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Value and momentum strategies: Evidence from the Johannesburg Stock Exchange

1. INTRODUCTION

Value strategies are defined as those in which shares perceived to be relatively under-valued by the market are purchased in order to realise superior returns. Measures of value have included equity book-to-market ratios, dividend price ratios (Asness, 1997) and cash-flow-to-price ratios (Lakonishok, Shleifer and Vishny, 1994). Shares are considered under-valued when they exhibit high ratios, i.e. the shares of a company whose book value of equity is high relative to the current market value are considered cheap (value shares) whereas the shares of a company whose book equity is low relative to the current market value are considered expensive (glamour shares).

Momentum strategies are based on the premise that past performance can be used to earn superior returns in the short-term. Shares classified as winners on the basis of past performance, are believed to out-perform those classified as losers on a similar basis.

Following Asness (1997), the purpose of this paper is twofold. Firstly, to independently determine the validity of momentum and value strategies when applied to the industrial sector of the Johannesburg Stock Exchange and, secondly, to determine whether there is any interaction between these two strategies. We find that both value and momentum strategies, applied independently, explain the cross-section of share returns. This is consistent with Asness's findings. On the other hand, we do not find that these strategies are interrelated. Rather our findings suggest that they are independently significant. This is in contrast to Asness's results, which indicated that value strategies are strongest amongst loser shares and momentum strategies are strongest amongst expensive (glamour) shares.

2. LITERATURE REVIEW

International research has shown both value and momentum strategies to be effective in earning excess returns/predicting future returns.

Rosenberg, Reid, and Lanstein (1985) and Fama and French (1992), in the United States, and Chan, Hamao, and Lakonishok (1992), in Japan, show that equity book-to-market ratio is positively related to the cross-section of average returns. Lakonishok, Shleifer, and Vishny (1994) find further support for this argument but show that a company's cash-flow-to-price ratio has an even stronger relationship with average returns than the book-to-market equity ratio. Chan, Hamao, and Lakonishok (1991) show similar evidence of the role of cash-flow-to-price ratio in explaining the cross-section of average returns.

Plaistowe and Knight (1986) show that, between 1973 and 1980 in South Africa, a portfolio of "discount" companies, essentially high equity book-to-market ratio companies in the context of our research, earn persistent, if small, abnormal returns. However, a portfolio of "premium" companies earn significantly negative abnormal returns over the same period. In addition, they show that there is a significant difference between the performance of the "discount" and the "premium" portfolios, providing an early hint at the potential of value strategies to earn abnormal returns.

While value strategies, using the book-to-market ratio (B/M) as an indicator of value, have been demonstrated to explain the cross-section of average returns, the causality behind this finding remains open to debate. One suggestion is the contrarian nature of value. Naïve investors have been shown to be poor Bayesian decision-makers who over-react to recent information, whether it is good or bad. Their consequent trading results in shares being temporarily over (under) priced (De Bondt and Thaler, 1985). Contrarian investors make use of this phenomenon to earn abnormal returns by investing in the under-priced shares and selling the over-priced shares (Lakonishok, Shleifer, and Vishny, 1994). Fama and French (1992) offer two alternative explanations. The first is consistent with the contrarian view expressed by others. They suggest that the observed equity book-to-market ratio effect is the result of market over-reaction and that asset pricing is irrational. The other explanation posits that asset pricing is rational, and that size and equity book-to-market ratios (which they also show to be effective in explaining the cross-section of average returns) proxy for risk. This explanation suggests value strategies are fundamentally riskier and that, for example, equity book-to-market ratios may capture the relative distress factor first discussed by Chan and Chen (1991).

Internationally, there is evidence to suggest that momentum strategies can earn superior returns. Jegadeesh and Titman (1993) demonstrate that investing in winners (companies that have performed

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well over the previous six to twelve months) and shorting losers (companies that have performed poorly over the same period) produces excess returns within the first year. However, they find that there is some reversal of these returns over the following two years. This reversal is congruent with the earlier findings of De Bondt and Thaler (1985, 1987). No research into momentum strategies appears to have been published for Johannesburg Stock Exchange listed equities. Page and Way (1992/1993) find evidence of reversal over two and three year periods, while Robertson (1998) finds evidence of short-term over-reaction for up to twenty trading days post portfolio formation.

As with previous work into value and momentum strategies, we are unable to identify a satisfactory rational, or irrational, explanation for our results. We can only debate the alternatives of market inefficiency and over-reaction on the irrational asset pricing front versus risk misspecification and rational asset pricing.

3. DATA AND METHODOLOGY

Consistent with Asness (1997), we run our tests using monthly data for all the industrial shares listed on the Johannesburg Stock Exchange from January 1973 to October 1997. The data set consists of daily closing prices and trading indicators for all industrial companies[1]. The number of companies included in the data ranges from a minimum of 273, in the earlier years, to a maximum of 454 in the latter part of the study. Monthly holding period returns are computed from the daily return series over twenty-eight day intervals commencing 1 January 1973 to produce thirteen "months" over each fifty-two week interval. Adjustments for share splits, consolidations, capitalisation issues and cash dividends are affected on the first trading day in which they took effect[2].

Starting from 26 December 1977, or the beginning of the sixth year (sixty-sixth month) in the data set, we obtain an historical average monthly return, the dividend yield, the market value of equity, the book-to-market ratio and an estimate of the equity beta for each listed industrial company and for each month. The specific values are computed as follows: PAST(12) is the arithmetic average of the prior twelve months of returns; D/P is the dividend yield computed as the sum of the preceding year's declared dividends divided by the current share price; ME is the number of ordinary shares in issue multiplied by the current share price; B/M is the book value of the ordinary equity divided by the market value of the ordinary equity; and, β is the estimated ordinary equity beta based on the prior five years of monthly returns data. The book value of equity is extracted from the latest financial statements with the proviso that the year-end occurred at least four months prior to the current month. This procedure ensures that the generated value and momentum strategies are unlikely to suffer from "look-ahead" bias. The equity betas are estimated by running a Dimson (1979) multivariate regression with the historical monthly return on the share as the dependent variable and a one month lead, one month lag, the contemporaneous historical return and the market index as the independent variables[3]. The estimated beta is the sum of the three slope coefficients. Consistent with Bradfield and Barr (1989), an equally weighted portfolio of the entire set of industrial shares is used as the market index. New companies listed for less than three years (thirty-nine months) are excluded from our analyses.

For each month, the cross-section of data is used to develop two sets of portfolios based on different measures of value and one set of portfolios based on a measure of momentum. The first value strategy ranks the companies on the basis of sector-relative[4] D/P while the second value strategy ranks the companies according to sector-relative[4] log(B/M). The momentum strategy ranks the companies according to PAST(12). Once they have been ordered, the companies are assigned to five portfolios for each of the ranking approaches. For each quintile, and for each strategy, an equally weighted portfolio is constructed and the average β, log(ME), log(B/M)[5], D/P and PAST(12) computed. Additionally, the average realised return for the month ahead is also computed. This procedure is repeated for 257 consecutive months, ending August 1997, and the time series averages and standard deviations of the portfolios computed.

As suggested by Asness and Stevens (1995), we use sector-relative D/P and log(B/M) to construct the value based portfolios. For the USA equity markets they

[1] The database is managed by Professor Wim Gevers at the Graduate School of Business, University of Stellenbosch. It does not suffer from survivorship bias. "Non-survivors" have been liquidated on the last date prior to their de-listing and the notional proceeds reinvested in the remainder of the portfolio. A validated record of all share splits, cash and equity dividends and any re-capitalisations is maintained.

[2] In a thin traded market such as the JSE, a significant bias can be introduced into the returns computation if the adjustments are effected around the LDR as a default because the ex-price will only manifest itself when the subsequent trade occurs.

[3] It has been suggested that equity betas estimated by running a Dimson (1979) multivariate regression are misspecified if the index is serially correlated. The one month returns on the index were tested for serial correlation to fifteen lags. The data was found to be significantly autocorrelated to one lag. However, since the Dimson betas were reported for the purposes of comparison with Assness' (1997) and as corroborative evidence only, further, and possibly more rigorous work was not deemed necessary.

[4] The sector-relative variables are defined as the difference between the company D/P or log(B/M) and the D/P or log(B/M) for the relevant sector for each month.

[5] For the measures of both size and book to market value, the natural logarithm is used. This is consistent with the convention used by Fama (1992) as well as in other prior work and has the advantage of returning a linear relationship.

found "intra-industry" variables more effective across the range of value based strategies. For each month containing three or more shares, we therefore subtract the JSE industrial sub-sector equally weighted average D/P and log(B/M) from the corresponding company values. For companies in sectors containing less than three shares, we deduct the overall averages as a standardisation method[6].

Any possible interaction between value and momentum strategies is assessed by constructing equally weighted portfolios on the basis of the intersection of the value quintiles and momentum quintiles. Each value strategy was independently intersected with the momentum strategy to create two sets of twenty-five portfolios.

4. VALUE AND MOMENTUM AS INDEPENDENT STRATEGIES

Tables 1 through 3 present the univariate results for the two value strategies and for the momentum strategy over the twenty-year period ending September/October 1997. The time series averages of the ranking variables, the beta, a measure of size, and the subsequent month average return are shown for each quintile.

Tables 1 and 2 provide strong evidence in support of value strategies. The average monthly return increases monotonically from the lowest value (glamour) quintile to the highest value (cheap) quintile. This trend applies equally whether one uses a sector-relative dividend yield or a sector-relative book-to-market ratio when building the portfolios. The highest value (cheap) quintiles out-perform the lowest value (glamour) quintiles by approximately 0,6% per month for both strategies, approximately 8% per annum. A comparison of means test finds this difference to be significant at the 1% level.
Although both definitions of value produce similar subsequent month average returns across the quintiles, the two ranking procedures produce somewhat different portfolios. With the exception of the fifth quintile, log(B/M) and D/P increase monotonically from the low value (glamour) to high value (cheap) portfolios when sector relative log(B/M) is used as the ranking variable. This is not the case when D/P is used as the ranking variable. In Table 2, the most expensive portfolio based on past dividend yield produces the portfolio having the highest "value" on a book-to-market ratio basis (i.e. a portfolio that would be considered cheap using book-to-market ratio as the measure of value).

The sector-relative log(B/M) ranking procedure produces quintile portfolios that have almost identical betas rather than the U-shaped beta variation across quintiles described by Asness (1997:31). Although the historical portfolio returns, measured as PAST(12), show no evidence of a correlation between value and momentum strategies, the average size of the companies in each portfolio declines monotonically from the low (glamour) to high (cheap) value portfolios. This inverse relationship between book-to-market ratio and size is consistent with the USA findings of Fama and French (1992). The log(B/M) of –1,348 for the first quintile implies that the glamour portfolio trades at an approximate premium of 285%. Similarly, the value ("cheap") portfolio trades at an approximate discount of 60%.

Table 1: Sorting on Sector-Relative Log(B/M)

Statistic	Q1	Q2	Q3	Q4	Q5	Q5-Q1 (t-statistic)
Return	1,80%	1,91%	2,19%	2,37%	2,44%	0,63%
β	1,079	1,164	1,107	1,109	1,087	(3,489)
log(ME)	11,352	11,078	10,499	9,881	9,216	
Log(B/M)	-1,348	-0,552	-0,101	0,332	0,928	
D/P	5,26%	5,85%	6,30%	6,70%	6,20%	
PAST(12)	2,18%	2,12%	2,16%	2,09%	2,04%	

The sample consists of all industrial companies over the period December 1977 to September 1997. Monthly ordinary equity returns are measured as Monday-to-Monday four-week (twenty-eight day) returns. Return is the average portfolio return for the first month, post the portfolio formation date, over a time series of 257 months. β is the times series average of the Dimson (1979) adjusted equity betas estimated using between three and five years of historical data. Log(ME) is the time series average of the mean natural logarithm of the market value of ordinary equity for the companies in each portfolio. Log(B/M), D/P and PAST(12) are the time series averages of the measures used for the two value strategy approaches and for the momentum strategy. Q5-Q1 is the average difference between the return earned by the highest value portfolio (Q5) and the lowest value portfolio (Q1). The t-statistic measures the significance of the average difference over the 257 months.

The sector-relative D/P ranking procedure, shown in Table 2, produces quintiles following an inverted U-shape with respect to portfolio beta, company size, and past performance. All the portfolio variables, β, log(B/M) and PAST(12), increase with increasing value up to the third quintile and then decline or remain level between quintiles three and five.

[6] As a check on this approach we also ran our results using non-adjusted value based portfolios. The results were not materially different from those presented in the paper.

Table 2: Sorting on Sector-Relative D/P Ratio

Statistic	Q1	Q2	Q3	Q4	Q5	Q5-Q1 (t-statistic)
Return	1,77%	2,08%	2,16%	2,32%	2,38%	0,62%
β	0,885	1,017	1,225	1,224	1,199	(3,274)
log(ME)	9,313	10,585	11,246	10,573	10,343	
log(B/M)	0,094	-0,318	-0,372	-0,136	-0,038	
D/P	0,84%	2,74%	5,21%	7,73%	14,03%	
PAST(12)	1,79%	2,43%	2,25%	2,15%	1,97%	

The sample consists of all industrial companies over the period December 1977 to September 1997. Monthly ordinary equity returns are measured as Monday-to-Monday four-week (twenty-eight day) returns. Return is the average portfolio return for the first month, post the portfolio formation date, over a time series of 257 months. β is the time series average of the Dimson (1979) adjusted equity betas estimated using between three and five years of historical data. Log(ME) is the time series average of the mean natural logarithm of the market value of ordinary equity for the companies in each portfolio. Log(B/M), D/P and PAST(12) are the time series averages of the measures used for the two value strategy approaches and for the momentum strategy. Q5-Q1 is the average difference between the return earned by the highest value portfolio (Q5) and the lowest value portfolio (Q1). The t-statistic measures the significance of the average difference over the 257 months.

Table 3: Sorting on PAST(12)

Statistic	Q1	Q2	Q3	Q4	Q5	Q5-Q1 (t-statistic)
Return	2,24%	1,50%	1,84%	2,14%	3,00%	0,76%
β	1,085	0,856	1,017	1,241	1,357	(2,935)
log(ME)	10,142	10,127	10,609	10,884	10,297	
log(B/M)	-0,085	-0,119	-0,212	-0,201	-0,156	
D/P	6,11%	5,33%	5,94%	6,77%	6,16%	
PAST(12)	-1,89%	0,36%	1,57%	3,33%	7,39%	

The sample consists of all industrial companies over the period December 1977 to September 1997. Monthly ordinary equity returns are measured as Monday-to-Monday four-week (twenty-eight day) returns. Return is the average portfolio return for the first month post the portfolio formation date over a time series of 257 months. β is the times series average of the Dimson (1979) adjusted equity betas estimated using between three and five years of historical data. Log(ME) is the time series average of the mean natural logarithm of the market value of ordinary equity for the companies in each portfolio. Log(B/M), D/P and PAST(12) are the time series averages of the measures used for the two value strategy approaches and for the momentum strategy. Q5-Q1 is the average difference between the return earned by the highest value portfolio (Q5) and the lowest value portfolio (Q1). The t-statistic measures the significance of the average difference over the 257 months.

Table 3 presents the results for the momentum strategy. Quintiles are formed by ranking companies on the basis of prior twelve-month ordinary equity returns. The average historical performance of the worst portfolio is –1,89% per month while the average historical performance of the best performing portfolio is 7,39% per month. The independence of the value and momentum strategies, alluded to in Tables 1 and 2, is again evident. No trends are apparent for the log(B/M) and D/P variables across the five momentum based portfolios. The means for the two variables are –0,155 and 6,06% respectively over the five portfolios. Loosely interpreted, this suggests that the average industrial company trades as a book-to-market ratio of 0,857 and that the average premium to book value paid for ordinary equity is 17%.

The difference in average performance for the subsequent month between the worst and the best momentum portfolios is a significant 0,76% per month, or approximately 10% on an annual basis. However, this difference may understate the potential for momentum based strategies given the aberrant characteristics of the worst performing quintile relative to the other four. Excluding this, the only quintile with a negative PAST(12), results in a ranked set of momentum based portfolios that are monotonic in beta and subsequent month average return. The best portfolio outperforms the worst (the second quintile) by 1.50% per month, or approximately 20% per annum.

The only portfolio having a negative PAST(12) is aberrant in that its subsequent month average return is only exceeded by the highest momentum portfolio. Its performance is therefore more consistent with short-term over-reaction of the type identified by Cox and Peterson (1994) for the USA equity markets and by Robertson (1998) for the Johannesburg Stock Exchange.

The univariate tests lead us to two conclusions. Firstly, that each of the three variables considered, log(B/M), D/P and PAST(12), are positively related to average returns for the subsequent month and, as a result, both value and momentum strategies work in the short-term. Value shares, defined on the basis of either sector-relative book-to-market ratio or sector-relative dividend yield clearly out-perform their expensive counterparts for the month post portfolio formation. Similarly, high momentum portfolios out-perform their low (but positive returning) momentum counterparts for the month post formation. Secondly, the value and momentum variables, and hence the strategies, are not related to one another. Contrary to Asness (1997), our univariate results do not suggest that value and momentum are negatively associated. The cross-sectional variation in PAST(12) for the value strategy portfolios and in log(B/M) and D/P for the momentum portfolios, suggests these portfolio construction approaches are relatively independent.

5. The Interaction of Value and Momentum Strategies

Table 4 reports the results for twenty-five portfolios formed at the intersection of the sector-relative log(B/M) quintiles and of the PAST(12) quintiles. For instance, the portfolio results presented in the second row and fourth column of the table are estimated using only those companies whose ordinary equity fell into the second sector-relative log(B/M) quintile and the fourth momentum quintile. Using the notation Qn,Qm to represent the n^{th} value quintile and the m^{th} momentum quintile, we the label this portfolio Q2,Q4. The time series averages of the subsequent month average return, log(B/M) and PAST(12) for this illustrative portfolio are 2,01%, -0,554 and 3,33% respectively.

The independence of the value and momentum strategies is fairly clear from the table. The variability across momentum based strategies, holding value constant, is relatively consistent. For the first four value quintiles, the return variability across the momentum strategies increases monotonically for positive PAST(12) portfolios and almost monotonically for the fifth quintile. In addition, the return is high for the aberrant prior negative performers across all value quintiles. The differences between the average subsequent month return across the first and fifth momentum strategies for each value class is significant at the 5% level for two of the five quintiles and shows no trend as one moves up the value ranking. The differences between the highest momentum portfolios (winners) and the lowest positive PAST(12) momentum portfolios (losers, earning a positive return) for the five value bands are an impressive 1,70%, 0,97%, 1,35%, 1,58% and 1,63% per month and also show no clear trend as one moves up the value ranking.

Table 4: Sorting on PAST(12) and on Sector-Relative Log(B/M)

Statistic	Q1 PAST(12) Loser	Q2	Q3	Q4	Q5 PAST(12) Winner	Q5-Q1 (t-statistic)
Q1: Glamour Log(B/M)						
Return	1,93%	1,03%	1,45%	1,85%	2,73%	0,80%
Log(B/M)	-1,338	-1,465	-1,329	-1,209	-1,341	(1,987)
PAST(12)	-1,87%	0,37%	1,57%	3,32%	7,42%	
Q2						
Return	1,72%	1,49%	1,68%	2,01%	2,46%	0,74%
Log(B/M)	-0,538	-0,557	-0,553	-0,554	-0,556	(1,805)
PAST(12)	-1,82%	0,35%	1,57%	3,33%	7,07%	
Q3						
Return	2,82%	1,57%	1,82%	2,14%	2,92%	0,09%
Log(B/M)	-0,106	-0,095	-0,100	-0,109	-0,098	(0,153)
PAST(12)	-1,81%	0,38%	1,57%	3,33%	7,37%	
Q4						
Return	2,14%	1,91%	2,12%	2,28%	3,49%	1,35%
Log(B/M)	0,335	0,332	0,335	0,327	0,328	(3,008)
PAST(12)	-1,95%	0,36%	1,59%	3,32%	7,51%	
Q5: Value Log(B/M)						
Return	2,75%	1,51%	2,58%	1,96%	3,14%	0,40%
Log(B/M)	0,973	1,000	0,845	0,797	0,904	(0,852)
PAST(12)	-1,97%	0,33%	1,57%	3,32%	7,76%	
Q5-Q1	0,81%	0,48%	1,12%	0,12%	0,41%	
(t-statistic)	(1,987)	(1,723)	(3,528)	(0,337)	(0,991)	

The sample consists of all industrial companies over the period December 1977 to September 1997. Monthly ordinary equity returns are measured as Monday-to-Monday four-week (twenty-eight day) returns. Return is the average portfolio return for the first month post the portfolio formation date over a time series of 257 months. Log(B/M) and PAST(12) are the time series averages of the twenty-five equally weighted portfolios formed from companies within the quintile intersections of the sector-relative book-to-market based value strategy and momentum strategy. The Q5-Q1 column contains the average difference between the return earned by the winner versus loser portfolio for each value quintile. The Q5-Q1 row contains the average difference between the return of the value portfolio versus the glamour portfolio for each momentum quintile. The t-statistic measures the significance of the average difference over the 257 months.

A less clear picture emerges when one examines the value strategies within each momentum quintile. Value seems to work for two of the five momentum groupings (the first and third momentum quintiles), but the trend in subsequent month average return for the value portfolios is by no means monotonic. In particular, the fourth and fifth momentum quintiles show no significant trend in value-based performance. The weaker performance of value strategies within momentum classes suggests that sector-relative book-to-market value strategies may be less effective than momentum strategies.

Following Asness (1997), we confirm our conclusion that value and momentum strategies are uncorrelated by testing whether momentum strategies amongst high value (cheap) equities perform similarly to momentum strategies amongst low value (glamour) equities and whether value strategies amongst past losers perform similarly to value strategies amongst past winners. We assess momentum amongst low value (glamour) equities as Q1,Q5-Q1,Q2 (1,71%) and amongst high value (cheap) equities as Q5,Q5-Q5,Q2 (1,64%) and test whether there is a significant difference between the performance of the two "hedge" strategies.[7,8] Similarly, we compare the performance of Q5,Q2-Q1,Q2 (0,48%) and Q5,Q5-Q1,Q5 (0,41%) to assess whether value strategies differ across momentum categories. The relevant comparison of means tests for the respective strategies produce an insignificant Student's t-statistic of 0,139 and the null hypothesis of independence therefore cannot be rejected.

Table 5 reports the results for twenty-five portfolios formed at the intersection of the sector-relative D/P quintiles and of the PAST(12) quintiles. The independence of the value and momentum strategies is again evident. The variability across momentum strategies, holding value constant, is relatively consistent and tends to increase for positive PAST(12) portfolios. As was found to be the case in Table 4, the return is high for prior negative performers across all value quintiles. The differences between the average subsequent month return across the first and fifth momentum quintiles for each value class is significant at the 5% level for two of the five quintiles and shows no trend as one moves up the value ranking. The differences between the highest momentum portfolios and the lowest positive PAST(12) momentum portfolios for the five value bands are 1,16%, 1,71%, 1,23%, 0,84% and 1,07% per month.

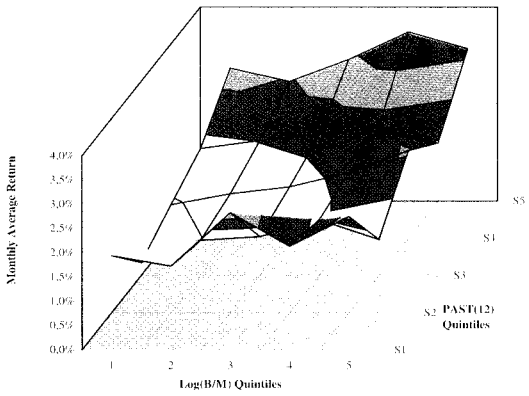

Figure 1: Return Surface for PAST(12) and Sector-Relative Log(B/M)

The sample consists of all industrial companies over the period ordinary shares over the period December 1977 to September 1997. Monthly returns are measured as Monday-to-Monday four-week (twenty-eight day) returns. Return is the average portfolio return for the first month, post portfolio formation date over a time series of 257 months. Log(B/M) and PAST(12) are the time series averages of the twenty-five equally weighted portfolios formed from companies within the quintile intersections of the sector-relative book-to-market based value strategy and momentum strategy.

Examining the D/P ratio based value strategies within each momentum quintile produces no significant differences between the fifth and first quintiles. This finding suggests that sector-relative D/P ratio may be a poor measure of value.

The extremely poor performance of D/P ratio as a measure of value further supports the notion that value and momentum strategies are uncorrelated. Momentum for low value (glamour) equities, measured as Q1,Q5-Q1,Q2 (2,16%), is not significantly different from momentum amongst high value (cheap) equities, measured as Q5,Q5-Q5,Q2 (1,04%). Similarly, value amongst poor but positive returning past performers, measured as Q5,Q2-Q1,Q2 (0,65%), is not significantly different from value for prior winners, measured as Q5,Q5-Q1,Q5 (-0,47%). Although the mean difference is 1,11% in both cases, the Student's t-statistic of 1,810 is not significant at the 5% level.

[7] For this analysis we exclude the quintile of prior losers that seems to experience a measure of short-term reversal.
[8] The term "hedge" strategy is used to indicate that the investment approach involves going long one portfolio and shorting the other.

Table 5: Sorting on PAST(12) and on Sector-Relative D/P Ratio

Statistic	Q1 PAST(12) Loser	Q2	Q3	Q4	Q5 PAST(12) Winner	Q5-Q1 (t-statistic)
Q1: Glamour D/P Ratio						
Return	2,39%	1,16%	1,80%	1,82%	3,32%	0,93%
D/P	0,83%	0,84%	1,30%	1,86%	1,07%	(1,405)
PAST(12)	-1,98%	0,37%	1,52%	3,32%	8,92%	
Q2						
Return	2,11%	1,54%	1,86%	2,20%	3,25%	1,14%
D/P	2,66%	2,73%	2,79%	2,91%	2,74%	(2,279)
PAST(12)	-2,09%	0,33%	1,52%	3,36%	7,69%	
Q3						
Return	2,11%	1,63%	1,71%	2,17%	2,86%	0,74%
D/P	5,19%	5,21%	5,20%	5,20%	5,22%	(1,971)
PAST(12)	-1,72%	0,37%	1,60%	3,31%	6,62%	
Q4						
Return	2,57%	1,83%	2,27%	2,10%	2,67%	0,09%
D/P	7,76%	7,72%	7,78%	7,70%	7,67%	(0,225)
PAST(12)	-1,81%	0,37%	1,62%	3,32%	6,80%	
Q5: Value D/P Ratio						
Return	2,31%	1,81%	2,19%	2,15%	2,86%	0,55%
D/P	14,41%	13,54%	13,48%	13,94%	14,31%	(1,285)
PAST(12)	-2,07%	0,35%	1,61%	3,32%	7,06%	
Q5-Q1	-0,09%	0,65%	0,38%	0,33%	-0,47%	
(t-statistic)	(-0,175)	(1,890)	(1,002)	(0,780)	(-0,917)	

The sample consists of all industrial companies over the period December 1977 to September 1997. Monthly ordinary equity returns are measured as Monday-to-Monday four-week (twenty-eight day) returns. Return is the average portfolio return for the first month, post the portfolio formation date over a time series of 257 months. D/P and PAST(12) are the time series averages of the twenty-five equally weighted portfolios formed from companies within the quintile intersections of the sector-relative book-to-market based value strategy and momentum strategy. The Q5-Q1 column contains the average difference between the return earned by the winner versus loser portfolio for each value quintile. The Q5-Q1 row contains the average difference between the return of the value portfolio versus the glamour portfolio for each momentum quintile. The t-statistic measures the significance of the average difference over the 257 months.

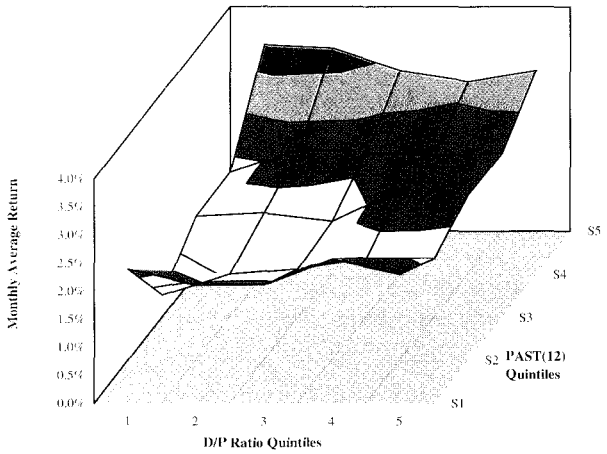

Figure 2: Return Surface for PAST(12) and Sector-Relative D/P Ratio

The sample consists of all industrial companies over the period ordinary shares over the period December 1977 to September 1997. Monthly returns are measured as Monday-to-Monday four-week (twenty-eight day) returns. Return is the average portfolio return for the first month, post portfolio formation date over a time series of 257 months. D/P and PAST(12) are the time series averages of the twenty-five equally weighted portfolios formed from companies within the quintile intersections of the sector relative dividend yield based value strategy and momentum strategy.

Figures 1 and 2 present the results graphically. The return surface plots highlight the general trend towards improved returns for better past performing portfolios. The over-reaction amongst prior losers (negative returning portfolios) is also apparent. Finally, a "hedge" strategy involving going long the high value (cheap) prior winners (Q5,Q5) and shorting the low value (glamour) prior poor performers (Q1,Q2), using book-to-market value as a measure of value, earns an average of 2,11% per month of the gross investment. This is significant at the 1% level and equates to approximately 28,5% per annum. The same "hedge" strategy based on dividend yield as a measure of value, earns an average of 1,69% per month of the gross investment. This is significant at the 1% level and equates to approximately 22% per annum. This indicates the relative strength of log(B/M) compared to D/P.

6. CONCLUSION

We conclude that, among industrial firms on the JSE between January 1973 and October 1997, both value strategies, based on B/M and D/P, and momentum strategies, based on PAST (12), have the power, independently, to predict the return on a share one month into the future and, thereby earn superior returns. With reference to the value strategy, the D/P measure was found to be weaker than the B/M. This is similar to the finding of Asness (1997) on the NYSE, NASDAQ and Amex.

Secondly, using the univariate tests, we do not observe any correlation, negative or positive between the value and momentum strategies. Using bivariate tests we find no relation or interaction between the two strategies. This is contrary to the findings of Asness (1997). He finds that value strategies are strongest amongst loser shares and weakest amongst winners. In the case of the momentum strategy he finds that it is particularly strong amongst glamour shares.

The implications of our findings have not been directly addressed in this paper. However, from a theoretical point of view, a satisfactory explanation for the predictive power of value and momentum strategies must be found. One possible explanation could lie in the misspecification of risk. High value (cheap) and high momentum shares may in fact involve greater risk and therefore the relatively higher return is rational compensation. This is supported in the case of the value strategy by the clear relationship between B/M and size – high value or cheap companies are also relatively small, and may therefore be riskier.` An alternative explanation may be found in the overreaction hypothesis discussed in De Bondt and Thaler (1985, 1987) and Page and Way (1992/1993). This would hint at weak-form market inefficiencies. What is clear, is that the causes behind the ability of these strategies to earn superior returns warrant further investigation.

At a practical level, each of these strategies could be used, independently, in the formation and/or evaluation of investment portfolios.

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