# RELATIONSHIP BETWEEN CHANGES IN STOCK PRICES AND CHANGES IN MANAGEMENT: EVIDENCE FROM NAIROBI SECURITIES EXCHANGE 

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# A RESEARCH PROJECT REPORT SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE AWARD OF THE DEGREE OF MASTER OF BUSINESS ADMINISTRATION, SCHOOL OF BUSINESS, UNIVERSITY OF NAIROBI 

## DECLARATION

This project report is my original work and has not been submitted for a degree in any other University.

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

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When I began, God was with me and through it all, He remained the greatest inspiration. Knowing that He was by my side though invisible gave me a rare courage to keep the fight knowing too well that, He-the source of all knowledge, wisdom, strength and ability would suffice at every stage of the study. He , as always never disappointed. All the glory belongs to God without whom I am vain.

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To my family, my darling wife, Lydiah Wachinga, beloved daughters, Terry Muthoni and Mary Wachuka for immeasurable sacrifice, encouragement, prayers, support and kind words. May every moment of your life be filled with abundance, laughter and pure joy. God richly bless you.

## DEDICATION

To my beloved family - My mother, Teresiah Muthoni, my darling wife, Lydiah Wachinga and beloved daughters Terry Muthoni and Mary Wachuka

To God the Most High, for everything.


#### Abstract

Stakeholders use amongst other measures, stock prices to gauge performances of firms, and consequently, performances of management. The study aimed at establishing the relationship between changes in price and change in management at the Nairobi Securities Exchange. The study further aimed at establishing the nature of such relationship if any. Studies establishing relationship between changes in stock prices in developed countries gave conflicting results. Similar studies conducted in Kenya, a developing country with unique set of operating environmental factors did not adequately address the aspect of relationship between changes in price and change in management at the Nairobi Securities Exchange and hence the need for study in this area. Out of a total of 54 companies listed on the Nairobi Securities Exchange as at $2^{\text {nd }}$ January 2001, a sample of 37 companies met the criteria for inclusion. Data relating to persistent changes in stock prices and changes in the management was collected from Nairobi Securities Exchange, Capital Market Authority and financial reports of firms. A longitudinal study was used to evaluate the relationship between changes in stock prices and change in management at the Nairobi Securities Exchange. A logistic regression model was used to explain the relationship between a dichotomous response variable (change in management) and a categorical predictor variable (stock price). The Wald Test was used to test the significance of the relationship between changes in price and change in management. The study showed that the relationship between changes in price and change in management was significant. Further the study showed that a unit fall in stock price increased the $\log$ odds (logit), the odds and the probability of change in management. Conversely, a unit rise in stock price decreased the log odds (logit), the odds and the probability of change in management. The study concluded that a relationship between change in stock prices and change in management existed in the Kenyan market, that is, the Nairobi Securities Exchange and that the relationship was an inverse relationship. The study recommends that Nairobi Securities Exchange and Capital Market Authority put in place mechanisms to ensure data accessibility, that reasons for varied reactions time wise to changes in stock price by different firms be analyzed and that Nairobi Securities Exchange and Capital Market Authority compel firms to give reasons for all management changes carried out at any one particular time. The study suggests further studies to investigate causes of changes in management in cases where stock prices do not change as well as investigate if time is a significant variable in explaining change in management.


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## LIST OF ABBREVIATIONS

| CEO | Chief Executive Officer |
| :--- | :--- |
| AMEX | American Stock Exchange |
| NYSE | New York Stock Exchange |
| USA | United States of America |
| NSE | Nairobi Securities Exchange |
| SPSS | Statistical Product and Service Solutions |
| CMA | Capital Market Authority |

## CHAPTER ONE: INTRODUCTION

### 1.1 Background of the Study

The set of formal and informal cooperative agreements describing a corporation has long been the subject of critical evaluation. Researchers have attempted to determine whether this institution, in fact, is characterized by managerial behavior beneficial to shareholders. Some have alleged that because ownership is separated from control, managers of the corporation can use corporate resources to enhance their specific interests and that such use will not be in the interests of shareholders (Berle and Means, 1932).

Ownership of shares in the modern corporation is wide making it hard for the owners to perform managerial functions meant to maximize shareholders returns (Pratt and Zeckhauser 1985). To ensure that modern corporations are run in a manner that maximize shareholders' returns, services of skilled management are sought and an agency relationship is formed. In the agency relationship, owners are principals and managers as agents. An agency loss exists which is the extent to which returns to the residual claimants who are the owners, fall below what they would be if the principals, the owners, exercised direct control of the corporation (Jensen and Meckling, 1976). Such an agency loss if caused by poor performance will form the basis of removing management from office by blockholders whose expectations of high returns the managers could not meet.

According to Fama (1980), hiring and firing of managers by the board of directors is one of the most important and possibly beneficial internal mechanisms of corporate control. Firing of managers by the board of directors is more often than not linked to a prior poor share performance and such action cause changes in the set of individuals holding the title of chief executive officer (CEO), president, or chairman of the board, essentially causing change in management (Warner, Ross, and Karen, 1988).

To a great extent, management and business policy has been influenced by agency theory. According to Jensen and Meckling (1976), managers will not act to maximize the returns to shareholders unless appropriate governance structures are implemented in firms to safeguard the interests of shareholders. In order for a firm to perform well, the board of directors which has an important supervisory function must foster a good relationship between the chairperson and the chief executive officer (Tricker, 1984).

According to Williamson (1985), Shareholder interests are only protected where the chair of the board is not held by the CEO or where the CEO has the same interests as the shareholders by ensuring a compensation plan that is properly designed. Contrary to this view about management is the view that the more critical factor for shareholder returns to be maximized is a correctly designed organization structure which allows the CEO to take effective action.

While external mechanisms (such as takeover) of removing inefficient managers do exist, Fama and Jensen (1983), there are potentially important internal mechanisms one of which is monitoring by the board of directors (Fama, 1980). According to Fama and Jensen (1983), the second mechanism is mutual monitoring among the firm's managers. The third mechanism is monitoring by holders of large share blocks (Shleifer and Vishny, 1986). If these mechanisms are effective and if stock price performance reflects information on managers' efficiency, the relationship between management change and share performance will be negative.

Caution must however be taken to distinguish important from unimportant CEO changes. Vancil (1987) argues that many CEO changes are part of the normal succession process. Mere transfer of the CEO title from one to another in the same management team does not constitute a management change as it does not involve a change in the group of individuals comprising management and can therefore not be related to performance.

### 1.1.1 Change in Management

Warner et al. (1988) defines management change as any change in the set of individuals holding the title of chief executive officer (CEO), president, or chairman of the board. Besides the CEO, changes within the top management should be considered to fully and accurately capture performance consequences of CEO succession (Shen and Cannella, 2002). Wagner and O'Reilly (1984) posit that such consideration is important because any change in the senior executive team affects team composition.

### 1.1.2 Stock Prices

Stock price is market value of a share of common stock on the date shown. Stock prices are set by a combination of factors that no analyst can consistently understand or predict. In general, they reflect the long-term earnings potential of companies. Investors are attracted to stocks of companies they expect will earn substantial profits in the future; because many people wish to buy stocks of such companies, prices of these stocks tend to rise. On the other hand, investors are reluctant to purchase stocks of companies that face bleak earnings prospects; because fewer people wish to buy and more wish to sell these stocks, prices fall.

### 1.1.3 Factors that influence Changes in Stock Prices

According to the law of demand and supply, generally, if there is a low supply and a high demand, the price will be high. In contrast, the greater the supply and the lower the demand, the lower the price will be. Demand and supply are the most important factors responsible for change in a stock's price. When more investors want to buy a stock than sell it, the stock's price goes up. This is because there is a good demand for the stock and there are not enough sellers to satisfy that demand. This forces some investors to bid higher for the stock thus driving the price up.

Conversely when more people want to sell a stock than buy it, the stock's price goes down. This is because there is a good supply of stock but there are not enough buyers willing to buy them. Some investors offer a lower selling price in the hope of selling the stock and drive the price downwards.

Consistent with the efficient market theory, the next factor that can have a big impact on a stock's price is positive or negative news related to that company or industry. The stock market is quick to react to such news, often without any rational explanation. A stock's price can rise quickly on positive news and fall drastically in case of negative news.

The other important factor affecting a stock's price is the perceived value of the company. This is determined by the company's profits and what the investors are willing to pay for the company's growth. Stewardship theory posits that managers who are good stewards produce superior returns to shareholders. An important component of a financial result is the profit made by the company and this is used to determine the true value of the company. If the company posts better than expected results, the stock price goes up. On the other hand if the company posts disappointing results, the stock price goes down.

### 1.1.4 The Nairobi Securities Exchange

The Nairobi Stock Exchange (NSE) was established in 1954 as a voluntary association of stockbrokers registered under the Societies Act (NSE, 1997). The number of companies listed on the NSE has since grown and so has its turnover, capitalization and index levels. The NSE currently has two market indices; the NSE 20-Share Index which is price weighted and an all inclusive NSE All Share Index (NASI) which is market capitalization weighted (NSE, 2013).

The Nairobi Stock Exchange changed its name to The Nairobi Securities Exchange in July 2011. The Nairobi Securities Exchange (NSE) is custodian to a lot of information in
respect of listed firms and changes in management of listed firms is some of the vital information in the custody of the Nairobi Securities Exchange.

### 1.2 Research Problem

Investors are attracted to stocks of companies they expect will earn substantial profits in the future; because many people wish to buy stocks of such companies, prices of these stocks tend to rise. On the other hand, investors are reluctant to purchase stocks of companies that face bleak earnings prospects; because fewer people wish to buy and more wish to sell these stocks, prices fall. All other factors constant, high stock prices signal good times and this means that the management is doing a good job and is therefore under no threat from the board that is responsible for firing and hiring (Manne, 1965). Low stock prices signal poor performance by the management and replacement of such management is a certainty (Warner et al., 1988). In their study examining the role of pre-succession performance in explaining stock market reactions to succession events, Lubatkin, Chung, Rogers and Owers (1986) found no relationship. In a similar study however, Friedman and Singh (1987) found (at the 0.10 level of significance) that when pre-succession performance is poor, the market's reaction to succession tends to be positive. Ocasio (1994) found that CEO replacement is often triggered by poor performance. According to Gamson and Scotch (1964), replacement of a leader does not matter. Weiner and Mahoney (1981) on the other hand found that change in leadership mattered but that the disruption that is caused by succession cancels the positive effect of replacing an unsuccessful manager (Pfeffer and Davis-Blake, 1986).

In the Kenyan market, Kiptoo (2010) studied the relationship between the stock prices and the movement in inflation rate, exchange rate, money supply, interest rates and gross domestic product. The result indicated that of all the variables, only gross domestic product had the expected sign. In addition, exchange rate and inflation were found to have significant impact on stock prices. Interest rates, money supply and gross domestic product were found to be insignificant. Ondieki (2011) studied 15 instances of chief executive officer change announcement during the period 2005 to 2009 to establish the
effect of chief executive officer change announcements on the stock returns of firms listed at the NSE and found that such announcement had significant effect on stock returns. A study by Muiruri (2010) to establish the relationship between executive compensation and stock prices using firms quoted on the NSE found that the actions of the board had a great deal of influence on firm performance. A study by Tonui (2009) to establish the relationship between board size and share performance found a strong positive relationship between board size and share returns indicating that the board of directors actually play an important role in the governance of corporations.

Studies carried out in developed countries have proved worthwhile notwithstanding some inconsistencies as to the relationship between change in stock prices and change in management. Studies carried out in Kenya do not adequately address the relationship between change in stock prices and change in management and hence the need for a study in this area in the Kenyan market, a market which has political, economic, social, technological, environmental and legal climate that is different from one existing in developed countries where most studies have been done and proved worthwhile.

Most studies establishing the relationship between change in stock performance and change in management have been done in developed countries such as USA, thereby equipping such countries with unmatched competitive advantage in the takeover market and therefore giving them the rights to manage corporate resources (Jensen and Ruback, 1983). Studies done in Kenya do not adequately address the relationship between change in stock performance and change in management making Kenya less competitive in the takeover market.

Competition to manage corporate resource is global and Kenya as one of the competitors in the takeover market would immensely benefit from the knowledge of the relationship between change in stock prices and change in management if only to enable it retain the local segment of the market and not lose it altogether to the knowledgeable competitors from developed countries.

A study by Manne (1965) showed that the lower the stock price, relative to what it could be with more efficient management, the more attractive the take-over becomes to those who believe that they can manage the company more efficiently, and the potential return from the successful takeover and revitalization of a poorly run company can be enormous. Evidently, studies investigating relationship between change in stock prices and change in management conducted in developed countries give conflicting results. Kenya is a developing country with a unique economic, technological, environmental, legal, social and political environment. There was need therefore to study the relationship between change in stock prices and change in management in the NSE. Is there a relationship between change in stock prices and change in management in the Kenyan market? What is the nature of relationship if any?

### 1.3 Research Objectives

(i) To determine if there is a relationship between change in stock prices and change in management in the Kenyan market-NSE.
(ii) To determine the nature of relationship if any.

### 1.4 Value of the Study

Knowledge of the relationship between change in stock prices and change in management will be of great importance to all stakeholders of whom investors (both current and potential) are. Investors expect good returns from their investments. Blockholders play the important role of monitoring the affairs a firm in which they invest. They participate in firing and hiring decisions. The study will provide an additional tool on which to base their decisions.

Lenders of finances play the important role of providing finances to firms. Lenders of finances want to sure of getting back money lent out plus interest earned. The study will provide an additional tool on which to base their lending decisions.

Investment managers perform the important task of guiding their clients when deciding in which firms to invest. Investment managers rely on empirical information in discharging their obligations. The study will provide an additional tool on which to base their decisions.

As the field of management evolves and competition to manage corporate resources in the takeover market increases, the relationship between stock performance and change in management of corporations will continue to attract attention from scholars who seek to the relationship more and hence more research opportunities in this area.

## CHAPTER TWO: LITERATURE REVIEW

### 2.1 Introduction

In this section, the study identified various theories with respect to ownership, management and performance firms.

### 2.2 Theoretical Review

The theories that explain management changes in relation to stock performance are explained here. The specific theories are Agency theory, Kindred theory of organizational economics, Stewardship theory and Contingency theory of management.

### 2.2.1 Stock Market Efficiency Theory

Fama (1970) defined an efficient market as one in which prices always "fully reflect" available information. It is the degree to which stock prices reflect all available, relevant information. Market efficiency was developed in 1970 by Economist Eugene Fama whose theory, efficient market hypothesis (EMH), stated that it is not possible for an investor to outperform the market because all available information is already built into all stock prices. However, secondary stock market prices, often viewed as the most "informationally efficient" prices in the economy, have no direct role in the allocation of equity capital since managers have discretion in determining the level of investment (James and Gary, 1997). If these mechanisms are effective, and if stock price performance reflects information on managers' efficiency, there will be a negative relation between the probability of change in share performance and management (Warner et al., 1988)

### 2.2.2 Agency Theory

According to agency theory, ownership of shares in the modern corporation is wide making it hard for the owners to perform managerial functions meant to maximize shareholders returns (Pratt and Zeckhauser 1985). Agency theory regards owners as principals and managers as agents and recognizes existence of an agency loss which is the extent to which returns to the residual claimants who are the owners, fall below what they would be if the principals, the owners, exercised direct control of the corporation (Jensen and Meckling, 1976).

### 2.2.3 Kindred Theory

Kindred theory of organizational economics is concerned with forestalling managerial "opportunistic behaviour" which includes shirking and indulging in excessive benefits at the expense of shareholder interests (Williamson, 1985). According to Lex and James (1991), the board of directors is a major structural mechanism to curtail such managerial "opportunism" since it monitors managerial actions on behalf of the shareholders. Impartiality of review will be achieved if the chairperson of the board is independent of executive management and will be compromised otherwise (Lex and James, 1991).

### 2.2.4 Stewardship Theory

Stewardship theory holds that there is no inherent, general problem of executive motivation since the manager far from being an opportunistic shirker, essentially wants to do a good job, to be a good steward of the corporate assets (Lex and James, 1991). Stewardship theory emphasizes on facilitative, empowering structures rather than on motivation of the CEO. It holds that assigning the roles of chair and CEO to the incumbent manager enhance effectiveness and produce superior returns to shareholders than if the roles of the chair and CEO were separated

### 2.2.5 Contingency Theory of Management Succession

According to the contingency view of management succession, a new leader has a positive, neutral, or negative influence on performance depending on how compatible the characteristics of the leader are with requirements set by the context of a job (Hambrick and Mason, 1984). Different task demands are associated with high- and low-performing firms and may require the different leadership influences associated with outside and inside appointments.

### 2.3 Factors that influence Changes in Management

Management changes occur for different reasons. Some are prior performance related and others not (Warner et al., 1988). Termination of top manager's employment is more likely to be a response to poor management performance than are management changes in general. Recognizing that top management is not restricted to one individual raises the possibility that competition between top managers is an important force affecting management turnover (Warner et al., 1988). In performing its functioning of hiring and firing, the board essentially causes changes in management (Weisbach, 1988) and so do monitoring functions by blockholders (Shleifer and Vishny, 1986). Replacement of a team member or an addition to the management team whether by promoting a current lower-level manager or by hiring from outside the firm also does cause change in management (Warner et al., 1988). Other causes of management change include retirement, death, ill health and leaving the firm to pursue other interests (Warner et al., 1988).

### 2.4 Empirical Review

There are many reasons why management changes take place and the effects of such changes differ with relation to prior share performances. While some changes will be as a result of good performance, others will have no relation to prior performance (Warner et al., 1988).

A study by Warner et al. (1988) sampled 269 firms listed on the New York and American Stock Exchanges (NYSE and AMEX) and found a significant association between poor stock performance and the frequency of management turnover but found no significant excess returns to shareholders at the announcement of management change. Warner et al. (1988) notes that most often, termination of a manager's employment, which constitutes a forced departure, is most likely the result of poor management performance than are management changes in general. Additionally, the study found significant association between poor stock performance and the frequency of management turnover but found no significant excess returns to shareholders at the announcement of management change.

Beatty and Zajac (1987) sampled 209 large corporations in USA and found an insignificant negative return at management change announcements. In their study, Furtado and Rozeff (1987) carried out a study in USA and found that there were significant positive returns at the announcement of management change According to Gamson and Scotch (1964), replacement of a leader does not matter. Weiner and Mahoney (1981) on the other hand found that change in leadership mattered but that the disruption that is caused by succession cancels the positive effect of replacing an unsuccessful manager (Pfeffer and Davis-Blake, 1986).

In their study examining the role of pre-succession performance in explaining stock market reactions to succession events, Lubatkin et al. (1986) found no relationship. In a similar study however, Friedman and Singh (1987) found (at the 0.10 level of significance) that when pre-succession performance is poor, the market's reaction to succession tends to be positive.

According to Allen and Panian (1982), the performance of an organization greatly determines the tenure of the executive. Dalton \& Kesner (1985) observed that poor financial performance was the most reason for executive replacement.

Ocasio (1994) found that CEO replacement is often triggered by poor performance. Under the adaptive approach to strategy, top management change occurs in response to
the demands of the external environment (Friedman and Singh, 1989). This perspective is based on the resource dependence view of the firm, which suggests that firms will replace a CEO when performance is poor because poor performance indicates that the CEO is not able to successfully manage the firm's resources (Bommer and Ellstrand, 1996).

A study conducted by Bresser, Valle Thiele, Biedermann and Lüdeke (2005) showed that CEO dismissals are preceded by poor firm financial and/or stock price performance Replacing management following periods of poor performance demonstrates the organization's willingness to accede to outside demands (Arthaud-Day, Certo, Dalton and Dalton, 2006). According to Schwartz \& Menon (1985), top managers have symbolic roles in organizations and replacing them when performance is poor has the potential to improve both internal and external perceptions of the company and restore confidence in its future. The signal sent at the announcement of CEO change is that the person responsible for the poor performance is about to be replaced and that his successor can lead the firm to recovery.

Forced departure of CEO more than purely symbolizes imminent change and creates a strong break with the past, and the publicity associated with the exit communicates the board's mandate for change (Helfat and Bailey, 2005)

The replacement of a CEO is a relatively rare event in a corporation's life (James \& Soref, 1981). A study comprising large US companies by Kaplan and Minton (2007) conducted between 1992 and 2005 indicated an average CEO tenure of 6.4 years. A study covering later periods suggested a decline in the average CEO tenure both in the US and worldwide (Lucier and Dyer, 2007). Nonetheless the selection of the top executive remained one of the most critical organizational decisions (Finkelstein and Hambrick, 1996).

Besides predicting CEO change, poor performance in many cases result into an outside successor being selected if the board cannot find a suitable replacement within the firm (Finkelstein and Hambrick, 1996). Appointing a CEO following a forced departure of the
previous CEO sends an even stronger message demonstrating the need to break from the past (Friedman and Saul, 1991). According to Wiersema (1995), outsiders are seen as better placed to bring a new perspective and are better equipped bring about the needed change to improve performance.

Booz Allen Hamilton study, which was conducted in the world's largest 2,500 corporations and reports that although the average rate of external successions doubled between 1995 and 2003, 55 percent of outsider CEOs in North America, and 70 percent of outsider CEOs in Europe, were forced to resign for performance-related reasons in 2003 (Lucier, Schuyt, and Handa, 2003).

Boeker and Goodstein (1993) explains that poor performance acts as a catalyst to organizational adaptation by signaling that the existing way of operating is inappropriate and that leadership needs to achieve a more successful alignment with the external environment. According to Tushman and Rosenkopf (1996), incremental changes to existing operating procedures will most likely not suffice and neither will reinforcement of the status quo improve performance.

According to Wagner and O'Reilly (1984), change in the senior executive team affects team composition and as posited by Shen and Cannella (2002), the team dynamics. As a result, some researchers concluded that focusing on the CEO successor alone without considering other personnel changes within top management cannot fully and accurately capture the performance consequences of CEO succession (Shen and Cannella, 2002).

Ondieki (2011) found that change announcements had significant effect on stock returns in the Kenyan market. A study by Muiruri (2010) established that the actions of the board had a great deal of influence on firm performance. Tonui (2009) established that there exists a strong positive relationship between board size and share performance in the Kenyan market.

### 2.5 Summary of Literature Review

Change in management is dependent on variety of factors one of which is stock performance - the stock price, which affects the wealth of shareholders. Shareholders play monitoring functions to ensure that management plays its role of an agent as per the agreement entered into with the principle, the shareholders. Holding all other factors constant, rising stock prices indicate a well performing management. Falling stock prices indicate poor performance by management.

Studies carried out in developed countries indicate existence of inconsistencies as pertains to the relationship between stock performance and management changes. Studies carried out in Kenya do not adequately address the relationship between change in stock prices and changes in management and hence it was needful for a study to be carried out in this area in the Kenyan market.

## CHAPTER THREE: RESEARCH METHODOLOGY

### 3.1 Introduction

This section identified the research design for the study, the sample size, data collected and the data analysis techniques that were used.

### 3.2 Research Design

A longitudinal study was used to evaluate the relationship between changes in stock prices and changes in management at the NSE. A longitudinal study is a research study that involves repeated observations of the same variables over periods of time. A longitudinal study is advantageous because the study needs to be well documented. Longitudinal data involve repeated measures of the same variables over periods of time and hence the prevalence of the factor of interest at several points in time, and can provide information on causation, prognosis, stability, and change (Rutter, 1988). Longitudinal studies enable factors of interest to be examined for stability and continuity, and can identify developments over time (Sanson et al., 2002).

Longitudinal studies also allow researchers to differentiate between change over time in aggregate (group) data and changes in individual units of study. A longitudinal study can also examine change within individual study units as well as variation between them (Farrington, 1991 cited in Sanson et al., 2002). Repeated measures allow for the detection of change in individual study units or their environments from one data point to the next (Hunter et al., 2002). The relationship between changes in stock prices and changes in management was estimated using logit regressions.

### 3.3 Population of the Study

The population of this study was all the 54 companies listed on the NSE as at $2^{\text {nd }}$ January 2001.

### 3.4 Sample

The study used all the 54 companies listed on the NSE as at $2^{\text {nd }}$ January 2001. Appendix A shows companies listed on the NSE as at $2^{\text {nd }}$ January 2001. Data availability was the basis for inclusion. Any company that did not have data at all was left out. Data for 17 companies was missing. Out of the total of 54 companies listed on the NES as at $2^{\text {nd }}$ January 2001, 37 qualified for inclusion.

### 3.5 Data Collection

This study made use of secondary data which was collected from the NSE. Data that was collected for analysis comprised; period of persistent change in stock prices (month and year) and when management change occurred (month and year). Data entry form with respect to dates (month and year) when changes in management occurred is given in appendix D. Data entry form with respect to dates (month and year) when persistent changes in stock price occurred is given in appendix B. The study used data from $2^{\text {nd }}$ January 2001 to $31^{\text {st }}$ December 2012. This data was collected from the NSE, CMA and Financial statements of firms.

### 3.6 Data Analysis

Changes in management in each of the 37 companies were identified by comparing management team composition across the years and recording dates (month and year) when change occurred. Management team changes involving two or more individuals were treated as one change unless if the separate changes occurred at different dates. Management changes which did not involve a change in the group of individuals comprising management such as mere changes of titles alone were not considered.

For each company and for the entire period of study was ascertained the total number of management changes attributable to a prior stock price changes, total number of management changes not attributable prior stock price changes, total number of times
management changes were not observed despite prior stock price changes and total number of times there were no management changes as a result of no changes in prior stock price

To constitute a stock price change, stock price were ascertained to have risen or fallen persistently for a period of not less than a month. This was a necessary condition to distinguish between temporary daily stock price fluctuations and stock price changes for purposes of this study. Dates (month and year) for the change period were determined.

Change in management will be the response variable and change in prior stock price will be the predictor variable. The response will have two categories: change and no change. The predictor is a categorical variable. Change in stock price will be measured as a simple dichotomy coded yes or no.

The relationship between change in stock prices and change in management will be estimated using a logit regression. The dependent variable is one if a change in management occurs during the Period in question and zero otherwise. The counts of management changes will be treated as realizations of the independent variables. A one factor model will be used. SPSS will be used in data analysis. Given below is the logit regression model that will be used:
$\operatorname{Logit}(\Pi)=a_{0}+a_{1} \mathrm{P}$
Where; Logit $(\pi)$ is the natural $\log$ of $(\Pi /(1-\Pi))$
$\Pi$ is the probability of a management change
$1-\Pi$ is the probability of no management change
$a_{0}$ is the overall logit
$a_{1}$ is the incremental effect of P
$P$ change in stock price

The logit regression model was introduced by Berkson (1944) who coined the term "logit". Berkson read physics at Columbia, and then went to Johns Hopkins for his M.D. and a doctorate in statistics in 1928. The Wald test will be used as the statistical inference tool.

## CHAPTER 4: DATA ANALYSIS, RESULTS AND DISCUSSION

### 4.1 Introduction

The study set out to ascertain stock price changes as well as management changes of 37 companies listed on the NSE. The study further set out to determine and evaluate the relationship between changes in stock prices and changes in management. This chapter explains how the data was analyzed, analysis techniques used and discussions of the results.

### 4.2 Analysis of Logistic Regression Results and Discussion

### 4.2.1 Cases Processed

As given in the SPSS "Case Processing Summary" table 4.1 below, the total number of cases included in the analysis was 534. Of the total cases, 534 cases were used in the analysis with zero cases missing and none unselected. The table shows that $100 \%$ of cases were analyzed.

Table 4.1 Case Processing Summary

| Unweighted Cases $^{\mathrm{a}}$ | N | Percent |  |
| :--- | :--- | :--- | :--- |
| Included in <br> Selected Cases <br>  <br> Analysis <br>  <br>  <br> Missing Cases <br> Total |  |  |  |
| Unselected Cases | 534 | 100.0 |  |
| Total | 534 | .0 |  |

### 4.2.2 Dependent Variable Encoding

Values were used to name the categories on the dichotomously scored dependent variable (change in management). In the study, the response "No change" was coded " 0 " and the response "change" was coded "1." Coding was done in accordance to the general rule in logistic analysis that the value of the dependent variable of most interest be coded as 1.0. This is shown in the SPSS ‘Dependent Variable Encoding" table 4.2 below.

## Table 4.2 Dependent

Variable Encoding

| Original Value | Internal Value |
| :--- | :--- |
| No change | 0 |
| Change | 1 |

### 4.2.3 Categorical Variable Coding

As per SPSS analysis, categorical variable coding as well as the frequency of outcomes with respect to the categorical variable (stock price) was as shown in "Categorical Variable Codings" table 4.3 below. "Stock price change-No" was coded " 1 " and occurred 209 times, translating to $39.14 \%$ while "stock price change-Yes" was coded " 0 " and occurred 325 times translating to $60.86 \%$.

Table 4.3 Categorical Variables Codings

|  | Frequency | Parameter <br> coding |
| :--- | :--- | :--- |
| $(1)$ |  |  |

### 4.2.4 Constant Estimate

As per the results of SPSS analysis, the total number of iterations ("rounds") at step 0 used by the algorithm to compute the estimate for the constant term was 4 at step 0 . As shown in the "Iteration History" - "Block 0: Beginning Block" table 4.4 below, estimation terminated at iteration number 4 because parameter estimates changed by less than .001. A constant term deemed satisfactory was estimated at iteration 4 as 1.315 . This is the first analysis and it contains no predictor but only a constant in the model.

The "-2 Log likelihood" is a statistic used in estimation. The log-likelihood value of 551.176 serves nicely as a "baseline" value by which the model containing the predictor of interest (change in stock price) is compared. The value 551.176 was used for purposes of comparison with the log-likelihood value in "Block 1" when the predictor was included into the model

Table 4.4 Iteration History ${ }^{\text {a,b,c }}$ - Block 0: Beginning Block

| Iteration |  | -2 Log <br> likelihood | Coefficients |
| :--- | :--- | :--- | :--- |
|  |  | 1 | Constant |
| Step 0 | 2 | 553.578 | 1.154 |
|  | 3 | 551.180 | 1.308 |
|  | 4 | 551.176 | 1.315 |

### 4.2.5 Predictive Power of the Constant Model

According to the SPSS results shown in "Classification Table" - "Block 0: Beginning Block" table 4.5 below, of the 421 cases of management change, the model classified 421 of them correctly i.e. $100 \%$ correct classifications. Of the 113 cases of no management change, 0 were classified correctly i.e. $0 \%$ correct classifications. Overall classification for the model was equal to $78.8 \%$.

Table 4.5 Classification Table ${ }^{\text {a,b }}$ - Block 0: Beginning Block

| Observed |  | Predicted |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  | Change in management |  | Percentage Correct |
|  |  | No change | Change |  |
| Step 0 | Change in No change management Change Overall Percentage | $0$ | $\begin{aligned} & 113 \\ & 421 \end{aligned}$ | $\begin{aligned} & \hline .0 \\ & 100.0 \\ & 78.8 \\ & \hline \end{aligned}$ |

### 4.2.6 Parameters associated with the Constant Model

According to the SPSS results and as shown in the "Variables in the Equation" - "Block 0 : Beginning Block" table 4.6 shown below, " $B$ " associated with step 0 , the equivalent of " $a_{0}$ " in the model formulated to describe the relationship between change in stock prices and change in management in the NSE is equal to 1.315 (which matches up with the value of 1.315 earlier seen for iteration 4 under "iteration history- Block 0: Beginning Block). The "S.E." is the standard error for the "B," (i.e., how much sample to sample fluctuation in the estimated parameter can be expected in the long run if an infinite number of samples were possibly to be taken) is 0.106 . The "Wald" is an inferential statistic calculated on 1 degree of freedom is 154.111 is statistically insignificant at $\mathrm{p}<$ .05 since the probability of observing a statistic of 154.11 or more extreme is equal to 0.000 . The exponential of " $B$ " coefficient is 3.726 . Interpretation of statistics at the constant model level is not very useful.

Table 4.6 Variables in the Equation- Block 0: Beginning Block

|  |  | B | S.E. | Wald | df | Sig. |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Step 0 $\quad$ Constant | 1.315 | .106 | 154.111 | 1 | .000 | 3.726 |

### 4.2.7 Variables not in the Equation for the Constant Model

Table 4.7 Variables not in the Equation- Block 0: Beginning Block

|  |  | Score | df | Sig. |
| :--- | :--- | :--- | :--- | :--- |
| Step 0 | Variables Stockpricechange(1) | 20.335 | 1 | .000 |
|  | Overall Statistics | 20.335 | 1 | .000 |

As per the output provided by SPSS in the "Variables not in the Equation" - "Block 0: Beginning Block" table 4.7 above information contained therein indicates that had stock price change been included it would have contributed to predicting the dependent variable. Change in stock price has a p-value of .000 . This information is "superfluous" as it is futuristic and the predictor variable, change in stock price is yet to be entered into the model. At minimum, it more or less indicates that the variable may definitely be meaningful in the study, and that the logistic regression should not be interpreted at the intercept-only phase but rather when it already has the predictor variable included.

### 4.2.8 Estimation of Coefficients

Table 4.8 Iteration History ${ }^{\text {a,b,c,d }}$ - Block 1: Method = Enter

| Iteration |  | 2 Log <br> likelihood | Coefficients |  |
| :--- | :--- | :--- | :--- | :--- |
|  |  |  | Constant | Stockpricecha <br> nge(1) |
| Step 1 | 1 | 536.564 | 1.409 | -.653 |
|  | 3 | 531.316 | 1.718 | -.922 |
|  | 4 | 531.265 | 1.752 | -.957 |
|  | 531.265 | 1.753 | -.957 |  |

According to SPSS results shown in "Iteration History" - "Block 1: Method = Enter" table 4.8 above, the best estimate of the coefficients for the "constant" and "change in stock price" are best estimated at step 4, where SPSS deemed that the difference between values at step 3 and step 4 were less than .001 i.e. insignificant. Iteration process therefore stop at step 4 where estimates are deemed best estimated. The -2 Log likelihood value gets smaller as the number of iteration steps increases. It goes from 536.564 to 531.265 , stopping at step 4.

### 4.2.9 Change in Price as a better Predictor of Management Change than the Constant model

Table 4.9 Omnibus Tests of Model Coefficients- Block 1: Method = Enter

|  |  | Chi-square | df | Sig. |
| :--- | :--- | :--- | :--- | :--- |
| Step | 19.912 | 1 | .000 |  |
|  | Block | 19.912 | 1 | .000 |
|  | Model | 19.912 | 1 | .000 |

According to SPSS results, the "Omnibus Tests of Model Coefficients"-"Block 1: Method = Enter" table 4.9 above, the "Omnibus" i.e. "overall," tests indicates that the model with change in stock price predicts change in management better than the constant model and that the model worthy looking into further. SPSS designed the above table for instances in which it is necessary to perform a stepwise or hierarchical logistic regression, hence the existence of "Step" and then "Block". If it were a stepwise or hierarchical logistic regression, differences between the "Step" "Block" and "Model" numbers would emerge along the way. The study however used the method "enter," the reason for the same values. The above table indicates that the model with change in stock price as the predictor does better than the constant model at predicting change in management, and is statistically significant at $\mathrm{p}<.001$. The chi-square value of 19.912 is computed by taking a difference between the $\log$ likelihood shown in "Iteration History", b,c - Block 0 :

Beginning Block" table 4.4 and the log-likelihood shown in "Iteration History" - "Block 1: Method $=$ Enter" table 4.8 , and as such is equal to $551.176-531.265=19.911$

### 4.2.10 Summary of Model Statistics

Table 4.10 Model Summary- Block 1: Method = Enter

| Step | -2 Log <br> likelihood | Cox \& Snell R <br> Square | Nagelkerke R <br> Square |
| :--- | :--- | :--- | :--- |
| 1 | $531.265^{\mathrm{a}}$ | .037 | .057 |

As per the SPSS results, "Model Summary," - "Block 1: Method = Enter" table 4.10 above shows summary statistics for the model at "Step 1," which is the model with change in stock price as the predictor. The first statistic is the -2 Log likelihood value, and is equal to 531.265 . This value was compared with that of the "constant-only" model shown in "Iteration History" - "Block 0: Beginning Block" table 4.4 which shows a -2 Log likelihood value of 551.176 . Evidently, with the inclusion of change in price as the predictor, the -2 Log likelihood value has decreased, the difference being 551.176 $531.265=19.911$, the value of chi-squared shown in the "Omnibus Tests of Model Coefficients"-"Block 1: Method = Enter" table 4.9. The decrease in -2 Log likelihood value and the low value of chi-squared are indications of a well fitting model. The Cox \& Snell R Square and Nagelkerke R Square with values of 0.037 and 0.057 respectively are "pseudo" R-square values which should never be interpreted exactly as would be Rsquared in OLS (ordinary least-squares) regression. Cohen, West and Aiken (2003) call these statistics "Multiple R-squared Analogs" to emphasize that they are not equivalent to the R-squared in OLS regression. Overall, high values are better than low values, with higher values suggesting that the model fits increasingly well.

### 4.2.11 Goodness of fit

Table 4.11 (a) Hosmer and Lemeshow
Test- Block 1: Method = Enter

| Step | Chi-square | Df | Sig. |
| :--- | :--- | :--- | :--- |
| 1 | .000 | 0 | . |

According to SPSS results, the "Hosmer and Lemeshow Test" - "Block 1: Method = Enter" table 4.11 (a) above, which is a measure of fit used to evaluate the goodness of fit between predicted and observed probabilities in classifying on the dependent variable shows a low chi-squared value of 0.00 . Similar to the $-2 \log$ likelihood test, the expectation is this chi-squared value to be low and non-statistically significant if the predicted and observed probabilities match up nicely. In this study the chi-squared value is zero (0), low and statistically insignificant, suggesting that the probabilities of predicted versus observed match up as nicely as per the expectation and hence goodness of fit. SPSS reports the details of the Hosmer and Lemeshow Test in "Contingency Table for Hosmer and Lemeshow Test" - "Block 1: Method = Enter" table 4.11 (b) below. The observations were divided up into 2 groups. These 2 groups were defined based on predicted probabilities. Of importance is the agreement or lack of it between observed and expected frequencies. As per the results, the agreement is perfect for both partitions and in both step 1 and 2 . In partition 1, for "Change in management $=$ No change," the observed is equal to 65 (step 1 ) and 48 (step 2 ), while the expected is equal to 65 (step1) and 48(step 2 ), a perfect match. Similarly for partition 2 , for "Change in management $=$ change," the observed is equal to 144 (step 1) and 277 (step 2), while the expected is equal to 144 (step1) and 277 (step 2), a perfect match once again. The "fit" between observed and expected is perfect, which is one reason why the result of the Hosmer and Lemeshow test was statistically insignificant. A chi-squared test will be statistically significant when the observed frequencies deviate from the expected frequencies. The $\mathrm{p}<.001$ in this case suggests that the observed Frequencies do not deviate from the expected, hence, there is a match between both frequencies, which suggests that predicted probabilities are lined up
with the observed probabilities and that the model is a well-fitting. In conclusion, the Hosmer and Lemeshow Test according to the SPSS results suggest the model fit is good.

Table 4.11 (b) Contingency Table for Hosmer and Lemeshow TestBlock 1: Method = Enter

|  |  | Change in management $=$ <br> No change |  | $\begin{aligned} & \text { Change in anagement } \\ & =\text { Change } \\ & \hline \end{aligned}$ |  | Total |
| :---: | :---: | :---: | :---: | :---: | :---: | :---: |
|  |  | Observed | Expected | Observed | Expected |  |
| Step 1 | 1 | 65 | 65.000 | 144 | 144.000 | 209 |
|  | 2 | 48 | 48.000 | 277 | 277.000 | 325 |

### 4.2.12 Correct Predictions of Model with Change in Price as Predictor

Table 4.12 Classification Table ${ }^{\text {a }}$ - Block 1: Method = Enter

| Observed |  | Predicted |  |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  | Change in management |  | Percentage <br> Correct |
|  |  | No change | Change |  |
| Step 1 | Change in No change | 0 | $\begin{aligned} & 113 \\ & 421 \end{aligned}$ | . 0 |
|  | management Change |  |  | 100.0 |
|  | Overall Percentage |  |  | 78.8 |

As shown in "Classification Table" - "Block 1: Method = Enter" table 4.12 above, overall percentage of correct classifications is equal to $78.8 \%$. Of the 421 cases of management change, the model correctly classified 421 out of 421 (421/421) i.e. $100 \%$. Of the 113 cases of no management change, the model correctly classifies 0 out of 113 $(0 / 113)$ i.e. $0 \%$. The overall percentage figure of 78.8 was calculated by summing up the correct predictions (421 and 0 ) and dividing over the total number of predictions i.e. 534 calculated thus $113+421=534$. The correct predictions consist of the sum of "No changeNo change" and "Change-Change" frequencies. In the above table, there are 0 correct
predictions for " No change-No change," and 421 correct predictions for "ChangeChange," giving us $0+421=421$ correct predictions. When divided by the total frequency of 534, the resulting percentage correctly classified is $421 / 534=78.8 \%$.

The model does well in classifying cases with respect to management change but poorly in classifying cases with respect to no management change. The overall performance of $78.8 \%$ nonetheless implies that the model is good.

### 4.2.13 Complete Logistic Regression Mode: - Coefficients and Inference

Table 4.13 (a) Variables in the Equation- Block 1: Method = Enter

|  |  | B | S.E. | Wald | df | Sig. | $\operatorname{Exp}(\mathrm{B})$ |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| Step 1 ${ }^{\text {a }}$ | Stockpricechange(1) <br> Constant | -.957 | .216 | 19.597 | 1 | .000 | .384 |
|  | 1.753 | .156 | 125.693 | 1 | .000 | 5.771 |  |

Table 4.13 (b) Variables in the Equation- Block 1: Method = Enter

|  |  | $95 \%$ C.I.for EXP(B) |  |
| :--- | :--- | :--- | :--- |
|  | Lower | Upper |  |
| Step 1 ${ }^{\text {a }}$ | Stockpricechange(1) <br> Constant | .251 | .587 |

Given the best estimates of both the constant and the change in stock price as shown in "Variables in the Equation" - "Block 1: Method = Enter" table 4.13 (a), it was possible to write the model with coefficients incorporated: - Logit $(\Pi)=1.753-9.57 * \mathrm{P}$

The logistic regression model, loit $(\Pi)=1.753-0.957 * \mathrm{P}$ can be written on three different scales (logit, odds, or probability). It can therefore be interpreted on these different scales.

With respect to logit, the interpretation of the coefficient of P in the model is that a unit change in P affects the log odds (logit) of change in management depending on whether the change in P is positive or negative. A unit increase (positive change) in P reduces the log odds (logit) of change in management by 0.957 while a unit decrease (negative change) in P increases the log odds (logit) of change in management by 0.957 on average, i.e. a shilling increase in stock price reduces the log odds (logit) of change in management by 0.957 while a shilling decrease in stock price increases the log odds (logit) of change in management by 0.957 .

The logistic regression model, loit $(\Pi)=1.753-0.957 \mathrm{P}$ can also be written as the odds model by taking the exponent of both of sides, i.e.

$$
\mathrm{e}^{1.753-0.957 \mathrm{P}}=\mathrm{e}^{1.753} \mathrm{e}^{-0.957 \mathrm{P}}
$$

Thus, a shilling increase in stock price changes the odds of change in management multiplicatively by a factor equal to $e^{-0.957}$, i.e. by 0.384 . This factor is called an odds ratio and is computed by SPSS and displayed in the final column (labelled $\operatorname{Exp}(\mathrm{B})$ ) of the "Variables in the Equation" table. If it is a one shilling decrease, the multiplicative factor changes to 2.60 . The odds of change in management therefore changes multiplicatively by a factor equal to $e^{0.957}$, i.e. by 2.604 .

Finally, the logistic regression model, loit $(\Pi)=1.753-0.957 \mathrm{P}$ can also be written on the probability scale, i.e.

$$
\Pi=\frac{e^{1.753-0.957 p}}{1+e^{1.753-0.957 p}}
$$

Thus, the probability of change in management can be predicted for any given change in price.

If stock prices remain static, then the probability that there will be a change in management was 0.85 , i.e.

$$
\Pi=\frac{e^{1.753-0.957 p}}{1+e^{1.753-0.957 p}}=\frac{e^{1.753}}{1+e^{1.753}}=0.85
$$

This implies that if stock prices stagnate at one price, it is very likely that there will be a management change. Static prices may be interpreted to mean that the management is not doing enough and hence the need for change to spur performance.

If there is a unit increase in stock price, then,

$$
\Pi=\frac{e^{1.753-0.957 p}}{1+e^{1.753-0.957 p}}=\frac{e^{1.753-0.957}}{1+e^{1.753-0.957}}=0.69
$$

If there is a unit increase in stock price, the probability that there will be change in management is 0.69 .

If there is a unit decrease in stock price, then,

$$
\Pi=\frac{e^{1.753-0.957 p}}{1+e^{1.753-0.957 p}}=\frac{e^{1.753+0.957}}{1+e^{1.753+0.957}}=0.94
$$

If there is a unit decrease in stock price, the probability that there will be change in management is 0.94 .

From the findings of the study, it can be deduced that changes in management will take place even when stock prices are static. This may be because static prices are not an incentive to the stakeholders who will most likely occasion changes in management in a bid to spur performance.

The standard error (S.E) is shown in "Variables in the Equation" - "Block 1: Method = Enter" table 4.13 (a) is 0.216 . Essentially, the standard error is a measure of how stable
our estimate is. The low standard error of 0.216 implies a fairly precise estimate with respect to change in stock price

The Wald statistic was used to test that the null hypothesis that the "B" population coefficient, is equal to 0 . There is no good reason to reject the null hypothesis based on the p-value of .000 . Evidence proved that the "B" i.e. change in stock price coefficient was not equal to 0 in the population from which data were drawn, i.e., there was evidence to suggest that "change in stock price," holding other factors constant, predicts the response variable better than chance alone.

As per SPSS results in "Variables in the Equation" - "Block 1: Method = Enter" table 4.13 (b), in $95 \%$ of samples drawn from the population, it was expected that the interval from 0.251 to 0.587 would include the true parameter of $\operatorname{Exp}(\mathrm{B})$ with respect to increase in stock price. In $5 \%$ of samples drawn from the population, the true parameter will not lie between the lower and upper limits of 0.251 and 0.587 respectively.

### 4.3 Interpretation of Results

37 companies listed in the NSE which met the criteria for inclusion in the sample were used in the study. Data was analyzed using SPSS and the model explaining the relationship between change in stock prices and change in management subjected to a variety of test. Significance of the coefficients of both the constant and change in stock price was conducted and their suitability of the model determined.

It was found that while the model did not pass all the tests, on average, it performed well. It was also established that all coefficients of both the constant and change in price, deemed best estimated by the model were significant and further that change in price was indeed a predictor of change in management.

# CHAPTER 5: SUMMARY, CONCLUSION AND RECOMMENDATIONS 

### 5.1 Introduction

Objectives were set and data analyzed. This chapter, based on the results from the data analysis conducted gives the conclusion, recommendations, limitations the study had and ideas on more studies to be done relating to this particular paper.

### 5.2 Summary

### 5.2.1 Relationship between change in stock prices and change in management

As given in "Case Processing Summary" table 4.1, all the 534 included in the analysis were used, none were missing and none were unselected, hence $100 \%$ cases were analyzed. SPSS determined before time if inclusion of change in price would contribute towards predicting change in management. Evidence in "Variables not in the Equation" "Block 0: Beginning Block" table 4.7 shows the findings. The table shows that price has a p-value of 0.00 and that change in price would indeed predict change in management.

A comparison of "Iteration History" - "Block 0: Beginning Block" table 4.4 and "Iteration History" - "Block 1: Method = Enter" table 4.8 shows a bigger best estimate (at step 4) of-2 $\log$ likelihood value of 551.176 in the former table 4.4 and a smaller best estimate (at step 4) of-2 $\log$ likelihood value of 531.265 in the latter table 4.8 respectively. In the latter table 4.8 , change in stock price has been included in the model and is the reason why $-2 \log$ likelihood dropped from a value of 551.176 shown in table 4.4 (constant only model) to a value of 531.265 shown in table 4.8 (model including
predictor). The drop in -2 log likelihood implies that change in stock price indeed predicts change in management.

The "Omnibus Tests of Model Coefficients" - "Block 1: Method = Enter" table 4.9 is the overall test and it indicates that the model with change in stock price as the predictor does better than the constant model at predicting change in management and is statistically significant at $\mathrm{p}<0.001$. The chi-square value of 19.912 is computed by taking a difference between the $\log$ likelihood shown in "Iteration History", ${ }^{\text {a,b, }}$ - Block 0: Beginning Block" table 4.4 and the log-likelihood shown in "Iteration History" - "Block 1: Method $=$ Enter" table 4.8 , and as such is equal to $551.176-531.265=19.911$.

According to "Hosmer and Lemeshow" - "Block 1: Method = Enter" table 4.11, the chisquared value is zero (0), low and statistically insignificant suggesting that that the probabilities of predicted versus observed match up nicely as per the expectation and hence goodness of fit. According to "Contingency Table for Hosmer andLemeshowTest" - "Block 1: Method = Enter" table 4.12, there is a perfect agreement between observed and expected for both partitions and in both step 1 and 2, indicating a perfect fit of the model.

Results shown in "Classification Table" - "Block 1: Method = Enter" table 4.13 indicate that the model was able to perform $78.8 \%$ correctly which is fairly high to conclude that the model is good.

### 5.2.2 Nature of Relationship

The SPSS "Variables in the Equation" - "Block 1: Method = Enter" table 4.14 give all the coefficients deemed best to be incorporated in the logistic regression model. The model incorporating all coefficients was: - Logit $(\Pi)=1.753-9.57 * P$. The logistic regression model, loit $(\Pi)=1.753-0.957 * P$ could be written on three different scales (logit, odds, or probability). It was therefore interpreted on these different scales.

When interpreted on the logit scale, loit $(\Pi)=1.753-0.957 * \mathrm{P}$ was the relevant logistic regression and without quoting figures, it was deduced that a unit increase in stock price reduced the log odds of change in management and a unit decrease in stock price increased the log odds of change in management, i.e. as stock price increases, the log odds of change in management is diminished. Conversely, as stock price decreases, the $\log$ odds of change in management is increased and hence, an inverse relationship between change in stock prices and change in management.

When interpreted on the odds scale, the relevant equation for this purpose was: -$\mathrm{e}^{1.753-0.957 \mathrm{P}}=\mathrm{e}^{1.753} \mathrm{e}^{-0.957 \mathrm{P}}$. On the basis of the equation and without quoting figures, it was deduced that a unit increase in stock price reduced the odds of change in management and a unit decrease in stock price increase the odds of change in management, i.e. as stock price increases, the odds of change in management is diminished. Conversely, as stock price decreases, the odds of change in management is increased and hence, an inverse relationship between change in stock prices and change in management.

When interpreted on the probability scale, the relevant equation for this purpose was: -$\Pi=\frac{e^{1.753-0.957 p}}{1+e^{1.753-0.957 p}}$. On the basis of the equation and without quoting figures, it was deduced that a unit increase in stock price reduced the probability of change in management and a unit decrease in stock price increased the probability of change in management, i.e. as stock price increases, the likelihood of change in management is diminished. Conversely, as stock price decreases, the likelihood of change in management is increased and hence, an inverse relationship between change in stock prices and change in management.

### 5.3 Conclusion

The study aimed at establishing if there exists a relationship between changes in stock prices and changes in management. A further aim was to establish the nature of the
relationship between changes in stock prices and changes in management if any. Companies listed at the NSE were scrutinized for persistent changes in stock prices as well as changes in management to extract a sample. Data analyzed using SPSS. Logistic results obtained were critically analyzed and interpreted and the resulting model tested for validity and relevance.

The study has shown that there is a relationship between changes in stock prices and changes in management in the NSE. The study has also shown that the nature of relationship is between change in stock prices and change in management is an inverse relationship.

From the study, it is apparent that there are other reasons why changes in management take place. There exists probability of change in management even when prices are static. The results of this study are in agreement with the findings of Warner et al., 1988. According to Warner et al., 1988, there are many reasons why management changes take place and the effects of such changes differ with relation to prior share performances. While some changes will be as a result of performance, others will have no relation to prior performance.

### 5.4 Recommendations

There were some listed companies with missing data. Availability of data on performance on performance of all firms as well as data on changes in management would enhance quality of study. Lack of data may have had an impact on the study. NSE and CMA should put mechanisms in place to ensure such data is accessible.

Different companies on average reacted differently to changes in stock prices. Some were swift, others waited for a long time before they reacted and yet others never reacted at all. The reasons for the varied reactions were not explicit. It may be argued that those companies that reacted long after stock price changes or never reacted at all deviated
from expectation. This may have had an impact on the study. An analysis should be done to determine reasons for the varied reactions to stock price changes by firms.

The fact that a particular management change is preceded by a change in stock price change does not necessarily mean there is a relation between the two unless the reason for change is given. In some cases, there were no reasons given for changes in management. NSE and CMA should compel firms to give reasons for all management changes carried out at any one particular time.

### 5.5 Limitations of the Study

The study focused on establishing the relationship between change in stock prices and change in management. In order to differentiate daily price fluctuations from stock price changes, a condition that prices must either have persistently risen or fallen for a period not less than one month was to be fulfilled. A shorter duration of one week may be ideal.

The study covered a period of twelve years from January 2001 to December 2012. A longer period would be ideal.

### 5.6 Suggestions for Further Studies

There were instances when changes in management occurred despite the fact that stock prices remain fixed which points to other factors that influence change in management. A study should be done to investigate the causes of such changes in management.

Almost in all cases a time lag between a change in stock price and a change in management was observed. A study should be done to investigate if time is a significant variable in explaining change in management.

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## APPENDIX A

The Following are the 54 companies that were listed on the NSE as at $2^{\text {nd }}$ January 2001

1 A.Baumann \& Co.Ltd
2 African Lakes Corporation PLC.
3 Athi River Mining
4 B.O.C Kenya Ltd
5 Bamburi Cement Ltd
6 Barclays Bank Ltd
7 British American Tobacco Kenya Ltd
8 Brooke Bond Ltd
9 C.F.C Bank Ltd
10 Car \& General (K) Ltd
11 Carbacid Investments Ltd
12 City Trust Ltd
13 CMC Holdings Ltd
14 Crown Berger Ltd
15 Diamond Trust Bank Kenya Ltd
16 Dunlop Kenya
17 E.A.Cables Ltd
18 E.A.Packaging Ltd
19 E.A.Portland Cement Ltd
20 Eaagads Ltd
21 East African Breweries Ltd
22 Express Ltd
23 Firestone East Africa Ltd
24 George Williamson Kenya Ltd
25 Housing Finance Co Ltd
26 Hutchings Biemer Ltd
27 I.C.D.C Investments Co Ltd

28 Jubilee Insurance Co. Ltd
29 Kakuzi
30 Kapchorua Tea Co. Ltd
31 Kenya Airways Ltd
32 Kenya Commercial Bank Ltd
33 Kenya National Mills Ltd.
34 Kenya Oil Co Ltd
35 Kenya Orchards Ltd
36 Kenya Power \& Lighting Ltd
37 Limuru Tea Co. Ltd
38 Lonrho Motors EA Ltd
39 Marshalls (E.A.) Ltd
40 Nation Media Group
41 National Bank of Kenya Ltd
42 National Industrial Credit Ltd
43 Pan Africa Insurance Ltd
44 Pearl Drycleaners Ltd
45 Rea Vipingo Plantations Ltd
46 Regent Undervalued Assets Africa Fund
47 Sasini Tea \& Coffee Ltd
48 Standard Chartered Bank Ltd
49 Standard Newspapers Group
50 Theta group Ltd
51 Total Kenya Ltd
52 Tourism Promotion Services Ltd (Serena)
53 Uchumi Supermarket Ltd
54 Unga Group Ltd

## APPENDIX B

## Table 4.14 (a) Data Categorization

|  | Name of company | Stock price change | Change in management |  |
| :---: | :---: | :---: | :---: | :---: |
|  |  |  | Change | No change |
| 1. | A.Baumann \& Co. Ltd | Yes | 6 | 2 |
|  |  | No | 3 | 1 |
| 2 | Athi River Mining Ltd | Yes | 4 | 2 |
|  |  | No | 0 | 1 |
| 3 | Barclays Bank Ltd | Yes | 3 | 0 |
|  |  | No | 7 | 0 |
| 4 | BAT Ltd | Yes | 12 | 3 |
|  |  | No | 7 | 0 |
| 5 | BOC Gases | Yes | 7 | 1 |
|  |  | No | 4 | 1 |
| 6 | Carbacid Investments Ltd | Yes | 1 | 1 |
|  |  | No | 1 | 0 |
| 7 | Bamburi CementLtd | Yes | 13 | 1 |
|  |  | No | 6 | 1 |
| 8 | CFC Bank Ltd | Yes | 3 | 2 |
|  |  | No | 2 | 2 |
| 9 | Car \& General (K) Ltd | Yes | 3 | 1 |
|  |  | No | 2 | 4 |
| 10 | CMC Holdings Ltd | Yes | 1 | 4 |
|  |  | No | 2 | 1 |
| 11 | Crown Berger Ltd | Yes | 1 | 2 |
|  |  | No | 3 | 1 |


| 12 | Diamond Trust Bank Kenya Ltd | Yes | 9 | 3 |
| :---: | :---: | :---: | :---: | :---: |
|  |  | No | 3 | 1 |
| 13 | E. A. Cables Ltd | Yes | 7 | 2 |
|  |  | No | 5 | 1 |
| 14 | E. A. Portland Cement Ltd | Yes | 20 | 1 |
|  |  | No | 8 | 1 |
| 15 | East African Breweries Ltd | Yes | 17 | 1 |
|  |  | No |  |  |
| 16 | Express Kenya Ltd | Yes | 6 | 3 |
|  |  | No |  |  |
| 17 | Housing Finance Co. Ltd | Yes | 11 | 1 |
|  |  | No | 7 | 1 |
| 18 | Jubilee Insurance Co. Ltd | Yes | 7 | 3 |
|  |  | No |  |  |
| 19 | Kakuzi Ltd | Yes | 5 | 2 |
|  |  | No | 7 | 0 |
| 20 | Kapchorua Tea Co. Ltd | Yes | 4 | 2 |
|  |  | No | 4 |  |
| 21 | Kenya Commercial Bank Ltd | Yes | 10 | 1 |
|  |  | No |  |  |
| 22 | Kenya Oil Co. Ltd | Yes |  |  |
|  |  | No |  |  |
| 23 | Kenya Orchards Ltd | Yes | 1 | 2 |
|  |  | No | 2 |  |
| 24 | Kenya Power \& lighting Co. Ltd | Yes | 10 | 3 |
|  |  | No |  |  |
| 25 | Limuru Tea Co. Ltd | Yes |  |  |
|  |  | No |  |  |
| 26 | Marshalls (E.A) Ltd | Yes | 15 |  |
|  |  | No | 4 | 4 |


| 27 | Nation Media Group | Yes | 11 | 2 |
| :---: | :---: | :---: | :---: | :---: |
|  |  | No | 7 | 0 |
| 28 | National Bank Of Kenya Ltd | Yes | 5 | 2 |
|  |  | No | 1 | 0 |
| 29 | Pan Africa Insurance Ltd | Yes | 15 | 0 |
|  |  | No | 6 | 0 |
| 30 | Rea Vipingo Plantations Ltd | Yes | 3 | 3 |
|  |  | No | 1 | 0 |
| 31 | Sasini Tea \& Coffee Ltd | Yes | 3 | 2 |
|  |  | No | 2 | 0 |
| 32 | Standard Chartered Bank Ltd | Yes |  |  |
|  |  | No | 9 | 0 |
| 33 | Standard Newspaper Group | Yes | 6 | 3 |
|  |  | No | 1 | 3 |
| 34 | Total Kenya Ltd | Yes | 6 | 1 |
|  |  | No | 9 | 2 |
| 35 | Tourism Promotion Services Ltd(Serena) | Yes | 7 | 1 |
|  |  | No | 3 | 1 |
| 36 | Uchumi Supermarket Ltd | Yes | 11 | 0 |
|  |  | No |  |  |
| 37 | Unga Group Ltd | Yes | 3 | 3 |
|  |  | No | 2 |  |

Source: NSE data

## Table 4.14 (b) Summary of Data Tabulation

| Stock Price Change | Change in management |  | Total |
| :--- | :--- | :--- | :--- |
|  | Change | No Change |  |
| Yes | 277 | 65 | 342 |
| No | 144 | 48 | 192 |
| Total | 421 | 113 | 534 |

## APPENDIX B

Table 4.15 Data Entry Form for recording Period of Change in Stock Prices

| Company <br> Name | Date <br> (Month and year when persistent <br> fall or rise in stock price | Date (Month and year marking end of rise or fall in stock price |
| :---: | :---: | :---: |
| 1. |  |  |
|  |  |  |
| 2 |  |  |
|  |  |  |
| - |  |  |
|  |  |  |
| - |  |  |
|  |  |  |
| - |  |  |
|  |  |  |
| 37. |  |  |
|  |  |  |

## APPENDIX C

Table 4.16 Data Entry Form for recording Change in Management

|  | Company <br> Name | Date when change occurred (Month and Year) |  |  |  |  |  |
| :--- | :--- | :--- | :--- | :--- | :--- | :--- | :--- |
| 1. |  |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |  |
| . |  |  |  |  |  |  |  |
| . |  |  |  |  |  |  |  |
| . |  |  |  |  |  |  |  |
| 37 |  |  |  |  |  |  |  |

