recommendations and limitations of the study, policy implications and suggestions for further research.

5.1 Summary, Conclusions and Recommendations of the Study

The purpose of this study was primarily to determine the nature and extent of usage of stock indicators by Stockbrokers, Investment Banks and Mutual Funds at the NSE. Secondly, the study was to determine whether the profile of a Stockbroker, Investment Bank or Mutual Fund influence the choice of stock indicators at the NSE.

The data analysis shows that Price Averages e.g. Median Price, which are trend indicators are the mostly used stock indicators by Stockbrokers, Investment Banks and Mutual Funds at the NSE. Trend indicators attempt to provide an objective measure of the direction of the trend. Volume indicators are fairly used with the exception of the Comparison between Closing Price, Range and Volume indicators, which are rarely used. Volume indicators are used to confirm the strength of trends. Volatility indicators, which are used to confirm price behaviour, are rarely or slightly used at the NSE. Lack of confirmation may warn of a reversal. Momentum indicators are the rarely or not used at all except for the Closing Price Relative to Previous Closing Price indicators e.g. momentum and Rate of Change (Price)

that are fairly used. Momentum indicators measure the speed at which price is changing and are most useful when a stock is bound in a trading range.

Market indicators are not used at all at the NSE with the exception of the inflation rate and the price differential indicators that are fairly used. Market indicators are used to summarize activity in the entire market or in a particular sector.

The result of the chi-square test show low values of asymptotic significance suggesting that the data does not follow the specified distribution leading to not accepting the null hypothesis. Consequently, the alternate hypothesis is accepted. Thus, the profile of a Stockbroker, Investment Bank or Mutual Fund does not influence the choice of stock indicators used at the NSE.

The recommendation from the study is that the NSE should formulate guidelines for Stockbrokers, Investment Banks and Mutual Funds trading in the market to enhance the usage of stock indicators. The limited usage of stock indicators is partly due to some firms' undertaking limited or no research on market data. Enhanced usage of stock indicators at the NSE by Stockbrokers, Investment Banks and Mutual Funds will direct investment to financially sound assets thereby directing resources to the most efficient companies in the NSE.

5.2 Limitations of the Study

- Traders and investors in the NSE are subject to fads in buying stocks thus disregarding chart movements.

- The NSE is an emerging market that is small in size with limited international integration, has low activity and few intermediaries. Thus, usage of stock indicators in making investment decisions is limited.

5.3 Policy Implications of the Study

The test results show that Price Averages e.g. Median Price are the mostly stock indicators while market indicators e.g. the Coppock indicator are not used at all at the NSE. Additionally, the profile of a Stockbroker does not influence the choice of stock indicators at the NSE. The policy implications of the test results are on regulation of the Stockbrokers, Investment Banks and Mutual Funds in the market as follows: -

- What role should the NSE & other interested bodies e.g. the Government play in regulating Stockbrokers, Investment Banks and Mutual Funds at the NSE? Regulation may be on the capital base of the firms or on the activities undertaken by them. For example the collapse of Messrs Francis Thuo and Partners Limited in February 2007 with millions of investors money is partly due to mismanagement of the firm and lack of an effective capital base.
- What guidelines should the NSE & other interested bodies e.g. the Government develop to enhance efficiency & effectiveness of these institutions? Invariably in developed markets, regulation is market driven while in emerging markets like the NSE it is policy driven. This is because the impact of market forces may not be at the same level between a developed and an emerging market. Strong market forces in developed markets lead to self-regulation of the various players in the capital and money markets.

5.4 Suggestions for Further Research

This study is a survey of stock indicators used by Stockbrokers, Investment Banks and Mutual Funds at the NSE. The study leaves investigation of a relationship between stock price and economic indicators e.g. the odd-lot ratio, the 90-day Treasury bill rate and the mutual funds cash ratio at the NSE for further research.

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APPENDIX 1

Introductory letter

NAME OF ORGANIZATION

ADDRESS

Attention
Dear sir/madam,

RE: Letter of introduction-Lawrence Nyalle

I am a student at the University of Nairobi, pursuing a Master of Business Administration degree. The University of Nairobi requires a student to conduct a research study in partial fulfilment of the MBA program. My research question is: what is the nature and extent of usage of stock indicators by Stockbrokers, Investment Banks and Mutual Funds at the Nairobi Stock Exchange (NSE)?
The study seeks to this question. The research will be conducted on all Stockbrokers, Investment Banks and Mutual Funds trading in the NSE.

Your firm has been selected because it will educe information to support this study. You are required to fill in the questionnaire attached herein. Kindly provide answers to all the questions in the questionnaire to the best of your knowledge and ability.

The information collected will strictly be used for academic purposes and will be treated in strict confidence. No publication if any, shall be made without prior approval of the respondent(s). A copy of the research project will be made available to you on request.

Your cooperation and assistance will be highly appreciated.

Yours faithfully,

.....
MBA STUDENT

APPENDIX 2

The Research Instrument

Objectives of the study

This study has two objectives. The primary aim is to determine the nature and extent of usage of stock indicators by Stockbrokers, Investment Banks and Mutual Funds at the NSE. The secondary objective is to determine whether the profile e.g. the nature and type of clientele of a Stockbroker, Investment Bank or Mutual Fund influence the choice of stock indicators used at the NSE.

The study focuses on all Stockbrokers, Investment Banks and Mutual Funds trading in the NSE.

TO THE RESPONDENT;

The questions in this questionnaire are intended to elicit data to enable the researcher determine the nature and extent of usage of stock indicators by Stockbrokers, Investment Banks and Mutual Funds at the NSE.

This study is purely for academic purposes intended to make a contribution to the existing body of knowledge. Responses to questions will be held in strict confidence. No publication if any shall be made without prior approval of the respondent(s).

The questionnaire has two sections. Please provide answers to all the questions appropriately to the best of your capability.

If there are any issues that require clarification, please get in touch with the researcher (Nyalle .L) on cell number phone +254 722 679138 or e-mail - Lnyalle@boc.co.ke

Designation of Respondent.....

Section A

General Information

1 In what towns/cities does your firm operate from?

Nairobi ( ) Mombasa ( ) Kisumu ( ) Nakuru ( ) Eldoret ( ) Thika ( ) Others specify( )

2. What form of stock exchange business are you involved in? Please tick as appropriate

Advisory ( ) Manage portfolio ( ) Do both ( )

Others (specify)

3. How long has your firm been operating on the Nairobi stock exchange (NSE)? Please tick as appropriate

0-2years ( ) 3-5 years ( ) 6-10 years ( ) Over 10 Years ( )

3. Do you have an information technology department? Please tick as appropriate

Yes ( ) No ( )

4. To what extent does your organization utilize computer driven systems in its operations? Please tick as appropriate

To a very great extent ( ) To a great extent ( ) To some extent ( )

To a small extent ( ) To no extent ( )

5. Has the application of computer systems resulted in value enhancement to your firm? Please tick as appropriate

Very significantly ( ) Significantly ( ) Slightly significant ( ) Not significant ( )

6. Which of the following best describes your clientele? Please tick as appropriate

Corporate ( ) Individual ( ) Groups/organisations ( ) All ( )

7. What is the size of your client base? Please tick as appropriate

0-100 clients ( ) 101-1,000 clients ( ) 1,001-5,000 clients ( ) Over 5,000 clients ( )

8. How frequent does you firm monitor stock prices in the Nairobi stock exchange (NSE)? Please tick as appropriate

Hourly ( ) Daily ( ) Weekly ( ) Bi-weekly ( ) Monthly ( ) other specify ( )

9. Does your firm seek market information from the following stock exchanges outside Kenya? Please tick as appropriate

Uganda ( ) Tanzania ( ) South Africa ( ) No ( ) other specify ( )

10. What type of foreign investors does your firm handle? Please tick as appropriate

Corporate ( ) Individual ( ) Groups/organisations ( ) All ( )

11. How many employees does your firm have? lease tick as appropriate

1-10 employees ( )11-20 employees ( ) 21-30 employees ( ) Over 30 employees ( )

Section B

2. To what extent does your firm use the following stock indicators for trading at the NSE? Please tick as appropriate (Use the aspects indicated below and the scale provided i.e. 1= Not at all 2= Rarely 3= Slightly 4= Fairly 5 = Mostly)

	1	2	3	4	5
1. TREND INDICATORS					
1.1 Moving Average - Closing Price					
1.1a Single Moving Average					
1.1b Moving Average Directional Filter					
1.1b Two Moving Average					
1.1c Three Moving Average					
1.1d Multiple Moving Average					
1.2 Moving Average Oscillator					
1.2a Moving Average Convergence Divergence (MACD)					
1.2b MACD Histogram					
1.2c TRIX Indicator					
1.2d Smoothed Rate of Change					
1.3 Moving Average - Overbought / Oversold					
1.3a Price Envelope					
1.3b Bollinger Bands					

	1	2	3	4	5
1.4 Directional Movement					
1.4a Directional Movement System					
1.5 Stop and Reverse System					
1.5a Parabolic SAR					
1.6 Closing price compared to Moving Average					
1.6a Commodity Channel Index (CCI)					
1.6b Detrended Price Oscillator					
1.7 Price Averages					
1.7a Median Price					
1.7b Typical Price					
1.7c Weighted Close					
1.8 Price Comparison					
1.8a Price Comparison					
1.8b Price ratio					
1.8c Price Differential					
1.8d Billy Freddy Trends					
1.8e Elder Ray Index					
1.8f Directional Movement v. Weinstein					
1.8g Fibonacci Numbers					
1.8h Fibonacci Retracements & Extensions					
1.8i Trend Lines					

	1	2	3	4	5
2. MOMENTUM INDICATORS					
2.1 Closing Price relative to previous Closing Price					
2.1a Momentum					
2.1b Rate of Change (Price)					
2.1c Smoothed Rate of Change					
2.1d Relative Strength Index					
2.1e TRIX Index					
2.2 Closing Price relative to Range					
2.2a Stochastic					
2.2b Slow Stochastic					
2.2c Williams %R					
2.3 Closing Price relative to High/Low					
2.3a Williams Accumulation Distribution					
2.4 High/Low compared to Moving Average					
2.4a Elder Ray Index					
2.5 Range relative to Previous Range					
2.5a Mass Index					
2.6 Range relative to absolute Price Movement					
2.6a Vertical Horizontal Filter					
2.6b Chaikin Oscillator					

	1	2	3	4	5
2.6c Ease of movement					
2.6d Vertical Horizontal Filter					
3. VOLUME INDICATORS					
3.1 Volume Only					
3.1a Rate of Change Volume					
3.1b Volume Oscillator					
3.2 Compares Closing Price and Volume					
3.2a On Balance Volume					
3.2b Price and Volume Trend					
3.2c Force Index					
3.3 Compares Closing Price, Range and Volume					
3.3a Accumulation Distribution (AD)					
3.3b Chaikin Oscillator					
3.3c Money Flow Index					
3.3c Chaikin Money Flow					
3.4 Compares Range and Volume					
3.4a Ease of Movement					
3.4b Twiggs Money Flow					
3.4c Williams Accumulation/Distribution					
4. VOLATILITY INDICATORS					
4.1 Based on Daily Range (High - Low)					

	1	2	3	4	5
4.1a Chaikin Volatility					
4.1b Volatility ratio					
4.1c Volatility Ratio - Schwager					
4.1d Average True range					
4.2 Price compared to Moving Average					
4.2a Volatility					
4.2b Bollinger Bands					
4.2c Williams Accumilate/Distribute					
5. MARKET INDICATORS					
5.1 Coppock Indicator					
5.2 Negative Volume Index					
5.3 Positive Volume Index					
5.4 Price Differential					
5.5 Inflation rate					
5.6 Bullish percentage Index					
5.7 McClellan Oscillator					
5.8 McClellan summation Index					

KINDLY ADD STOCK INDICATORS USED BY YOUR FIRM NOT INCLUDED IN THIS QUESTIONNAIRE

Thank you for taking time to complete this questionnaire.

APPENDIX 3

List of Stockbrokers, Investment Banks and Mutual Funds comprising the population of study

Stockbrokers
1. African Alliance Kenya Securities
2. Ashbhu Securities Ltd
3. Bob Mathews Stockbrokers Ltd
4. CFC Financial Services – Stock broking Division
5. Crossfield Securities Ltd
6. Discount Securities Ltd.
7. Faida Securities Ltd
8. Kestrel Capital (EA) Limited
9 Ngenye Kariuki & Co. Ltd.
10 Nyaga Stockbrokers Ltd
11 Reliable Securities Ltd.
12 Solid Investment Securities Ltd
13 Sterling Securities Ltd
Investment Banks
14 Apex Africa Investment Bank Ltd
15 Drummond Investment Bank Limited
16 Dyer & Blair Investment Bank Ltd
17 Standard Investment Bank Ltd
18 Suntra Investment Bank
Mutual Funds
19. African Alliance Mutual Fund

20 British-American Mutual Fund

21 Commercial Bank of Africa Mutual Fund

22 Old Mutual Fund

23 Stanbic Mutual Fund

24 Zimele Mutual Fund

APPENDIX 4

List of Stockbrokers, Investment Banks and Mutual Funds that responded to the questionnaire

Stockbrokers
1. African Alliance Kenya Securities
2. Ashbhu Securities Ltd
3. Bob Mathews Stockbrokers Ltd
4. CFC Financial Services – Stock broking Division
5. Discount Securities Ltd.
6. Faida Securities Ltd
7 Ngenye Kariuki & Co. Ltd.
8. Nyaga Stockbrokers Ltd
9. Reliable Securities Ltd.
10. Solid Investment Securities Ltd
11. Sterling Securities Ltd
Investment Banks
12 Dyer & Blair Investment Bank Ltd
13 Standard Investment Bank Ltd
14 Suntra Investment Bank
Mutual Funds
15 African Alliance Mutual Fund
16 Stanbic Mutual Fund
17.Zimele Mutual Fund