The Characteristics and Performance of Concept Stocks on the Johannesburg Securities Exchange

A research project submitted to the Gordon Institute of Business Science, University of Pretoria, in partial fulfilment of the requirements for the degree of Masters of Business Administration.

Gary Bryant
27528716

13 November 2008

Abstract

The backdrop to this study is derived from an international paper which analysed the characteristics and performance of concept stocks across different North American stock exchanges. The empirical findings indicated that concept stocks underperform the market as well as control stocks. Concept stocks were also found to exhibit abnormally high levels of research and development spending. This study replicates the North American research in the South African setting by analysing the characteristics and performance of concept stocks on the Johannesburg Securities Exchange.

The method used analyses a number of the characteristics of the stocks based on financial indices. Their performance is measured using the buy-and-hold abnormal returns method.

The results indicated that the concept stocks outperformed their control stocks on certain accounting characteristics, but underperformed on others. The returns generated by the concept stocks significantly underperformed the control stocks, but only in Years 3, 4 and 5. The concept stocks are therefore only accurately valued over the long term.

Declaration

I declare that this research project is my own work. It is submitted in partial fulfilment of the requirements for the degree of Masters of Business Administration at the Gordon Institute of Business Science, University of Pretoria. It has not been submitted before for any degree or examination in any other University. I further declare that I have obtained the necessary authorisation and consent to carry out this research.

……..

Gary Bryant

Acknowledgements

This research project would not have been possible without the efforts of my supervisor Adrian Saville who offered sage and pragmatic advice whenever I felt I was floundering. His prompt responses and attention to detail were particularly appreciated.

To the staff at the information centre for their willingness to assist with my many requests, you made data gathering a simple process. To the staff at McGregor BFANet for their patience and assistance with my queries.

To my family and friends for their unfailing support throughout the research process and the entire MBA, I would never have made it without you.

In memory of Tessa Vriend and Rick Crossley,

you will always be an inspiration.

Table of Contents

1 Introduction to the Research Problem

1.1 Introduction

The phenomenon of concept stocks, or stocks that attract a disproportionate degree of investors' attention, has been prevalent across stock markets for many years. However, concept stocks were brought to particular prominence during the internet bubble in the early part of this century. For example Van Knapp (2006, 47) notes:

> Many of the best performing internet stocks had no profits at all: They were losing money. Yet investors continued to pump money into these stocks, driving up their prices. The more companies lost, it seemed, the more their stock prices went up. There's a term for this: concept stocks.

A concept stock is one which appears to be overvalued, having a high market-to-revenue ratio (Hsieh and Walking, 2006). A study by Hsieh and Walking (2006) has been conducted in the United States (US) to empirically determine the long-term performance of concept stocks on different stock exchanges in the US. The results of their study indicate that concept stocks underperform the market as well as a selected portfolio of control stocks in the long term. This has important implications for investors when considering such stocks amongst other available prospects on the market.

Despite the international evidence, the topic of the performance of concept stocks has not received much exposure in South Africa. This highlights a gap in our knowledge, as a number of stocks listed on the Johannesburg Securities

Exchange (JSE) have shown, and continue to show, the characteristics of a concept stock.

This stance is easily evidenced by some of the internet-related stocks that came to prominence during the internet bubble period. Dimension Data, for instance, had a market capitalisation of R 60.7 billion off revenues of R14.0 billion in 2000 (Dimension Data Annual Report 2000, 5). One year later the market capitalisation had slumped to R 18.7 billion on increased revenues of R19.8 billion (Dimension Data Annual Report 2001, 61). This represents a sudden drop in the market-to-revenue ratio from 4.18 to 0.94 in the space of one year and this came off the back of increased revenues.

The shares were trading at R51.40 at financial year-end on September 30 2000 and closed one year later at R14.40. This drop in price, given the great revenue growth, indicates that perhaps the shares were not valued correctly during the boom. It is interesting to note in passing that to date the share price has never recovered, and at end August 2008 was trading at R7.44, still well below levels achieved in the pre-bubble period.

This is just one of the many stocks that, in their time, have traded at heady valuations and that have fallen from their former glory, some never to recover again. These stocks have captured the imagination of the public and investor community and have attracted substantial flows of capital, only to collapse disastrously. Worldcom is one such firm whose market capitalisation grew at great pace for 15 years under CEO Bernard J. Ebbers who had a great appetite for acquisitions. He built the second largest long-distance telecom firm in the US.

These acquisitions gave the business great presence and promised future profit, but the firm failed to deliver, as output prices crashed due to oversupply of capacity (Sridhar 2002). At its peak the firm had a market capitalisation of over $100 billion and collapsed rapidly from this level (Romero and Rivas, 2002). The market-to-revenue ratio was as high as 4.1 in 2000, and dropped to almost zero, before the firm eventually filed for bankruptcy in 2002 (Thornburgh, 2002). This is a classic example of a firm growing strongly on the back of potential future earnings and then failing to deliver.

Against this backdrop, following the Hsieh and Walking (2006) study, this study aims to analyse the characteristics and performance of concept stocks on the JSE. The reason for this is to develop an understanding of characteristics and performance of concept stocks in the context of the South African stock market.

1.2 Research problem

This study aims to replicate aspects of the study conducted by Hsieh and Walking (2006) in South Africa on the JSE.

The study analyses the characteristics of concept stocks to understand if they share commonalities that distinguish such stocks from the broader equities market. To develop a fuller appreciation of the nature and behaviour of concept stocks, the study also examines the long-term performance of concept stocks relative to a portfolio of control stocks. This method is in line with that adopted by Hsieh and Walking (2006) as well as other similar studies such as Brav, Geczy and Gompers (2000).

2 Theory Base

2.1 Definition of a concept stock

According to Hsieh and Walking (2006) a concept stock is so called because the investor is essentially buying into a 'concept' that is believed to deliver future returns despite a lack of financial evidence to support such an assertion. The concept stock is often one which does not have clearly measurable records or prospects that have been tested in a variety of economic climates (Fridson, 1996). The stock essentially sells based on the fact that it is 'the next Xerox' (Fridson, 1996, 13).[1]

Whilst this creates a context for what a concept stock is, it is not that useful for an empirical study on the subject. To this end, however, Hsieh and Walking (2006) provide a workable and objective definition of concept stocks.

Hsieh and Walking (2006) define a concept stock as one which has a high market-to-revenue ratio, that is, the stock generates a fairly low revenue stream versus the total market capitalisation. This measure is used in preference to the price-earnings ratio which does not accurately measure the relative ratings given by investors to firms with negative earnings. In order to provide an objective measure of which stocks qualify as concept stocks, Hsieh and Walking (2006) classify a concept stock as one falling into the final decile (91%-100%) of all stocks on the market when ranked according to the market-to-revenue ratio. It

[1] Xerox was one of the so called 'Nifty Fifty' stocks on the New York Stock Exchange favoured by investors in the 1960's and 70's. They were said to be stocks that one could buy-and-hold forever.

should be noted that Hsieh and Walking (2006) also exclude non-industrial stocks from their sample due to the difficulty in defining revenue figures (banks, for example, do not report revenue).

The researchers also exclude stocks that trade at less than US$5. This is done to address micro-structure and liquidity concerns. The micro-structure effect is a well documented phenomenon relating to 'the economic forces affecting trades, quotes and prices' (Biais, Glosten & Spatt, 2005, 217). In his synthesis of the subject Madhavan (2000) notes that the manner in which information is disseminated is not necessarily symmetrical and thus prices do not always reflect their true value due to various frictions in the structure of trades. These could include timing of information or private information for instance. Madhavan (2000) finds this is more pronounced in lower priced stocks due to the percentage change that a small move may have on a low priced stock.

In terms of liquidity, Brennan and Subrahmanyan (1996) indicate that adverse selection of stocks based on liquidity occurs. This adverse selection results in inaccurate pricing of assets. They believe that cheaper stocks may well be more susceptible to this phenomenon. This is likely to cause a skew in the data when trying to accurately measure the performance of concept stocks in which an asset may not be correctly priced.

Thus, in recognising the constraints identified by Brennan and Subrahmanyan (1996) and Madhavan (2000), this study confines the discussion of concept stocks to stocks that are liquid, relatively highly priced and that fall into the non-financial sectors of the JSE, namely the industrial and resource sectors. The

financial sector is excluded because the stocks do not reflect a revenue line item but derive income based on other factors rather than pure sales.

2.2 Glamour versus concept stocks

Before proceeding, it is useful to distinguish between concept stocks and so called 'glamour stocks'. A glamour stock is defined by Chan, Jegadeesh and Lakonishok (1995) as one with a low book-to-market ratio (as oppose to the high market-to-revenue ratio of a concept stock). This definition is used as an empirical measure for research studies on glamour stocks. Much of this research is centred on the value versus glamour stock debate initiated by Fama and French (1992).

In this vein, Barberis, Shliefer and Vishny (1998, 314) identify glamour stocks as 'stocks with very high valuations relative to their assets or earnings (glamour stocks), which tend to be stocks of companies with extremely high earnings growth over the previous several years'. As such, this definition serves to differentiate a glamour stock from a concept stock. Specifically, the glamour stock would normally have displayed good earnings growth over previous years, with investors buying into the stock in the hope or belief that the firm will continue to achieve a high rate of earnings growth.

The concept stock is purchased in the hope or belief that a particular concept will succeed and thus deliver future value with little evidence of profitability or growth in profit having been displayed; moreover, the firm may have little asset underpin given its lack of profit and profit history. Given this distinction, the market-to-revenue metric is a ready means of measuring the extent of investor appetite for

concept stocks. It should be noted, though, that this definition does not exclude a glamour stock from being recognised as a concept stock.

To reinforce this point, recently, Hong and Stein (2007) have provided an even broader definition of glamour stocks indicating that they are stocks with high ratios of market-to-earnings, -cash flow or -book value. Importantly, this definition excludes the market-to-revenue ratio and assumes that there are positive earnings.

Kohers, Kohers and Kohers (2007) find that the acquisition of 'glamour' firms proves to be value-decreasing purchases. This supports the fact that hubris plays a role in decision making on acquisitions of such firms (Kohers *et al*, 2007). Hubris is something associated with concept stocks as their value is driven by the concept rather than by sound analytical fundamentals; once again displaying some degree of similarity between the two types of stocks.

Glamour stocks do appear to show variation in performance based on the level of research and development that the firms undertake. Chan, Lakonishok and Sougiannis (2001) find that glamour stocks with high research and development intensity differ from most glamour stocks in that they deliver returns in line with the market, whereas those glamour stocks that do not invest heavily in research and development underperform the market. Hsieh and Walking's (2006) findings also note that concept stocks are often associated with high research and development spending. This would indicate further overlap between the two types of stocks.

Thus, the research findings suggest that glamour stocks and concept stocks exhibit valuations that may not be based on rational financial analysis. The glamour stock trades at a high value based on previous earnings growth, whereas the concept stock trades at a high level based on the 'concept' that may come to fruition in the future.

Hsieh and Walking (2006) choose to control for the glamour effect through matching stocks by size and book-to-market values. The use of book-to-market values aims to control for glamour stocks which are defined as having low book-to-market ratios (Chan *et al*, 1995).

2.3 Small size effect

Considering the performance of concept stocks, another concern noted by the Hsieh and Walking (2006) is that of the small size effect. Ritter (1991) notes that investors appear to be overly optimistic about the earnings potential of young growth companies. This would provide another case where the valuation of a stock may not be based on a rational financial analysis with expectations being driven by size. Additionally, Loughran (1997) notes that small growth firms exhibit exceptionally low stock returns. This would seem to indicate that the earnings potential of small firms is not correctly assessed.

The small stock effect could distort the results, however Hsieh and Walking (2006) find that few of their selected concept stocks actually fell into the smallest firms when ranked by the market-to-revenue ratio. In fact small sized companies were evenly spread across the all the deciles.

2.4 Efficient markets

If the market is operating efficiently, then the concept stocks should be fairly valued according to the efficient market hypothesis. Fama (1970, 383) wrote the definitive paper on the efficient market hypothesis stating that 'a market in which prices fully reflect available information is called efficient'. Thus, the efficient market hypothesis holds that market prices always reflect fair value.

Despite strong academic support for the efficient market hypothesis, a number of authors have looked to discount the notion of efficiency, notably Grossman and Stiglitz (1980) who found that informed individuals bid the price of a security up if they have information that it will earn high returns, with the converse also being true; however they note that this is done imperfectly. This notion would indicate that it is possible that a stock may not reflect true value at a point in time based on the information available. This is an important point as it would indicate that over the short term, a stock may not fully reflect its fair value. A concept stock is likely to be one of these instances as the price is driven by a concept, and information available to the market may not be entirely accurate or measurable by commonly used methods.

Another author who discounts the efficient market hypothesis is Shiller (2000) who coined the phrase 'Irrational exuberance'. Shiller (2000) is of the belief that, at times, market prices are set by irrational traders. The important aspect of this is that the phenomenon is short-lived. A key example cited by him is the internet bubble. Malkiel (2003), traditionally an advocate of the efficient market hypothesis, has sympathy in this particular instance noting the novelty and

different business models of the internet firms which initially were not fully understood. He argues that even seasoned professional investors made errors in their estimations of the so-called 'hi-tech boom' and the future cash flows that they expected to arise from technology stocks. In the case of such misguided analysis, it was not possible for the rational investor to extract above average returns from these stocks. However, this phenomenon of 'irrational exuberance' does relate well to the notion of concept stocks that may be purchased out of the belief in a concept.

Fama (2000) in defence of his position goes on to say that his theory stands the test of the literature. He believes that long-term event studies indicate that it is difficult to realise above average returns through stock selection. Further, Fama (2000, 284) notes 'that long-term return anomalies are sensitive to methodology'. Thus 'most long-term return anomalies can reasonably be attributed to chance'.

The important aspect of the various arguments put forward by authors over the years is that markets are efficient only over the long term and that short-term inefficiencies may appear. Thus a concept stock may appear in the short-term, however its true value will be realised over the long-term. Further over the long term, and by using multiple return measurement methods, returns should reflect all available information.

2.5 Measuring performance

An efficient market should quickly absorb new information and stock prices should react to this by reflecting the changes in the stock price. Fama, Fisher, Jensen and Roll (1969) found that, what they termed 'residuals,' could be found

by subtracting stock price performance from the expected return. These were to become known as ‘abnormal returns’ and most performance measurements make use of this as a basis for measurement.

As noted by Fama (2000) in paragraph 2.4.4 above, it is prudent to subject results to multiple measurement methods due to the sensitivity of event studies to method.

After reviewing various aspects of literature two methods of measuring long-term performance emerge as the most robust. They are the Fama-French three factor model (Fama and French, 1993) and the buy-and-hold abnormal return method of Barber and Lyon (1997).

The Fama-French three factor model is widely used in various studies (see, for example, Pástor and Stambaugh, 2003). There is evidence that the Fama-French three factor model is superior to the previously popular Capital Asset Pricing Model (CAPM) when predicting long-term returns (Simpson and Ramchander, 2008). CAPM, as a model, was put forward as far back as 1964 by Sharpe (1964). Sharpe introduced the notion of accounting for risk beyond that taken into account by interest rates. The formula included a beta value to account for market risk in determining future values. The Fama-French three factor model provides a more robust method, as it accounts for more than just market risk as used by the CAPM model, by including size and value factors. This is done because Fama and French (1993) identified that small cap stocks outperform the market regularly. In Hsieh and Walking’s (2006) study, however, it was found that

small stocks were not an influence as they were distributed equally across the deciles.

Fama and French (1993) also found that value stocks outperform growth stocks. Thus values for this phenomenon are also taken into account in their more robust model. Once again the Hsieh and Walking (2006) definition of a concept stock excludes value stocks which have low market-to-fundamental ratios (Hong and Stein, 2007).

The Hsieh and Walking method inherently controls for the factors associated with Fama-French three factor model.

The Barber and Lyon (1997) buy-and-hold abnormal return method has also been widely used by others (see for example Teoh, Welch and Wong, 1998). The Barber-Lyon buy-and-hold abnormal returns method can be used to measure returns versus market indices as well as control stocks which made the method particularly useful for the Hsieh and Walking (2006) study which analysed both.

There are two key aspects to the Barber-Lyon buy-and-hold abnormal returns method. The first is the method of calculation of the abnormal return and the second refers to the matching technique used to select a control stock. The latter aspect is dealt with in section 2.6 below.

Barber and Lyon (1997) favour the use of simple buy-and-hold abnormal returns over the use of cumulative abnormal returns which are subject to three biases, namely: new-listing bias (associated with newly listed stocks consistently under-performing the market); rebalancing bias (in which the control portfolio is

rebalanced monthly and whose returns are not compounded like the sample stock); and skewness bias arising from long-term abnormal returns being positively skewed.

To counter these inherent biases Barber and Lyon (1997, 349) recommend the use of a simple buy-and-hold return 'calculated as the change in price plus dividends scaled by the beginning-of-period price'. These returns are then subtracted from those of the matching control stock to produce the abnormal return results.

The findings from the Hsieh and Walking (2006) study indicate that there was no difference in results when using the Fama-French three factor model or the Barber-Lyon buy-and-hold abnormal return method. In fact they note that the Fama-French model is less likely to show abnormal returns than the buy-and-hold method.

Each of these approaches has been widely applied, and both are used in the Hsieh and Walking (2006) study even though their method largely controls for the factors used in the Fama-French three factor model. The use of both methods increases the accuracy of results based on Fama's (2000) assertion that event studies are method-sensitive.

2.6 Control stocks

The Hsieh and Walking (2006) study makes use of control stocks as a means of comparison for long-run abnormal returns. The method used in this study will replicate their method which is drawn from Barber and Lyon (1997). The method

has been used in other studies such as Eckbo and Norli (2005) and more recently by Ngatuni, Captsaff and Marshall (2007).

Barber and Lyon (1997, 343) specifically note:

> …the efficacy of a control firm approach for detecting long-run abnormal stock returns. We document that matching sample firms to control firms of similar sizes and book-to-market ratios yields test statistics that are well specified in virtually all sampling situations that we consider.

The Barber-Lyon buy-and-hold abnormal returns method, in conjunction with the use of control firms, is likely to provide the most accurate measurement for long-term abnormal returns.

As noted above, the Barber and Lyon (1997) method makes use of a matching technique whereby stocks of a similar size (market capitalisation) and book-to-market ratio are used to measure against the set of sample stocks, in this case the concept stocks. These factors are also prevalent in the Fama-French three factor model (1993) which controls for the small stock and value factors.

Stehle, Ehrhardt and Pryzborowsky (2000) also find that size portfolios and matching stocks are better benchmarks than market portfolios. By using this method, the results derived will allow for comparison with the Hsieh and Walking (2006) findings.

2.7 Summary

Concept stocks are ones that sell on the promise of future value being delivered by a concept that is as yet untested. In order to empirically study concept stocks Hsieh and Walking (2006) define them as stocks in the final decile when ranked by the market-to-revenue ratio.

The difference between concept stocks and glamour stocks is not immediately clear although glamour stocks are likely to have shown good earnings growth in preceding years. They may display the characteristics of a concept stock though. Hsieh and Walking (2006) specifically control for them through the control stock selection process. The effect of small size is also one which may affect measurement although Hsieh and Walking (2006) found that this effect did not really influence their results.

The efficient market hypothesis has implicit bearing on this study as it argues that stocks reflect their true value over the long-term. By measuring the performance of concept stocks over the long-term it will be possible to identify if all information is accurately reflected in the market capitalisation.

It is generally accepted that the Fama-French three factor model (1993) and Barber and Lyon (1997) buy-and-hold abnormal return method are the most accurate methods in measuring long-term performance. The Hsieh and Walking (2006) study accounts for the factors of the Fama-French model (through the selection of the control portfolio) and given their results using both methods were no different, it is may only be necessary to use the Barber-Lyon buy-and-hold abnormal return method.

The use of matching control stocks is advised by Barber and Lyon (1997) as providing the most accurate measure for long-term abnormal returns. This finding is corroborated by Stehle *et al* (2000) which found that matching stocks provide for better benchmarks than market portfolios when measuring long-term stock

performance. For this reason, this study makes use of the size and book-to-market ratio method for creating a control portfolio.

3 Research Hypotheses

Two aspects are investigated by this study:

a. The characteristics of the identified concept stocks; and
b. The performance of the concept stocks versus the control stocks.

The first step in terms of analysis will be to describe the characteristics of the concepts stocks selected. They will be analysed using the following financial ratios: operating profit margin; net profit margin; return on assets; and return on equity.

The second step will be to measure the long-term performance of the concept stocks against the control stocks. This is in line with Barber-Lyon buy-and-hold abnormal returns (1997) method, used by Hsieh and Walking (2006).

Against this backdrop, this study tests four hypotheses.

Hypothesis 1a

The null hypothesis states that the operating profit margin of concept stock firms (Con_{OPM}) is equivalent to the operating profit margin of the control stock firms ($Cont_{OPM}$). The alternative hypothesis states that the operating profit margin of concept stock firms (Con_{OPM}) differs significantly from the operating profit margin of the control stock firms ($Cont_{OPM}$).

H_0: $Con_{OPM} - Cont_{OPM} = 0$

H_1: $Con_{OPM} - Cont_{OPM} \neq 0$

Hypothesis 1b

The null hypothesis states that the net profit margin of concept stock firms (Con_{NPM}) is equivalent to the net profit margin of the control stock firms ($Cont_{NPM}$). The alternative hypothesis states that the net profit margin of concept stock firms (Con_{NPM}) differs significantly from the net profit margin of the control stock firms ($Cont_{NPM}$).

H_0: $Con_{NPM} - Cont_{NPM} = 0$

H_1: $Con_{NPM} - Cont_{NPM} \neq 0$

Hypothesis 1c

The null hypothesis states that the return on assets ratio of concept stock firms (Con_{ROA}) is equivalent to the return on assets ratio of the control stock firms ($Cont_{ROA}$). The alternative hypothesis states that the return on assets ratio of concept stock firms (Con_{ROA}) differs significantly from the return on assets ratio of the control stock firms ($Cont_{ROA}$).

H_0: $Con_{ROA} - Cont_{ROA} = 0$

H_1: $Con_{ROA} - Cont_{ROA} \neq 0$

Hypothesis 1d

The null hypothesis states that the return on equity ratio of concept stock firms (Con_{ROE}) is equivalent to the return on equity ratio of the control stock firms ($Cont_{ROE}$). The alternative hypothesis states that the return on equity ratio of

concept stock firms (Con_{ROE}) differs significantly from the return on equity ratio of the control stock firms ($Cont_{ROE}$).

H_0: $Con_{ROE} - Cont_{ROE} = 0$

H_1: $Con_{ROE} - Cont_{ROE} \neq 0$

Hypothesis 2

The null hypothesis states that the simple buy-and-hold abnormal returns (Barber and Lyon 1997) of concept stocks ($B\&H_{Con}$) are equivalent to the simple buy-and-hold abnormal returns of the control stocks ($B\&H_{Cont}$). The alternative hypothesis states that the simple buy-and-hold abnormal returns of concept stocks ($B\&H_{Con}$) differ significantly from the simple buy-and-hold abnormal returns of the control stocks ($B\&H_{Cont}$).

H_0: $B\&H_{Con} - B\&H_{Cont} = 0$

H_1: $B\&H_{Con} - B\&H_{Cont} \neq 0$

Hsieh and Walking (2006) found that concept stocks underperformed the control stocks and one would expect to find a similar result in this study.

4 Research Design and Methodology

4.1 Research design

The study was empirical in nature and made use of a quantitative method to measure the identified areas of investigation, however, the study was founded on secondary research of a qualitative nature (Zickmund, 2003).

4.1.1 Secondary research

Secondary research took the form of a literature review performed prior to the quantitative section of research. This was performed to provide context and current thinking regarding the identified research problem (Zickmund, 2003). Information sources included journal articles, books, websites and magazines relating to investment and concept stocks. The literature review also encompassed a review of measurement tools used to measure long-term performance.

4.1.2 Quantitative research

The quantitative element of the study covered two key areas. The first being descriptive of the characteristics of the concept stocks identified in the study. The second area made use of statistical method to measure the accounting characteristics and performance of concept stocks using the Barber and Lyon (1997) buy-and-hold abnormal return method.

4.2 Unit of analysis

The unit of analysis was the return of concept and control stocks over the period 1994 to 2006 as measured by the Barber and Lyon (1997) buy-and-hold abnormal return method.

4.3 Population

The population for the study was all industrial stocks listed on the JSE from 1994 to 2006. The study specifically excluded all stocks valued at less than R5 per stock to remain in line with the Hsieh and Walking (2006) method which controlled for microstructure and liquidity (driven by low stock price) concerns noted by Madhavan (2002) and Brennan and Subrahmanyam (1996) respectively.

4.4 Population of relevance

The population of relevance focused on all stocks that fell into the specified criteria of a concept stock (noted in paragraph 4.3.1 above), that is, stocks ranked in the final (91%-100%) decile according to market-to-revenue ratio (Hsieh and Walking, 2006).

In order to calculate an annual ratio for the market-to-revenue ratio that was comparable across all stocks, it was important to ensure that the market capitalisation figures were all recorded on the same day for all stocks. This helped ensure that market news equally affected all stocks under consideration.

Market capitalisation figures for 31 December were drawn from McGregor's BFA database for the years 1994 to 2006.

The revenue figures were thus required to match the timing of the market capitalisation figures and therefore needed to reflect the trading period from 1 January to 31 December each year. Revenue data were drawn from the McGregor BFA database using the blink tool. In cases where the financial year end of the firm was in the month of December, the revenue figure was matched to the market capitalisation figure to provide an accurate annual market-to-revenue ratio.

Naturally many firms had financial year-ends that fell outside this time-frame. It was thus necessary to create a matching process whereby an extrapolated revenue figure could be calculated for the calendar year so as to match the market capitalisation figure. For instance, a firm with a year end in October of year t would use the revenue figure for that year (t) multiplied by a factor of 10/12 plus the revenue figure for the following year (t+1) multiplied by 2/12 to make up a notional revenue figure for the calendar year t.

This method is obviously not entirely accurate given that revenues are not earned uniformly over a year. Thus if a firm had a particularly seasonal revenue stream it is likely to have created an element of bias in the result. However, it is argued that this method was more accurate than that utilised by Hsieh and Walking (2006) which matched revenue figures for companies with year-ends from January to May to the previous year's market capitalisation figure and those with

year-ends between June and December to the current year's market capitalisation.

The process of deriving a revenue figure was further complicated by the fact that a number of JSE listed stocks reported earnings in foreign currencies, for example Richemont, which, over the time period under study, had reported revenue in Swiss Francs and Euros at different stages. These revenue figures needed to be converted into an equivalent Rand amount in order to compare them with the Rand denominated market capitalisation.

To do this, exchange rate data were drawn from the South African Reserve Bank detailing the closing daily exchange rate for the period under review. From this information a mean exchange rate covering the appropriate period was calculated. For example the revenue of a firm reporting in US dollars with a financial year end in October would be calculated by multiplying the mean exchange rate for the period January to October by the revenue figure for the same period plus the mean exchange rate for the period November to December by the revenue for that period. This provided a comparable Rand amount that could be used to create the market-to-revenue ratio required.

Once the annual market-to-revenue ratios had been calculated the stocks were ranked according to the ratio. The final decile of stocks was then selected as being concept stocks.

A set of control stocks was constructed by selecting all stocks with a market capitalisation within 30% of the identified concept stock. If the subset contained less than five stocks then the margin was extended to 40%; this was in line with

the Hsieh and Walking (2006) method. The firm with the closest book-to-market ratio amongst this set was then selected as the control stock.

Data for this exercise were drawn from the McGregor BFA database. In some cases book-to-market ratios were not available and were manually calculated to maintain the integrity of the method. Some of the identified matching control stocks had previously been concept stocks themselves. If the stock had been a concept stock two years prior to the event, it was excluded and the second closest stock by book-to-market ratio was selected.

This method of control stock selection was suggested by Barber and Lyon (1997) and has been used in numerous subsequent studies including Desai and Jain (1999). Further, this method controlled for the factors found in the Fama-French three factor model reducing the necessity to utilise their method.

4.5 Data collection process

Data were collected from the McGregor-BFA database. Data were entered into a Microsoft Excel spreadsheet listing the relevant data including market capitalisation and revenue figures. This enabled the annual ranking of all stocks to identify those in the final decile which made the set of concept stocks for that year. Once selected the concept stocks were matched using the abovementioned method.

In order to study the financial characteristics of the stocks, the appropriate financial ratios (listed in Hypothesis 1a, b, c and d) were drawn from the

McGregor BFA database for the concept stocks and control stocks. In this case the Hsieh and Walking (2006) method of matching data from firms with financial year-ends between January and May to the previous year, was followed.

Data required for the Barber-Lyon (1997) buy-and-hold abnormal return were also drawn from the McGregor BFA database using the total return function calculates as follow:

$$100 \text{ x } \left[\frac{Pn + \left(\sum_{t=0}^{n-1} \frac{Dt}{K} xPt \right)}{Po} \right] - 1$$

Where:

P_n = end price (at month end);
P_o = beginning price (at beginning of month);
P_t = price at time t;
n = number of intervals in period of calculations;
D_t = dividend yield at time t (use published dividend per share in order to avoid problems with calculated dividend per share); and
K = 12 for monthly calculations.

This provided a simple buy-and-hold annual return as recommended by Barber and Lyon (1997).

4.6 Data analysis approach

To test the hypotheses all data were subjected to a two-tailed t-test which measured for significant abnormal results (of the concept stock) from the expected result (of the control stock).

4.6.1 Measuring financial ratios

In measuring the financial ratios a similar approach to the buy-and-hold abnormal returns approach was utilised. The testing procedure measured for results which were considered abnormal from the expected. The expected result was defined by the control set and abnormal results were represented by the simple concept ratio percentage subtracted from the expected ratio of the control stock as recommended by Barber and Lyon (1997) and used by Smit (2005).

The concept stock ratio was subtracted from the matched control stock to arrive at an abnormal value. This formed a set of abnormal results. A two-tailed t-test was then performed in the NCSS statistical package to measure for significant difference from zero at a 95% confidence interval. A p-value above 0.05 would prove the null hypothesis.

The t-tests were run over a period of four years. Year 0 was defined as the event year, which is the year in which the stock was noted as a concept stock. Although the focus of this study was on the subsequent performance of the concept stock it was of interest to note the figures for the event year. Years 1 to 3 represented the subsequent years after the stock entered as a concept stock.

Due to the fact that measurements were taken over a three year period after the event, some of the stocks were delisted from the exchange in the subsequent years. This may have occurred due to acquisition, liquidation, purchase by an unlisted entity or a decision to become private. In such cases the blank data was substituted with the data from the matched pair. If for

example the concept stock was delisted in Year 3, the ratio of the matching control stock was substituted for the concept stock in that year. This was the method utilised by Hsieh and Walking (2006) and is recommended by Barber and Lyon (1997) to cater for survivor bias.

A large number of de-listings occurred across the period under study, particularly within the concept portfolio. Within this portfolio the majority of these were due to firm failure. Due to the high number of failures as a percentage of the total firms being studied, it was prudent to also form a portfolio in which the missing ratio values were substituted with a zero value instead of the matched pair value. This would offer a more fair reflection of accounting performance.

After an initial run of descriptive statistics it was noted that there was a high degree of variance in the concept portfolio when compared to the control portfolio. As such a Wilcoxon/Mann-Whitney signed-rank test was also run to test for significant difference between the paired medians. This was also found in the Hsieh and Walking (2006) study.

4.6.2 Measuring financial performance

The second section of the analysis measured the performance of the concept stocks versus the control stocks. This was accomplished through the use of the buy-and-hold abnormal return method proposed by Barber and Lyon (1997).

As with the measurement of the financial ratios above, a two-tailed t-test was run to determine the long-run performance of the concept stocks compared to the control stocks.

As with the accounting data above, a number of the stocks delisted over the period subsequent to the event of being selected as a concept stock. This occurred in 22 out of the 124 cases, a 17.7% prevalence, which is relatively high. It was thus likely to materially affect the results. Barber and Lyon (1997) recommended substituting the missing returns with the matched stock. This was the method used in the Hsieh and Walking (2006) study as well and was utilised in this study.

In addition to this, where stocks were delisted due to failure, the missing values were substituted for a zero value to offer a more accurate reflection of performance. The portfolios were re-constructed with these figures and tested for significant abnormal returns.

The result of the two-tailed t-test was a p-value which tested for the null hypothesis stating that there is no difference in performance between the concept stock and the control stock. This was done at a 95% confidence interval. A Wilcoxon/Mann-Whitney signed-rank test was also run on the median returns due to the variation noted in the concept portfolios. This test would be more sensitive to significant abnormal returns.

4.7 Limitations

This study had several limitations; the first of which was the time period under study. It cannot be concluded that performance over the years under review was representative of concept stock performance on the JSE over its history.

The study focused only on the JSE and did not consider South Africa's Alternative Exchange (Alt-X) which is likely to be a rich source of concept stocks given the bourse is rich in emerging companies. The Hsieh and Walking (2006) study analysed all the stock exchanges across the US and did find that some differences were evident. It is thus possible that similar results would hold in South Africa.

Hsieh and Walking (2006) found that concept stocks in their study displayed significantly higher research and development spending than their set of control stocks. In South Africa, research and development spending is not required as a line item in terms of financial reporting and thus this study was unable to test this hypothesis.

The databases used did not always have the required information available for all stocks over the period under study. Stocks that fell into this category (eight in total) were excluded from the study.

The size of the JSE universe is very small (approximately 400 stocks) when compared with the study undertaken by Hsieh and Walking which analysed a universe of approximately five thousand stocks. Further, after focusing on the industrial stocks and removing those trading at below five rand, the population size was reduced to approximately one hundred.

The use of R5.00 as a minimum stock value could be considered to be quite high and may have excluded a number of stocks which would qualify as concept stocks.

Due to the nature of the research project and the time available for completion, fewer characteristics of the concept stocks were measured than in the Hsieh and Walking (2006) study. These included: advertising spend; capital expenditure-to-sales ratio; firm age; and firm size.

None of the above characteristics were however found to be significant when measured against the control stocks in the US study.

Hsieh and Walking (2006) also made use of the Fama-French three factor model (1993) in their study when measuring long-term performance. This model was not used in this study as the control stocks selected made use of the factors noted by the model. Further, Hsieh and Walking (2006) found no difference between the results derived from the Fama-French three factor model and the Barber-Lyon (1997) buy-and-hold abnormal return method used in this study.

Hsieh and Walking made use of multiple control portfolios in addition to the size and book-to-market ratio used in this study. This assisted in testing the robustness of their findings. These control portfolios were not constructed for this study.

In terms of data integrity the calculation of book-to-market ratios for some companies was done as accurately as available accounting data allowed.

As noted, some of the revenue figures were extrapolated to match a calendar year through a matching process. This process may have introduced an element of bias as revenue was not likely to have been earned uniformly across a year.

5 Data Analysis

5.1 Description of data and concept stock characteristics

The study took into consideration all stocks that were listed on the JSE from 1994 to 2006. From this initial set, all industrial stocks are selected (excluding financial and mining stocks) as well as stocks with prices lower than R5.00.

Table 1 below indicates the total number of stocks selected based on the qualification criteria in each year of the study. The number of concept stocks which are ranked in the final decile when ranked by the market-to-revenue ratio are also noted, as is the mean market-to-revenue ratio for the concept stocks for each of the thirteen years under study.

Table 1: Summary of data set

Year	Total stocks qualifying	Total concept stocks	Mean market-to-revenue ratio
1994	91	9	3.18
1995	105	11	3.71
1996	111	11	3.42
1997	115	12	3.06
1998	105	11	3.76
1999	82	8	6.79
2000	83	9	4.46
2001	76	8	2.39
2002	74	8	2.04
2003	75	8	2.38
2004	88	9	3.33
2005	101	10	3.57
2006	96	10	3.91

Also, there are a number of stocks which entered as concept stocks on multiple occasions. The number of times firms appear as concept stocks is captured in Table 2 below.

Table 2: Number of years firms are concept stocks

Number of years	Number of firms	Percentage	Cumulative percentage
1	14	35.9%	35.9%
2	5	12.8%	48.7%
3	8	20.5%	69.2%
4	4	10.3%	79.5%
5	3	7.7%	87.2%
6	1	2.6%	89.7%
7	0	0.0%	89.7%
8	1	2.6%	92.3%
9	1	2.6%	94.9%
10	1	2.6%	97.4%
11	1	2.6%	100.0%

Concept stocks are widely represented across the various sectors on the JSE. Table 3 captures the number of concepts stocks by industry by year. The year is noted as the year the stock was selected as a concept stock.

Table 3: Industry sector analysis of concept stocks by year

Sector	Total	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006
Chemicals	6	1	1	1		2						1		
Construction and materials	11	1	1					1	2	2	1	1	1	1
Consumer goods	6				1	2	1	1			1			
Food and beverage	1			1										
Healthcare	8	1	1						1	1	1	1	1	1
Industrial goods and services	18	2	2	1	4		1	2	2	2	1		1	
Media	10	1	2	2	1							1	1	2
Oil and gas	1			1										
Personal and household goods	11			1	1	1	1	1	1	1	1	1	1	1
Retail	7	1	1				1				1	1	1	1
Technology	18		1	3	3	5	3	3						
Telecommunications	8				1	1	1		1	1	1	1		1
Travel and leisure	18	2	2	1	1				1	1	1	2	4	3
Venture cap	1							1						

5.2 Accounting characteristics of concept stocks and control stocks

The study analyses four key accounting ratios, namely: operating profit margin (OPM); net profit margin (NPM); return on assets (ROA) and return on equity (ROE). These ratios are analysed across four years with Year 0 representing the year in which the stock enters as a concept stock based on the market-to-revenue ratio. This is done to show the performance of the stock in that year. It is not possible to pick a concept stock at the beginning of the year; however the accounting characteristics are of interest in this year. It is however the subsequent performance over Year 1, 2 and 3 which form the focus of this study.

Before analysing the figures for significant differences between the concept and control portfolios, the data itself are run through a set of descriptive statistics. It is noted that the variance levels of the concept stocks are substantially higher than the set of control stocks. This is best illustrated through the use of box plots. Four box plots are shown below and cover each of the four accounting variables being analysed over one of the Years (0, 1, 2 or 3). For the sake of brevity only four of the sixteen box plots are shown. However, they are broadly representative of the pattern across all the plots.

Figure 1: Box plot for operating profit margin in Year 0

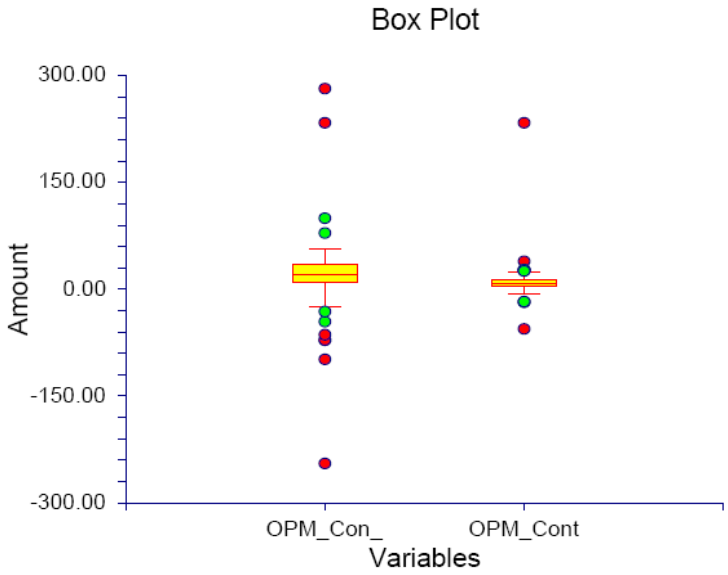


Figure 2: Box-plot for net profit margin in Year 1

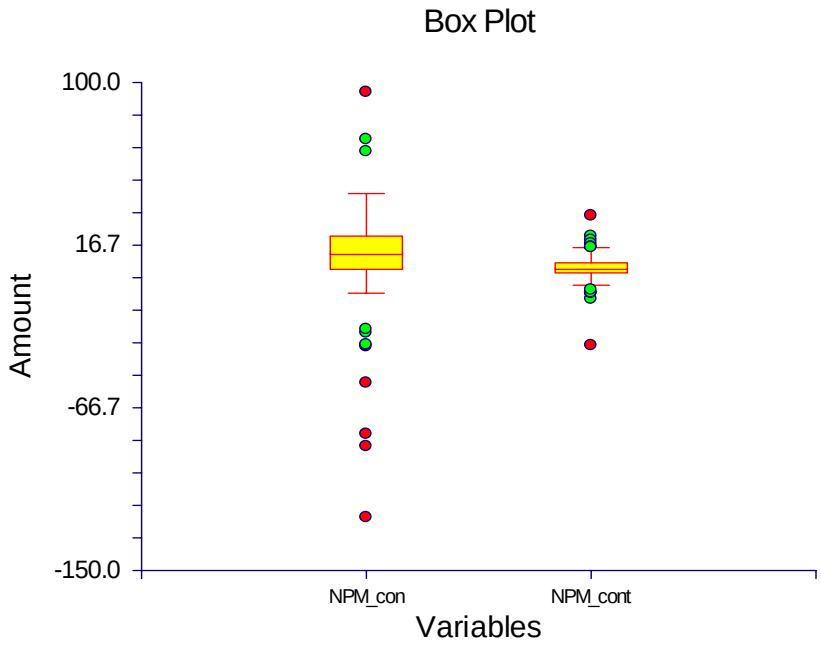


Figure 3: Box plot for return on assets in Year 2

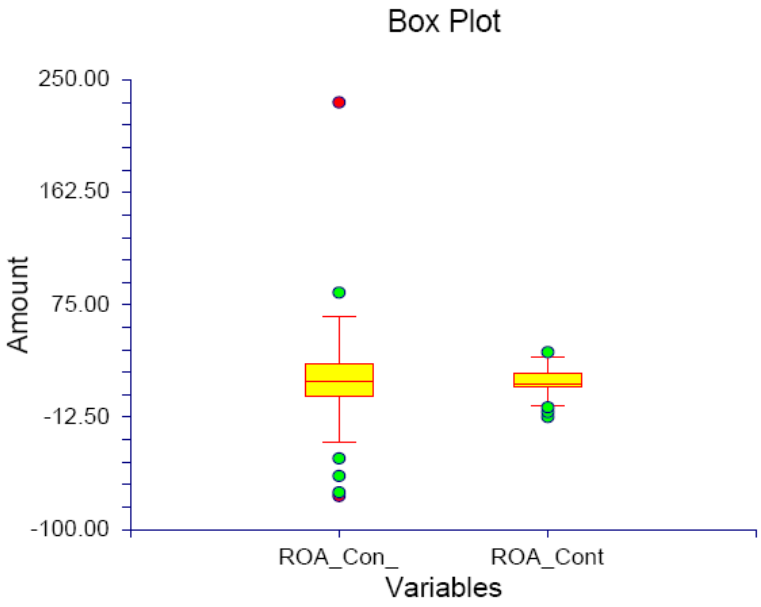
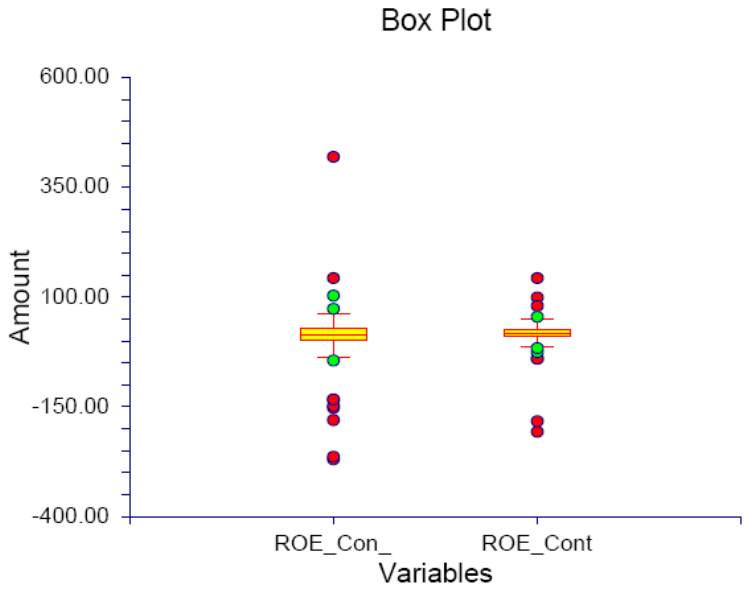


Figure 4: Box plot for return on equity in Year 3



These box plots clearly indicate the wide spread of data delivered by the concept stocks when compared with the control stocks. For this reason it is considered prudent to make use of the median as well as the mean when comparing the two sets of data. The Wilcoxon/Mann-Whitney signed-rank test is thus used to compare the ranked median values in addition to the two-tailed t-test used to analyse the difference of mean results.

For each year, the portfolio mean and median values are calculated across the four accounting variables. In order to test for a significant difference between the two portfolios the ratio of the control stock is subtracted from that of the matched concept stock. This provides the variance from the expected result. These variance figures are then run through a two-tailed t-test. This produces a t-statistic and p-value. The p-value is used to determine if the variance from the expected value is significant at a 95% confidence interval. P-values above 0.05 indicate no significant difference and confirm the null hypothesis. P-values below 0.05 indicate a significant variance from the expected zero outcome and the null hypothesis is thus rejected.

The test for the difference in median is conducted in the same way by subtracting the ratios to arrive at the variance from the expected median score. It is then subjected to the Wilcoxon/Mann-Whitney signed-rank test (t-statistic for a median). This test is not commonly used however due to the high variation noted for the ratios of the concept stocks it is appropriate. Hsieh and Walking (2006) also make use of this test due to high variance noted from their data set. Healy, Palepu and Ruback (1992) also made use of the median t-statistic after noting high variation in their data set measuring post-acquisition stock performance.

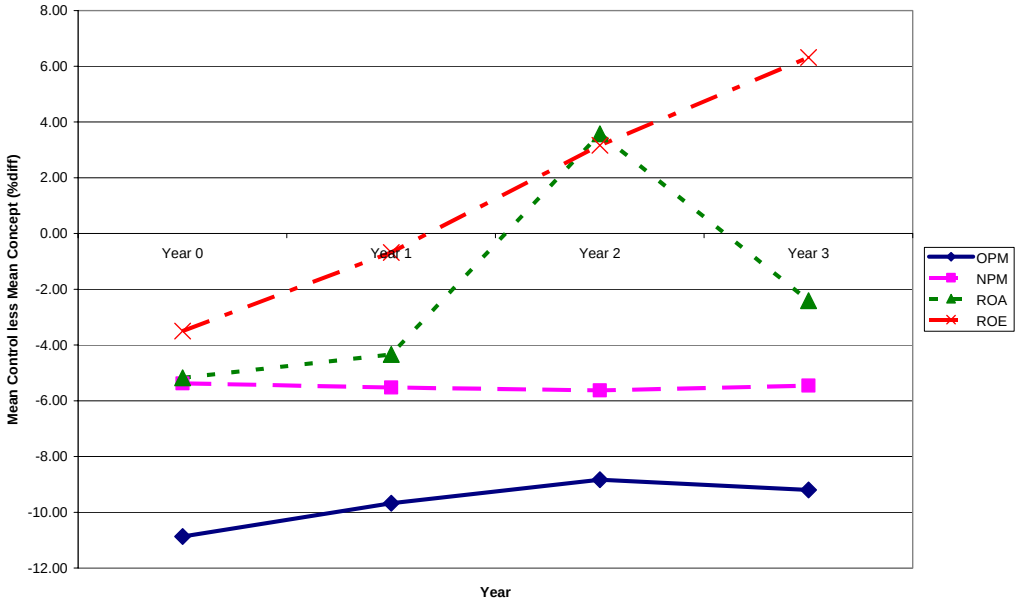
Table 4 below shows the key statistical data drawn from the analysis. Year 0 indicates the event year in which the concept stock is recorded as a concept stock. The subsequent three years represent the years after it was first selected as a concept stock. The analysis covers each of the four accounting variables and shows the portfolio mean and median and below them, the relevant p-value. P-values that were noted as significant (p-value ‹ 0.05) are bolded in blue.

Table 4: Mean, median and p-values for control and concept portfolios across four accounting variables

		OPM		NPM		ROA		ROE	
		Mean	**Median**	**Mean**	**Median**	**Mean**	**Median**	**Mean**	**Median**
Concept									
	Year 0	21.04	22.76	10.65	14.02	17.67	21.66	8.13	21.2
	Year 1	19.44	20.53	10.66	12.35	18.88	20.16	12.55	19.21
	Year 2	18.98	19.05	11.09	10.59	18.05	17.73	10.79	16.1
	Year 3	20.06	16.42	11.68	8.37	17.59	16.00	9.90	14.3
Control									
	Year 0	10.17	8.77	5.27	4.52	12.50	14.80	13.47	17.7
	Year 1	9.76	8.95	5.14	4.91	14.54	14.33	18.50	18.53
	Year 2	10.15	8.87	5.47	4.51	14.54	14.27	16.48	19.27
	Year 3	10.86	9.04	6.22	4.89	15.18	14.41	15.43	20.62
p-value	Year 0	**0.006**	**0.000**	0.085	**0.000**	0.084	**0.000**	0.423	0.499
	Year 1	**0.000**	**0.000**	**0.010**	**0.000**	0.074	**0.001**	0.129	0.927
	Year 2	**0.003**	**0.000**	**0.035**	**0.000**	0.646	0.080	0.405	0.494
	Year 3	**0.009**	**0.001**	0.074	**0.004**	0.463	0.177	0.276	**0.009**

It is also useful to track the trend in the difference of means between the concept stock portfolio and control stock portfolio over time. Figure 5 below is constructed by subtracting the concept stock mean from the control stock mean for each of the years under study.

Figure 5: Trended performance of the difference in mean ratios



The box-plots indicate a high degree of variation across the portfolio. This indicates that some stocks are pulling the mean in a certain direction and unduly influencing the result.

To try and better understand these outlying stocks, the concept portfolio is ranked across each of the four accounting values from highest to lowest. This provides an insight as to which stocks display strong accounting performance across the measures. The stocks are then analysed to identify if they have any characteristics in common. Characteristics analysed included industry sector, year recorded as a concept stock and stocks which had entered the concept portfolio on six or more occasions.

The only characteristic that makes any difference to the outcome is the set of stocks which enter the concept portfolio on six or more occasions (henceforth referred to as 'repeat stocks'), although this difference was marginal. The

results for this set of data which exclude the repeat stocks are listed in Table 5 below.

Table 5: Mean, median and p-values for control and concept portfolios across four accounting variables once the five 'repeat stocks' and their matching control stocks have been removed from the portfolios

		OPM		NPM		ROA		ROE	
		Mean	Median	Mean	Median	Mean	Median	Mean	Median
Concept									
	Year 0	21.08	20.76	10.62	12.81	18.19	21.97	7.31	22.35
	Year 1	17.55	19.05	9.83	10.48	19.19	19.52	13.14	19.21
	Year 2	17.16	16.20	10.62	8.05	18.14	15.76	11.13	14.96
	Year 3	17.73	13.59	10.54	6.44	16.53	13.85	-9.20	11.67
Control									
	Year 0	11.28	8.65	6.18	4.52	12.52	13.63	13.03	16.74
	Year 1	9.19	8.54	4.40	4.89	13.99	12.88	16.65	16.06
	Year 2	9.10	7.76	4.61	4.24	24.17	12.84	15.37	17.23
	Year 3	10.20	8.17	5.42	4.72	14.43	14.02	10.50	17.23
p-value	Year 0	0.085	**0.000**	0.307	**0.000**	0.185	**0.006**	0.534	0.169
	Year 1	**0.006**	**0.000**	**0.047**	**0.000**	0.114	**0.010**	0.491	0.587
	Year 2	**0.036**	**0.002**	0.084	**0.006**	0.608	0.259	0.631	0.792
	Year 3	0.122	0.163	0.227	0.389	0.648	0.858	0.395	**0.020**

It is also notable that the set of top performing stocks in Year 1 differs significantly from the set of top performing stocks in Year 2 and similarly for Year 2 versus Year 3. Thus the variance of the stocks does not appear to be driven by a common set of stocks across the three year period.

5.3 Calculating long term stock performance

As noted in the methodology the simple buy-and-hold abnormal returns are measured so as to create a portfolio of concept stocks and control stocks that can be compared using the two-tailed t-test.

The buy-and-hold returns are listed for a period of six years. Year 0 represents the year the stock was identified as a concept stock. Years 1 to 5 represent the

subsequent years. The simple buy-and-hold abnormal return of the concept stocks and their matched control stock are recorded on a monthly basis across the six year period. The monthly control stock return is subtracted from the monthly concept stock to derive an abnormal return as noted in the method prescribed by Barber and Lyon (1997). The abnormal return values are then run through a two-tailed t-test that tests for significant difference from the expected zero return value. As with the accounting variables in section 5.2, a p-value is derived from the t-statistic and where this p-value exceeds 0.05, the null hypothesis is accepted. A p-value below 0.05 indicates rejection of the null hypothesis. A Wilcoxon/Mann-Whitney signed-rank test is also run on the median return scores. The results of this test procedure are likely to be more sensitive to abnormal returns.

The study set out to test for significant abnormal returns of the concept stock from the expected return represented by the control stock. Essentially the return should match the control return to deliver a zero abnormal return. Abnormal returns are measured on either side of the zero value.

As noted in the Hsieh and Walking (2006) study, where stocks were delisted, the matched stocks returns are substituted for the delisted stock for the remainder of the period.

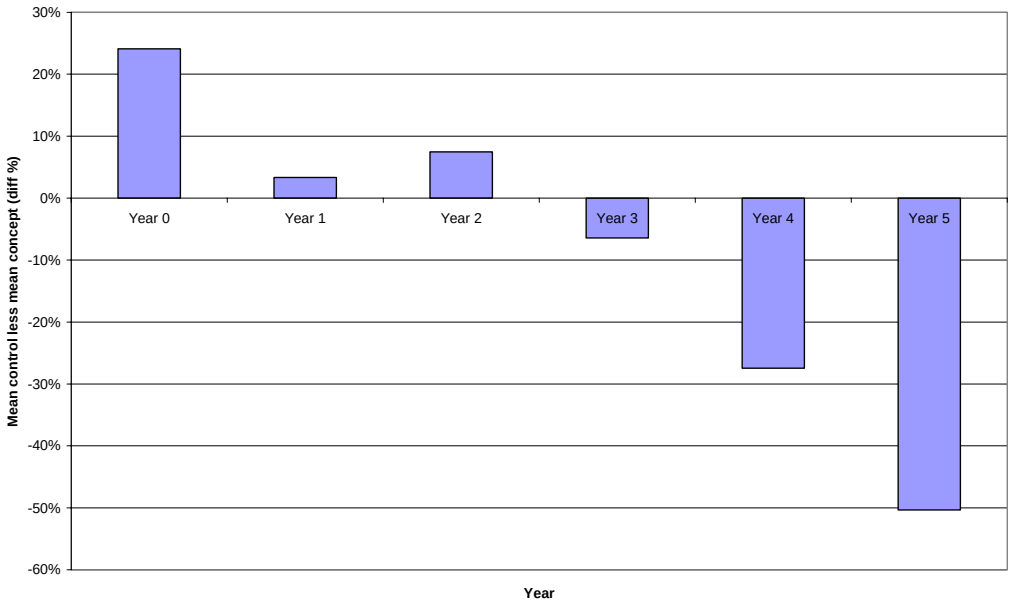
Table 6 below details the mean and median return data for the two portfolios over the five years subsequent to the stock's entry into the concept portfolio, as well as the event year (Year 0). As with the accounting variables, t-tests are run on the mean and the Wilcoxon/Mann-Whitney signed-rank test on the median abnormal returns.

Table 6: Concept and control portfolio mean and median returns with associated p-values

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Concept mean	50%	18%	38%	54%	64%	61%
Control mean	25%	15%	31%	61%	92%	111%
Concept median	35%	17%	25%	5%	-4%	-3%
Control median	16%	11%	18%	22%	47%	61%
p-value (mean)	**0.001**	0.541	0.459	0.695	0.217	**0.031**
p-value (median)	**0.002**	0.632	0.526	0.268	**0.022**	**0.019**

As with the accounting variables it is useful to track the trend in the difference of means between the concept stock portfolio and control stock portfolio over time. Figure 6 below is constructed by subtracting the control stock mean from the concept stock mean for each of the years under study.

Figure 6: Difference between concept and control means



The use of the Barber and Lyon (1997) method to cater for stocks which delist has a significant effect on the results given the small size of the sample. In a

number of cases the delisting occurred because the firm went out of business. This happened in eleven of the sixteen delisted firms in the concept portfolio and two of the eight delisted firms in the control portfolio. In these cases instead of substituting the matched pair return, the return value is recorded as zero to reflect the fact that firm is no longer in existence.

The mean t-test and Wilcoxon/Mann-Whitney signed-rank test are then run once more on the portfolios which have been adjusted for failed firms, yielding the results listed in Table 7 below.

Table 7 Concept and control portfolio mean and median returns with associated p-values after adjusting portfolios for failed firms

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Concept mean	50%	18%	37%	55%	64%	59%
Control mean	25%	15%	31%	61%	93%	113%
Concept median	35%	17%	22%	0%	0%	0%
Control median	16%	11%	18%	22%	47%	61%
p-value (mean)	**0.001**	0.541	0.543	0.693	0.195	**0.024**
p-value (median)	**0.001**	0.632	0.669	0.217	**0.013**	**0.005**

The adjustment for failed firms did not influence the results in a significant manner. It is thus important to analyse the portfolios further to better understand which stocks are driving the performance of the concept portfolio in particular.

As with the accounting variables, it is possible that certain stocks are achieving superior performance and pulling the mean in an upward direction. In order to test this, the returns data are ranked from highest to lowest after Year 1, Year 3 and Year 5. The top performing stocks are then analysed for similarity.

Characteristics analysed included industry sector, year recorded as a concept stock and stocks which had entered the data set as concept stocks on six or more occasions (repeat stocks). As with the accounting variables, the repeat stocks appear to become very prevalent amongst the top performing stocks, and to a far greater degree than for the accounting variables.

Five stocks appear on six or more occasions in the concept portfolio as repeat stocks. A list of the top performing decile of stocks by return for the Years 1, 3 and 5 is compiled and the number of occurrences of the repeat stocks in each of these years is recorded to identify their frequency of appearance. The results are noted in Table 8 below.

Table 8: Repeat stocks as a percentage of top performing concept stocks by return

	Year 1	Year 3	Year 5
Repeat Stocks	6	8	10
Total in decile	12	12	12
% Repeat Stocks	50%	67%	83%

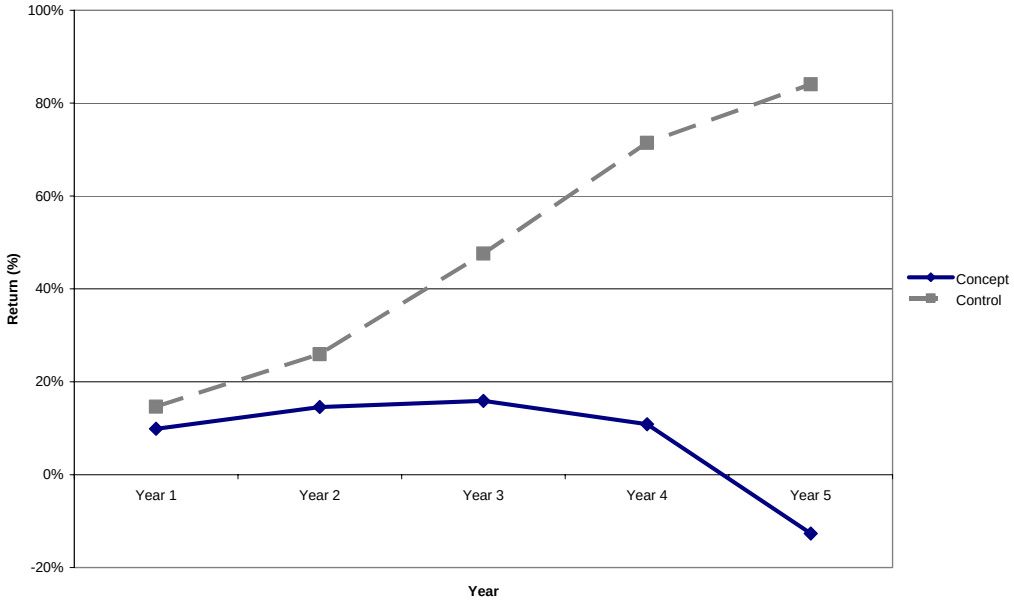
It is clear that the repeat stocks are performing well. To test how significant an effect these stocks are having on the total data set, they are removed from the concept portfolio along with their matched control stocks being removed from the control portfolio. Abnormal returns are again calculated and the t-test and Wilcoxon/Mann-Whitney tests are again run. The results are noted in Table 9 below.

Table 9: Concept and control portfolio mean returns and p-values when repeat stocks and their matching control stocks are removed

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Concept mean	55%	10%	15%	16%	11%	-13%
Control mean	22%	15%	26%	48%	71%	84%
Concept median	35%	7%	3%	-9%	-27%	-25%
Control median	10%	12%	12%	15%	19%	33%
p-value (mean)	**0.002**	0.485	0.380	0.133	**0.036**	**0.000**
p-value (median)	**0.001**	0.485	0.284	**0.003**	**0.000**	**0.000**

The effect these stocks have on the portfolios is visually and statistically evident, with the concept stocks significantly underperforming in Year 4 and 5 when measured by mean and in Year 3, 4 and 5 when measured by median. Figure 7 below shows the five year performance of the concept and control portfolios once the repeat stocks have been removed.

Figure 7 Concept and control portfolio yearly returns with repeat stocks removed



To take this a step further a new portfolio consisting only of the repeat stocks and their matched control portfolio is constructed to identify if abnormal returns are earned by the repeat stock portfolio.

The means two-tailed t-test results are noted in Table 10 below.

Table 10: Means and p-values for 'repeat stocks' and their matching control stocks over a five year period

	Year 0	Year 1	Year 2	Year 3	Year 4	Year 5
Repeat stocks mean	40%	33%	81%	131%	178%	238%
Control stocks mean	32%	15%	41%	88%	138%	184%
p-value	**0.000**	0.895	**0.000**	**0.027**	**0.039**	**0.037**

It is also worth analysing the worst performing stocks to identify any similarities that may be exhibited by them. After identifying the bottom decile of stocks when ranked by returns in Year 1, 3 and 5 it is evident that the technology stocks form a significant portion of this sample as shown in Table 11 below.

Table 11: Technology stocks as a percentage of worst performing decile of concept stocks by return

	Year 1	Year 3	Year 5
Technology Stocks	5	6	8
Total in decile	12	12	12
% Technology Stocks	42%	50%	65%

6 Discussion of results

6.1 Concept stock characteristics

6.1.1 General characteristics

The market-to-revenue ratio is noted as the key criteria in the Hsieh and Walking (2006) study. The yearly mean market-to-revenue ratio as noted in Table 1 clearly indicates an elevated result for the years 1999 and 2000, followed by a sharp decline in 2001. This high figure is driven primarily by technology related stocks which were experiencing the highs of the internet bubble. These stocks were trading at very high market capitalisations which were not driven by accounting fundamentals. This is evident in the high mean market-to-revenue ratio over these years.

Table 3 also indicates the prevalence of the internet bubble on the JSE. From 1997 to 2000, technology stocks represent the highest proportion of stocks in the concept portfolio (except in 1997 where they are the second highest). Since 2000, no stock from the technology sector has entered the concept portfolio. This anecdotally supports the argument that concept stocks are certainly a part of the JSE.

A number of stocks also enter the concept portfolio on multiple occasions. Table 2 lists the number of years stocks enter the concept portfolio. A concept stock is said to be one that appears over-valued given the revenue it is generating (Hsieh and Walking, 2006). If this is the case, Fama (1970) notes

that if a stock is earning an abnormal return in the short-term, it should revert to earning the expected return in the long-term according to the efficient market hypothesis. These stocks that continually enter the concept portfolio do not appear to be displaying these characteristics. As subsequently noted in section 6.1.3, these stocks also significantly influence the overall performance of the concept portfolio.

6.1.2 Accounting characteristics of control and concept stocks

The concept stock portfolio shows a high level of variance across the total portfolio when compared with the control portfolio. This is evidenced by the box plots in Figures 1 through 4. This indicates a lack of uniformity in terms of these characteristics when compared to the control sample whose values fall within a more tightly defined range. The top performing stocks according to the accounting variables also varied greatly across the three year period, again indicating the variance in accounting results achieved by the firms when compared with each other, as well as individually. This high variance does differentiate them from the control stocks.

This high degree of variation across the portfolio makes it difficult to identify specific accounting characteristics displayed by concept stocks other than the fact that they are highly variable. The high variance also makes valuation of concept stocks via traditional methods difficult. Fridson (1996) noted the difficulty of valuing a concept stock and the variance in accounting variables found in this study, would tend to support this assertion.

In contrast the control portfolio values are more tightly clustered around the mean giving more predictability and allowing more accurate valuations.

When the concept portfolio and control portfolio are measured against each other in terms of the four accounting ratios some unexpected results are returned. Hsieh and Walking (2006) found their concept portfolio under-performed their control portfolio on all four of these measures by a significant amount.

This study tests four hypothesis concerning accounting ratios. These are discussed below.

Hypothesis 1a)

H_0: $Con_{OPM} - Cont_{OPM} = 0$

H_1: $Con_{OPM} - Cont_{OPM} \neq 0$

The data in Table 4 indicates that the null hypothesis, of the concept portfolio operating profit margin (OPM) being equal to the expected OPM of the control portfolio, is rejected across all three years subsequent to the concept stock entering the portfolio. This is particularly surprising given that OPM relies on a strong revenue figure and it is noted that revenues for a concept stock are not likely to be high as the stock sells on a 'concept' which is not yet proven (Hsieh and Walking, 2006).

Due to the high variance recorded in the concept portfolio, the tests were run on the median as well, and returned a similar result.

In order to try and better understand this result the concept portfolio stocks were ranked from highest to lowest to analyse if any particular stocks or group of stocks were driving the high mean OPM for the concept portfolio. No single

factor could be identified that explained the superior performance of the concept portfolio.

The second hypothesis tested was that of the net profit margin (NPM).

Hypothesis 1b)

H_0: $Con_{NPM} – Cont_{NPM} = 0$

H_1: $Con_{NPM} – Cont_{NPM} \neq 0$

The data in Table 4 indicates that the null hypothesis, that the concept portfolio NPM will perform equal to the expected NPM of the control portfolio, is accepted in Year 3, but is rejected in Years 1 and 2.

When run through the Wilcoxon/Mann-Whitney signed-rank test which measures for significant difference in median, the null hypothesis is rejected across all years under study. This finding is perhaps even more surprising, given the expectation that the firms are not to likely be generating high profits. In fact Van Knapp (2006, 47) notes that concept stock prices seemed to go higher the more money they lost. This seems contrary to the findings of this study where the concept portfolio outperforms the control portfolio.

When one refers to the box plot in Figure 2, it is evident that the variance in the NPM ratios in the concept portfolio is extremely high. This would tend to indicate that a number of the stocks are recording high variation from the expected ratio. By analysing the top performing stocks according to the NPM ratio, it was found that the repeat stocks featured quite prominently in this group. By removing them and their matched control stocks from the portfolios, it

was found that the null hypothesis was only rejected in Year 1 using the mean scores, and in Year 1 and 2 using the median scores as evidenced in Table 5. Thereafter no significant difference is recorded. A finding more in line with the Hsieh and Walking (2006) results.

Hypothesis 1c)

H_0: $Con_{ROA} - Cont_{ROA} = 0$

H_1: $Con_{ROA} - Cont_{ROA} \neq 0$

The data in Table 4 indicates that the null hypothesis of the concept portfolio return on assets (ROA) ratio will perform equal to the expected ROA ratio of the control portfolio is accepted across all three years when using a two-tailed t-test for a difference in means. When using the Wilcoxon/Mann-Whitney signed-rank test for the difference of medians, the null hypothesis is rejected in Year 1 and accepted in Year 2 and 3.

When accounting for the repeat stocks, it is found that the null hypothesis is accepted across all years when using the mean t-test and is rejected only in Year 1 when using the Wilcoxon/Mann-Whitney signed-rank test as noted in Table 5. The effect on the ROA exerted by these stocks is thus not particularly significant.

When compared with the Hsieh and Walking (2006) results, the South African concept stocks appear to perform better than their US counterparts which underperformed the control portfolio. Firms which are concept stocks should not be delivering strong earnings and thus not show a high return on assets. The only other explanation could be that the firm has a low asset base. This may

provide an explanation in some cases, particularly for technology firms and other firms relying mainly on intellectual capital, where the asset base is quite low. ROA is also likely to vary greatly across different industries and the matched stocks may not be accurately reflective of the true results, given the small number of stocks being analysed.

Hypothesis 1d)

H_0: $Con_{ROE} - Cont_{ROE} = 0$

H_1: $Con_{ROE} - Cont_{ROE} \neq 0$

The data in Table 4 indicates that the null hypothesis of the concept portfolio return on equity (ROE) ratio will perform equal to the expected ROE ratio of the control portfolio is accepted across all three years. In Year 3 when tested by the Wilcoxon/Mann-Whitney signed-rank test for difference in median, a significant difference between the control portfolio and concept portfolio emerges. The control portfolio ROE exceeds the concept portfolio ROE by a significant amount.

Figure 5 indicates a strong upward trend in the difference between ROE means between Year 0 and Year 3. This would tend to indicate that over the long-term, the control portfolio stocks are better able to utilise their shareholder funds to achieve returns for their investors. The ability to achieve this would also tend to point to the fact that over the long-term, the control portfolio should generate higher returns than that concept portfolio. This ratio is also the only one which comes close to recording similar results to the Hsieh and Walking (2006) study.

6.1.3 Returns performance of concept stocks

The returns data for the concept portfolio are measured against that of the control portfolio over five years subsequent to the concept stock entering the portfolio.

The hypothesis states:

H_0: $B\&H_{Con} - B\&H_{Cont} = 0$

H_1: $B\&H_{Con} - B\&H_{Cont} \neq 0$

The data in Table 6 indicate that no abnormal buy-and-hold abnormal returns are earned by the concept stocks in Years 1 to 4 and the null hypothesis is thus accepted for these years when measured on mean returns. Year 5 however shows that the concept portfolio significantly underperforms the control portfolio on mean and median measures. The null hypothesis is thus rejected in Year 5 for both mean and median. The concept portfolio further underperforms the control portfolio in Year 4 when using the Wilcoxon/Mann-Whitney signed-rank test. The null hypothesis is thus rejected in this year when using the median measure.

This is once again a very surprising finding given that the Hsieh and Walking (2006) study found that concept stocks significantly underperformed the expected returns provided by the control portfolio in all years under study and against a variety of different control portfolios. If one does not take the statistical significance into account and looks only at the difference in means shown in Figure 6, it is evident that from Year 3 onwards, the concept portfolio underperforms the control portfolio, reaching -50% in Year 5.

It is also interesting to note that in Year 0 the concept portfolio delivers significant abnormal returns when compared with the control portfolio. This would be expected due to the fact that this is the year in which the market-to-revenue ratio is high and driven mainly by a high stock price. This lends further credibility to the evidence of concept stocks being prevalent on the JSE.

The Barber and Lyon (1997) method of accounting for returns of delisted stocks is used in the above analysis, however given the high degree of firm failures in the concept portfolio, the returns of these stocks after delisting is then substituted with a zero value instead of the return of the matching stock. The t-test and Wilcoxon/Mann-Whitney signed-rank test were once again run to identify if these changes to the portfolios would influence their performance.

The results yielded were nearly identical to the previous results set with the null hypothesis accepted in Year 1, 2, 3 and 4 and being rejected in Year 5 when measured by the mean t-test. It is rejected in Year 4 and 5 when using the Wilcoxon/Mann-Whitney signed-rank test. This seems to indicate that the concept stocks are only correctly valued in the long-term and that short-term price imperfections are prevalent as noted by Grossman and Stiglitz (1980).

In order to better understand the performance of the concept portfolio it is important to analyse which stocks are performing best. Once again the stocks are ranked in terms of returns performance in Years 1, 3 and 5. The final decile of stocks across these years shows a number of the repeat stocks appearing in the sample, as evidenced by Table 7. In Year 5 for instance, ten of the twelve top performing stocks are repeat stocks.

To test the sensitivity of the sample to the repeat stocks, they are removed from the portfolios and the abnormal returns are again calculated and subjected to the two testing procedures. The results differ from the previous portfolios, with the concept portfolio significantly underperforming the control portfolio in Year 4 and 5. When measured by median performance, the concept stocks significantly underperform in Years 3, 4 and 5. These findings continue to support the assertion by Fama (2000) that stocks will always reflect their true value in the long-term.

Looking purely at the mean returns of the two portfolios in Figure 7 it is clearly evident that, over the long-term, the returns of the concept stock portfolio (excluding the repeat stocks) is trending strongly downwards versus the strong upward trend evidenced in the control portfolio. Further, at no point does the mean return of the concept portfolio exceed that of the control portfolio. This tends to support the Hsieh and Walking (2006) findings of underperformance, however the JSE concept portfolio tends to perform somewhat better in the short-term.

The repeat stocks thus influence the overall performance of the concept portfolio to a large degree. Table 9 runs the buy-and-hold abnormal returns mean t-test procedure on the portfolio of repeat stocks and their matched control stocks. Over the five years, they significantly outperform their matched stocks. This unusual finding would tend to indicate that these stocks do not behave like true concept stocks, and are thus potentially incorrectly specified as concept stocks in this study. This may explain the relatively good performance

of the concept portfolio in this study when compared with the poor performance of the concept portfolio in the US study.

7 Conclusion

The study produced some unexpected results in terms of the accounting characteristics and performance of the concept stocks on the JSE. It was expected that the findings would mirror those of the Hsieh and Walking (2006) study in the US, where concept stocks significantly underperformed the control stocks on accounting criteria and in terms of buy-and-hold returns achieved.

There is strong anecdotal evidence that concept stocks are prevalent on the JSE. This is supported by the performance of the concept stocks in the year they are identified as concept stocks, Year 0. They significantly outperform the control portfolio in this year. The internet bubble, a rich source of concept stocks in the US study, as well as in the literature, is also clearly evident on the JSE.

When analysing the accounting characteristics of concept stocks on the JSE it is apparent that they outperformed the control stocks in terms of OPM and NPM. They performed equal to the control stocks when measured on ROA. The ROE figures, however, did not follow the trend of the other ratios. In Year 1 the concept stocks outperformed the control stocks slightly, although not at a significantly level. Over the following two years, the control portfolio showed strong ROE increases, versus falling ratios for the concept portfolio. Finally in Year 3, the ROE of the concept stocks significantly underperformed the control portfolio. Hence over a longer time period, it appears as if investors are able to correctly value the concept stocks.

No particular stock or group of stocks drive the performance of the accounting ratios. In fact, the ratios showed a high degree of variance across the portfolio, and accounting ratios of individual stocks proved to be highly erratic from year to year. This, in part, may contribute to the difficulty in being able to accurately value these stocks using traditional valuation tools such as CAPM. As noted above, however, as time passes and more historical information is built up on the stocks, investors begin to value the stocks more accurately, as indicated by the falling ROE of the concept portfolio.

In terms of performance, the concept stocks faired better than their US counterparts with significant negative abnormal returns only being recorded in Year 4 and 5 when measured by median and in Year 5 when measured by mean.

These results differ from the Hsieh and Walking (2006) findings in which the concept portfolio significantly underperforms the control portfolio over all five years. There are a number of possible reasons as to why this may have occurred. These relate to three areas in particular: size and nature of the universe; method used for this study; and mis-specification of data.

In terms of universe size, the US study covered approximately five thousand stocks and in contrast this study only considered an average of one hundred stocks each year. This small size would indicate that the results are more sensitive to outliers and could be affected by a mis-specified group of stocks which drive the portfolio returns in a particular direction.

Also, the method specifically excluded stocks valued at under R5. It is speculated that due to the specific microstructure of the JSE, an appropriate figure might be

lower, perhaps as low as R1. Further, the method closely followed the Hsieh and Walking (2006) study and included only the final decile of stocks when ranked by market-to-revenue ratio. This produced a small portfolio of concept stocks (as few as eight in some years) in each year. Due to the smaller universe this, perhaps, could have been extended to include the final quintile of stocks, giving rise to a higher number of concept stocks each year and reducing the impact of outliers.

Some mis-specified stocks could have entered the concept portfolio and skewed the results in a particular manner. When analysing the concept portfolio, it was found that a number of stocks entered the portfolio on numerous occasions. They were termed ‘repeat stocks’ for the purposes of this study. The continued re-entry of these stocks into the concept portfolio is not characteristic of a concept stock which typically sells on the ‘concept’ reaching fruition. The fact that the stocks keep re-entering the portfolio would require the firms to be continuously generating new concepts; this is an unlikely scenario.

It is instead postulated that these ‘repeat’ stocks are mis-specified, and are actually glamour stocks. Glamour stock’s market capitalisation growth is driven by consistent high earning growth which these stocks have displayed. The control portfolio should control for this phenomenon, but once again the small number of stocks analysed means that this may not have occurred in these cases.

In testing this assertion, the repeat stocks were removed from the concept portfolio. This removal significantly influences the performance of the concept portfolio, which reflects much poorer returns. The control portfolio positively outperforms the concept portfolio in all years and does so significantly from Year 3 onwards when measured by median.

Although these results do not mirror the Hsieh and Walking (2006) results they broadly indicate a similar trend of underperformance over time. In explaining the initial performance of the stocks (in which they do not significantly underperform the control portfolio as expected), two particular aspects appear to have a strong influence, namely: the accounting ratio volatility and market efficiency.

The accounting data derived from the concept portfolio displayed a high degree of variance and erratic performance across the three years studied. This would make it difficult for a rational investor to accurately value the stock using traditional valuation methods. They are thus likely to be trading on the 'concept' in these initial years with investors believing in the concept. In Year 3 after entering the portfolio of concept stocks, a set of historical data become available to the investor who is then better equipped to value the stock. At this point the data reflects the ROE of the concept portfolio significantly underperforming the control portfolio, coupled with a significant underperformance in terms of abnormal returns. The correct valuation of the concept stocks then seems to become evident.

The above argument also has implications relating to the efficiency of the JSE. Efficient markets should quickly reflect the accurate valuation of all securities. This appears to be the case in the US study. However, it appears as if the efficiency of the JSE in accurately valuing concept stocks in the short-term is potentially some way behind that of the US bourses, possibly driven by the low awareness of the phenomenon or, more simply, the relative inefficiency of the South African market.

The overall conclusion of this study clearly indicates the prevalence of concept stocks on the JSE. They exhibit broadly similar characteristics and performance when compared with their US counterparts over the long-term. In the short-term, however, JSE investors appear to 'buy the concept' for a longer period rather than relying on accounting fundamentals. Over time however the true value of the concept stocks is reflected in the pricing of the stocks.

This has important implications for JSE investors in that they should first of all be aware of the existence of this phenomenon which has not received much local attention. Their initial attention is likely to be drawn by a year of strong performance (as indicated by the superior Year 0 returns produced in this study). However, as a long-term investment, the stocks significantly underperform. When considering the array of investment options, these stocks should be avoided as long-term purchases and can be initially identified by the high relative market-to-revenue ratio and thereafter are likely to be characterised by erratic financial performance.

This study is one of only a handful of studies which considers the performance of concept stocks, and the first to focus on South African equities. For these reasons, further research is required to improve our understanding of concept stocks as a phenomenon on the JSE. Further research should consider lowering the entry criteria for stocks for consideration to R1. This will increase the size of the study and reduce the effect of outliers. The stocks should also be measured against multiple portfolios of control stocks as well as against market indices to form a more accurate picture of long-term performance. The concept stock portfolio should be analysed more closely to identify stocks which have realised

the potential shown by their 'concept' to identify if there are any commonalities evident to enable an investor to potentially earn abnormal returns. The Fama-French three factor model (1993) should also be applied to better test the robustness of the findings.

8 References

Books

Fridson, M. S. (2006) *Investment illusions*, New Jersey: John Willey and Sons

Shiller, R. J. (2000) *Irrational Exuberance,* Princeton: Princeton University Press

Van Knapp, D. P. (2006) *Sensible stock investing,* London: Universe Inc

Zickmund, W. G. (2003) *Business Research Methods,* 7th Edition. Ohio: Thomson South Western

Journals

Barber, B. M. & Lyon, J. D. (1997) Detecting long-run abnormal stock returns: The empirical power and specification of test statistics. *Journal of Financial Economics*, 43(3), 341-372.

Barberis, N., Shliefer, A. & Vishny, R. (1998) A model of investor sentiment. *Journal of Financial Economics,* 49, 307-343.

Biais, B., Glosten, L. & Spatt, C. (2005) Market microstructure: A survey of microfoundations, empirical results, and policy implications. *Journal of Financial Markets,* 8(2), 217-264.

Brav, A., Geczy, C. & Gompers, P. A. (2000) Is the abnormal return following equity issuances anomalous. *Journal of Financial Economics,* 56, 209-249.

Brennan, M. J. & Subrahmanyam, A. (1996) Market microstructure and asset pricing: On the compensation for illiquidity in stock returns. *Journal of Financial Economics,* (41), 441-464.

Chan, L. K. C., Jegadeesh, N. & Lakonishok, J. (1995) Evaluating the performance of value versus glamour stocks: The impact of selection bias. *Journal of Financial Economics,* 38(3), 269-296.

Chan, L. K. C., Lakonishok, J. & Sougiannis, T. (2001) The stock market valuation of research and development expenditures. *Journal of Finance,* 56(6), 2431 – 2456.

Desi, H. & Jain, P. C. (1999) Firm performance and focus: long-run stock market performance following spinoffs, *Journal of Financial Economics,* 54(1), 75-101.

Eckbo, B. E. & Norli, Ø. (2005) Liquidity risk, leverage and long-run IPO returns. *Journal of Corporate Finance,* 11(1-2), 1-35.

Fama, E. F. (1970) Efficient capital markets: A review of the theory and empirical work. *The Journal of Finance*, 25 (2), 383-417.

Fama, E. F. (2000) Market efficiency, long-term returns and behavioural finance. *Journal of Financial Economics,* 49 (3), 283-306.

Fama, E.F., Fisher, L., Jensen, M.C. and Roll, R. (1969) The adjustment of stock prices to new information. *International Economic Review*, 10 (1) p.1-21.

Fama, E. F., & French, K. R. (1992) The Cross-Section of Expected Returns. *Journal of Finance*, 47(2): 427-65

Fama, E. F. & French, K. R. (1993) Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics,* 33 (1), 3-56.

Grossman, S. J. & Stiglitz, J. E. (1980) On the impossibility of informationally efficient markets. *The American Economic Review,* 70 (3), 393-408.

Healy, P.M., Palepu, K.G. and Ruback, R.S. (1992) Does corporate performance improve after mergers? *Journal of Financial Economics*, 31, 135-175.

Hong, H. & Stein, J. C. (2007) Disagreement and the stock market. *Journal of Economic Perspectives,* 21 (2), 109-128.

Hsieh, J. & Walking, R.A. (2006) The history and performance of concept stocks, *Journal of Banking and Finance,* 30(9), 2433-2469

Kohers, G., Kohers, K., & Kohers, N. (2007) Glamour, Value and the form of takeover. *Journal of Economics and Business,* 59 (1), 74-87.

Loughran, T. (1997) Book-to-Market across Market Size, Exchange and Seasonality: Is There an Effect? *Journal of Financial and Quantitative Analysis,* 32 (3), 249-268.

Madhavan, A. (2000) Market Microstructure: A survey. *Journal of Financial Markets,* 3(2000), 205-258

Malkiel, B.G. (2003) The Efficient Market Hypothesis and its Critics. *Journal of Economic Perspectives,* 17 (1), 59-82.

Ngatuni, P., Capstaff, J. & Marshall, A. (2007) Long-term performance following rights issues and open offers in the UK. *Journal of Business Finance & Accounting,* 34(1), 33-64.

Pástor, L. & Stambaugh, R. F. (2003) Liquidity risk and expected stock returns. *Journal of Political Economy,* 11(3), 642-685.

Ritter, J.R. (1991) The Long-Run Performance of Initial Public Offerings. *Journal of Finance,* 46 (1), 3-27.

Sharpe, W. F. (1964) Capital Asset prices: A theory of market equilibrium under risk, *Journal of Finance,* 19(3), 425-442.

Simpson M.W. & Ramchander, S. (2008) An inquiry into the economic fundamentals of the Fama French equity factors. *Journal of empirical finance,* doi: 10.1016/j.jempfin.2008.02.003

Stehle, R., Ehrhardt, O. & Pryzborowsky, R. (2000) Long run performance of German initial public offerings and seasoned equity offerings. *European Financial Management,* 6 (2), 173-196.

Teoh, S.W., Welch, I. & Wong, T.J. (1998) Earnings management and the long-run performance of initial public offerings, *The Journal of Finance,* 53(6), 1935-1974.

Research reports

Smit, C., J., B. (2005) *The impact of large acquisitions on the share price and operating financial performance of acquiring companies listed on the JSE.* Masters of Business Administration research report, Gordon Institute of Business Science.

Websites

Dimension Data, (2000) *Dimension Data Annual Report 2000,* [Online], http://www.dimensiondata.com/NR/rdonlyres/C0C5EF55-A3C9-4CC6-8D73-FBAC96CA6D71/6910/AnnualReport20001.pdf (accessed 30/05/2008)

Dimension Data, (2001) *Dimension Data Annual Report 2001,* [Online], http://www.dimensiondata.com/NR/rdonlyres/ABC939DF-F0A3-45EE-8FDD-88F8E6405C3E/6912/AnnualReport20011.pdf (accessed 2/08/2008)

Reserve Bank of South Africa, *Historical Exchange Rates,* [Online], http://www.resbank.co.za/economics/histdownload/histdownload.htm (accessed 27/09/08)

Romero, S., Rivas, D.A. (2002) WorldCom's collapse: The overview; WorldCom files for bankruptcy; Largest US case, *The New York Times*, [Online] http://query.nytimes.com/gst/fullpage.html?res=9C04E6D81738F931A15754C0A9649C8B63&sec=&spon=&pagewanted=1 (accessed 02/10/2008)

Sridhar, V. (2002) The WorldCom collapse, *Frontline*, [Online] 19(15). http://www.hinduonnet.com/fline/fl1915/19150810.htm (accessed 02/10/2008)

Thornburgh, D. (2002) First Interim Report of Dick Thornburgh, *United States Bankruptcy Court Southern District of New York,* [Online], http://www.news.findlaw.com/hdocs/docs/worldcom/thornburgh1strpt.pdf (accessed 10/11/2008)

9 Appendix 1 – List of Concept Stocks by Year

1994	1995	1996	1997	1998	1999	2000
Foschini	Foschini	Richemont	Richemont	Richemont	Richemont	Richemont
PPC	Afrox	Sasol	Didata	Didata	MTN	Didata
Afrox	PPC	Comparex	Comparex	Comparex	Didata	MTN
Trencor	Naspers	Didata	Naspers	Datatec	Datatec	Tigon ltd
Adcock	Trencor	Afrox	Canadian Overseas Packaging	ABI	Profurn	ABI
Canadian Overseas Packaging	Adcock Ingram	Naspers	MTN	MTN	Cadbury Schweppes	Canadian Overseas Packaging
City Lodge	Unitrans	Trencor	Trencor	Softline	Frontrange	Idion
Primedia	Primedia	Primedia	Avis	Cadbury Schweppes	Metrofile	Ceramic industries
Spur Holdings	City Lodge	City Lodge	Datatec	Computer Configuration		Micromega
	Datatec	Datatec	Metrofile	Tridelta magnet		
	Spur Holdings	Crookes Brothers	City lodge	Metrofile		
			Macadams			
9	11	11	12	11	8	9

2001	2002	2003	2004	2005	2006
Richemont	Richemont	Richemont	Richemont	Richemont	Richemont
MTN	MTN	MTN	MTN	PPC	MTN
PPC	PPC	ABI	PPC	Aspen	Naspers
Aspen	Aspen	PPC	Afrox	Truworths	PPC
Delta electrical	Delta electrical	Aspen	Truworths	Gold reef	Truworths
Canadian Overseas Packaging	Canadian Overseas Packaging	Truworths	Aspen	Peermont Global	Aspen
Ceramic industries	Ceramic industries	Canadian Overseas Packaging	Kagiso	City lodge	Gold reef
City lodge	City lodge	City lodge	City lodge	Kagiso	City lodge
			Spur Corporation	Delta electrical	Kagiso
				Spur Corporation	Spur Corporation
8	**8**	**8**	**9**	**10**	**10**