

**THE EFFECT OF DIVIDEND ANNOUNCEMENT ON STOCK RETURN
VOLATILITY OF COMPANIES LISTED AT THE NAIROBI SECURITIES
EXCHANGE**

BY

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DECLARATION

I, the undersigned declare that this research project is my original work and has not been presented in any other University.

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This research project has been submitted for examination with my approval as the University Supervisor.

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DEDICATION

This study is dedicated to the current and would-be investors in the Nairobi Security Market

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ABSTRACT

Stock prices are always affected by corporate action and any information that can be perceived by the market as adverse or good. Dividends is important to investors as it is one of the ways they get return on their investments. Thus, dividend information has a potent effect on stock return volatility. Due to limited studies that have been conducted on the same, this study sought to establish the effect of dividend announcement on stock return volatility of companies quoted at the NSE. The study adopted an event study research design approach on a target population of 63 firms listed at the NSE. Secondary data on the firms' stock prices was collected for 30 days before and after dividend announcement for 5 years (2011-2015). The study sampled 29 firms which had consistent dividend policies. The study used GARCH model to calculate volatility by determining the heteroskedasticity in the returns. Linear regression analysis was used to determine the relationship between dividend announcement and stock return volatility. The study established that there was significant differences in the stock return volatility before and after dividend announcement. Conducting a GARCH (1,1) model, significant results were established pointing to a GARCH and ARCH effect in the stock return volatility. From the linear regression analysis, a negative but significant regression results were established between stock return volatility and dividend announcement.

TABLE OF CONTENTS

DECLARATION	ii
DEDICATION	iii
ACKNOWLEDGEMENT	iv
ABSTRACT	v
LIST OF TABLES	viii
LIST OF ABBREVIATIONS	ix
CHAPTER ONE: INTRODUCTION	1
1.1 Background to the Study	1
1.1.1 Dividend Announcements.....	2
1.1.2 Stock Returns Volatility.....	3
1.1.3 Dividend Announcement and Stock Return Volatility.....	4
1.1.4 Nairobi Securities Exchange.....	5
1.2 Research Problem.....	6
1.3 Research Objective.....	9
1.4 Value of the Study.....	9
CHAPTER TWO: LITERATURE REVIEW	10
2.1 Introduction	10
2.2 Theoretical Framework	10
2.2.1 The Dividend Irrelevance Theory	10
2.2.2 The Bird-In-The-Hand Theory	11
2.2.3 The Signaling Theory.....	12
2.2.4 Efficient Market Hypothesis (EMH)	12
2.3 Determinants of Stock Returns Volatility	13
2.3.1 Inflation.....	13
2.3.2 Leverage.....	14
2.3.3 Supply and Demand of Stocks in the market.....	14
2.3.4 Dividend Announcements.....	15
2.4 Empirical Review	15
2.4.1 International Studies	15
2.4.2 Local Studies.....	18
2.5 Conceptual Model	20

2.6 Summary of Literature Review	21
CHAPTER THREE: RESEARCH METHODOLOGY	23
3.1 Introduction	23
3.2 Research Design	23
3.3 Population and Sample	23
3.4 Data Collection	23
3.5 Data Collection Methods	24
3.6 Data Analysis	24
3.7 Analytical Model	24
3.7.2 Model Specifications	25
3.7.1 Test of Significance	27
CHAPTER FOUR:	29
DATA ANALYSIS, RESULTS AND DISCUSSION.....	29
4.1 Introduction	29
4.2 Descriptive Analysis	29
4.2.1 GARCH Test	30
4.2.2 Test of Independence	31
4.3 Regression Analysis	32
CHAPTER FIVE	35
SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS	35
5.1 Introduction	35
5.2 Summary of Findings	35
5.3 Conclusions	36
5.4 Recommendations	37
5.5 Limitations of the Study	37
5.6 Areas for Further Research	39
REFERENCES.....	40
APPENDICES	45
Appendix 1: Companies Listed at the NSE.....	45
Appendix II: Independent T-Test – Stock Returns	48
Appendix III: Time Series Test Plots.....	50
Appendix V: Dividend Payout Ratio	55
Appendix VI: Stock Returns	56

LIST OF TABLES

Table 4.1: Descriptive Statistics – Stock Returns	30
Table 4.2: GARCH Model	31
Table 4.3: Independent T-Test	32
Table 4.4: Regression Coefficients	32

LIST OF ABBREVIATIONS

ADF	Augmented Dickey-Fuller test
AIM	Alternative Investment Markets Segment
ARCH	Autoregressive Conditional Heteroskedasticity
CDS	Central Depository System
CPI	Consumer Price Index
EGARCH	Exponential Generalized Autoregressive Conditional Heteroskedasticity
EMH	Efficient Market Hypothesis
GARCH	Generalized Autoregressive Conditional Heteroskedasticity
IID	Independent and identically distributed
KNBS	Kenya National Bureau of Statistics
LM	Lagrange Multiplier
MIMS	Main Investments Market Segment
NASI	NSE All Share Index
NSE	Nairobi Securities Exchange
VAR	Vector Autoregressive

CHAPTER ONE: INTRODUCTION

1.1 Background to the Study

Announcements of dividends are a critical company's event, since they entail cash flow from firm to the shareholders and also send insights in regard to the firm's current and future performance (Shahid, Muhammad and Abdul, 2011). Dividend can be expressed as the sharing of a company's profit among shareholders of a firm in proportion to the ownership level of each and every shareholder. Dividend announcement is a critical element of a company's long term financing blueprint. However, the more a firm has a high dividend pay-out, the less will be the stock return volatility (Hussainey, Mgambe and Chijoke-Mgbame, 2010).

Stock return volatility relates to the ups and downs of the stock returns over specific time duration. Stock returns volatility is common occurrence in the stock markets and it measures the unforeseen shift in the stock returns. Investors can lose interest from participating in a stock market that does not have stock return volatility. This is because when new information is announced and becomes available to the public, the intrinsic value of the stock changes. Stock returns varies since volatility is an evaluation of the risk and the effect they have on the firm's value. Any shifts in the stock returns echo important intelligence about the firm. Shifts in stock returns are related to microeconomic factors like corporate earnings, corporate bond yields, interest rates changes, dividend yields, trading activity in the stock market, bond prices leverage, and other macro-economic factors (Misbah, Shafiq, Muhammad, Sayyad and Saif, 2013).

One of the most important issues that have occupied the management and the researchers in finance all over the world is the stock market's volatility and the need to forecast it accurately. Dividend announcement and stock return volatility has been of great deliberation in the earlier researches despite many years of research. (Allen and Rachim, 1996). "Miller and Modigliani (1961)", established that it was the investment policy that added value to a company and not the dividends policy. They advocated on the dividend irrelevance theory which assumes that investors do not pay any attention to the dividend history of a firm. This study determined the relation that exist between dividend announcement and stock return volatility.

1.1.1 Dividend Announcements

Dividend announcement pertain to the process that management pursue in informing the public on the size of the dividend and arrangement of cash sharing over time to the shareholders (Mahmood, Sheikh and Ghaffari, 2000). Dividend announcement is one of the most highly event studied by researchers and is seen as a sign of a company's high liquidity. If the dividend announcement matches the prediction of the shareholders, the stock return is positively affected. However, if not up to the shareholders prediction, the stock return is negatively affected.

Dividend announcement is perceived as a critical means of communication between the management of a company and its investors. Shareholders usually do not have enough information about the true circumstances of a company and hence they see perceive announcement as providing critical information about the company Bhattacharya (1979). Brealey, Myers, and Allen (2011) stated that dividends are determined by the company's directors. The three important dates during the stages of dividend announcement include the notification date, registration date and the

settlement date. Notification date is the day that the directors inform their intention to pay dividends. Mukora (2014) stated that a company will pay an interim dividend and a final dividend. An interim dividend is a dividend payment that is announced during the company's half year announcement of the profit while a final dividend is announced during the full year announcement of the profit.

1.1.2 Stock Returns Volatility

Volatility is the changeability of stock returns' considering any unforeseen variation that mainly occur due to new information in the market. Stock return volatility usually represents stock price variability changes that are perceived to be a measure of the risk faced by the investors. Fama (1965) argued, stock return volatility go up when recent news are discharged into the stock exchange, but its intensity to go up is affected by the importance of the new intelligence and the extent that the intelligence material shock the shareholders.

Morck, Yeung, and Yu (1999) stated that stock return is based on firm-specific information; hence stock return movement is less correlated with the market. Stock returns movements in less developed countries are hugely due to noise traders, or insider trading in the securities exchanges which tend to apportion capital inadequately, henceforth slowing growth of the economy. The function of a dynamic securities market is to analyse all intelligence gathered, and consequently apportion capital to the most optimal usage in the economy. Stock returns are important to investors as an indicator of how well a firm is performing. Jensen (1986) stated that when management have huge unutilised cash flow, they tend to increase dividends which could have instead been invested in projects with low-return or wasted.

Investing in low return projects would lead to a decline in stock return hence negative stock returns.

1.1.3 Dividend Announcement and Stock Return Volatility

Asquith and Mullins (1983) stated that stock return volatility increases when dividend announcement communicates critical information to the investors. Dividend announcements provide a platform for communicating information that concern the management's perception of the company past achievement and their analysis of its subsequent performance.

According to Modigliani and Miller (1961) dividends do not have any effect on the company value. Consequently, dividend announcements have no effect on stock returns volatility. Laabs and Bacon (2013) found that increased dividends announcements had a huge clear impact on the shares price. Vazakidis and Athianos (2010) observed that stock exchanges reacted both pre and post dividend announcements. Amir and Shah (2011) observed that dividend distribution was relevant for future price determination.

Dividend announcements usually exhibit a significant impact over the stock return volatility of the companies. Generally, dividend announcements, show positive signals to the shareholders and results in stock returns increase in a semi-strong form of market efficiency. Gordon (1963) argued in his bird in hand theory that dividends are significant in determining firms' value. Walter (1963) came up with a model that assumed that during dividends payments to the stockholders, the dividends are reinvested by the stockholders so as to attain better and more returns. Analytically, dividend announcement appear to convey relevant information to investors that has an effect on stock returns volatility (Aharony and Swary 1980).

1.1.4 Nairobi Securities Exchange

The NSE has been self-listed since 2014 and it offers an automated platform for both listing and trading of multiple securities. The two indicators that are commonly used to analyse the performance are the NSE twenty share index and the NSE all share index. The NSE twenty share index was introduced in 1964. It measures gains or losses of the twenty blue chip firms which have robust fundamentals and that have attained good financial results with consistency. The Nairobi Securities Exchange all share index (NASI) which was brought in as an alternate index is a comprehensive gauge of the securities exchange performance. NASI consolidates all the traded shares of the day (NSE, 2014). NSE is categorized into different market segments mainly the Main Investment Markets (MIM), or the Alternative Investment Markets (AIM). The companies are categorized into 11 sectors namely banking, agricultural, construction and allied commercial services, , automobiles and accessories, , insurance, investment, telecommunication and technology manufacturing and allied, growth enterprise market segment, energy and petroleum and.

During the prior year, 2015, majority of the companies issued profit warning announcements due to the unfavorable macro-economic environment. However, that seems to be reversing in 2016 as companies have started issuing dividends announcements with Safaricom in particular making a special dividend announcement earlier in the year. This has led to an increase in the stock return to a record high of 20 shillings.

Studies at the NSE indicate semi strong form market efficiency though it was still inconclusive. Mukora (2014) supported that the NSE was of semi strong form market efficiency. This meant, current securities prices incorporated significant knowledge in the public domain and shifts in the securities prices were as a result of unexpected

public information. Hence investors won't do any better at the NSE unless they had information which was not publicly available. Investors at the NSE were not capable of persistently surpassing the market if they continued to use information contained in past stock prices (Muragu, 1990). He further suggested that for investors to have succeeded in obtaining favorable stock returns then would have to select a well-diversified portfolio.

1.2 Research Problem

Stock return volatility is a barometer for gauging risk. Volatility shows the step in which stock returns change in a determined duration; higher volatility means that the prospect of a hike or not is more in the short term. Therefore, returns of volatile stocks will differ substantially over the period of time and hence it would be quite challenging to estimate its forthcoming prices. Shareholders prefer investment that got less risk to those with more risk (Kinder, 2002).

Dividend announcement and stock return volatility has been investigated by different researchers in different times though their findings are not consistent. Laabs and Bacon (2013) studied the reaction of announcement of increased dividends on the security prices at the New York stock exchange. Accordingly, the results demonstrated a huge effect in the market prior to the company pre-announcement of increased dividends. The findings supported the semi-strong form level of efficient market hypothesis that was crafted by Fama (1970). Mahmood, Sheikh and Ghaffari (2011) did a study on dividend announcements and Stock returns at the Karachi stock exchange. The study purposed to gather any importance of dividend announcements by the companies and to obtain the outcome of the announcement on the prices of stock. Those results defended dividend relevance hypothesis in Karachi stock

exchange and confirmed that the announcement of dividend were relevant to the company's value.

Poornima and Chitra (2015) did a study on stock market volatility during dividend announcement for selected banks in India. The analysis revealed that the mean of volatility was high during the pre-event period for the selected 21 banks in the Indian Capital market. Rahman and Nazim (2011) did a study on the reaction of dividends announcement on the securities price volatility of some specific publicly traded at the Bangladesh stock market. The study aimed at obtaining the effect of dividends announcement on the volatility of stock price in the Bangladesh stock market. The study found that the dividends announcement of the selected firms had a negative and insignificant effect on the stock price reaction in Bangladesh stock exchange. Akram and Abrar (2015) did a study on the volatility of stock prices and the dividend policy in Karachi stock exchange. The study aimed at testing the impact of dividend policies on the volatility of stock prices in Pakistan. The results showed that the dividend policies had no impact on the stock price volatility in Pakistan.

Onsunu and Onchiri (2014) studied the effect of dividends policies on volatility of stock prices. The research findings depicted absence of meaningful relation between the dividends policy and the volatility of stock prices. The study control variables which included company size, non-current debt and assets growth were noted to have no meaningful relation with the volatility of stock prices. Ngunjiri (2010) studied the relation between dividends payment policies and volatility of stock prices for firms listed at the NSE. Dividend yield and dividend payout ratio were noted not to have huge influence on the volatility of stock prices of firms quoted at the NSE for the duration between 2004 and 2008.

Kibet (2016) carried out a study on the effects of dividends policies on the prices of stocks for companies quoted at the NSE. The analysis of the market indicated a positively skewed relation between the cash dividend and the prices of shares while there was statistically insignificant inverse relation between share dividend and the prices of shares. Oyuga on (2013) did a study on the effects of announcement of earnings on the prices of stocks for companies quoted at the Nairobi securities exchange. Sampled population posted both negative and positive abnormal returns around the earnings announcement dates which show how the stock prices have reacted to the earnings announcement event. Marekia (2015) studied the reaction of dividend announcement on share prices for companies listed at the NSE. The study concluded that dividends announcement had a positively skewed influence on the share prices of companies listed at the Nairobi securities exchange.

The higher the volatility, the higher is the risk identified with the stock returns. Since risk and return are the two crucial factors that an investor considers prior to investing in securities, this project will help us understand if dividend announcements have any effect on stock return's volatility. The foreign studies highlighted above were done in different business environments that are not reflective of the Kenyan setting. Furthermore, local studies have mainly researched on the repercussion of announcements of dividends on the stock price only, not factoring the risk element. There is no study that has focused on effect of dividend announcement on stock return volatility of firms quoted at the NSE. As such, there is a research gap in this area. Hence, a unique study focusing on the Kenyan market is warranted. This research therefore intended to answer the question; what was the effect of dividend announcement on stock return volatility of companies listed at the NSE?

1.3 Research Objective

The objective of the study was to determine the effect of dividend announcement on stock return volatility of companies quoted at the NSE.

1.4 Value of the Study

The study would contribute to existing knowledge pool by adding adequate information on dividend announcements and their effect on volatility of stock returns of firms listed at the NSE. The research also establish the relevance of dividend announcements on stock returns. It also provides a useful basis upon which further studies on variables that affect stock returns will be conducted.

The suggestions for further research assists researchers to carry out more detailed studies to broaden the understanding of the influence of announcement of dividend on the volatility of stock returns of firms quoted at the NSE. This would assist in expanding theories on dividend announcement effect on stock returns.

The study can also assist managers of companies quoted in formulating corporate policy decisions especially those that focus on short term horizons since event studies focus on the effects of announcement for a brief duration around the event period. This study can help investors understand the relevance of information at the NSE. Whether dividend announcements affect stock returns enable them make decisions on the actions when to make investments, or when to pull out or if they should be indifferent. A portfolio manager may want to sell a stock or a portfolio before it becomes too volatile.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter summarize the knowledge from other researchers that have researched in similar fields of study. It consists of several theories that have been used to analyse dividend announcements and their effect on stock returns volatility. This chapter also consists of empirical studies on dividend announcement and other related events and their effect on stock returns volatility.

2.2 Theoretical Framework

The effect of dividend announcement on stock return volatility has been studied by various researchers (Miller and Modigliani, 1961, Gordon, 1959; Allen and Rachim, 1996, Baskin, 1989). Theories that include the bird in hand theory, dividends irrelevance theory, signaling theory, tax preference theory and the clientele effect theory, expound on the effect of announcement of dividend on stock return volatility. The theories are as discussed;

2.2.1 Dividend Irrelevance Theory

Dividends irrelevance theory was developed by Miller and Modigliani (1961). Miller and Modigliani asserted that dividend policy was not relevant since it had no impact on the stock price. Miller and Modigliani rooted that the key source of the price of the stock were the income and risk from the assets. MM made a number of assumptions as follows: firms operate under a perfect capital markets: information is available to all freely, investors behave rationally, transactions flotation costs and taxes are non-existent. MM argued that firms have a fixed investment policy and that shareholders can predict forthcoming dividends and prices with confidence, fixed discount rate is

applicable for the entire securities at all the time durations. MM argued in this theory that a company's worth is conditional to the company's earning that emanates from company's policy on investment. MM noted that capital gain and dividend are the items that contributed to the profits of the firm shareholders. Hence, management decision to share out the company profits to its stockholders causes the share price to decrease by the value of the dividends per share. In addition, MM argued that in a perfect market, the dividend's policy does not influence the stockholder's return.

2.2.2 The Bird-In-The-Hand Theory

Gordon (1963) and Lintner (1962) contradicted Miller and Modigliani theory and argued that dividends due to the uncertainty in capital gains will translate to a high discount rate being used. The theory was anchored on the adage that its worth to having a bird in hand that having two in the bush. As a result, firms which issue dividends are likely to report high prices. Gordon and Lintner noted that shareholders opt for the current dividend instead of the forthcoming capital gains considering the future position is not certain even in a capital market that is perfect. Furthermore, they noted that shareholders opt for the current dividend so as to avoid risk associated to subsequent capital gains. They argued that a direct relation existed between the dividend policies and share market value even when the internal rate of return and the requisite rate of return was similar. (Gordon, 1962) noted that in his constant growth model, the price of the shares was dependent on the discounted forthcoming dividends. The bird in the hand theory was anchored on a number of presumptions. It assumed that the firm has only equity with no external obligation in its structure of capital. The theory also assumed that there was no available external sources of financing and hence earnings were retained for any future development of the

company. It utilized the assumption that consistent returns ignores decreasing marginal efficiency of investment and that the company spends a fixed capital of cost.

2.2.3 The Signaling Theory

Ross (1977) advocated for this theory where he noted that issuance of dividends may transmit positive information to the investors which may cause prices to rise. If management increases dividend, it signals projected high profit and hence stock prices will rise. They noted that investors also ascertain intelligence about a company's forthcoming earnings where the announcements of dividends act as the signal. MM (1961), argued, when a company's price of stock appreciates with an upward movement in value of the dividend, then the shareholder desire may not be the dividend but they might be hoping for high returns in future earnings. Likewise, a reduction in value of the dividend may act as a sign to the shareholder that the company is anticipating fewer earnings in the subsequent periods. The indication made by this theory is that any change in dividends are correlated with changes in the forthcoming earnings and profitability. Henceforth, dividend decisions are pertinent and firms that pay more dividend usually have a greater value.

2.2.4 Efficient Market Hypothesis (EMH)

The EMH was advanced by Fama. Fama (1970) advocated for capital market efficiency such that share prices should always reflect the prevailing information. This implies that issuance or non-issuance of dividends should not affect share prices. No firm can persistently attain returns that are above the average market returns considering the information that is available when the investment is being made. EMF can either be described as strong form level of efficiency, semi strong level of

efficiency or weak level of efficiency. The three levels of market efficiency have different ramifications for how markets work (Fama, 1970).

Weak form level of market efficiency hypothesis indicates that the prices on listed securities already reflect the entire past publicly available information. As a consequence, analyzing prices from the past cannot help to forecast the future prices. Semi strong level of market efficiency notes, security price reflects all the information available publicly, both past and present and that prices immediately change to reflect the current public information. The strong form level of market efficiency follows that the entire information both private and public, is factored into a share price.

2.3 Determinants of Stock Returns Volatility

Stock returns are the most important readily available indicator for investors to make investment decisions on purchase or sale of a particular stock. Stock returns are affected by the fundamental factors in the market hence affecting the returns volatility. Analysis of stock returns volatility shifts tend to provide evidence that a change in the fundamental variables brings about changes in the stock returns. However, the actual fundamental factors vary from market to market. The most basic factors that influence stock returns volatility are;

2.3.1 Inflation

Inflation is the rise in the price of services and goods. Fama (1981) found out an inverse relation between the stock returns volatility and the inflation level. Price increases shrink the level of the stock price index. Although inflation negatively affects stock returns, Groenewold et al (2010) states that this ought not be a puzzle since it's an outcome of the interactions in the whole economy. They further argue

that inflation in itself does not directly affect stock returns volatility but does so through output.

2.3.2 Leverage

This is the degree to debt financing in the capital structure and usually has effect on the firm assets value. When management decide to finance the non-current assets and also sections of the current assets through long term financing, this is referred to as the “conservative approach”. The firms following this approach usually have their assets under-utilized resulting in low profitability that affect stock returns negatively. Black and Scholes (1973) analysed effects of leverage on the stock returns and noted that the stock returns volatility should emanate fully from any change in the value of the firm. The firm leverage also causes volatility of stock to change with the returns. A decreasing stock return causes equity value to decrease when debt is constant, hence company’s leverage goes up, thus increasing the future equity volatility and vice versa.

2.3.3 Supply and Demand of Stocks in the market

Supply and demand are critical elements that affect stock return volatility. The movement of the securities market trading, directly affects the return. During investor’s acquisition of more stocks, the price of that specific stock goes up. Consequently, if shareholders are disposing stocks, the price of that particular stock decreases. As supply and demand for security change over a period of time, different categories of investors are drawn to the market. Where the risk preferences of the new investors differ from those of current investors, the needed rate of return tend to change. Subsequently, price relationship will change quite separately of any changes

in earnings expectations. Presence of institutional investors at the NSE influences pricing and returns generated at the stock market (Reilly, 1997).

2.3.4 Dividend Announcements

Muriuki (2010) study revealed that announcement of a dividend by a firm had a short term influence on the price of stocks. Semi strong form level of market efficiency, stocks return reflected all the information available publicly (Fama, 1976). This would lead to an adjustment to stock return volatility when a dividend announcement was made. Muhammad (2012) found out that the announcement of dividend of the sampled firms had an inverse and less significant effect on the prices of shares in the Bangladesh stock market. Mukora (2014) found a positive reaction of announcements of dividends on the stock returns for companies quoted at the NSE.

2.4 Empirical Review

There exist a number of studies done locally and internationally from different periods and different markets and hence the varied results.

2.4.1 International Studies

Laabs and Bacon (2013) studied the reaction of increased announcement of dividend on stock prices of firms quoted at New York stock exchange. The study aimed to observe the level of market efficiency at the New York stock exchange by testing impact of announcement of increased dividends on the share price. Categorically, the study focused on whether there is a possibility to earn a return that is above the average return in a listed firm when increased dividend are announced. The study sampled fifteen announcements of increased dividend between 20th November 2008 and 26th July 2012. The study made use of the market adjusted event study

methodology. The outcomes showed a huge reaction before the company announced the dividends increase. The results concurred with the efficient market theory at the semi strong form level as was advocated by Fama (1970).

Mahmood, Sheikh and Ghaffari (2011) did a study on dividend announcements and share returns at the Karachi Stock Exchange. The study aimed at investigating any importance of dividend announced by quoted listed at Karachi Stock Exchange and gather the form of reactions of such kind of announcements on the stock price. The value of announcement of dividends was analysed on one hundred dividend announcements, between 2005 and 2009. The market model was used while applying the event study methodology on the returns of the stock. The underlying results noted that announcements of dividends had positive value relevance and dropped the dividend irrelevance theory in Karachi Stock Exchange. The study noted the investor's strong desire for the dividend backed the indication of agency cost. The results depicted signs of insider trading at the Karachi Stock Exchange that assumed the form of activism in the market before the event window. Lastly, the results showed the presence of arbitrage opportunities.

Poornima and Chitra (2015) did a study on stock market volatility during dividend announcement for selected banks in India. The researchers sampled companies that were listed at the Indian Capital Market and that had announced consequent dividend for 10 years from the year 2000-2001 to 2009-2010. There were 551 consequent dividend paying companies out of which 155 companies were found to be high trading volume companies and based on the availability of data only 21 banks were considered for the study. The empirical analysis was done by using the GARCH model. The study was based on the daily data for the duration from 1st January 2000

to 31st December 2010. The results revealed that the mean of the volatility was high during pre-event period for the selected 21 banks in the Indian Capital market by using both models.

Rahman and Nazim (2011) studied the influence of dividend announcements on the volatility of stock prices of some specific firms quoted at the Bangladesh stock market. The study purposed to obtain the influence of dividends announcements on the share price volatility of firms quoted at the Bangladesh stock market. Consequently, the usefulness of stock price volatility had been factored in as a gauge for analyzing the securities market performance. This study measured the impact of dividends announcement on share price volatility in the Bangladesh stock exchange using regression models for duration between 2004 and 2012 while size of the sample was twenty five firms. The critical logic to look at that specific duration and size of the sample, was time period and monetary constraints of the researchers. Finally, the study found that announcements of dividends of the sampled firms had an inverse and less significant effect on the stock price volatility in the Bangladesh stock exchange.

Akram and Abrar (2015) studied the volatility of stock prices and dividends policies at the Karachi stock market. The study aimed to examine the impact of dividends policy on stocks prices volatility at the Karachi stock exchange. The study made use of cross sectional data. The study population was comprised of eleven firms quoted on Karachi stock exchange for the duration between 2001 and 2014. The study made use of the time series model while regression models and descriptive statistics were utilised to analyse the information. The results showed that effects of dividend policies on the stocks prices volatility was not huge.

2.4.2 Local Studies

Onsunu and Onchiri (2014) studied the influence of dividends policies on volatility of stock price. The goal of the study was to analyse the link between dividend policies and volatility of stocks prices. The study also aimed at determining any other factors that could have possible effect on volatilities of stocks prices for firms quoted at the NSE. The study covered the duration between 2008 and 2012. A sample of 30 companies which were continuously listed and paid dividends continuously for the five year period was used to make generalization about population. The study employed correlation cross-sectional descriptive research method to deduce the linkage among dividend policies and volatility of stock price subsequent to controlling for non-current debt, size of the firm and assets growth. The research results depict no huge correlation between dividend policies and volatility of stocks prices. The control variables made up of non-current debt, size of the firm and assets growth were found to have no significant correlation with volatility of stock price.

Ngunjiri (2010) studied the link between dividend pay policies and share prices volatility for companies quoted at the Nairobi Securities Exchange. He sampled forty firms and tested for the duration between 2004 and 2008. This study was based on a regression analysis of the relation between volatility of stocks prices and dividends policies when controlling for the firm's size, volatility of earnings, company debt level and assets growth. Dividend yield and dividend pay-out ratio were found to have insignificant effect on the volatility of stock price at companies listed at the NSE for the duration from 2004 to 2008. The relation did not much improve even after putting control on the size of the firm, volatility of earning, company leverage and growth in assets. This implied that dividends policies had no influence on the volatility of stocks prices at the Nairobi Securities Exchange. Size of the firm and volatility of the

earnings were the only aspects in the model that were found to justify significantly the movements of stock price at the Nairobi Securities Exchange during the study duration. Though the findings were not compelling as compared to the situation of the more developed securities exchanges, they were rational with behavior of the less developed markets.

Kibet (2016) studied the effects of dividend policies on share price of firms listed at the NSE. The study aimed to establish the link between cash dividends and the share price and to examine the relation between share dividend and stock prices of companies quoted at the NSE. The data set consisting of volume weighted average price as the dependent item and cash dividend per share as the other independent variables were collected using data collection schedules for 55 companies sampled for the study. Random generalized least square regression test was done and the findings of the market indicated presence of a huge relevant positive link between the dividends paid and the shares prices while there was statistically insignificantly inverse relation between share dividend and the stock price. These results implied that the dividend policies affect the stock price and that a rise in cash dividend would end in an appreciation of the stock price of firms quoted at the NSE.

Oyuga (2013) studied the effects of announcement of earnings on the stock prices of companies quoted at the NSE. This was achieved by studying a nineteen sampled firms quoted at the NSE having made earnings announcement in the period of the study. The daily modified prices for the sampled stocks were recorded during the event window of seventeen days, eight days before and after the announcements. The study used a descriptive research method. The event study methodology was utilised to determine the impact of the announcement of earnings. The sample population

posted both negative and positive abnormal returns around the earnings announcement dates which show how the stock prices have reacted to the earnings announcement event. The above findings show that statistically negative abnormal returns were observed in the post and pre earnings announcements of companies quoted at the NSE. Given that a number of issues to be deliberated at earnings announcements are public information prior to earnings announcements and one would not expect revision in share prices that result into abnormal gains or losses. In which case abnormal gains or losses is only realizable if good or bad news emerges from the earnings announcements.

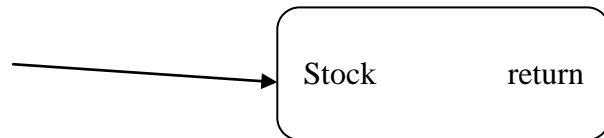
Marekia (2015) studied the impact of the dividends announcements on stock prices of companies quoted at the NSE. The target population was the 65 firms quoted at the NSE for the duration between January 2010 and December 2014. The abnormal returns were analysed by deducting the expected return from the actual return during the study period. The cumulative averaged abnormal returns were then analysed by summing the average abnormal returns pre and post the announcement. A graph of the averaged abnormal returns together with cumulative averaged abnormal returns for the duration was then plotted for each of the years to show the trend of the returns that were abnormal during the event window. Correlation and t-statistic were used in data analysis. The null hypothesis that dividends announcements have an inverse influence on stocks return of companies quoted at the NSE was rejected. The study concluded that the dividends announcements had a positive influence on the prices of stock of firms traded at the Nairobi securities exchange.

2.5 Conceptual Model

Independent Variable

Dependent Variable

Dividend announcement



Source: Based on Fama (1965)

2.6 Summary of Literature Review

Studies of dividends announcements and their impact on the firm's value have provided varying results. On one hand, Lintner (1962) and Gordon (1963), advocated that dividend are significant in obtaining the value of a company. Laabs and Bacon (2013) noted that a significant positive market reaction existed before companies announced increased dividends. Mahmood, Sheikh & Ghaffari (2011) study results noted that dividends announcement were significant and rejected the dividend irrelevance hypothesis at the Karachi stock exchange.

Contrary to the mentioned opinion, MM (1961) argued that companies dividend policies had no influence on either the firm's value or capital cost of the company and therefore dividends are were not relevant. Poornima and Chitra (2015) study on stock market volatility during dividend announcement for selected banks in India revealed that the mean of volatility was high during the pre-event period for the selected 21 banks. Onsunu and Onchiri (2014) research findings depicted that there existed no huge relation between dividend policies and the volatility of the share price. Ngunjiri (2010) noted that there never existed any significant impact link between dividends payment policy and the stock prices volatility for firms quoted at the NSE.

From the above literature and factual studies, there emanates mixed findings on the relevance of dividend announcement in assessing stock prices. From prior studies, the researchers have focused on investigating the effect of announcements of dividends on the stocks return or impact of dividend policies on the stock return but there exist

little research on the effect of dividends announcement on the stock return volatility. Considering, there exist no agreement among the researchers on the influence of dividend announcement on the stock return volatility, this research therefore intended to answer the query; what is the effect of dividends announcement on stock return volatility of companies listed at the Nairobi Securities Exchange?

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter focuses on the research design, data collection methods, data analysis procedures that were used and the mode of data presentation.

3.2 Research Design

The purpose of this study was to test the effects of dividend announcements on stock return volatility of companies quoted at the NSE. The study followed an event study methodology to measure stocks return volatility pre and post dividend announcements. This methodology is usually used to analyse the applicability and impact of a specific event which in this scenario it's the dividend announcements on stock return volatility of companies listed at the NSE. Sitthipongpanich (2011) described an event study methodology as being a factual test that is commonly used to analyse the impact of a specific event on the stock returns.

3.3 Population and Sample

The study population comprised of all companies listed at the NSE. As at the end of 2015, there were 63 firms listed at the NSE (NSE, 2016). The study however sampled only those firms that had consistent dividend policy. This owes to the fact that some firms do not give out dividend and the market does not perceive dividend information as new.

3.4 Data Collection

The sample constituted of all the listed companies at the NSE that have continuously listed and paid dividends for the past 5 years: 2011-2015. The period of study was

five years which was sufficient to establish a relationship between dividend announcements and stock returns volatility. The study collected daily stock prices for 30 days before and 30 days after dividend announcement. Also included was the value of dividend (dividend payout ratio) announced as this affects market reaction which the study seeks to establish.

3.5 Data Collection Methods

The research used secondary data that was obtained from Nairobi Securities Exchange information services. The data comprised of daily stock prices of all companies between 2011 and 2015 and dividend announcements dates of each stock for the same period.

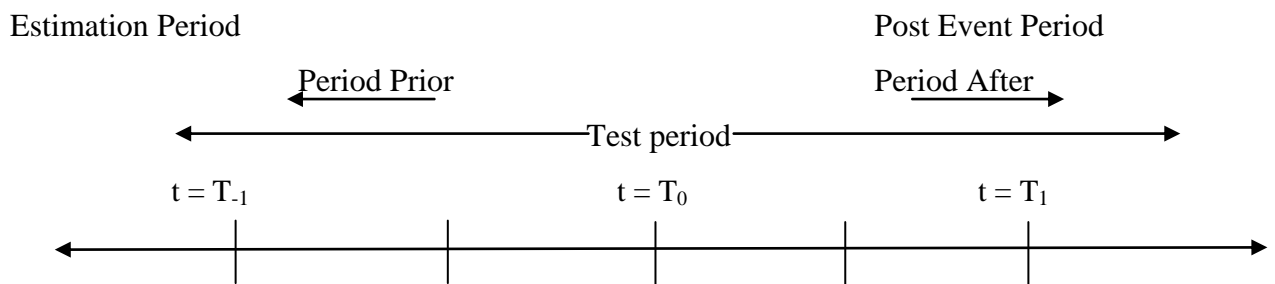
3.6 Data Analysis

GARCH models was used to measure stock returns volatility following dividend announcements. Statistical software Stata (version 13) was used to carry out data analysis and testing. Data was then presented in graphs and tables.

3.7 Analytical Model

The study was anchored on the assumption that under the EMH, the effect of the event would be instantly reflected in the stock returns. Hence, the stock reaction to the event was analysed by volatility of the stocks return over the periods prior and after dividend announcements. Differences in the stock returns volatility showed the market reaction to the dividends announcement. During the time period, the study made the assumption that the market reaction was not adversely influenced by other events or variables.

In this study the initial step was to establish the event of interest being dividend announcements and to pin-point the event date. This event date was the announcement date or ‘day 0’. Using the defined date, sample firms (stocks) were selected and classified according to their event date. Second step was to identify the period prior and after the incorporation of the test event. The effect of the dividends announcement on stock return volatility were observed in the test period that was in the range of T_{-1} to T_1 around the announcement date (day T_0) as shown below.



Stock returns were calculated as:

$$R_{it} = (P_{it} - P_{it-1}) / P_{it-1}$$

Where

R_{it} is the stock returns of firm i on day t

P_{it} is the closing stock price of firm i on day t .

P_{t-1} is the closing stock price of firm i on day $t-1$

The estimation period T_0 to T_{-1} and the post period T_0 to T_1 was the period in which the return volatility was assessed.

3.7.2 Model Specifications

Since the distribution of series is non-linear, the research employed a step-wise approach, where the standard linear GARCH(1,1) was applied to first capture the stock returns volatility. Descriptive statistics for nominal stock returns and dividend

announcements for the entire sample were then calculated. The coefficients for GARCH(1,1) volatility model for return series and their standard errors were estimated. To estimate volatility, GARCH model was calculated as follows:

Mean was calculated as $r_t = \mu + \varepsilon_t$

Variance was calculated as $\sigma_t^2 = \omega + \alpha_1 \varepsilon_{t-1}^2 + \beta_1 \sigma_{t-1}^2$

where $\omega > 0$, $\alpha_1 \geq 0$, $\beta_1 \geq 0$ to ensure that variance is strictly positive,

r_t is stock return at time t , μ is average stock return, ε_t is residual stock returns defined as $\varepsilon_t = \sigma_t z_t$ where z_t is standardized residual stock returns and σ_t^2 is conditional variance.

The variance equation modelled the time varying nature of volatility of the residuals generated from the mean equation. The GARCH(p, q) model was, thus as below:

$$\sigma_t^2 = \omega + \sum_{j=1}^q \alpha_j \varepsilon_{t-j}^2 + \sum_{i=1}^p \beta_i \sigma_{t-i}^2$$

Where, p was the number of lagged σ^2 terms which was 1 and q was the number of lagged ε^2 terms which was 1 in this study. As such, the model captured time varying volatility of stock returns. The study alongside sought to check the presence of asymmetry effects for stock returns volatility.

For the purposes of determining differences in stock return volatility in the pre and post dividend announcement periods, the study undertook test of differences using independent t-test. Independent t-test assessed whether there was a statistically

significant difference between the means in two groups: stock return volatility before and after dividend announcement.

Independent t-test tests the null hypothesis that the population means from the two groups were equal:

$H_0: \mu_1 = \mu_2$ against the alternative hypothesis that means are not equal $H_A: \mu_1 \neq \mu_2$

The study also ran a linear regression analysis to determine the effect of dividend announcement on stock returns volatility. This was informed by the fact that differences in volatility performed by t-test might not necessarily depict a dividend announcement effect. The regression model was of the form:

$$Y_{it} = \beta_0 + \beta_1 X_{it} + \varepsilon$$

Where Y_{it} was the stock return volatility for firm i in period t , β_0 is the regression constant, β_1 was the regression coefficient estimating the magnitude of linear effect of dividend announcement on stock return volatility, X_{it} was the dividend payout ratio while ε was the error term signifying other factors that might have influenced the relationship.

3.7.1 Test of Significance.

The study conducted several test of significance. Independent t-test was used to estimate the significance in stock return volatility in pre and post dividend announcement period. The t-test was conducted at 95% confidence level ($\alpha \leq .05$). Thus, should the significance value be less than 0.05, the study rejected the null hypothesis of population means from the two groups being equal and accept the alternative hypothesis of unequal means. This pointed to dividend announcement

having significant effect on stock return volatility. The study also conducted test of homogeneity of variance using Levene's Test of Equality of Variances. Levene produced f-statistics and significance value which is equal or less than 0.05 ($\alpha \leq .05$) signified equal variances between the groups. The study, further, conducted diagnostic test statistics on the GARCH model using ARCH-LM (Lagrange multiplier) test and Ljung-Box test were done to check if the standardized squared residual are serially uncorrelated and homoskedastic.

CHAPTER FOUR:

DATA ANALYSIS, RESULTS AND DISCUSSION

4.1 Introduction

This chapter presents the data findings and interpretation on dividend announcement and stock returns volatility. The data is presented through line graphs to illustrate the returns volatility before and after dividend announcement, the volatility of the returns using GARCH model and the differences of the mean volatility before and after dividend announcement using t-tests. Linear regression model is also used to determine the effect of dividend payout ratio on price return volatility. Data was collected from 29 firms that had consistent dividend payout policy.

4.2 Descriptive Analysis

Descriptive statistics provides the means and the standard deviation of the stock price volatility before and after dividend announcement from each firm for the five year period. The study established that the stock returns were higher after dividend announcement than before the announcement in majority of the firms. However, findings were converse in firms like Barclays Bank, BOC Kenya, BAT, Co-Operative Bank, Jubilee Holdings Ltd, KENGEN, Kenya-Re, Limuru Tea, Pan Africa Insurance, Sasini Tea, Total Kenya and Unga Group (Appendix V). Table 4.1 shows that the mean stock return volatility after the dividend announcement was 0.00285 compared to 0.00173 before the announcement. The findings also shows that BOC Kenya Ltd and BAT Ltd had the highest dividend payout ratio of 92.8 and 97.7. Williamson Tea Ltd and Total Kenya Ltd declared dividend despite making losses.

Table 4.1: Descriptive Statistics – Stock Returns

Event	Observations	Mean Return Volatility
Before Announcement	4350	0.00173
After Announcement	4495	0.00285

4.2.1 GARCH Test

The study conducted GARCH test to establish the volatility of the stock returns. The study conducted a GARCH (1,1) model which incorporates 1 lag in its estimation. That is, 1 lag of the model residual and another for the variance. Appendix III shows that the autocorrelation function (ACF) and partial autocorrelation function (PACF) pointed at running 1 ARCH and 1 GARCH terms as the first lags went beyond the confidence bands. Average stock return volatility had a constant of 0.00169 ($p < .001$). Therefore, stock return is 0.169%.

The study established a GARCH effect of 0.5133 and ARCH of .1113 both significant at $p = .096$ and $p = .20$ respectively. Since the ARCH t-ratio is significant, the study concludes that the variance is autoregressive conditionally heteroskedastic. Therefore, the overall variance or volatility in returns is 0.5133.

Table 4.2: GARCH Model

ARCH family regression

Sample: 2011 - 2015

Distribution: Gaussian

Log likelihood = 1284.2

Number of obs = 305

Wald chi2(2) = -

Prob > chi2 = -

		Coef.	OPG Std. Err.	z	P> z	[95% Conf. Interval]	
Aver							
	_cons	.0016937	.0002049	8.27	0.000	.0012921	.0020953
ARCH							
	arch L1.	.1112557	.0833116	2.32	0.020	-.052032	.2745434
	garch L1.	.5132627	.3088037	1.66	0.096	-.0919814	1.118507
	_cons	4.94e-06	3.72e-06	1.33	0.184	-2.35e-06	.0000122

4.2.2 Test of Independence

The study conducted independent t-test to determine the differences in stock return volatility before and after dividend announcement. Independent t-test test the null hypothesis of no significant differences against the alternative of significant differences. As presented in Appendix II, it was established that there is no significant differences in return volatility of majority of the firms. However, the overall independent t-test was significant. That is, $t = -3.399$ at 56 degrees of freedom with a significance value of $p = .016$. This signifies that there is an overall differences in the means of the return volatility before and after dividend announcement.

Table 4.3: Independent T-Test

	Levene's Test for Equality of Variances		t-test for Equality of Means		
	F	Sig.	t	df	Sig. (2-tailed)
Equal variances assumed	3.939	0.052	-3.399	56	0.016
Equal variances not assumed			-3.389	51.793	0.016

4.3 Regression Analysis

The study conducted a linear regression analysis using ordinary least square to measure the effect of dividend announcement on stock return volatility. This owes to the randomness of the stock volatility as it is a function of the variance in returns. Being a macroeconomic data, the study removed outliers lying 5% above or below the confidence level as depicted from the box plots in Appendix IV.

Table 4.4: Regression Coefficients

. regress vol dpr

Source	SS	df	MS	Number of obs = 126		
Model	.000340822	1	.000340822	F(1, 124) =	6.64	
Residual	.006368868	124	.000051362	Prob > F =	0.0112	
Total	.00670969	125	.000053678	R-squared =	0.0508	
				Adj R-squared =	0.0431	
				Root MSE =	.00717	

vol	Coef.	Std. Err.	t	P> t	[95% Conf. Interval]	
dpr	-.0000659	.0000256	-2.58	0.011	-.0001165	-.0000153
_cons	.0207135	.0011773	17.59	0.000	.0183833	.0230438

The results produced R-Square value of 0.0508 which illustrates that dividend announcement contributes 5.08% of the changes in stock return volatility. From ANOVA, f-value of 6.64 was produced with a significance of $p = .011$. This means that the model is significant at 95% confidence level. The results presented above produced the equation:

$$\text{Volatility} = 0.0207 - 0.0000659 * \text{DPR}$$

The results, thus, estimates that without dividend issue, the stock volatility would be 0.0207. However, dividend announcement leads to 0.0000659 decrease in stock return volatility of firms listed at the NSE.

4.4 Summary and Interpretation of Findings

The study established a high stock return volatility during the announcement period. A study conducted by Laabs and Bacon (2013) in New York Stock Exchange found that the market had a huge reaction to dividend announcement especially with dividend increase. Mahmood, Sheikh and Ghaffari's (2011) results found a positive value relevance of dividend announcement. However, this was inverse in a number of firms which had higher return volatility before than after dividend announcement.

The study established that there were higher overall stock return volatility after dividend announcement than before the announcement. Conducting a similar study in Karachi Stock Exchange, Mahmood, Sheikh and Ghaffari (2011) established that dividend announcements had positive value relevance. Thus, the return volatility was higher during the post event than the pre-event period.

The study established a GARCH effect in the stock price volatility after and before the dividend announcement. This result is consistent with the findings by Poornima

and Chitra (2015) who established a high volatility during pre-event period using GARCH on firms in Indian Capital Market. This study also established a one GARCH and ARCH effect.

The study established a negative linear relationship between dividend announcement, as measured by dividend payout ratio, and stock return volatility. Rahman and Nazim (2011) also established an inverse and less significant effect dividend announcement and stock price volatility in Bangladesh Stock Market. However, the regression coefficient was very small ($\beta = -0.0000659$). This is consistent with findings by Onsunu and Onchiri (2014) who established very low correlation between correlation between dividend policies and volatility of stocks prices. Akram and Abrar (2015) also established miniscule effect of dividend policies on the stocks prices volatility in Karachi Stock Exchange.

CHAPTER FIVE

SUMMARY OF FINDINGS, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

This chapter discusses the summary of findings presented in the previous chapter. From the findings, conclusions are drawn and recommendations made. The chapter further discusses the possible limitations of the study and suggests areas for further research.

5.2 Summary of Findings

The findings were collected from 29 listed firms that had consistent dividend policies which were nearly half of the listed companies. The study established erratic stock returns before and after the dividend announcement. However, the returns were higher after the dividend announcement. The firms that had lower return volatility after the announcement were Barclays Bank, BOC Kenya, BAT, Co-Operative Bank, Jubilee Holdings Ltd, KENGEN, Kenya-Re, Limuru Tea, Pan Africa Insurance, Sasini Tea, Total Kenya and Unga Group. The overall return volatility before the dividend announcement was 0.00173 which increased to 0.00285 after announcement.

The findings further reveal that the dividend announcement affected the stock price performance in majority of the companies as measured by the relative average increase in return during post announcement period. Levene test of equality of variances or homoskedasticity was insignificant revealing a heteroskedastic overall return volatility. There was overall significant ($p = .016$) differences in stock returns during the post announcement period.

The study established that stock returns had autoregressive conditionally heteroskedastic variance with a volatility of 0.5133 as measured by the GARCH coefficient. It was further determined that dividend payout ratio had a significant effect on stock return volatility as measured by OLS regression. A coefficient of -0.0000659 was produced meaning that dividend information has an effect of decreasing the volatility.

5.3 Conclusions

The study established differences in mean overall volatility of stock returns before and after dividend announcement. Thus, the study conclude that there is a signaling effect of the dividend announcement. Dividend represents the shareholders/investor initial returns on their investment before sale of their shares in the secondary market at a profit or loss. As such, investors puts a lot of informational value to the dividend announcements. However, some growth oriented companies like Centum Investment prefers to retain their earnings for growth purposes or opportunities and issue no dividends. This might be poorly perceived by investors who subscribe to liquidity preference and are not willing to postpone consumption for greater future rewards in terms for company growth.

Individual investors might, therefore, profit if they act on the dividend information as they will earn above normal return in the periods following the announcement. Companies that announced high dividend payout ratio experienced higher return volatility with the returns being higher in periods following the announcement. In some firms, there was insignificant differences point to dividend information having little impact on the share prices/returns.

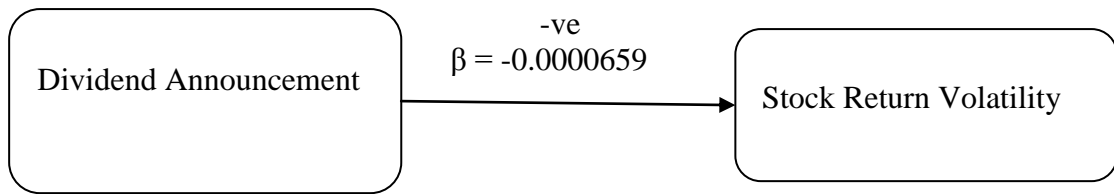


Figure 5.1: Revised Conceptual Model

The study concludes that there was negative but very low linear effect of dividend announcement as measured by dividend payout on stock return volatility. This is contradictory to dividend irrelevance theory which posits that dividend carries no much value with no impact on stock prices. However, the results are consistent with a Bird-In-The-Hand Theory which states that firms which issue dividend are likely to experience higher stock prices. The conceptual framework was thus reversed as shown in the figure above.

5.4 Recommendations

The study recommends that listed firms need to adopt a proper dividend payout policy as that affects their stock prices. The management need to minimize dividend announcement that can be perceived by the market as adverse information as that would negate the firm's market capitalization. Proper policy should be adopted by the market regulators to minimize market panic to perceived adverse information. Investors should take note that failure to pay dividend could point to growth opportunity as some firms could prefer to retain earnings for growth projects.

5.5 Limitations of the Study

Stock prices and returns reacts to a myriad of corporate actions and other macroeconomic variables. Thus, it might not be proper to proffer that the returns volatility were only due to dividend announcements as other variables might have also

contributed. The study minimized this by looking at longer estimation period by which other variables or corporate actions might have been incorporated in the prices. This conforms to the statistical ‘law of large numbers’ which states that the more observations one incorporates in determining statistics about a population, the more s/he reaches the true probability.

The study is based on five-year longitudinal data. Within and beyond this period, many changes in the security market may have happened which the study cannot account for. For instance, the study does not account for the periods before stock market automation when the price reaction was slow. However, it is assumed that 5-year period is enough to account for as many changes in market microstructure as possible.

The study used secondary data which are limited to the tenacity and objectivity of the person compiling it. At times, the validity of secondary data is constraints to the purposes and objects of the first user. This study minimized this by collecting stock price data from NSE which is reliable and valid as Kenya’s only security market and regulated by Capital Markets Authority.

Limitation could be faced by the statistical model used in showing the relationship between stock returns and dividend announcement. The study opted for stock returns volatility test using GARCH model. It is conceptualized that GARCH accounts for both systemic and firm-specific influencers of stock return. The study used t-test to establish the differences in return before and after the announcement. Linear regression model was used to measure the effect of DPR on stock return volatility.

The study targeted 62 firms listed at the NSE from which 29 were sampled as they had a consistent dividend policy. The findings could thus might not represent

companies outside the sampled one. Besides, the findings doesn't represent the dividend value of unlisted public firms. The study delimited this by sampling firms from each sector.

5.6 Areas for Further Research

The study suggests that future studies can be done on other corporate actions such as profit warning, stock splits and bonus announcements. This could help isolate other factors affecting stock return volatility other than dividend announcement. It will also compliment this study by facilitating comparison on how the market reacts to different announcements. Future studies can be done on extended periods of time like 10 years. This will help account for the speed of market reaction during different development stage of the stock market microstructure.

Future studies on stock market reaction to dividend announcement can augment secondary with primary data. The primary data sources will help account for issues not directly captured in stock prices. For instance, how the investors perceive dividend payment versus retention of earnings. Furthermore, future studies can use better models for volatility estimation like EGARCH which would strengthen the findings. Future studies can be done on private or unlisted companies to determine how investors perceive dividend announcement and their preferred dividend policy. This would help strengthen the study's findings. Future studies can also look at non-cash dividend payments such as bonus issue.

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APPENDICES

Appendix 1: Companies Listed at the NSE

Number	Company Name
1	Eaagads limited
2	Kakuza limited
3	Kapchorua Tea Co limited
4	The Limuru Tea Co limited
5	Sasini limited
6	Williamson Tea Kenya limited
7	Car & General (K) limited
8	Marshalls (EA) limited
9	Sameer Africa limited
10	Barclays Bank of Kenya limited
11	CFC Stanbic of Kenya Holdings limited
12	Diamond Trust Bank Kenya limited
13	Equity Group Holdings limited
14	Housing Finance Group limited
15	I&M Holdings limited
16	KCB Group limited
17	National Bank of Kenya limited
18	NIC Bank limited
19	Standard Chartered Bank Kenya limited
20	The Co-operative Bank of Kenya limited
21	Atlas African Industries limited
22	Express Kenya limited
23	Hutchings Biemer limited
24	Kenya Airways limited
25	Longhorn Publishers limited
26	Nation Media Group limited
27	Standard Group limited
28	TPS Eastern Africa limited
29	Uchumi Supermarket limited

30	WPP Scangroup limited
31	ARM Cement limited
32	Bamburi Cement limited
33	Crown Paints Kenya limited
34	East African Cables limited
35	East Africa Portland Cement Co limited
36	KenGen Co limited
37	KenolKobil limited
38	Kenya Power & Lighting Co limited
39	Total Kenya limited
40	Umeme limited
41	Britam Holdings limited
42	CIC Insurance Group limited
43	Jubilee Holdings limited
44	Kenya Re Insurance Corporation limited
45	Liberty Kenya Holdings limited
46	Sanlam Kenya
47	Centum Investment Co limited
48	Home Afrika limited
49	Kurwitu Ventures limited
50	Olympia Capital Holdings limited
51	Trans-Century limited
52	Nairobi Securities Exchange limited
53	ABaumann& Co limited
54	BOC Kenya limited
55	British American Tobacco Kenya limited
56	Carbacid Investments limited
57	East African Breweries limited
58	Eveready East Africa limited
59	Flame Tree Group Holdings limited
60	Kenya Orchards limited
61	Mumias Sugar Co limited

62	Unga Group limited
63	Safaricom limited

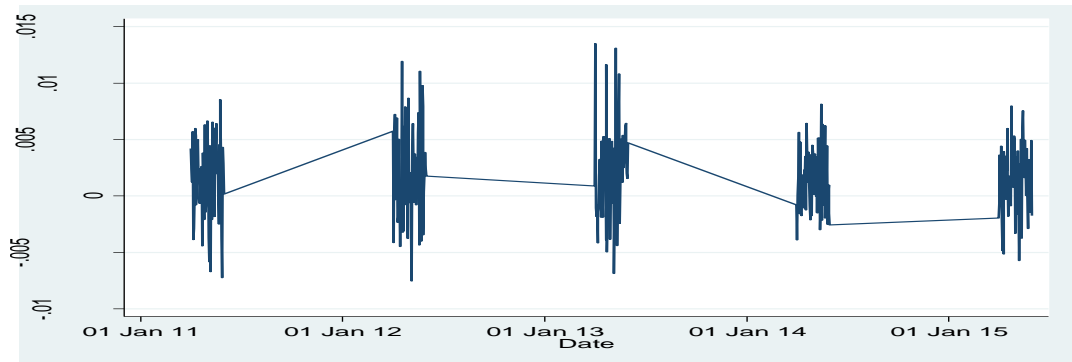
Appendix II: Independent T-Test – Stock Returns

Firm		Levene's Test		t-test		
		F	Sig.	t	df	Sig. (2-tailed)
ARM Cement Ltd	Equal variances assumed	1.363	0.244	-0.8	303	0.424
	Equal variances not assumed			-0.796	265.045	0.427
Bamburi Cement Ltd	Equal variances assumed	8.908	0.003	-0.801	303	0.424
	Equal variances not assumed			-0.795	238.177	0.427
Barclays Bank Ltd	Equal variances assumed	0.166	0.684	0.433	303	0.665
	Equal variances not assumed			0.433	302.844	0.665
BOC Kenya Ltd	Equal variances assumed	0.141	0.708	0.352	303	0.725
	Equal variances not assumed			0.353	301.93	0.724
British American Tobacco Kenya Ltd	Equal variances assumed	1.027	0.312	0.81	303	0.418
	Equal variances not assumed			0.813	297.067	0.417
Carbacid Investments Ltd	Equal variances assumed	0.058	0.81	-0.225	303	0.822
	Equal variances not assumed			-0.225	302.871	0.822
Co-operative Bank of Kenya	Equal variances assumed	0.752	0.386	1.195	303	0.233
	Equal variances not assumed			1.201	280.691	0.231
Crown Berger Ltd	Equal variances assumed	0.257	0.612	-1.143	303	0.254
	Equal variances not assumed			-1.142	301.721	0.254
Diamond Trust Bank Kenya Ltd	Equal variances assumed	6.568	0.011	-0.03	303	0.976
	Equal variances not assumed			-0.03	278.699	0.976
E. A. Cables Ltd	Equal variances assumed	0.119	0.731	-0.082	303	0.934
	Equal variances not assumed			-0.082	302.764	0.934
East African Breweries Ltd	Equal variances assumed	1.857	0.174	-1.588	303	0.113
	Equal variances not assumed			-1.594	292.313	0.112
Equity Group Holdings Ltd	Equal variances assumed	10.894	0.001	-0.406	303	0.685
	Equal variances not assumed			-0.409	256.732	0.683
HF Group Limited	Equal variances assumed	5.151	0.024	-0.845	303	0.399
	Equal variances not assumed			-0.848	294.561	0.397
Jubilee Holdings Ltd	Equal variances assumed	3.926	0.048	0.704	303	0.482
	Equal variances not assumed			0.703	297.005	0.483
Kenya Commercial Bank	Equal variances assumed	1.793	0.182	-0.329	303	0.743
	Equal variances not assumed			-0.329	301.467	0.742
Kenya Electricity	Equal variances assumed	2.11	0.147	0.474	303	0.636

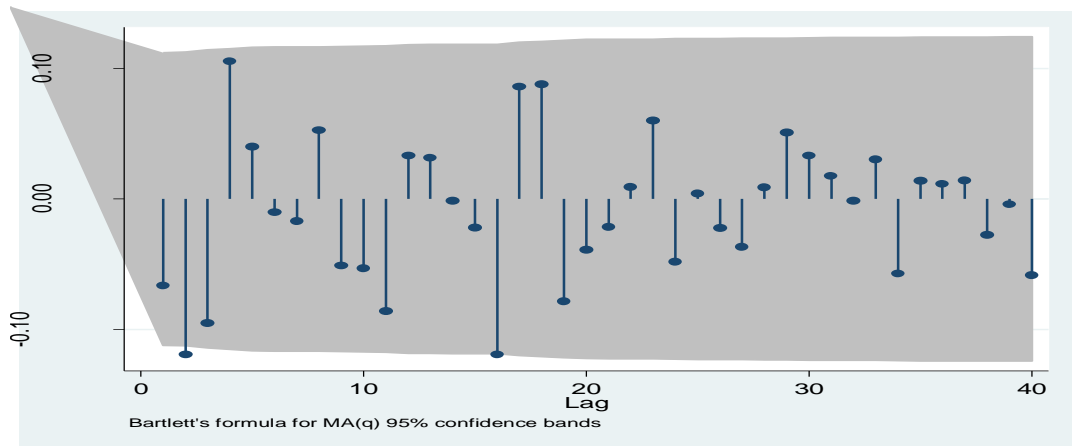
Generating Company Ltd						
	Equal variances not assumed			0.472	283.235	0.637
Kenya Re-Insurance Corp.	Equal variances assumed	3.01	0.084	1.481	303	0.14
	Equal variances not assumed			1.479	298.401	0.14
Limuru Tea Company Ltd	Equal variances assumed	0.009	0.925	0.292	303	0.77
	Equal variances not assumed			0.293	300.595	0.77
Nation Media Group	Equal variances assumed	3.9	0.049	-0.018	303	0.986
	Equal variances not assumed			-0.018	301.156	0.986
NIC Bank Ltd	Equal variances assumed	0.46	0.498	-0.664	303	0.507
	Equal variances not assumed			-0.662	289.955	0.509
Pan Africa Insurance	Equal variances assumed	0.085	0.771	0.55	303	0.583
	Equal variances not assumed			0.55	302.04	0.583
Safaricom Ltd	Equal variances assumed	0.29	0.591	1.063	303	0.289
	Equal variances not assumed			1.065	301.093	0.288
Sasini Tea and Coffee Ltd	Equal variances assumed	1.475	0.226	0.056	303	0.955
	Equal variances not assumed			0.056	295.228	0.955
Standard Chartered Bank Ltd	Equal variances assumed	2.712	0.101	-0.557	303	0.578
	Equal variances not assumed			-0.558	296.9	0.577
Total Kenya Ltd	Equal variances assumed	0.003	0.954	0.595	303	0.552
	Equal variances not assumed			0.595	302.992	0.552
TPS Eastern Africa (Serena)	Equal variances assumed	0.223	0.637	-0.002	303	0.998
	Equal variances not assumed			-0.002	295.937	0.998
Unga Group Ltd	Equal variances assumed	17.027	0	0.491	303	0.624
	Equal variances not assumed			0.487	223.951	0.627
Williamson Tea Kenya Ltd	Equal variances assumed	7.005	0.009	1.097	303	0.274
	Equal variances not assumed			1.092	275.319	0.276
WPP ScanGroup Ltd	Equal variances assumed	0.401	0.527	0.352	303	0.725
	Equal variances not assumed			0.351	299.608	0.726

Appendix III: Time Series Test Plots

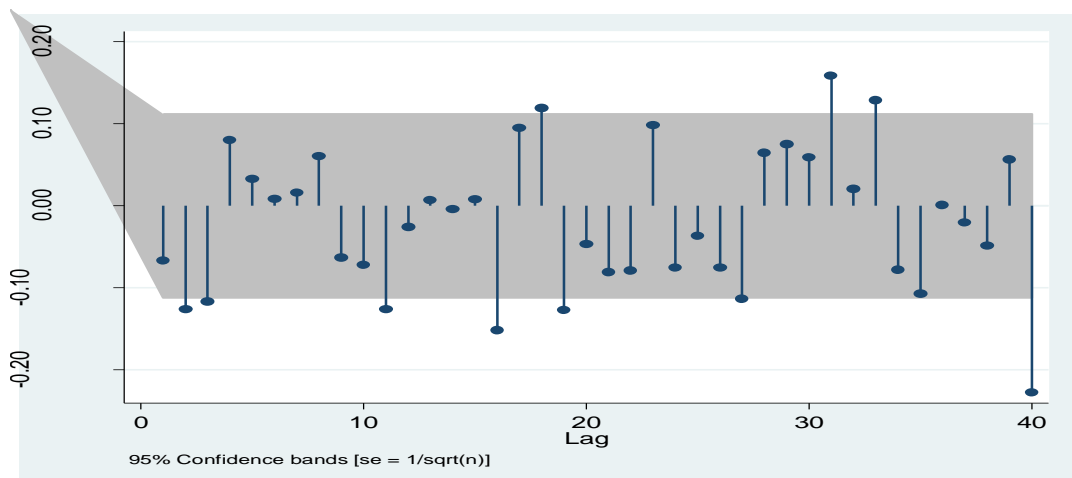
Line graph



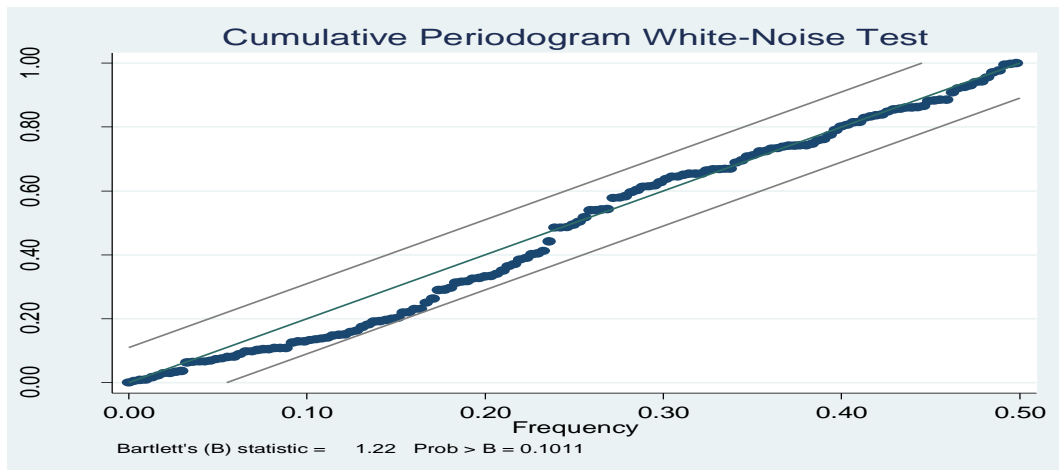
Autocorrelation - Correlogram



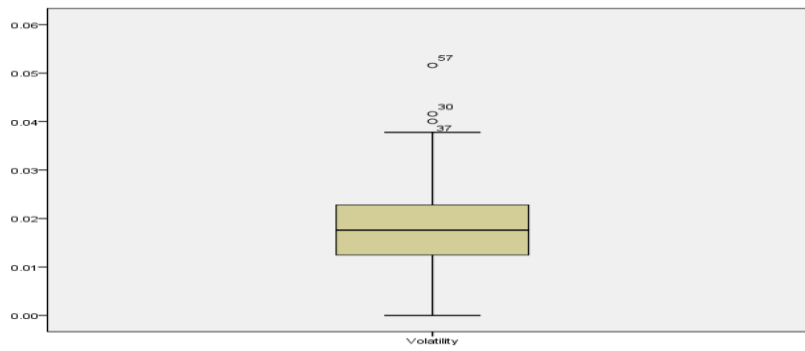
Partial Autocorrelation



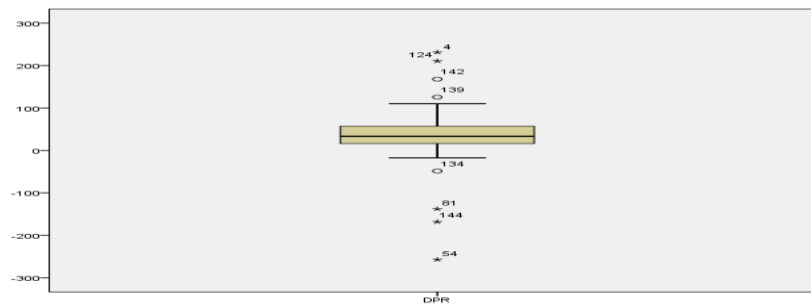
Bartlett Test - Cumulative Periodogram Based on White Noise



Appendix IV: Box Plots



Volatility



DPR

Extreme Values

		Case Number	Value	
Volatility	Highest	1	57	.05
		2	30	.04
		3	37	.04
		4	4	.04
		5	86	.04
	Lowest	1	18	.00
		2	127	.00
		3	98	.00
		4	44	.01
		5	34	.01
DPR	Highest	1	4	231.32
		2	124	210.61
		3	142	167.95
		4	139	125.52
		5	10	110.14
	Lowest	1	54	-257.27
		2	144	-168.30
		3	81	-137.81
		4	134	-48.58
		5	83	-17.32

Appendix V: Descriptive Statistics

	Announcement	N	Mean	Std. Deviation	Std. Error Mean
ARM Cement Ltd	Before	150	0.0026	0.02561	0.00209
	After	155	0.0046	0.01782	0.00143
Bamburi Cement Ltd	Before	150	-0.0014	0.01906	0.00156
	After	155	0.0001	0.01111	0.00089
Barclays Bank Ltd	Before	150	0.0008	0.01315	0.00107
	After	155	0.0002	0.01329	0.00107
BOC Kenya Ltd	Before	150	0.0018	0.02618	0.00214
	After	155	0.0007	0.02872	0.00231
British American Tobacco	Before	150	0.0022	0.0149	0.00122
	After	155	0.0007	0.01776	0.00143
Carbacid Investments Ltd	Before	150	0.0008	0.02323	0.0019
	After	155	0.0014	0.02351	0.00189
Co-operative Bank	Before	150	0.0017	0.00926	0.00076
	After	155	0.0002	0.01281	0.00103
Crown Berger Ltd	Before	150	0.0014	0.02641	0.00216
	After	155	0.0048	0.02557	0.00205
Diamond Trust Bank Kenya Ltd	Before	150	0.0021	0.01572	0.00128
	After	155	0.0022	0.02206	0.00177
E. A. Cables Ltd	Before	150	0.0009	0.01722	0.00141
	After	155	0.0011	0.0183	0.00147
East African Breweries	Before	150	0.0006	0.01208	0.00099
	After	155	0.0031	0.01516	0.00122
Equity Group Holdings Ltd	Before	150	0.002	0.01235	0.00101
	After	155	0.0027	0.02016	0.00162
HF Group Limited	Before	150	0.0012	0.01627	0.00133
	After	155	0.0029	0.01996	0.0016
Jubilee Holdings Ltd	Before	150	0.0033	0.0262	0.00214
	After	155	0.0012	0.02347	0.00189
Kenya Commercial Bank Ltd	Before	150	0.0014	0.01382	0.00113
	After	155	0.0019	0.01534	0.00123
Kenya Electricity Generating Company	Before	150	0.0026	0.02307	0.00188
	After	155	0.0014	0.01821	0.00146
Kenya Re-Insurance Corporation Ltd	Before	150	0.003	0.02015	0.00165
	After	155	-0.0002	0.01838	0.00148
Limuru Tea Company Ltd	Before	150	0.0006	0.01167	0.00095
	After	155	0.0002	0.01319	0.00106
Nation Media Group	Before	150	0.0026	0.01712	0.0014
	After	155	0.0026	0.01914	0.00154
NIC Bank Ltd	Before	150	0.0015	0.01882	0.00154
	After	155	0.0028	0.01569	0.00126

Pan Africa Insurance Holdings Ltd	Before	150	0.0031	0.02378	0.00194
	After	155	0.0016	0.02323	0.00187
Safaricom Ltd	Before	150	0.0042	0.01522	0.00124
	After	155	0.0122	0.01704	0.00137
Sasini Tea and Coffee Ltd	Before	150	0.0011	0.02158	0.00176
	After	155	0.0009	0.01894	0.00152
Standard Chartered Bank Ltd	Before	150	0.0017	0.01291	0.00105
	After	155	0.0026	0.01542	0.00124
Total Kenya Ltd	Before	150	0.0003	0.01522	0.00124
	After	155	-0.0007	0.01565	0.00126
TPS Eastern Africa (Serena) Ltd	Before	150	0.0003	0.0234	0.00191
	After	155	0.0003	0.02827	0.00227
Unga Group Ltd	Before	150	0.002	0.02871	0.00234
	After	155	0.0007	0.01511	0.00121
Williamson Tea Kenya Ltd	Before	150	0.0027	0.0357	0.00291
	After	155	-0.0013	0.02661	0.00214
WPP ScanGroup Ltd	Before	150	0.003	0.02138	0.00175
	After	155	0.0022	0.01986	0.0016

Appendix VI: Dividend Payout Ratio

Firm	2015	2014	2013	2012	2011	Mean	STDEV
ARM Cement Ltd	19.9	22.0	19.9	17.2	16.1	19.0	2.357
Bamburi Cement Ltd	55.8	19.8	78.1	62.6	58.2	54.9	21.458
Barclays Bank Ltd	64.8	49.9	62.2	100.9	70.4	69.6	19.032
BOC Kenya Ltd	44.2	50.1	50.0	88.2	231.3	92.8	79.416
BAT Ltd	92.3	99.4	99.4	98.5	99.0	97.7	3.041
Carbacid Investments Ltd	4.9	42.9	26.3	56.2	55.3	37.1	21.714
Co-operative Bank	30.5	23.0	27.0	26.0	31.0	27.5	3.317
Crown Berger Ltd	210.6	19.4	22.2	23.0	32.4	61.5	83.480
Diamond Trust Bank	9.3	9.7	11.5	12.5	8.7	10.3	1.594
E. A. Cables Ltd	37.1	63.6	48.0	64.3	110.1	64.6	27.865
EABL Ltd	63.4	66.7	61.9	76.8	78.3	69.4	7.638
Equity Bank Ltd	38.9	41.8	38.3	28.7	8.6	31.3	13.582
HF Group Limited	24.5	40.6	43.5	44.4	42.4	39.1	8.273
Jubilee Holdings Ltd	13.5	16.8	18.4	15.7	14.8	15.8	1.848
KCB Ltd	38.1	48.0	46.3	50.0	51.4	46.8	5.216
KENGEN.	31.1	25.1	46.9	52.8	33.5	37.9	11.550
Kenya Re- Corp	17.9	15.0	10.0	11.0	13.6	13.5	3.163
Limuru Tea Ltd	-48.6	70.5	9.9	22.2	12.0	13.2	42.406
Nation Media Group	19.2	62.0	62.6	104.5	81.7	66.0	31.417
NIC Bank Ltd	14.1	16.3	16.6	9.0	10.9	13.4	3.347
Pan Africa Ins.	49.6	34.6	48.0	43.3	24.4	40.0	10.468
Safaricom Ltd	81.8	70.7	69.7	60.8	52.8	67.2	10.954
Sasini Tea Ltd	125.5	62.2	-137.8	13.1	16.4	15.9	97.202
Stanchart Bank Ltd	51.2	49.3	47.0	57.1	72.7	55.4	10.325
Total Kenya Ltd	0.9	8.0	-17.3	-257.3	19.8	-49.2	117.103
TPS (Serena)	168.0	54.5	39.0	31.3	35.9	65.7	57.803
Unga Group Ltd	14.8	2.1	16.3	12.9	16.0	12.4	5.913
Williamson Tea Ltd	-168.3	8.6	7.9	8.0	12.8	-26.2	79.462
WPP ScanGroup Ltd	30.3	18.2	26.6	21.9	25.6	24.5	4.622

Appendix VII: Stock Returns

Year	Date	ARM Cement Ltd	Bamburi Cement Ltd	Barclays Bank Ltd	BOC Kenya Ltd	British American Tobacco Kenya Ltd	Carbacid Investments Ltd	Co-operative Bank of Kenya Ltd	Crown Berger Ltd	Diamond Trust Bank Kenya Ltd	E. A. Cables Ltd
2011	t-30	.013	-	.000	.000	.008	.000	-	.024	.000	.019
			.036					.009			
2011	t-29	.007	-	.000	.000	.017	.000	-	-	.029	.000
			.016					.013	.023		
2011	t-28	.000	-	-	.000	.003	.000	.004	.036	-	.009
			.027	.016						.028	
2011	t-27	.000	-	.008	.000	-	.027	-	.000	.000	-
			.017			.003		.004			.027
2011	t-26	.000	-	.021	.000	.000	.009	.013	.000	-	.028
			.006							.036	
2011	t-25	.006	.017	.048	.088	.008	.000	.004	.000	.000	-
											.027
2011	t-24	.000	.000	.012	.009	.000	.000	-	.000	.000	.005
								.004			
2011	t-23	.013	.006	.004	.000	.008	.009	.004	.000	.022	.005
2011	t-22	.000	.000	-	-	-	.070	.000	-	.022	-
				.004	.089	.003			.034		.005
2011	t-21	.019	-	-	.000	.016	.000	.000	.000	.000	-
			.006	.004							.005
2011	t-20	.013	-	.000	.000	.005	-.041	-	.000	.000	-
			.011					.004			.005
2011	t-19	-	-	.000	.000	-	.000	.009	.036	-	.000
		.006	.006			.005				.007	
2011	t-18	.006	.011	.008	.000	-	-.025	.017	-	.007	.005
						.005			.023		
2011	t-17	-	.006	.015	.000	-	.018	.004	.012	.000	-

			.018							.007	
2011	t2	.000	.019	-	.000	.000	.000	-	.000	.000	.018
			.108						.005		
2011	t3	-	.000	.004	.000	.005	.000	-	.021	.007	.009
			.059						.007		
2011	t4	.056	.012	.025	.000	.028	-.008	.012	-	-	.000
									.010	.029	
2011	t5	.000	.006	.008	.000	.003	.000	-	.031	.022	-
									.028		.009
2011	t6	.006	.000	-	.000	-	.000	-	-	-	-
			.032			.003		.005	.030	.036	.023
2011	t7	.000	.000	-	.000	.000	-.008	-	.000	.023	.009
			.008						.004		
2011	t8	.000	.006	-	.000	.000	.000	.004	.072	.000	-
			.013								.014
2011	t9	-	-	.008	.000	-	.000	.000	-	.022	-
		.012	.006			.015			.029		.009
2011	t10	.006	.000	.008	-	.018	.000	.009	.050	.000	.009
						.027					
2011	t11	.006	.012	.000	-	-	-.008	-	.000	.000	.000
					.018	.098		.009			
2011	t12	.000	.000	.000	.000	.102	.000	.005	-	-	-
								.009	.029	.005	
2011	t13	.053	.029	-	.000	.003	-.032	.004	-	.000	-
			.008						.010		.005
2011	t14	.006	.000	-	.000	-	.000	-	.000	.000	.000
			.004			.003		.009			
2011	t15	.000	.000	-	.000	-	.050	.000	.000	.000	-
			.004			.018					.042
2011	t16	.028	.000	.008	.000	.000	-.064	.000	.000	.007	-
											.005
2011	t17	.011	.000	.013	-	.046	.017	.000	.000	.000	.010
					.019						

2011	t18	-	.006	.021	.000	.012	.000	.000	.087	-	.029
		.027								.030	
2011	t19	.027	-	.028	-	-	.008	-	-	-	-
		.006		.009	.005		.004	.080	.008	.009	
2011	t20	-	.000	.024	-	.000	-.008	.000	.000	.000	-
		.011		.010						.005	
2011	t21	.016	.000	.000	.000	.000	.008	-	.000	.046	.000
							.004				
2011	t22	.043	.000	.000	.000	.005	-.008	.004	.010	.007	.000
2011	t23	.000	.000	.000	.000	-	.000	-	-	-	-
						.005		.004	.010	.007	.010
2011	t24	.000	.000	-	-	-	.000	-	.000	-	.000
				.004	.038	.027		.009		.015	
2011	t25	.000	.000	-	.000	.027	.000	.000	.000	.022	.043
				.004							
2011	t26	.026	-	-	-	-	.000	.005	.000	.000	.028
		.029	.012	.020	.005						
2011	t27	.020	.029	.008	-	.010	.000	.000	.000	.022	-
				.082							.027
2011	t28	-	.000	.000	.000	-	.000	.000	.000	.000	-
		.005				.010					.014
2011	t29	-	.000	-	.000	.010	.000	.000	.000	.007	.009
		.020		.004							
2011	t30	-	.017	.004	.100	.002	.000	.004	.000	.007	-
		.015									.023
2012	t-30	-	-	.000	.000	.000	-.024	.020	.067	-	.005
		.005	.024							.067	
2012	t-29	.005	-	.007	.000	.012	.000	.012	-	.000	-
		.010						.027			.005
2012	t-28	.025	.000	.011	.000	.005	.000	.004	.000	.000	-
											.005
2012	t-27	-	.005	.000	.000	.000	-.017	.008	.000	.000	.000
		.015									

2012	t-26	-	.005	-	.000	.002	.000	-	.000	.000	.005
		.030		.003				.008			
2012	t-25	.005	-	-	.000	.000	.000	-	.000	.014	.000
			.024	.021				.004			
2012	t-24	.000	.025	.000	.000	.014	.017	-	.000	.007	.038
								.004			
2012	t-23	.000	.044	.004	.000	.002	.017	.004	.037	.000	-
											.046
2012	t-22	.010	-	.000	.005	.000	.008	.000	.000	.007	.014
			.019								
2012	t-21	-	.005	.000	.000	.000	.000	.007	-	.000	-
		.085							.098		.019
2012	t-20	.000	-	.000	.000	.002	.000	.012	.000	.000	.010
			.019								
2012	t-19	.088	-	-	.000	.021	.000	.031	.089	.000	-
			.005	.004							.005
2012	t-18	.005	.000	.004	-	.000	.000	-	-	.000	.014
					.010			.023	.082		
2012	t-17	.005	.015	.004	.010	.009	.000	-	.000	.000	-
								.008			.009
2012	t-16	.005	-	.000	.000	.002	.000	.004	.089	.014	.005
			.005								
2012	t-15	.015	-	.025	-	-	.000	.000	.000	-	-
			.005		.005	.007				.007	.014
2012	t-14	-	.000	.010	.005	.018	.000	-	.000	.007	.010
		.015						.004			
2012	t-13	-	.014	.017	-	.000	-.024	-	.000	-	.005
		.005			.050			.012		.021	
2012	t-12	.020	-	-	.000	.000	.000	-	-	.000	.038
			.014	.010				.011	.009		
2012	t-11	.000	.000	.000	.032	.000	.000	.004	.000	-	-
										.021	.023
2012	t-10	-	-	-	.000	.002	.025	.012	-	.021	.023

		.015	.005	.017					.028		
2012	t-9	-	.005	.000	.000	.000	.000	.007	-	.007	.005
		.005							.066		
2012	t-8	.000	.000	-	.000	.004	.000	-	.010	-	-
				.010				.004		.007	.037
2012	t-7	.010	-	-	.000	.002	-.016	.008	.040	.000	.005
		.005	.004								
2012	t-6	.010	.000	-	.071	.002	.000	-	.000	-	-
				.004				.004		.014	.005
2012	t-5	-	.000	-	.000	.009	.009	.015	.000	-	-
		.005	.014							.007	.005
2012	t-4	-	.000	.032	.000	.000	-.090	.004	.000	.014	.000
		.089									
2012	t-3	.092	.005	.003	.000	.000	.000	.015	-	.000	-
								.019			.005
2012	t-2	-	-	.000	.000	.013	.000	.011	.020	-	-
		.084	.005							.007	.010
2012	t-1	.092	.005	.014	-	.004	.000	.003	.000	.021	.005
				.038							
2012	t0	-	.000	-	-	.000	.090	.015	.000	-	.019
		.010		.003	.010					.021	
2012	t1	-	.000	.000	.000	.004	.000	.014	.000	.000	-
		.015									.019
2012	t2	.005	-	-	.000	.000	.000	-	.048	.028	-
		.005	.003					.011			.005
2012	t3	.005	-	.007	-	.000	.000	-	.083	.000	-
		.005		.100				.014			.014
2012	t4	-	-	-	.211	-	-.008	-	-	-	.020
		.015	.005	.003		.011		.026	.017	.007	
2012	t5	.041	-	-	-	.009	.000	-	.026	-	-
		.005	.003	.009				.003		.028	.019
2012	t6	-	-	.007	-	.000	.000	.000	.034	.007	.005
		.005	.005	.074							

2012	t7	.010	.000	-	.000	.004	.000	-	.008	-	.000
					.010				.011		.007
2012	t8	.000	-	.007	.050	-	.092	-	.000	.029	-
			.005			.011		.004			.005
2012	t9	.000	-	-	-	-	-.084	.000	.056	.000	.025
			.005	.003	.019	.006					
2012	t10	.005	.020	-	-	.000	.000	.012	-	.007	-
				.003	.029				.015		.019
2012	t11	.000	-	-	.000	-	-.042	.007	-	-	.000
			.015	.007		.026			.008	.007	
2012	t12	-	.000	.007	.000	.000	.087	.031	.023	-	.000
		.005								.007	
2012	t13	.000	.000	-	.000	-	.000	.014	.023	.014	.000
				.010		.042					
2012	t14	.020	-	-	.060	.021	.000	.036	.037	.007	-
			.005	.028							.005
2012	t15	-	.000	.000	.000	.020	.000	-	.007	.014	-
		.019						.010			.010
2012	t16	.015	-	.004	.000	.020	.000	.007	-	.014	-
			.005						.014		.005
2012	t17	-	.000	.004	-	-	-.080	.028	-	-	.015
		.010			.047	.002			.029	.013	
2012	t18	.015	-	.000	.000	-	.000	.054	.015	.007	.005
			.045			.002					
2012	t19	.024	.000	.000	.000	-	.000	.035	.015	.000	-
						.002					.020
2012	t20	-	.026	.007	-	.000	.000	-	-	.081	-
		.019			.010			.009	.014		.005
2012	t21	.010	-	.007	.010	.004	-.017	-	-	.006	.000
			.005					.040	.015		
2012	t22	-	-	.011	-	-	.000	-	-	.043	.005
		.033	.021		.015	.002		.030	.007		
2012	t23	.034	-	.007	.005	.000	.009	-	.030	-	-

			.026					.003		.018	.005
2012	t24	.005	.000	.007	.000	.004	.000	.006	-	-	.005
									.015	.036	
2012	t25	.005	.005	.017	-	.004	.000	.010	-	.000	.000
					.010				.007		
2012	t26	.028	.000	.044	.005	.002	.000	-	.007	-	.025
								.003		.063	
2012	t27	.000	-	.013	.000	.000	.000	-	.030	.000	.019
			.005					.003			
2012	t28	.014	.000	-	.005	.000	.000	.010	.000	.067	-
				.006							.005
2012	t29	.013	-	.006	.000	-	.000	.003	-	-	-
			.022			.002			.022	.025	.010
2012	t30	-	.006	.006	.070	.011	.088	.072	.000	.006	.000
		.009									
2013	t-30	.031	.000	.003	.000	.009	.000	-	.000	.000	.014
								.009			
2013	t-29	.000	.000	.000	.010	.032	-.048	-	.000	.006	.010
								.037			
2013	t-28	-	-	.015	.059	.004	-.025	-	.000	.000	.024
		.030	.006					.009			
2013	t-27	.000	.006	.006	.000	.002	.000	.009	-	.000	-
									.029		.023
2013	t-26	.000	.000	.000	-	.000	.009	.003	-	.000	.028
					.009				.007		
2013	t-25	.000	.012	.000	.028	.000	.000	-	.015	-	.009
								.003		.019	
2013	t-24	.000	-	.059	.000	.002	.017	-	.022	-	.009
			.011					.003		.006	
2013	t-23	.121	.017	-	.000	.000	-.017	-	.000	.006	-
				.017				.003			.005
2013	t-22	.040	-	-	.000	.000	-.009	.000	-	.006	-
		.011	.037						.036		.005

2013	t-21	-	.058	.012	.000	.014	.000	.000	.000	.000	.005
		.010									
2013	t-20	.058	-	-	.000	.004	.000	-	.000	.006	.005
		.038	.009					.006			
2013	t-19	.009	.000	.000	.000	.004	.000	-	-	-	.005
								.006	.045	.006	
2013	t-18	.018	.000	.012	.000	.002	.000	-	.000	.013	.009
								.012			
2013	t-17	.054	-	.006	.000	.038	.000	-	.031	.019	.000
		.006						.009			
2013	t-16	.000	.000	.006	.000	.002	.000	.004	-	.050	-
									.030		.009
2013	t-15	.008	-	.006	.000	.010	.000	.006	.016	.000	-
		.011									.013
2013	t-14	.000	.000	-	.000	.019	.061	-	-	-	.000
				.006				.003	.015	.006	
2013	t-13	-	-	-	.000	.000	-.017	-	.000	.006	.000
		.042	.006	.003				.003			
2013	t-12	.009	.000	.003	.000	.000	.000	-	-	.000	.005
								.009	.016		
2013	t-11	-	.012	-	-	.000	-.017	.003	.032	.006	.009
		.009	.006	.009							
2013	t-10	-	-	.000	.009	.000	.000	.009	.015	-	-
		.053	.006							.006	.013
2013	t-9	-	.023	-	.000	-	.000	.003	.015	.006	.000
		.028	.003		.093						
2013	t-8	.000	.000	.000	.000	.082	.060	.000	.015	.006	.009
2013	t-7	.000	.000	.000	.000	-	.000	-	.022	-	-
						.028		.006		.006	.005
2013	t-6	-	-	.006	.000	.008	-.048	-	-	.000	-
		.010	.017					.004	.007		.005
2013	t-5	-	.000	.000	.000	-	.000	.000	.000	.000	.000
		.019				.004					

2013	t-4	.020	.000	.014	.000	.000	.000	.004	.014	.000	.009
2013	t-3	-	.034	.000	.000	.000	.000	-	-	.006	.014
		.010						.009	.014		
2013	t-2	.019	-	-	.000	.000	.008	.015	.007	.012	-
		.033	.003								.009
2013	t-1	.057	.000	.000	.000	.004	.000	.028	.000	.000	-
											.004
2013	t0	.018	.006	.000	.045	.000	.025	.000	.000	-	.005
										.023	
2013	t1	.062	.000	.000	.000	.002	.008	.003	.000	.006	.009
2013	t2	-	-	.003	-	.002	.008	-	.000	.006	.000
		.008	.006	.035				.003			
2013	t3	-	.006	.000	.000	.015	.000	.000	.000	-	-
		.017								.023	.009
2013	t4	.009	-	-	.000	.002	-.040	-	.000	.006	.004
		.006	.008					.003			
2013	t5	.017	-	.000	.000	.017	.000	.003	.007	.000	-
		.017									.013
2013	t6	-	.012	.000	.000	.000	.042	-	.029	.006	.014
		.008						.009			
2013	t7	.008	.000	.003	.000	.000	.000	-	.000	-	.000
								.009		.018	
2013	t8	-	.000	.000	.036	.002	-.032	.003	-	.006	.004
		.008							.021		
2013	t9	.008	.012	.003	.000	-	.025	.003	.021	.036	.004
						.002					
2013	t10	.017	.000	.011	.000	-	.000	-	.000	-	.004
						.004		.003		.058	
2013	t11	.016	.000	-	.000	-	.000	.000	.000	.000	.004
			.008		.006						
2013	t12	.008	.000	.000	-	.002	.000	-	-	.086	.013
					.026			.006	.007		
2013	t13	.000	-	.011	.027	-	.000	.003	.007	-	.000

			.006			.009				.045	
2013	t14	-	.000	.017	.000	-	.000	-	-	.036	.009
			.008				.002		.009	.007	
2013	t15	.000	.011	.003	.000	.002	.000	.000	.000	-	.000
										.006	
2013	t16	.000	-	.016	.000	-	-.008	-	-	-	.000
			.006				.013		.003	.007	.023
2013	t17	.008	.000	.008	.000	.013	-.008	.003	.000	.018	.000
2013	t18	.000	.023	-	.000	-	.000	-	.000	-	.004
				.008			.002		.003		.023
2013	t19	.000	-	-	.000	.019	.000	-	.000	.012	-
			.028	.032					.021		.004
2013	t20	.008	.006	-	.000	-	.000	.003	.014	.023	.034
				.006			.004				
2013	t21	.016	.000	.008	.000	.000	.000	-	-	-	.004
								.009	.035	.006	
2013	t22	.055	-	-	.000	.006	.016	-	.007	-	-
			.023	.003				.015		.023	.004
2013	t23	.059	.006	.000	.000	-	-.008	.003	.000	.000	.000
						.002					
2013	t24	-	.000	-	-	-	-.008	.004	.000	.018	.004
			.007	.006	.043	.007					
2013	t25	-	-	-	.000	.007	.000	.000	-	-	-
			.021	.012	.020				.007	.006	.008
2013	t26	-	.000	-	.000	-	-.017	-	.000	.012	.008
			.007	.020	.007		.016				
2013	t27	-	.006	-	.000	.007	.000	-	.007	.000	.004
			.029	.003				.035			
2013	t28	.000	-	-	.000	-	.000	-	-	.000	.008
			.006	.006	.017		.003	.007			
2013	t29	.015	-	.000	.045	.000	.050	.030	.094	.011	.004
			.006								
2013	t30	.000	-	-	.000	.000	.000	-	-	.023	-

				.012	.015				.006	.079		.004
2014	t-30	-	-	.000	.000	.000	.000	.004	.000	.006	-	
				.007	.005							.040
2014	t-29	.015	.000	.000	.000	.000	-.048	.013	-	.011	-	
									.079			.021
2014	t-28	.015	-	.006	.000	.017	.000	-	.000	-		.004
				.010				.010		.011		
2014	t-27	.022	.015	-	.000	.000	.008	.006	.000	-		.030
				.006						.006		
2014	t-26	-	.000	.015	-	.002	-.008	-	.000	.006	.000	
				.029		.078		.003				
2014	t-25	.007	.005	-	.094	.000	.058	.010	.000	.000	.000	.004
				.015								
2014	t-24	-	.000	.000	.000	.000	-.039	.010	.014	.011	.004	
				.007								
2014	t-23	-	.000	.003	.000	.000	.000	.003	.000	.000	.020	
				.022								
2014	t-22	.000	-	-	-	.004	.033	.003	-	-	-	
				.075	.003	.009			.007	.017	.036	
2014	t-21	.015	.065	-	.000	-	.000	.004	.043	.011	.004	
				.003		.002						
2014	t-20	.000	-	-	.000	.007	.000	-	.034	.006	.004	
				.051	.006			.004				
2014	t-19	.000	-	-	.000	-	.024	.007	-	-	.033	
				.005	.003		.006		.007	.006		
2014	t-18	-	-	.009	.000	.000	.000	.007	.007	.006	.056	
				.015	.011							
2014	t-17	.015	.000	.006	.009	.002	.039	.009	.000	.022	.011	
2014	t-16	.007	-	.000	-	.002	-.030	-	.000	-	-	
				.005		.009		.009		.011	.004	
2014	t-15	-	.060	.015	.009	-	.077	-	.026	.011	-	
				.007		.007		.006			.004	
2014	t-14	-	.026	.012	.000	.015	.000	-	-	-	.004	

			.015					.012	.026	.011	
2014	t-13	-	-	.006	.000	.011	-.029	.003	.000	-	-
			.008	.070						.017	.004
2014	t-12	-	.000	-	.000	.002	-.007	-	.007	.006	.008
			.015	.006				.015			
2014	t-11	.008	.000	-	-	.009	.000	.013	.020	.056	.011
				.036	.043						
2014	t-10	-	.000	.009	.000	.000	.007	.006	.000	.000	.004
			.008								
2014	t-9	-	.005	.012	.000	.000	.000	.013	.000	-	.000
			.038							.005	
2014	t-8	.000	-	.000	.000	.000	-.044	-	.000	.000	-
			.005					.006			.022
2014	t-7	.040	.000	.000	.000	.000	.000	.015	.000	.021	.015
2014	t-6	.000	.000	.000	.036	-	.000	-	-	-	-
						.020		.009	.026	.005	.004
2014	t-5	.015	.000	-	.000	-	.000	.006	.026	.010	.000
				.009	.007						
2014	t-4	-	.000	.000	-	.000	.039	.006	-	.005	.000
			.008		.009				.026		
2014	t-3	.038	.000	-	.000	.000	.015	.003	.000	.000	-
				.012							.004
2014	t-2	.015	.000	.006	.009	.000	.000	-	.000	.000	.007
								.003			
2014	t-1	-	.000	.000	.000	.007	.000	.003	.000	-	.015
			.014							.010	
2014	t0	-	.022	.000	-	.002	.014	.009	.026	.016	-
			.007		.009						.022
2014	t1	.030	-	.003	.000	.000	-.014	-	.013	.026	.015
			.021					.006			
2014	t2	.007	.000	.006	.000	.000	-.008	.006	.025	.090	-
											.011
2014	t3	-	.005	.000	.000	-	.000	-	.012	.018	.004

		.014				.036		.003			
2014	t4	.007	.022	.000	.053	.000	.000	.000	.000	.009	.004
2014	t5	.000	-	.000	.000	.034	.015	-	.000	-	-
			.011					.004		.018	.004
2014	t6	.007	-	.006	-	.000	.015	-	-	.000	.000
			.011		.042			.006	.006		
2014	t7	.000	.022	.012	.000	-	-.007	-	.000	.000	.000
						.033		.016			
2014	t8	-	.032	.009	.000	.038	.000	.000	.006	.018	.000
		.007									
2014	t9	.007	-	.000	.000	-	.008	-	.000	-	.000
			.026			.015		.009		.018	
2014	t10	-	.021	.012	.035	.002	.007	.009	-	.009	.000
		.029						.049			
2014	t11	.000	.026	.000	.000	.013	.014	-	.051	-	.022
								.006		.072	
2014	t12	.000	-	.000	.000	.000	.049	-	.000	.039	.087
		.015						.007			
2014	t13	.000	.005	.000	.000	.000	-.034	-	.000	.009	.000
								.012			
2014	t14	-	.005	.000	.050	.002	.000	.013	.000	.009	-
		.029									.013
2014	t15	.015	.000	.000	-	-	.000	.003	.037	.009	-
					.048	.002					.031
2014	t16	.000	.005	.003	.050	.000	.000	.004	.000	.000	.024
2014	t17	.007	-	-	.000	.000	-.013	-	.000	.009	.007
		.005	.003					.004			
2014	t18	.015	.005	.000	.000	.000	-.014	.000	.000	-	.003
										.009	
2014	t19	-	.000	.000	.000	.000	-.007	.007	.000	.000	.051
		.015									
2014	t20	.007	.000	-	.000	.000	.000	-	-	.000	.048
			.003					.007	.035		

2014	t21	.015	.000	-	.000	-	.000	.009	.000	.000	-
				.018		.007					.009
2014	t22	.007	-	-	-	-	-.007	-	.000	.000	-
			.005	.003	.040	.013		.009			.019
2014	t23	.022	.000	-	.033	-	.000	.000	.000	.000	-
				.009		.013					.063
2014	t24	.000	.005	.000	.008	.000	.000	.007	.012	.000	.054
2014	t25	-	.000	.003	.000	.013	.008	.003	.000	-	-
		.007								.018	.013
2014	t26	.000	.000	.000	.000	.071	.000	.004	.024	-	.003
										.019	
2014	t27	.000	-	.003	.000	.000	.000	.006	.000	.000	-
			.005								.003
2014	t28	-	.005	.003	.000	-	.000	-	.000	.000	.000
		.007				.062		.009			
2014	t29	.007	-	.012	.000	-	.000	-	.000	.028	-
			.005			.002		.003			.016
2014	t30	-	.005	.009	.000	.000	.007	.000	-	.009	-
		.007							.018		.003
2015	t-30	.000	-	-	.000	-	.000	-	.006	.009	.078
			.005	.038		.023		.004			
2015	t-29	-	.005	.031	.000	-	.000	.004	.012	-	-
		.007				.023				.009	.009
2015	t-28	-	.000	.015	.000	.000	.000	.003	.012	.000	-
		.007									.015
2015	t-27	.014	.000	.000	.000	.004	-.014	.012	-	.000	-
									.012		.009
2015	t-26	.007	.000	-	.000	-	.014	.009	.000	.028	.018
			.003		.004						
2015	t-25	-	-	.000	.000	.067	-.014	.024	-	.009	.000
		.021	.010						.012		
2015	t-24	.000	.000	.003	-	-	.000	.006	.012	.027	.009
				.080	.021						

2015	t-23	.000	.000	.000	-	-	.000	.000	.000	.009	-
					.009	.027					.020
2015	t-22	.000	.030	.003	-	.002	.014	.003	.000	.009	.012
					.070						
2015	t-21	.007	-	.003	.075	.000	.000	.000	.000	.008	.012
			.020								
2015	t-20	-	.000	-	.018	-	.000	.000	.000	-	-
		.007		.003		.002				.025	.006
2015	t-19	.000	.000	.000	.000	.004	.000	-	.000	.009	-
								.003			.018
2015	t-18	.000	-	.000	.000	.005	-.014	.005	.000	.026	-
			.010								.003
2015	t-17	.014	.010	.003	.000	.000	.000	.006	.000	.000	.012
2015	t-16	.000	.000	.000	.000	.000	.000	.000	.000	.017	.000
2015	t-15	-	.010	-	.000	.031	.000	.000	.000	.049	-
		.007		.015							.009
2015	t-14	.007	-	.021	.078	.000	.000	.000	.000	.023	.006
			.010								
2015	t-13	.000	.010	.014	-	.000	.000	.003	.000	.061	.003
					.040						
2015	t-12	.007	-	-	.000	.002	.000	.006	.000	.000	-
			.010	.063							.012
2015	t-11	.007	.000	.003	.042	.002	.000	.009	.000	-	-
										.050	.018
2015	t-10	.000	.000	.006	.000	.002	.000	.014	.000	-	-
										.015	.024
2015	t-9	.007	.005	.000	.000	.000	.014	.011	-	.008	.000
									.012		
2015	t-8	-	-	.000	-	.002	.000	.008	.012	.023	-
		.007	.020		.008						.053
2015	t-7	.000	.015	-	.008	-	.000	.000	.000	-	.007
				.006		.010				.007	
2015	t-6	.014	-	.000	.000	.009	.000	.008	-	.015	.000

			.010					.041			
2015	t-5	-	.000	-	.016	-	.007	.003	.043	-	-
		.007		.009		.002				.007	.003
2015	t-4	.007	.010	-	.000	.000	.000	-	.006	.000	-
				.018				.003			.013
2015	t-3	-	-	-	.000	.000	-.007	-	.000	.000	-
		.007	.010	.003				.019			.017
2015	t-2	.007	.005	.000	.000	.002	-.014	-	.000	-	.017
								.019		.030	
2015	t-1	.000	.005	-	.000	-	.000	.000	.000	-	.007
				.006		.009					.015
2015	t0	.000	.000	-	.000	.000	.000	.011	.006	-	-
				.003						.016	.020
2015	t1	.007	.000	-	.000	.002	.028	.003	.000	.008	.014
				.013							
2015	t2	.007	.000	.000	-	-	-.014	.003	-	.024	-
				.008	.002				.012		.023
2015	t3	.007	.015	-	.000	.000	.014	.000	-	.008	-
				.010					.035		.014
2015	t4	.027	.010	-	.000	.007	-.028	.003	.037	-	-
				.010						.008	.003
2015	t5	-	-	.007	.000	.005	.000	.014	.000	.008	-
		.020	.020								.003
2015	t6	.000	.000	.003	.000	-	.000	.014	.000	.031	.049
						.012					
2015	t7	.020	-	.010	.000	.005	.000	.000	.000	-	.003
				.005						.015	
2015	t8	-	.000	-	.000	.002	.000	.000	.000	.008	-
		.020		.006							.030
2015	t9	.013	.000	.013	.000	-	.000	.005	.000	-	.024
						.007				.007	
2015	t10	.000	.000	.016	.000	.004	-.072	.003	.082	.015	.007
2015	t11	.000	.010	.000	-	-	.000	-	-	-	-

					.008	.017		.014	.065	.007	.007
2015	t12	.007	-	-	-	.023	.000	-	.070	.000	.013
			.010	.009	.040				.005		
2015	t13	.000	.005	.000	.000	.000	.000	-	.000	-	-
									.017	.007	.026
2015	t14	.007	-	-	.033	.000	.000	.000	.005	-	.017
			.005	.003						.015	
2015	t15	.039	.000	.000	.000	-	.085	.005	.005	-	-
						.009				.008	.003
2015	t16	.013	.000	.013	.008	.007	-.007	.000	.000	.000	-
											.027
2015	t17	-	.000	-	-	.000	.021	.000	.022	.000	.007
		.006		.006	.024						
2015	t18	.000	.000	-	.025	-	.014	-	.000	.008	-
				.003	.007				.005		.007
2015	t19	.019	.000	-	.000	.000	.000	-	.000	.008	-
				.022					.006		.007
2015	t20	.006	.000	.000	.000	.009	.000	-	-	.000	-
									.005	.011	.003
2015	t21	.024	.005	-	-	.000	.000	-	.000	.008	-
				.003	.024				.011		.021
2015	t22	.018	-	-	.000	.000	.000	.003	.016	.000	.014
		.005	.003								
2015	t23	.000	.000	-	.033	.000	.007	.003	-	-	-
				.003					.026	.015	.003
2015	t24	-	.000	-	-	.000	.000	.003	.011	-	-
		.006		.003	.008					.008	.010
2015	t25	-	.000	-	.000	.000	.000	-	.016	.000	.011
		.012		.003					.003		
2015	t26	.006	.000	.000	.000	.000	.000	-	.005	.008	.031
								.003			
2015	t27	.006	.005	.003	.000	.000	.000	.003	.031	-	.027
										.008	

2015	t28	-	.010	.016	.000	-	.007	.003	.081	-	.007
		.012				.009				.008	
2015	t29	.006	.000	.000	.008	-	.000	-	.019	.008	.013
						.002		.003			
2015	t30	-	-	-	.000	.009	-.007	-	.000	-	-
		.006	.010	.003				.003		.008	.049