INVESTMENT POTENTIAL ASSESSMENT: 
AN ANALYSIS MODEL

by

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Abstract

Everyday the financial world is dominated by news from the international stock markets. A general market meltdown is viewed with alarm and dismay by all those investors who take a short-term view of investments or see their pensions erode. Nothing can be done to what has already happened, but a lot can be learnt from successful investors.

One of these successful investors who are one of the richest people in the world is Warren Buffett. As a student of Benjamin Graham at Columbia Business School in the 1950's and a native of Omaha, Warren Buffett is renowned as the chairman of Berkshire Hathaway Incorporated and are one of the world's legendary investors.

This dissertation addressed the need that exists to provide investors with an investment philosophy that will limit the risk of failure when investing in the stock market by identifying and evaluating investment potential the Warren Buffett way. The was done by a literature study of the various investment fundamentals, analyzing the investment philosophy of Warren Buffett's mentor, Benjamin Graham and a in-depth study of the investment criteria used by Warren Buffett.

The empirical study was conducted in five phases. The first phase consisted of identifying the study sample and the second phase was to identify the most important regression equations. Phase three consisted of multiple regression analysis that was used to determine the most important quantitative criteria, based on the analysis done on twenty two companies listed on the Johannesburg Stock Exchange. The most important criteria that were identified were the margin of safety, the book value and book value per share, the intrinsic value per share of the company, the debt pay-off period and the profit margin.

Based on the criteria identified within phase three, a five step model was developed in phase four to assist investors in analyzing and successfully identifying companies with the highest investment potential and this model was tested in phase five. The results of the tests done on the study sample indicated the success rate of the model for the specific number of criteria. These results were compared to the average price per share for 2004 and the results indicated that the success rate of the model decreases as the number of
criteria within the model decreases. The results achieved were satisfactory considering that the model only addresses the quantitative investment criteria and not the qualitative criteria.

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CHAPTER 1

INTRODUCTION

"It takes 20 years to build a reputation and five minutes to lose it"
— Warren Buffett

1.1 Background

The word investing is being used for describing all kinds of activities in the financial world. Some of these activities are antithesis of investing and very few actually are investing. Investment involves the commitment of a capital sum for benefits to be received in the future in the form of an income flow or capital gain or a combination of both. In economic terms, investment utilizes capital for maximum possible return. Dictionary.com defines investing as “To commit (money or capital) in order to gain a financial return.”

According to Graham (1940:17) analysis connotes the careful study of available facts with the attempt to draw conclusions there from based on established principles and sound logic. Therefore it is part of the scientific method, however applying analysis to the field of investment leads to some serious obstacles, since investment is by nature not an exact science. It is these obstacles that make the study of investment theory so popular. If the background of stock investments are considered it is without a doubt one of the greatest tools ever invented for building wealth. Stocks are a part, if not the cornerstone, of nearly any investment portfolio. Over the last few decades, the average person’s interest in the stock market has grown exponentially. What was once a toy of the rich has now turned into the vehicle of choice for growing wealth. This demand coupled with advances in trading technology has opened up the markets to enable nearly anybody to own shares.

People normally invest in the stock market for two reasons, namely since they anticipate their future cash needs, and expect their earnings potential will not meet those needs, and
secondly the desire to become wealthy in the future. Most people however search for instant wealth and many of them believe that it can be achieved by investing in the stock market and more recently by playing the lottery. But as investors throughout the years have proven, it could lead to great wealth or instant bankruptcy.

Everyday the financial world is dominated by news from the international stock markets. A general meltdown is viewed with alarm and dismay by all those investors who take a short-term view of investments or see their pensions erode. Nothing can be done to what has already happened, but a lot can be learnt from successful investors. One of these successful investors who are one of the richest people in the world is Warren Buffett.

Many view the American, Warren Buffett, as the most successful stock investor of all time. Buffett is also the principal owner of arguably the most successful publicly traded company, Berkshire Hathaway Inc. Due to his ability to pick wealth generating shares, Warren Buffett is consistently one of the five richest men in America. From 1957 to the present, investments made by Buffett have appreciated at an average rate of more than 25 per cent per year.

Warren Buffett buys companies with the intent of never selling them. He meticulously studies each company of interest and only buys the shares of companies in sound financial condition that can be purchased well below his assessment of their value. Warren Buffett's largest investment returns have been made in household names like Coca-Cola. Buffett is also famous for not joining the infamous technology/internet share rally in the late 1990's, stating that he refuses to invest in companies that he can't visualize 10 years down the road.

It is therefore very important that investors limit the risks of investing by ensuring that they have the best possible knowledge regarding the security when investing their money. To enable them to make an informed decision, investors need to know what criteria are important when evaluating different shares.
1.2 Problem statement

Investors are faced daily with numerous different investment opportunities; however it seems as if there are only a few businesses worth buying into. How to decide what to invest in: that is a question so many investors are trying to answer. There is always the possibility that the right or wrong choice can be made. Should investors reinvent the wheel and develop their own investment philosophy or should the investment philosophy of one of the great successful investors be personalized. Many of these investors have years of experience and have learnt the hard way by losing money and experiencing the hardship of poverty.

If the choice is made to follow the investment philosophy of a great investor such as Warren Buffett, is it possible to determine the exact criteria he evaluates when making an investment? In most of the cases identifying and calculating the criteria is straight forward, but it is the interpretation of these criteria that requires insight into the stock market and past experience to build on. Warren Buffett used the foundation that Benjamin Graham set for him and built his own investment philosophy on that.

The results of this study will assist the investor to identify and evaluate investment potential the Warren Buffett way. It explores the specific criteria used by Warren Buffett when picking stock investments and determines acceptable limits for each of these criteria. Another problem addressed within this study after the determination of the critical criteria, is to verify the validity of these criteria within the South African context, since Warren Buffett practices his investment philosophy within the American market. This study therefore strives to limit the risks of investing by insuring that the investor is equipped with the relevant knowledge pertaining to investing and also a basic tested (proven) investment philosophy that can be utilized. This investment philosophy is only to support or assist the investor and will not guarantee that the right choices are made, since there are other qualitative criteria that should also be considered.
1.3 Aim of the study

Within the problem statement it was indicated that there is a need to provide investors with an investment philosophy that will limit the risk of failure when investing in the stock market. This study therefore aims to assist the investor in identifying and evaluating investment potential the Warren Buffett way. The study also aims to apply Warren Buffett's philosophy to the South African share market and to identify the most important criteria within this specific market.

Therefore the primary objective of the study is to identify the quantitative criteria that can assist investors to determine the investment potential of listed companies based on investment philosophy of Warren Buffett.

The secondary objectives are:

1. To determine the criteria necessary to evaluate investment potential.
2. To evaluate the criteria identified and to determine acceptable limits for these criteria.
3. To determine the most critical criteria that can be applied to evaluate investment potential within the South African stock market.

1.4 Scope and boundaries

Given the width of the field of study the following boundaries needs to be applied:

i. To focus on investment from an individual's perspective (meaning retail investors) and not a company's perspective.
ii. The study will focus on investment in terms of purchasing shares of listed companies. Therefore the purchasing of financial assets.
iii. This study will only focus on the investment philosophy of Warren Buffett.
iv. The study will only focus on developing a model based on the quantitative criteria as identified within the empirical study.
v. It is envisaged that the study will focus on twenty two South African companies listed on the Johannesburg Securities Exchange (JSE). The data from these companies will also be used to test the model developed.

1.5 Methodology

When analysing shares two possible routes can be followed, namely to immerse oneself in the academic literature on share analysis and another is to conduct a study of the key elements used by the world’s most respected investors. Within this dissertation both routes will be exploited with more emphasis on the last option, namely to study the investment behaviour of successful investors and more specific Warren Buffett.

The methodological paradigm to be used in this study will consist of an extensive literature study as well as the practical testing of the criteria to evaluate investment potential. The literature study will focus on the definition of the key approaches to investments and the various financial terms associated with it. It will also focus on the proposed study regarding Warren Buffett’s investment strategy and the various quantitative criteria identified within the study. It should however be noted that the most of the literature regarding Warren Buffett is written from an American context. Within the empirical study the criteria as identified within the literature study, will be tested and the most important criteria will be identified. A practical model will then be developed based on the criteria identified within the empirical study and finally the model will be tested.

1.6 Limitations of the dissertation

The following are considered limitation of the study:

- This document only explores the investment philosophy of Warren Buffett for purchasing shares; all other securities investments are excluded.
- Due to the fact that Warren Buffett has never published literature regarding his investment philosophy, all the literature used within this dissertation are based
on other people's perceptions and research regarding Warren Buffett's investment strategy. The only literature available compiled by Warren Buffett, is his annual letters to the shareholders of Berkshire Hathaway.

- This study will only focus on the quantitative criteria used by Warren Buffett and not the qualitative criteria.

1.7 Exposition of chapters

Chapter 2:

The fundamental theory regarding investment is discussed within this chapter as foundation for the more in depth discussion on Warren Buffett's investment strategies. The types of investments, the risks involved in investing, the types of investment analysis and the various financial theories are discussed. Although this section discusses investments in general, more emphasis is placed on shares.

Chapter 3:

This chapter focuses on the specific investment philosophy of Benjamin Graham - one of the great investors. The reasons for including this within the study are that Benjamin Graham is considered to be the father of investing and was also Warren Buffett's mentor. Benjamin Graham is researched within this section with emphasis being placed on how he started his very successful career and what he regarded as important and essential when investing.

Chapter 4:

Chapter four details the biography and investment philosophy of Warren Buffett. The various quantitative and qualitative investment evaluation criteria of Warren Buffett will also be discussed in detail indicating the measurement and importance thereof.
Chapter 5:

The research for this study was conducted by means of an empirical study and the process is discussed within chapter 5. The chapter firstly describes the research methodology followed, including how the study population and sample were selected. It also explains how the most important quantitative criteria used by Warren Buffett were determined and how the step by step model was developed to evaluate these criteria.

Chapter 6:

Chapter 6 presents the results of the empirical study. The first results presented and discussed were the financial information of the companies together with the various models that were determined per year. Multiple regressions are used to determine the five most important criteria and these results are used as the foundation for the development of the analysis model. The model is described in detail within this chapter.

Chapter 7:

The conclusions and suggestions for further studies are described in order to emphasize how important the correct analysis is for investors to limit failures.
CHAPTER 2

INVESTMENT THEORY

"Should you find yourself in a chronically leaking boat, energy devoted to changing vessels is likely to be more productive than energy devoted to patching leaks"

– Warren Buffett

2.1 Introduction

Within this section, the fundamental theory regarding investment is discussed as foundation for the more in depth discussion on Warren Buffett’s investment strategies. For the discussion of investment strategies it is imperative to understand what an investment is, what types of investments can be made, the risks involved with investments and how these risks can be managed. It is also important to discuss the various types of investment analyses and financial theories. Although this section discusses investments in general, more emphasis is placed on shares.

2.2 Defining an investment

Most people think of investing as synonymous with putting money into the stock market and for those with a broader view, buying property can also be classified as investing. This is however far from the truth and therefore investment needs to be properly defined. Investment involves the commitment of a capital sum for benefits to be received in the future in the form of an income flow or capital gain or a combination of both (Adair et al., 1994:32). Another definition for investment is anything which is expected to change the consumer’s risk position or time pattern of consumption in future period (Jacob & Pettit, 1988: 57). In economic terms, investment exploits capital for maximum possible return. By investing a person is placing capital in a business with the expectation of profit or income.
To understand investment one needs to understand the investment process and the environment. The first important facet is the distinction between the several classes of assets namely real assets and financial assets. The material wealth of a society is ultimately determined by the productive capacity of its economy, that is the goods and services its members can create (Bodie et al., 1999: 3). This capacity is a function of the real assets of the economy namely the land, buildings, machines and intellectual capital that can be used to produce goods and services. Financial assets on the other hand can be defined as no more than sheets of paper or entries on a computer and do not contribute directly to the productive capacity of the economy. Examples of financial assets are stocks and bonds. Table 2.1 shows the differences between the two types of assets.

Table 2.1: The distinction between real assets and financial assets

<table>
<thead>
<tr>
<th>Real Assets</th>
<th>Financial Assets</th>
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<tr>
<td>Contribute directly to productive capacity of the economy</td>
<td>Contribute indirectly to the productive capacity of the economy since they allow for separation of the ownership and management of the firm and facilitate the transfer of funds to enterprises with attractive investment opportunities.</td>
</tr>
<tr>
<td>Are income-generating assets</td>
<td>Define the allocation of income or wealth among investors.</td>
</tr>
<tr>
<td>Appear only on the asset side of the balance sheet.</td>
<td>Appears on the assets and liabilities side of the balance sheet.</td>
</tr>
<tr>
<td>Are destroyed only by accident or by wearing out over time.</td>
<td>Are created and destroyed in the ordinary course of doing business</td>
</tr>
</tbody>
</table>

Source: (Bodie et al., 1999:3)
2.3 The investment management process

The investment management process involves the following five steps (Fabozzi, 1995: 2):

1. setting the investment objectives
2. establishing investment policy
3. selecting a portfolio strategy
4. selecting the assets
5. measuring and evaluating performance

There is no single approach towards investing. Each individual has different assets, different needs and goals and most of all a different tolerance to risk. It is also very important to consider your legal and moral obligations when determining your investment goals. Two basic investment goals are, first, the accumulation of assets and, second, the derivation of income from accumulated assets (Steinberg, 2000: 99). Examples of investment goals are to expand your pension fund, to earn a return that is higher than the cost of the investment to meet daily obligations and to meet moral obligations such as paying for the education of a family member.

The second step is to establish policy guidelines to satisfy the investment objectives. Setting policy begins with the asset allocation decision. That is, the investor needs to decide how funds should be distributed among the major classes of assets. The major asset classes typically include stocks, bonds, real estate and foreign securities (Fabozzi, 1995:3). Due to the fact that these investments perform differently depending on economic conditions, a good balance can keep a portfolio strong; that is asset allocation may be the most important form of diversification. Tax implications should also be considered when satisfying investment objectives. For example certain tax-exempt institutions might find tax-free investments unattractive, since these institutions are already exempt from taxes.

The next step consists of selecting a portfolio strategy that is consistent with the objectives and policy guidelines. A portfolio is essentially the sum of all the investors’ different investments (Investorguide.com, 2004). The portfolio strategies can be classified as either active or passive. An active portfolio strategy is the attempt to profit from security
selection, market timing or both. It makes use of available information and forecasting techniques to seek a better performance than a portfolio that is simply diversified broadly. A passive strategy is based on the assumption that the markets are too efficient to permit much success in either selection or timing (Cohen et al., 1987: 587). It involves minimum anticipated input and instead relies on diversification to equal the performance of some market index.

The fourth step involves selecting the specific assets to include in the portfolio. As mentioned above, these assets will probably include stocks, which are investments in individual businesses; bonds, which are investments in debt that are designed to earn interest; and mutual funds, which are essentially pools of money from many investors that are invested by professionals or according to indices. It is during this step that an attempt is made to construct an efficient portfolio. An efficient portfolio is one that provides the greatest expected return for a given level of risk, or equivalently, the lowest risk for a given expected return (Fabozzi, 1995: 4).

The final step consists of measuring the performance of the portfolio and then evaluating that performance relative to some benchmark. A benchmark can be defined as the performance of a predetermined set of securities used as a standard to measure the performance of the portfolio. Typical benchmarks are popular indexes such as the Standard & Poor and the Dow Jones. It should however be noted that this is not really the final step since the investment management process is an ongoing process. Figure 2.1 indicates the five steps discussed above.
2.4 Equity Investments

A company's capital (sources of finance) is either debt or equity. Equity represents ownership in a company. Due to the boundaries set within this dissertation, the focus will be placed on equity and more specific on stock, since it represents equity in a company. While there are many different types of debt instruments, there are only two types of stock: common stock and preferred stock (Mayo, 2001: 242). As the name implies, preferred stock has a preferred or superior position whereas common stock represents the final claim on a company's earnings and assets.
2.4.1 Common stocks

Common stocks are also known as equity securities or equities and represent ownership of a company. Therefore common stock represents the residual claim on the assets and earnings of a company. Each share of common stock entitles its owner to one vote on any matters of corporate governance that are put to a vote at the corporation's annual meeting and to a share in the financial benefits of ownership (Bodie et al., 1999: 46). The return from common stock investment comes principally in the form of price appreciation, referred to as capital gains. Another form of return on such an investment is in the form of dividends paid by the company on its stock. However companies are not obliged to pay dividends to common stockholders and in the case of a company that is enjoying rapid growth in sales and earnings, investors would prefer that the earnings be retained in the business to fuel further growth.

The common stock of most large companies can be bought or sold freely on one or more stock exchanges. Certain rights and privileges come with ownership of common stock. The securities laws require a public company to supply its stockholders with timely reports (quarterly and annually) of the company's financial condition and progress (Steinberg, 2000: 27). Shareholders also need to be informed of any significant event that affects the company for example the destruction of a plant or an offer to buy the company. Furthermore any changes within a company's charter must be approved by the shareholders. Lastly, the company's management need to solicit the votes of its shareholders on an annual basis. This solicitation is in the form of a proxy statement, which requests that shareholders vote to approve the continuation of existing management, provides information about the shareholdings of all company officers, directors and other shareholders and discloses the remuneration paid to management (Steinberg, 2000: 27).
The characteristics of common stock are as follows:

- **Residual claim:** this means that the stockholders are the last in line of all those who have a claim on the assets and income of the company. In the case of liquidation or income distribution, the shareholders have a claim to what is left after all other claimants have been paid.

- **Easy transfer:** Ownership can readily be passed from and between individual and corporate owners.

- **Active market:** Due to the fact that ownership is readily transferable, an active and dynamic market generally exists for common stocks.

- **Limited liability:** The most that shareholders can lose in the event of failure of the company is their original investment.

The disadvantage of common stock is that the common stock shareholders are last in line to receive the company's assets. This means that common stock shareholders receive dividend payments only after all preferred shareholders have received their dividend payments and also if the company goes bankrupt they receive whatever assets are left over only after all creditors, bondholders, and preferred shareholders have been paid in full.

### 2.4.2 Preferred Stocks

Preferred stock is another type of equity investment, which first became popular during the 1920's and 1930's as a hybrid form of equity investment possessing some characteristics of common stock and some of bonds (Steinberg, 2000: 30). Therefore preferred stock has features similar to both equity and debt. Preferred stock is an equity investment that usually pays a fixed dividend and while most companies only have one issue of common stock, they may have several issues of preferred stock. If the company should however omit to pay the dividend on preferred stock, the divided is said to be in arrears. This implies that these dividends have to be paid in full before any dividends may be paid to the holders of common stock. This type of preferred stock is known as cumulative preferred stock. There is also non-cumulative preferred stock whose dividends do not accumulate if
it was not paid. The other types of preferred stock are redeemable, participating and finally convertible preferred stock. Unless stated to the contrary, a preferred share is cumulative and non-redeemable (Correia, 1993: 259).

The disadvantages of preferred stock can be summarized as follows:

- While common stock holders can look forward to dividend increases as the financial situation of the company improves and to possible stock dividends or stock splits, preferred stockholders do not enjoy any of the benefits of growth and expansion.
- Preferred stock offers no protection from inflation. If the rate of inflation increases, the real purchasing power of the dividend is diminished. Increased inflation will also lead to higher interest rates, which in turn will diminish the market value of the stock (or any fixed income, long-term security).
- Preferred stock tends to be less marketable than other securities depending on the size of the issue.
- Inferior position of preferred stock to debt obligations. The investor therefore needs to realize that preferred stock is more risky than bonds.

Since preferred shares carry fixed dividend payments, they tend to fluctuate in price far less than common shares (Investorguide.com, 2004). This implies that the opportunity for both large capital gains and capital losses is limited. Preferred shares are common in private companies, where it is more useful to distinguish between the control of and the economic interest in the company (Wikipedia, 2004).

2.5 Characterizing Stocks investments

Stocks can be classified into many different categories. The most fundamental categories of stock are common stock and preferred stock, which differ in the rights that it confers upon its owners as discussed above. But stocks can also be classified according to a number of other criteria, including the growth of the company, the value of the stocks itself, the country that the company is headquartered in and finally the industry sector.
The first way of characterizing stocks is according to the market capitalization of the company. The market capitalization of a company represents the total financial value of the company's outstanding shares (Investorguide.com, 2004). This is equal to the market price of a company's stock multiplied by the number of shares that are outstanding. Market capitalization is considered a measure of the company's size. There are three basic categories of market capitalization namely large cap, mid cap and small cap. The stock of small companies that have the potential to grow rapidly is classified as small-cap stock. The price of and rate of return on this type of stock is normally more volatile and their behaviour is more difficult to predict. Small-cap stocks are popular among investors that are looking for growth, do not need current dividends and can tolerate price volatility (Ameritrade, 2003). Mid-cap stocks are typically stocks of medium-sized companies that offer growth potential with some of the stability of a larger company. Large-cap stocks typically belong to large companies such as Sasol and Anglo American Platinum Corporation Limited that are large, established companies. It is not expected that large companies will grow as rapidly as smaller companies but pay relatively more in dividends than small- and mid-cap stocks.

Shares are often grouped into different sectors depending upon the company's business. Standard & Poor breaks the market into eleven different sectors. Examples of these sectors are transportation, technology, health care, financial, energy and consumer cyclicals.

Classification can also be done according to how companies react to business cycles (Investorguide.com, 2004). Cyclical shares are shares of companies whose profits move up and down according to the business cycle. Cyclical companies have a tendency to produce products or provide services that are in lower demand during slumps in the economy and higher demand during upswings. The automobile and steel industries are typical examples of cyclical businesses. Defensive shares are the opposite of cyclical shares, since they tend to do well during poor economic conditions. These shares are typically issued by companies whose services and products enjoy a steady demand. Typical examples are food and utilities shares.
2.6 Portfolio strategy

Investors have the opportunity to participate in share markets with varying degrees of activity. Choices need to be made by the investors regarding the time and effort devoted to portfolio management, the degree and nature of analysis of individual shares or groups of shares and the process of portfolio choice based on the results of this analysis (Jacob & Pettit, 1988: 647). There are two portfolio management strategies based on the degree of active participation, namely active and passive management strategies.

2.6.1 Active Portfolio strategy

Active portfolio management portrays what most investment professionals do to earn their living. Active portfolio management is an attempt to profit from security selection, market timing or both (Cohen et al., 1987: 586). It uses available information and forecasting techniques to seek a better performance, than a portfolio that is simply diversified broadly. Indispensable to all active strategies are expectations about the factors that could have an effect on the performance of an asset class. Active portfolio strategies generally require frequent buying and selling of securities and will therefore have a higher portfolio turnover rate (Fabozzi, 1995: 177). Active portfolio management requires either (Cohen et al., 1987: 587):

a) Concentration in a fairly small number of issues with continuous reassessment of alternatives (the emphasis being on selection)

b) Moving in and out of well-diversified portfolios (the emphasis being on timing).

2.6.2 Passive Portfolio strategy

A passive portfolio strategy involves minimal anticipated input, and instead relies on diversification to match the performance of some market index (Fabozzi, 1995: 4). In effect, a passive strategy assumes that the marketplace will reflect all accessible information in the price paid for shares. This strategy aims only at establishing a
well diversified portfolio of shares without attempting to find under- or overvalued shares. Passive portfolio strategies typically require less frequent portfolio transactions (buy-and-hold strategy) and therefore will have a low portfolio turnover (Fabozzi, 1995:177).

Passive portfolios are characterized by (Cohen et al., 1987: 587):

a) Very low turnover – minimum transaction costs
b) Reduced management expenses
c) Low levels of specific risk.

The following diagram, Figure 2.2, represents the trade-off between active and passive portfolio management. It is important to note that any strategy that attempts to capture benefits only from market mispricing must depend on a proportionally greater investment in the "undervalued" set of shares. This could however lead to greater exposure to the possibility of investing in a portfolio that will perform inferior to a passively managed portfolio.

Figure 2.2: The two basic Portfolio Management Styles

Source: (Jacob & Pettit, 1998: 649)
2.7 Investment risk

At present probably the major impediment to private investment is the perceived high level of risk (Collier & Pattillo, 2000: 27). Investment risk comes in many forms and each can be used as a tool in pursuing financial goals. Risk can be defined as the possibility of loss or the uncertainty that the anticipated return will not be achieved (Mayo, 2001: 181). If there were no uncertainty, there would be no risk, but that is not possible in the real world. Risk can be assessed by tracking the volatility of a given investment. Volatility is simply the tendency of the value of the investment to change. The more volatile the investment, the more risky it is. The key to dealing with investment risk is learning how to recognize it and manage the risks identified.

2.7.1 Types of investment risks

2.7.1.1 Non-diversifiable risk (Systematic risk)

a. Market risk

Market risk is the likelihood that the value of a security will move in tandem with its overall market (AXA Advisors, 2003). For example, if the stock market is experiencing a decline, the stock mutual funds in an investment portfolio may decline as well. The most common strategies for dealing with market risks are to invest only funds not needed for normal day-to-day expenses, to take a long-term approach toward investment and to diversify investments over a number of asset categories.

b. Inflation risk

It is the risk that the value of a portfolio will erode by a decline in the purchasing power of the investor’s savings, as a result of inflation. This risk needs to be considered when evaluating investments such as bonds, bond
funds and money market funds as long term investments. This risk implies that while an investment may post gains over time, it may actually be losing value if it does not at least keep pace with the rate of inflation (AXA Advisors, 2003). Typical strategies during periods of inflation are to place assets in the stock market to keep up with inflation and investments in tangible assets such as art, diamonds, gold and real estate (Steinberg, 2000: 11).

c. Credit risk

Credit risk is the possibility that the issuer of a bond or other debt instrument may be unable to meet its contractual obligation and will default on the payment of interest and the repayment of principal (Steinberg, 2000: 12).

d. Liquidity risk

This type of risk entails the basic free market concept that an item is worth only what someone is willing to pay for it (Steinberg, 2000:12). This means that the seller of an investment may suffer a loss simply because there is no active demand for that investment at the time of selling the stock. This risk can be avoided by investing in active markets, such as large capitalization stocks.

e. Interest rate risk

This risk is most often associated with fixed-income investments and is the risk that the price of a bond or the price of a bond fund will fall with rising interest rates. This risk can be reduced by diversifying the durations of the fixed-income investments that are held at a given time (Investorguide.com, 2004).
f. Exchange rate risk

Exchange rate risk is the risk of loss from changes in the value of foreign currencies (Mayo, 2001: 183). This is currently very applicable to South Africa due to the fluctuations within the Rand. If the Rand value of a foreign currency raises, the return from the investment increases when converted back to Rand. However, if the value of the foreign currency falls, the return from the investment is reduced when converted back to Rand.

2.7.1.2 Diversifiable risk (Unsystematic risk)

Diversifiable risk refers to the risk associated with individual events that affect a particular asset. It is therefore the firm-specific risk that is reduced through the construction of diversified portfolios and its sources are business risk and financial risk (Mayo, 2001: 181). Business risk refers to the risk associated with the nature of a business. Financial risk is associated with the types of financing used by the company to acquire assets. For example, the business risk of industrial companies depends on factors such as the cost of raw materials, the capacity of manufacturing plants and changes in demand. The financial risk associated with industrial companies depends on how it finances new plants and equipment. Since business risk and financial risk are company specific they are unsystematic or diversifiable risk and can be reduced by constructing a diversified portfolio because not all companies experience problems at the same time. How diversification reduces unsystematic risk for portfolios can be illustrated with a graph (Fabozzi, 1995: 88). Figure 2.3 indicates that the company specific risk of an individual stock can be eliminated if the stock is held in a reasonably well-diversified portfolio and essentially all that is left is systematic risk. Some risk always remains, however, so it is virtually impossible to diversify away the effects of broad stock market movements that affect almost all stocks (Brigham & Ehrhardt, 2002: 218).
2.7.2 Measuring investment risks

2.7.2.1 Beta

The unique risk attached to each share is diversified away when a portfolio of shares is held (Moran, 1997:198). Thus the risk attached to a well-diversified portfolio depends on the combined weighted market risk of the shares in that portfolio. The risk of a portfolio is measured by the variability of possible returns – the greater the variety of possible returns, the greater the risk. In statistical terms, risk is expressed in terms of standard deviation and variance. The sensitivity of a portfolio (stocks’ return) to market movements is usually called its beta. (The beta reflects the variability of possible returns...
compared to the variability of possible returns of the market. The variability of the market returns is called the movement of the market.

The beta of a specific share can be calculated by running a regression with returns on the share in question plotted on the Y axis and returns on the market portfolio plotted on the X axis. The slope of the regression line, which measures relative volatility, is then defined as the share’s beta coefficient, or $b$. This value for beta can be found using a calculator with a regression function or a spreadsheet program. In practice analysts typically use four to five years’ of monthly returns to establish the regression line, but some also uses 52 weeks of weekly returns. The beta can be interpreted as follows (Brigham & Ehrhardt, 2002: 221):

1. If $b = 1.0$, stock has average risk.
2. If $b > 1.0$, stock is riskier than average.
3. If $b < 1.0$, stock is less risky than average.

2.7.2.2 Standard Deviation

Standard deviation is a statistical measurement that shows the likelihood of above or below average returns, as well as their distance from the average return (Wachovia, 2004). The standard deviation thus emphasizes the extent to which the return differs from the average or expected return and it measures the dispersion around an average value. When applied to investments it considers an average return and the extent to which individual returns deviate from the average. If there is a small difference between the average return and the individual return, the dispersion will be small; however, if the difference is large the dispersion will be large. The larger the dispersion the greater the risk associated with the investment.
The equation for calculating the standard deviation of a probability distribution is as follows (Brigham & Ehrhardt, 2002:203):

1. Calculate the expected rate of return:
   
   \[
   \text{Expected rate of return } = \hat{k} = \sum_{i=1}^{n} k_i P_i
   \]

2. Subtract the expected rate of return from each possible outcome \( (k_i) \) to obtain a set of deviations from \( \hat{k} \):
   
   \[
   \text{Deviation } = k_i - \hat{k}
   \]

3. Square each deviation, then multiply the result by the probability of occurrence for its related outcome and then sum these products to obtain the variance of the probability distribution:
   
   \[
   \text{Variance } = \sigma^2 = \sum_{i=1}^{n} (k_i - \hat{k})^2 P_i \sigma
   \]

4. Finally, find the square root of the variance to obtain the standard deviation:
   
   \[
   \text{Standard deviation } = \sqrt{\sum_{i=1}^{n} (k_i - \hat{k})^2 P_i}
   \]

**2.7.2.3 The coefficient of variation**

When choosing between two investments that have the same expected returns but different standard deviations, most investors would choose the investment with the lower standard deviation (i.e. the lower risk) and similarly if the two investments had the same risk but different expected returns, investors would prefer the investment with the higher return. This however becomes more difficult if investors have to choose between two investments where one has the higher expected return and the other the lower standard deviation.
The answer to this is by using the coefficient of variation (CV) and it is calculated by dividing the standard deviation by the expected return of the share as follows ((Brigham & Ehrhardt, 2002:209):

\[ \text{Coefficient of variation} = CV = \frac{\sigma}{k} \]

Therefore, if the expected returns and or the standard deviations on two alternative investments differ, the coefficient of variation can be used to compare the alternatives since it shows the risk per unit of return.

2.7.3 Investment choices based on the needs of the investor

There are two important points to consider when deciding how much risk to take namely the time horizon and the investor's bankroll. The time horizon is important since investors need to determine the investment period. The riskier an investment is, the greater its volatility or price fluctuations. Therefore if the investment time horizon is relatively short, the investor may be forced to sell at a significant loss. With a longer time horizon, investors have more time to recoup any possible losses and are therefore theoretically more tolerant to higher risks (Investopedia.com, 2004).

The bankroll is important, since it indicates the amount of money that can be lost. By investing money that the investor can afford to lose or afford to have unavailable for some period of time, will relieve the pressured to sell any investments due to panic or a liquidity crisis.

After deciding on the amount of risk acceptable, the investor needs to decide how to balance their assets. The following pyramid, Figure 2.4, indicates the various types of investments and the risk associated with each. This pyramid can be used to diversify the portfolio investments according to the risk profile of each security. The pyramid has three distinct tiers namely the base of the pyramid that represents the largest portion and is comprised of investments that are low in risk and have
predictable returns. The middle portion is made up of medium risk investments that offer a stable return while still allowing for capital appreciation. The summit is reserved for high-risk investments and within an investment portfolio it should be made up of money that can be lost without serious repercussions. When compiling an investment portfolio this pyramid is useful to spread the risk and compile a well diversified portfolio. The more risk adverse investor can increase the size of the base of the pyramid and for the more riskier investor the size of the summit can be increased.

Figure 2.4: Risk Pyramid

Source: (Investopedia.com, 2003)
2.7.4 Tactics for managing risk

1. Diversification

According to Pike and Neale (2003:309) diversification is a strategic device for dealing with risk. Modern Portfolio Theory suggests that putting our eggs in a variety of baskets can reduce overall risks, even if the baskets themselves are risky (Wachovia, 2004). The goal of diversification is to reduce the risk involved in building a portfolio. Volatility is limited by the fact that not all asset classes or industries or individual companies move up and down in value at the same time or at the same rate (Investorguide.com, 2004).

2. Appropriate asset allocation

This refers to how an investor’s portfolio is spread among different types of investments, such as shares, bonds and money market investments.

3. Weathering market fluctuations

Staying invested through periods of market turbulence can also help to manage risk of loss as the variability of returns tends to decrease over time (AXA Advisors, 2003).

4. Buy stocks individually or grouped in mutual funds

Investors can purchase shares directly or can purchase mutual funds or annuities which may invest in individual stocks. It is believed that the stock market can be best assessed by purchasing shares of mutual funds that invest in shares. Mutual funds provide the potential advantage of professional money management, diversification, and liquidity. These advantages are particularly apparent when investing in international and emerging market shares.
2.8 Analysis

There are two basic approaches to analyzing the stock market, namely fundamental analysis and technical analysis. The fundamental analyst concentrates on the underlying causes of price movements, while the technical analyst studies the price movements themselves. The common thread between technical and fundamental analysis is the study of trends. Where technical analysis is the study of trends in price and volume, fundamental analysis concerns itself with economic and corporate growth trends and the projection of performance based on trends of relevant factors.

2.8.1 Fundamental analysis

Fundamental analysis is a method used to determine the value of a share by analysing the financial data that is ‘fundamental’ to the company (Investorguide.com, 2004). Therefore fundamental company analysis takes into account only those variables that are directly related to the company itself, such as its earnings, its dividends and its sales. Fundamental analysis does not consider the overall state of the market nor does include behavioural variables in its methodology. Ultimately, it represents an attempt to determine the present discounted value of all the payments a shareholder will receive from each share of stock. If that value exceeds the stock price, the fundamental analyst would recommend purchasing the stock (Bodie et al., 1999: 336). It is generally used to discover an appropriate stock and studies the causes of price movements.

The late Benjamin Graham, credited by Warren Buffett, Peter Lynch and other disciples as the most influential proponent of fundamental investing, stated in this seminal work The Intelligent Investor that “the habit of relating what is paid to what is being offered is an invaluable trait in investing” (Steinberg, 2000: 162).
According to Investorguide.com (2004) some of the valuation measures are:

1. **Earnings** – Earnings are important to investors since it gives an indication of the company’s expected dividends and its potential for growth and capital appreciation.

2. **Earnings per share (EPS)** – In order to make earnings comparisons useful across companies it is necessary to look at a company’s earnings per share. EPS is calculated by dividing a company’s net earnings by the number of outstanding shares the company has.

3. **Price/Earnings Ratio** – This gives an indication of how much the market is willing to pay for a company’s earnings (that is how the market values the stock).

4. **Projected Earnings Growth (PEG)** – This ratio takes into consideration a share’s projected earnings growth. It is calculated as Price/Earnings ratio divided by expected percentage earnings growth for the next year.

5. **Dividend Yield** – The dividend yield measures what percentage return a company pays out to its shareholders in the form of dividends. It is calculated by taking the amount of dividends paid per share over the course of a year and dividing it by the share’s price.

6. **Dividend Payout Ratio** – The dividend payout ratio indicates what percentage of a company’s earnings it is paying out to investors in the form of dividends. It is calculated by taking the company’s annual dividends per share and dividing it by annual earnings per share.

7. **Book Value** – The book value of a company is the company’s net worth, as measured by its total assets minus its total liabilities. This indicates how much assets the company would have left over if it went out of business immediately.

8. **Price/Book Ratio** – A company’s price-to-book ratio is calculated by dividing a company’s per share stock price by the company’s book value per share. This ratio is of more interest to value investors than growth investors.

9. **Price/Sales Ratio** – The price/sales ratio is calculated by dividing the share’s current price by the company’s total sales per share for the past year.
Price/Sales ratios are usually used only for unprofitable companies, since such companies do not have a Price/Earnings ratio.

10. Return on Equity (ROE) — Return on equity indicates how much profit a company generates for the suppliers of owners equity.

It should however be noted that these are not the only valuation measures, since it is important to consider if the company is in a growth stage or if it is a company whose assets significantly exceeds their liabilities (asset play). These types of classifications indicate whether more attention should be given to the balance sheet or the income statement and which numerical ratios have the most significance for the company. Therefore it is important to look at the various valuation measures as being interdependent variables that need to be considered holistically.

2.8.2 Technical analysis

Technical analysis is essentially the search for recurrent and predictable patterns in stock prices (Bodie et al., 1999: 331). It uses an assortment of charts and calculations to spot trends in the market and individual stocks and tries to predict what will happen in the future. Technical analysis is also called charting since it is essentially the charting of actual price changes as they occur (Steinberg, 2000: 192). Technical analysis assumes that market psychology influences trading in a way that permits them to predict when a stock will rise or fall. Charting can be used for at least three purposes (Steinberg, 2000: 193):

- **Price Forecasting** - The technician can project price movements either in tandem with a fundamental approach or solely on the basis of charted movements.
- **Market Timing** - Chart analysis is much better suited than the fundamental approach for determining exactly when to buy and sell.
- **Leading Indicator** - If market action discounts all influences on it, then price movement may be considered as a leading indicator.
Some of the different quantitative metrics that are used by technical analysts are (Investorguide.com, 2004):

1. Moving Averages – A moving average is an average of closing prices over a certain number of days (Steinberg, 2000: 211). Moving averages are used as a trend-tracking tool since it is used to create charts that show whether or not a share's price is trending up or down.

2. Relative Strength – Relative strength is used in order to compare the price performance of one share to the entire market. The relative strength of a share is calculated by dividing the percentage price change of a stock by a set period of time and then it is ranked on a scale of 1 to 100 against all other stocks on the market.

3. Charts – Charts are the primary tool that can be used for technical analysis to plot data and envisage prices. The different types of charts that can be used are line charts, bar charts, point and figure charts, etc.

4. Volume – Not all technical analysts focus exclusively on price, since many of them believe that volume is often a better indicator of the future price of a certain stock. Volume is simply the number of shares of a stock that are traded over a particular period of time (Investorguide.com, 2003).
2.9 Finance theory

Finance theory as a subject for serious academic study in its own right is relatively new, having grown out of applied economics over the last few years. Economists have long been aware of the basic economic function of credit markets but they were not keen on analysing it much further than that (Cepa Newschool, 2001). Due to this, early ideas about financial markets were mainly intuitive and mostly devised by practitioners. Finance theory fulfils a very useful conceptual role in providing an analytical framework with which to dissect and understand actual finance transactions. It is important to remember that no financial theory claims to be able to predict the "actual value" for any particular share at a particular point in time. Yet this is the critical requirement for the practising investment analyst.

2.9.1 Portfolio theory

Portfolio theory tells investors how they should go about putting together their portfolios of assets (Wärneryd, 2001: 14). Portfolio theory deals with the selection of portfolios that maximize expected returns consistent with individually acceptable levels of risk (Fabozzi, 1995: 58). With the used of quantitative models and historical information, portfolio theory defines "expected portfolio returns" as well as "satisfactory levels of portfolio risk", and shows how to compose an optimal portfolio.

2.9.1.1 Markowitz - "The Efficient Frontier"

The basic elements of modern portfolio theory emanate from a series of propositions relating to rational investor behaviour set forth by Dr. Harry M. Markowitz in 1952. In the Markowitz portfolio theory, it is assumed that investors make investment decisions based on two parameters, the expected return and the variance of returns (Fabozzi, 1995: 81). Prior to Markowitz's portfolio theory several economists had pointed to the need for diversification in investment ("do not put all your eggs in one basket").
By using the portfolio theory it is possible to reduce the risk associated with a combination of any potential investment by more than the return is reduced; clearly achieving this should increase investor value.

The first step is to determine the risk-return opportunities available to the investor. These can be summarized by the minimum-variance frontier of risky assets. The minimum-variance frontier is a graph of the least possible portfolio variance that can be obtained for a given portfolio expected return. The minimum-variance portfolio for any targeted expected return can be calculated given the set of data for expected returns, variances and covariances. This is diagrammatically illustrated in Figure 2.5. As there are many efficient portfolios for any given range of investments, the final choice appears to depend on the investors’ risk appetite.

Figure 2.5: The minimum-variance frontier of risky assets

Source: (Bodie et al., 1999: 218)
All the portfolios that lie on the minimum-variance frontier from the global minimum variance portfolio and upwards, provide the optimal risk-return combinations and thus are entrants of the optimal portfolio (Bodie et al., 1999: 218). The efficient frontier is thus the part of the frontier that lies above the global minimum variance portfolio and it represents the best return for any given level of risk. The bottom part of the minimum-variance frontier is inefficient, since there is a portfolio with the same standard deviation and a greater expected return situated directly above it.

The theory using efficient portfolios goes one step further by establishing the ability for the investor to lend or borrow funds at the risk-free rate. This additional principle permits the investor now to achieve any optimal desired position, by simply investing in one efficient share portfolio and either lending or borrowing the balancing funds.

Diagrammatically this is displayed in Figure 2.6 which indicated that the optimal line (capital allocation line (CAL)) is drawn through the risk-free intercept and is tangential to the efficient portfolio curve. This line is established by searching for the capital allocation line with the highest reward-to-variability ratio. This capital allocation line dominates all alternative feasible lines and therefore portfolio P is the optimal risky portfolio.
Figure 2.6: The efficient frontier of risky assets with the optimal capital allocation line.

Source: (Bodie et al., 1999:218)

The beauty of this is that it implies that investors can achieve their best financial position by holding a mixture of their optimal investment portfolio and risk-free assets or a higher proportion of the same investment portfolio with borrowings to finance this extra investment in shares. This implies that it is not necessary for a risk-averse investor to focus entirely on low risk shares or for the high risk taker to focus only on high volatility shares.
2.9.1.2 Capital Asset Pricing Model (CAPM)

The Capital Asset Pricing Model (CAPM), which was originally based on the works of Sharp (1964) and Lintner (1965), rests on the basic assumption of perfect competition rather than on market-efficiency theory (Wärneryd, 2001: 22). The CAPM shows how rational investors should combine risky assets with a given distribution of returns. The model is based on the following important assumptions (Wärneryd, 2001: 23):

1. All assets can be freely traded.
2. Investors operate over a one-period planning horizon.
3. Investors can hold long or short positions in all assets.
4. Investors are indifferent between any two portfolios with identical means and variances.
5. A riskless asset exists.

The CAPM enumerates the relationship between risk and return that is used either to value an asset or to judge an asset's expected return. While the model may be applied to any type of investment, it is usually explained in terms of acquiring common stock. The CAPM builds on the proposition that additional risk requires a higher return. This return has two components: (1) what may be earned on a risk-free asset, such as a federally insured savings account or a Treasury bill, plus (2) a premium for bearing risk (Mayo, 2001: 201). Since unsystematic risk is reduced through diversification, a stock's risk premium is the added return required to bear the non-diversifiable or systematic risk associated with a stock. This risk-adjusted required return \(k\) is expressed by the following equation (Mayo, 2001: 201):

\[
k = \text{risk-free rate} + \text{risk premium}
\]
The risk premium consists of two components:

1. The added return that investing in securities in general offers above the risk-free rate. This is measured by the difference between the expected return on the market \( (r_m) \) and the risk-free rate \( (r_f) \). This differential \( (r_m - r_f) \) is the risk premium that is required to induce the individual to purchase risky assets (Mayo, 2001: 202).

2. The volatility of the particular security relative to the market as a whole. The volatility of the individual stock is measured by the beta coefficient \( (\beta) \).

Thus the required return is represented by the following formula:

\[
k = r_f + (r_m - r_f) \beta
\]

The culmination of the sequence of conceptual building blocks is CAPM's risk/expected return relationship. This risk/expected return relationship is called the security market line (SML). This is graphically illustrated in Figure 2.7 below. In the freely competitive markets described by CAPM, no share can sell for long at prices low enough to yield more than its appropriate return on the SML. The share would then be very attractive and investors will bid its price up until its expected return fell to the appropriate position on the SML or conversely, investors would sell off any share selling at a price high enough to put its expected return below its appropriate position (Crane, 1983: 282). This reduction in price would continue until the shares' expected return rose to the level justified by its systematic risk.
Figure 2.7: The Security Market Line.

Source: (Crane, 1983: 282)

The primary conclusion of CAPM is this: The relevant risk of an individual stock is its contribution to the risk of a well-diversified portfolio (Brigham & Ehrhardt, 2002: 218). Thus if CAPM correctly describes the market behaviour, the relevant measure of a share's risk is its systematic risk measured by beta. If a share's return bears a high beta, it will be priced to yield a high expected return; if it has a low beta, it will be priced to yield a low expected return. Due to the fact that unsystematic risk can be easily eliminated through diversification, it does not influence a share's expected return. According to the CAPM model, financial markets care only about systematic risk and price shares such that expected returns lie along the security market line.
2.9.1.3 Arbitrage Pricing Theory (APT)

The arbitrage pricing model was developed by Stephen Ross (1976) as a means of identifying the equilibrium returns that would be offered by securities that are influenced by a number of macro factors. Arbitrage can be defined as a term to denote actions that are risk-free and require no investment to capitalize on a market imperfection (Jacob & Pettit, 1988:296). Another definition found in the literature is that arbitrage is the simultaneous buying and selling of a security at two different prices in two different markets and therefore the arbitrageur profits without risk by buying in one market and simultaneously selling at the higher price in the other market (Fabozzi, 1995: 108). The arbitrage pricing theory model suggests that a share’s expected return is influenced by a variety of factors, contradictory to just the single market index of the CAPM.

According to Fabozzi (1995: 113) the advantages of the APT are:

1. It makes less restrictive assumptions about investor preference toward risk and return compared to CAPM that assumes investors trade off between risk and return solely on the basis of the expected returns and standard deviations of prospective investments.

2. No assumptions are made about the distribution of security returns.

3. Due to the fact that APT does not rely on the identification of the true market portfolio, the theory is potentially testable.

The disadvantage of the APT is that it does not identify the number of factors nor what the specific factors are that influence returns. However, the factors can be determined by an intricate statistical procedure called factor analysis, but unfortunately the results of such an analysis are not easily interpreted and therefore do not provide significant insights into the underlying economic determinants of risk. The APT is in an early stage of development and there are still many unanswered questions, nevertheless, the basic premise of the APT – that returns can be a function of several factors rather than just one, has considerable intuitive appeal (Brigham & Ehrhardt, 2002: 275).
2.9.2 Efficient Markets Hypothesis (EMH)

A body of theory called the Efficient Markets Hypothesis according to Brigham & Ehrhardt, (2002: 399) holds that:

1. That stocks are always in equilibrium and
2. That it is impossible for an investor to consistently “beat the market”.

In effect these two points says that it is impossible for ordinary investors using publicly available information to out-perform the market index, except by chance and that share prices correctly measure the current value of a firm’s future earnings and dividends. This controversial theory also suggests that analysing stocks is a waste of time because all available information is reflected in current prices. Those who adhere to this theory claim, only partly in jest, that investment professionals could throw darts at a page of stock quotes and pick winners just as successfully as a seasoned financial analyst who spent hours poring over the latest annual report or quarterly statement (Hagstrom, 1997:1).

There are three versions of the EMH namely the weak, semi-strong and strong forms. These versions differ by their notions of what is meant by the term “all available information” (Bodie et al., 1999: 330). The weak form hypothesis holds that share prices already reflect all information that can be derived by studying market trading figures such as the history of past prices, trading volume, or short interest. This version of the EMH thus implies that trend analysis is fruitless, since all the information is costless publicly available and if this information ever conveyed reliable signals about future performance, all investors would have learned already to exploit the signals. Ultimately, the signals lose their value as they become widely known because a buy signal, for instance, would result in an immediate price increase (Bodie et al., 1999: 331).

The semi-strong form of the hypothesis states that all publicly available information regarding the prospects of a firm must be reflected already in the share price (Bodie et al., 1999: 331). Examples of such information are fundamental data on the
company's product line, management quality, balance sheet make-up and accounting practices. As above, if this information is publicly available to any investor, it is expected that it would be reflected in share prices.

The strong form of the hypothesis states that share prices reflect all information pertinent to the company including insider information. This version is quite extreme. There are also few arguments regarding the proposition, that company employees have access to important information in advance to public release, to enable them to profit from trading on that information. However, trading on inside information is regarded as a violation of the law. The result of this form of the hypothesis is that it is impossible for any investor to consistently outperform the market.

2.9.3 Random Walk

This theory was advocated by French Mathematician Louis Bachelier in 1900 which claims that market prices follow a random path up and down, without any influence by past price movements, making it impossible to predict with accuracy which direction the market will move at any point (ADVFN Financial Glossary, 1999). According to the theory, share prices reflect reactions of the market to information being fed into the market completely randomly. In short, the random walk theory states that shares take a random and unpredictable path.

The random walk hypothesis of stock price movements is based on the assumption that the trading mechanism for stocks represents an efficient marketplace (Cohen, 1987: 144). The market is therefore characterized by the presence of a large number of rational, profit-seeking, risk-averting investors who compete freely with each other in their efforts to predict the future value of individual stocks. Significant information that affects the future value of the share is therefore quickly available and as a result this information becomes quickly reflected in the price of the share.
Investors who believe in the random walk theory feel that it is impossible to outperform the market without taking on additional risk and believe that neither fundamental analysis nor technical analysis have any validity. The Random Walk theory is therefore diametrically opposed to technical analysis since the theoretical underpinning of technical analysis is that markets react in a consistent way to share price movements.
CHAPTER 3

BENJAMIN GRAHAM

"It is far better to buy a wonderful company at a fair price than a fair company at a wonderful price." – Warren Buffett

3.1 Introduction

The previous chapter discussed fundamental theory regarding investments and build the foundation for the following two chapters focusing on specific investors and their investment philosophies. This chapter focuses on the specific investment philosophy of one of the great investors, Benjamin Graham. The reason for this chapter is that Warren Buffett can not be studied without referring to a major influence in his life namely his mentor Benjamin Graham. Benjamin Graham is researched within this section with emphasis being placed on how he started his very successful career and what he regarded as important and essential when investing.

Warren Buffett has attributed much of his success to the investment philosophy of the legendary Wall Street analyst Benjamin Graham. As a young man, Buffett was Benjamin Graham's student at Columbia University and he was so impressed by Graham that he offered to work for him for free, but Benjamin turned him down. Warren Buffett however did work for Benjamin Graham later on and he developed great respect for him. In an introduction to Graham's continuing best-seller, The Intelligent Investor, Warren Buffett says that Graham, more than anyone except Warren's father, influenced his life (Warren Buffett Secrets, 2004).
3.2 Biography

Benjamin Graham was born Benjamin Grossbaum in London in 1894 and his family immigrated to America when he was a year old. Benjamin's father was a dealer in china dishes and figurines. Benjamin Graham's father died in 1903 not long after they moved to America and his mother lost the family savings in 1907 during an economic crisis (Warren Buffett Secrets, 2004). His mother tried to boost the family income through risky investment strategies, but the result was disappointing and distressing. Although poor, Graham had a good education and was exceptionally bright. Graham managed to win a scholarship at Columbia University and although offered a teaching post there after graduation, took a job as a chalker on Wall Street with Newburger, Henderson and Loeb. His talent quickly came to the fore and his progress was rapid and even spectacular (Arnold, 2002: 60). Before long his natural intelligence won out when he began doing financial research for the firm and he became a partner in the firm, earning over $500,000 a year (Warren Buffett Secrets, 2004).

On 1 January 1926, the Benjamin Graham Joint Account was established as a private investment organisation. Investors put in $400,000 at the beginning. Graham was later joined by Jerry Newman at the end of 1926. Each year new friends were keen to place funds in the account so that by 1929 Graham and Newman were managing a fund of some $2.5 million (Arnold, 2002: 61). According to Arnold (2002: 61) Graham had all the required qualities of an excellent teacher such as being logical, witty and engaging. Graham put those skills to practice by teaching a course called Security Analysis as a part-time assistant professor in the School of Business in Columbia starting 1927. This teaching career of his lasted for more than 40 years and included professorships with various titles at Columbia, the New York Institute of Finance and UCLA.

The Crash of 1929 almost wiped Benjamin Graham out but the partnership survived with the assistance of friends and the sale of most of the partners' personal assets (Warren Buffett Secrets, 2004). Benjamin Graham survived and thrived in the aftermath of the crash, harvesting bargains from the wreckage of the bull market. There is no exact record of Graham's earliest returns, but from 1936 until he retired in 1956, his Graham-Newman
Corporation gained at least 14.7% annually versus 12.2% for the stock market as a whole – one of the best long term track records on Wall Street history (Graham & Zweig, 2003, xii).

In 1934, Benjamin Graham together with David Dodd, another Columbia academic, published the classic Security Analysis which has never been out of print. Within this book, Benjamin Graham and David Dodd introduced the concept of "intrinsic value" and the wisdom of buying stocks at a discount to that value. In 1949, Benjamin Graham wrote The Intelligent Investor, considered the Bible of value investing and too has never been out of print (Warren Buffett Secrets, 2004). Benjamin Graham died in 1976 with the reputation of being the "Father of Security Analysis”.

3.3 Investment Principles

In the summation of The Intelligent Investor Benjamin Graham wrote, “Investing is most intelligent when it is most businesslike.” These words are, Buffett says, “the nine most important words ever written about investing” (Hagstrom, 1995: 97).

According to Graham & Zweig (2003: xi) Benjamin Graham was not only one of the best investors who ever lived, but he was also one of the greatest practical thinkers of all time. Benjamin Graham was a conservative in his financial teachings and introduced the concept of looking at share investments as buying a share in a business, rather than as a stand-alone investment. During the Great Depression, Graham developed a unique approach to investment. Benjamin Graham tried to establish the difference between an investment and a mere speculation. The conclusion of Benjamin Graham’s ruminations according to Arnold (2002:62) led him to reject the common idea that the difference lies in the type of financial instrument purchased or the length of time a security is held, but Benjamin Graham rather believed that it lied within the mind of the individual making the investment. The speculator’s primary concern is with anticipating and profiting from market fluctuations, where as from an investment perspective it should be based upon thorough analysis and it should promise safety of principal and satisfactory return. Figure 3.1 indicates the key features of an investment operation according to Benjamin Graham.
The first requirement is thorough analysis by which is meant studying the facts. Benjamin Graham believed that market perceptions or inefficiencies created opportunities of under valuation, usually caused by currently disappointing results, protracted neglect or unpopularity, or the market's failure to recognize a company's true earnings or asset picture. It is therefore emphasized that the investment should be considered as being part of a private business and this business-like approach would consider the asset values being offered, the strength of the financial resources as well as the earnings potential. The investor needs to become knowledgeable about the business or businesses carried on by the company that was identified as an investment opportunity. This includes knowing what the company sells (their product/s), how it operates, what the competitive environment is and what are the threats and opportunities, the strengths and the weaknesses (Warren Buffett Secrets, 2004). This focus enables an investor to avoid the error of considering only short-term prospects for the movement of the shares.
The second requirement is to determine the intrinsic value of the company or as Benjamin Graham defined it the value of the company to a private owner. It is therefore the price at which a share should sell if properly priced in a normal market. Some time ago intrinsic value was thought to be about the same thing as “book value”, that is equal to the net assets of the business. However this method proved almost worthless according to Graham and Dodd (1940:21) since neither the average earnings nor the average market price evinced any tendency to be governed by the book value. Benjamin Graham therefore proposed that the intrinsic value of a business is determined by its earning power. This is very difficult to establish with any precision (Arnold, 2002:65). Examining past earnings is of some use, but there must be good grounds for believing the trend to be a guide to the future if simple extrapolation is to be used. Despite these difficulties to determine exactly what the intrinsic value of a business is, it is necessary to derive expectations of future earnings in which the investor has confidence. According to Benjamin Graham a precise number is not necessary, since the investor only needs to establish either that the value is adequate (to justify a share purchase) or else that the value is considerably higher or lower than the market price.

The third requirement is to determine the margin of safety. The margin of safety must be well in excess of the price paid, so that even if the bought shares are found to be less attractive than it appeared at the time of analysis it is still possible to obtain a satisfactory return (Steinberg, 2002:66). The margin of safety resides in the discount at which the shares are selling below their minimum intrinsic value, as measured by the investor. The intrinsic value can be calculated differently among different investors. Benjamin Graham acknowledges that calculations may be erroneous or external events may take place to influence the value of the share and that these can not be envisaged. Therefore the investor must have a margin of safety, and inbuilt factor that allows for these possibilities (Warren Buffett Secrets, 2004).

According to Steinberg (2000: 162) Benjamin Graham’s methodology requires a sound intellectual framework for making decisions and the ability to keep emotions from corrupting that framework.
3.4 Mr. Market

Benjamin Graham used an imaginary investor called Mr. Market to demonstrate his point that an intelligent investor chooses investments based on their fundamental value rather than on the views of others or the direction of the markets. According to Graham and Zweig (2003: 213) Benjamin Graham's image of Mr. Market is probably the most brilliant metaphor ever created for explaining how stocks can become mis-priced.

Benjamin Graham explains it as follows: An investor, call him Mr. A, should imagine himself as owning a share in a business. One of the partners called Mr. Market is very obliging indeed. Every day Mr. Market tells the investor what he thinks Mr. A's interest is worth and furthermore offers either to buy Mr. A's share or sell his own at a specific price. His moods can fluctuate anywhere between incredibly optimistic to overwhelming depressive. Sometimes his idea of value appears plausible and justified and sometimes Mr. Market lets his enthusiasm or his fears run away with him and the value that he proposes seems a little short of silly (Graham & Zweig, 2003: 205).

The point that Benjamin Graham wants to make is that Mr. Market's judgement is based on mood swings rather than on rational thoughts and this gives the intelligent investor buying and selling opportunities. Benjamin Graham does not conclude from Mr. Market's wild behaviour that market fluctuations should be ignored, rather that they can be valuable as an indicator that something is going wrong or right with the investment. The point therefore is that the market is there for the investors' convenience and profit and that market valuations are often wrong. Generally an investor will be wiser to form independent stock valuations and then to exploit divergences between those valuations and the market's prices.
3.5 Margin of Safety

The traumatic experience of the boom and bust of the 1920s and 1930s caused Benjamin Graham to place primary emphasis upon protection against unfavourable developments. The value must be well in excess of the price paid, so that even if the bought security is found to be less attractive than it appeared at the time of the analysis it is still possible to obtain a satisfactory return. Benjamin Graham taught investors that this investment policy can be reduced to three simple words: "Margin of Safety" – the price at which a share investment can be bought with minimal downside risk.

This approach lends itself to two possible techniques according to Graham and Dodd (1940: 369) namely to buy at times when the general market is low or to discover undervalued individual common stocks, which presumably are available even when the general market is not particularly low. In both these cases the "margin of safety" resides in the discount at which the stock is selling below its minimum intrinsic value, as measured by the investor. Both these methodologies do have some disadvantages however. The disadvantages of the first approach according to Graham and Dodd (1940: 370) are as follows:

1. Although the general pattern of the market's behaviour may be properly anticipated (since this information is readily available), the specific points for buying and selling might have been badly chosen leading to the investor missing an opportunity at one extreme or the other.

2. There is always a possibility that the character of the market's behaviour may change drastically, so that the scheme of operation that would have worked well in the past, will not be practical any more.

3. Lastly it requires a considerable amount of courage, since it involves buying and selling when the prevalent psychology favours the opposite action. This entails watching one's shares going lower after purchase and higher after sale and often staying out of the market for long periods.
The disadvantage of the second approach is the uncertainty whether or not investments can be successfully carried on in common stocks that appear cheap from the quantitative angle and that, upon study, appear to have average prospects for the future.

The margin of safety concept is the touchstone that distinguishes an investment operation from a speculative one. Speculators persuade themselves that on taking a chance that the odds are in their favour that they are functioning with a margin of safety. However according to Arnold (2002: 66) these claims are implausible because these spectators have not sought out the relevant facts nor used a conclusive line of reasoning, but these spectators' reasoning are based on subjective judgement of future moves in prices. In contrast, investors should base their decisions on experienced reasoning and by making use of statistical data. By following this approach, the margin of safety can be established based on facts rather than relying on opinion. However, Benjamin Graham did acknowledge that good profit opportunity combined with safety occurs seldom in the financial markets (Arnold, 2002:66). Some guidelines according to Benjamin Graham for choosing stocks that have a margin of safety are as follows (Warren Buffett Secrets, 2004):

- Avoiding popular stocks since they are likely to be fully priced.
- Growth stocks should be avoided since it tends to be popular and since it tends to become overpriced in good markets.
- Following rules pertaining to low price/earnings ratios and low price/book value ratios.

Therefore to summarize, Benjamin Graham holds that to have a true investment a true margin of safety needs to be present (Graham & Zweig, 2003: 520). A true margin of safety is one that can be demonstrated by figures, by persuasive reasoning and by reference to a body of actual experience.
3.6 What Benjamin Graham avoids

Benjamin Graham identified six important additional stumbling blocks (Arnold, 2002: 71):

1. Forecasting the economy or the market

Benjamin Graham paid little or no attention to other investor’s attempts to forecast macroeconomic activity or stock market indexes. Benjamin Graham’s results solely relied on the price attractiveness of the shares. The reason for doing this was due to the fact that so many other intelligent and skilful investors with the help of forecasting were trying to buy at the bottom and sell at the top, that their attempts neutralized each other. The net results were that the market already reflected all that these experts can say about the future. There is therefore no reason for any typical investor to believe that more dependable guidance on the market direction can be achieved, than that of countless other investors.

2. Engage in market timing and use technical analysis

All investors are tempted to time the market, since the rewards for being consistently right are enormous (Arnold: 2002: 72). But there is however, no logical ground to believe that any investor can be constantly right. According to Benjamin Graham, market timing leaves no margin of safety, since the investor is either right or wrong and in the case of being wrong a lot of money is lost. This does not however mean that Benjamin Graham automatically dismissed technical analysis, but he rather put forward robust arguments against it, following a thorough examination. For example one of these arguments was that chart reading cannot possibly be regarded as a science, since its rules are not dependable and if it were, it would be easy for all investors to predict prices.
3. Short-term selectivity

Most of the activity of the larger community of investors focused on the company's near-term business prospects. Their reasoning is that if the next 12 months are anticipated to be good, the issue should be bought, since when larger profits are reported, it will be possible to sell at a higher price. According to Arnold (2002: 74) Benjamin Graham had three objections to this approach namely:

- Analysts are imperfect. The forecast of next year's results may be incorrect and the expected profits might not realize.
- Even if the forecast is correct recent market actions may have led to the prospects being reflected in the price already.
- There might be some reason or no reasons for why the price will not move the way it should.

Therefore the short-term selectivity should not be awarded too much weight.

4. Growth Stocks

Benjamin Graham defines a growth stocks as one where the company has preformed better than average for a period of years and are expected to do so in the future (Arnold, 2002: 75). There are difficulties to finding a good investment in growth stocks namely:

- Normally growth stocks are selling at high prices due to their good records and good prospects.
- Most growth stocks are technologically based. Therefore the analyses of the future prospects of such companies are riding on the "coat tails of science" and are fundamentally a qualitative exercise.
- Growth stocks' future earnings are less predictable and less tied to the evidence of the past. Due to this there is no margin of safety.
5. Management

According to Benjamin Graham there are three levels of problems with management for the investor to be wary of. The first is out-and-out deceitfulness and selfishness that should be avoided, since it is impossible to make a quantitative subtraction to allow for unprincipled management. The second level is honesty combined with incompetence, since shareholders can too easily take for granted that management is competent. The third level is where managers are generally honest and competent in managing the business. The problem with them is that everyone is only human and therefore subjected to conflicts of interest.

6. Bubble stocks

There are times of great stock market optimism, when prices leave values far behind and it is times like these that Benjamin Graham experienced frustration and puzzlement. During these times a successful investor needs great strength of character to withstand the temptation to join the market wave. The reason for calling this bubble stocks is that when more and more investors become infatuated with the promised rate of return, the price lifts free from underlying value and is enabled to float abundantly upward creating a bubble that will expand quite beautifully, until finally it has to burst.

3.7 Difficulties of Benjamin Graham’s approaches

There are some serious difficulties with trying to implement a Grahamite investment approach according to Arnold (2002: 100). The first problem results from not fully understanding what Graham was saying or from over-simplifying the technique. It is important to consider the fact that Benjamin Graham’s approach entails a long list of tests for a stock to pass before it is accepted. This long list of tests is also based on the years of experience of Benjamin Graham and can not therefore merely be simplified to formulas claiming to be based on Benjamin Graham’s methods. It also consists of qualitative factors
such as management quality and the competitive position of the industry or firm that will produce merely satisfactory results and not the extraordinary returns that simple criteria value investors are looking for. Implementing a Grahamite investment approach is also hard work. It is important to obtain high quality data and this is not handed to any investor on a plate. The investor needs a good knowledge of accounting to make the necessary adjustments for accounting artifices. Experience and skill are also needed to try uncovering information which has been deliberately concealed.

The second difficulty is that there are certain personal traits necessary to implement Benjamin Graham’s investment approach. Strength of character is a trait that is necessary to resist the temptation to go with the rest of the investors when there are a general state of panic or when investors are irrationally exuberant. Other traits necessary is fortitude and courage to persist when all other investors appear to be doing well and it is necessary to wait for your harvest time.

Thirdly for long periods of time the methods are not applicable, since it will tell the investor to buy few or no shares because the market is at a high level. The fourth difficulty is that Benjamin Graham’s approach of value investing can be dangerous for short-term security buyers, since the strongest “buy” signals occur at times of market recession (Arnold, 2002: 101). These tend to be times of high volatility and the future can not be clearly seen due to depressing near-term news. Furthermore Benjamin Graham’s approach is based on the two assumptions that the market price can be out of line with the intrinsic value and that the disparity will correct itself. This is true for the long-run, but for short-run investing the results may be unsatisfactory.
Chapter 4

Warren Buffett

"You only have to do a very few things right in your life so long as you don't do too many things wrong." – Warren Buffett

4.1 Introduction

The foundation for this chapter was laid within chapter two and chapter three. Chapter two described the investment fundamentals, whereas chapter three discussed Benjamin Graham and his investment philosophy. This chapter focuses on Warren Buffett starting with his biography and ending with a summary of Warren Buffett's investment criteria. Berkshire Hathaway and Charlie Munger are also discussed within this chapter.

4.2 Biography

Warren Edward Buffett was born on 30 August 1930 in Omaha, Nebraska, the son of a stockbroker-turned-Congressman. Warren Buffett displayed an amazing aptitude for both money and business at a very early age. While other children his age were playing and enjoying their childhood, Warren was making money. At only six Warren Buffett purchased six-packs of Coca-Cola from his grandfather’s grocery store for twenty-five cents and resold each of the bottles for a nickel, making a profit of five cents per bottle (About.com, 2004). He was only eight when he started to read his father’s books on the stock market (Arnold, 2002: 152).

When he was eleven years old he would mark up the board at Harris Upham, a New York Stock Exchange firm which was in the same building as his father’s stock brokerage (Buffett-Falk). He would just watch the market movements. Eventually Warren felt confident enough to buy some share and he took his first step into the world of high finance.
and purchased three shares of Cities Service Preferred at $38 per share for both himself and his older sister, Doris. Shortly after purchasing the stock, it fell to just over $27 per share. A frightened but resilient Warren held his shares until they rebounded to $40. Warren promptly sold the shares – a mistake he would soon come to regret. Cities Service shot up to $200 per share (About.com, 2004). He learned two lessons from this investment namely (1) that patience and fortitude is needed not to panic and sell when stock prices fall and (2) if the investor has faith in the company invested in, do not sell just because a short-term gain presents itself.

After Warren’s family moved to Washington DC when he was 13 years old, irrespective of his family background, he delivered newspapers to make extra money and this probably sparked his interest in the media where he has made several successful investments including the Washington Post Company, a stock that has made him a lot of money. Warren also published a racetrack trip sheet and recycled golf balls. A particularly lucrative activity was the placing of reconditioned pinball machines in barbershops. The first one cost $25 and in the first day he found customers had spent $4. With seven machines he was taking $50 per week. In 1944 he bought a 1934 Rolls Royce for $350 and he rented it out for $35 a day. To boost his fund further he purchased forty acres of Nebraska agricultural land which he rented to a farmer and this was all at the age of fourteen.

In 1947, at seventeen Warren Buffett graduated from High School and since he had already made $5000 delivering newspapers, it was never his intention to go to college (Arnold, 2002: 154). Warren Buffett's father on the other hand had different plans and urged Warren to attend the Wharton Business School at the University of Pennsylvania. Warren only lasted two years complaining that he knew more than his professors (About.com, 2004). When Warren’s father was defeated in the 1948 Congressional race, he returned home to Omaha and transferred to the University of Nebraska-Lincoln. Working full-time he managed to graduate in only three years. He earned a Bachelor Science Degree in 1950.

Warren approached graduate studies with the same resistance that he displayed years earlier, but he was finally persuaded to apply to Harvard Business School and by serendipitous fate Warren failed to gain a place. He then applied to Columbia Graduate
Business School where he learned first hand from Benjamin Graham and David Dodd. Warren Buffett was the only student ever to earn an A+ in one of Benjamin Graham’s classes. Through his simple yet profound investment principles, Benjamin Graham became an idyllic figure to the twenty-one year old Warren Buffett (About.com, 2004). Disappointingly both Warren’s father and Benjamin Graham advised Warren not to make a career in stocks. But Warren Buffett was so determined that he offered to work for Benjamin Graham for free, but Benjamin turned him down since he preferred to hold his positions for Jews who were not hired at Gentile firms at the time.

After being crushed when rejected by Benjamin Graham, Warren returned home. He took a job at his father’s brokerage house and began seeing a girl called Susie. In April 1952 they were married. During this time period, Warren’s investments where limited to a Texaco station and some real estate, but neither were successful. He also started teaching night classes at the University of Omaha. While working for his father’s brokerage, Warren wrote to Benjamin Graham with various investment ideas. In 1954 Warren’s luck changed and Benjamin Graham phoned him inviting him to join Graham-Newman in New York. Warren worked for Benjamin Graham until Graham’s retirement in 1956, where after he returned to Omaha (Arnold, 2002: 156).

When Warren returned to Omaha at the age of twenty five he owned two valuable things namely knowledge of investment principles that gave him confidence when communicating with other investors and a substantial sum of money (Some literature reports this amount as much as $140 000). In 1956 he set up his first investment partnership called Buffett Associates Ltd. He had seven partners, including his sister, who contributed a total of $105 000 with the biggest contributor being Warren’s Aunt Alice who invested $35 000. Warren himself invested $100 and before the end of the first year Warren Buffett was managing capital of $300 000. Over the next five years the Buffett partnerships showed an impressive 251.0% profit and by 1962 the partnerships had capital in excess of $7.2 million with over 90 partners (About.com, 2004). In one decisive move, he melded the partnerships into a single entity called “Buffett Partnerships Ltd.”

In 1962 the Buffett partnership started buying Berkshire Hathaway stock at $8 per share. In 1965 Warren Buffett’s role at Berkshire Hathaway started taking direction after he
accumulated 29 per cent of Berkshire Hathaway and he became director. During 1969 Warren decided to liquidate the partnership since he was "unable to find any bargain in the current market" (About.com, 2004). He liquidated the whole portfolio except for two companies namely Berkshire Hathaway and Diversified Retailing. In 1970 Warren Buffett became Chairman of the Board of Berkshire Hathaway. In the 1973-4 crash Warren bought more stock in Berkshire Hathaway at a steep discount to book value and eventually holding 43 per cent. By the late 1970's Berkshire Hathaway's stocks were trading at more than $290 a share and Warren's personal wealth was almost $140 million. Berkshire Hathaway has over the last thirty years seen its book value grow at an average annual rate of 23 per cent, from $19 per share to more than $40 000 and its stock market price increase at an average annual growth rate of 29 per cent, from $13 a share to approximately $70 000 (Buffett & Clark, 2002: 16). Warren Buffett created his wealth solely through his superior ability to make investment decisions and with his clever use of an insurance company as an investment vehicle. This does not only make him one of the richest people in the world, but also one of the greatest investors of all time.

4.3 Berkshire Hathaway – The textile company

The original company, Berkshire Cotton Manufacturing, was incorporated in 1889 and forty years later, Berkshire combined operations with several other textile mills, resulting in one of New England’s largest industrial companies (Hagstrom, 1997:5). In 1955 Berkshire merged with Hathaway Manufacturing and the name changed to Berkshire Hathaway. The years following the merger were unfortunately gloomy since the shareholder’s equity dropped by half and the company experienced an operating loss of $10 million.

Warren Buffett’s investment partnership (later named Berkshire Hathaway, an acquired textile company) began in 1956 with $150 of Buffett’s money and seven limited partners contributing a combined investment of $105 000. One business in which the Buffett Partnerships Ltd. held a controlling interest was the publically traded textile company Berkshire Hathaway. Once the partnership had control Warren Buffett used Berkshire’s working capital to buy the first of many insurance companies it was to purchase over the next 30 years (Buffett & Clark, 2002:15). When the partnership liquidated in 1969, Warren
Buffett bought up his partners’ shares in Berkshire and continued to buy more shares on the open market until he personally controlled the company. The reasons for Warren Buffett wanting Berkshire Hathaway according to Buffett and Clark was twofold namely due to the fact that Berkshire was acquiring insurance companies that will provide Warren with an investment float and the second reason was for tax purposes. At that time the personal income tax rate was higher than the corporate tax rates ensuring that he could easier accumulate capital. After Warren Buffett took control of Berkshire Hathaway, the company fulfilled dual roles, namely it maintained its core textile business and Warren Buffett gradually started to use it as an investment vehicle (Warren Buffett Secrets, 2004).

Buffett’s early days at Berkshire Hathaway were difficult since the company was in an industry facing real challenges from exports and high manufacturing costs. For the next twenty years, Warren Buffett, along with Ken Chace who managed the textile group, laboured intensely to turn around the situation of the New England textile mills, however the results were disappointing (Hagstrom, 1997: 5). By the late 1970’s the question was being raised whether it made sense retaining an investment in textiles. According to Hagstrom (1997: 6) as the 1980’s were entered, Warren Buffett came to grips with the following realities namely (1) that the very nature of the textile business made high returns unlikely, since textiles are commodities that makes it difficult to differentiate it from competitors and (2) that in order for Berkshire to stay competitive significant capital improvements need to be made to the textile mills. In July 1985 Warren Buffett closed down the textile group ending a business almost a hundred years old.

In 1967, Warren Buffett turned the company’s focus towards the insurance business, negotiating the purchase of two Nebraska companies namely National Indemnity and National Fire and Marine Insurance. This first investment in the insurance industry served as the foundation for Berkshire Hathaway’s rise to the investment legend it has become today. Warren Buffett’s reasons for investing in insurance companies where (Warren Buffett Secrets, 2004):

- Insurance companies charge premiums against a risk that may or may not eventuate, this generates a float of cash that can be used to generate further profits by investing it elsewhere.
If the insurance company is monetarily strong, customers of that insurance company will have confidence in its ability to pay claims, enabling the company to remain vibrant and viable even if insurance margins increase due to increased competition or larger than usual claims.

Warren Buffett's annual letters to the shareholders of Berkshire Hathaway has been the theme of various books and contains valuable information regarding investments and life in some instances. Berkshire Hathaway has since then become the 40th ranked US Corporation with revenues of over $50 billion. In Berkshire Hathaway's annual report for the year ending 31 December 2003, the total net worth for the company during the year was 13.6 billion dollars, up by 21 percent. This gave the company an annualized compound return for the 39-year period under present management of 22.2 per cent (Berkshire Hathaway, 2004).

4.4 Charles Munger – Warren Buffett's partner

Charles Munger was born in 1923 and grew up in Omaha where as a teenager he worked in Warren Buffett's grandfather's grocery store. In 1962 Charlie Munger moved back to his childhood home of Omaha from California. Charlie Munger was brilliant and attended Harvard Law School without a Bachelor's Degree. After graduating from Harvard Charles started a law firm in Los Angeles called Munger Tolles & Olson. Introduced by mutual friends in 1959, Warren and Charles were immediately drawn together providing roots for a friendship and business collaboration.

Throughout the 1960's and 1970's Warren Buffett and Charles Munger had numerous discussions regarding investments and occasionally bought shares in the same companies. It was however only in the late 1970's that Charles Munger merged some of his interests into Berkshire Hathaway, that he became a shareholder (Arnold, 2002: 172). Charles Munger then joined Berkshire Hathaway as Vice-Chairman and the partnership between Charles Munger and Warren Buffett started. Warren Buffett and Charles Munger made a great team due to their different intellectual roots. Warren Buffett followed a
predominantly quantitative approach, whereas Charles Munger focused on the characteristics of the business that gave it a sustainable competitive advantage.

4.5 Investment Criteria

Warren Buffett's investment strategy, known as value investing has been one of the most successful ever. Value investing looks for stocks whose prices are low for their companies' supposed intrinsic worth, which is determined by an analysis of certain characteristics and fundamentals of companies (Investopedia.com, 2004). Warren Buffett's investment criteria as describe within various literature are summarized within Appendix A. This was done in a matrix format indicating the percentage occurrence of each of the criteria. The criteria identified within the matrix are discussed in detail, indicating the measurement thereof, the acceptable limits and the calculations that need to be done.

4.5.1 Consumer Monopoly

Warren Buffett does not like to invest in what he calls commodity companies (Warren Buffett Secrets, 2004). These are companies whose product does not differ from that of competitors in any significant way. A commodity company therefore can be vulnerable to the actions of competitors and have limited power to raise prices to retain their profit position in the light of inflation. Buffett and Clark (1999: 91) summarized the basic characteristics of a commodity business as follows:

1. Low profit margins: This is the result of competitive pricing.
2. Low returns on equity: Low return on equity is a good indication of poor business economics created by typically commodity-type markets and pricing.
3. Absence of any brand-name loyalty: If the brand name of a product does not mean a lot, it is an indication that the company manufacturing this product is a commodity-type business.
4. Presence of multiple producers: Multiple producers breed competitions and this breeds lower prices and this leads to lower profit margins.

5. Existence of substantial excess production capacity in the industry: If in any industry there is substantial excess production capacity, no company can really profit from an increase in demand until the excess production capacity is used up.

Warren Buffett prefers to invest in companies whose products or services are unique in some way. Within such situations the customers either need the product, or there is no real competitor or the reputation of the product is such that it has consumer loyalty. It is normally these companies that will be dominating their fields for an investment lifetime (Arnold, 2002: 179). These companies have a competitive advantage that enables the business producing the product or service to earn monopoly-like profits. According to Buffett and Clark (2002: 57) competitive advantage allows these businesses greater freedom to charge higher prices, which equates to higher profit margins, which means higher profits for shareholders. Therefore competing with these companies head-on will be financial insanity. Generally one or more of the following indicates the presence of a consumer monopoly (Warren Buffett Secrets, 2004):

- The product will be a brand name (For example Coca Cola).
- The company will be a brand name.
- The company will be in a monopoly situation or monopolistic cartel.

It is however not enough for Warren Buffett that these companies should have a competitive advantage, this competitive advantage should be robust and maintainable. This entails that the company must be able to keep its competitive advantage well into the future, without spending great sums of capital to maintain it. Buffett and Clark (2002: 57) summarize two reasons why a low-cost durable competitive advantage is important to Warren Buffett:

- Predictability of the business's earning power. According to Buffett consistent products equate to consistent profits. If the company can continue to produce the same product year after year, it will be in a
better position to exist in the future and recover from short-term bad news events.

- It increases the company's ability to use the above-average earnings that a consumer monopoly produces to expand shareholder's fortunes.

The problem with these companies according to Buffett and Clark (1999: 97) is that when these monopolistic companies are recognized by the investment community, their selling prices are then usually astronomically high. Since the price paid determines the rate of return received, the investor will in effect be getting a smaller rate of return. Therefore the challenge is to find these companies before the rest of the world can identify them.

4.5.2 Return on equity – ROE

Benjamin Graham defines shareholders equity as "the interest of the stockholders in a company as measured by the capital and surplus" (Warren Buffett Secrets, 2004). Shareholder's equity can also be defined as a company's total assets less the company's total liabilities. Return on equity tells the investor the rate at which shareholders are earning income on their shares. Good managers concentrate on improving the earnings of their businesses while utilizing little additional capital.

Customarily, analysts measure annual company performance by considering earnings per share, but Warren Buffett considers it as a smokescreen. Since most companies retain a portion of their previous year's earnings as a way of increasing their equity base without investing in productive assets, he sees no reason for getting excited about record earnings per share. According to Buffett and Clark (2002: 118) Warren realized that a company with a durable competitive advantage almost always shows a consistent high rate of return on equity (consistency is indicative of durability).
To enable the investor to make use the return on equity ratio effectively, several adjustments need to be made (Hagstrom, 1997: 88):

- All marketable securities should be valued at cost and not at market value because values in the stock market as a whole can greatly influence the returns on shareholder equity in a particular company.
- Investors must control the effects that unusual items may have on the shareholder’s equity. Warren Buffett excludes all capital gains and losses as well as any extraordinary items that may increase or decrease operating earnings, since he wants to determine how well the company’s management accomplishes a return on the operations. This is therefore used as a measure of management’s economic performance.
- A company should be employing little or no debt to achieve good returns on equity. Therefore the debt-to-equity ratio should not be used to increase the return on equity. Highly leverage companies are also more risky during economic slowdowns.

Hagstrom (1997: 58) also stated that according to Warren Buffett there are only five ways for companies to increase their return on equity:

1. Increase asset turnover (ratio between sales and assets)
2. Widen operating margins.
3. Pay lower taxes.
4. Increase leverage.
5. Use cheaper leverage.

Warren Buffett always looks at the return on equity to see whether or not a company has consistently performed well in comparison to other companies within the same industry. Thus, Warren is seeking to invest in companies that consistently earn high returns on shareholders’ equity (Buffett & Clarke, 1999). Buffett and Clark (2002:120) also indicates that companies that benefit from some kind of durable competitive advantage have high returns on equity (typically above 12% - the rate of return on a government bond in America), whereas price-competitive commodity-type businesses historically low returns on equity, (typically below 12% in America).
In South Africa this value of 12 percent is not applicable, since the rate of return differs between the various bonds.

The ROE is calculated as follows:

\[
\text{ROE} = \frac{\text{Net Income}}{\text{Shareholder's Equity}}
\]

Caution should however be taken not to average returns over a long period, since a company might start with above average rates which then fall away, but still have a healthy average (Warren Buffett Secrets, 2004). Warren Buffett has reiterated the point that there is also a correlation between the trend of a company's return on equity and the trend of future earnings (Vick, 2001: 143). If the yearly return on equity's is rising, the earnings should also be rising and if the return on equity is steady, there is a strong possibility that the earnings will also be steady. The return on equity therefore enables the investor to make more confident assumptions about the future earnings.

4.5.3 Debt

A good indication that a company has a durable competitive advantage is that it will be relatively free of long-term debt. Long-term debt makes Warren Buffett nervous, because it impedes a company's ability to survive a business recession or tragedy (Buffett & Clark, 2002: 129). Warren Buffett prefers to see a very small amount of debt, which means earnings growth, is being generated from shareholder's equity (Investopedia.com, 2004).

Therefore the best test then of a company's financial power is its ability to service and pay off debt out of its earnings. A measure used therefore by Warren, is whether the company has long-term debt burdens of fewer than five times current net earnings, since this is the benchmark set by companies with a durable
competitive advantage according to Buffett and Clark (2002: 131). The formula for this calculation is as follows:

\[
\text{Long term debt} = \frac{\text{Number of years to pay off debt}}{\text{Current annual profit}}
\]

The debt/equity ratio is another key characteristic that Warren Buffett carefully considers. This ratio specifies the proportion of equity and debt the company is utilizing to finance its assets and the higher the ratio the more debt, rather than equity, is financing the company. A high level of debt compared to equity can result in volatile earnings and large interest expenses. The debt/equity ratio is calculated as follows:

\[
\text{Debt/Equity Ratio} = \frac{\text{Total Liabilities}}{\text{Shareholder's Equity}}
\]

However caution should be taken when using this ratio, since Warren Buffett indicated that this ratio for ascertaining the financial strength of a company is a poor measure of the financial power of a business. This is because a company's assets are never a source of funds for retiring long-term debt unless the company is in bankruptcy (Buffett & Clark, 2002: 130).

4.5.4 Profit Margin

The profitability of a company depends not only on having a good profit margin but also on consistently increasing this profit margin. High profit margins reflect not only a strong business, but management's tenacious spirit for controlling cost. Buffett loves managers who are cost-conscious and detest managers who allow costs to escalate. Indirectly, shareholders own the profits of the business; therefore every dollar that is spent unwisely deprives the owner of the business of profit.
According to Hagstrom (1997: 264), Warren Buffett has observed that companies with high-cost operations typically find ways to sustain or add to their costs, whereas companies with below-average costs pride themselves on finding ways to cut expenses. Therefore a high profit margin indicates that the company is executing its business well, but increasing margins means that management has been extremely efficient and successful at controlling expenses.

This margin is calculated as follows:

\[
\text{Profit margin} = \frac{\text{Net income}}{\text{Net sales}}
\]

To get a good indication of historical profit margins, investors should look back at least five years. It is important to remember when considering the profit margin that the type of business also plays a role. According to Warren Buffett, companies that have some kind of durable long-term competitive advantage, that allows them to set prices on their products, like a monopoly, will have higher profit margins and higher inventory turnover (Buffett & Clark, 2002: 43). Both these criteria are important to Warren Buffett, since this enables a business to survive any bad-news situation.

4.5.5 Intrinsic value

According to Vick (2001: 108) the intrinsic value of a company is simply the sum total of its future expected earnings, with each year’s earnings “discounted” by the time value of money. This is however the most difficult aspect of valuing a company, since it is very easy to completely misjudge companies and entire industries on occasion.

When estimating the future earnings, the investor should firstly consider the past of the company. The most reliable predictor of a company’s future course is the company’s growth record (Vick, 2001: 110). Stability is a very important determinant
in valuing a company, since the more unstable the company's record, the more unstable its future will be. The most common mistake investors make is to extrapolate beyond a company's true growth rate and assuming that the company can depart from its past.

Caution should be taken when evaluating cyclical companies whose earnings fluctuate with the business cycle, since they display no long-term operating consistency. Benjamin Graham taught Warren Buffett that cyclical companies should be valued based on their average earnings, ensuring never to pay a massive premium for any single year's earnings (Vick, 2001: 112). The guideline used by Benjamin Graham is that an investor should not pay more that sixteen times a company's average earnings.

Where Warren Buffett differs from other business analysts is that he believes, correctly, that standards of valuation are universal (Vick, 2001:109). He is not influenced by the new-era advocates that claim that technology businesses deserve to be treated in a different way, or more leniently, because of their novelty. All businesses should be judged exactly the same, namely on how they can convert sales to earnings and in the annual increase in earnings. According to Vick (2001: 109) Warren Buffett believes that all businesses should be treated economically equally whether they are manufacturing products or are cellular phone operators.

As discussed above the intrinsic value per share of a company can be calculated as follows:

- When estimating future earnings, investment analysts should consider the past of the business first. This is done by taking the earnings per share for the past ten years and calculating the growth rate. The average growth rate is then calculated.
- The second step is to apply a discounting factor to the estimated earnings per share for the next year that compensates the investor for the time value of money. The discount rate that Warren Buffett uses is the same rate offered by long-term Treasury/Government bonds,
preferably 10-year instruments. This rate is then used to determine whether the stock is more or less attractive than a bond.

- He then divides this estimated earnings per share for the next year (for example $2.50) by the Treasury bond rate (say 6%) to obtain a discounted value ($2.50/0.06 = $40). This price then becomes Warren Buffett's hurdle rate.

- Thus if the earnings of the company remains fixed (at $2.50) per year perpetually, the company becomes a proxy for a bond. Therefore if the stocks of the company trades for less than the discounted value calculated ($40), it offers a more attractive price than a bond because of the earnings yield ($2.50 / $30 = 8.33%).

- If the stock of the company trades for more than the discounted value (for example $50) the earnings yield would be less than that of a bond ($2.50 /$50 = 5%) and Warren Buffett would rather buy the bond than the stock of the company.

- Therefore the formula for calculating intrinsic value is as follows (Vick, 2001: 117):

  \[
  \text{Intrinsic value per share} = \frac{\text{Estimated Earnings per share for next year}}{\text{Discount rate}}
  \]

Some analysts believed that intrinsic value was thought to be the same thing as "book value". This implied that it was equal to the net assets of the business, however this proved almost worthless as a practical matter, because neither the average earnings nor the average market price evinced any tendency to be governed by the book value (Graham & Dodd, 1940: 20). There are also various obstacles in determining the intrinsic value namely:

- The inadequacy and incorrectness of the data.
- The uncertainties of the future.
- The irrational behaviour of the market.
A company's intrinsic value is therefore dynamic and changes constantly based on economic conditions, interest rates, debt levels and changes in the marketplace. Intrinsic value changes from day to day for each company but hardly ever at the rate at which the company's stock price changes. According to Vick (2001: 120) Warren Buffett sees intrinsic value as very elusive — every asset possesses a true worth that can be discovered through thorough analysis. But pinpointing intrinsic value is very difficult, excruciating and ultimately subjective. If it was very easy and precise, then all analysts around the world would be in agreement on the price that a certain share should sell for and there would be consensus on what can be called a "bargain". However, Benjamin Graham escapes this dilemma of uncertainty by insisting on a "margin of safety".

Another measurement of intrinsic value found in literature is that once Warren Buffett establishes the intrinsic value of the company as a whole, he contrasts it to its current market capitalization, which is the current total worth (price) of the entire company. If his measurement of intrinsic value is at least 25 percent higher than the company's market capitalization, Warren Buffett sees the company as one that has value (Investopedia.com, 2004).

4.5.6 Earnings per share growth rate

The ability to grow the per share earnings of a company is key to growth of the shareholders' value in the company. Over a period of time an increase in per share earnings will increase the market valuation of the company and companies need to employ its retained earnings in such a manner that it will increase the earnings per share.

A mathematical way of reviewing the company's ability to increase per share earnings is to calculate the annual compounded rate of growth of the company's per share earnings for a number of years. This is calculated by taking the per share earnings of a company for a period of about ten years and using a financial calculator to calculate the growth rate by entering the first year's per share earnings.
as the present value (PV= first year's per share earnings), the last year's value as the future value (FV= last year's per share earnings), the period is the number of years (N= number of years) and calculating the percentage (%i). This indicates the annual compounding rate of earnings growth over the long and the short run.

It is possible to envisage the future price of a company's stock by using the company's per share earnings annual growth rate (Buffett & Clark, 1999: 233). By making use of the per share annual growth rate, the future year's per share earnings can be projected that can be use to project the stock's price. This can be done as follows:

- If Company A's per share net income grew from 1980 to 1990 with 20%, the per share earnings for the next ten years can be calculated (for the purpose of this example a financial calculator is used).
- This is done by entering the per share earnings for 1990 as the present value on a financial calculator (PV=R x). The time period is ten years (N=10) and the percentage is 20% (i= 20%).
- By calculating the future value, the per share earnings are projected.
- The price-to-earnings ratio can therefore be calculated to indicate the ratio of the share price to the earnings.
- Finally by multiplying the price-to-earnings ratio value, by the projected per share earnings, the market price for the stock is projected.

According to Hagstrom (1997: 235) Warren Buffett is not calculating a specific value for the stock. Warren Buffett rather determines the expected annual compounding rate of return of the company's per share earnings and compares it then to other investments and the annual compounding rate of return that is required to stay ahead of inflation. There is thus no specific measure of what is acceptable and not acceptable.
4.5.7 Share price

According to Hagstrom (1997: 96) Warren Buffett notes that focusing on businesses that are understandable, with enduring economics, run by shareholder-orientated managers does not guarantee success. The first factor is to buy at sensible prices and the second factor being that the company needs to perform to Warren Buffett’s business expectations.

It is Warren Buffett’s intention not only to identify businesses that earn above-average returns, but also to buy these businesses at bargain prices. The lower the price paid, the higher the investor’s expected return. Graham taught Warren Buffett how important it is to buy a stock only when the difference between its price and its value represents a margin of safety. The margin of safety principle supports Warren Buffett by firstly protecting him from downside price risk and secondly it provides opportunities for extraordinary returns.

Warren Buffett however differed from Benjamin Graham by insisting that the price be linked to growth and quality (Vick, 2001: 55). Warren Buffett knew that the best returns would come from purchasing shares of established growth companies – companies that are capable of growing faster than the market, but at low prices.

4.5.8 Retained earnings

When a corporation makes a profit it can be spend in two ways namely (Warren Buffett Secrets, 2004):

1. Return the profits to shareholders by way of dividends, share buybacks or bonus issues.
2. Use the money to increase the profitability of the company.

Warren Buffett prefers the second option namely to increase the value of the company by investing the retained earnings back into the company, therefore Warren’s holding company, Berkshire Hathaway has never paid a dividend. This led
to an increase in the underlying value of the company and pushed up the company's share price.

To Warren Buffett the ability to use retained earnings wisely is a sign of good company management. He believes that management should only retain unrestricted earnings if it can earn a higher rate of return on the unrestricted earnings than the shareholders could earn by investing the money outside the company (Buffett & Clark, 2001: 148). The test for Warren Buffett is whether the management of a company can transform each dollar/Rand of earnings retained into no less that a dollar/Rand of market value.

It is however not enough for Warren Buffett that retained earnings should be used profitably, but it should rather increase earnings substantially. Shrewd use of share repurchase programs can greatly enhance shareholder wealth but they do not substitute the rectifying power of actual net earnings growth. The way for an investor to determine whether a company's management is doing a superior job of allocating its retained earnings is as follows (Buffett & Clark, 2001: 150):

- Calculate the per share amount of earnings retained by a business for a specific period of time.
- Compare it then to any increase in per share earnings that occurred during this period. This indicates the total percentage return earned on the retained earnings retained.

### 4.5.9 Share buy-backs

Once Warren has made an investment in a business he lobbies the company's board of directors to begin a share repurchase program. The reason for this is that when a business in which he owns an interest, repurchases its own shares, it is effectively shrinking the number of shares outstanding, which in turn increases Warren's ownership interest in the company without Warren having to invest another penny (Buffett & Clark, 2001: 138). If the company should pay out the money, rather than buying back its shares, Warren will have to pay income tax on his portion
of the dividend disbursement, which means that he will have less money to invest with. Therefore, through the use of share repurchases it is possible for a company to cause an increase in per share earnings, while increasing the ownership interests of the remaining shareholders, therefore leave the pie the same size, while increasing the size of the slice.

According to Warren Buffett a company should buy back shares under the following conditions (Warren Buffett Secrets, 2004):

- When it has a surplus of funds.
- When it can buy back the shares at a price below intrinsic value.
- It should never buy back shares simply to strengthen the share price or to prevent a fall in the price.

The repurchasing of shares is one of Warren Buffett's preferred mechanisms to increase his ownership in a company without having to invest any more of his own money (Buffett & Clark, 2002: 273). To determine whether the company are actively buying back its shares the following steps can be followed:

- Determine the number of shares outstanding for example ten years ago.
- Subtract the number of shares outstanding in the current year from the number above (Shares outstanding ten years ago - Shares outstanding in the current year = Number of shares repurchased over past ten years).
- This indicates the number of shares that the company has repurchased over the last ten years.
- A negative number indicates the number of shares additional.
- The desired result that Warren Buffett requires is a decrease in the number of shares outstanding.
4.5.10 Sound management

Warren Buffett prefers to invest in companies where management focuses on activities that are part of their core business and do not spend shareholders' money on areas that they know very little about. Quality of management is very important for Warren Buffett when considering a business acquisition. This ability to keep a company strategically aligned is an attribute of sound company management and is therefore a sound investment principle.

Warren Buffett has identified aspects of management that he requires when investing, namely (Warren Buffett Secrets, 2004):

- Capability in allocation of capital: The most important management act is the allocation of capital since it determines the shareholder value (Hagstrom, 1997: 80).
- Demonstrated ability to consistently escalate company earnings and rates of return.
- The use of retained profits to increase the company profitability at beyond market rates.
- Ability and readiness to undertake challenging problems as it arise.
- A conservative approach to debt and liquidity.
- Buy back of share where it is in the interest of the company.
- Managers who keeps on doing what the company does best. Therefore focussing on their core business.

Warren Buffett does not prefer the following of company management (Warren Buffett Secrets, 2004):

- Managers who enrich themselves at company expense with excessive salaries and the abuse of share option arrangements.
- Managers who pursue growth for growth's sake, not considering the value of that growth to the company.
- Managers who pursue company acquisitions for reasons other than for the good of the company.
Managers who disburse excessive amounts of the company’s worth by issuing valuable shares or using debt to buy overvalued assets.

It is however difficult for the average investor to determine if a company is soundly managed. The average investor can however research the company extensively before investing, to assess whether the management is sound.

4.5.11 Inflation

According to Bodie et al. (1999: 935) inflation can be defined as the rate at which the general level of prices for services and goods is rising. Warren Buffett maintains that inflation is a political and not an economic phenomenon, since there is, as yet, no permanent restraint on government spending and therefore the constant printing of money will push inflation higher (Hagstrom, 1997: 56). Inflation causes prices to rise. In a price-competitive business, when prices for instance for labour and raw materials increase, overproduction may force the company to decrease the prices of its products to stimulate demand. Inflation also hurts investors since if they hold on to their money; they will lose their value at the equivalent rate of inflation. This entails that if inflation is running say for example at 25 percent per year, the investor will be losing 25 percent of its money’s purchasing power per year. Warren Buffett therefore believes that if the inflation rate is 25 percent, the investor must receive at least a 25 percent return on his investment, in order for the real purchasing power of the investors’ wealth to stay even with inflation (Buffett & Clark, 1999: 162).

For years Warren Buffett felt that inflation was his worst enemy and also for the average investor. However in 1983 Warren Buffett created a theory that investments in companies that profited from a strong consumer monopoly (or as referred to above, a durable competitive advantage) and required nominal incremental amounts of capital to continue operations, actually benefit from the results of inflation (Buffett & Clark, 1999: 165).
For Warren Buffett inflation is a permanent part of the economic landscape and therefore takes its punitive effects into consideration whenever viewing a prospective investment. It actually makes the investor richer, since inflation can benefit the shareholders of companies that have a consumer monopoly.

4.5.12 Book value

The book value of a company is generally considered its net worth and the book value per share would be the net worth of the company divided by the number of shares outstanding (Warren Buffett Secrets, 2004). According to Vick (2001: 124) Warren Buffett is eagerly aware that book-value growth is probably the most important ingredient in rewarding shareholders over time. A company that can, on a continual basis, increase per-share book value at high rates necessarily also has to increase earnings at high rates. It follows from this that an increase in book value over time need to lead to proportionate increases in intrinsic value and share price.

In Warren Buffett's annual report he indicates that he views growth in book value as the key to assessing whether management has successfully increased the firm's intrinsic value (Vick, 2001: 125). Warren Buffett considers short-term share price movements as irrelevant in measuring managers' abilities, since theoretically managements can do little to control the daily biases of the market. He therefore considers the company's growth in per-share book value as the relevant measure of management performance. Warren Buffett annually compares the growth of Berkshire Hathaway's book value to the gains of the S&P 500 index. If the book value of Berkshire Hathaway grows faster than the stock index, it implies that Warren Buffett has done a better job than the index of delivering value to shareholders.

The reasons motivating Warren Buffett to use the book value as a yardstick of performance, rather than earnings or stock price is that Warren believes that stock price movements are too inconsistent. He informs investors never to measure the management performance based on how much the stock has gained from year to
year. However over long periods, a stock will move in tandem with the company's performance, while in the short term, there may be no correlation between the two. The second reason for dwelling on book value is because earnings are adjustable. There are many ways in which the management of a company can inflate the bottom line of the company. Methods that can be used are restructuring charges, asset sales, write-offs, employee layoffs and more. By doing this management is not creating any real value.

The formulas used to calculate the book value and the book value per share is as follows:

\[
\text{Book value (net worth or shareholder's equity)} = \text{Total Assets} - \text{Total Liabilities}
\]

\[
\text{Common Equity}
\]

\[
\text{Book value per share} = \frac{\text{Common Equity}}{\text{Shares outstanding}}
\]

In Warren Buffett's view understanding changes in book value is vital to assessing whether a company is truly worth owning.

4.5.13 Investment Period

Investor Warren Buffett believes the ideal holding period for a good investment is forever- and historical market studies support this view. He strongly believes that the investor has the luxury of waiting indefinitely. During the 70-year period from 1926-1996 the return on the 20-year U.S Government bond outperformed a market portfolio of common stocks in only one decade. The average return for common stocks during these seven decades was in excess of 11% compared to a 5.2% yield on a portfolio of 20-year bonds and an average inflation rate of 3.1% (Steinberg, 2000: 9). Time also lowers the risk inherent in market fluctuations. The possibility of loss associated with trading during a one-year period is 24%. This risk factor declines to 1% at 10 years and 0% at 20 years (Steinberg, 2000: 10).
Warren Buffett's patience serves as a great check and balance to his portfolio according to Vick (2001: 97). His patience gives him time to conduct due diligence and prevents him to act emotionally. Warren Buffett has studied nearly all the large United States companies for more than 40 years, some repetitively, and this gives him the confidence to wait for them to reach the right price. Warren also then waits sometimes for years for the company's share to reach the price he is willing to pay and then he purchases the shares.

This expectation to keep the shares for a very long period also helps the investor to focus his/her mind when analysing a stock for purchase. Areas of focus will then be the durability of the company's advantage, rather than the short-term market movements. This is one of the reasons why Warren Buffett's investment philosophy differs from that of other investors. He strongly believes that he is not making a short-term investment, but rather believes that he is buying part of the company.

4.5.14 Understanding the company

Warren Buffett believes, as did Benjamin Graham, that investors should look upon share investment as buying a part of a business (Warren Buffett Secrets, 2004). Therefore investors should take the same approach to buying shares as they would if they were buying a business. According to Arnold (2002: 177) this approach is followed to have the mindset of a business analyst rather than a market analyst or a security analyst. Warren Buffett strongly believes that a prudent investor should never buy shares in a company whose business they do not understand.

In Warren Buffett's view, an investor's financial success is in direct proportion to the degree to which the investor understands the investment. This distinguishes investors with a business orientation from most hit-and-run investors, people who merely buy shares of stock (Hagstrom, 1997: 77). That is one of the reasons why Warren Buffett did not get involved in the technology/internet wave. Therefore Warren Buffett purposely limits his selections to companies that are within his frame
of financial and intellectual understanding. This enables him to preserve a high level of knowledge about Berkshire’s businesses.

People have criticised Warren Buffett for placing these self-imposed restrictions on his investments, arguing that he excludes himself from great investment potential by only investing in businesses he knows. In response Buffett explained that investment success is not a matter of how much you know, but how realistically you define what you know and he has achieved above-average results by doing ordinary things that he knows. The key is therefore to do ordinary things exceptionally well.

It is also very important for Warren Buffett to know the business he is buying shares of. Warren Buffett analyses the underlying economics of the industry and the firms within this industry. He also needs to know the operating realities of day-to-day management within the company. According to Arnold (2002: 177) a successful investor does not need a high IQ, but rather discipline and a capacity for hard work. It is also important to do sufficient reading, especially annual reports, not only for the company the investor are interested in, but also those of the competitors.

4.5.15 Margin of safety

Investment analysis is subject to uncertainty. Not only when estimating future values with a variety of possible outcomes, but there are also unpredictable events such as September 11th. For these reasons the investor can be wrong about many things for example:

- Economic franchise evaluation: Perhaps the strength or durability of the competitive advantage and the characteristics of the industry are not as good as evaluated.
- Management evaluation: Judging people, especially people that the investor does not work with every day, can be extremely difficult.
- Financial strength: Outsiders, such as investors, may not be in possession of the full facts.
Because there is so much potential for making possible mistakes, it is necessary to build in a "margin of safety".

The margin of safety principle assists Warren Buffett in two ways according to Hagstrom (1997: 96):

- Provides protection for Warren against downside price risk. Therefore Warren Buffett would not purchase the shares of a company if the intrinsic value per share is only slightly higher than the share price. If the margin of safety is large enough, the risk of declining intrinsic value is minimized.
- It provides Warren Buffett with the opportunities for extraordinary share returns. This indicates that if Warren Buffett correctly identifies a company with high economic returns, the value of the shares will steadily increase as the share price follows the returns of the business. Therefore by using the margin of safety, Warren Buffett is able to buy a business at a discount to its intrinsic value and earn an additional bonus when the market corrects the price of the business.

The margin of safety is calculated as follows:

\[
\text{Margin of safety} = \text{Share price} - \text{Per-share intrinsic value}
\]

This value needs to be large enough to ensure the investor of an adequate return, even if the value of the shares decline.
4.5.16 Businesslike Investing

Investing from a business perspective is one of the challenges facing the investor striving to invest like Warren Buffett. This type of investment requires a total mind shift, since this is contradictory to the general approach to investing; the reasons being that an investor needs to start thinking about the economics of ownership of those businesses that the stock represents. Warren Buffett was taught by Benjamin Graham that the successful investor should ask not in what stock and at what price he/she should invest, but rather in what enterprise and on what terms the commitment is proposed (Buffett & Clark, 1999: 33). This approach places the line of questioning into a businesslike perspective. The reason for following this approach is that Warren Buffett believes that it is more valuable to have ownership of the right company over the long-term, than to make short-term profits.

4.5.17 Consistent Operating History

Consistency is very important for Warren Buffett for the reason being that consistency helps to remove the risk from a stock portfolio. An important way to attain consistency is a proven track record. Buffett has managed to protect his portfolio from broad fluctuations in value by focussing on companies with long and notorious records of increasing net worth and value for shareholders.

A proven track record is only one of the criteria that are important to minimize stock-price risk, the other criteria, is to own companies whose future can be quantified and predicted with some degree of accuracy. Warren Buffett believed that if a company's future can not be predicted that it cannot be valued. This is one of the reasons why Warren does not invest in technology shares.
4.5.18 **Price/Earnings Ratio**

The price to earnings ratio (P/E) is the relationship that the price of a share bears with its earnings per share (EPS), either current or potential. The formula is:

\[
\text{Price to earnings ratio} = \frac{\text{Share Price}}{\text{Earnings per share (EPS)}}
\]

Benjamin Graham considered P/E ratios as a measure of stock market performance and calculated average ratios for periods of time (Warren Buffett Secrets, 2004). These calculations are then compared to the rates available on high-class bonds. However, most analysts concentrated on the current or prospective P/E of a share, Benjamin Graham preferred to look at average earnings due to the fact that Benjamin is always conscious of the margin of error factor.

4.5.19 **Dividend per share**

The dividend policy of a company is often reported to the shareholders, but seldom explained meaning that no analysis is supplied as to why that particular policy is best for the owners of the business. The dividend policy is however crucial to business and investment management. Since Warren Buffett does not buy a few shares within a company but rather invests in the whole company he has influence over the dividend policy of the company.

Warren Buffett prefers profitable companies that re-invest their profits in the business, rather than paying out profits to shareholders, since higher retained earnings provides opportunities for a company to increase growth.
4.5.20 Classification of the criteria

The criteria identified can be classified within two classes' namely quantitative criteria and qualitative criteria. Qualitative criteria are categorical or nominal whereas quantitative criteria are measurable or countable. This classification of the criteria is therefore based on whether the criteria can be calculated and measured from the financial results of a company.

Quantitative criteria can be calculated from the financial results and consists of the following criteria:

1. ROE-Return on Equity
2. Debt
3. Profit Margin
4. Per share intrinsic Value
5. Earnings per share growth rate
6. Company management (Growth in per share book value)
7. Retained earnings (Earnings retained per share)
8. Share price
9. Companies that have been public for more than 10 years
10. Margin of safety
11. Share repurchases
12. Price/Earnings Ratio
13. Dividend policy
14. Book Value & Book value per share

The qualitative criteria that can not be calculated or measured from the financial results are the following:

1. Company management (Quality of company management) – The average investor can research the company extensively before investing, to assess whether the management is sound.
2. Consumer Monopoly – A study should be done on the company to assist what the competitive advantages and disadvantages are.
3. Business the investor understands – The investor needs to study the business, read annual reports and analyze the strengths and weaknesses of the business.

4. Businesslike investing – The investor should be interested in long-term ownership of the company and not short term profits.

5. Consistent Operating history – An important way to attain consistency is a proven track record. This can be done by studying the company and focussing on the situations that affected the company and how these situations were overcome.

6. Investment Period – This criterion will differ between various investors since it is based on investment objectives and expectations. Therefore the categories for this criterion are short-term and long-term investing.

7. Inflation (Whether it can be priced to keep abreast of inflation) – This is assessed by studying the price of the company’s product/products over a time period.

The following table, Table 4.1 summarizes the investment criteria used by Warren Buffett as identified within the literature study. The table indicates the criterion, the formula for calculating the criterion, the time period necessary for evaluation and the acceptable limit thereof.
Table 4.1: A summary of the investment criteria used by Warren Buffett

<table>
<thead>
<tr>
<th>No</th>
<th>Criteria</th>
<th>Formula</th>
<th>Time Period</th>
<th>Acceptable Limit</th>
</tr>
</thead>
</table>
| 1  | Return on equity (ROE)          | Net Income / Shareholder’s Equity |             | • Companies that benefit from some durable competitive advantage have a ROE of above the rate of return on a government bond (Buffett & Clark, 2002: 120). The rate of return on bonds does however change over time and differs between countries.  
  |                                |                               |             | • Consistently performed well in comparison to other companies within the same industry (Investopedia.com, 2004).  
  |                                |                               |             | • Prerequisites:  
  |                                |                               |             |   • All marketable securities should be valued at cost and not at market value.  
  |                                |                               |             |   • Investors must control the effects that unusual items may have on the numerator of this ratio.  
  |                                |                               |             |   • A company should be employing little or no debt to achieve good returns on equity.  |
| 2  | Debt:                           | Total Liabilities / Shareholder’s Equity | 5-10 years | This shows the proportion of debt to shareholder’s equity. Warren Buffett does not give any suggestions as to what are acceptable or unacceptable debt levels (Hagstrom, 1997: 89). This is due to the fact that different companies, depending on their cash flows, can manage different levels of debt.  
  | |                               |                               |             | Acceptable Limit:  
<p>|                                |                               |             | Whether the company has long-term debt burdens of fewer than five times current net earnings.  |</p>
<table>
<thead>
<tr>
<th><strong>Profit Margin</strong></th>
<th><strong>Net Income / Net Sales</strong></th>
<th><strong>5 Years</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Know and understand the business</strong></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Warren Buffett believes that if an investor does not understand how the product works the investor will never be able to determine the chances of its becoming obsolete.</td>
<td>Ongoing</td>
<td>Warren Buffett wants to own businesses with high profit margins and high inventory turnover. According to Warren Buffett, companies that have some kind of durable long-term competitive advantage, that allows them to set prices on their products, like a monopoly, will have higher profit margins and higher inventory turnover (Buffett &amp; Clark, 2002: 43).</td>
</tr>
</tbody>
</table>
| **Consumer Monopoly** | Two types of competitive advantage:  
- Producing a unique product  
- Providing a unique service.  
Warren's test for a consumer monopoly: Is to ask whether it would be possible to create a competing business even if one did not care about losing money. Questions to determine if it is a consumer monopoly (Buffett & Clark, 2001: 45):  
- Can a consumer monopoly type product or service that the company sells be identified? | Generally one or more of the following situations will be taking place for a consumer monopoly company to exist (Warren Buffett Secrets, 2004):  
- The product will be a brand name (For example Coca Cola).  
- The company will be a brand name.  
- The company will be in a monopoly situation or monopolistic cartel.  
Businesses that are not consumer monopolies have the following characteristics (Buffett & Clark, 2001, 36):  
- Low profit margins on sales coupled with low inventory turnover.  
- Low returns on shareholder’s equity.  
- Absence of any brand loyalty.  
- Presence of multiple producers.  
- Existence of substantial excess production capacity in the industry.  
- Erratic profits. |
### Inflation

<table>
<thead>
<tr>
<th>Related to:</th>
<th>Criteria no 5 namely Consumer Monopoly</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Do historical earnings show and upward trend?</td>
</tr>
<tr>
<td></td>
<td>• Is the company conservatively financed (limited debt)?</td>
</tr>
<tr>
<td></td>
<td>• Is the company free to adjust prices for inflation?</td>
</tr>
<tr>
<td></td>
<td>• Does the company earn a high rate of return on shareholder's equity?</td>
</tr>
</tbody>
</table>

#### Yearly, since the inflation rate changes. 

<table>
<thead>
<tr>
<th></th>
<th>• Profitability that is almost entirely dependent upon management's abilities to efficiently utilize tangible assets.</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th></th>
<th>A financial calculator can be used to determine the company's ability to raise prices with inflation according to Buffett and Clark (2002: 274):</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Enter the price of the company's product; say 20 years ago as the present value (PV).</td>
</tr>
<tr>
<td></td>
<td>• The current value of the product is entered as the future value (FV) and the number of years, N= 20.</td>
</tr>
<tr>
<td></td>
<td>• The percentage interest (%i) is then calculated.</td>
</tr>
<tr>
<td></td>
<td>• The percentage calculated should be at least equal or higher than the current inflation rate to indicate that the company is not a price-competitive business.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th></th>
<th>• According to Bodie et al. (1999: 935) inflation can be defined as the rate at which the general level of prices for services and goods is rising.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• However in 1983 Warren Buffett created a theory that investments in companies that profited from a strong consumer monopoly and required nominal incremental amounts of capital to continue operations, actually benefit from the results of inflation (Buffett &amp; Clark, 1999: 165).</td>
</tr>
<tr>
<td></td>
<td>• Warren Buffett believes that if the inflation rate is 25 percent, the investor must receive at least a 25 percent return on his investment, in order for the real purchasing power of the investors' wealth to stay even with inflation (Buffett &amp; Clark, 1999: 162).</td>
</tr>
</tbody>
</table>
| 7 | **Earnings per share growth rate** | This is calculated by taking the per share earnings of a company for a period of about ten years and using a financial calculator to calculate the growth rate by entering the first year's per share earnings as the present value (PV= first year's per share earnings), the last year's value as the future value (FV= last year's per share earnings), the period is a number of years (N= number of years) and calculating the percentage (%). | 10 years | • Warren Buffett determines the expected annual compounding rate of return of the company's per share earnings and compares it to other investments and the annual compounding rate of return that is required to stay ahead of inflation.  
• There is thus no specific measure of what is acceptable and not acceptable. |
| 8 | **Sound management** | The average investor can research the company extensively before investing, to assess whether the management is sound. | 8 | • Warren Buffett prefers to invest in companies where management focuses on activities that are part of their core business and do not spend shareholders' money on areas that they know very little about.  
• Quality of management is very important for Warren Buffett when considering a business acquisition.  
• This ability to keep a company strategically aligned is an attribute of sound company management and is therefore a sound investment principle. |
| 9 | **Retained Earnings** | The way for an investor to determine whether a company's management is doing a superior job of allocating its retained earnings is as follows (Buffett & Clark, 2001: 150):  
1. Calculate the per share amount of earnings | 5 - 10 Years | • When a corporation makes a profit it can be spend in two ways namely (Warren Buffett Secrets, 2004):  
1. Return the profits to shareholders by way of dividends, share buy-backs or bonus issues.  
2. Use the money to increase the profitability of the |
1. Retain earnings for a specific period of time.  
2. Compare it to any increase in per share earnings during this period. This indicates the total percentage return earned on the retained earnings retained.

- Warren Buffett typically only considers companies that have been operational for at least ten years (Investopedia.com, 2004).

- One of Warren Buffett’s criteria is longevity: value investing means looking at companies that have stood the test of time, but are currently undervalued.

- The value of the historical performance of a company should never be underestimated since it demonstrates the company’s ability (or inability) to increase shareholder earnings.

Time period that the company been public

“arren Buffett prefers the second option namely to increase the value of the company by investing the retained earnings back into the company.

- This is a quick test that can be used to judge the economic attractiveness of a business and also how well management has accomplished creating shareholder value.

- If Warren Buffett has selected a company with positive long-term economic prospects, run by talented and shareholder-orientated managers, the proof will be reflected in the increased market value of the company.

- This increase should at the very least match the amount of retained earnings, dollar for dollar (Hagstrom, 1997: 92).
<p>| 12 | <strong>Intrinsic Value</strong> | The intrinsic value of a company is the sum total of its future expected earnings, with each year's earnings &quot;discounted&quot; by the time value of money | 10 years | • There are various obstacles in determining the intrinsic value namely: 1. The inadequacy and incorrectness of the data. 2. The uncertainties of the future. 3. The irrational behaviour of the market. • A company's intrinsic value is therefore dynamic and changes constantly based on economic conditions, interest rates, debt levels and changes in the marketplace. |
| 13 | <strong>Investment period:</strong> | Ideal holding period for a good investment is forever. |  | • Warren Buffett believes that time reduces the risk inherent in market fluctuations. |
| 14 | <strong>Share price:</strong> | The shares should be purchased at the lowest possible price. |  | • It is Warren Buffett's intention not only to identify businesses that earn above-average returns, but also to buy these businesses at bargain prices. |
| 15 | <strong>Book Value:</strong> | Total Assets – Total Liabilities  • Warren Buffett annually compares the growth of Berkshire Hathaway's book value to the gains of the S&amp;P 500 index. |  | • Warren Buffett is eagerly aware that book-value growth is probably the most important ingredient in rewarding shareholders over time.  • A company that can, on a continual basis, increase per-share book value at high rates necessarily also has to increase earnings at high rates.  • Understanding changes in book value is vital to assessing whether a company is truly worth owning, in Buffett's view.  • Warren Buffett annually compares the growth of Berkshire Hathaway's book value to the gains of the S&amp;P 500 index. If the book value of Berkshire Hathaway grows faster than the stock index, it implies that Warren Buffett has done a better job than the index of delivering |</p>
<table>
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<th></th>
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</tr>
</thead>
</table>
| **Share buy-backs:** | Shares outstanding ten years ago - Shares outstanding in the current year = Number of shares repurchased over past ten years | 10 years | • Negative number is required.  
• This negative number indicates the number of shares repurchased.  
• The number of shares outstanding should be decreasing to increase Warren Buffett's ownership within the company. |
| **Margin of safety** | Intrinsic value per share - Price per share |   | • Provides protection for Warren Buffett against downside price risk.  
• Provides opportunities for extraordinary share returns. |
| **Consistent operating history** |   |   | • Consistency helps to remove the risk from a stock portfolio.  
• A proven track record is an important way to attain consistency.  
• Focus on companies with long and notorious records of increasing net worth and value for shareholders. |
| **Businesslike Investing** |   |   | • Investor should not be interested in short-term profits, but rather in long-term ownership of the company. |
| **Price/Earnings ratio** | Share price / Earnings per share (EPS) |   | • P/E ratios as a measure of stock market performance |
4.5.21 Conclusion

Buffett and Clark (1999: 99) summarize these investment criteria discussed within this chapter within nine questions namely:

- Does the business have a consumer monopoly?
- Are the earning of the company strong and showing an upward trend?
- Is the company conservatively financed?
- Does the business consistently earn a high rate of return on shareholder’s equity?
- Is the business retaining its earnings?
- What is the amount necessary to maintain the current operations of the business?
- Does the management of the company do a good job? Is the company free to reinvest earnings in new business adventures, expanding their operations or share repurchase?
- Is the company free to adjust their prices to inflation?
- Will the market value of the company be increased by the value added by retained earnings?

It can therefore be concluded from the discussion and the nine questions above that there are very specific criteria Warren Buffett evaluates when investing. These criteria can be divided into two categories namely quantitative and qualitative criteria. The most important criteria that will be evaluated in this study will be the quantitative criteria.
Chapter 5

The gathering and processing of information

"If past history was all there was to the game, the richest people would be librarians."

— Warren Buffett

5.1 Introduction

The objectives of the previous chapters were primarily targeted at a literature study of investments in general and the investment philosophies of some of the great investors. More specifically chapter three focussed on Benjamin Graham as Warren Buffett’s mentor and emphasised his investment philosophy. Chapter four focused on the investment philosophy of Warren Buffett and the various quantitative and qualitative investment evaluation criteria were also discussed in detail indicating the measurement and importance thereof. The research for this study was conducted by means of an empirical study and the process will subsequently be discussed in this chapter.

The objectives of chapter five are firstly to describe the research methodology that was followed and how the study population and sample was selected. This chapter also explains how the most important quantitative criteria used by Warren Buffett were determined and how the step by step model was developed to evaluate these criteria. The testing of these criteria on the companies evaluated is also discussed. To date, limited literature regarding this subject exists in South Africa, since this subject is predominately discussed in articles and books by American writers within an American context.
5.2 Research methodology

The empirical study was conducted in five phases namely:

Phase 1: This phase entailed determining the study population consisting of companies listed on the Johannesburg Stock Exchange. The second step was to evaluate the population and dismiss, if necessary, members of the population that does not meet the population requirements and then the sample was selected. Finally the necessary information for the selected companies was obtained from McGregor BFA and this information consisted of the financial statements, ratios and share information for the period from 1989 to 2004. This time period is based on the information gathered within the literature study stating that Warren Buffett's investments philosophy requires the evaluation of a company's financial results for at least ten years.

Phase 2: The information was then processed as follows:
- The information was converted to the relevant monetary unit, namely Rand (where necessary).
- The necessary calculations were done where the required information was not available.
- Statistical software (Essential Regression 2.219) was used to assess the data of the various years and propose a regression equation.

Phase 3: This equation served as a basis for the multiple regressions per year that was done within Microsoft Excel. The results from the regression analysis were summarized within a matrix and the most important criteria were identified.
Phase 4: Based on the final criteria determined by the regression analysis a step-by-step model was compiled to assist the assessment of investment potential.

Phase 5: This model was tested by evaluating the twenty two companies identified during the first phase of the empirical study. The results from the test were compared with the 2004 results of the various companies.

5.3 Determination of the study population

Sampling design is very important due to the fact that if the sample is selected appropriately it can provide the desired degree of accuracy without the necessity of testing the whole population. The term target population within this study refers to the group of companies or sectors listed on the Johannesburg Stock Exchange. Due to the specific requirements that Warren Buffett has when selecting shares, a list of population requirements were set up. The following were all considered as population requirements:

- Company must have been public for more than ten years.
- Financial information for the company needs to be available for the period 1989 to 2004 (Requirement of this study).
- According to Buffett & Clark (2002: 48) Warren Buffett avoids price competitive businesses whose price is the single most important motivating factor in the consumer’s decision to buy the product or service. Examples according to Buffett & Clark (2002: 48) are:
  - Internet portal companies
  - Internet service providers
  - Memory-chip manufacturers
  - Airlines
  - Producers of raw foodstuffs such as corn and rice
  - Steel producers
  - Gas and oil companies
  - The lumber industry
- Paper manufacturers
- Automobile manufacturers

- Warren Buffett avoids cyclical companies whose earnings fluctuate with the business cycle (Vick, 2001: 112). The only circumstances under which Warren Buffett will invest in a cyclical company, is when the share is misprised in the marketplace and if there exists a catalyst to ensure a rise in share prices. The problem with cyclical stocks is the lack of long-term operating consistency due to rises in interest, inflation and unemployment rates that can lead to poor performance, whereas a decrease in these factors can lead to very strong earnings.

- High-tech companies are avoided by Warren Buffett since he believes that he should understand the company and how the product is used. Warren Buffett also avoids products that become obsolete because of some technical advancement (Buffett & Clark, 1999: 128).

- According to Vick (2001: 18) Warren Buffett prefers to invest in insurance companies, since this provides him with a low-cost float of money that can be utilized to invest elsewhere (these companies however need to hold cash reserves to pay out projected claims).

- Warren Buffett invests in companies that fulfil a repetitive need with a consumer product with brand-name appeal. Some examples of this are brand-name beverages, brand-name foods and brand-name fast food restaurants. Therefore Warren Buffett's investment in Coca-Cola.

- Advertising companies provides a service that manufacturers must continuously use to reach their target market. This is the reason for Warren Buffett's investment in the Washington Post.

- Low-cost producers and sellers of common products that most people have to buy at some time in their life also appeals to Warren Buffett (Buffett & Clark, 2002: 104).

- An unconventional investment that Warren Buffett made in 1998 is to buy 129 million ounces of silver at about $5 an ounce (Vick, 2001: 97). Warren Buffett made this investment since the price was attractive at that stage and the industry prospects was promising.
Based on these requirements the following sectors were chosen from the Johannesburg Stock Exchange consisting of thirty three companies:

1. Resources – Mining: Platinum
   **Motivation:** Based on Warren Buffett’s investment in silver the mining industry proposed an opportunity to test the viability of purchasing shares within the South African mining industry. Platinum was chosen based on the current popularity of this precious metal.

2. Financials: Insurance & Life Insurance
   **Motivation:** Insurance companies provide Warren Buffett with the necessary money reserves to invest elsewhere. This makes it a very popular choice when investing the Warren Buffett way. For this reason the insurance and life insurance sectors were included in the sample.

3. Non-cyclical consumer goods: Beverages
   **Motivation:** Warren Buffett invests in companies that fulfil repetitive needs of consumers and also prefers not to invest in cyclical sectors. The beverages sector complies with these requirements and is therefore included in the sample.

4. Non-cyclical services: Food and drug retailers
   **Motivation:** This sector represents non-cyclical low-cost producers and sellers of common products that most people have to buy.

The companies within these sectors that did not meet the population requirements are as follows:

- Spar: no financial information available.
- Sanlam Limited: information only available from 1998.
- Old Mutual: information only available from 1999.
- Metropolitan Holdings: information only available from 2001.
- Discovery Holdings Limited: information only available from 2000.

The description of the sample of companies that were used for the study can be found in Table 5.1.

### Table 5.1: Sample of companies that met the population requirements

<table>
<thead>
<tr>
<th>Short Name</th>
<th>Long Name</th>
<th>Share Code</th>
<th>JSE Sector</th>
<th>Business</th>
</tr>
</thead>
<tbody>
<tr>
<td>KWW-bel</td>
<td>KWV Beleggings Beperk</td>
<td>KWW</td>
<td>Beverages - Distillers &amp; Vintners (416)</td>
<td>The company is an investment holding company which holds 50% of the issued share capital of Remgro-KWV Investments (Pty) Ltd. The latter company holds 59.76% of the issued share capital of Distell Group Ltd, which invests its funds mainly in the manufacture, distribution and marketing of wine, spirits and alcoholic fruit beverages.</td>
</tr>
<tr>
<td>Pikwik</td>
<td>Pick n Pay Holdings Limited</td>
<td>PWK</td>
<td>Food &amp; Drug Retailers (630)</td>
<td>Investment holding company with controlling interests in Pick 'n Pay Stores Ltd.</td>
</tr>
<tr>
<td>Lonmin</td>
<td>Lonmin Plc</td>
<td>LON</td>
<td>Platinum (044)</td>
<td>The Lonmin Group is a platinum producer.</td>
</tr>
<tr>
<td>Angloplat</td>
<td>Anglo American Platinum Corporation Limited</td>
<td>AMS</td>
<td>Platinum (044)</td>
<td>Anglo Platinum is the world's largest platinum producer. It mines platinum and PGM metals in the Bushveld Complex with 5 underground mines and one open pit mine. Gold, copper, nickel and cobalt are recovered as by-products. The company has its own precious metals and base metals refinery.</td>
</tr>
<tr>
<td>Barplat</td>
<td>Barplats Investments Limited</td>
<td>BPL</td>
<td>Platinum (044)</td>
<td>Implats is in the business of mining, beneficiating and marketing platinum group metals, and associated base metals and in secondary sourcing where core competencies bring the group a competitive advantage.</td>
</tr>
<tr>
<td>Implats</td>
<td>Impala Platinum Holdings Limited</td>
<td>IMP</td>
<td>Platinum (044)</td>
<td></td>
</tr>
<tr>
<td>Company</td>
<td>Description</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>-------------------------</td>
<td>-----------------------------------------------------------------------------</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Messina Limited</td>
<td>Mvelaphanda Resources Limited (Previously called East Daggafontein Mines Limited)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MES</td>
<td>Platinum (044)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Platinum (044)</td>
<td>Mvelaphanda Resources (Mvela) is a broadly-based empowerment company with significant stakes in quality South African precious metal and mineral assets including Gold Fields, Northam Platinum and Trans Hex. Chaired by Tokyo Sexwale, the direct and indirect shareholders and beneficiaries in Mvela Resources include numerous established broad-based black economic empowerment (BEE) investment companies, several trusts representing various historically disadvantaged individuals and companies, several community based trusts and local charities.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Northam Limited</td>
<td>Northam Platinum Limited</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>NHM</td>
<td>Platinum (044)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Platinum (044)</td>
<td>The company holds mining licences in the Northern Province, near the town of Northam, to recover platinum and other precious metals.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Aflife</td>
<td>African Life Assurance Company Limited</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>AFI</td>
<td>Life Assurance (840)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Life Assurance (840)</td>
<td>Aflife conducts life assurance, group benefit business, and related activities.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Capital</td>
<td>Capital Alliance Holdings Limited</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CPT</td>
<td>Life Assurance (840)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Life Assurance (840)</td>
<td>Capital Alliance Holdings Ltd is an investment holding company. The company's principal subsidiaries at the end of the current financial year are registered for life assurance and pensions business.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Liberty</td>
<td>Liberty Group Ltd</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>LGL</td>
<td>Life Assurance (840)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Life Assurance (840)</td>
<td>Liberty Group Ltd is a financial services group focused on developing, marketing and managing a comprehensive range of investment and risk products designed to cater for all personal and corporate investment, life assurance, disability, health assurance and retirement needs.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Sage</td>
<td>Sage Group Limited</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SGG</td>
<td>Life Assurance (840)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Life Assurance (840)</td>
<td>Sage Group's major core activities are: life assurance, investment management and unit trusts.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>M-F</td>
<td>Mutual &amp; Federal Insurance Company Limited</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MAF</td>
<td>Insurance - Non-Life (834)</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Company</td>
<td>Holding Company</td>
<td>Trading Activity</td>
<td></td>
<td></td>
</tr>
<tr>
<td>-----------</td>
<td>-----------------</td>
<td>----------------------------------------------------------------------------------</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Santam</td>
<td>Santam Limited</td>
<td>Conducts all classes of short-term insurance business in the Republic of SA.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ABI</td>
<td>Amalgamated</td>
<td>The principal trading activity of the ABI group is the bottling and distribution</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Beverage</td>
<td>of soft drinks under franchise.</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Industries</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Limited</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Distell</td>
<td>Distell</td>
<td>Distell is an investment holding company whose subsidiaries are engaged in the</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>manufacturing of brandies, spirits, and wines and their wholesale distribution</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>under various trademarks.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SABmiller</td>
<td>SABmiller Plc</td>
<td>SABMiller plc is an international company committed to achieving sustained</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>commercial success, principally in beer and other beverages, but also with</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>strategic investments in hotels and gaming.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shoprit</td>
<td>Shoprite</td>
<td>The holding company is involved in supermarket chains, property, fresh produce</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Holdings Limited</td>
<td>and furniture. The main listing of the holding company is on the JSE Securities</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exchange. Secondary listings of the company are on the Namibia and Lusaka Stock</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Exchanges.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Picknpay</td>
<td>Pick n Pay</td>
<td>The company is an investment holding company whose subsidiaries are active in</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>Stores Limited</td>
<td>the FMCG area. The Pick 'n Pay chain is one of the country's largest supermarket</td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>chains.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Source: (Sharenet, 2004)
5.4 Multiple Linear regression

Multiple linear regression uses more than one explanatory variable to explain or predict a single response variable. The statistical model for a multiple linear regression is

\[ y_i = \beta_0 + \beta_1 x_{i1} + \beta_2 x_{i2} + \ldots + \beta_p x_{ip} + \epsilon_i \quad \text{for} \quad i = 1, 2, \ldots, n. \]

Multiple regression models are particularly complex in both their structure and the statistical assumptions that support it (Wisniewski, 2002: 346). The proportion of variation of the response variable \( y \) that is explained by the explanatory variables \( x_1, x_2, \ldots, x_p \) in a multiple linear regression is denoted by the squared multiple correlation, \( R^2 \). This model was used within this study to explain the change in average share price with several explanatory variables such as the book value, average share price, the per-share intrinsic value and more.

The four key assumptions behind this regression model that needs to be checked are (Wisniewski, 2002: 356):

1. There is a linear relationship between \( y \) and the \( x \) variables. This can be checked by producing scatter plots before the regression process is started. These scatter plots need to indicate that there is a linear relationship between \( y \) and the \( x \) variables.
2. The regression errors have a constant variance. This assumption implies that the difference between the actual \( y \) value and the \( y \) value predicted remains relatively constant over the entire range of data. This can be done by using scatter plots.
3. The regression errors are independent of each other. This assumption implies that each error is independent of the errors before it and if this assumption is not met autocorrelation exists. The Durbin-Watson test can be used to assess this assumption.
4. The \( x \) variables are independent of each other. Multicollinearity exists if the \( X \)-variables are not independent of each other. This can be checked by calculating a correlation matrix.
Before multiple linear regression can be done all four of these assumptions need to be tested. A very important additional assumption that was made within this study is that the financial information of the one year is not influenced by the financial data of any of the other years. Therefore a regression model was determined per year. This approach ensured the validity of the various models for a wider range of possible values of the explanatory variables, since it was determined over a wide range of values over the various years and not only over one set of values applicable for a certain year. The multiple linear regressions were done with the help of Microsoft Excel after the equation was determined with the help of Essential Regression 2.219 (statistical software). The results of the regression were then evaluated and the necessary tests were done to ensure that all the models were valid and representative of the information.

5.5 Development of the analysis model

The analysis model was developed based on the criteria evaluated within the multiple regression models. These criteria were selected by counting the number of times it was represented in the various models. The criteria with the highest score were selected to be included in the analysis model. This indicated the most important criteria that will assist the investor in assessing investment potential. The analysis model developed was not a mathematical equation, but rather consisted of a step by step model to evaluate the criteria identified and to indicate acceptable limits of these criteria. The reason for not developing a mathematical model is to avoid the limitations of fixed coefficients and to make the model applicable to a wide range of data, rather than to data within a specific confidence interval.

The aim of this model is to assess investment potential and giving investors an indication of probable good investments. The model was tested by using the information available of the twenty two companies in the study sample for the period 1990 to 2003 and comparing it to the current 2004 results.
5.6 Summary

This chapter is a summary of the empirical part of the study. This includes the way in which the information was gathered, the size and choice of the population group, the evaluation of the information and the processing and testing of the analysis model.

The problem experienced within this part of the study was to obtain all the financial information of the study sample. A very important limitation of the study is that it is only evaluating quantitative criteria based on Warren Buffett's investment philosophy. The results of this limitation is that only certain companies formed part of the study population and that the model does not consider any external economic factors such as inflation and interest rates. The interpretation of the results will be discussed in chapter 6.
Chapter 6

Interpretation of results obtained from the empirical study

"I don't look to jump over 7-foot bars: I look around for 1-foot bars that I can step over."

— Warren Buffett

6.1 Introduction

This chapter presents the results of the empirical study. The first results that will be presented and discussed are the financial information of the companies together with the various models that were determined per year. These results were used for the multiple regressions done per year to determine the proportion of variation of the response variable (the change in average share price) that is explained by the various explanatory variables. The correlation between the actual change in average share price per year and the predicted value were also determined. From these results the five most important criteria were identified and these results were used as the foundation for the development of the analysis model.

The step-by-step model enables an investor to determine whether the shares of a company should be bought based on the quantitative criteria of Warren Buffett's investment philosophy. It is important to keep in mind that this model only evaluates the quantitative financial criteria. This model was tested on the companies identified within the sample population and the results of the tests were compared with the actual 2004 results to date.

6.2 Determination of the regression models

The regression models were determined after the financial information was compiled and verified. The regression models were determined with statistical software and the results are summarized within Table 6.1. The various regression coefficients are represented by $b_0$ to $b_7$. 

105
Table 6.1: A summary of the multiple linear regression models per year

<table>
<thead>
<tr>
<th>Model</th>
<th>Formula</th>
</tr>
</thead>
<tbody>
<tr>
<td>Model 1990</td>
<td>Average Change in share price per year = b0 + b1 * Average Price per share + b2 * Book value + b3 * Share repurchases + b4 * Margin of safety</td>
</tr>
<tr>
<td>Model 1991</td>
<td>Average Change in share price per year = b0 + b1 * Number of years to pay off debt + b2 * Dividend/Share + b3 * Average Price per share</td>
</tr>
<tr>
<td>Model 1992</td>
<td>Average Change in share price per year = b0 + b1 * Intrinsic Value per share</td>
</tr>
<tr>
<td>Model 1993</td>
<td>Average Change in share price per year = b0 + b1 * Intrinsic Value per share</td>
</tr>
<tr>
<td>Model 1994</td>
<td>Average Change in share price per year = b0 + b1 * Intrinsic Value per share + b2 * Book value per share + b3 * Return on Equity + b4 * Debt/Equity Ratio + b5 * Book value</td>
</tr>
<tr>
<td>Model 1995</td>
<td>Average Change in share price per year = b0 + b1 * Margin of safety + b2 * Earnings per share growth rate + b3 * Profit Margin</td>
</tr>
<tr>
<td>Model 1996</td>
<td>Average Change in share price per year = b0 + b1 * Earnings retained per share</td>
</tr>
<tr>
<td>Model 1997</td>
<td>Average Change in share price per year = b0 + b1 * Share repurchases</td>
</tr>
<tr>
<td>Model 1998</td>
<td>Average Change in share price per year = b0 + b1 * Book value per share + b2 * Number of years to pay off debt + b3 * Debt/Equity Ratio + b4 * Price/Earnings Ratio</td>
</tr>
<tr>
<td>Model 1999</td>
<td>Average Change in share price per year = b0 + b1 * Margin of safety + b2 * Growth in per share book value + b3 * Dividend/Share</td>
</tr>
<tr>
<td>Model 2000</td>
<td>Average Change in share price per year = b0 + b1 * Intrinsic Value per share + b2 * Book value + b3 * Profit Margin</td>
</tr>
<tr>
<td>Model 2001</td>
<td>Average Change in share price per year = b0 + b1 * Average Price per share + b2 * Book value per share + b3 * Number of years to pay off debt + b4 * Book value + b5 * Profit Margin</td>
</tr>
<tr>
<td>Model 2002</td>
<td>Average Change in share price per year = b0 + b1 * Earnings retained per share + b2 * Intrinsic Value per share</td>
</tr>
<tr>
<td>Model 2003</td>
<td>Average Change in share price per year = b0 + b1 * Margin of safety + b2 * Profit Margin + b3 * Debt/Equity Ratio + b4 * Book value + b5 * Dividend/Share + b6 * Book value per share + b7 * Number of years to pay off debt</td>
</tr>
</tbody>
</table>

Source: Own
6.3 The results from the multiple regression analysis

The multiple regression analysis was done to determine the value of the various coefficients, to determine the relevance of the model and to determine the proportion of the total variation in the observed values of the change in average share price that is explained by the overall regression model. F-tests were done to determine the relevance of each of the models and the detailed results of these tests can be found in Appendix B.

Graph 6.1 indicates the values of the multiple coefficient of determination of the various models. This indicates that the overall regression model for 1990 and 2003 explains 99.5% of the total variation of the change in average share price. The model for 1997 only explains 20.1% of the total variation of the change in average share price and therefore will be excluded in further analysis. It was decided to include the model for 1992 even though it only explains 52.1% of the total variation.

Graph 6.1: The multiple coefficient of determination of the various models

Source: Own
After assessing the various models, the variables identified within the models were summarized in a matrix format, indicating the number of times the specific criteria formed part of one of the regression models. The following table, Table 6.2, indicates the results of this analysis.

<table>
<thead>
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<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>R Squared (R^2)</td>
<td>0.995</td>
<td>0.976</td>
<td>0.921</td>
<td>0.912</td>
<td>0.962</td>
<td>0.867</td>
<td>0.965</td>
<td>0.449</td>
<td>0.201</td>
<td>0.946</td>
<td>0.895</td>
<td>0.857</td>
<td>0.934</td>
<td>0.985</td>
<td>0.976</td>
</tr>
<tr>
<td>Correlation Coefficient (R)</td>
<td>0.988</td>
<td>0.988</td>
<td>0.722</td>
<td>0.910</td>
<td>0.991</td>
<td>0.946</td>
<td>0.965</td>
<td>0.946</td>
<td>0.895</td>
<td>0.926</td>
<td>0.857</td>
<td>0.934</td>
<td>0.985</td>
<td>0.976</td>
<td>0.997</td>
</tr>
<tr>
<td>Average price per share</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>5</td>
</tr>
<tr>
<td>Book value</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>5</td>
</tr>
<tr>
<td>Share repurchases</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>5</td>
</tr>
<tr>
<td>Margin of safety</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>5</td>
</tr>
<tr>
<td>Return on Equity</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>5</td>
</tr>
<tr>
<td>Debt/Equity Ratio</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>5</td>
</tr>
<tr>
<td>Profit Margin</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>5</td>
</tr>
<tr>
<td>Intrinsic Value per share</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>5</td>
</tr>
<tr>
<td>Earnings per share growth rate</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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</tr>
<tr>
<td>Company Management-</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>5</td>
</tr>
<tr>
<td>Growth in per share book value</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<tr>
<td>Price/Earnings Ratio</td>
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<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<td>x</td>
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<td>x</td>
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<tr>
<td>Book value per share</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>5</td>
</tr>
<tr>
<td>Number of years to pay off debt</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
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<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>5</td>
</tr>
<tr>
<td>Dividend/Share</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>5</td>
</tr>
<tr>
<td>Earnings retained per share</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>5</td>
</tr>
</tbody>
</table>

Source: Own
Within this table the important criteria are listed and it is indicated in which models it is represented. The last column indicates the number of times the specific criteria was represented in a regression model. As mentioned earlier the model for 1997 is excluded from the analysis due to low multiple coefficient of determination.

The radar graph, Graph 6.2, indicates these results clearly. The most important or most represented criteria are the per-share intrinsic value and the book value. The following criteria are also important and need to be included in the analysis model:

- Book value per share
- Number of years to pay off debt
- Profit Margin
- Margin of safety

Graph 6.2: Identification of the model criteria

Source: Own
6.4 Development of a model to assess investment potential

Models come in a variety of forms in business, since they are not always quantitative. A model has a distinctive feature since it is an attempt to represent a situation in a simplified form (Wisniewski, 2002: 7). The purpose of a model is therefore to represent a complex real-world situation in a more understandable and simplified form.

The model developed within this study is a step by step model describing how the criteria identified above should be evaluated. This model consists of five steps namely:

1. Evaluate the book value and book value per share (the book value and book value per share are evaluated in one step).
2. Calculation of the intrinsic value per share.
3. Determine the margin of safety.
4. Evaluate the profit margin of the company.
5. Assess the usage of debt within the company (Number of years to pay off the long term debt).

The five steps as identified above can be described as follows:

**Step 1:** Evaluation of the book value and the book value per share.

**Book value per share:**

**Time Period:** 10 years

**Calculation:**

Calculate the growth in the book value per share for each of the ten years.

**Description:**

Growth in the book value per share is a measure of performance.

**Measurement:**

Compare the year-to-year growth in book value per share with the growth in book value per share of the Standard and Poor 500 index in America. For the purpose of this study the growth in book value per share of the Top 40 index are used. If the company's book value per share grows faster than the stock
index, the company's management has out performed the index by delivering
value to the shareholders.

**Book value:**

**Time Period:** 10 Years

**Calculation:**

Calculate the growth in the book value for each of the ten years.

**Description:**

The book value growth is an important ingredient in rewarding shareholders over time. The growth in book value is the key to assess whether management has successfully increased the firm's intrinsic value. An increase in book value over time should lead to proportionate increases in intrinsic value and share price (Vick, 2001: 124).

**Measurement:**

Evaluate the growth in book value. A comparison can also be done between the growth in book value, the growth in intrinsic value and the share price movements.

**Step 2:** Calculation of the intrinsic value per share

**Time period:** 10 years

**Calculation:**

The intrinsic value is calculated by dividing the estimated earnings per share for the next year by the discount rate. The discount rate is equal to the return on a government bond (The government bond that was used in this study was the R 153.

**Description:**

It is the price at which a share should sell if properly priced in a normal market.

**Measurement:**

The lower the intrinsic value, the better since that leads to a higher rate of return.

**Step 3:** Determine the margin of safety

**Time period:** 10 years
Calculation:
It is calculated by subtracting the share price from the per-share intrinsic value.

Description:
Provides protection for the investor against downside price risk and provide opportunities for extraordinary returns.

Measurement:
The higher the margin of safety the better. This will however differ between investors, since it is dependent on the investor's risk preference.

Step 4: Evaluate the profit margin of the company
Time period: 10 years
Calculation:
Divide the net income by the net sales.

Description:
The profitability of a company depends on having a good profit margin and consistently increasing this profit margin. Increasing profit margins indicate that management has been efficient and successful at controlling expenses and that the company is executing its business well.

Measurement:
High and consistently increasing profit margin.

Step 5: Assess the usage of debt within the company (Number of years to pay off the long term debt)
Time period: 10 years
Calculation:
Long term debt divided by the current annual profit.

Description:
The best test of a company's financial power is its ability to service and pay off debt out of its earnings.

Measurement:
The number of years should be less than five.
These five steps therefore describes the process to be followed when assessing investment potential based on the quantitative criteria as used by Warren Buffett.

6.5 Testing of the model developed

The model developed in this study was tested on the twenty-two companies used in the empirical study. The methodology was to follow each of the five steps of the model and to identify the companies that satisfy the requirements. Finally the companies that met the various criteria were identified and it was compared to their 2004 average stock price.

The results of these steps are as follows:

Step 1:
The average growth in book value (from 1995 to 2003) of the twenty two companies is illustrated by Graph 6.3. A company that was excluded from the graph is Mvelaphanda Resources Limited, since their average growth in book value was 5807 % (this percentage is due to the change in book value from R11 000 in 1996 to R 7 656 000 in 1997). The reason for excluding this is to ensure a proper graph scale representation for the other companies. If Mvelaphanda Resources Limited should be included in the graph, the other companies would not be visible on the graph.
Chapter 7

General conclusion and recommendations for further study

"I always knew I was going to be rich. I don't think I ever doubted it for a minute."

– Warren Buffett

7.1 General conclusion

The overall objective of this study was to identify the quantitative criteria that can assist investors to determine the investment potential of listed companies based on the investment philosophy of Warren Buffett. Specific reference was made to the quantitative and qualitative investment criteria as used by Warren Buffett and each of these criteria were discussed.

The background of the study was set in chapter two through a comprehensive study of investment theory. This discussion was based on the various types of investment, the risks involved with investing, the analysis of shares and the financial theories pertaining to shares. Chapter three discussed Warren Buffett's mentor Benjamin Graham. The investment philosophy of Benjamin Graham is investigated as well as the difficulties regarding his investment philosophy. Benjamin Graham was famous for his "Mr Market" and "Margin of safety" concepts.

Chapter four focused on Warren Buffett and his investment philosophy. Emphasis was placed on his investment criteria and the measurement thereof. It was concluded from the various literature studied that the criteria can be categorized as quantitative and qualitative criteria. This study only focused on the quantitative criteria namely:

1. ROE-Return on Equity
2. Debt
3. Profit Margin
4. Per share intrinsic Value
5. Earnings per share growth rate
6. Company management (Growth in per share book value)
7. Retained earnings (Earnings retained per share)
8. Share price
9. Companies that have been public for more than 10 years
10. Margin of safety
11. Share repurchases
12. Price/Earnings Ratio
13. Dividend policy
14. Book Value & Book value per share

In the empirical study these criteria were evaluated and the six most important criteria were identified. The research methodology followed was to make use of multiple regression and to identify the variables included in most of the regression models. The six most important criteria were:

- The margin of safety
- Book value
- Book value per share
- Intrinsic value per share
- Debt
- Profit margin

Based on these criteria a model was built to evaluate investment potential and the model was tested on the twenty-two companies that formed part of the study sample. From these tests various companies were identified as companies with high investment potential. These results were compared to the average price per share for 2004 and the results indicated that the success rate of the model decreases as the number of model criteria decreases.

Therefore it can be concluded that this study indicated six important quantitative criteria as used by Warren Buffett to evaluate investment potential. The model developed can therefore be used within the South African context to evaluate a company's shares.
7.2 Recommendation for further study

Flowing from this study there is a number of research fields that require more detailed analysis namely:

- A detailed study regarding the qualitative investment criteria and the evaluation thereof.

- A detailed analysis of the applicability of the quantitative criteria identified in this study on the various sectors of the Johannesburg Stock Exchange.

- A detailed evaluation of the success rate of the quantitative criteria identified over the short-term and the long-term.
Bibliography


## Appendix A

### APPENDIX A: IDENTIFICATION OF THE INVESTMENT CRITERIA USED BY WARREN BUFFETT

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## Appendix B
### Statistical Tests

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### Model for the specific year

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<th>Avg Change in share price per year = b0 + b1<em>Book value per share + b2</em>Number of years to pay off debt + b3<em>Debt/Equity Ratio + b4</em>Price/Earnings Ratio</th>
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### Relevance of model:

| F Test: | H₀ : b₁=b₂=b₃=b₄=...=bₘ=0 | Hₐ : at least one of the variables is statistically significant | Accept H₀, therefore at least one of the variables is statistically significant | Accept H₀, therefore at least one of the variables is statistically significant | Accept H₀, therefore at least one of the variables is statistically significant | Accept H₀, therefore at least one of the variables is statistically significant | Accept H₀, therefore at least one of the variables is statistically significant | Accept H₀, therefore at least one of the variables is statistically significant |
|---------|-----------------------------|---------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------|--------------------------------------------------------------------------------|
|-----------------------------------------------------|-----------|-----------|-----------|-----------|
| The number of explanatory variables included in equation | 3         | 5         | 2         | 7         |
| F statistic                                          | 29.44442229 | 80.00570847 | 153.7028609 | 271.793251 |
| Significance F                                       | 4.57E-06  | 8.62E-09  | 1.02E-10  | 1.36E-10  |
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| Number of companies                                  | 17        | 18        | 18        | 18        |
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## APPENDIX C:
Top 40 Companies from 1996 to 2003

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Note: The table contains the top 40 companies from 1996 to 2003, with each year listed in the first column and the company names listed thereafter.
## Appendix A

### Identification of the Investment Criteria Used by Warren Buffett

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<th>Margin of Safety</th>
<th>Share Appreciation</th>
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<td>Avg Change in share price per year = b0 + b1<em>Number of years to pay off debt + b2</em>Dividend/Share + b3*Avg Price per share</td>
<td>Avg Change in share price per year = b0 + b1*Intrinsic Value per share</td>
<td>Avg Change in share price per year = b0 + b1<em>Intrinsic Value per share + b3</em>Return on Equity + b4<em>Debt/Equity Ratio + b5</em>Book value</td>
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<td>Avg Change in share price per year = b0 + b1<em>Margin of safety + b2</em>Growth in per share book value + b3*Dividend/Share</td>
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<td>Avg Change in share price per year = b0 + b1<em>Intrinsic Value per share + b2</em>Book value + b3*Profit Margin</td>
<td>Avg Change in share price per year = b0 + b1<em>Avg Price per share + b2</em>Book value per share + b3<em>Number of years to pay off debt + b4</em>Book value + b5*Profit Margin</td>
<td>Avg Change in share price per year = b0 + b1<em>Earnings retained per share + b2</em>Intrinsic Value per share</td>
<td>Avg Change in share price per year = b0 + b1<em>Margin of safety + b2</em>Profit Margin + b3<em>Debt/Equity Ratio + b4</em>Book value + b5<em>Dividend/Share + b6</em>Book value per share + b7*Number of years to pay off debt</td>
<td></td>
</tr>
<tr>
<td>Relevance of model: F Test:</td>
<td>Accept $H_0$, therefore at least one of the variables is statistically significant</td>
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