

**THE RELATIONSHIP BETWEEN PRICE EARNING RATIO AND STOCK
RETURNS OF COMPANIES LISTED AT THE NAIROBI SECURITIES
EXCHANGE**

SAMUEL NDUATI MWAI

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DECLARATION

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

Samuel Nduati Mwai

D61/80862/2012

Signed.....

Date.....

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

Signed.....

Date.....

Ms. Zipporah Onsomu

Lecturer, Department of Finance and Accounting

School of Business, University of Nairobi

Signed.....

Date.....

Chairman, Department of Finance and Accounting

School of Business, University of Nairobi

DEDICATION

To my family for the special part they occupy in my life and for the support they accorded me during the entire period of study.

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ABSTRACT

This study sought to establish the relationship between stock returns and price earnings ratio for firms listed at the Nairobi Security Exchange. While the effect of price earnings ratio has been extensively examined in developed markets, studies in developing markets are notably limited. The study used a descriptive research design. A census targeting the sixty companies listed between 2009 and 2013 was conducted. The study used secondary data obtained from the Nairobi Securities Exchange handbook. Data was collected for forty firms that were continually listed over the period cover by the study. The relationship between stock returns and price earnings ratio was evaluated by conducting regression analysis. Two regression models were constructed one in which stock returns were regressed against the price earnings ratio and the other in which returns were regressed against the price earnings ratio and book to market ratio with the latter being used as a control variable for size. In both regressions the coefficient of price earnings ratio was found to be positive. This means that there existed a positive relationship between stock returns and price earnings ratio. However the relationship was found to be not significant. The results of the study revealed that in both regressions the coefficient of determination was very low. This means that a very low percentage change in stock returns was explained by variation in price earnings ratio both individually or together with book to market ratio. The study concluded that there existed a positive relationship between stock returns and price earnings ratio at the Nairobi Securities Exchange but the relationship is not statistically significant. Investors may not find it useful in selecting investment stocks on the basis of their price earnings ratio since stock returns bears insignificant relationship with price earnings ratio at the Nairobi Securities Exchange. Further studies may explore whether portfolios formed of stocks with low price earnings ratio perform better than a portfolio formed of high price earnings ratio on a risk adjusted basis. Also further studies may seek to use earnings yield rather than price earnings ratio in order to avoid omitting stocks whose price earnings ratio is negative.

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LIST OF ABBREVIATIONS

CAPM: Capital asset pricing model

CMA: Capital market authority

EMH: Efficient market hypothesis

NSE: Nairobi securities exchange

P/E: Pricing earnings

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CHAPTER ONE: INTRODUCTION

1.1 Background of the Study

Tversky and Kahneman (1986) posit that market anomalies is a deviation from the presently accepted paradigms that is too widespread to be ignored, too systematic to be dismissed as random error, and too fundamental to be accommodated by relaxing the normative system. According to George and Elton (2001) financial market anomaly means a situation in which a performance of stock or a group of stocks deviate from the assumptions of efficient market hypotheses. Such movements or events which cannot be explained by using efficient market hypothesis are called financial market anomalies. One such anomaly observed in financial markets is the price earnings anomaly. The price earnings anomaly refer to the effect that stocks with low P/E ratio earn large risk adjusted return than high P/E ratio because the companies with low price to earnings are mostly undervalued as investors become pessimistic about their returns after a bad series of earning or bad news. A company with high price to earnings ratio tends to be overvalued (De bondt and Thaler, 1985).

Fama (1970) stated that the extent to which information is reliable depends on the efficiency of the stock market. He further added that, the Efficiency Market Hypothesis (EMH) states that at any given time, security prices reflect all the available information. However, Galai and Kedar (2005) contradict the efficient market hypothesis. They stated that the anomalies that have been cited tend to work against the efficiency of the stock market. These anomalies include price earning effect, January effect, small size firm effect, day of the week effect, Neglected stock effects, holiday and turn of the month effect and dogs of the dow effects. Nicholson (1960)

suggested that the price earnings effect anomaly occur when companies having low P/E ratios earn higher returns than companies having high P/E ratios.

There has been continued investors interest in the Kenyan capital market as an investment avenue as investors seek return on their investment. Investors select their investments on the basis of some criteria such as trend in share price and market sentiments. The price earnings ratio is a commonly used measure of market sentiment that investors use to make stock selection. Price earnings effect documented in developed equity markets posit that stocks with low P/E ratio earn significantly higher returns than high P/E ratio. Value investing strategies such as on based on P/E thus could earn investors substantial returns, if at all such an anomaly could be confirmed to exist in this market.

1.1.1 Price-Earnings Ratio

Anderson and Brooks (2005) define price earnings ratio as market price per share divided by annual earnings per share. The price earnings ratio reflects the price that the market is willing to pay for a shilling of earnings of the share. Verok (2009) indicates that the P/E ratio can be calculated on a leading or trailing basis. A trailing price to earnings ratio is a company's current market price per share divided by the past twelve months earnings per share while the leading earnings per share is the current market price per share divided by the next twelve months forecast earnings per share.

Graham and Dodd (1934) introduced price to earnings ratio and its reciprocal, earnings to price, as a benchmark for equity valuation. The application of P/E ratio is based on the idea that earnings are related to value. The fact that each share is worth a number of times its current

earnings became commonly accepted as market makers and financial investors based their buy/sell decisions on a specific P/E level (Drenman, 1977). Anderson and Brooks (2005) posit that P/E ratio reflects the price that the market is willing to pay for a shilling of earnings of the share. Investors especially those who believe in value investing use price earnings (P/E) ratio as a tool to measure how cheap or expensive a stock is.

1.1.2 Stock Returns

Stocks normally generate two types of returns for investors. They may provide periodic income through cash dividends or capital gains/ losses from the increase or decrease of the stock price. Stock returns are used to measure the performance of a company stock. The financial objective of the firm is maximizing investment returns which are reflected by the change in the company stock prices. Financial performance of a company is measured using stock returns. Pinto, Henry, Robinson and Stowe (2007) defines holding period return as the return earned from investing in an asset for a specified time period. The specified time period is the holding period under consideration whether it is one day, a year, a month or any other length of time. The stock return includes change in the value of a stock (capital gain yield) and cash dividend paid during the period.

Stock returns are modeled using return generating models to provide an estimate of a stock expected return. One such model, the capital asset pricing model of Sharpe (1964) explain stock returns as a function of stocks systematic risk using the beta coefficient. However over the year the capital asset pricing model has come under criticism for failing to explain stock returns. Arbitrage pricing theory of Ross (1976) indicates that beta is not the only factor that could explain stock returns. According to APT the relevant factors that explain returns may be

economic, financial, firm fundamentals or statistical factors. Fama and French (1992) developed a three factor return model in which returns are explained by the beta coefficient, firm size and the book to market ratio. Carhart (1997) extended Fama and French model by adding another factor: momentum, defined as relative past stock returns.

1.1.3 Price Earnings Ratio and Stock Returns

Nicholson (1960) showed that companies having low P/E ratios on average subsequently yield higher returns than companies having high P/E ratios. Peavy and Goodman (1983) found that stocks with a low P/E ratio give, on average, a higher return than those with a high P/E ratio, for stocks with the same CAPM beta models. Capaul, Rowley and Sharpe (1993) found that value strategies outperformed growth strategies in the US, Europe and Japan in the period 1981– 1992. Campbell and Shiller (1998) show only partial or non-linear relationships between the P/E ratio and growth of earnings and stock prices. Anderson and Brooks (2005) noted that many value / contrarian fund managers use a low P/E ratio as an indicator of the desirability of a particular stock for investment.

These results are inconsistent with the returns generating process of capital asset pricing model in which asst returns are explained by the stock systematic risk measured by the beta coefficient. Fama and French (1992) suggested that the return generating model for stock returns should include relative size of the company and relative book to market value of the company in addition to beta.

1.1.4 Nairobi Securities Exchange

NSE was established in July 1953 as Nairobi Stock exchange as an overseas stock exchange. However, in 1954 the Nairobi Stock Exchange was then constituted as a voluntary association of

stockbrokers registered under the Societies Act. Since Africans and Asians were not permitted to trade in securities, until after the attainment of independence in 1963, the business of dealing in shares was confined to the resident European community. In July 2011, the Nairobi Stock Exchange Limited changed its name to the Nairobi Securities Exchange Limited. The aim was to reflect the strategic plan of the Nairobi Securities Exchange to evolve into a full service securities exchange which supports trading, clearing and settlement of equities, debt, derivatives and other associated instruments.

The market capitalization of stocks listed at the Nairobi securities exchange has grown steadily over the years to stand at Kenya shilling 1691.5 billion by end 2013 relative to Kenya shilling 853.7 billion in 2008 (CMA, 2013). This represents approximately 98.14% increase in market capitalization over the period. The price earnings ratio is one of the key performance metric reported by the exchange as well as the media at the NSE. The NSE staff calculates and report the P/E ratio for each stock and the sector average. Currently there are 60 companies listed at the NSE classified in 10 sectors, see appendix 1(CMA, 2013).

1.2 Research Problem

Efficient Market Hypothesis (EMH) claims that security prices fully reflect all publicly available information in a rapid and unbiased manner. However anomalies observed in capital markets contradicts the predictions of the efficient market hypothesis. One such anomaly is Price Earning (P/E) ratio Effect, which is based on the premise that P/E ratios are indicators of the investment performance of a security and low P/E stocks have a tendency to outperform high P/E stocks even after adjusting for underlying risks. There is also a counter argument that a stock with a low

P/E ratio may not always be undervalued hence strategies that emphasize only low P/E multiple may be futile as they ignore the growth potential and risk associated with the stock. However efficient market hypothesis fails to explain observed anomalies in stock markets.

Investors and investment analyst commonly rely on the price earnings ratio in selecting investment stocks since Graham and Dodd (1934) and Nairobi securities exchange is not an exceptional. When investors at the NSE select investment stocks on the basis of price earnings ratio it is important that they understand the relationship between stock returns and the P/E ratio. Investors at the NSE can easily calculate the P/E of stocks from the published information from which they can make their buy or sell decisions. The objective of investors at the NSE like any other stock market is to identify investments that meet their investment selection criteria. By using the P/E ratio as investing criteria the investor would establish a benchmark P/E ratio which if attained would indicate whether a stock is considered overvalued or undervalued.

Fritzmeier (1936) first found that the low priced stocks provided greater returns but varied more in prices than the higher price stocks. McWilliams (1966) found that stocks with low P/E ratios experienced greater rates of return based on their cross sectional studies. However, they did not explicitly take risk into consideration. Basu (1977) found that the risk-adjusted returns were higher for lower P/E stocks. Furthermore, Peavy and Goodman (1983) showed that the low P/E stocks provided superior risk-adjusted returns after taking into account firm size, industry effects and infrequent trading. Fama and French (1992) concluded that the Earning-Price ratio is significant when the unique explaining variable for the cross sections of stock return is, but its significance disappears when book to market ratio is also taken into account for NYSE and AMEX stocks during 1963 -1990. Odiero (2008) found moderate positive relationship between

price earnings ratio and the growth of stock prices. Omete (2008) found that shareholders pay attention to earnings per share and price earnings data and that a significant relationship between earnings per share, dividend per share, P/E ratio and stock price existed. While the P/E effect has been examined rather extensively in developed markets there are notably limited in developing markets. It is this research gap that this study sought to fill by examining the P/E effect at the Nairobi Securities Exchange. The study sought to address the following question; how are stock returns related to P/E ratio at the NSE?

1.3 Research Objective

The study sought to examine the relationship between price earnings ratio and stock returns at the Nairobi Securities Exchange.

1.4 Value of the Study

This study will contribute to the existing literature on the effect of price earnings ratio effect and the efficiency of Nairobi Securities Exchange. It will enhance the understanding of the price earnings anomaly by confirming its existence or absence in this market. Academicians who want to contribute to the body of knowledge, this research will help in opening up opportunities for doing further research.

The findings of this study will also indicate to investors whether value investing strategies based on P/E ratio can potentially be used to produce market beating returns. The importance of information contained in P/E ratio and its implication for investment selection can be better understood.

The actions taken by manager responsible for managing respective companies affects the price earnings ratio through the denominator-earnings per share as well as influences on the market price of a stock. Thus understanding the effect of the P/E ratio on stock returns and investors decision will enable manager to evaluate their decisions appropriately so as to maximize return to their shareholders.

CHAPTER TWO: LITERATURE REVIEW

2.1 Introduction

This chapter reviewed the theories relevant to this study and a review of relevant studies that have been conducted. The chapter was organized in such a way that it begun with a discussion of the relevant theories followed by an empirical review, concluding by a summary of the literature.

2.2 Theoretical Review

Several theories have been advanced to explain the relationship between stock returns and stock characteristics and how information concerning the stocks relates to returns. The efficient market hypothesis explains how stock prices should behave in the market, what has been regarded as the norm but a number of other theories explains the deviations from the norm. Capital asset pricing model measure a stock returns in equilibrium.

2.2.1 Efficient Market Hypothesis

Fama (1970) defined the efficient market as a market in which prices always fully reflect available information. Information in efficient market shall be recognized as anything that may lead to changes in share prices but is unknown at the present, and thus appears randomly in the future. Consequently market is being efficient when it reacts to the introduction of new, relevant for stock shares, information by adjusting quickly and precisely. From that perspective it is impossible for an investor to outperform the market using investment strategy based on available information, except through luck.

Basu (1977) observed that the low P/E portfolios have earned higher absolute and risk-adjusted rates of return than the high P/E securities. This result is consistent with the view that P/E ratio

information was not fully assimilated in security prices in as quickly as postulated by the semi-strong form of the efficient market hypothesis. Basu (1982) confirmed that the average returns of the common stock of high earnings to price ratio firms are more than that of low E/P firms. Small cap firms on New York Stock Exchange earned substantially higher returns than the large cap firms, which is inconsistent with efficient market hypothesis.

2.2.2 Capital Asset Pricing Model

Sharpe (1964) and Lintner (1965) contributed their efforts to develop CAPM as an equilibrium asset pricing model for pricing risky assets. CAPM is a model for pricing risky security in relation with risk and expected return of the security. The model states that the expected return of an underlying security or a portfolio is equal to the rate on a risk free security plus a risk premium. CAPM provides a tool how to measure risk and the relation between expected return and risk of a particular security. The model is used to determine the required rate of return of an underlying security if the underlying asset is subject to a portfolio and the assets systematic risk is given. Systematic risk of a security is measured by the beta coefficient. Beta is a measure of the sensitivity of returns on a security to the returns on the market portfolio.

Since Sharpe (1964), Lintner (1965) formulated the Capital Asset Pricing Model (CAPM), it has become one of the most used in financial modeling either by academics and practioners. However, some anomalies in the stock market have emerged where the return characteristics of stocks seem to contradict the CAPM principle that risk beta is able solely to explain the cross-section of expected return. Fama and French (1992) showed that beta could not explain neither alone nor joined with other fundamental variables- the differences between stock returns for

NYSE and AMEX stocks during the period 1963-1990. Firm size and book to market ratio were statistically significant instead.

2.2.3 Price Earnings Hypothesis

Basu (1977) popularized the price earnings ratio hypothesis, an argument that price earnings ratio are indicators of the future investment performance of securities. The hypothesis attempted to determine the usefulness of the P/E ratio as an analytical tool for stock selection. The low P/E effect hypothesis that securities with low P/E ratios, on average, outperform their high P/E counterparts.

A related concept is that of the winner-loser anomaly hypothesis articulated by De Bondt and Thaler (1985). This hypothesis is based on the finding that the worst performing stocks in one period (low P/E stocks) outperformed the market in the subsequent periods, and the best performing stocks in one period (high P.E stocks) underperformed the market in the subsequent periods.

2.3 Determinants of Stock Returns

Pinto et al (2007) suggest that stock returns are affected by macroeconomic factors as well as fundamental factors. These factors represent priced risk for which investors require an additional return for bearing risk. The macroeconomic factors are surprises in macroeconomic variables that significantly explain equity returns. Such factors include anticipated inflation rate, interest rates, gross domestic product, market indices, yield curves, exchange rates (Pinto et al, 2007). Naik and Padhi (2012) observed that the stock returns are positively relate to the money supply and industrial production but negatively relate to inflation. The exchange rate and the short-term

interest rate are found to be insignificant in determining stock returns. They conclude that macroeconomic variables affect stock returns in the long run more than in the short run.

Fundamental factors are attributes of a company or a stock that are important in explaining stock returns. Commonly used fundamental factors include market capitalization, book to market value, financial leverage, dividends, price to earnings ratio, liquidity and firm size (Bodie, Kane and Marcus 2009). The price-earnings ratio (PER) effect states that firms with low ratios between stock price and stock earnings provide higher returns than those with high price-earnings ratios. Nicholson (1960) showed that companies having low P/E ratios on average subsequently yield higher returns than companies having high P/E ratios. Peavy and Goodman (1983) found that stocks with a low P/E ratio give, on average, a higher return than those with a high P/E ratio, for stocks with the same systematic risk models.

Baker and Wurgler (2006) suggested that investor sentiment affects the cross-section of stock returns. Investor sentiment is defined as optimism or pessimism about stocks in general. This optimism or pessimism creates investors' propensity to speculate. The sentiment drives relative demand for speculative investments, which causes cross-sectional variations in return. A wave of investor sentiment has larger effects on securities returns. When sentiment is low, subsequent returns are relatively high for small stocks, young stocks, high volatility stocks, unprofitable stocks, non-dividend-paying stocks, extreme growth stocks, and distressed stocks. When sentiment is high, on the other hand, these categories of stock earn relatively low subsequent returns.

2.4 Empirical Review

Basu (1977) examined the common stock of approximately 1400 industrial firms listed on the New York Stock Exchange (NYSE) for the period between 1957 and 1971. Stocks were ranked by E/P ratios (the reciprocal of the P/E ratio – also referred to as earnings yield) and divided into quintiles. By ranking the firms on earnings yield, this meant that firms with negative earnings formed a part of the highest P/E ratio quintile. These portfolios were rebalanced yearly. This study found that low P/E ratio portfolios have significantly higher absolute and risk-adjusted rates of return than high P/E portfolios. The average annual rate of return and beta were 9.34% and 1.11 respectively for the highest P/E ratio portfolio, and 16.3% and 0.99 respectively for the lowest P/E ratio portfolio.

Reinganum (1981) analysed a sample of 566 New York Stock Exchange and American Stock Exchange stocks and finds that portfolios formed on the size of firms or earnings-price ratios exhibit average returns systematically different from those predicted by the CAPM. However, the earnings-price effect is not evident when the size effect is controlled for, leading. The study concludes that the firm size effect for the most part subsumes the P/E effect. The study also reports that firms characterised by small market capitalisation have higher risk adjusted returns relative to those firms with larger market capitalisation.

Lakonishok, Shleifer, and Vishny (1993) investigated whether value strategies outperform the market. These value strategies call for buying stocks that have low prices relative to earnings, dividends, book assets, or other measures of fundamental value. They documented the existence of P/E effect as market inefficiency UK market. They found that high future stock returns are

generally associated with initially low P/E stocks so it is possible to accumulate excess returns by taking long positions in such stocks.

Ryan, Scapens and Theobald (2002) examined the effect of price earnings ratio and size. They argue that while it may be thought that the size effect subsumes the low P/E effect, it may be that both 'effects' are capturing the same phenomena and, as such, the size effect may simply serve as a proxy for the P/E effect. They concluded that the price earnings ratio did not have a significant effect on stock returns.

Kyriazis, Dimitris and Diacogiannis (2004) find that investment on stocks with low P/E ratio is justified in the short term (1 year holding period), as the ratio was found to be negatively related to subsequent equity performance. However they could not verify the existence of P/E effect on firms listed on Athens Stock Exchange using the extrapolation model. The study confirmed the overreaction hypothesis of De Bondt and Thaler (1985) and concluded that the relation of P/E to future stock returns can be attributed to the investor's overreaction to news announcements. In addition accounting variables such as market value and earnings growth play an important role in the explanation of the cross- sectional variation of stock returns. We also found industry to be an indicative factor of such variables, as well as, past market returns to be negatively related to subsequent stock performance.

Khan (2009) studied the effect of price earnings ratio and market to book value on stock returns at the Karachi Stock Exchange. The study analyzed firms listed in the textile sector for the period 2001-2006. It was found that price earnings ratio had a positive but insignificant effect on stock returns. The study also established that price to book ratio had a negative but insignificant relationship with returns. The coefficient of determination was found to be very low, that both

price earnings ratio and market to book ratio had very low explanatory power on stock returns. The study concluded that stock returns were independent of both the price earnings ratio and market to book ratio.

Odiro (2008) investigated the effect of growth of earnings and stock prices on the price - earnings ratio of firms listed at the NSE. The study found that there exist a moderate but positive association between the price earnings ratio and the growth of stock prices, but an insignificant relationship between the price earnings ratio and the growth of earnings. However, it found a moderate to strong positive association between the growth in the price earnings ratio and the growth in stock prices, and a moderate and negative association between the growth in price earnings ratio and the weighted average annual riskless rate.

Omete (2008) studied the effect of earnings per share, dividend per share and P/E ratio on stock prices at the NSE. The result showed that shareholders pay attention to information in earnings per share and P/E ratio. Also a significant relationship between earnings per share, dividend per share, P/E ratio and stock price was observed.

Lishenga, Magutu, Barasa and Onsongo (2011) tested the profitability of momentum strategies in at the NSE using relative strength strategies and weighted relative strength strategies. The study found that stock prices at NSE exhibit a momentum anomaly and exhibit medium term return continuation over the entire sample period. The anomaly is driven by continuation in the idiosyncratic component of individual-security, rather than by cross-sectional differences in expected return and risks.

2.4 Summary of Literature

Basu (1977) found that low P/E ratio portfolios have significantly higher absolute and risk-adjusted rates of return than high P/E portfolios. Reinganum (1981) found portfolios formed based on the size of firms or earnings-price ratios exhibit average returns systematically different from those predicted by the CAPM. However, the earnings-price effect is not evident when the size effect is controlled for. Lakonishok, Shleifer, and Vishny (1993) documented the existence of P/E effect as market inefficiency UK market. Elfakhani (1994) found no support for the low P/E effect except in quarters ending in December. Ryan, Scapen and Theobald (2002) argue that the size effect subsumes the low P/E effect. Both effects are capturing the same phenomena hence the size effect may simply serve as a proxy for the P/E effect.

Odiero (2008) found that there exist a moderate but positive association between the price earnings ratio and the growth of stock prices, but an insignificant relationship between the price earnings ratio and the growth of earnings. Kamuruci (2003) found that share prices moved in the same direction with the earnings. Omete (2008) indicate that shareholders pay attention to information in earnings per share and P/E ratio. While Kii (2006) argued that the market does not efficiently react to cash dividend announcement in price adjustment. While the low P/E effect has been examined rather extensively in developed markets there are notably limited in developing markets. It is this research gap that this study sought to fill by examining the P/E effect at the Nairobi Securities Exchange.

CHAPTER THREE: RESEARCH METHODOLOGY

3.1 Introduction

This chapter focused on the research design and methodology used in the study. It also discussed the population of the study and how the data used was collected and analyzed.

3.2 Research Design

A descriptive research design was used in this study. Kothari (2004) states that a descriptive research includes surveys and fact-finding enquiries of different kinds. The major purpose of descriptive research is description of the state of affairs as it exists at present. In descriptive studies, the researcher must be able to define clearly, what he wants to measure and must find adequate methods for measuring it along with a clear cut definition of population being studied. A descriptive study is rigid focusing on formulating the objective of the study, designing methods of data collection, selecting the sample, collecting data analyzing the data and reporting the findings. A descriptive design is justified for this study since it is based on the dimension .This study is suitably described as a descriptive study because it follows the procedures necessary for such a study.

3.3 The Population of Study

There were 60 companies listed at the NSE as of December 2013. The population of the study consisted the 44 firms listed and continuously traded on the Nairobi securities exchange between 2009 and 2013. It was expected that the five year period will be adequate data to allow reasonable inferences to be drawn. A census study was carried out. Using a census was important

so as to ensure the results are not affected by extreme value of P/E ratio that may occur with a sampled study.

3.4 Data Collection

The study made use of secondary data. Share price data was obtained from the Nairobi Securities Exchange and authorized data vendors while price earnings ratio data was obtained from the NSE handbook for the period of study.

3.5 Data Analysis

Cross-sectional regression analysis was used to determine the relationship between stock returns and price to earnings ratio. Annual stock returns were regressed against the stock P/E ratio using the following model;

$$R_{i,t} = \alpha + \beta_1 PER_{i,t} + \varepsilon_i$$

Where $R_{i,t}$ = return for stock i in period t

$PER_{i,t}$ = Price earnings ratio of stock i in period t

α, β_1 are regression coefficients

ε_i = residual term

To control for the effect of size a multiple regression analysis to include book-to market ratio was conducted. A number of studies such as Fama and French (1992) and Ryan, Scapens and Theobald (2002) indicate that the P/E effect disappear when the size effect is considered. The specific multiple regression model used was;

$$R_{i,t} = \alpha + \beta_1 \text{PER}_{i,t} + \beta_2 \text{BMR}_i + \epsilon_i$$

Where BMR_i = Book to market ratio for firm i .

3.5.1 Operationalization of the Variables

Stock returns were measured as the natural logarithm of the stock price at the end of the year divided by the stock price at the start of the year. Bodie et al (2009) suggest that logarithmic return series have the property of time consistency which is desirable for research purposes. Trailing price earnings ratio calculated as the stocks year end market price divided by the year's earnings per share was used. Book to market ratio was be calculated as the book value per share divided by the market price per share at the end of each year.

3.5.2 Test of Significance

The significance of price earnings ratio and book market ratio in explaining stock returns was tested using t test at 5% level of significance. To test overall significance of the model an F-test was conducted at 5% significance level.

CHAPTER FOUR: DATA ANALYSIS AND INTERPRETATION

4.1 Introduction

This chapter focused on the analysis of the data collected and discussions of the findings. Data was collected from secondary source, the NSE handbook. The study covered all firms listed on the NSE and that were continuously traded between the years 2009 and 2013. Forty four firms satisfied the requirement for inclusion in the analysis. In the year where a company's price earnings ratio was negative the data point was omitted. The data was analyzed using Microsoft excel. The study sought to establish the relationship between stock returns and price earnings ratio at the NSE. To do this two regression models were used; simple regression model using price earnings ratio as the independent variable and a multiple regression using price earnings ratio and the book to market ratio as the independent variables. The results of the regression are present hereunder starting with the simple regression analysis followed by multiple regression.

4.2 Regression of Stock Returns on Price Earnings Ratio

In this section the results of regressing stock returns on price earnings ratio are presented

Table 1: Regression Statistics, Simple Regression analysis

Multiple R	0.024788351
R Square	0.000614462
Adjusted R Square	-0.004458561
Standard Error	0.480967725
Observations	199

Table 1 indicates the regression statistics obtained when price earnings ratio was used as the independent variable. The table indicates that the coefficient of determination R^2 was found to be

0.000614462, indicating that variation in price earnings ratio explain just about 0.06% of the variation in stock returns. This result suggests that P/E ratio has a very low explanatory power of stock returns. The coefficient of correlation between stock returns and P/E ratio was found to be 0.024788351. This indicates a positive but very weak relationship between stock returns and P/E ratio.

Table 2: Analysis of variance, simple regression analysis

	df	SS	MS	F	Significance F
Regression	1	0.028019	0.028019	0.121124	0.728191
Residual	197	45.572	0.23133		
Total	198	45.60002			

Table 2 shows the result of analysis of variance for the single variable model. From the table it is noted that the simple regression model has an F statistic of 0.121124 with a significance level of 0.728191. The result of this regression was not significant at 5% since the F statistic has a significance level of 0.728 which is greater than 0.05.

Table 3: Regression Coefficients, simple regression analysis

	Coefficients	Standard Error	t Stat	P-value
Intercept	0.011853414	0.038224	0.310101	0.756812
P/E Ratio	0.000464735	0.001335	0.348028	0.728191

Table 3 indicates the regression coefficients, the t statistic and the p-value (the significance level) for the coefficients for the simple regression model based on stock returns and price earnings

ratio. Price earnings ratio has a coefficient of 0.000464735. The resulting regression model is $R_i = 0.011853414 + 0.000464735PER_i$. The coefficient of P/E ratio in the regression model is 0.000464735 with a significance level of 0.728191. This indicated that a price earnings ratio had a positive effect on stock returns. However the effect was not significant at a 5% level of significance p-value of 0.728191 is greater than 0.05.

4.3 Regression of Stock Returns on Price Earnings Ratio and Book to Market Ratio

This section presents the results of regressing stock returns on price to earnings ratio and book to market ratio.

Table 4: Regression Statistics, Multiple Regression analysis

Multiple R	0.106667158
R Square	0.011377883
Adjusted R Square	0.001289902
Standard Error	0.479589474
Observations	199

Table 4 reports the regression statistics obtained when both price earnings ratio and book to price ratio were regressed against stock returns. The results indicated a coefficient of determination R^2 of 0.011377883. The two variables jointly explained just about 1.14% of the variation in stock returns. This indicated a slight improvement in explanatory power although it remained at a low level.

Table 5: Analysis of variance, multiple regression analysis

	df	SS	MS	F	Significance F
Regression	2	0.518832	0.259416	1.127865	0.325815
Residual	196	45.08119	0.230006		
Total	198	45.60002			

Table 5 reports the analysis of variance for the regression analysis using price to earnings ratio and book to price ratio as the independent variables. The model has an F statistic of 1.128 with a significance level of 0.3258. Since 0.325 is greater than 0.05 the overall regression results are not significant at a 5% level.

Table 6: Regression Coefficients, multiple regression analysis

	Coefficients	Standard Error	t Stat	P-value
Intercept	0.058422685	0.049689	1.175756	0.241118
P/E Ratio	0.000365562	0.001333	0.274191	0.784227
B/P Ratio	-0.034432001	0.023571	-1.46079	0.145674

Table 6 presents the regression coefficients for price earnings ratio and book to price ratio the respective t statistics and the corresponding levels of significance, the p-value. Price earnings ratio has a coefficient of 0.000365562 while the book to market value has a coefficient of -0.03443. The resulting regression model is $R_i = 0.0584 + 0.000365562P/E_i - 0.034432B/M_i$. The coefficient of price earnings ratio P/E is positive indicating that price earnings ratio had a positive effect on stock returns. The p-value for the coefficient of price to earnings ratio is 0.784 which is greater than 0.05, thus price earnings ratio did not have a significant effect on stock

returns at 5%. The coefficient of book to market ratio was negative. Book to market ratio had a negative effect on stock returns. The p-value for the coefficient of book to market ratio was 0.1457 which being greater than 0.05 was not significant.

4.4 Discussion

The effect of price earnings ratio on stock returns was examined using two regression models. In one model price earnings ratio was used as the independent variable while in the other price earnings ratio and book to market ratio were used as the independent variables. In both regressions it was found that the coefficient of price earnings ratio was positive but not significant. The results support those of Ryan, Scapens and Theobald (2002) who found that price earnings ratio had a positive but insignificant effect on stock returns. The study also confirmed the finding of Khan (2009) that price earnings ratio had a positive but insignificant effect on stock returns while the book to market ratio had a negative and insignificant effect on stock returns.

It was also found that price earnings ratio and book to market ratio had very low explanatory power on stock returns as indicated by the low coefficient of determination. The explanatory power did not improve substantially even after book to market was included in the regression. Similar findings were documented by Khan (2009). In overall the result suggested that price earnings ratio and book to market ratio did not have effect on stock returns. The stock returns were found to be independent of both price earnings ratio and book to market ratio.

CHAPTER FIVE: SUMMARY, CONCLUSIONS AND RECOMMENDATIONS

5.1 Introduction

In this chapter a summary of the findings from the study, conclusions, limitations and recommendations are presented. Also areas for further research are suggested.

5.2 Summary of the Findings

This study sought to establish the relationship between stock returns and price earnings ratio at the Nairobi securities exchange. Simple and multiple regression analysis were conducted. When price earnings ratio was regression on stock returns the result in table 1 indicate that P/E ratio explained only 0.06% of the variation in stock returns. Stock returns and P/E ratio exhibited a positive relationship as indicated by the positive coefficient on P/E ratio of 0.000464735 reported in table 3. However the relationship is not significant at 5% level. As indicated in table 3 P/E ratio has a p-value of 0.728191 which is greater than 0.05.

When P/E ratio and B/M ratio were used as the independent variable, it was found that the variables explained 1.14% of the variations in stock returns as indicated in table 4. The coefficient of P/E ratio was found to be 0.000365562 while that of B/M ratio was found to be -0.034432001. This indicated a positive relationship between stock returns and P/E ratio while stock returns and B/M exhibited a negative relationship. The relationship between stock returns and P/E ratio had a p-value of 0.784 which is not significant at 5% level. Also the relationship between stock returns and B/M ratio was not significant at 5% level since it had a p-value of 0.1456.

5.3 Conclusions

This study sought to determine the relationship between stock returns and price earnings ratio. The results of regression analysis indicated that stock returns have a positive relationship with price earnings ratio. However the t test for the significance of the relationship showed that the relationship is not significant at the 5% level of significance. The relationship between stock returns and P/E ratio remained positive but insignificant even after controlling for size effect using the book to market ratio. This study concludes that there exist a positive but statistically insignificant relationship between stock returns and price earnings ratio for stocks listed at the Nairobi Securities Exchange.

5.4 Recommendations

This study found that price earnings ratio had positive but statistically insignificant effect on stock returns while book to market ratio had a negative effect on stock returns. It recommends that investors may not base their stock returns on the price earnings ratio or book to market ratio in pursuit of returns as it was found that returns are independent of these variables. Also the variable did not explain stock returns substantially.

5.5 Limitations of the Study

This study relied on data for five years for each company considered. Possibly relying on data for a longer time series may provide different results. Also in the study negative price earnings ratio were excluded. The effect of such exclusion may require to be evaluated.

5.6 Suggestions for Further Study

Further study may seek explore the price earnings anomaly at the Nairobi Securities Exchange. Such a study will seek to establish whether portfolios formed of low price earnings ratio stock realized superior returns to portfolio form of high price earnings stock. Also the study evaluating the relationship between stock returns and price earnings ratio may be based on the reciprocal of the price earnings ratio-the earnings yield. The used of earnings yield will help deal with the problem of negative price earnings ratio.

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APPENDICES

Appendix 1: Nairobi Securities Exchange Listed companies

<p>AGRICULTURAL SECTOR</p> <p>Eaagands</p> <p>Kakuzi</p> <p>Kapchorua tea company</p> <p>Limuru tea company ltd</p> <p>Rea vipingo plantation ltd</p> <p>Sasini ltd</p> <p>Williamson tea (K) ltd</p> <p>COMMERCIAL AND SERVICES SECTOR</p> <p>Express Ltd</p> <p>Kenya airways Ltd</p> <p>Nation Media Group ltd</p> <p>Standard Group Ltd</p> <p>TPS Eastern Africa (Serena) Ltd</p> <p>Scangroup Ltd</p> <p>Uchumi Supermarket Ltd</p> <p>Hutching Beimer Ltd</p> <p>Longhorn (K) Ltd</p> <p>CONSTRUCTION AND ALLIED</p> <p>Athi River Mining ltd</p>	<p>MANUFACTURING AND ALLIED</p> <p>BOC Kenya ltd</p> <p>British American Tobacco ltd</p> <p>Carbacid Investments ltd</p> <p>East African Breweries ltd</p> <p>Mumias Sugar co ltd</p> <p>Unga Group ltd</p> <p>Eveready E.A ltd</p> <p>Kenya Orchards ltd</p> <p>A.Bauman co ltd</p> <p>INVESTMENT</p> <p>Olympia Capital ltd</p> <p>Centum Investment ltd</p> <p>Trans-Century ltd</p> <p>AUTOMOBILES</p> <p>Car and General ltd</p> <p>CMC ltd</p> <p>Sameer Africa ltd</p> <p>Marshals ltd</p> <p>TELECOMMUNICATIONS AND TECHNOLOGY</p>
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Bamburi Cement Ltd	Safaricom Ltd
Crown Paints Ltd	INSURANCE
East African Cables Ltd	Jubilee Holding Ltd
East African Cement Ltd	Pan Africa Insurance Holding Ltd
ENERGY AND PETROLEUM	Kenya Re-Insurance Corporation Ltd
Kenolkobil Ltd	CFC Insurance holding Ltd
Total Kenya	British American Investment Co (K) Ltd
Kengen Ltd	CIC Insurance Group
Kenya power and Lighting Co. Ltd	GROWTH ENTERPRISE MARKET
Umeme Ltd	SEGEMENT
BANKING	Home Africa Ltd
Barclays Bank Ltd	
CFC Stanbic Holding Ltd	
Diamond Trust Bank Ltd	
Housing Finance	
Kenya Commercial Bank Ltd	
National Bank of Kenya	
NIC Bank Ltd	
Standard Chartered Bank Ltd	
Equity Bank Ltd	
Cooperative Bank Ltd	
I& M bank Ltd	

Source: NSE