

Equity style timing

1. INTRODUCTION

Christopherson and Williams (1997) define an equity style as an investment belief held by a group of managers who believe that following it will add value. They further state that to be valid, a style should result in the clustering of factor tilts or portfolio characteristics among those portfolios that share the style, and furthermore have a broad following among investors. If only one firm holds a philosophical belief, it is more appropriate to refer to the belief as an "investment insight" that belongs to that firm alone.

The Frank Russell Company (in Christopherson and Williams, 1997) defines and utilises four broad style categories:

1.1 Value

A Value manager focuses on companies that have shown growth and profitability characteristics well below market averages and which have experienced price declines because of adverse investor sentiment. Christopherson and Williams (1997) identify three value sub-styles:

The Low price/earnings (P/E) manager concentrates on companies selling at low prices relative to current normalised or discounted future earnings. These are usually companies from cyclical or out of favour industries.

The Contrarian manager, on the other hand, focuses on shares trading at low prices relative to their tangible book value. S/he invests, in these companies in the hope that a cyclical rebound or an item of company specific news will result in a substantial earnings turnaround.

Yield managers, possibly the most conservative according to Christopherson and Williams (1997), focus on companies with above average dividend yields that are able to maintain or increase their dividend payments.

1.2 Growth

A Growth manager invests in companies with above average growth prospects, and is prepared to pay above market multiples for these growth rates. Christopherson and Williams (1997) document two growth sub-styles: consistent growth, and earnings momentum. Consistent growth managers emphasise

high quality, consistently growing companies. These typically exhibit valuation multiples above their respective market sectors. Earnings momentum managers prefer those companies with volatile above average growth, and purchase companies at appropriate times in anticipation of earnings acceleration.

1.3 Market oriented

The third broad style category is market orientated. Market oriented managers do not have a strong preference for either growth or value, preferring to hold well diversified portfolios which are characteristic of the market averages.

1.4 Size

The fourth style described by Christopherson and Williams (1997) is that of size. In particular the Small capitalisation manager focuses on small companies. The attraction to this sector is the belief that institutional investors follow these companies with less rigour, and therefore there are more opportunities to add value. These style managers may be further segmented to reflect a value, or growth or market oriented bias.

2. EVIDENCE FOR THE EXISTENCE OF STYLES

A significant body of research supports the existence of styles and especially the effectiveness of value strategies for choosing individual stocks.

In South Africa, the size effect and the value effect have been the subject of several studies.

2.1 Size effect

As indicated above, the small firm effect refers to the observation that over a long time horizon, stocks with low market capitalisation (small caps) outperform stocks with high market capitalisation (large caps), even after adjusting for standard measures of risk. Banz (1981) is credited with one of the first empirical observations of the small firm effect. Subsequent studies, including Reinganum (1981, 1999), Shultz (1983), and Fama and French (1992) made the same observation.

In South Africa, De Villiers, Lowings, Pettit and Affleck-Graves (1986) investigated the small firm effect and found no evidence of it on the Johannesburg Securities Exchange (JSE). They did however find evidence for a large firm effect, which they attributed to

* Wits Business School, University of the Witwatersrand, PO Box 98, Wits 2050, Republic of South Africa.
Email: chrism@iafrica.com

the predominance of institutional investors and extensive cross holdings found in listed companies on the JSE. Similarly, Page and Palmer (1991) also found no evidence of a small firm effect on the JSE.

Van Rensburg (2001) used a cluster analysis methodology to extract a parsimonious decomposition of style based effects on the JSE over the 16 year period to 1999. The results suggested three style factors: value, size and earnings-momentum.

Van Rensburg and Robertson (2003a) extended this research using a cross-sectional regression methodology (following Daniel and Titman (1997)) on share returns and style characteristics. In contrast to the earlier study they found no momentum effect, but did confirm significant size and value (P/E) effects.

In a further study, Van Rensburg and Robertson (2003b) examined the explanatory power of size, value (P/E) and beta. They noted that many previous studies had failed to identify a size effect on account of small sample sizes. Using ten years of monthly data ending 2000 and a two-way sorting procedure of quantile portfolios they presented evidence that small size earned a higher return on the JSE, but with a lower beta. They also reported similar findings for low P/E stocks.

2.2 Value effect

Graham and Dodd (1934) first advocated the efficacy of a value strategy whereby stocks, trading at a low price to book ratio have been observed to outperform, over the long term, those shares trading at comparatively higher ratios. Their approach was to look at how much capital a company had raised, and how much of its profits it had reinvested, and how much the company was willing to pay out as dividends. The first two measures combine to form the book value of the company, and the third its dividend payout ratio, all of which are components of 'value'.

Several studies have documented a value effect including Basu (1983), Rosenberg, Reid and Lanstein (1985), De Bondt and Thaler (1985,1987), and Fama and French (1992, 1998).

The seminal study of Fama and French (1998), for the period 1975-1995, showed that the difference between average returns on global portfolios of high and low book-to-market stocks was 7,6% per year, and value stocks outperformed growth stocks in 12 of 13 major markets.

Fama and French (1993, 1995, and 1998) showed that value stocks, defined as high book to market (B/M) stocks, have outperformed growth stocks over long periods of time. Capaul, Rowley and Sharpe (1993) also demonstrated this effect. Fama and French (1998) went on to show that the value premium also

exists outside the USA. According to Black (1993) however, the value effect is sample specific, and is a chance result.

Lakonishok, Shleifer and Vishny (1994) argued that the value premium arises because the market undervalues distressed stocks and overvalues growth stocks. Once these errors are corrected, value stocks have high returns and growth stocks have lower returns.

In South Africa, Plaistow and Knight (1986) used 35 JSE listed industrial shares and classified them as premium or discount shares depending on whether their Net asset value/ Market value was greater than or smaller than 1. They calculated the abnormal weekly returns for the year following the release of their annual report, and found that discount shares outperformed the premium shares over the year. They did not however ensure risk-adjusted returns for the portfolios.

Bhana (1992) randomly selected 50 shares listed on the JSE, and ranked them into value and growth portfolios based on their Tobin's Q ratio (defined as the ratio of the replacement value of assets to their market value). Tobin's Q is typically used as a measure of the excess economic value created by a company over the value of the assets. Bhana found a 6,4% annualised return differential in favour of the portfolio with the lowest Q value. Based on this result, he noted that the fact that a company creates economic value does not necessarily make its shares a good investment.

Gates (1997) created annual value and growth portfolios using 100 randomly selected shares using annual rebalancing between 1986 and 1996. He found that portfolios with low Price/Book (P/B) ratios provided superior risk adjusted returns as compared to those portfolios with high P/B ratios.

Van Rensburg (2002) observed that the two factor APT model needed to be augmented with measures of securities' exposures to market capitalization, momentum, and value: he described these styles as additional axes of risk in the model.

These findings, together with those of Van Rensburg noted earlier, present clear evidence of opportunities for style managers following both a size and/or value strategy.

3. ECONOMICS OF STYLE INVESTING

According to Bernstein (1995), the commodity bought and sold in the equities market is earnings growth. Investors will usually only invest in companies they believe will experience a growth of profits, which will significantly increase the share price. Those companies that can grow at a superior rate produce returns that will outperform the market, and those that

do not will under-perform. Bernstein (1995) argues that if superior profit growth were to become scarce, investors would be willing to pay higher prices to obtain ownership in those select companies. If earnings growth were abundant, however, then investors would be less willing to pay high prices for growth shares. He further postulates that the abundance or scarcity of nominal earnings growth will affect how market segments, and investing styles, perform.

What is important here is the concept of market timing. As the market moves through different phases Christopherson and Williams (1997) show that the risk for the value manager is in timing the purchase to capitalise on an expected price appreciation. For the growth manager, the risk lies in that the growth expected may not materialise. At times the market is better suited to a growth style, and at other times a value style.

4. RESEARCH PROPOSITIONS

Kao and Schumaker (1999) and Levis and Liodakis (1999) both contend that the style spreads, (the differential returns from investing in opposite ends of the style spectrum e.g. value against growth), are persistent and significant. This study pursues this idea, and three research propositions are considered:

The market capitalisation effect occurs independently of the value effect.

There are persistent, and significantly higher returns for style managers following a high price to book (growth) strategy compared with a low price to book (value) strategy.

A strategy of timing the style turning points will out-perform one of buying and holding the index.

5. RESEARCH METHODOLOGY

5.1 Overview

A standard methodology for studying the value and market capitalisation effects has been established over time (e.g. Basu, 1977; De Villiers, Lowings and Affleck-Graves, 1986; Fama and French, 1992). This methodology is applied in this study.

Portfolios of shares representing the cross sectional factors being investigated were created at the beginning of each year, starting in December 1986 until May 2006, and their monthly total returns (including dividends) were calculated over the subsequent 12-month period. At the end of each 12-month period, the portfolios were reconstituted using a new sample of shares free of survivorship bias.

To isolate the market capitalisation effect, the companies were ranked in descending order of market capitalisation. Those companies whose market value cumulatively made up the bottom 10% of this total capitalisation ranking constituted the small cap-portfolio. The next 10% of the total capitalisation constituted the mid-cap portfolio while companies in the top 80% constituted the large-cap portfolio.

For the value effect, the shares were ranked in descending order of P/B ratio. The top 50% of the companies by number with the highest P/B ratio were placed in the growth portfolio, while the rest were placed in the value portfolio. Each share was therefore either in the growth portfolio or in the value portfolio. Portfolios were rebalanced annually.

To define the twelve-month period, Fama and French (1997) used the December-to-December duration. Other researchers, e.g. Robins, Sandler and Durand (1999) used the November-to-November period. To prevent a look-ahead bias and ensure that only information available to investors at the time of portfolio formation was used, both the issued shares and P/B values were obtained from the previous year's Annual Financial Statements.

5.2 Population

The population under consideration was that comprising all shares listed since 1986 on the Industrial sector of the JSE. As far as was possible, survivorship bias was avoided by including delisted shares. For unbundled shares, the new entities were treated as new listings, separate from the predecessor.

For the reasons following, and to remain consistent with other South African studies (e.g. Robins, Sandler and Durand 1999, and Gates, 1987), this study excluded those shares listed on the mining sector, the financial sector, and all non main-board shares. The mining sector is highly dependent on the gold price (De Villiers, Lowings, Petit and Affleck-Graves 1986; Gates, 1987; Robins *et al.*, 1999). Financial companies have a unique treatment of book value (Robins *et al.*, 1999) and were excluded by Fama and French (1992). Non main-board companies tend to be very small, and highly illiquid. Limited research has been done on non main-board securities, and hence they may possess a large amount of non-systematic risk.

5.3 Data

Data for this study were obtained from the BFA-Net and I-NET online databases, while the *JSE Monthly Bulletin* was used to track name changes, corporate actions and de-listings.

The study assumed that at portfolio formation, an investor was able to purchase shares at the closing price. These shares were then subsequently sold at

the corresponding date twelve months later. Transaction costs, taxes, minimum block size requirements, impact cost and liquidity were not taken into account, as these factors were assumed to be relatively immaterial.

5.4 Data integrity tests

Both the BFA-NET and I-NET databases adjust data for share splits, consolidations and swaps. All the share price data was checked to ensure that this had been performed consistently. To confirm the accuracy of the data, an index comprising all the shares used each year was created. The returns from this index were plotted against the returns of the Industrial index. Since the population of (non-excluded) shares used in this study was the entire Industrial sector, whose index is the Industrial Index (J257), it was necessary to ensure that the share data closely tracked the index to confirm the reliability of the data.

To ensure that all share splits and other actions were appropriately incorporated, a test was run to check whether any movement in share price in excess of 40% month on month had occurred. A sample of such moves was examined and checked against corporate actions to ensure accuracy.

If a share was de-listed during any twelve-month period, it was held in the portfolio until its last trading day, at which point the share was sold. For rights issues, a passive investment strategy was followed, therefore no rights were taken up; these were allowed to lapse.

The book value was obtained from the BFA-NET database. It was calculated as ordinary capital plus distributable and non-distributable reserves, less the cost of control of subsidiaries and intangible assets. Where there were gaps in the data these were filled using *FACTS Investors Guide*.

5.5 Portfolio return calculations

For each portfolio, total monthly returns were calculated. Because it was not possible to identify the exact payment dates for dividends, it was assumed that they were received evenly during the year. Instead of using the actual dividend paid, Fama and French (1998) assumed that the dividend yield (defined as the trailing twelve-month dividend divided by the monthly closing price) would suffice in calculating total monthly returns. The annual dividend yield was accounted for as one-twelfth per month for the year. Compounding this monthly return reproduced the annual return. In using this method, they assumed that the capital gain component, measured monthly, accurately reproduced the volatility and covariance structure of total monthly returns.

From each time series, cumulative monthly total returns were obtained in order to observe the total returns for the entire 20-year period.

5.6 Prediction model

An effective implementation of a style rotation strategy requires the development of a trading model to predict the appropriate switching events. Although not the main focus of this study, an attempt to construct an appropriate econometric model was made. In this context and following their rationale, the following macroeconomic variables identified by Kao and Shumaker (1999) and Levis and Liodakis (2000) were analysed:

The (10 year vs 5 year) yield curve spread

Corporate credit spread (AA vs BBB rated corporate bonds)

Earnings yield gap (ALSI earning yield vs long bonds)

The equity risk premium

The inflation rate (historical CPI)

The index of coincident economic indicators

The rate of change of M3 money supply

The return on the all share index

The index of leading economic indicators

A regression equation was constructed using the monthly return spread between value and growth portfolios as the dependent variable. To construct the model data from December 1986 to December 1993 was used, so that the remaining data could be used to perform an out-of-sample test of the regression model.

6. RESULTS

Proposition 1: The market capitalisation effect occurs independently of the value effect.

To test this proposition, the cumulative monthly returns obtained from the high price to book ratio (growth) portfolio were plotted together with those obtained from the low price to book ratio (value) portfolios. To ensure that the influence of size did not introduce bias into the result, this was conducted for both the large capitalisation and small capitalisation stocks independently.

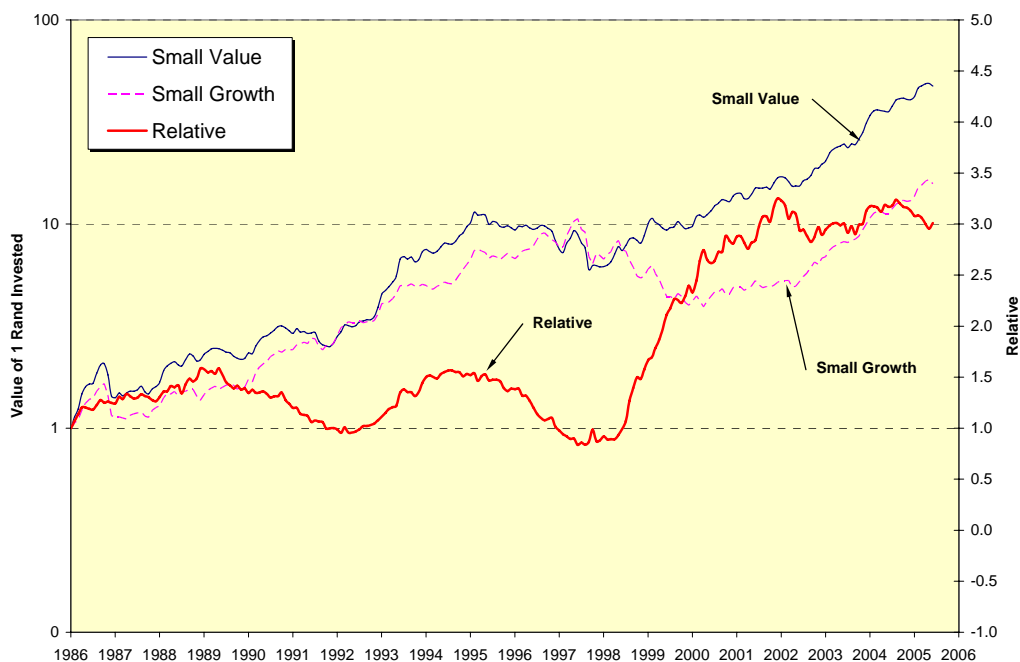


Figure 1: Value and growth in small cap stocks

Figure 1 shows the returns of a small-cap growth portfolio and a small-cap value portfolio over the 20 years of the study. The relative performance of the two portfolios against each other reveals that there are periods of persistent out-performance for one or other strategy.

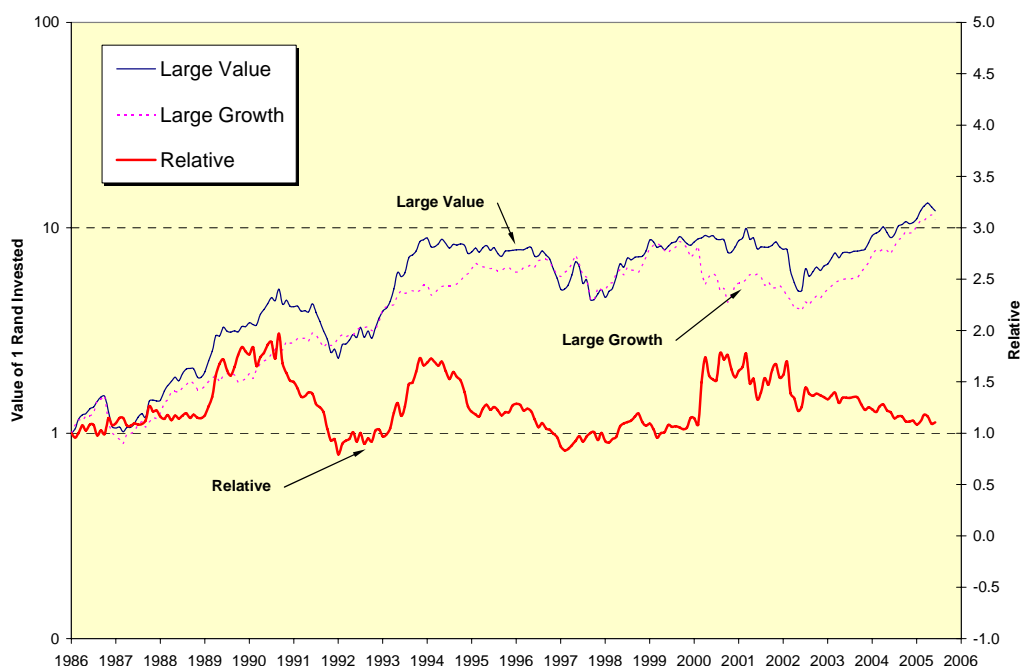


Figure 2: Value and growth in large cap stocks

Figure 2 shows the returns of a large-cap growth portfolio and a large-cap value portfolio over the 20 years of the study. The relative performance of the two portfolios against each other reveals that there are periods of persistent out-performance for one or other strategy – irrespective of company size.

6.1 Value and growth: Small cap universe

From Figure 1 above, five (including the start) turning points are evident from the relative performance graph. For the period from December 1986 to December 1989, small cap value shares generally outperformed small cap growth shares. This trend was reversed until December 1992 when there was a cyclical shift into small cap value. This shift lasted until March 1994 when growth came back into favour again. Growth continued to out perform value until November 1998 when the cyclical shift again turned to value. From December 1998 to December 2002, however, value clearly outperformed growth, when the trend reversed before returning to favour value in August 2003.

When examining only small cap shares, value and growth were profitable at different times over this period. Any investor able to consistently switch between the two, at the right time, would have outperformed an investor who bought and held small cap stocks.

6.2 Value and growth: Large cap universe

Figure 2 above shows the returns a style investor would have earned by investing only in large cap shares over the twenty-year period.

Here the swings are less evident than in the small cap scenario, but no less dramatic. Starting in 1986, value was marginally ahead of growth, all the way to September 1991, when a definite shift out of value into growth occurred. This persisted until December 1992, when value came again to the fore. The next shift into growth started in November 1994 and persisted until December 1997 when a movement into value emerged, dominating until March 2001, when growth took over the trend to the current time.

6.3 Proposition 2: There are persistent, and significant higher returns for style managers following a high price to book ratio (growth) strategy as opposed to a low price to book (value) strategy

If an investor were to ignore the influence of size and concentrate on the value/growth swings, the profile would have been that in Figure 3.

The two time series seem to track each other closely, however the relative return series tells a different story. For the period between December 1986 and August 1991, value marginally outperformed growth. From August 1991, growth clearly outperformed value until a turning point in December 1992, which shifted sentiment back to value. This trend prevailed until

December 1994 when growth again came into the fore. Growth predominated until 1997 and since then value appears to have returned to favour, peaking in September 2001, and January 2003. Subsequently, it appears that returns to growth marginally outpaced returns to value for the period to 2006

6.4 Proposition 3: A strategy of timing the style turning points will out perform one of buying and holding the index.

The following scenarios were modelled in order to investigate the efficacy of various levels of predictive accuracy in switching between styles. In all of these scenarios, the switching frequency used was monthly, i.e., all decisions to switch were made at the beginning of each month.

- Perfectly accurate
The investor was able to correctly predict every time a shift from value to growth happened, and was able to shift funds into the right style. In order to test this it was assumed that each time a shift happened, the investor was able to get into the outperforming style on time, and out of the underperforming style simultaneously.
- Highly accurate
In this scenario the investor was able to predict only the major switches discussed above and was able to move into the outperforming style and out of the underperforming style.
- Perfectly inaccurate
The investor made the wrong switch each month.

Figure 4 shows that an investor who was able to perfectly time the market would have obtained a return of 43% pa. One who was able to find only the five major turning points would still have realised a return of 26,3% pa. An unfortunate investor who switched incorrectly each time would have lost 5,2%pa. In contrast, an investor who opted to invest in the Industrial or All Share Index would have obtained a return of 13,5% pa and 12,8% pa respectively. Clearly, any model designed to time the turns would have value, but only if it outperformed the benchmark index as shown in Table 1 below:

6.5 A prediction model

To test the practical viability of a market timing strategy for different styles, a prediction model is required. The prediction model should (parsimoniously) indicate appropriate switching points between styles over the 19 year period.

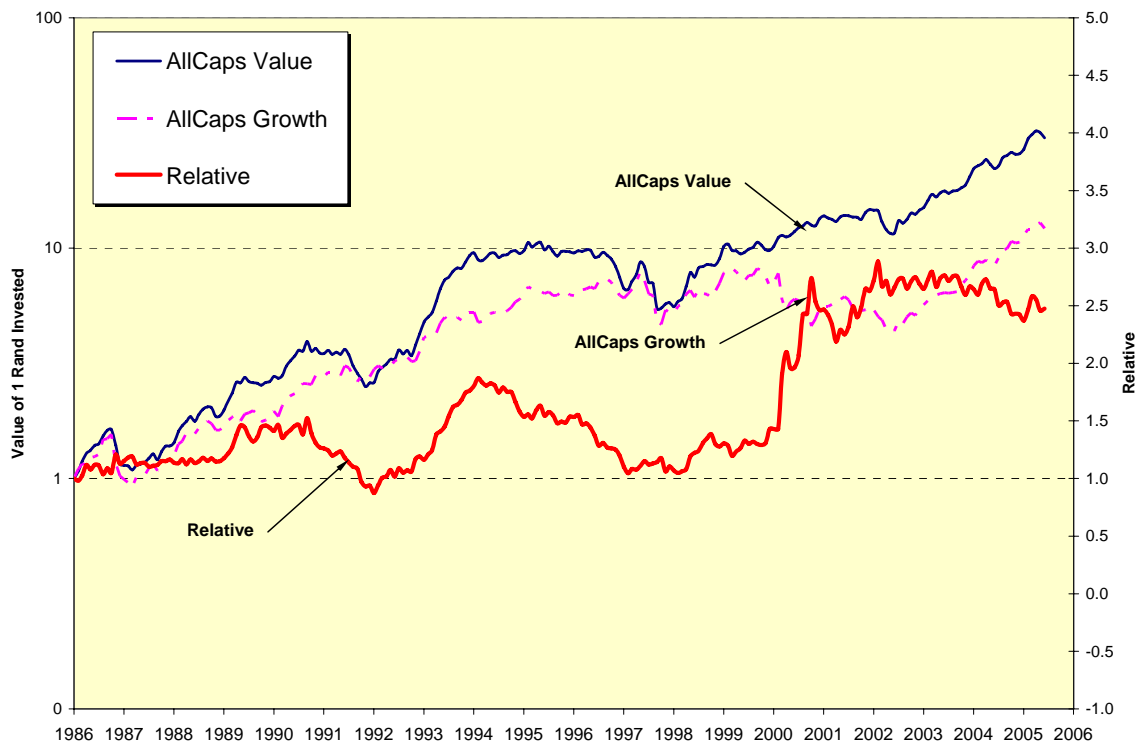


Figure 3: Value and growth across the market

Figure 3 shows the returns of a growth portfolio and a value portfolio for all the shares in the sample over the 20 years of the study. The relative performance of the two portfolios against each other reveals that there are periods of persistent out-performance for one or other strategy across the market.

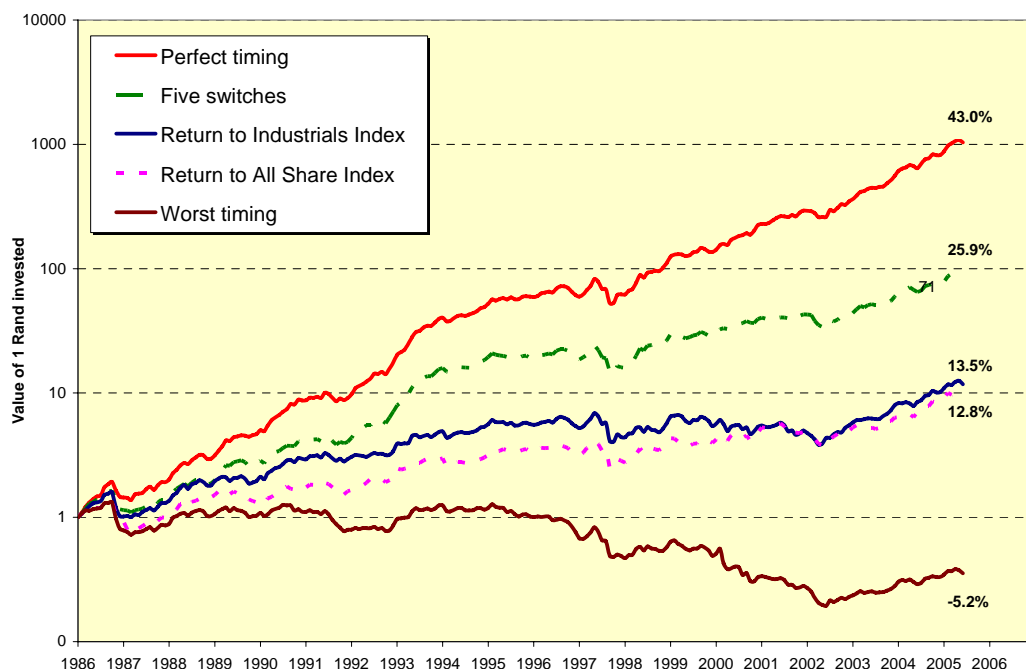


Figure 4: Effect of predictive accuracy

Figure 4 shows the returns from various market-timing strategies, switching between value and growth styles. Even a strategy which switches only five times (at the major turning points) significantly out-performs the indices.

Table 1: Comparative returns from the various strategies

	Perfect	5 Switches	All Value	Random	All Growth	Return to ALL Share	Return to Industrials Index	5 Bad Switches	Imperfect
Perfect	0,0%	13,2%	20,9%	22,3%	28,1%	29,1%	29,2%	36,8%	54,9%
5 Switches	-11,7%	0,0%	6,8%	8,0%	13,1%	14,0%	14,1%	20,8%	36,8%
All Value	-17,3%	-6,3%	0,0%	1,2%	6,0%	6,8%	6,8%	13,1%	28,1%
Random	-18,3%	-7,4%	-1,2%	0,0%	4,7%	5,5%	5,6%	11,8%	26,6%
All Growth	-22,0%	-11,6%	-5,7%	-4,5%	0,0%	0,7%	0,8%	6,8%	20,9%
Return to ALL Share	-22,5%	-12,3%	-6,3%	-5,2%	-0,7%	0,0%	0,1%	6,0%	20,0%
Return to Industrials Index	-22,6%	-12,3%	-6,4%	-5,3%	-0,8%	-0,1%	0,0%	5,9%	19,9%
5 Bad Switches	-26,9%	-17,2%	-11,6%	-10,6%	-6,3%	-5,7%	-5,6%	0,0%	13,2%
Imperfect	-35,4%	-26,9%	-22,0%	-21,0%	-17,3%	-16,7%	-16,6%	-11,7%	0,0%

For example, the 5 switches strategy outperformed the All Share Index by 14%pa

In order to ensure the model had predictive power the variables were lagged for three months relative to the dependent variable (AIV/AIIG). A correlation analysis of the variables indicated that only the term structure, co-incident indicator, and earnings yield gap added to the explanatory power of the equation (Table 2).

Table 2: Regression statistics for a three variable model

Multiple R	73%			
R square	53%			
Adjusted R square	52%			
Standard error	11%			
Observations	85,0			
ANOVA	Df	SS	MS	F
Regression	3	1,11	0,37	31,03
Residual	81	0,96	0,01	
Total	84	2,07		
	Coefficients	Standard Error	t-Stat	P-value
Intercept	0,47	0,20	2,35	0,02
Term structure	-0,11	0,02	-,687	0,00
Co-incident indicator	0,01	0,00	4,09	0,00
Earnings yield gap	-0,02	0,01	-2,10	0,04

Table 2 shows the regression statistics for an econometric model with three independent variables (viz: the term structure, the co-incident indicator and the earnings yield gap) to predict style turning points.

6.6 Testing the predictive power of the regression

In order to test the predictive ability of the model, a trading strategy was designed and tested using the out-of-sample data. It was assumed that the investor was fully invested in value shares at the beginning, i.e. January 1994. Using monthly output from the model and to minimise transaction costs, the following trading strategy was tested: "Switch to growth if the model indicates that the value/growth variable would narrow over the next two consecutive months. If either one of the following months showed an increase in the variable, then no switch was made."

Table 3 below presents the results of the analysis:

As indicated in Table 3, the cumulative return of the trading strategy was lower than that from the perfect timing example, but nevertheless outperformed the All Share Index, the Industrial Index and the passive strategies of remaining in either value or growth over the entire period.

7. INTERPRETATION OF RESULTS

Fama and French (1998) showed that the value premium is a global phenomenon. This research affirmed their findings by showing the differential returns to investing in the different styles over a 20-year period in South Africa.

The research also mirrored the findings of Lakonishok *et al.* (1994), and Capaul *et al.* (1993) that the value style outperforms growth over long periods of time. In addition, it also showed that this outperformance was cyclical, with growth sometimes outperforming value.

The influence of size was significant, as predicted by Reinganum (1999). However, it was evident that the value effect occurred across the size spectrum, thus disagreeing with Reinganum (1981) who found that the value effect was a manifestation of the market capitalisation effect.

The findings corroborated Van Rensburg (2001), Van Rensburg and Robertson (2003a, 2003b), Plaistow and Knight (1986), and Gates (1997) who found evidence for the value effect in South Africa.

In contrast, the research did not corroborate Robins *et al.* (1999) who found no evidence of either the market cap effect or the value effect.

The benefits of style timing were evident in the research. Following Christopherson and Williams (1997), timing had an influence in determining the returns to the style manager: If the value manager buys a share too soon, s/he may have to endure an extended period of under-performance. The same problem applies to growth managers.

Table 3: Comparative returns on out-of-sample data Dec 1993 to Feb 2006.

	Value	Growth	Strategy	Perfect Timing	Imperfect Timing	C127	ALSI
Monthly return	1,07%	0,52%	1,17%	2,38%	-0,77%	0,53%	0,66%
Annual return	17,26%	9,82%	18,22%	36,44%	-10,46%	10,06%	12,01%
13 year return	675%	307%	745%	4162%	-27%	302%	432%
Monthly Std Dev	5,49%	5,98%	5,73%	5,29%	5,80%	5,92%	5,94%

Table 3 shows the comparative returns of the style timing portfolios. The strategy using the econometric model (column 3) shows that it is possible to outperform the indices and the simple value and growth styles on a consistent basis.

8. CONCLUSIONS

The objective of this research was to investigate whether the style timing strategies could be profitable on the JSE Securities Exchange.

During the 20-year period, 1986 to 2006, value stocks outperformed growth stocks across the size spectrum. An econometric model to predict style turning points showed that timing the style spreads was a potentially more profitable strategy than buying and holding the index or simple (fixed) style strategy.

A limitation of this research was that transaction costs were not considered. As the number of switches increase, the costs would naturally increase. Nevertheless, it is believed that the conclusions reached gave a fair and general indication of the potential of style switching strategies.

For fund managers, a strategy of monitoring style shifts and then tilting the portfolio, would allow them not have to trade too often, and in this way minimise trading costs.

The fundamental implication of these findings is that style timing can improve returns to investors. In addition, the research clearly shows that managers should be measured against their style benchmarks. Measuring managers by market aggregates can only encourage style drift, and style inconsistency.

In agreement with Levis and Liodakis (1999) this research showed that style consistency may be prudent for very long investment horizons especially when investors have very strongly held views on the performance of any given style. Any shorter investment horizon would benefit from controlled style rotation strategies.

REFERENCES

- Banz RW. 1981. The relationship between return and market value of common stocks. *Journal of Financial Economics*, 9: 3-18.
- Basu S. 1983. The Relationship between earnings yield, market value and return for NYSE common stocks. *Journal of Financial Economics*, 12: 129-156.
- Basu S. 1977. The investment performance of common stocks in relation to their price-earnings ratios: A test of the efficient market hypothesis. *Journal of Finance*, 32(3): 663-681.
- Bernstein R. 1995. *Style investing*. New York: John Wiley & Sons, Inc.
- 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(3/4): 63-68.
- Black F. 1993. Beta & return. *Journal of Portfolio Management*, 20: 8-18.
- Capaul C, Rowley I and Sharpe W. 1993. International value and growth stock returns. *Financial Analysts Journal*, 49(1): 27-36.
- Christopherson JA and Williams CN. 1997. Equity style: What it is and why it matters, in *The Handbook of Equity Style Management*, Fabozzi FJ (editor), Second Edition New Hope, PA: Frank Fabozzi & Associates.
- De Bondt WFM and Thaler RH. 1985. Does the stock market overreact? *Journal of Finance*, 40(3): 793-805.
- De Bondt WFM and Thaler RH. 1987. Further evidence on investor overreaction and stock market seasonality. *Journal of Finance*, 42(3): 557-581.
- De Villiers P, Lowings T, Petit 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.
- Fama E 1991. Efficient capital markets II. *Journal of Finance*, 46 (5): 1575-1617.

- Fama E and French K. 1992. The cross section of expected stock returns. *Journal of Finance*, 47(2): 427-465.
- Fama E and French K. 1993. Common risk factors in the returns of stocks and bonds. *Journal of Financial Economics*, 53: 427-465.
- Fama E and French K. 1995. Size and book to market factors in earnings and returns. *Journal of Finance*, 50(1): 131-155.
- Fama E and French K. 1998. Value versus growth: The international evidence. *Journal of Finance*, 53(6): 1975-1999.
- Gates SR. 1997. The market to book effect on the Johannesburg Stock Exchange. Unpublished MBA Research Report, Johannesburg: University of the Witwatersrand.
- Graham B and Dodd D. 1934. *Security analysis*. New York: McGraw Hill.
- Kao D and Shumaker R. 1999. Equity style timing. *Financial Analysts Journal*, January/February: 37-47.
- Lakonishok J Shleifer A and Vishny RW. 1994. Contrarian investment, extrapolation and Risk. *Journal of Finance*, 49(5): 1541-1578.
- Levis M and Liodakis M. 1999. The profitability of style rotation strategies in the United Kingdom. *Journal of Portfolio Management*, Fall: 73-86.
- Page MJ and Palmer F. 1991. The relationship between excess returns, firm size and earnings on the Johannesburg Stock Exchange: An empirical analysis. *South African Journal of Business Management*, 22(3): 63-73.
- Plaistowe T and Knight RF. 1986. Premium to book value may be a contrary indicator. *The Investment Analysts Journal*, 28: 35-39.
- Reinganum MR. 1981. Misspecification of capital asset pricing: Empirical anomalies based on earnings yield and market values. *Journal of Financial Economics*, 9: 19-46.
- Reinganum MR. 1999. The significance of market capitalisation in portfolio management over time. *Journal of Portfolio Management*, Summer: 39-49.
- Robins E Sandler M and Durand F. 1999. Interrelationships between the January effect, market capitalisation and value investment strategies on the JSE. *Investments Analysts Journal*, 50: 53-64.
- Rosenberg B Reid K and Lanstein R. 1985. Persuasive evidence of market inefficiency. *Journal of Portfolio Management*, 11: 9-17.
- Shultz P. 1983. Transaction costs and the small firm effect – A comment. *Journal of Financial Economics*, 3: 379-402.
- Van Rensburg P. 2001. A decomposition of style-based risk on the JSE. *Investments Analysts Journal*, 54: 45-60.
- Van Rensburg P and Robertson M. 2003a. Style characteristics and the cross-section of JSE returns. *Investments Analysts Journal*, 57: 1-10.
- Van Rensburg P and Robertson M. 2003b. Size, price to earnings and beta on the JSE. *Investments Analysts Journal*, 58: 1-11.