

# Do the value, size and January effects exist on the JSE?

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## ABSTRACT

This paper updates and expands the study done by Robins, Sandler and Durand (1999) in which they investigated whether or not the inter-relationships between the value, size and January effects can be detected on the JSE. The aim of this study is to investigate whether or not their findings can be corroborated in the first period and whether these effects can be detected in the second period. Therefore, the two periods used in this study are from January 1988 to December 1995 (chosen to coincide with Robins *et al.*, 1999) and from January 1996 to December 2006. No significant value, size or January effects were found in either of the periods. This is partially consistent with Robins *et al.* (1999)'s findings in so far as they do not find significant value or size effects. However, unlike Robins *et al.* (1999), no January effect was evident in either period.

## 1. INTRODUCTION

This study aims to update and expand the study of Robins, Sandler and Durand (1999). In their study, they empirically investigated the possible existence of the January, value and size effects on industrial shares listed on the JSE Limited (JSE) over the 9 year period from November 1986 – November 1995. The authors found a significant January effect but no significant value or size effects.

The value effect, first documented by Basu (1977), is thought to exist when buying shares with a high ratio of a balance sheet or income statement measure of value to their market capitalization. One would then sell shares with low ratios. Results of studies done by Basu (1977), Lakonishok, Shleifer and Vishny (1994) and Fama and French (1992) show that this value strategy yields abnormally and consistently higher risk-adjusted returns. According to the Efficient Market Hypothesis (EMH) and Capital Asset Pricing Model (CAPM) these anomalies, viewed individually and collectively, should not occur.

The market capitalization effect or size effect, first noted by Banz (1981), holds that small market capitalization shares outperform large capitalization shares, after adjusting for risk.

The January effect, first demonstrated by Rozeff and Kinney (1976), is the phenomenon that risk-adjusted, returns in January are abnormally higher than in any other month.

This study follows a similar methodology as used by Robins *et al.* (1999), but continues the study to cover the period after the Robins *et al.* (1999) study ended. The Robins *et al.* (1999) period is redone to ensure consistency with the second period. Therefore we use a 19-year period from 1988 to 2006 inclusive, subdivided into an 8-year period from January 1988 to December 1995 to corroborate the results of Robins *et*

*al.* (1999) and an 11-year period from January 1996 to December 2006 to expand the study. Furthermore, in this study, shares listed in the JSE overall index were tested whereas they tested only industrial shares.

## 2. LITERATURE REVIEW

A value stock, also known as an out-of-favour stock, is the opposite of a growth stock - one which appears to have significant growth prospects. The value-growth effect is an anomaly which states that value stocks outperform growth stocks. In other words, a portfolio formed consisting of value stocks has a higher excess return than a portfolio formed on growth stocks. The outperformance of value stocks over growth stocks has been an area of research for many years.

Broadly speaking, the value effect is said to exist when shares with a high ratio of a balance sheet or income statement measure of value to their market capitalization provide a larger risk-adjusted return than shares with a low ratio (Basu 1977). Different proxies have been used in the literature to separate a value stock from a growth stock. The most common ratios for a value stock is a low price to earnings (PE) ratio, a low price to cash-flow (PTCF) ratio, a high book to market value (BTM) ratio and a high net asset value to price (NAV/P) ratio. A growth stock would exhibit the inverse. According to Chen and Zhang (1998) the BTM variable successfully captures firm distress risk, riskiness of a firm's cash flow and financial risk. Vassalou and Xing (2004) suggest that the BTM variable is largely a proxy for a default effect. Fama and French (1992) and Auret and Sinclair (2006) also use the BTM variable as a proxy for the risk of default. Auret and Sinclair (2006) find that when the BTM variable is added to the van Rensburg and Robertson (2003b) PE and size model for the JSE, the BTM variable almost completely subsumes the effect of both size and PE in the two-factor model of van Rensburg and Robertson (2003b). However, Auret and Sinclair (2006) found that incorporating the BTM variable into the analysis does not actually improve the two-factor size and PE model. Basiewicz and Auret (2009) also find a value effect on the JSE after controlling for transaction costs and liquidity. These authors also

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\* School of Economics and Business Sciences, University of the Witwatersrand, PO Box 3, Wits 2050, Johannesburg, Republic of South Africa.  
Email: christo.auret@wits.ac.za

found that the BTM variable is superior in explaining cross section returns on the JSE.

The BTM variable, according to Chen and Zhang (1998) successfully captures all three types of risk missed by other proxies and is thus a superior proxy for the value effect. These are distress of a firm, riskiness of a firm's cash flows and financial risk. Fama and French (1993) suggest that the extra return derived from value stocks is simply compensation for the inherent systematic risk as BTM is a proxy for distress and that distressed firms may be more sensitive to certain business cycle factors such as changes in credit conditions. Fama and French (1995) show that stocks with high BTM ratios had sustained low earnings for four years prior to and five years after portfolio formation date. Conversely, low BTM ratios have sustained high earnings for four years prior to and five years after portfolio formation date.

The literature is replete with examples of the existence of the value effect; Basu (1977), Davis (1994), Chan, Hamao and Lakonishok (1991), Capaul, Rowley and Sharpe (1993) and Fama and French (1998). In a South African context, Plaistowe and Knight (1986), Page and Palmer (1991), Bhana (1992), Graham and Uliana (2001), van Rensburg and Robertson (2003a), Auret and Sinclair (2006) and Basiewicz and Auret (2009) all find significant value effects. However Robins *et al.* (1999) did not find a significant value effect.

The size effect was first noted by Banz (1981). He investigated the relationship between the total market value of common stock for a NYSE firm and its return for the period 1936 - 1975. He found that small stock firms had, on average, a higher risk-adjusted return than their large firm counterparts. The average difference in annual returns between a portfolio consisting of small and large firms was 19,8%. The small firm portfolio however is not well diversified. The author suggests that a possible reason for the size effect is that there is little information about these small firms and thus these returns are compensation for this risk which is not captured by CAPM. Fama and French (1992) also noted the size effect. They found a negative relationship between size and excess returns. This is in agreement with Akgun and Gibson (2001) who also found that size had strong explanatory power in explaining returns. Other studies which provided evidence of the size effect include Lakonishok and Shapiro (1986) who found that the smaller the firm's capitalization, the larger its abnormal return. Reinganum (1981) found evidence of a size effect, whereby a portfolio comprised of 50 small firms experienced abnormal returns of just under 15% per annum and that these abnormal returns continue for at least two years.

The size effect in South Africa was investigated by de Villiers, Lowings, Pettit and Affleck-Graves's (1986) in

their study on the JSE industrial sector from 1976 - 1980. However, contrary to studies on other markets, the authors did not find any indication of a size effect. Their results seem to suggest support for a different effect, a high price effect.<sup>1</sup> Waelkens and Ward (1997) studied the size effect on the JSE industrial sector for the period 1<sup>st</sup> of November 1983 to 31<sup>st</sup> of October 1993. Although they do not account for transaction costs, they considered survivorship bias as well as the effects of thin trading. Portfolios were constructed using the quintile method. The results showed also that, on average, the high priced portfolio had the highest risk-adjusted returns (using the Sharpe and Treynor measures). However, the positive relationship between price and returns was found to be not significant.<sup>2</sup> They also did not find a significant size effect. This is consistent with de Villiers *et al.*'s (1986) finding. Thus they do not find evidence of a size effect. Robins *et al.* (1999) also did not find a significant size effect. Contrary to this and more in line with international evidence, more recent studies done in South Africa by van Rensburg and Robertson (2003b) and Basiewicz and Auret (2009), found a size effect on the JSE.

One of the more popular explanations for the size effect is the information cost or risk hypothesis which states that due to the lack of information surrounding small firms, investors require a premium to invest in them (Banz (1981) and Zeghal (1984)). Since more information is produced and distributed about large firms, investors have an easier time anticipating the performance of a company.

Turning to the January effect, one explanation has to do with 'window-dressing'. This is when investors and fund managers sell a share before the year-end if it has performed badly throughout the year. This is done so as to not taint the annual reports (Lakonishok, Shleifer, Thaler and Vishny (1991)). Another possible explanation has to do with tax benefits. Roll (1983) and Reinganum (1983) assert that tax laws influence investors' portfolio decisions by encouraging the sale of securities that have experienced recent price declines so that the capital loss can be offset against the amount of taxable income.

The evidence for the January effect is extensive; Rozeff and Kinney (1976), Gultekin and Gultekin (1983), Corhay, Hawawini and Michel (1987) found evidence of a January effect. On the other hand, the South African evidence is mixed. Both Bradfield (1990) and Le Roux and Smit (2001) do not find a January effect whilst Robins *et al.* (1999) do find a significant

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<sup>1</sup>The high price effect might may well be significant but falls outside the scope of this study.

<sup>2</sup>Waelkens and Ward (1997) also showed a high price effect which falls outside the scope of this study.

January effect despite the fact that these three studies cover roughly the same time period.

### 3. METHODOLOGY

The methodology for this study largely follows the standard procedure developed by Basu (1977) and subsequently followed by de Villiers *et al.* (1986) and Robins *et al.* (1999). This involves constructing annual portfolios of shares representing the cross-sectional factors under investigation on December 31<sup>st</sup> of each year. Monthly excess total returns are then calculated for the twelve month period (i.e. January to December). At the end of each year, a new portfolio is formed using a new sample. To recap, the first of the two periods in this study is from January 1988 to December 1995. The aim of this first period is to corroborate the findings of Robins *et al.* (1999) when using a different dataset. Robins *et al.* (1999) confined their study on industrial shares whereas this study is more inclusive, covering the whole share market. The second period of this study is from January 1996 to December 2006. The aim of the second period is to investigate whether or not a value, size and January effect can be detected on the JSE in the subsequent 11 years. Average excess monthly returns for each portfolio are calculated. Comparison of results between portfolios is done on a risk-*unadjusted* basis as well as a risk-adjusted basis (Sharpe and Treynor measures are used to adjust for risk).

The study uses the I-Net Bridge's database. See Appendix 1 for more details.

A 'value' share for the purposes of this study is defined as a firm which has an above median book value per share: price per share (BTM) ratio. A 'growth' firm would thus have a below median BTM ratio. A 'small firm' is characterised as having a below median market capitalization and a 'large firm' would have an above median market capitalization. Initially, we tried to split the portfolios into the 25<sup>th</sup> and 75<sup>th</sup> percentiles. However, after performing this task, there was very little data in some portfolios for some of the years under investigation. This occurred when portfolios had to be arranged according to hypothesis H2<sub>c</sub> below. This problem of insufficient data kept occurring until we reached a median split.

#### Hypotheses

The following hypotheses were formulated and subsequently tested:

**H1:** Shares with below (above) median market capitalizations will have below (above) median BTM ratios. Put another way, small firms will tend to be growth firms and large firms will tend to be value firms.

**H2<sub>a</sub>:** The risk-adjusted return of a portfolio composed of shares with above median BTM ratio is greater than

that of a portfolio composed of shares with below median BTM ratio.

**H2<sub>b</sub>:** The risk-adjusted return of a portfolio composed of shares with below median market capitalization is greater than that of a portfolio composed of shares with above median market capitalization.

**H2<sub>c</sub>:** From H2<sub>a</sub> and H2<sub>b</sub>: A portfolio composed of shares with a below median market capitalization and an above median BTM ratio should have the highest risk-adjusted return.

**H3:** Risk-adjusted monthly returns are higher in January than in other months of the year.

### 4 DATA

The data set includes all listed shares in the FTSE/JSE All Share Index (Main Board shares only) according to the I-Net Bridge database.

Closing share prices on the last trading day of the month were recorded. All ratios are obtained by using financial year-end reports only. The market capitalization (outstanding ordinary shares on 31<sup>st</sup> of December year multiplied by the price per share prevailing on the 31<sup>st</sup> of December of each year) for each share as of December 31<sup>st</sup> each year was obtained and the prevailing BTM ratio as of December 31<sup>st</sup> for each share was obtained. Thus possible survivorship and look-ahead biases are avoided.

For hypotheses 2<sub>a</sub> and 2<sub>b</sub> each share is placed into one of two portfolios depending whether it is above or below the median BTM or above or below median market capitalization respectively for a given year. For hypothesis 2<sub>c</sub>, a share is placed into one of four portfolios (large value, small value, large growth and small growth) depending whether it is above or below the median and market capitalization and above or below the median BTM for a given year.

If a share listed / delisted during a sample year, a return of 0% was assigned to that share for the duration of that year.

The average number of shares used for a particular year was 160. The number was substantially lower in the initial years of the study, followed by a steady increase in later years and subsequent drop-off from 2000 onwards.

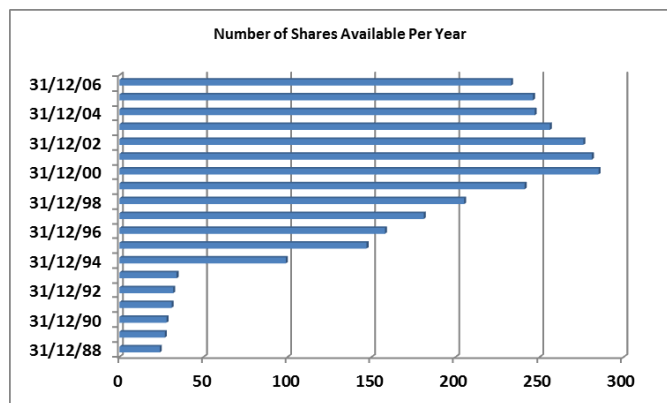


Figure 1: Number of shares available per year

4.1: Calculations

Average returns

For each portfolio, the monthly excess total return was calculated for the 19 years by using the continuously compounded rate of return as per de Villiers *et al.* (1986) as cited in Robins *et al.* (1999):

$$R_{pi,j,t} = \ln [(P_{i,j,t} + Div_{i,j,t} / P_{i,j,t-1}) - R_{Fj,t}]$$

where:

$R_{pi,j,t}$  = the portfolio value excess return at the end of month t for portfolio i in year j.

$P_{i,j,t}$  = the value of portfolio i in year j at the end of month t.

$Div_{i,j,t}$  = the monthly dividend paid for portfolio i in year j at the end of month t. Dividends were recorded at the Last Day to Register (LDR) date. This study includes dividends whereas both de Villiers *et al.* (1986) and Robins *et al.* (1999) excluded dividends from their studies. This would have the effect of a downward bias on the value portfolios as they tend to pay more dividends than the growth portfolios.

$P_{i,j,t-1}$  = the portfolio value of portfolio i in year j at the end of month t-1.

$R_{Fj,t}$  = the monthly risk-free rate of return for month t in year j. The South African three month Treasury Bill rate was used as the risk-free proxy.

Each year's monthly returns were placed continuously after one another. Thus the first period had 96 observations (12 monthly observations for eight years) and the second period had 132 observations (12 monthly observations for 11 years).

The mean monthly excess return for portfolio i was calculated as follows:

$$R_{pi} = R_{pi,j,t} / N$$

where

N = the number of monthly observations.

Risk adjustment procedures

The adjustment for total risk is the Sharpe measure of return:

$$S_i = R_i / \sigma_i$$

where

$S_i$  = Sharpe measure for portfolio i.

$R_i$  = the mean monthly excess return for portfolio i.

$\sigma_i$  = standard deviation of the average monthly excess returns for portfolio i.

The adjustment for systematic risk is the Treynor measure of return:

$$T_i = R_i / \beta_i$$

where:

$T_i$  = the Treynor measure of monthly excess return for portfolio i.

$R_i$  = the mean monthly excess return for portfolio i.

$\beta_i$  = the  $\beta$  for portfolio i.

The betas for each portfolio were calculated over the two periods of eight and eleven years respectively using Ordinary Least Squares (OLS) regression. The JSE All Share Index was used as the proxy for the market portfolio.

5. RESULTS

5.1 Hypothesis 1

**H1:** Shares with below (above) median market capitalizations will have below (above) median BTM ratios.

Table 1: Number of shares per portfolio: January 1988 - December 1995

	Value	Growth
Large	173	33
Small	32	176

Table 2: Number of shares per portfolio: January 1996 - December 2006

	Value	Growth
Large	1092	208
Small	205	1091

Tables 1 and 2 show the distribution of shares in the relevant portfolios. In both periods, a Chi-Squared Test ( $df=1$ ,  $\chi^2 = 0,00$ ) was conducted to see if the association between market capitalization and the BTM ratio is significant. The tests proved significant at the 5% significance level in both periods. Thus the null hypothesis that there is no association between market capitalization and the BTM ratio is rejected in both periods. Therefore small shares tend to be growth shares and large shares tend to be value shares in both periods. This result corroborates Robins *et al.*'s (1999) findings.

## 5.2 Hypothesis 2

**H2<sub>a</sub>:** The risk-adjusted return of a portfolio composed of shares with an above median BTM ratio is greater than that of a portfolio composed of shares with a below median BTM ratio.

**H2<sub>b</sub>:** The risk-adjusted return of a portfolio composed of shares with below median market capitalization is greater than that of a portfolio composed of shares with above median market capitalization.

**H2<sub>c</sub>:** From H2<sub>a</sub> and H2<sub>b</sub>: A portfolio composed of shares with below median market capitalization and an above median BTM ratio should have the highest risk-adjusted return.

**Table 3: Value / growth excess returns for Hypothesis 2<sub>a</sub> : January 1988 - December 1995**

	Value firms	Growth firms
Average Monthly Excess Return	0,90%	0,46%
Sharpe Ratio	0,013	0,011
Treynor Ratio	0,189	0,108

**Table 4: Large / small excess returns for Hypothesis 2<sub>b</sub> : January 1988 - December 1995**

	Large firms	Small firms
Average Monthly Excess Return	1,02%	0,66%
Sharpe Ratio	0,015	0,016
Treynor Ratio	0,217	0,148

**Table 5: Value / growth and large / small excess returns for Hypothesis 2<sub>c</sub> : January 1988 - December 1995**

	Large value firms	Large growth firms	Small value firms	Small growth firms
Average Monthly Excess Return	0,91%	0,11%	1,24%	0,55%
Sharpe Ratio	0,012	0,002	0,021	0,015
Treynor Ratio	0,190	0,016	0,178	0,128

For hypothesis 2<sub>a</sub> in the January 1988 – December 1995 period, although the value firm portfolio outperformed the growth firm portfolio by all three measures, the ANOVA p-value is not significant (0,61). ANOVA tables are not shown, but are available from the authors.

For hypothesis 2<sub>b</sub> the large firm portfolio outperformed small firm portfolio on a risk-unadjusted basis as well as outperforming according to the Treynor ratio. However, the Sharpe measure indicates that small firm portfolio marginally outperformed the large firm portfolio. The ANOVA p-value was however not significant (0,22).

Unsurprisingly, for hypothesis 2<sub>c</sub> the p-value results (including interaction effects) are also not significant (0,31).

**Table 6: Value / growth excess returns for Hypothesis 2<sub>a</sub> : January 1996 – December 2006**

	Value firms	Growth firms
Average Monthly Excess Return	-0,32%	0,01%
Sharpe Ratio	-0,004	0,00
Treynor Ratio	-0,06	0,00

**Table 7: Large / small excess returns for Hypothesis 2<sub>b</sub> : January 1996 – December 2006**

	Large firms	Small firms
Average Monthly Excess Return	-0,25%	0,02%
Sharpe Ratio	-0,003	0,00
Treynor Ratio	-0,04	0,00

**Table 8: Value / growth and large / small excess returns for Hypothesis 2<sub>c</sub> : January 1996 – December 2006**

	Large value firms	Large growth firms	Small value firms	Small growth firms
Average Monthly Excess Return	0,14%	-0,35%	0,43%	0,23%
Sharpe Ratio	-0,002	0,00	-0,007	0,00
Treynor Ratio	-0,02	-0,05	-0,059	0,04

For hypothesis 2<sub>a</sub> in the January 1996 – December 2006 period, although the growth firm portfolio outperformed the value portfolio according to all three measures (the value portfolio had negative excess returns), the ANOVA p-value is not significant (0,85).<sup>3</sup>

<sup>3</sup>Negative excess returns on equities might seem strange but, contrary to popular belief, equities do not always outperform

For hypothesis 2<sub>b</sub>, the small firm portfolio now outperforms the large firm portfolio for all three return measures. Again, however, the ANOVA p-value is not significant (0,80).

For hypothesis 2<sub>c</sub>, as to be expected from the data in the two previous tables, the best performing portfolio is the small growth firm portfolio. The results (including interaction effects), have a not significant ANOVA p-value (0,31).

### 5.3 Hypothesis 3

**H3:** Risk-adjusted monthly portfolio returns are higher in January than in the other months of the year.

The procedure used to test for the January effect is the same procedure used by Robins *et al.* (1999). This involved stripping out all January returns for all the portfolios and comparing the median of these returns with the median of all other months.

## 6. CONCLUSION

Overall, there is no significant support for value, small firm or January effects in either period (January 1988 – December 1995 and January 1996 – December 2006). The conclusion that there is no growth effect corroborates a number of studies done on the South African market, namely Plaistowe and Knight (1986), Page and Palmer (1991), Bhana (1992) and Graham and Uliana (2001). However, these studies use a different proxy for the value effect.

The conclusion that there is no significant small firm effect for both periods is in accordance with a number of other South African studies such as de Villiers *et al.* (1986), Page and Palmer (1991) and Robins *et al.* (1999) and is in contrast to Basiewicz and Auret (2009). The differing results can possibly be attributed to differing time periods tested and differing databases as this study focuses on the size and value effects on the entire Johannesburg Stock Exchange (JSE) All Share Index (ALSI).

There is also no support for the January effect in either period. This accords with some South African studies; namely Bradfield (1990) and Le Roux and Smit (2001), but is contrary to Robins *et al.* (1999) and Gultekin and Gultekin (1983). The lack of a significant January effect from January 1996 – December 2006 provides some continuity to the conclusions of previous studies.

In future studies the analysis could be restricted to the industrial sector to eliminate the differing BTM definition across sectors e.g. financial versus industrial shares. Furthermore, a liquidity filter and the inclusion of transaction costs as conducted by Basiewicz and Auret (2009) can also be introduced which will add to the analysis, as they do find a significant value and size effect when accounting for these factors.

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fixed interest investments in South Africa over time on a risk-adjusted basis. Auret and Vivian (2010) showed that on a comparative basis, returns of various financial asset classes in South Africa for the period 1986 to 2010 were roughly similar.

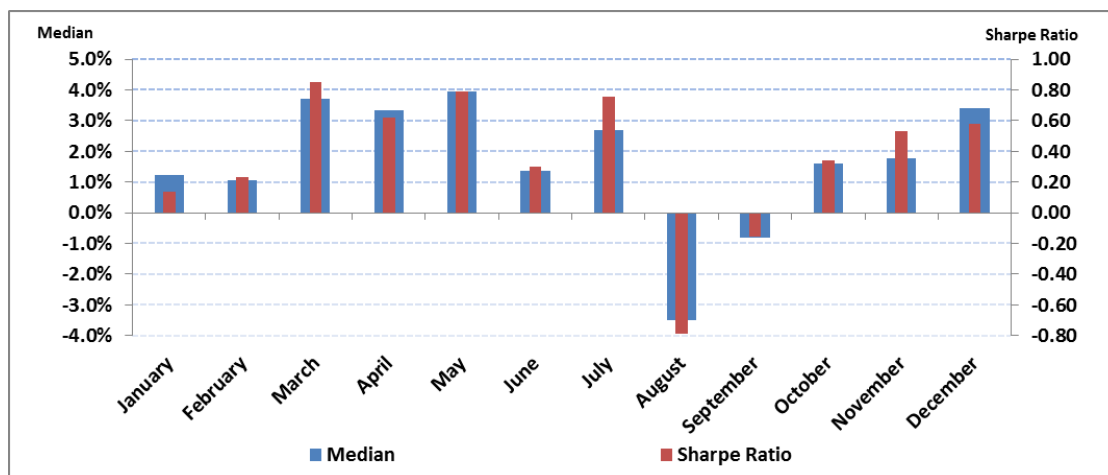


Figure 2: Median returns and Sharpe ratios by month: January 1988 – December 1995

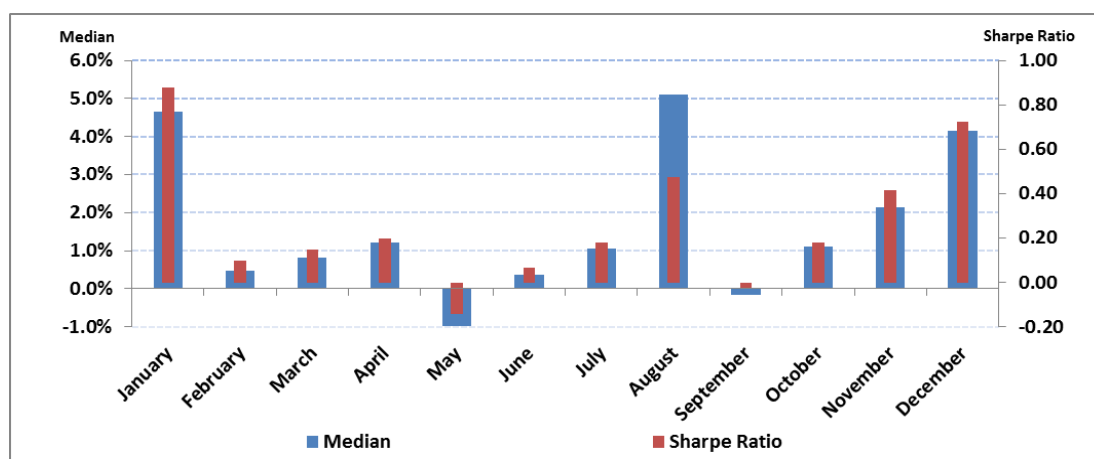


Figure 3: Median returns and Sharpe ratios by month: January 1995 – December 2006

REFERENCES

Auret CJ and Sinclair RA. 2006. Book-to-market ratio and returns on the JSE. *Investment Analysts Journal*, 19:31-38.

Auret CJ and Vivian RW. 2010. A comparative analysis of returns of various financial asset classes in South Africa for the period 1986 to 2010. Paper read at the *International Academy of Business and Economics (IABE) Conference, Las Vegas in October 2010* (unpublished).

Akgun A and Gibson R. 2001. Equity portfolio management – Recovery risk in stock Returns. *Journal of Portfolio Management*, 27(2): 22-31.

Basiewicz PG and Auret CJ. 2009. Another look at the cross-section of average returns on the JSE. *Investment Analysts Journal*, 69:23-38.

Banz RW. 1981. The relationship between return and market value of common stocks. *Journal of Financial Economics*, 9:3-18.

Basu S. 1977. Investment performance of common stocks in relation to their price-earnings ratios: A test of the efficient market hypothesis. *The Journal of Finance*, 32(3):663-682.

Bhana N. 1992. An empirical relationship between company growth and the market price of securities listed on the Johannesburg Stock Exchange. *South African Journal of Business Management*, 23(3):63-68.

Bradfield DJ. 1990. A note on the seasonality of stock returns on the Johannesburg Stock Exchange. *South African Journal of Business Management*, 21(1):7-9.

Capaul C, Rowley I and Sharpe WF. 1993. International value and growth stock returns. *Financial Analysts Journal*, 49(1):27-36.

Chan LKC, Hamao Y and Lakonishok J. 1991. Fundamentals and stock returns in Japan. *The Journal of Finance*, 46(5):1739-1764.

Chen N and Zhang F. 1998. Risk and return of value stocks. *The Journal of Business*, 49(4):501-535.

- Corhay A, Hawawini, G and Michel P. 1987. Seasonality in the risk-return relationship: Some international evidence. *The Journal of Finance*, 42(1):49-68.
- Davis JL. 1994. The cross-section of realized stock returns: The pre-COMPUSTAT evidence. *The Journal of Finance*, 49(5):1579-1593.
- de Villiers P, Lowings T, Pettit T and Affleck-Graves J. 1986. An investigation into the small firm effect on the Johannesburg Stock Exchange. *South African Journal of Business Management*, 17(4):191-195.
- Robins EM, Sandler M and Durand F. 1999. Inter-relationships between the January effect, market capitalization and value investment strategies on the JSE. *Investment Analysts Journal*, 50(4).
- Fama EF and French KR. 1992. The cross-section of expected stock returns. *The Journal of Finance* 47(2):427-465.
- Fama EF and French KR. 1993. Common risk factors in the returns on stocks and bonds. *Journal of Financial Economics*, 33:3-56.
- Fama EF and French KR. 1995. Size and book-to-market factors in earnings and returns. *The Journal of Finance*, 50(1):131-155.
- Fama EF and French KR. 1998. Value versus growth: The international evidence. *The Journal of Finance*, 53(6):1975-1999.
- Graham M and Uliana E. 2001. Evidence of a value-growth phenomenon on the Johannesburg Stock Exchange. *Investment Analysts Journal*, 53(1).
- Gultekin MN and Gultekin NB. 1983. Stock market seasonality: International evidence. *Journal of Financial Economics*, 12:469-481.
- Lakonishok J and Shapiro AC. 1986. Systematic risk, total risk and size as determinants of stock market returns. *Journal of Banking & Finance*, 10(2):115-132.
- Lakonishok J, Shleifer A, Thaler R and Vishny RW. 1991. Window dressing by pension fund managers. *The American Economic Review*, 81(2):227-231.
- Lakonishok J, Shleifer A and Vishny RW. 1994. Contrarian Investment, extrapolation, and risk. *The Journal of Finance*, 49(5):1541-1578.
- Le Roux J and Smit E vd M. 2001. Seasonal patterns on the Johannesburg Stock Exchange: Some new evidence. *Studies in Economics and Econometrics*, 25(1):27-61.
- Page MJ and Palmer F. 1991. The relationship between excess returns, firm size and earnings on the Johannesburg Stock Exchange. *South African Journal of Business Management*, 22(3):63-73.
- Plastow T and Knight RF. 1986. Premium to book value may be a contrary indicator. *The Investments Analysts Journal*, November:35-39.
- Reinganum MR. 1981. Abnormal returns in small firm portfolios. *Financial Analysts Journal*, 37(2):52-56.
- Reinganum MR. 1983. A direct test of Roll's conjecture on the firm size effect. *The Journal of Finance*, 37(1):27-35.
- Roll R. 1983. Was ist das? The turn-of-the-year effect and the return premia of small firms. *Journal of Portfolio Management*, 9:18-28.
- Rozeff MS and Kinney WR. 1976. Capital market seasonality: The case of stock returns. *Journal of Financial Economics*, 3:379-402.
- Van Rensburg P and Robertson M. 2003a. Style characteristics and the cross-section of JSE returns. *Investment Analysts Journal*, 57:7-15.
- Van Rensburg P and Robertson M. 2003b. Size, price-to-earnings and beta on the JSE securities exchange. *Investment Analysts Journal*, 58:7-16.
- Vassalou M and Xing Y. 2004. Default risk in equity returns. *The Journal of Finance*, 59(2): 831-868.
- Waelkens K and Ward M. 1997. The low price effect on the Johannesburg Stock Exchange. *Investment Analysts Journal*, 45.
- Zeghal D. 1984. Firm Size and the information content of financial statements. *The Journal of Financial and Quantitative Analysis*, 19(3):299-310.

**Appendix 1: I-Net Bridge Codes and Definitions**

I-Net Code	
Close	The value of the previous day's closing price
LI05	Equity is the aggregate of ordinary capital, capital reserve, revaluation reserves, equity counted reserves and revenue reserves
BI05	Intangibles excluded from shareholders' funds in the analysis
SISS	Shares in issue at date
M_Cap	Market capitalization of share at date of calculation

**Appendix 2: Summary of All Data for Hypothesis 2**

**Summary of Data for the first Sample Period: January 1988 – December 1995**

	Large Value Firms	Large Growth Firms	Small Value Firms	Small Growth Firms	Large Firms	Small Firms	Value Firms	Growth Firms	ALSI
Average Monthly Excess Return	0,91%	0,11%	1,24%	0,55%	1,02%	0,66%	0,90%	0,46%	1,74%
Average Annualised Excess Return	11%	1,29%	15,95%	7%	13%	8%	11%	6%	23%
Monthly Standard Deviation	4,80%	6,85%	6,99%	4,33%	4,73%	4,45%	4,76%	4,22%	5,27%
Sharpe Ratio	0,012	0,002	0,021	0,015	0,015	0,016	0,013	0,011	0,330
Treynor Ratio	0,190	0,016	0,178	0,128	0,217	0,148	0,189	0,108	0,017

**Summary of Data for the second Sample Period: January 1996 – December 2006**

	Large Value Firms	Large Growth Firms	Small Value Firms	Small Growth Firms	Large Firms	Small Firms	Value Firms	Growth Firms	ALSI
Average Monthly Excess Return	-0,14%	-0,35%	-0,43%	0,23%	-0,25%	0,02%	-0,32%	0,01%	0,97%
Average Annualised Excess Return	-1,7%	-4,12%	-5,08%	2,8%	-3,0%	0,3%	-3,8%	0,1%	12,22%
Monthly Standard Deviation	6,03%	7,73%	7,36%	5,14%	6,03%	5,02%	5,78%	5,32%	6,17%
Sharpe Ratio	-0,002	0,00	-0,007	0,00	-0,003	0,00	-0,004	0,00	0,16
Treynor Ratio	-0,02	-0,05	-0,059	0,04	-0,04	0,00	-0,06	0,00	0,010