Superior investment returns: The role of value-based investment

R.A. JANSE VAN RENSBURG

Mini-dissertation submitted in partial fulfilment of the requirements for the degree Masters in Business Administration at the North-west University, Potchefstroom campus.

Study Leader: Prof. I. Nel

November 2009

Potchefstroom

ABSTRACT

The strong form of the efficient market hypothesis (EMH) puts forward that it is impossible to achieve better than market results. Yet there are very famous investors, particularly a famous value based investor named Warren Buffett, that have achieved better than market returns.

The primary objective of this study is to investigate the role of value based investment in generating better than market or superior investment returns.

The study was conducted both as a literature study and an empirical study. The objectives of the literature study were threefold. Firstly, to discover value based investment as part of a discussion on investment strategies. Secondly, to investigate the possibility of achieving better than market returns. Lastly, to investigate the role of value based investing in achieving better than market returns. Through the literature study, value based investment parameters were also identified for empirical testing.

It was found in the literature that value based investing has a role to play in achieving superior returns.

By way of the application of correlation-based research, as well as regression analysis it was found that there is significant statistical evidence to underscore that value based investment parameters can lead to superior returns.

AKNOWLEDGEMENTS

- I would like to thank God for the ability to do this study
- I would like to thank my wife Magda for her support and understanding
- Thank you to my study leader Prof I Nel for the guidance and feedback, that enabled me to conduct this study.
- Thanks to Dr Huebsch for the professional language proofreading.

TABLE OF CONTENTS

LIST OF FIGURES

LIST OF TABLES

CHAPTER 1

NATURE AND SCOPE OF STUDY

1.1 INTRODUCTION

In this dissertation the concept of better than market results will be discussed and whether value based investment has a role in achieving better than market results.

Value based investment is a form of investment strategy where investment potential is defined as the difference of what the market will price a share at and what the fundamental value of the share is (Buffett, 1984:13-14).

The strong form of the efficient market hypothesis (EMH) states that all the relevant information pertaining to a stock's price, is already included in the stock's price. This originates out of the fact that the investors and analysts that look at stocks are intelligent and that all information is readily available to all of the analysts at the same time. It also leads out of the assumption that company insiders won't use any additional private information toward the insiders' own advantage or intentionally defraud investors as it is illegal (Brigham & Erhardt, 2005: 269-270).

The hypothesis implies in turn that all stock prices are always in equilibrium, that future movements of stock prices are completely random and unpredictable, and that it is impossible to beat the market on a consistent basis (Paulos, 2004: 59-63). This is supported by the fact that most mutual funds perform poorer than the market average over time (Paulos, 2004: 62). The EMH also implies randomness and randomness in turn implies that an investor can beat the market for years on end by pure chance (Damodaran, 2009f:8). However it can be perceived by the investor as well as the public that the outperforming of the market is based on skill.

According to Fabozzi & Peterson (2003: 45) the following forms of the efficient market hypothesis exist:

- **The weak form of the hypothesis** states that all past information is encapsulated in the share price. This means that the future movements of the price are random and, therefore, trend or technical analysis won't give worthwhile information regarding the stock's price movements.

- **The semi-strong form of the hypothesis** states that all publicly available information is reflected in the share price. It is, therefore, useless to do fundamental value analysis as the information gathered would have been reflected in the share price immediately after the information was released. Returns will match the returns predicted by the Security Market Line (SML) and only insiders might expect better returns, but acting on insider information is illegal.

- **The strong form of market efficiency** states that all relevant information is reflected in the share price and that even insiders won't perform consistently better than the market. Therefore it can be said that if the strong form of the hypothesis holds, it is more sensible to invest in broad-based indexes, than in particular stocks.

Claims of better–than-market results through different investment strategies are as old as the market itself. Obviously, any investor would be eager to partake in any method or strategy that would yield better than market results. Therefore, a lot of people are drawn into these methods.

An example would be the "Foolish Four" Strategy (Graham, 2003:44-45 and Zweig, 1995: 55-57). In this strategy the five shares listed on the Dow Jones industrial average (DJIA) with the lowest prices and highest dividend yields are chosen, discard the one with the lowest dividend yield and spread the money among the four left over. This process is repeated every year. The basic premise was a pattern that appeared out of a large amount of data.

Thousands of people were affected by losses with this strategy when it stopped working.

Some of the strategies that get touted as having better–than-market results seems to be only successful in the short-term, and some are illegal. Examples of this are pump and dump strategies, where false information about a company is provided by the owners of that company's shares to elevate the price and then sell of the shares once the price has elevated(US Securities Exchange, 2001). Some excess return strategies are just based on luck like the "Foolish Four" discussed earlier.

As far as value based investment strategies are concerned, it is put forward by Hagstrom, (2005:208) that some very famous investors have achieved better than market results over the long term, using the value based investment philosophies. These include the most famous investor Warren Buffett. In a study conducted by Tweedy Brown (2009:1-35) it was found that value based strategies also came out as winning strategies over the long term.

In conclusion the semi-strong and strong forms of the EMH imply that it is impossible for value based investing to create better-than-market returns. However, claims for excess returns are common, including for value based strategies. It would, therefore, be prudent to firstly investigate whether it is possible to generate returns in excess of the market over the long-term and then to investigate whether it is possible to obtain these returns using value based investing strategies.

1.2 PROBLEM STATEMENT

In financial literature it is argued that a buy-off exists between the amount of risk taken and the required return on an investment. In line with the wealth maximisation focus of financial management, it means that investors would want the highest possible return on an investment for a specific level of risk

taken. From a value based management investment perspective, it means that investment returns should be such that it remunerates not only the suppliers of capital according to what is generally required but that profits should be such that "excess" return over and above the generally required return is earned. From the literature many investment strategies both theoretical and practical, are proposed that will enable investors to generate rates of return better than the market in general. The question remains whether it is possible to outperform the market in the long-term. For purposes of this study the specific question is whether it is possible to earn returns higher than the market in general in the long-term if one relies on a value based approach in selecting investment opportunities.

1.3 OBJECTIVES OF THE STUDY

The goal of this study can be summarised in the primary and secondary objectives as set out below.

1.3.1 Primary objective

The primary objective is to determine whether it is possible to achieve long-term consistent, better-than-market returns on investment, when one follows value based investment strategies.

1.3.2 Secondary objectives

To achieve the primary objective, it is important to achieve the following secondary objectives.

- Conduct a literature study into different investment strategies and describe broadly the methods and claimed results.
- Conduct a literature study to determine whether it is possible to achieve better than market returns.

- Conduct a literature study whether value based investing can generate returns in excess of the market.
- Conduct a literature study into valuation methods to obtain optimal valuation and screening tools to achieve maximum returns.
- Conduct an empirical study into market data to determine if value based screens and methods can generate returns in excess of the market.

1.4 SCOPE AND LIMITATIONS OF THE STUDY

The literature pertaining to the financial concepts in this study, and the results it is based upon, will most probably not be limited to the Johannesburg Securities Exchange (JSE) as a lot of the development of these concepts and literature is of American origin. The empirical data will be limited to data from the JSE. The data analysed ranges from 1998 to 2007. From the dataset all companies that did not do business in 1998, were excluded. This left over very few Alt-X or venture capital board companies so the venture capital board companies were analysed together, with the main board companies.

1.5 RESEARCH METHODOLOGY

This study was done on market returns, market excess returns and investment strategies. It consisted of a literature survey and an empirical investigation into share data and returns.

1.5.1 Literature study

Literature regarding the EMH and market excess returns was studied. Specific topics studied are the use of value investment by investors to obtain better-than-market returns in the past. Literature was studied to find different mechanisms for relative valuation of shares and for calculating the intrinsic value of shares. Literature was also studied on the finding under valued shares. Sources used in the literature survey, include journals, financial publications and textbooks.

1.5.2 Empirical study

The different methods of intrinsic value calculation was analysed by physical application to data for securities on the JSE. Also, some general fundamental analyses were done on JSE securities to find leading indicators for share price movements. The empirical study will consist of correlation-based research and regression analysis. The tests will be for returns against value based investment parameters.

1.6 CHAPTER LAYOUT

In this section a layout for each of the chapters is provided. This is to clarify the division of the work in the chapters.

Chapter 1

In chapter 1 the research problem and the methods to be used are introduced. It includes the introduction, the problem statement and objectives, a summary of the research methodology and scope of the study.

Chapter 2

In chapter 2 the theoretical research and findings of the theoretical research are presented. The theoretical research included the following.

- A presentation of investment strategies.
- Research into the EMH and better-than-market returns.
- Value based investment and excess returns.
- Methods and formulae of valuation.

The findings of the theoretical research will include investing strategies, formulas and results, from different investors, that have used intrinsic value investment in the past.

Chapter 3

In chapter 3 the findings from the empirical study will be presented. These findings will include the results of the application of different methods of intrinsic value calculation and fundamental analysis to Johannesburg Securities Exchange (JSE) securities.

Chapter 4

The conclusions from the research, recommendations with regard to value based investing and intrinsic value calculation, and future research themes are presented to conclude the study in chapter 4.

1.7 SUMMARY

The background to the current study is described in this chapter. The background motivated and lead to the problem statement. The objectives of the study are listed and the sources of data and the research method are introduced. The chapter concludes with the division of the chapters of the study. The ensuing chapter supplies the theoretical background pertaining to the study.

CHAPTER 2

LITERATURE STUDY ON VALUE BASED INVESTMENT AND GREATER-THAN-MARKET RETURNS

2.1 INTRODUCTION

This chapter is organised as follows. In section 2.2 different share-picking strategies are surveyed. In section 2.3 the Efficient Market Hypothesis and the possibility of generating greater-than-market returns are investigated. In section 2.4 the possibility of value based investment achieving greater-than-market returns is investigated. Section 2.5 explores different methods of valuation.

2.2 SHARE-PICKING STRATEGIES

There are many examples of share-picking strategies. In this section some share-picking strategies are discussed. This is to give some background to the literature survey and to give some context to the discussion on returns for different strategies. Share-picking strategies are normally based on one of two central concepts. These concepts are namely fundamental analysis and technical analysis (Murphy, 2000:1).

2.2.1 Fundamental analysis

Fundamental analysis is concerned with the value of a company as put forward by its financials, rather than the value given to a company by the market. Fundamental analysis concerns the analysis of certain company parameters that would indicate that the company presents good investment potential. These parameters include the following.

- Earnings. Earnings are believed to be a main driver of returns or price increase over the long term (Busetti, 2009:6-7).

- Dividend payout. Dividends are cash flows paid out to investors from profits. Since it is a tangible return on an investment great value is sometimes put on it. Williams (1965:6) defined investment value as "the present worth of future dividends".
- Growth. Growth is a parameter primarily used by growth investors to determine future investment potential. The growth in question is normally related to earnings (See 2.2.1.2 on Growth investing)
- Book value. The book value or asset value of a company can relate fundamentally important share information. This is the case especially when it is related to market value (Graham & Dodd, 1934:495).
- Debt. Since an investor can lay claim only to company profits after obligations (Short-and long-term debt) are met, it is important to know if a company's financials are sound in this regard, as it is an indication of company risk. There are two popular measures that fundamentalists look at to analyse a company's performance regarding obligations. Liquidity is the first concept and a measure of meeting short-term obligations (Brigham & Ehrhardt, 2005: 444-446). Financial leverage is the second concept that paints a total obligations picture by looking at total debt (Brigham & Ehrhardt, 2005: 449-451).

The goal of analysing a company's fundamentals, is to find a share's intrinsic value (Murphy, 2000, 1). Intrinsic value is a term for what a share, as a representation of a company is really worth - as opposed to the marketplace value. Intrinsic value is calculated out of a company's fundamentals. If the intrinsic value is more than the current share price, your analysis is showing that the share is worth more than its price and that it makes it worthwhile to purchase (Buffett, 1984:14). This is based on the firm foundation theory (Oliveira, 2003:16) that implies that the share is linked to an anchor called intrinsic value which is determined out of the present financial condition and future prospects.

The intrinsic value concept of equalling future cash flows to the investor; to current value, can also be explained on how one would value a small

business and how it provides value to its owners (investopedia.com, 2009). The worth to its owners is the money taken from the company year after year. This money can be taken out of the company only if there is something left over after overheads have been covered like supplies and salaries, and reinvestment in new equipment has been done. A business is all about making money, - the basis of intrinsic value.

Fundamental analysis doesn't explain market volatility. A share represents ownership in a company and fundamentals are supposed to indicate the intrinsic value of the company. It doesn't make sense for a share's price to be so volatile when the intrinsic value isn't changing by the minute. However, looking at the history of the market, it is important to understand that volatility is a statistical manifestation of the market and does not over the long-term have any deeper meaning (Busetti, 2009:168-170).

Many people do not view the value of shares as a representation of discounted cash flows, but as trading vehicles to be speculated with (Busetti, 2009: 337). Who cares what the cash flows are if you can sell the share to somebody else for more than what you had paid for it? Critics of this speculative approach have labelled it the "greater fool theory", since the profit on a trade is not determined by a company's value, but about speculating whether you can sell profitably to some other investor – "the fool" (Santoni, 1987:21). This debate demonstrates the general difference between a technical and fundamental investor. A follower of technical analysis is guided not by value, but by the trends in the market often represented in charts.

Five investment strategies based on analysis of company fundamentals are discussed in this section. These strategies include value based investing, growth investing, growth at a reasonable price investing, income investing and "Dogs of the Dow" methods.

2.2.1.1 Value based investing

Value investing is one of the best known share-picking methods. The concept is actually very simple: find companies the shares of which are trading below inherent worth or intrinsic value. Damodaran (2003:8.1) defines a value investor as an investor that either pays a price that is less than the value of the assets in place in a firm, or an investor that buys low Price/Earnings (PE) or Price/Book value (PB) shares.

The value investor looks for shares with strong fundamentals - including earnings, dividends, book value, and cash flow - that are selling at a bargain price, given the quality of the shares as indicated by the fundamentals. The value investor seeks shares that seem to be incorrectly valued (undervalued) by the market and therefore, has the potential to increase in share price when the market corrects its error in valuation (Oliveira, 2003:17).

Value investing doesn't mean just buying any share that declines and therefore, seems "cheap" in price. Value investors have to do homework and be confident about picking shares of a company that is cheap given the high quality and intrinsic value. Therefore, "cheap" means a discount relative to intrinsic value; not just low price (Magliolo, 2008:150).

Graham (2003:297) calls the gap between price and calculated intrinsic value accounting for some error the "margin of safety". It is compared to an engineer building in a safety factor into building calculations. The safety factor is needed to compensate for extreme events or conditions like freakish winds or abnormal human behaviour. Busetti (2009:25) refers to the difference between business valuation and market valuation.

It's important to distinguish between a good value company selling at a discount and a company that simply has a declining price. For example Company A suddenly drops 60% in share price. This does not automatically mean that the shares are selling at a bargain. All that is known, is that the company is less expensive now than it was before. The drop in price could be

a result of the market responding to a fundamental problem in the company. The drop in price of Company A's shares could be linked to uncertainty in the company and must be seen as a warning signal (Magliolo, 2008:151). To be a real bargain, this company must have fundamentals healthy enough to imply that it is worth more than the lower price - value investing always compares current share price to intrinsic value, not to historic share prices (investopedia.com, 2009).

According to Graham (2003:523), "Investing is most intelligent when it is most business-like". It should be emphasised that the value investor sees a share as the vehicle by which a person becomes an owner of a company. To a value investor, profits are made by investing in quality companies, not by trading. Because the value investing method is about determining the worth of the underlying asset, value investors pay no mind to the external market factors affecting a company, such as market volatility or day-to-day price fluctuations. These factors are not inherent to the company, and therefore are not seen to have any effect on the value of the business in the long-run. A value investor, therefore, must have a long-term view and a lot of patience (Damodaran, 2009a:24).

The margin of safety principle also determines the value based investor's perception of risk (Buffet, 1984:7). In general finance theory, it is generally accepted under the capital asset pricing model (CAPM) definition that beta is a measure of risk for a share. It is also the understanding under the CAPM that a high beta relates to high risk and that implies high returns (Brigham & Ehrhardt, 2005:149-156). In a study conducted by Van Rensburg and Robertson (2003:14) it was found however, that low PE portfolios generated the largest returns, and in this study the same portfolios also had the lowest betas. The converse may also be true. If a company traded at a price below its intrinsic value it would be, an attractive investment to value investors. If the share price dropped by half, the company could possibly experience an increase in beta, because the volatility would increase which conventionally represents an increase in risk under the CAPM definition. If however, the value investor still maintained that the intrinsic value remained the same, s/he

would see this declining price as an even better bargain (Buffet, 1984:13-14). This is due to the increase in margin of safety. A high beta, therefore, does not necessarily scare off value investors. As long as there is confidence in the intrinsic value, an increase in downside volatility may be a good thing.

2.2.1.1.1 Value based investing methods

Three value based investing methodologies are discussed in this section. The first is the passive screening or ratio based relative valuation method. The second is the "Net Current Assets" method where the investor looks for a share which sells below its net operating working capital (NOWC) value. The third methodology discussed, is the intrinsic value calculation by discounting future cash flows.

Ratios used in value based investing (relative valuation methods)

Certain ratios can be used to determine if a share is undervalued. These ratios are normally related to the price of a share compared to some fundamental value parameter. These ratios provide a rating that can be used for decision making purposes. The process of using ratios for valuation is called relative valuation, as normally the ratios are used to compare companies, to find undervaluation. Keep in mind that the companies must be comparable (Damodaran, 2003:4.1). Some of the ratios than can be compared, are the following.

- **Price over Earnings ratio (P/E or PE)**

  Busetti (2009: 3) calls the PE ratio the rating that the market gives to a share. It makes the share generally comparable to other shares by being a ratio. The formula for PE is as follows (Brigham & Ehrhardt, 2005:455).

$$\frac{Price\ per\ Share}{Earnings\ per\ Share}$$

  The determination of the rating is therefore, from a market perspective (Price per Share) and from a fundamental perspective (Earnings per Share). Sometimes shares with good fundamentals (EPS) will have low

ratings relative to shares from comparable companies and will, therefore, have a relatively low PE ratio (Damodaran, 2009a:1-5). This could be seen as a miss-pricing that will generate returns in the future. It should be used in a market perspective as well as to compare companies within the same industry. For example, if the average PE of the technology consulting industry is 20, a company trading in that industry at 15 times earnings should entice value investors.

- **Price to book value (PB)**

  Price to book value is used in a similar fashion to PE ratios. The formula for PB is as follows (Brigham & Ehrhardt, 2005:456).

$$\frac{Price\ per\ Share}{Book\ value\ per\ Share}$$

  Book value per share is a proxy for the replacement value of the company assets (Damodaran, 2002:17.4). The PB ratio is, therefore, an indication of the premium paid on asset value. For comparable companies, lesser premiums could mean a discount and that could relate to additional returns in the future. It is a screening tool to indicate relative strength and is to be used in conjunction with other intrinsic value indicators (Paulos, 2004:105-106). Auret and Sinclair (2006:36) found a significant relationship between this ratio and returns. In the same study it was found that PB's explanatory power was greater than that for PE and for size.

- **PEG ratio**

  Another popular metric for valuing a company's intrinsic value, is the PEG ratio, calculated as a share's PE ratio divided by its projected year-over-year earnings growth rate. In other words, the ratio measures how cheap the share is, indicated by the PE ratio, while taking into account its earnings growth. If the company's PEG ratio is less than one, it is considered to be undervalued (Damodaran, 2002:17.13). (See section 2.2.1.3 on GARP investing).

Net current assets method of value investing

One well-known and accepted method of picking value shares is the "net current assets" or "Bargain Issues" method (Graham, 2003:381). This method particularly focusses on companies that are in some kind of trouble and are trading at less than typically two thirds the book value of their current assets or NOWC (Brigham & Ehrhardt, 2005:103). The reasoning behind this, is that if a company is trading at a share price less than NOWC per share, the buyer is essentially buying into a company at a value less than the replacement value of its net operating working capital. Unfortunately, companies trading this low are few and far between (investopedia.com, 2009).

Intrinsic value investing

Although there are many different methods of finding the intrinsic value, the premise behind all the strategies is the same: a company is worth the sum of its discounted future cash flows. Therefore it is the present value of all of its future expected cash flows to the investor (Damodaran 2006:4). This means that a company is worth all of its future cash flows to investors added together. These cash flows must be discounted to account for the time value of money. Time value of money basically means that money you receive now is worth more than money you receive in future. This is due to the following reasons given below.

Firstly monetary inflation decreases the value of money over time. As the saying goes "A bird in the hand is better than two in the bush"; this implies that consumers prefer current consumption over future consumption. If there is any risk associated with future cash flows, then the cash flows must be valued less in the present to compensate for that risk (Damodaran, 2009c:2).

- **Discounted cash flow valuation (DCF)**

  The basis for discounted cash flow valuation is to obtain a present value for future cash flows. Mathematically this is represented by the general formula for DCF valuation.

$$Value = \sum_{t=1}^{\infty} \frac{CF_t}{(1+r)^t}$$

Where:

Value = the present value of all future cash flows

r = the interest rate or discount rate

CF_t = cash flow

t = number of periods.

The limitation of DCF valuation for shares remains uncertainty. There are other claims on the cash flow of a company other than shareholders and therefore the cash flows can be lower or higher than estimated in the modelling (Damodaran, 2003: 4.9).

- **Dividend Discount Model**

When valuing equity investments in publicly traded companies, it could be assumed that the only cash flows investors in these investments get from the firm, are dividends. This would be the case if the investor planned to hold the investment forever (Brigham & Ehrhardt, 2005: 257). The dividend discount model is a discounted cash flow model where the future cash flows are assumed to be expected dividends.

$$Value = \sum_{t=1}^{\infty} \frac{D_t}{(1+r)^t}$$

Where:

Value = the present value of all future cash flows

r = the interest rate or discount rate

D_t = dividend as expected cash flow

t = number of periods.

In the general dividend discount model as discussed above the time pattern of dividends D_t can be difficult to predict. Dividends can rise over time or decline over time. The dividend discount model could also be written as follows.

$$Value = \hat{P}_0 = \frac{D_1}{(1+r_s)^1} + \frac{D_2}{(1+r_s)^2} + ... + \frac{D_\infty}{(1+r_s)^\infty}$$

D_1 could be smaller or larger than D_2. Some the values could even be zero and the model would still hold (Brigham & Ehrhardt, 2005:257-258). However if the dividends grow at a constant rate then the equation can be re-written as follows.

$$Value = \hat{P}_0 = \frac{D_0(1+g)^1}{(1+r_s)^1} + \frac{D_0(1+g)^2}{(1+r_s)^2} + ... + \frac{D_0(1+g)^\infty}{(1+r_s)^\infty}$$

$$\therefore Value = D_0 \sum_{t=1}^{\infty} \frac{(1+g)^t}{(1+r_s)^t}$$

$$\therefore Value = \frac{D_1}{(r-g)}$$

The last term is called the Gordon Constant Growth Model (Brigham & Ehrhardt, 2005: 258). The constant growth rate is represented by (g) and the discount rate (r) is (r_s) (Brigham and Ehrhardt, 2005: 566); where r_s is calculated as follows.

$$\therefore r_s = r_{RF} + r_{PM}(b)$$

Where:

r_{RF} = is the risk free rate

r_{PM} = is the market risk premium

b = is beta.

From the formula it can be seen that if g is larger than r_s then the valuation will return a negative value. This implies that the Gordon model can't be used as is for shares where g is larger than r_s(Brigham & Ehrhardt, 2005:

258). Another implication of the model, is that it works best for companies with a stable growth rate. This makes it easier to apply the model. To illustrate if dividends grow at 8% and earnings grow at 6% then dividends will outstrip earnings in future. Conversely, if earnings grow faster than dividends the dividend yield will converge to zero (Damodaran, 2002:13.2). There is also one other caveat with single stage constant growth models and this is that they are very sensitive to change in denominator values. The following example is an illustration.

$$\frac{1}{(0.1-0.06)} = 25$$

Where:

r = 10%

D_1 = 1

g = 6%

$$\frac{1}{(0.1-0.07)} = 33.33$$

Where:

r = 10%

D_1 = 1

g = 7%

The other limitation of dividend discount models in general, is that dividend policy determines the actual dividend payout every year. The management of a company must make dividend payout decisions every year. The concept of current dividends and future dividends must be taken into account very carefully (Brigham & Ehrhardt, 2005:260 & 614-615). This can lead to incorrect valuations using the standard dividend discount model. One way to circumvent this problem, is to assume that there is a full payout of all available cash as dividend or a so-called extended dividend discount model. This is the so called cash flow to equity (CFE) or free cash flow to equity (FCFE) approach (Oded & Michel, 2007:26 and Damodaran, 2002:14.1).

If dividends are represented by FCFE then the models will be stated as follows.

$$Value = \hat{P}_0 = \frac{FCFE_1}{(1+r_s)^1} + \frac{FCFE_2}{(1+r_s)^2} + ... + \frac{FCFE_\infty}{(1+r_s)^\infty}$$

or

$$Value = \sum_{t=1}^{\infty} \frac{FCFE_t}{(1+r)^t}$$

Where:

Value = the present value of all future cash flows
r = the interest rate or discount rate.
$FCFE_t$ = Dividend represented by FCFE as expected cash flow
t = number of periods

For constant growth then the model would become:

$$Value = \hat{P}_0 = \frac{FCFE_0(1+g)^1}{(1+r_s)^1} + \frac{FCFE_0(1+g)^2}{(1+r_s)^2} + ... + \frac{FCFE_0(1+g)^\infty}{(1+r_s)^\infty}$$

$$Value = \frac{FCFE_1}{(r-g)}$$

This model is also called the equity residual model (Brigham & Ehrhardt, 2005: 850). The same limitations and effects apply to this model, as for the Gordon Growth Model.

It is worthwhile to note that according to Damodaran (2006:17) results for studies with dividend discount models on shares to identify the highest return potential, tended to identify shares with high dividend yields and low

PE ratios. PE ratios and dividend yield is discussed elsewhere in this study (Section 2.2.1 and 2.2.5).

- **Corporate valuation model**

  The dividend and cash flow to equity models focus on valuating the equity of a company against the cost of that equity. Another way of valuating a company, is by cash flows from operating assets against the entire cost of capital (Damodaran, 2002: 15.1). Debt is therefore, taken into account as WACC.

  According to Brigham & Ehrhardt (2005:513), the horizon value of a company is given by the following formulae:

$$Value_{op_{(at\ time\ N)}} = \sum_{t=N+1}^{\infty} \frac{FCF_t}{(1+WACC)^{t-N}}$$

  Where:

  Value = the present value of all future cash flows

  WACC = the discount rate

  FCF_t = Free Cash Flow as expected cash flow

  t = number of periods.

  Similar to the dividend discount models, it can be a challenge to predict free cash flows for companies for an extended period of time.

$$Value = \hat{P}_N = \frac{FCF_1}{(1+WACC)^1} + \frac{FCF_2}{(1+WACC)^2} + ... + \frac{FCF_\infty}{(1+WACC)^\infty}$$

  Therefore, if some kind of stable growth could be assumed or calculated then a single stage growth model can be applied for valuation (Damodaran, 2002: 15-4). For constant growth, the model becomes:

$$Value = \hat{P}_N = \frac{FCF_0(1+g)^1}{(1+WACC)^1} + \frac{FCF_0(1+g)^2}{(1+WACC)^2} + ... + \frac{FCF_0(1+g)^\infty}{(1+WACC)^\infty}$$

$$Value_{op_{(at\ time\ N)}} = \frac{FCF_{N+1}}{(WACC - g)}$$

Damodaran (2009e:1) calls this the FCFF (Free Cash Flow to Firm) model. The discount rate is the (WACC) for the company and the growth rate for the cash flows is (g).

2.2.1.1.2 Proponents of value investing

In this section two of the main proponents of value based investing, Benjamin Graham and Warren Buffett are to be discussed. The focus is mainly on the guidelines for value investing as put forward by Graham and Buffett.

Benjamin Graham

Ben Graham is seen by many as the father of fundamental analysis and value investing. Many of the investors who are discussed later in this literature study have studied under him. These include Warren Buffett, Ed Anderson (Director at Tweedy Brown Inc), Bill Ruane (Manager of the Sequoa Fund) and Walter Schloss (Buffett, 1984:4-11).

Graham (2003:88 & 133) defined two types of investors, a defensive investor and an active or enterprising investor and prescribed investment strategies for both. Both these strategies are explored in the following paragraphs.

A defensive investor is defined as one that is interested in safety and freedom of bother (Graham, 2003: 22). This means that a defensive investor would like to have shares with good returns, but doesn't have the time to spend watching the market. The following factors were identified by Graham for share-picking for defensive investors (Graham, 2003: 348-349):

- An enterprise with adequate size. Larger than 100 million dollars in annual sales for an industrial company and larger than 50 million dollars in sales

for a public utility. This is to protect investors from companies that are more susceptible to go under due to misfortune.

- An enterprise that has a strong financial condition defined by a larger than 2 to 1 current ratio.
- Earnings stability over the last ten years.
- Uninterrupted dividend payments for the last 20 years.
- A 33% increase in EPS over ten years.
- PE ratio less than 15.
- PE x PB less than 22.5. That means that PB must be less than 1.5.

Graham has also defined criteria for enterprising investors, as mentioned earlier (Graham, 2003: 385- 386). These criteria are similar to the criteria for defensive investors, but not as severe. Graham points out that the first clue that a share is 'cheap' or of good value, is a low price in relation to recent earnings, or a low PE ratio. Graham's six criteria for picking shares for an enterprising investor include the following.

- Current assets must be greater than 1.5 times the current liabilities.
- Debt must be less than 1.1 times the NOWC (for industrial companies).
- The company must have had a stable earnings performance, preferably over at least 5 years.
- The company must at least had some current Dividend performance.
- The price must be less than 1.2 net tangible assets.

The criteria for an enterprising investor are more lax than for a defensive investor, because an enterprising investor is more involved in the dealings of the market. Both sets of criteria take into account a full picture of fundamental analysis and relative valuation screens. Asset value, dividends, debt and earnings are taken into account.

The use of Return on invested capital (ROIC)

Net income or earnings per share (EPS) has been distorted by factors like share-option grants and accounting gains and charges. To see how much a

company is truly earning on the capital, it deploys in its businesses, one needs to look beyond EPS. ROIC has the virtue of showing, after all legitimate expenses, what the company earns from its operating businesses and how efficiently it has used the shareholders' money to generate that return (Graham, 2003: 398). ROIC is given by the following formula.

$$\frac{NOPAT}{Operating\ Capital}$$

Where:

NOPAT = Net operating profit after taxes

Operating Capital = (Current assets – current liabilities) + Operating long term assets.

This measure gives focus on the operation side of the business. An ROIC of at least 10% is attractive; even 6% or 7% can be tempting if the company has good brand names, focused management, or is under a temporary cloud. In RSA with inflation around 6% ROIC must be above 11% to be adequate.

Warren Buffet

The most famous proponent of value based investing is Warren Buffett. He has consistently been one of the richest men in the world for a number of years; he is even rated as one of the ten richest men of all time, Askmen.com (2009), and he has done it through investment alone.

Warren Buffett implements value based investing by analysing a company in the following way, according to Hagstrom (2005). He follows the following investment guidelines that can be broken down into twelve tenets.

- **Business Tenets**
  - **Is the business understandable?**

    Buffett believes that success in investing is correlated to understanding of the fundamentals of a business (Hagstrom, 2005:63). These fundamentals include the costing of the business, the revenue streams, cash flows and capital allocation needs.

Without understanding the fundamentals of a business, it is difficult to gauge the performance and financial condition of a business and it would be even more difficult to predict the future prospects of the business.

Buffett has owned a wide variety of businesses over the years but in each of those businesses he has had clear understanding of the workings of the business. Buffett calls this intellectual and financial understanding of businesses, his "circle of competence".

Investing in businesses that are easy to understand, is what Charlie Munger, Buffett's partner calls "clearing one-foot hurdles" (Odelbo, 1998).

Case in point, is Coca-Cola. The business is selling beverages. The more beverages the company sells, the more revenue the company makes. The business is relatively simple to understand.

- **Does the business have a consistent operating history?**
  Buffett believes that consistent operating history or financial performance is very important in predicting future success. When a company has had steady financial performance with the same products or services over a long time, then there is no reason to believe that the company won't maintain that performance (Hagstrom, 2005:67-68).

- **Does the business have good long-term future prospects?**
  Buffett wants a long-term, enduring competitive advantage (Hagstrom, 2005:70-71). Buffet calls this a "franchise". A franchise has the following characteristics: its service or product must be needed or desired, have no close substitute and is not regulated.

Buffett tends to shy away (but not always) from companies whose products are indistinguishable from those of competitors. If the company does not offer anything different than another firm within the same industry, Buffett sees little that sets the company apart (investopedia.com, 2009).

- **Management Tenets**
  - **Rationality of management**

    Management rationality refers specifically to allocation of capital. This relates to dividends and reinvestment. This is important because it determines over time the shareholder value (Hagstrom, 2005:81-89). This issue comes more to the front in mature companies with slowing growth rates that generate more cash out of revenues than is needed for continuous operation and development needs. The excess cash needs to be allocated to shareholders if it can't be reinvested to produce above average return on equity. If it can be invested in above average returns then the logical summation is to keep the cash and reinvest it. If a company has a lot of cash, and it is currently providing low investment returns it can do the following three things.

    - It can continue to reinvest the cash in below-average endeavours in the belief that the low investment returns are temporary.
    - It can buy growth through acquisitions.
    - It can return the money to shareholders in two ways.
      - Buying back shares; or
      - Paying out dividends

    In Buffett's view, buying growth is often a poor decision as in the long term this entails the additional burden of a new business on an already underperforming management and it often comes at an overvalued price. It is therefore, concluded that the only logical

options in Buffett's mind is reinvestment at above average returns or distribution of money to shareholders.

Case in point is Berkshire Hathaway itself, that has never paid out a dividend, but has had above average returns on average in its entire operating history (Berkshire Hathaway, 2008:1-2).

- **Candid communication with shareholders**

  Buffet requires financial reporting to be honest and genuine (Hagstrom, 2005:94-96). Mistakes, as well as successes, need to be reported. Financial compliance or accepted accounting practices (previously generally accepted accounting practices (GAAP) now the international financial reporting standards (IFRS)), does not impress Buffett, as he believes, that for reporting to be truly of worth to investors the following questions need to be answered.

  - How much is the company approximately worth?
  - What is the likelihood of meeting future obligations?
  - How good is management actually performing given the circumstances the management are operating under?

  Buffet also believes that some managers use the minimum accounting requirements to clump all the separate business interests together into one financial statement, and that can make it difficult for owners to understand the dynamics of the underlying separate businesses. Berkshire's own financial statements are good examples of how Buffet feels about this fact and how he addresses this problem. Here is an excerpt of the 2008 Berkshire statement:

  "Now, let's take a look at the four major operating sectors of Berkshire. Each of these has vastly different balance sheet and income account characteristics. Therefore, lumping them together, as is done in standard financial statements, impedes analysis. So

we'll present them as four separate businesses, which is how Charlie and I view them." (Berkshire Hathaway, 2008: 5).

Buffett also admires chief executive officers (CEOs) who can discuss failure openly and honestly. This he believes serves everybody in the long term as everybody can make mistakes.

- **Resistance to the institutional imperative**

  Buffet calls the lemming-like tendency to emulate and imitate the irrational behaviour or actions of other managers the "institutional imperative" (Hagstrom, 2005:97-98). This can manifest itself in some ways which include the following.

  - Resistance to change of corporate direction.
  - The nature of subordinates to support any craving of the leader no matter how foolish.
  - Mindless imitation of peer companies, just not to look foolish in the short term, but collectively to go into the ocean in the long-term.

  Buffett says that it is human nature to follow the crowd as going against it can lead to poor short-term returns and this can lead to being fired. Buffett himself cannot be fired and that might make him freer to make emotionless decisions.

  Furthermore Buffett believes that senior management of companies might not have the necessary skills or experience in financing decisions. In a lot of instances these managers rose to their positions by excelling in fields like marketing or engineering.

- **Financial Tenets**
  - **Focus on Return on Equity (ROE), not Earnings per Share (EPS)**

    Buffet is not a great believer in Earnings per Share (EPS), he believes rather that true economical performance is reflected by

Return on Equity (ROE) for investors (Hagstrom, 2005:109-110). According to Brigham & Ehrhardt (2005:454) ROE is given by the following formula:

$$\frac{\textit{Net Income available to Common Shareholders}}{\textit{Common equity}}$$

Retained earnings can be used to increase the equity base of a company and the earnings per share will increase in the same amount. Buffett equates this to investing money in the bank and having the interest accumulate and compound.

Buffett recommends some amendments to the ROE calculation. The equity must be valued at cost, that is at the initial price paid for the equity and not at market value to prevent market factors influencing decision making, fairly or unfairly. If the market value of equity drops suddenly because of market influence and the net income available to share holders stays the same, then the ROE value will be large and falsely encourage investment. Conversely if the market value of equity rises and net income available to share holders stays the same then the ROE value will be low and falsely discourage investment.

Also Buffett believes that good ROEs (31.8% for Coca-Cola) should be achieved without employing a lot of debt or leverage. It is possible to increase ROE by increasing a company's debt to equity ratio, but this increases risk, and should not fool the shrewd investor.

- **Calculation of Owner Earnings to get a reflection of true value**
  Buffet believes that investors should look at "real owner earnings" for Earnings per Share calculations (Hagstrom, 2005:113-114). Often investors look at accounting earnings as an indicator of returns. However accounting earnings are only worthwhile if it can be related to the approximated expected cash flow of the company. However

the expected cash flow of the company in accounting terms doesn't take into account the depreciation of assets. Buffett believes that this is not adequate and therefore, necessitates the use of "real owner earnings".

The "real owner earnings" as defined by Buffett, is net income plus depreciation, depletion and amortisation, less capital expenditures and other requirements for working capital. This is in line with the definition of Free Cash Flow (FCF) used in other calculations (Brigham & Ehrhardt, 2005: 107).

- **Companies with high profit margins**

  Buffett believes that management in high cost operations will always find ways to add to cost while management in low cost operations will always find ways to cut cost (Hagstrom, 2005:114- 115). Companies that have cost cutting strategies and restructuring exercises are examples of companies that worry Buffett. Buffett believes that low cost drive is ingrained in good managers and therefore cost cutting and overhead management is not isolated to drives and programs, but is practised all the time.

- **Every dollar retained by the company must create at least a dollar of market value (the one dollar premise)**

  One of the fundamentals of value based investing is that over the long term the market will adequately reflect business value. Buffett naturally also holds this belief (Hagstrom, 2005:117). This is therefore the baseline of the investment requirement that retained earnings should in any one year time frame return an increase in value at least to the same value of the earnings retained. Therefore, earnings retained should be invested at market returns or greater than market returns.

- **Value Tenets**

  - **Determine the value of a business**

    As mentioned earlier Buffett is not one to necessarily use earnings per share as an indication of financial performance. The same goes for P/E and other popular value indicators (Hagstrom, 2005:122). Buffett believes that investment decisions should be based on intrinsic value and that this is calculated by discounting future cash flows (Berkshire Hathaway, 1989). He therefore, subscribes to a dividend discount model approach to calculate the intrinsic value of a business (Hagstrom, 2005:20-22).

  - **Buy when the business is selling at a discount to the intrinsic value**

    If Buffett wants to buy a share, then he looks to buy at 25% discounted value (Hagstrom 2005, 130-131 & investopedia.com Warren Buffett How he does it). This way he protects himself from some drops in value. If the price drops further the discount or margin of safety increases, and if the price increases, then there will still be some discount margin left.

2.2.1.2 Growth investing

In the late 1990s, when technology companies were flourishing, growth investing techniques yielded unprecedented returns for investors. Before any investor employs growth investing methods, s/he should realize that this strategy comes with substantial risks (investopedia.com, 2009). Damodaran (2003:9.1) presents two definitions for a growth investor. The conventional definition is an investor who buys high PE and PB stocks. The generic definition of a growth investor is an investor who buys into growth companies where the belief exists with the investor that the value of the growth potential of the company is underestimated.

As the name suggests, growth stocks represent companies that grow substantially faster than others (Magliolo, 2008:152). Activist growth investors are therefore, primarily concerned with young companies (Damodaran, 2009g:34-36).

The theory is, that growth in earnings and/or revenues will directly translate into an increase in the stock price. Typically a growth investor may look for investments in rapidly expanding industries especially those related to new technology. If the growth investor has found the investments s/he was looking for profits are mostly realized through capital gains and not dividends as nearly all growth companies reinvest earnings and do not pay dividends.

Every method of picking growth stocks (or any other type of stock) requires some individual interpretation and judgment. Growth investors use certain methods - or sets of guidelines or criteria - as a framework for analysis, but these methods must be applied with a company's particular situation in mind. Apart from the activist growth investors that focus on young companies, there are also small cap investors also called Venture capital investors, who focus on low market cap companies, believed to have underestimated growth potential, and initial public offering (IPO) investors who believe that start-up companies have large growth potential (Damodaran, 2009g:3).

2.2.1.3 Growth at a reasonable price (GARP) investing

The GARP strategy is a combination of both value and growth investing: it looks for companies that are somewhat undervalued and have solid sustainable growth potential. The criteria which GARP investors look for in a company, fall right in between those sought by the value and growth investors (Magliolo, 2008:156).

2.2.1.3.1 What GARP is not

As GARP borrows principles from both value and growth investing, some misconceptions about the style persist. Critics of GARP claim it is a fence-sitting method that fails to establish meaningful standards for distinguishing

good stock picks. However, GARP doesn't deem just any stock a worthy investment. Like most respectable methodologies, it aims to identify companies that display very specific characteristics.

Another misconception is, that GARP investors simply hold a portfolio with equal amounts of both value and growth stocks. Again, this is not the case: because each of the stock picks must meet a set of strict criteria, GARP investors identify stocks on an individual basis, selecting stocks that have neither purely value nor purely growth characteristics, but a combination of the two (Magliolo, 2008:156).

2.2.1.3.2 Screening for GARP shares

The PEG ratio may very well be the most important metric to any GARP investor, as it basically gauges the balance between a stock's growth potential and its value. The PEG ratio is defined as the PE ratio divided by the expected earnings growth (Damodaran, 2009f:6). GARP investors require a PEG no higher than 1 and, in most cases, closer to 0.5. A PEG of less than 1 implies that, at present, the stock's price is lower than it should be given its earnings growth. To the GARP investor, a PEG below 1 indicates that a stock is undervalued and warrants further analysis (Schatzberg and Vora, 2009:10).

Therefore, the GARP strategy not only fuses growth and value stock- picking criteria, but also experiences a combination of both types of returns: a value investor will do better in bearish conditions; a growth investor will do exceptionally well in a bull market; and a GARP investor will be rewarded with more consistent and predictable returns. GARP investing can be very risky because the PEG ratio can screen out stocks with high PE values (Damodaran, 2009f:16 and Magliolo, 2008:157). Also it can screen out stocks that are drastically undervalued, and will depend heavily on the forecasted growth, that if the growth doesn't materialise, then the perceived bargain will disappear.

2.2.1.4 Income investing

Income investors usually focus on companies that tend to pay out profits as dividends as a way to provide a return to shareholders. The goal for the investor is to establish a steady stream of income (Magliolo, 2008:155). Consequently, this means that shares of older established companies with known dividend policies are chosen.

Income investing is not simply about investing in companies with the highest dividends (Magliolo, 2008:155). The more important gauge is the dividend yield, calculated by dividing the annual dividend per share by share price. This measures the rate of actual return that a dividend gives the owner of the stock.

The driving principle behind this strategy is clear: find good companies with sustainable high dividend yields to receive a steady and predictable stream of money over the long-term (investopedia, 2009).

2.2.1.5 CANSLIM

CANSLIM is a philosophy of screening, purchasing and selling common stock. Developed by William O'Neil, the co-founder of Investor's Business Daily, it is described in his highly recommended book "How to Make Money in Stocks". Magliolo (2008:157-159) refers to it as the basic investment filter. What makes CANSLIM different is its attention to tangibles such as earnings, as well as intangibles like a company's overall strength and ideas. The best thing about this strategy is that there's evidence that it works: there are countless examples of companies that, over the last half of the 20th century, met CANSLIM criteria before increasing enormously in price. CANSLIM is an acronym for the components that will be discussed in detail (Canslim.net, 2009; Magliolo 2008:157-159).

The CANSLIM method can be summarised as follows.

C = Current interim earnings per share (O'Neil, 2002: 7-15)

Choose stocks whose earnings per share (EPS) in the most recent quarter have grown on a yearly basis. For example, a company's EPS figures reported in this year's April-June quarter should have grown relative to the EPS figures for that same three-month period one year ago.

The percentage of growth a company's EPS should show, is somewhat debatable, but the CANSLIM system suggests at least 25%-50% (Canslim.net, 2009). O'Neil found that in the period from 1953 to 1993, three-quarters of the 500 top-performing equity securities in the U.S. showed quarterly earnings gains of at least 70% prior to a major price increase. The other one quarter of the five hundred top performing equities showed price increases in the following two quarters after the earnings increases. This suggests that basically all of the high performance stocks showed outstanding quarter-on-quarter growth. Although 18-20% growth is a rule of thumb, the truly spectacular earners usually demonstrate growth of 50% or more.

The system strongly asserts that investors should know how to recognise low-quality earnings figures - that is, figures that are not accurate representations of company performance. Because companies may attempt to manipulate earnings, the CANSLIM system maintains that investors must dig deep and look past the superficial numbers companies often put forth as earnings figures.

If a company's earnings are of fairly good quality, it's a good idea to check others in the same industry. Solid earnings growth in the industry confirms the industry is thriving and the company is ready to break out.

A = Annual earnings per share assessed (O'Neil, 2002: 16-23)

CANSLIM also acknowledges the importance of annual earnings growth. The system indicates that a company should have shown good annual growth (annual EPS) in each of the last five years. It's important that the CANSLIM investor, like the value investor, adopt the mindset that investing is the act of buying a piece of a business, becoming an owner of it. This mindset is the

logic behind choosing companies with annual earnings growth within the 25-50% range.

N = New things or business (O'Neil, 2002: 24-31)

The third criterion for a good company, is that it has recently undergone a change, which is often necessary for a company to become successful. Whether it is a new management team, a new product, a new market, or a new high in stock price, O'Neil found that 95% of the companies studied had experienced something new.

S = Supply and demand or shares outstanding (O'Neil, 2002: 32-36)

The S in CANSLIM stands for supply and demand, which refers to the laws that govern all market activities.

The analysis of supply and demand in the CANSLIM method maintains that, all other things being equal, it is easier for a smaller firm, with a smaller number of shares outstanding, to show outstanding gains. The reasoning behind this is that a large cap company requires much more demand than a smaller cap company to demonstrate the same gains.

This is explored further and explained how the lack of liquidity of large institutional investors restricts the large institutional investors to buying only large-cap, blue chip companies, leaving these large investors at a serious disadvantage that small individual investors can capitalise on. Due to the laws of supply and demand, the large transactions that institutional investors make, may inadvertently affect share price, especially if the stock's market capitalisation is smaller. Individual investors invest mostly a relatively small amount, therefore they can get in or out of a smaller company without pushing the share price in an unfavourable direction.

It was also found that 95% of the companies displaying the largest gains in share price had fewer than 25 million shares outstanding when the gains were realised.

L = Leader or laggard (O'Neil, 2002: 37-41)

In this part of CANSLIM analysis, distinguishing between market leaders and market laggards, is of key importance. In each industry, there are always those that lead, providing great gains to shareholders, and those that lag behind, providing returns that are mediocre at best. The idea is to separate the contenders from the pretenders.

I = Institutional sponsorship or safety net (O'Neil, 2002: 42-47)

CANSLIM recognises the importance of companies having some institutional investors. Basically, this criterion is based on the idea that if a company has no institutional sponsorship, all of the thousands of institutional money managers have not considered investing in the company. CANSLIM methodology suggests that a stock worth investing in has at least three to ten institutional investors.

However, be wary if a very large portion of the company's stock is owned by institutions. CANSLIM acknowledges that a company can be institutionally over-owned and, when this happens, it is too late to buy into the company. If a stock has too much institutional ownership, any kind of bad news could spark a spiralling sell-off.

M = Market direction (O'Neil, 2002: 48-56)

The final CANSLIM criterion is market direction. When picking stocks, it is important to recognise what kind of a market you are in, whether it is a bear or a bull. Although CANSLIM is not a market timing methodology, it is argued that if investors don't understand market direction, the investors may end up investing against the trend and thus compromise gains or even lose significantly.

CANSLIM maintains, that the best way to keep track of market conditions, is to watch the daily volumes and movements of the markets. This component of CANSLIM may require the use of some technical analysis tools, which are designed to help investors/traders discern trends.

2.2.1.6 Dogs of the DOW

The investing strategy which focuses on Dogs of the Dow was popularised by Michael Higgins in his book, "Beating the Dow". The strategy's simplicity is one of its most attractive attributes. The Dogs of the Dow are the 10 companies in the Dow Jones Industrial Average (DJIA) with the highest dividend yield. In the Dogs of the Dow strategy, the investor shuffles around his or her portfolio, adjusting it so that it is always equally allocated in each of these 10 stocks. This strategy is also called the High Yield 10 strategy (Wolmarans, 2001:43).

Typically, a portfolio of consisting of these stocks will have to be purged of about three to four stocks every year to be replaced with different ones. The stocks are usually replaced because the dividend yields have fallen out of the top 10, or occasionally, because the shares have been removed from the DJIA altogether.

This is a very simple strategy. At the end of every year, the 30 components of the DJIA is re-assessed, to determine which ones have the highest dividend yield, and make your portfolio as equally weighted in each of these 10 stocks as possible. Hold onto these 10 stocks for one calendar year, until the following Jan 1st, and repeat the process. This is a long term strategy, requiring a long period to see results. There have been a few years in which the Dow has outperformed the Dogs, so it is the long term averages that proponents of the strategy rely on.

As is the case with the other strategies discussed, the Dogs of the Dow strategy is not fool-proof. The theory puts a lot of faith in the assumption that the time period from the mid-20th century to the turn of the 21st century will repeat itself over the long-run. If this assumption is accurate, the Dogs will provide about a 3% greater return than will the DJIA, but this is by no means guaranteed.

2.2.2 Technical analysis

Technical analysts, or technicians, select stocks by analyzing statistics generated by past market activity, prices and volumes. Normally the statistics are presented in charts of prices and other different indicators to make inferences about the future movement of a stock's price (Murphy, 2000,1).

Pure technical analysts do not focus on the elusive intrinsic value of a company or any other factors that pre-occupy fundamental analysts, such as management, business models or competition. Technicians are concerned with the trends implied by past data, charts and indicators, and often make a lot of money trading companies that is almost unknown (Busetti, 2009: 337).

2.2.2.1 Charting or statistical analysis also referred to as technical analysis

"Chart analysis (also called technical analysis) is the study of market action, using price charts, to forecast future price direction. The cornerstone of the technical philosophy is the belief that all factors that influence market price - fundamental information, political events, natural disasters, and psychological factors - are quickly discounted in market activity. In other words, the impact of these external factors will quickly show up in some form of price movement, either up or down" (Murphy, 2000:3).

The most important assumptions that all technical analysis techniques are based upon, can be summarised as follows.

- Prices already reflect, or discount, relevant information. In other words, markets are efficient.
- Prices move in trends.
- History repeats itself.

2.2.2.1.1 Charting and long term investment

Technicians are usually very active in their trades, holding positions for short periods in order to capitalise on fluctuations in price, whether up or down. A technical analyst may go short or long on a stock, depending on what direction the data is saying the price will move (investopedia.com, 2009).

2.2.2.1.2 Concepts in charting and statistical analysis

Technicians have a very full toolbox. There are hundreds of indicators and chart patterns to use for picking stocks. However, it is important to note that no one indicator or chart pattern is infallible or absolute; the technician must interpret indicators and patterns, and this process is more subjective than formulaic. A couple of the most popular chart patterns (of price) that technicians analyse, will be discussed.

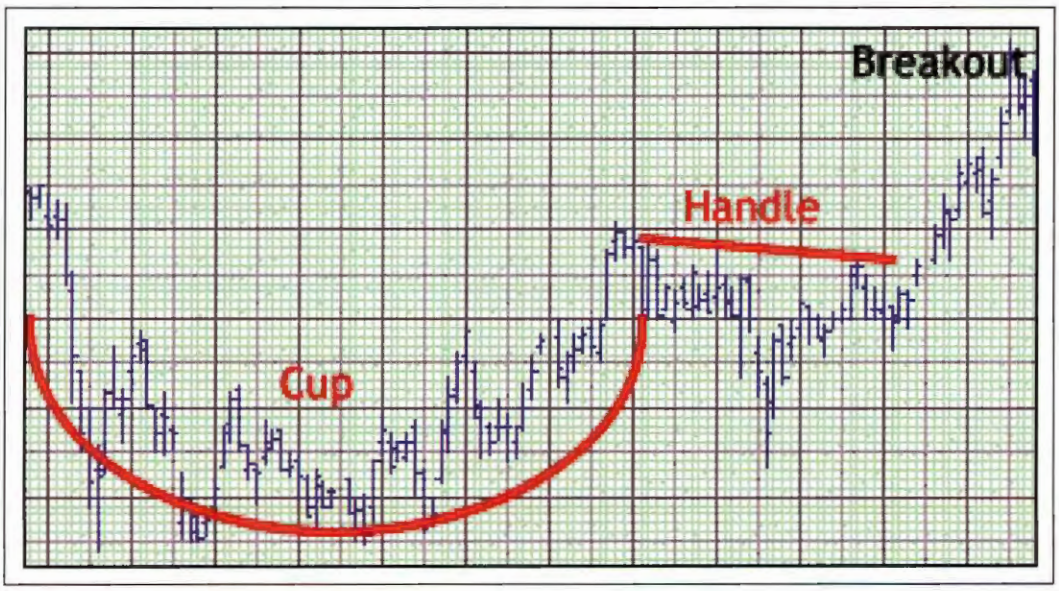
Among the most important concepts in technical analysis are support and resistance. These are the levels below the market where buying pressure exceeds selling pressures (support) and above the market where selling pressures exceed buying pressures (resistance). When either is decisively broken role reversal occurs. For example a share price can start increasing after a decline (support), or begin decreasing after an increase (resistance). Trades are generally entered around these important levels because the levels indicate the way in which a stock may bounce (Murphy, 2000: 9). Technicians will enter into a long position if a support level has been hit, or enter into a short position if resistance level has been struck. A long position is where the share will be bought and held for maximum gains, and a short position is where a share will be sold as soon as possible so as to minimise losses. Figure 2.1 illustrates where technicians might set support and resistance levels. The chart specifically illustrates role reversal. The old support level becomes the new resistance level.

Figure 2.1: Support and resistance levels: a practical example

Source: investopedia.com 2009

The Cup and Handle is a bullish pattern that looks like a pot with a handle. The stock price is expected to break out at the end of the handle, so by buying here, investors are able to make a lot of money. Another reason for this pattern's popularity is how easy it is to spot. Figure 2.2 illustrates a cup and handle pattern.

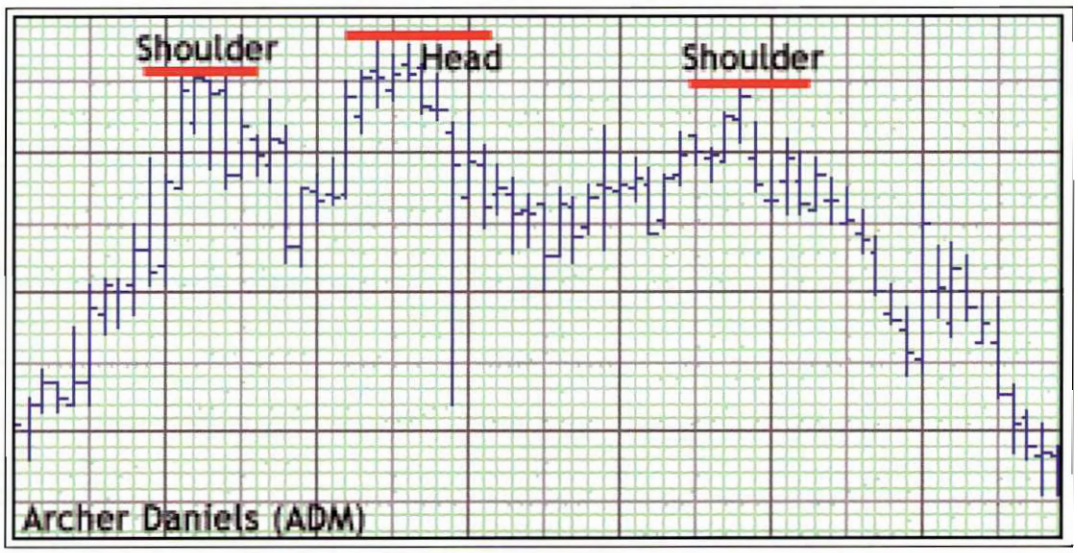
Figure 2.2: Cup and Handle phenomenon: a practical example



Source: investopedia.com 2009

The Head and Shoulders pattern resembles a head with two shoulders. Technicians usually consider this a bearish pattern. Figure 2.3 presents a great example of this particular chart pattern. It can however, also be upside down and then it will be a bullish pattern. The head and shoulders pattern is the best known and probably the most reliable of the reversal patterns. Before the phenomenon is observed, trends would have been bullish or bearish. After the phenomenon, it will be the reverse (Murphy, 2000:13-14).

Figure 2.3: Head and shoulders phenomenon: a practical example



Source: investopedia.com 2009

2.2.2.2 Momentum investing

Momentum is a trend following or technical system used by speculators (Busetti, 2009:245). Momentum investors buy shares with accelerating or increasing numbers. These numbers include share price, earnings or turnover. At the first sign of a dip they will usually sell. The buy or sell decision has very little to do with the fundamentals of the share or the industry in which it operates (Magliolo, 2008:153-154).

Momentum investing is based on what is called the "cockroach theory": Good news and bad news, like cockroaches, is believed to come in bunches or

groups. This means that a signal for a buy or a sell will be the first bit of news. That news will, under the cockroach theory, be followed by more of the same news (Magliolo, 2008:153). This will, therefore, drive the price of the particular share into a direction or give it momentum. If the momentum investor got into the action soon enough, returns should be more than adequate. The converse is unfortunately true as well. The longer the momentum investor takes to act, the more of the return opportunity will be lost.

2.3 INVESTIGATION INTO THE POSSIBILITY OF GENERATING HIGHER THAN MARKET RETURNS

In this section the possibility of generating excess to market returns is investigated. This is done by exploring the different forms of the EMH and the implication that the different forms have on the possibility of excess returns. As mentioned earlier, there are three forms of market efficiency put forward (Brigham & Ehrhardt, 2005: 269-271).

- The **weak form** of market efficiency that states that market prices reflect all past information with regard to prices and price movements. Therefore, future prices cannot be determined by current or past prices and or price movements.
- The **semi-strong form** of market efficiency that states that market prices reflect all publicly available information. Therefore, no advantage can be gained from company analysis in published data. Only inside information or pure chance can generate excess returns.
- The **strong form** of market efficiency states that current prices reflect all pertinent information and that consistent excess returns is impossible.

Market efficiency, therefore, implies that the odds for finding under-valued shares must be random (Damodaran, 2009d:7). The market, therefore, goes on a so-called "random walk". This implies that being able to perform better than the market in the long-term must be "lucky" or improbable. If there is

evidence that the market is efficient in the weaker form or not efficient at all, then there are definite possibilities for excessive returns for the investor beyond insider trading practices.

Mangani (2007:62-68) conducted a study into the distribution of JSE prices and returns. This study concluded that returns on the JSE are not random and could be profitably predictable over time. Mhlambo & Biekpe (2007:15) conducted studies on ten African markets, excluding the JSE with regard to market efficiency, and found that the weak form of the hypothesis is supported or at least that the random walk hypothesis is rejected.

Cubin et al; (2006:45-46) presents a study of the JSE that looks at one key challenge to the efficient market hypothesis, namely the mean reversion of returns of shares. It is postulated that mean reversion of returns is a challenge to market efficiency as it implies that future prices can be predicted to some extent by past prices or price movements. In this particular study mean reversion implies that poor performers will be good performers and good performers will be poor performers on a relative basis. This is then a challenge even to the weak form of the efficient market hypothesis. The basis for mean reversion is because of investor behaviours and decision making bias. In this study specifically, the bias toward recent information is pointed out as the main bias in generating excess return trading opportunities.

Bailey and Gilbert (2007:26-27) expands on this idea and found that one of the reasons for the investor bias to exist on the JSE, is the fact that large institutional investors might not be able to capatalise on mean reversion opportunities due to the risk associated with some of the shares. This originates out of the liquidity for different shares, especially smaller low PE shares. Nevertheless the existence of excess return opportunities for smaller investors is confirmed. Bajaj et al; (2004:4-5) also wrote on mean reversion of earnings and the influence or bias it can lend to accurate corporate valuation. This study relates to US shares.

Du Plessis and Ward (2009:42-45) conducted a study to test whether a trading rule based on Markowitz's (1952) mean-variance optimal portfolio construction can outperform an appropriate index on the JSE. The study was conducted with the following four portfolios:

- Portfolio 1: Short-selling allowed, and no other restrictions.
- Portfolio 2: Short-selling allowed with a minimum of -10% and a maximum of +10% invested in any one share.
- Portfolio 3: No short-selling and no other restrictions.
- Portfolio 4: No short-selling allowed with a maximum of 10% invested in any one share.

All four the portfolios generated better returns than the Top 40 index.

The literature presented in this section support the weak form of the EMH at best and supports market inefficiency at worst. Therefore, the concept of achieving better than market returns is supported.

2.4 INVESTIGATION INTO WHETHER VALUE BASED INVESTMENT GENERATES BETTER THAN MARKET RESULTS

While the strong form efficient market hypothesis (EMH) claims that prices are always reflecting all relevant information, and therefore are already showing the intrinsic worth of companies, value investing relies on a premise that opposes that theory. There is much research and evidence to indicate that value investing strategies perform better than the market and other popular strategies. Busetti, (2009) presents some compelling figures for the South African Market (Table 2.1 and Figure 2.4). Damodaran (2009) presents results for PE and PB values for the US Market (Figure 2.5 and Figure 2.6). Buffett, (1984) presents better than market results for investors of the Graham and Dodd Investment Philosophy (Table 2.2). Buffett and Munger's own

results at Berkshire Hathaway have been nothing less than staggering (Figure 2.7)

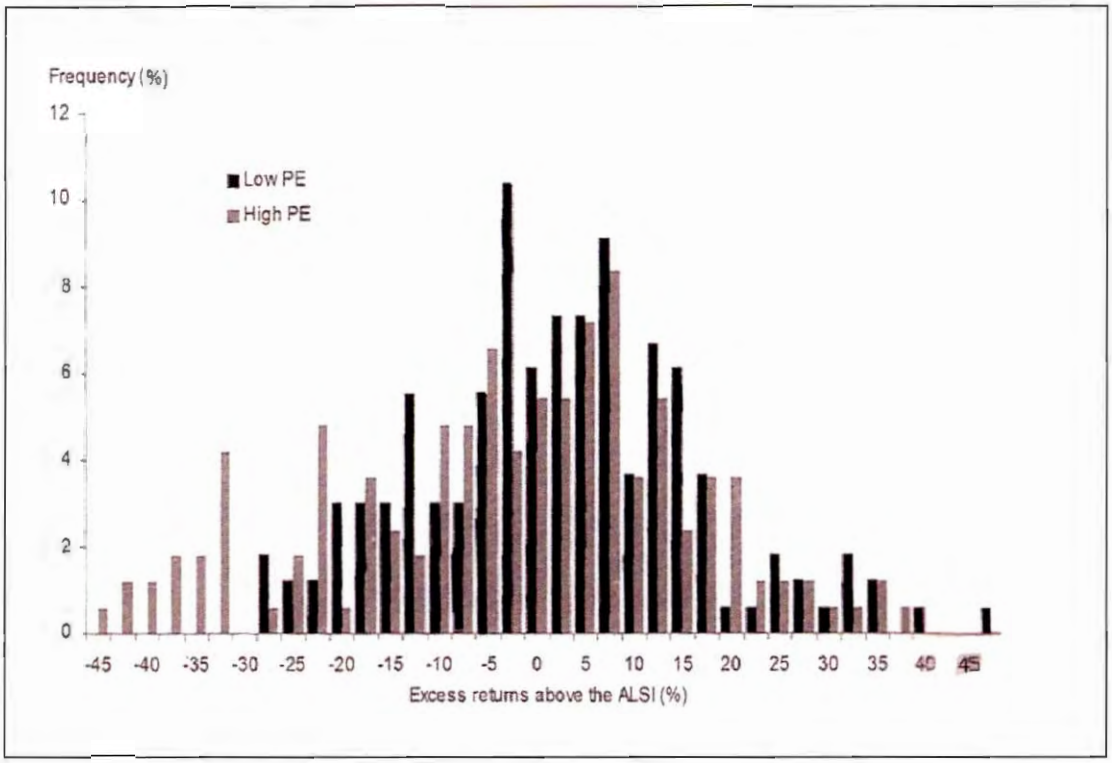
Table 2.1: Value and growth returns in South African Market (1993-2007)

Strategy	Average 12 month excess returns (%p.a.)	Risk (SD) (%p.a.)	Sharpe ratio (x)	Absolute loss frequency (%)	Frequency of under-performance of ALSI (%)	Average out performance of ALSI (%p.a.)	Average under performance of ALSI (%p.a.)
Value	20.0	24.7	0.81	20.4	46.1	28.8	-10.7
Growth	13.4	23.7	0.57	27.5	53.9	24.7	-18.1
ALSI	18.0	20.4	0.88	19.2			

Source: Busetti (2009:321)

Table 2.1 presents a results summary of JSE returns for value, growth and index (All Share Index - ALSI) strategies. It shows that value strategies on average outperform the ALSI more than do growth strategies. This can be seen by the average net out performance of the market of value investing of 18.1% per annum compared to the net out-performance of the market by growth investing of 6.6% per annum. The average net out performance is calculated by taking the average out-performance value in the table, and subtracting the average under performance value. For instance, for the value strategy: the 10.7% average under-performance is subtracted from 28.8% average out-performance to get 18.1%. As a whole all the data given support the idea that value based investment portfolios will out-perform growth based portfolios and by far.

Figure 2.4: Value and growth portfolios - Returns relative to ALSI

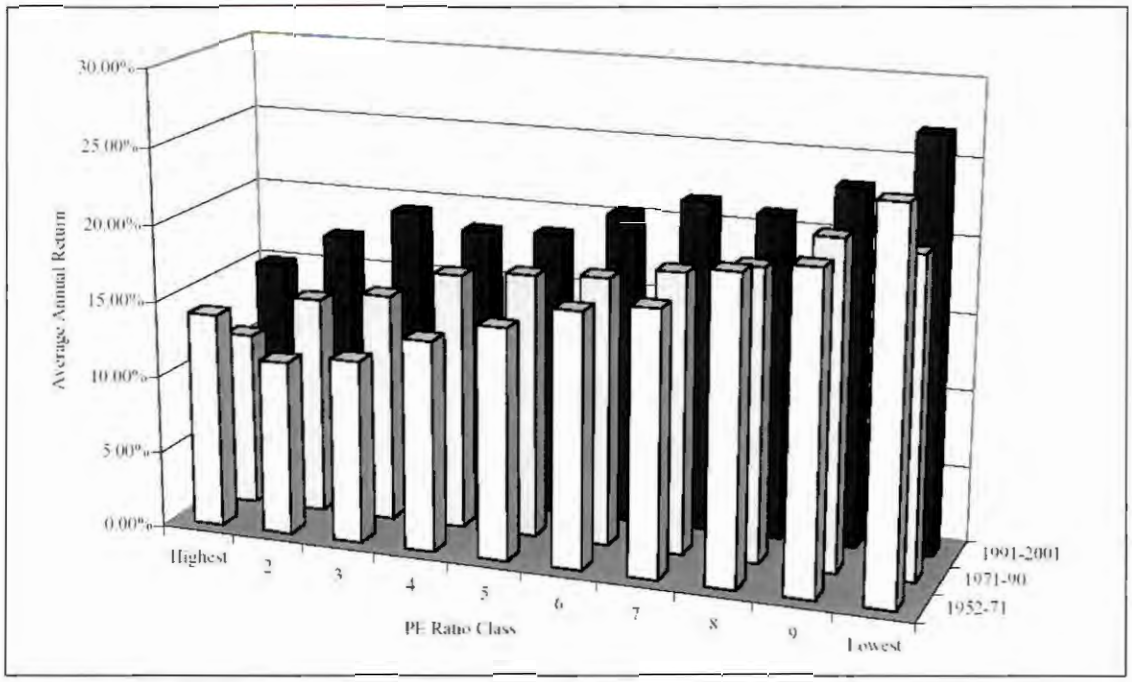


Source: Busetti (2009:320)

Figure 2.4 presents a comparison for market excess returns between high and low PE shares. By comparing the position, skew-ness and kurtosis of the two results, it puts forward that low PE shares generate market excess returns more often and also with larger effect.

This is also reflected in work by Bailey and Gilbert (2007:26-27) on mean reversion of returns on the JSE. In this study month returns for high PE and low PE portfolios on the JSE were compared. It is put forward that high PE portfolios under-perform the ALSI, while low PE portfolios outperform the ALSI. The study also suggested the possibility of making abnormal profits by investing in a contrarian fashion in low PE portfolios.

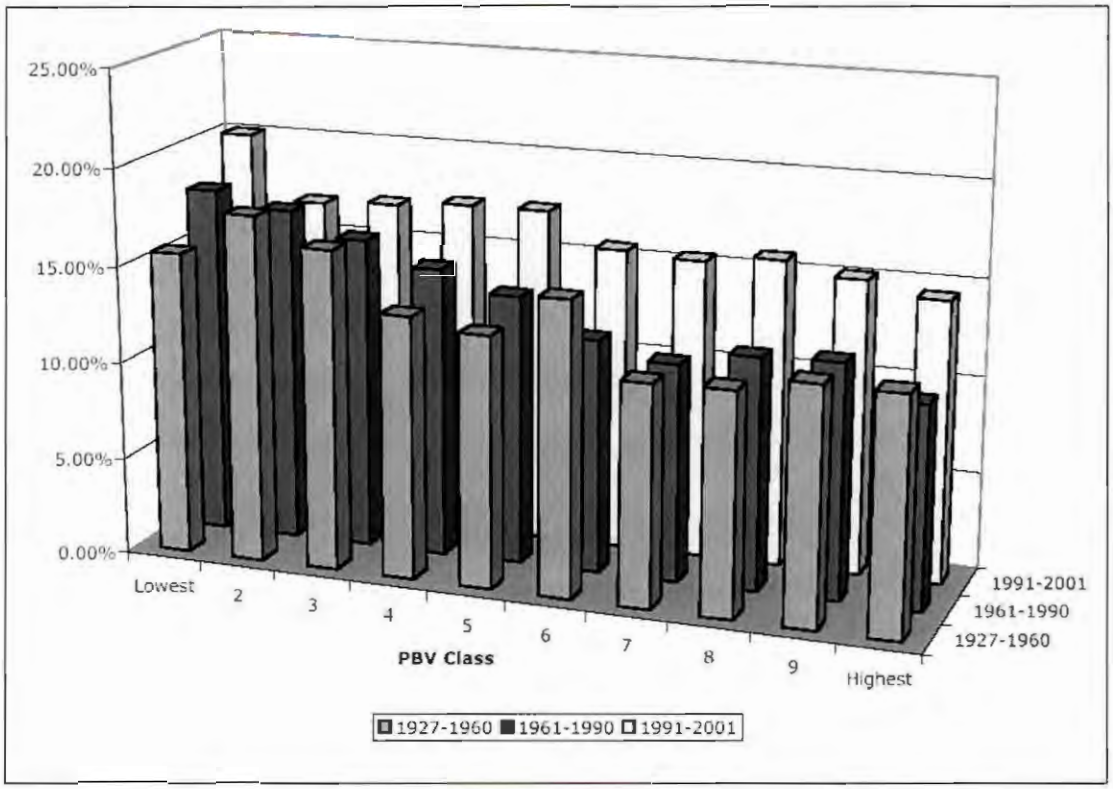
Figure 2.5: PE results for US Market 1952-2001



Source: Damodaran (2003:8.15)

Figure 2.5 presents return results for the US market from 1952 to 2001 in three consecutive 19-year time-frames. It can be seen that Low PE ratio class shares had the highest returns in each of the three time frames. This is good news, as PE ratios constitute one of the screens identified as a relative valuation value based investment method. This means that the concept of value based investment being able to generate better than market returns, is supported.

Figure 2.6: P/B results for US market 1927-2001



Source: Damodaran (2003:8.10)

Figure 2.6 presents PB or Market-to-Book value results for the US market. It shows that there is a general tendency for lower PB ratios to have higher returns. This result is in accordance with what was identified from literature. Low PB values identify shares which will generate the highest returns and this supports the concept that value based investment parameters can achieve higher-than-market returns.

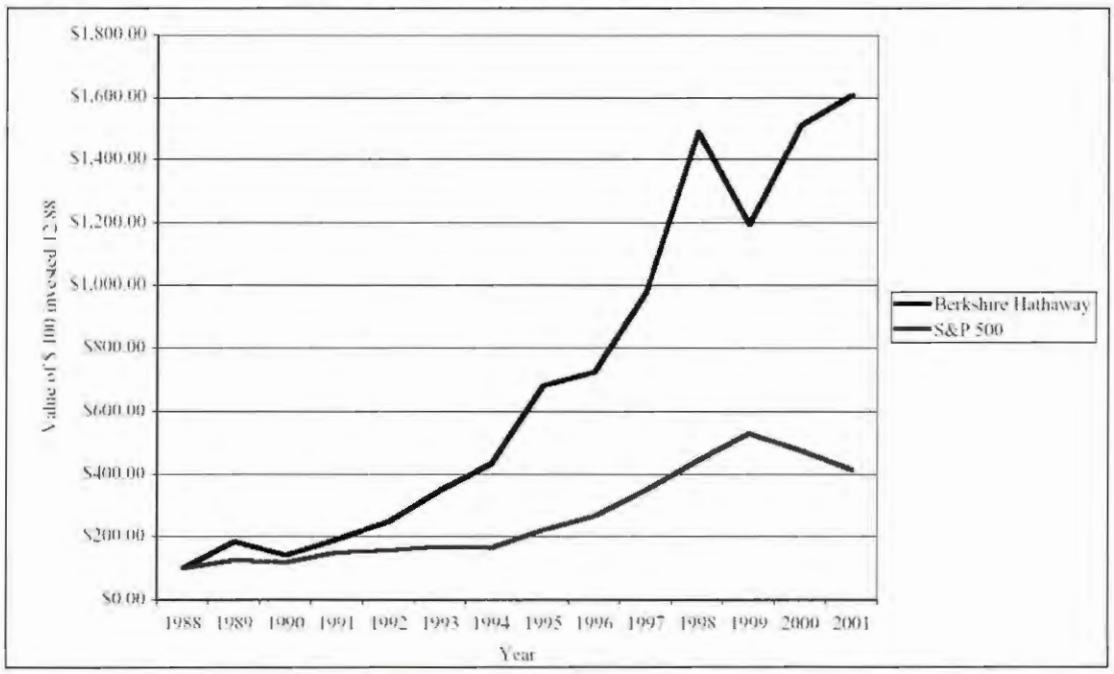
Table 2.2: Value investors and US Market returns compared

Investor or Firm	Investment performance as compounded annual rate (%)	S&P 500 or Dow * performance over same period (%)
Walter J Schloss	16.1	8.4
Tweedy Brown Inc	20	7
Buffett Partnership	23.8	7.4*
Sequoia Fund Inc.	18.2	10
Charles Munger	19.8	5*
Pacific Partners Inc.	32.9	7.8

Source: Buffett (1984)

In Table 2.2 Buffett presents long-term returns of some value investors, compared to market returns. In all instances the investors outperformed the market. All of these funds and investors were students of Benjamin Graham and or David Dodd. The better-than-market returns achieved by the investors were based on concepts in value based investing discussed and tested in this dissertation.

Figure 2.7: Berkshire Hathaway results vs S&P



Source: Damodaran (2003:8.6) and Berkshire Hathaway Share holder letters

Figure 2.7 presents the total value a 100 dollar investment would amount to after 13 years, 1988-2001. The comparison is between Berkshire Hathaway and the S&P 500 index.The figure presents what would have happened to 100 dollars invested in Berkshire Hathaway against 100 dollars invested in an S&P 500 index fund for a 12 year period. As can be clearly seen, the performance of Berkshire Hathaway outstrips the index fund by four.

2.5 SUMMARY

In this chapter the results of the literature study conducted, are presented. The literature survey was conducted in textbooks, investment and financial journals and publications. As far as the secondary objectives are concerned, all of them were met. Firstly share-picking strategies were discussed to give background to the survey and to give context to value based investment. Different valuation methods, particularly valuation methods used in value based investment were identified and discussed. The possibility of better-than-market results was explored in literature and presented. It was found in literature, that there is significant support for the achievement of better than market results. The possibility for value based management to achieve better-than-market results, was also discussed out of literature surveyed and presented. Significant support was found in literature that value based investing can achieve better-than-market returns. Since the resistance for better-than-market results originate out of market efficiency, it can be stated that the findings in the literature for better than market results, particularly for value based investment, rejects the strong and semi-strong forms of the EMH.

CHAPTER 3

RESULTS AND DISCUSSION OF EMPIRICAL RESEARCH

3.1 INTRODUCTION

In this chapter the secondary objective of empirical analysis to determine if value based investment methods can achieve better-than-market returns is addressed. This chapter is organised as follows. A link will be established with the previous chapter to identify the parameters that will be empirically tested. Then the data gathering methods and the data filtering and validation are discussed. Next, the statistical analysis is presented and discussed.

3.2 PARAMETERS FOR ANALYSIS

In section 2.2.1.1 on value based investment, it was identified that value based investors use intrinsic valuation or relative valuation to pick shares. The intrinsic value markers are "Margin of Safety" variables, while the relative valuation markers are screening ratios. For the empirical analysis it was decided to choose both relative valuation markers and intrinsic value markers. The parameters chosen, are presented in Table 3.1.

Table 3.1: Parameters for empirical analysis

Parameter	Description
Dependent Variables	
Return 5 Y	5 year return on share
Return 10 Y	10 year return on share
Independent Variables	
PE	PE or price over earnings ratio for the share in the base year
PB	PB or price over book value ratio for the share in the base year
Equity	Total equity of the company for the share in the base year
P/CF	Price over cash flow ratio for the share in the base year

P/FCF	Price over free cash flow ratio for the share in the base year
ROIC	Return on invested capital for the share in the base year
V_{firm}	Corporate of firm valuation of the company for share in the base year as per corporate valuation model (Section 2.5.3)
V_{edvm}	Valuation of the company for share in the base year as per extended dividend valuation model (Section 2.5.2)
MOS V_{firm}	Margin of safety calculated out of firm or corporate valuation model
MOS V_{edvm}	Margin of safety calculated out of the extended dividend valuation model

From the table above the following dependent variables were selected for analysis against independent variables:

- Return for 5 years, for example 1998 to 2003.
- Return for 10 years, for example 1998 to 2007.

These dependent variables were chosen to give some indication of the effect of time scale on return effects. The primary objective of the study is to determine if value based investment can achieve greater-than-market results, in the long-term (Section 1.3.1). To test the effect of value based investment on returns, the returns have to be measured against value based investment parameters. The primary objective is also the reason for focussing on five and ten year returns.

However, during the empirical analysis one year and three year returns have also been calculated. The correlation between one year returns, three year returns, five year returns and ten year returns is presented in Table 3.2.

Returns are calculated by the following formula.

$$\frac{Share\ price_{End\ of\ period} - Share\ price_{Base\ Year}}{Share\ price_{Base\ Year}} \times 100$$

For example:

$$\frac{Share\ price_{2007} - Share\ price_{1998}}{Share\ price_{1998}} \times 100$$

will give the ten year returns on share prices for the year 1998 and the period 1998-2007.

The independent variables or input variables are the following:

- PE, PB and P/CF ratios. These are the most commonly used ratios in value based investing, as discussed in Section 2.2.1.1.1

- Total company equity as to give an indication of size effects.
- P/FCF to see if the use of FCF instead of reported earnings gives a different effect than PE ratio. This is out of the recommendation from Buffett to concentrate on real "Owner earnings" instead of EPS (see 2.2.1.1.2 Buffett financial Tenets).

- ROIC as a measure of historical return performance.

- Horizon values were calculated for the corporate valuation single stage model (V_{firm}). The horizon values for the extended .dividend valuation (V_{edvm}) were calculated on a variation on the equity residual model.

  The variation on the equity residual model was namely that net cash flow was used instead of FCFE. Net cash flow is often reported as cash flow/share. Therefore, the cash flow used was calculated out of cash flow/share.

  In the calculation V_{firm} was discounted at Hamada calculated WACC and V_{edvm} was discounted at cost of equity (r_s).
  The Hamada WACC is calculated as follows.

$$WACC = w_d r_d (1-T) + w_{ce} r_s$$

$$r_s = r_{RF} + RP_M(b)$$

$$b = b_U[1+(1-T)(D/S)]$$

Where

b = levered beta

b_U = unlevered beta

T = Tax rate

D = Market value of debt

S = Market value of equity

$r_d(1-T)$ = Cost of debt after tax

r_s = Cost of equity

w_{ce} = Weight for equity

w_d = Weight for debt

For r_s the beta and r_{RF} values were obtained from the data sets and r_{PM} was assumed to be 6%. Horizon growth rates were assumed to be 6%.

- Margin of safety values were calculated for both horizon models compared to total market value for each share. Positive values indicated larger than market values and therefore, real safety margins. The margins were presented as factors.

Margin of safety values were calculated using the following formula.

$$MOS\ V_{firm} = \frac{V_{firm} - (Share\ price \times Shares\ outstanding)}{(Share\ price \times Shares\ outstanding)}$$

$$MOS\ V_{edvm} = \frac{V_{edvm} - (Share\ price \times Shares\ outstanding)}{(Share\ price \times Shares\ outstanding)}$$

3.3 RESEARCH DESIGN

The research consisted of data gathering and data analysis. The data gathered are analysed for validity. Finally statistical analysis for effects was done. The effect analysis is correlation-based and regression-based.

3.3.1 Data gathering

The data used for empirically analysis in this study are secondary data obtained through the faculty, but initially gathered and compiled by McGregor BFA, [http://www.mcgregorbfa.com]. The data are compiled out of the standardised financial statements and JSE information. When secondary data are used, it is important that the data are relevant to the research being done (Struwig & Stead, 2001: 80). A disadvantage of secondary data, is that the researcher was not involved in the planning, execution and cleaning of the data. This can influence the relevance and accuracy of the data.

3.3.2 Data analysis and validation

The data gathered were filtered for invalid data, then analysed for distribution, and outliers were identified and eliminated from the dataset. Data were also tested for normality.

The invalid data that were eliminated, were all for missing parameters and division by zero error. After this, outliers were removed outside 2 standard deviations for each independent and dependent parameter. The normal probability plots for the dependent variables are presented in Appendix A.

3.3.3 Correlation-based research

Correlation-based research is done to compare two or more variables in order to determine if a relationship exists (Jaisingh, 2006:107). Statistics determine if a relationship exists and if the relationship is significant. In this study the

effects or relationships that are specifically tested for, are the relationships between returns and value based investing metrics.

3.3.4 Regression analysis

Linear regression is used to predict the 'line of best fit' between two variables (Jaisingh, 2006: 108). The response variables are the return variables while the explanatory variables are other variables in Table 3.1. Multiple linear regression analysis is employed in evaluating the variables for the current study. Simple linear regression results in a model of the type (Levine et al, 2008: 515), given as follows.

$$y = b_o + b_1 x$$

Where:

y =Predicted value of the response variable

b_o =Y-intercept

b_1 =slope of regression line $(y - y_0) / (x - x_0)$

x =Explanatory variable.

According to Levine et al; (2008: 573) multiple linear regression results in a model of the type:

$$y = b_o + b_1 x_1 + b_2 x_2 + ... + b_i x_i$$

Where:

y = Predicted value of the response variable

b_o = Y-intercept

b_i = Slope of Y with x_i variable while all the other x's are held constant.

The results from regression analysis are valid when the assumptions on which regression is based, are satisfied with regard to residuals. (Levine et al, 2008: 530-537). These assumptions are the following.

- Linearity
- The error is normally distributed
- Homoscedasticity or equal variance of errors
- Independence of errors or autocorrelation (Durbin-Watson).

There is also one other assumption that must be satisfied for multiple linear regression. That is the assumption of collinearity. Collinearity refers to a condition where one or more of the independent variables in a multiple linear regression model are correlated with each other (Levine et al, 2008:625-626). Therefore, the assumption has only to be tested in multi-factor models.

Finally the principle of parsimony comes into play with multiple regression modelling. The parsimony principle is the belief that the simplest model that is adequate, must be selected. This is to prevent complexity and collinearity (Levine et al, 2008:627).

3.4 PRESENTATION OF RESULTS

The results presented in this section are the correlation-and regression-based results. This is done according to the designs specified in section 3.3.3 and 3.3.4.

3.4.1 Results from correlation based research

The results of the correlation based research are presented in this section and discussed. All values that are marked red in the tables, are statistically significant to a p-value of less than 0.05.

Table 3.2: Correlation table for returns

	Base year	1998	1999	2000	2001	2002	1998
Base year	Parameter	Return 5 Y 2003	Return 5 Y 2004	Return 5 Y 2005	Return 5 Y 2006	Return 5 Y 2007	Return 10 Y 2007
1998	Return 1 Y 1999	0.508	-0.245	-0.239	-0.207	-0.363	0.158
1999	Return 1 Y 2000	0.153	0.222	-0.121	-0.064	-0.088	0.123
2000	Return 1 Y 2001	0.397	0.350	0.269	-0.224	-0.061	0.355
2001	Return 1 Y 2002	0.349	0.318	0.446	0.500	0.133	0.280
2002	Return 1 Y 2003	0.186	0.541	0.761	0.686	0.596	0.263
2003	Return 1 Y 2004	-0.036	0.433	0.467	0.532	0.468	0.232
2004	Return 1 Y 2005	-0.062	0.030	0.244	0.502	0.445	0.196
2005	Return 1 Y 2006	0.062	0.045	0.078	0.322	0.295	0.324
2006	Return 1 Y 2007	-0.256	0.015	0.033	-0.102	0.438	0.287
1998	Return 3 Y 2001	0.797	0.151	-0.034	-0.199	-0.326	0.443
1999	Return 3 Y 2002	0.622	0.605	0.311	0.013	-0.054	0.482
2000	Return 3 Y 2003	0.485	0.676	0.782	0.406	0.352	0.469
2001	Return 3 Y 2004	0.253	0.609	0.835	0.860	0.590	0.378
2002	Return 3 Y 2005	0.093	0.507	0.756	0.871	0.742	0.330
2003	Return 3 Y 2006	0.008	0.197	0.337	0.662	0.564	0.340
2004	Return 3 Y 2007	-0.211	-0.015	0.104	0.201	0.622	0.408
1998	Return 5 Y 2003	1.000	0.514	0.424	0.213	-0.056	0.634
1999	Return 5 Y 2004	0.514	1.000	0.805	0.503	0.440	0.614
2000	Return 5 Y 2005	0.424	0.805	1.000	0.785	0.652	0.606
2001	Return 5 Y 2006	0.213	0.503	0.785	1.000	0.722	0.439
2002	Return 5 Y 2007	-0.056	0.440	0.652	0.722	1.000	0.549
1998	Return 10 Y	0.634	0.614	0.606	0.439	0.549	1.000

In Table 3.2 a correlation matrix is presented between long- and short-term returns. As mentioned before, the values in red are statistically significant to a p-value less than 0.05. The cells with the grey backgrounds are the relevant correlations for the same base years. An example to illustrate this: the correlation value for five year returns, 1998 base year with one year returns, 1998 base year equals 0.508. It can be seen that there are larger correlation between ten year returns and five year returns than there are correlations between ten year returns and one or three year returns. There are also larger correlations between five year returns and three year returns than there are for 5 year returns and 1 year returns. This supports the longer term view propagated for value based investment in section 2.2.1.1. However, there are statistically significant correlations between the longer term returns and some of the shorter term returns, and all of the same base year correlations are positive. It can be stated therefore that the same inferences made for long term returns can be made to a lesser extent for short-term returns.

Table 3.3: Correlation matrix: 10 year-returns 2007 vs. 1998 data

Base year 1998	Return 10 Y	PE	PB	Equity	P/CF	P/FCF	ROIC	V_{firm}	V_{edvm}	MOS V_{firm}	MOS V_{edvm}
Return 10 Y	1.00	-0.39	-0.18	-0.02	-0.35	0.07	-0.12	-0.04	-0.03	-0.18	0.34
PE	-0.39	1.00	0.34	0.03	0.32	0.05	0.07	-0.03	0.03	0.43	-0.27
PB	-0.18	0.34	1.00	-0.18	0.34	0.00	0.22	0.04	-0.08	0.16	-0.38
Equity	-0.02	0.03	-0.18	1.00	-0.10	0.01	-0.18	-0.32	0.93	0.21	0.28
P/CF	-0.35	0.32	0.34	-0.10	1.00	0.23	0.06	-0.09	-0.20	-0.02	-0.53
P/FCF	0.07	0.05	0.00	0.01	0.23	1.00	-0.09	0.09	0.04	-0.01	0.05
ROIC	-0.12	0.07	0.22	-0.18	0.06	-0.09	1.00	0.10	-0.14	0.03	0.03
V_{firm}	-0.04	-0.03	0.04	-0.32	-0.09	0.09	0.10	1.00	-0.28	0.36	0.15
V_{edvm}	-0.03	0.03	-0.08	0.93	-0.20	0.04	-0.14	-0.28	1.00	0.25	0.35
MOS V_{firm}	-0.18	0.43	0.16	0.21	-0.02	-0.01	0.03	0.36	0.25	1.00	-0.04
MOS V_{edvm}	0.34	-0.27	-0.38	0.28	-0.53	0.05	0.03	0.15	0.35	-0.04	1.00

Table 3.3 presents two points of importance. Firstly the response variable (Return 10 years) has linear relationships with PE ratio (-) P/CF ratio (-) and the margin of safety variable (+) for the Equity residual model. Secondly the margin of safety variable for the extended dividend valuation model is correlated (-) with PE, PB, P/CF ratios as well. These results are highly encouraging. Out of the literature survey it would be expected for returns to have negative correlations to PE, P/CF and PB ratios and positive correlation to margin of safety. It is also mentioned that DCF (dividend) portfolios are

correlated with low PE portfolios, this means negative correlation with PE (See Section 2.2.1.1.1), and this shows in the results too.

Table 3.4: Correlation summary table for 5-year and 10-year returns

Correlation summary (red values significant p<0.05)	Return 5 Y 2003 Base year 1998	Return 5 Y 2004 Base year 1999	Return 5 Y 2005 Base year 2000	Return 5 Y 2006 Base year 2001	Return 5 Y 2007 Base year 2002	Return 10 Y 2007 Base year 1998
P/E	-0.41	-0.12	-0.38	-0.44	-0.35	-0.34
P/B	-0.41	-0.35	-0.31	-0.24	-0.13	-0.18
Equity	0.17	-0.14	-0.21	-0.24	-0.24	-0.02
P/CF	-0.38	-0.33	-0.11	-0.22	-0.27	-0.35
P/FCF	0.10	0.22	0.17	0.11	0.13	-0.07
ROIC	-0.09	-0.06	-0.07	-0.01	0.02	-0.12
V_{firm}	0.01	0.06	0.07	0.02	-0.05	-0.04
V_{edvm}	0.14	-0.22	-0.26	-0.21	-0.26	-0.03
MOS V_{firm}	-0.16	-0.43	-0.34	-0.45	-0.17	-0.18
MOS V_{edvm}	0.58	0.48	0.27	0.46	0.26	0.34

Table 3.4 presents the correlation results for 5 year and 10 year returns for the entire data set. As discussed earlier, the effects of the independent parameters on the dependent parameters are very similar. When looking at five year returns, P/E, P/B P/CF ratios were negatively correlated for all years and significantly so for a number of base years for P/E (1998, 2000, 2001 and 2002), for P/B (1998, 1999 and 2000) and for P/CF (1998, 1999 and 2002). This is as expected from literature (Damodaran, 2002:2.10). The margin of safety parameter for the extended dividend valuation model was significantly positively correlated for all years considered in five year returns. This is also as expected. Results that have gone against expectation, are the P/FCF correlations which are all positive, although not significantly so. The margin of safety parameters for the corporate valuation model is negatively correlated in all cases, and in three cases significantly so. This is also against expectation.

The full correlation tables for each of the 5 year-return parameters are presented in Appendix B.

3.4.2 Presentation of results from regression analysis

In this section the results from the regression analysis are presented. Each analysis is presented in tabular form, followed by the analysis for the assumptions of each regression model. Residual analysis is presented for all models. The result for collinearity analysis is only presented for the five year return 2006, base year 2001 regression model. This is because it is the only two-factor model. Each model was run as a multiple regression model. Under the parsimony principle discussed earlier, models were then re-run for the most significant factor or factors. If the resulting least factor model is statistically significant, it is presented and discussed.

Table 3. 5: Summary of regression models with most significant factors

	Return 5 Y 2003	Return 5 Y 2004	Return 5 Y 2005	Return 5 Y 2006	Return 5 Y 2007	Return 10 Y 2007
Parameter most significant	MOS V_{edvm}	MOS V_{edvm}	PE	MOS V_{edvm} and PE	PE	MOS V_{edvm}

Table 3.5 presents the summarised results for the regression results in all years, for 5 year and 10 year returns. It can be seen that the independent parameters that were the most significant, is the margin of safety parameter for the adapted equity residual model, and the PE parameter. This is in line with what was observed from the correlation studies and it is also confirming what was expected from the literature, insofar as the significance of value based investment metrics are on returns.

Table 3.6: Regression table for 10 year returns vs margin of safety for the modified equity residual model

Regression Summary for Dependent Variable: Return 10 Y 2007 (Alldata) R= .33939927 R^2= .11519186 Adjusted R^2= .10068681 F(1,61)=7.9415 p<.00650 Std.Error of estimate: 441.38						
	Beta	Std Error for Beta	B	Std Error for B	t(61)	p-level
Intercept			400.1358	55.6570	7.1893	0.0000
MOS V_{edvm} 1998	0.3394	0.1204	193.6963	68.7340	2.8181	0.0065

Table 3.6 presents the results for the regression analysis for the 10 year returns. The single factor model explains only 11.5% of the total variation of the ten year returns 1998-2007, as indicated by the R^2 value. However p-values are very low for the factors and the model, so the model is statistically significant. The model underlines the significance of the observations in the correlation study and supports what is expected from literature.

Table 3.7: Durbin-Watson statistic to test for auto correlation 10 year Return Regression Model

Durbin-Watson d (Alldata) and serial correlation of residuals		
	Durbin-Watson(d)	Serial Correlation
Estimate	1.873828	0.056363

From the table the Durbin Watson statistic of 1.87 which is close to 2 indicates that the successive residuals are not correlated Therefore, there is little or no autocorrelation. This is good as a regression model with high autocorrelation in residuals could be in serious doubt (Levine et al, 2008: 534-536).

Figure 3.1: Residual plot vs Independent variable to test for linearity and homoscedasticity

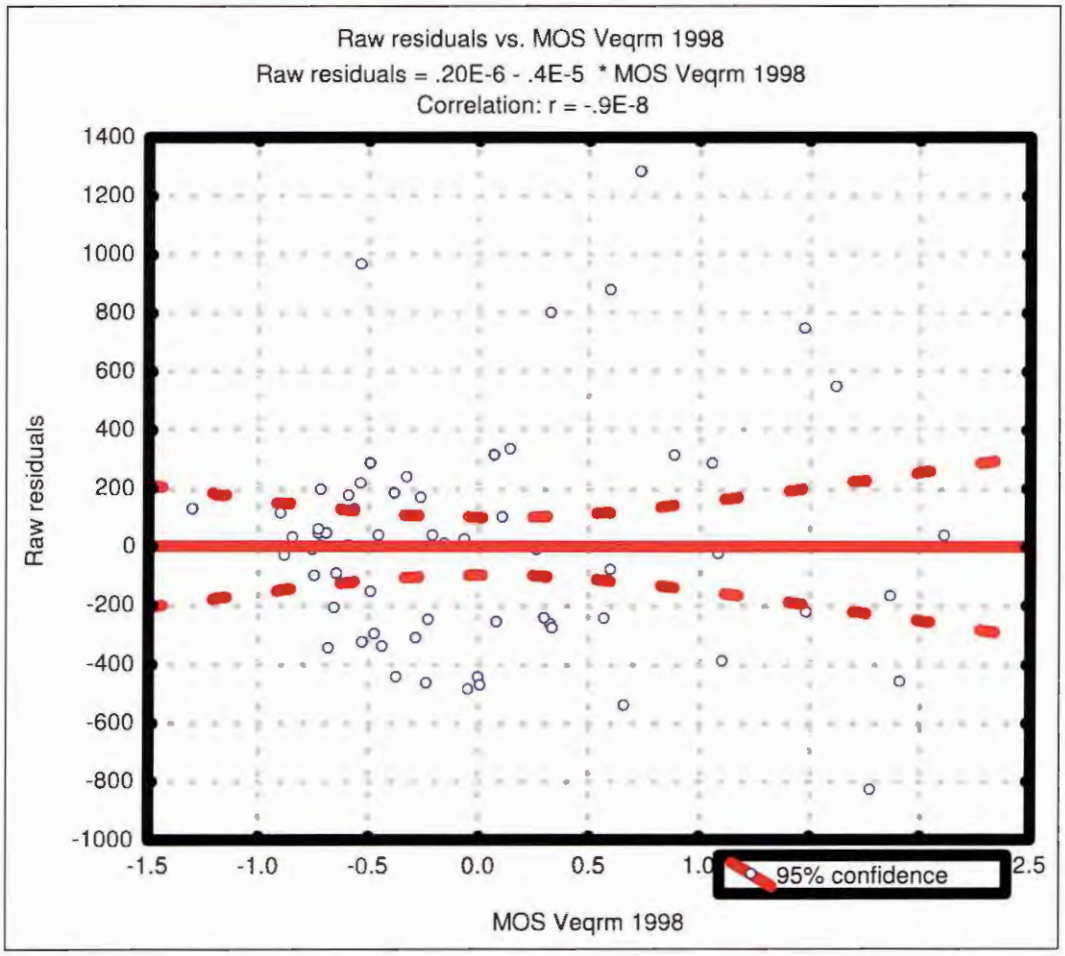


Figure 3.1 shows that there is equal spread around zero. This means the equal variance assumption is not violated. Equal variance or homoscedasticity is important for inferences made about the coefficients in the regression model (Levine, 2008: 529). Also, there is no apparent pattern in the graph. There is especially no linearity. The fact that there is no linearity indicates that a linear model is supported. These factors indicate support for the regression model.

Figure 3.2: Normal probability plot for residuals

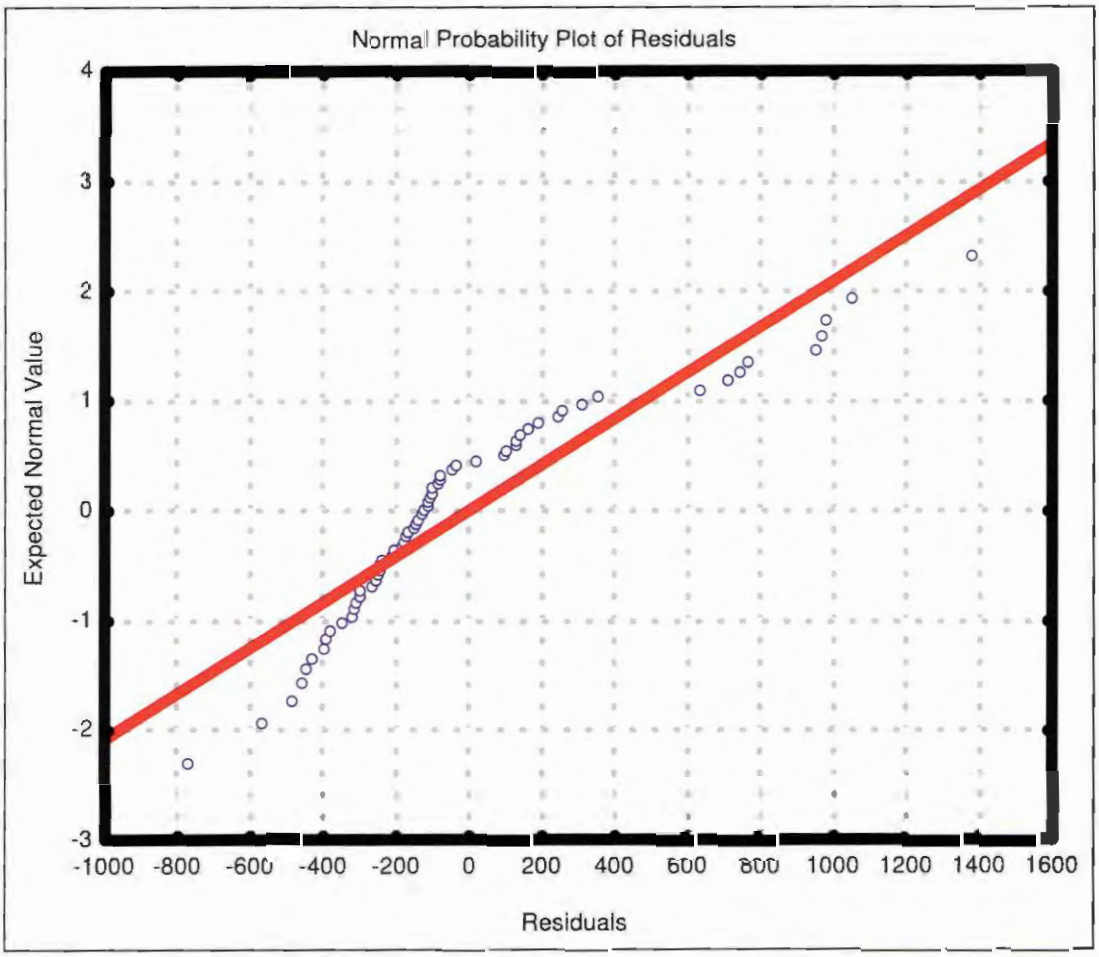


Figure 3.2 shows that there is a modest departure from normal for the residuals, although there is a departure from normal, the regression analysis is fairly robust against the departures from normality assumption (Levine et al, 2008: 532). Therefore, it could be concluded that the model is supported.

Table 3.8: Regression summary for 5 year-returns: 1998-2003

Regression Summary for Dependent Variable: Return 5 Y 2003 (Alldata.sta) R= .58475498 R^2= .34193839 Adjusted R^2= .33115050 F(1,61)=31.696 p<.00000 Std.Error of estimate: 86.595						
	Beta	Std Error for Beta	B	Std Error for B	t(61)	p-level
Intercept			46.5828	10.9196	4.2660	0.0001
MOS V_{edvm}	0.5848	0.1039	75.9211	13.4852	5.6300	0.0000

The five year return regression model gives similar results to the ten year regression model for the base year 1998. This supports the observations made in the correlation study about the returns being correlated and the effects of the margin of safety parameter on returns. The p- values for the model and the factors are very low, indicating high levels of significance. This single independent variable also explains 34% of the total variation for the five year returns 1998-2003 as indicated by the R^2 value.

Table 3.9: Durbin- Watson statistic for test of autocorrelation

Durbin-Watson d (Alldata) and serial correlation of residuals 5 year Returns 1998-2003		
	Durbin-Watson(d)	Serial Correlation
Estimate	2.1659	-0.0869

Table 3.9 presents the Durbin Watson statistic for autocorrelation. The value (2.17) is close to two and therefore, there is strong evidence against

autocorrelation. Independence of residuals is therefore, implied and the regression model is supported.

Figure 3.3: Residual plot vs Independent variable to test for linearity and homoscedasticity

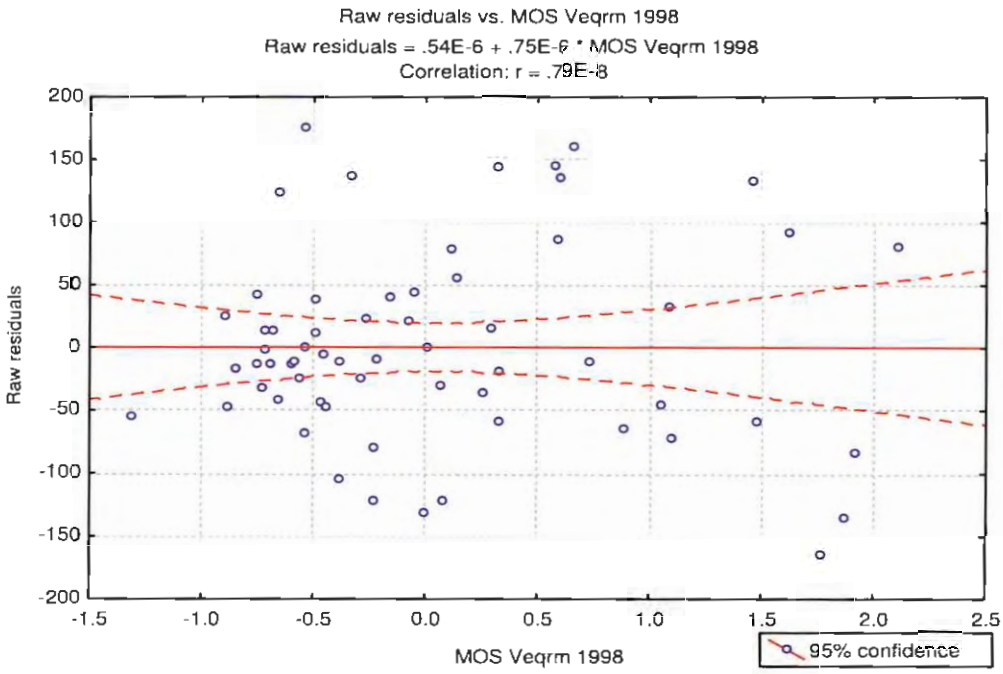


Figure 3.3 shows that there is equal spread around zero. This means the equal variance assumption is not violated. Also, there is no apparent pattern, specifically linearity in the graph. The fact that there is no linearity, indicates that a linear model is supported. These factors indicate support for the regression model.

Figure 3.4: Normal probability plot for residuals 5 year-returns: 1998-2003

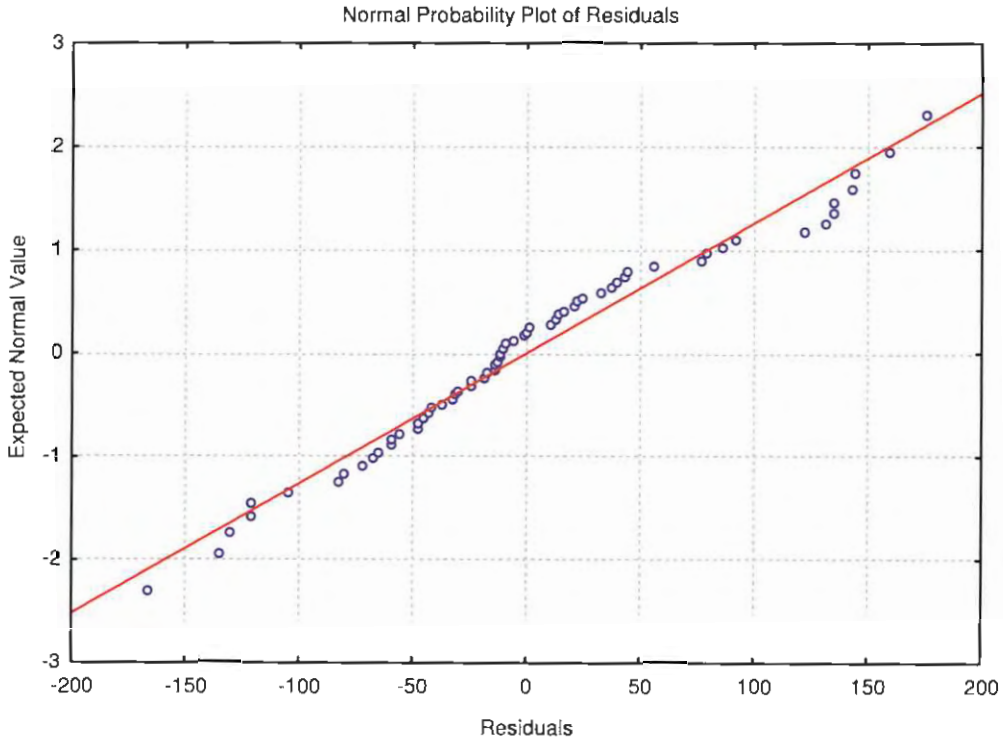


Figure 3.4 shows modest departure from normality for residuals. The regression model is highly significant, so departure from normality presents no problem

Table 3.10: Regression summary for 5 year-returns: 1999-2004

Regression Summary for Dependent Variable: Return 5 Y 2004 (Alldata.sta)

R= .48243655 R^2= .23274502 Adjusted R^2= .22016707

F(1,61)=18.504 p<.00006 Std.Error of estimate: 171.45

	Beta	Std Error for Beta	B	Std Error for B	t(61)	p-level
Intercept			93.6897	24.3928	3.8409	0.0003
MOS V_{edvm}	0.4824	0.1122	104.0214	24.1817	4.3017	0.0001

The results in the table present a statistically significant effect for the margin of safety effect out of the extended dividend valuation model and for the regression model itself. This can be seen out of the extremely low p-values for the factor and the model. This lends support to the margin of safety principle and the effect of value based investment parameters. This single independent variable also explains 23% of the total variation for the five year returns 1999-2004 as indicated by the R^2 value.

Table 3.11: Durbin-Watson statistic to test for autocorrelation for 5 year-returns: 1999-2004

Durbin-Watson d (Alldata) and serial correlation of residuals 5 year Returns 1999-2004		
	Durbin-Watson(d)	Serial Correlation
Estimate	1.7352	0.1301

Table 3.11 presents the Durbin Watson statistic for autocorrelation. The value (1.74) is close to two and therefore, there is strong evidence against autocorrelation. Independence of residuals is therefore, implied and the regression model is supported.

Figure 3.5: Residual plot vs independent variable plot to test for linearity and homoscedasticity

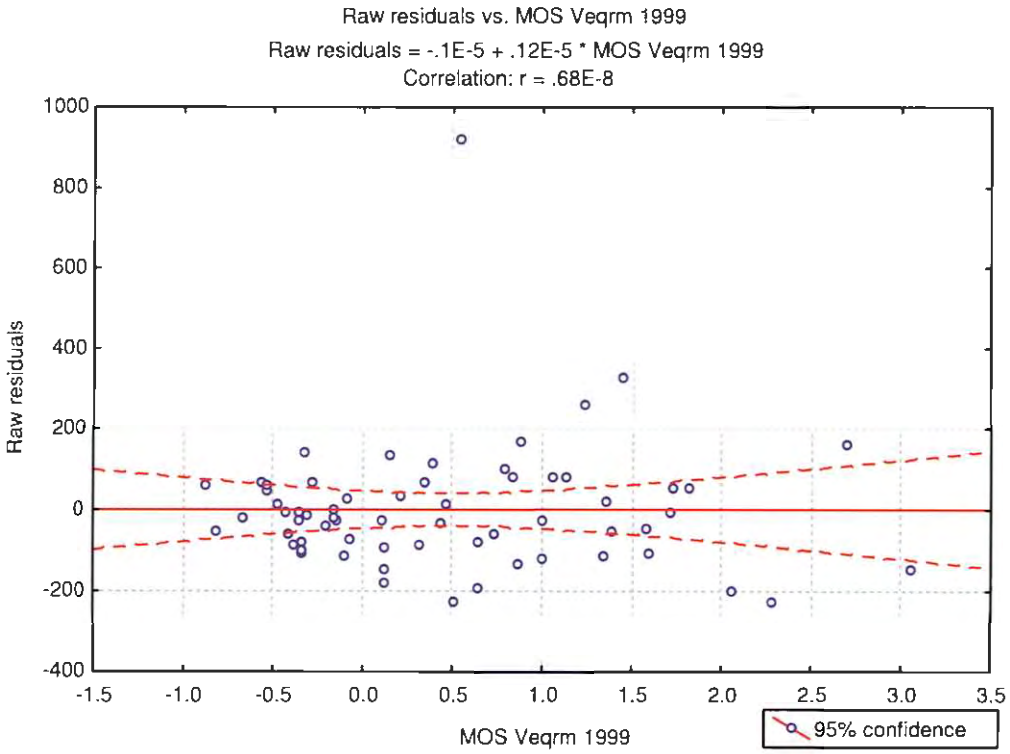


Figure 3.5 shows that there is equal spread around zero. This means the equal variance assumption is not violated. Also, there is no apparent pattern, specifically linearity in the graph. The fact that there is no linearity, indicates that a linear model is supported. These factors indicate support for the regression model.

Figure 3.6: Normal probability plot for residuals 5 year-returns: 1999-2004

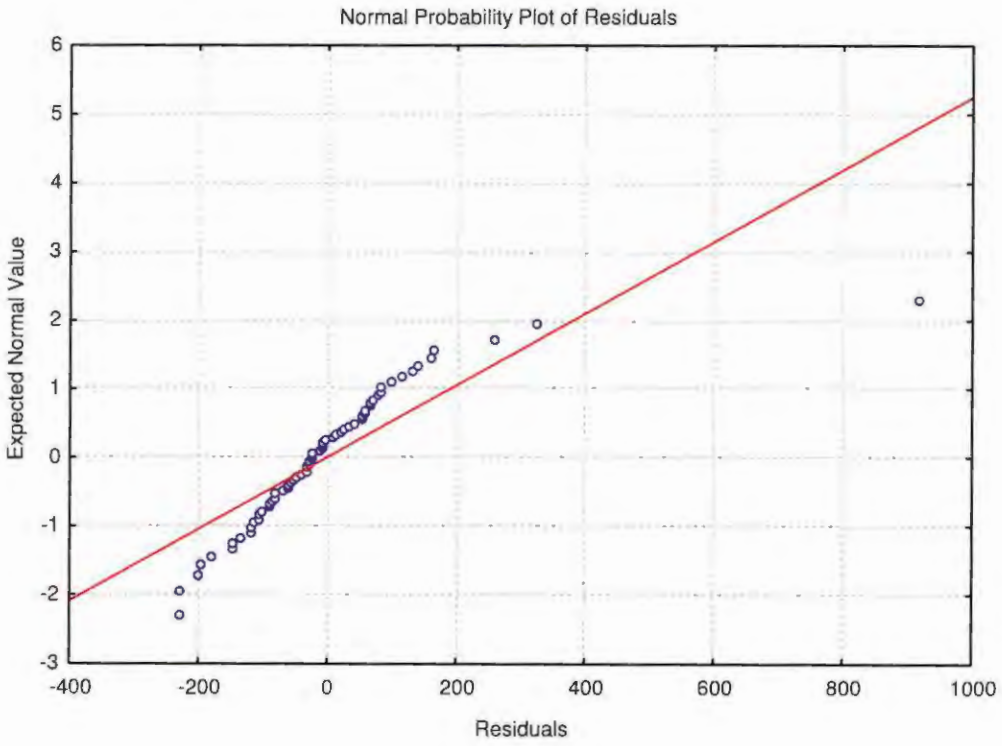


Figure 3.6 illustrate non-normal residuals. However, the regression model has a very low p-value and all the other characteristics are met, so the regression model should hold.

Table 3.12: Regression summary for 5 year-returns: 2000-2005

Regression Summary for Dependent Variable: Return 5 Y 2005 (Alldata.sta) R= .37846428 R^2= .14323521 Adjusted R^2= .12918989 F(1,61)=10.198 p<.00222 Std.Error of estimate: 211.75						
	Beta	Std Error for Beta	B	Std Error for B	t(61)	p-level
Intercept			244.9223	28.4680	8.6034	0.0000
PE	-0.3785	0.1185	-4.3520	1.3628	-3.1934	0.0022

The regression model in the table presents the negative effect of PE ratios on returns. It however explains only 12.55% of the total variation of the five year-returns, as seen by the R^2 value. P-values are very low for the model and the factor, making it statistically significant. It supports the observations in the correlation-based research and the claims from the literature survey (Section 2.4) that low PE-ratios lead to higher returns.

Table 3.13: Durbin-Watson statistic to test for autocorrelation for 5 yr returns 2000-2005

Durbin-Watson d (Alldata) and serial correlation of residuals 5 year Returns 2000-2005		
	Durbin-Watson(d)	Serial Correlation
Estimate	1.6391	0.1799

Table 3.13 presents the Durbin Watson statistic for autocorrelation. The value (1.64) is close to two and therefore there is strong evidence against autocorrelation. Independence of residuals is therefore, implied and the regression model is supported.

Figure 3.7: Residual plot vs independent variable plot to test for linearity and homoscedasticity

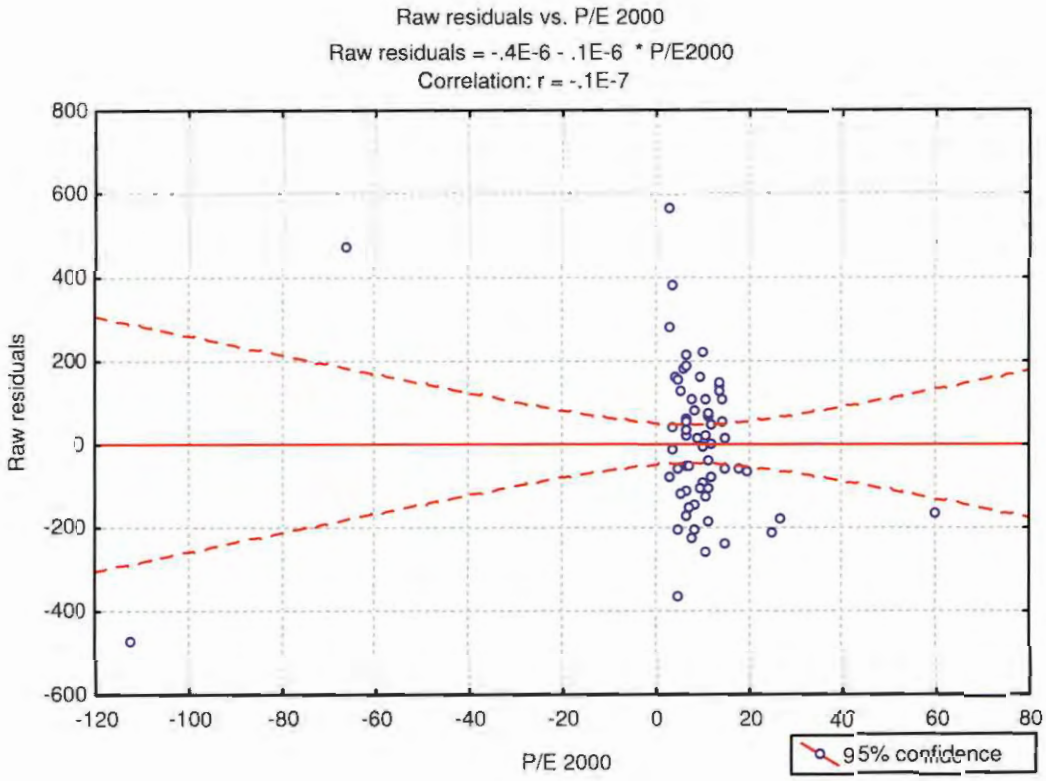


Figure 3.7 shows that there is equal spread around zero. This means the equal variance assumption is not violated. Also there is no apparent pattern, specifically linearity in the graph. The fact that there is no linearity, indicates that a linear model is supported. These factors indicate support for the regression model.

Figure 3.8: Normal probability plot for residuals 5 year-returns: 2000-2005

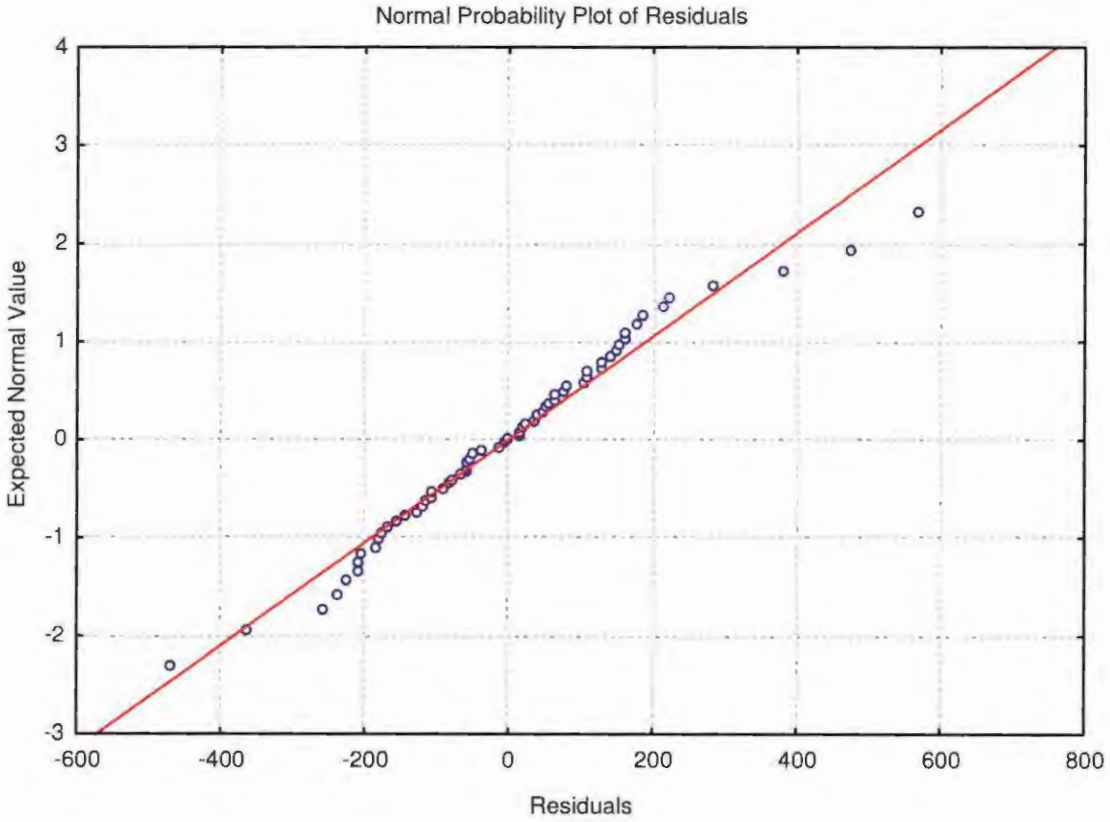


Figure 3.8 shows modest departure from normality so not enough evidence to reject regression model, given p-value and other results.

Table 3.14: Regression summary for 5 year returns: 2001-2006

Regression Summary for Dependent Variable: Return 5 Y 2006 (Alldata.sta) R= .54316723 R^2= .29503064 Adjusted R^2= .27153166 F(2,60)=12.555 p<.00003 Std.Error of estimate: 302.31						
	Beta	Std Error for Beta	B	Std Error for B	t(61)	p-level
Intercept			396.4564	94.6196	4.1900	0.0001
PE	-0.3130	0.1171	-21.6842	8.1140	-2.6724	0.0097
MOS V_{edvm}	0.3410	0.1171	100.9794	34.6781	2.9119	0.0050

The regression model in the table presents the negative effect of PE-ratios and the positive effect of margin of safety valuation on returns. P-values are very low for the model and the factors, making it statistically significant. It supports the observations in the correlation-based research and the claims from the literature survey (Section 2.4) that low PE-ratios lead to higher returns. This also lends support to the margin of safety principle and the effect of value based investment parameters as a whole. This model explains 29.5% of the total variation of the 5 year returns 2001-2006 as indicated by the R^2 value.

Table 3.15: Durbin-Watson statistic to test for autocorrelation for 5 year returns: 2001-2006

Durbin-Watson d (Alldata) and serial correlation of residuals 5 year Returns 2001-2006		
	Durbin-Watson(d)	Serial Correlation
Estimate	1.8879	0.0507

Table 3.15 presents the Durbin Watson statistic for autocorrelation. The value (1.89) is close to two and therefore, there is strong evidence against autocorrelation. Independence of residuals is therefore, implied and the regression model is supported.

Figure 3.9: Residual plot vs independent variable plot to test for linearity and homoscedasticity

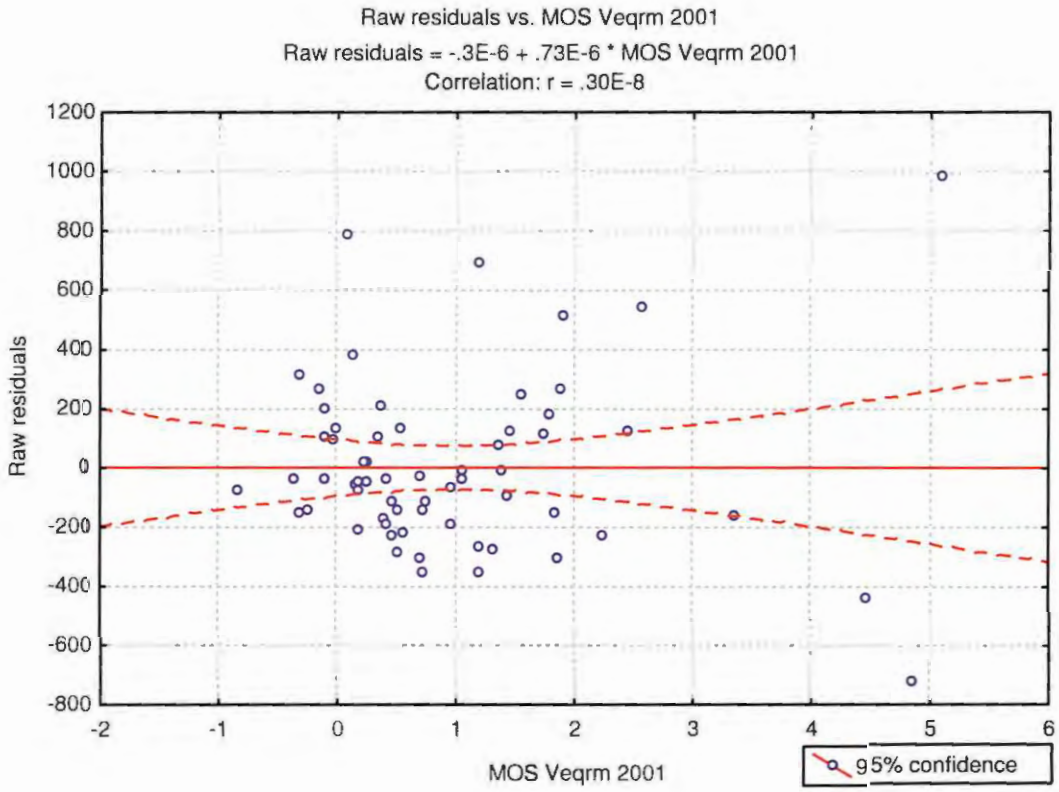


Figure 3.9 shows that there is equal spread around zero. This means the equal variance assumption is not violated. Also there is no apparent pattern, specifically linearity in the graph. The fact that there is no linearity, indicates that a linear model is supported. These factors indicate support for the regression model.

Figure 3.10: Normal probability plot for residuals 5 year-returns: 2001-2006

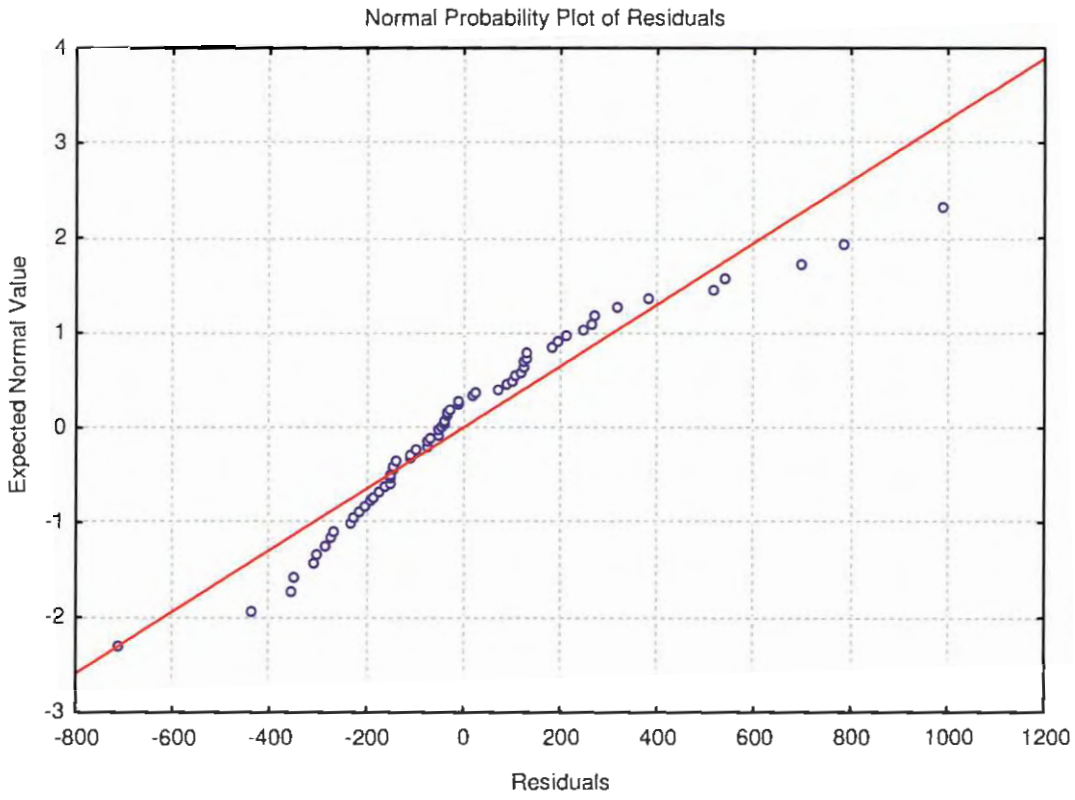


Figure 3.10 shows a modest to large departure from normality. However, the regression model has very low p-value and all other measures are met. There is no rejection of regression.

Because there are two factors in the regression model for the five year returns 2001-2006 the no-collinearity assumption has to be tested. This is done by calculating the variance inflationary factor (VIF) for each of the independent variables. According to Levine et al; (2008:625) the formula for VIF_j for an independent factor j is the following.

$$VIF_j = \frac{1}{1 - R_j^2}$$

Where:

R_j^2 = Coefficient of determination between factor j and all other independent variables.

Since there are only two independent variables in the model, the VIF value for both are the same. If the value is close to one, then it can be assumed that there is no collinearity.

For this particular model the value of R the correlation coefficient between the two parameters can be found in Table B.4 in Appendix B. R = -0.38

Therefore:

$$VIF_{PE} = \frac{1}{1-(-0.38)^2_{PE}} = 1.129$$

This value is close to one so there is no collinearity.

Table 3.16: Regression summary for 5 yr returns 2002-2007

Regression Summary for Dependent Variable: Return 5 Y 2007 (Alldata.sta) R= .35426447 R^2= .12550331 Adjusted R^2= .11116730 F(1,61)=8.7544 p<.00439 Std.Error of estimate: 344.43						
	Beta	Std Error for Beta	B	Std Error for B	t(61)	p-level
Intercept			615.39	96.72	6.36	0.000
PE	-0.35	0.12	-29.82	10.08	-2.96	0.004

The regression model in the table presents the negative effect of PE ratios on returns. It, however, explains only 12.55% of the total variation of the five year-returns as seen by the R^2 value. P-values are very low for the model and the factor, making it statistically significant. It supports the observations in the correlation-based research and the claims from the literature survey (Section 2.4) that low PE-ratios lead to higher returns.

Table 3.17: Durbin-Watson statistic to test for autocorrelation for 5 year returns: 2002-2007

Durbin-Watson d (Alldata) and serial correlation of residuals 5 year Returns 2002-2007		
	Durbin-Watson(d)	Serial Correlation
Estimate	1.7608	0.1175

Table 3.17 presents the Durbin Watson statistic for autocorrelation. The value (1.76) is close to two and therefore, there is strong evidence against autocorrelation. Independence of residuals is therefore, implied and the regression model is supported.

Figure 3.11: Residual plot vs independent variable plot to test for linearity and homoscedasticity

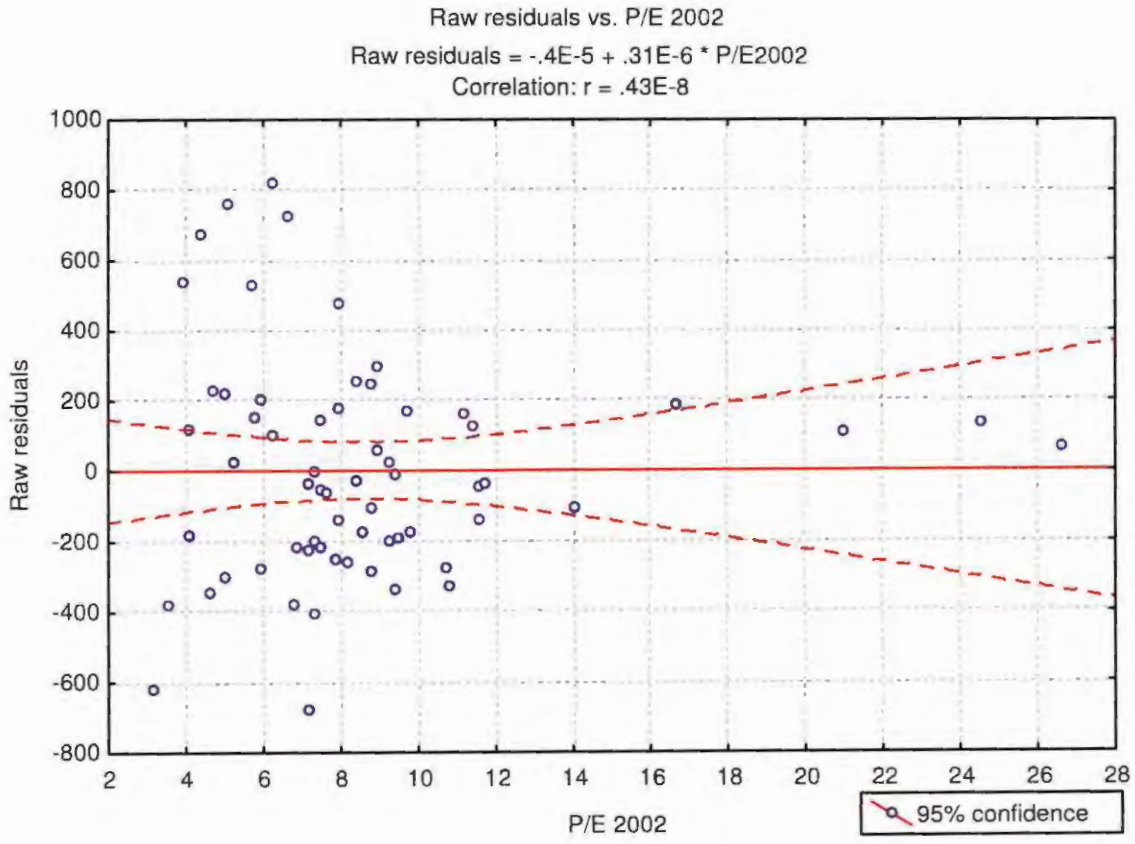


Figure 3.11 shows that there is equal spread around zero. This means the equal variance assumption is not violated. Also, there is no apparent pattern, specifically linearity in the graph. The fact that there is no linearity, indicates that a linear model is supported. These factors indicate support for the regression model.

Figure 3.12: Normal probability plot for residuals 5 year-returns: 2002-2007

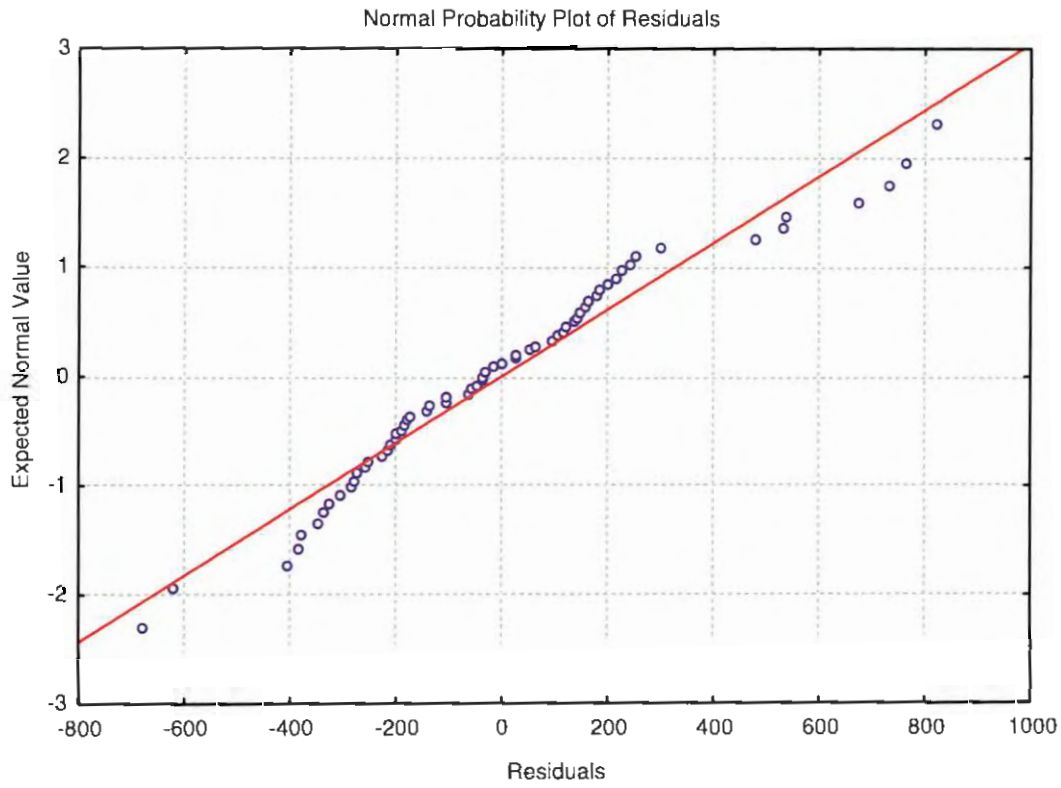


Figure 3.12 shows a modest departure from normality. There is not enough evidence to reject regression model given, model p-value.

3.5 SUMMARY

In this chapter empirical analysis was done to see if better than market returns can be achieved. Value based investment metrics identified in literature were measured against actual returns with correlation testing and regression analysis.

CHAPTER 4

CONCLUSIONS AND RECOMMENDATIONS

4.1 INTRODUCTION

In the previous chapter parameters that were identified out of the literature survey in chapter 2, were tested statistically. The tests were in order to determine if the claims made in literature with regard to the parameters and the effect of the parameters in obtaining excess returns could be substantiated.

In this chapter the conclusions with regard to the observations made in the previous chapter will be discussed. Recommendations will also be made.

4.2 CONCLUSIONS

Empirical evidence gives significant statistical support to claims in the literature survey. The traditional ratios that are PE, PB and P/CF are supported in being negatively correlated to returns. This means that portfolio strategies with a focus on the low PE-, PB- and P/CF-ratios will probably generate higher returns than do portfolios with average or high PE-, PB- and P/CF-ratios.

It was also found that the concept of margin of safety could be successfully implemented. This was done by calculating with the DCF approach the horizon value of the company with an adapted form of the equity residual model. The margin of safety variable was positively correlated as expected and it also was the main factor in most of the regression analysis.

As far as the identified secondary objectives are concerned, all have been achieved. In the literature survey it was determined that better-than-market results are achievable and that these results can be achieved with value

based investment strategies. These results were statistically supported by the empirical analysis, which was the last objective. As put forward before in chapter 2, this alludes to the rejection of the strong and semi-strong forms of the EMH.

The primary objective with regard to the role of value based investment was then also achieved. The possibility for value based investing to achieve better-than-market returns, is supported.

4.3 RECOMMENDATIONS FOR FURTHER RESEARCH

It must still be determined which of the value based strategies obtains the best results, as the independent parameters were somewhat correlated. A ratio based relative valuation strategy is much easier to follow than a DCF strategy and the additional reward over effort must still be clarified.

4.3 SUMMARY

The aim of this chapter was to provide a conclusion for the literature survey in chapter 2 and the results obtained form empirical analysis in chapter 3. It was found that a definite link between the literature and the empirical results existed. It was also therefore, found that both the literature survey and the empirical analysis supported the objectives of the study. Recommendations for future research were also given in this chapter.

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