Extreme returns from extreme value stocks

Enhancing the value premium

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Abstract

Investigations into value-based 'anomalies' such as the P/E effect typically sort shares into quintiles, or at most deciles. These are blunt instruments. We test whether most of the extra value to be found in the lower end of the P/E spectrum is to be found in the very lowest P/E shares, and whether the worst investments are in the few shares with the highest P/E. Using a long-term definition of earnings, and attributing influences on the P/E to company size and sector, we find that small portfolios of value shares give returns of 40%+ per annum, while small portfolios of glamour shares give returns less than the risk-free rate. We thus show that by a more judicious use of the P/E ratio, we can considerably enhance the value premium.

The price-earnings effect, in which shares with low price-to-earnings (P/E) ratios give better subsequent returns than high P/E shares, was first documented almost fifty years ago, by Nicholson [1960]. It has been reported in many markets around the world[i], and across various time periods. Dreman [1998] used it as one of his main demonstrations of the superiority of value shares for investment, for example. Academic studies dating back to Nicholson [1960] have typically found that a portfolio of glamour (high P/E) stocks underperforms the market by around 3%-4% a year, and a portfolio of value (low P/E) stocks outperforms it by 3%-4%. The difference between the returns to portfolios of value and glamour stocks has been termed the "value premium". Similar results have been replicated over various time periods and in various stock markets around the world. There is an ongoing debate about the causes of this effect, which on the surface calls into question the weak-form efficiency of stock markets. Some hold it to be a reward for the extra riskiness of value shares. However, the CAPM beta does not increase as the P/E decreases; if anything, it decreases (Basu [1977]), so the risk must reside in other measures. According to Dreman and Lufkin [1997], sector-specific effects are also unable to explain the value premium, and more complex multifactor models have similarly failed to rationalise the outperformance of value stocks (see, for example, Fuller *et al*. [1993]). Others (e.g., Lakonishok, Schleifer and Vishny, [1994]) resort to behavioural explanations, ascribing the extra returns from value shares to psychological factors affecting market participants.

However, academic papers that investigate the P/E effect have always sorted shares into E/P quintiles, or at most deciles. These are blunt instruments since the portfolios are typically large (100-300 shares) and no sensitivity analysis is usually conducted to determine the effect of portfolio size. In this paper, we test whether most of the extra value to be found in the lower part of the P/E spectrum is to be found in the very lowest P/E shares. Similarly, the very worst investments might be in the few shares with the highest P/E.

We do not use the traditional P/E ratio in this paper. Instead, we develop an appropriate P/E statistic for identifying extreme value and glamour shares. We sum earnings over eight years, instead of using the traditional one-year P/E, which gives us a clearer view of the long-term earnings power of each company. We also strip away the predictable influences of the overall market, company size and sector influences on the P/E, to make clear the idiosyncratic (stock-specific) component of each company's P/E. We use this idiosyncratic P/E to decide what size the very best and very worst portfolios might be. We find that there is a 30%+ annual gap in returns between the extreme value and glamour portfolios. This finding is used to provide a final extraordinary example.

Data Sources and Methodology

Initially, we collated a list of companies from the London Business School's 'London Share Price Database' (LSPD) for the period 1975 to 2003. The LSPD holds data starting from 1955, but only a sample of one-third of companies is held until 1975. Thereafter, data for every UK listed company are held, so we took 1975 as our start date. We excluded two categories of companies from further analysis. These were financial sector companies, including investment trusts, and companies with more than one type of share, for instance, voting and non-voting shares. Apportioning the earnings between the different share types would be problematic.

Earnings data are available on LSPD, but only for the previous financial year. We therefore used Datastream, as this service is able to provide time series data on most of the statistics it covers, including earnings. A four-month gap is allowed between the year of earnings being studied, and portfolio formation, to ensure that all

earnings data used would have been available at the time. We therefore requested, as at 1st May on each year 1975-2004, normalised earnings for the past eight years, the current price, and the returns index on that date and a year later, for each company.

A common criticism of academic studies of stock returns is that the reported returns could not actually have been achieved in reality, due to the presence of very small companies or highly illiquid shares. In an attempt at least to avoid the worst examples, we excluded companies if the share mid-price was less than 5p, and we also excluded the lowest 5% of shares by market capitalisation in each year. We checked whether this removal of micro-cap and penny shares had a serious effect on returns. Penny shares and micro-caps did indeed contribute to returns, although this contribution was across all deciles, not just for value shares. Average returns were 1-1.5% higher when all companies are included, across all deciles and holding periods. An arbitrage strategy that is long in value companies and short in glamour companies would therefore be largely unaffected by the exclusion of very small companies and of penny shares. A further criticism of many studies is that they do not deal appropriately with bankruptcies. Companies that failed during the year are flagged in the LSPD. In such cases, we set the RI manually to zero, as in Datastream it often becomes fixed at the last traded price. We assumed a 100% loss of the investment in that company in such cases.

The Long-Term P/E Ratio

Does taking more years of earnings into account widen the P/E effect? To examine this, we calculated up to eight E/P statistics for each company/year return, by dividing the sum of the earnings per share over the previous one to eight years by the current price:

$$EPn_i = \frac{\sum_{j=1}^{n} EPS_{ij}}{nP_i} \qquad (1)$$

where EPS_{ij} is the normalised earnings per share for company i for j years ago, P_i is the current price of company i, and n is the number of years of earnings used in the EPn calculation. Where a company was reported

by Datastream as having a zero EPS, i.e. normalised earnings were negative, or there was no EPS recorded for one or more previous years, EPn for those year(s) could not be calculated. Due to these factors, the number of companies for each EPn calculation reduces from 40,000 initially, to 16,000 that have a full eight years of positive earnings history.

Exhibit 1 shows the distribution of returns after using the EP1–EP8 statistics for sorting, assuming a one-year holding period[ii]. For all EPn in Exhibit 1, the average returns increase from the glamour decile D1 to the value decile D10, although not monotonically. The value premium, i.e. the difference between the glamour and value deciles, also widens as more and more years of past earnings are taken into account. Using a full eight years of past earnings, which is the cut-off point for our calculations, gives a value premium almost twice that obtained from using one year. We therefore use EP8, i.e. the sum of the last eight years' earnings divided by the current share price, as the base E/P in subsequent sections.

Deconstructing the P/E Ratio

A company's share price is influenced not only by idiosyncratic factors particular to that company, but also by the sector in which the company operates, and by the market as a whole. In this section, we show the value of an analogous approach in deconstructing the P/E ratio. Throughout this section, we used the 16,000 company/year items with a full eight years of positive normalised earnings.

We identify four possible influences on a company's P/E below, and test the direction and power of each of these influences in turn:

1) The **year** of portfolio formation: the average market P/E varies year by year, depending on the general level of investor confidence.

2) The **sector** in which the company operates. Average earnings in the computer services sector, for example, are growing faster than the water supply sector. This sweeping statement applies only to the sector as a whole, regardless of the fortunes of individual companies, and over the long term. Companies in sectors that are

growing faster in the long-term should warrant a higher P/E on average, so as correctly to discount the faster-growing future earnings stream.

3) The **size** of the company. There is a very close positive relationship between a company's market capitalisation and the P/E accorded.

4) **Idiosyncratic** effects. Companies in the same year, operating in the same sector and of similar sizes nevertheless always have different P/E's. Idiosyncratic effects, that do not affect any other company, account for this. Such effects could be the announcement of a large contract, whether the directors have recently bought or sold shares, or how warmly the company is recommended by analysts.

The P/E Ratio Through Time

The market average P/E's for each year are shown graphically in Exhibit 2. A major peak in P/E's can be observed in 1987, representing the run-up to the 'Black Wednesday' crash of October 1987. Average P/E's were fairly constant throughout the period 1995-2002, while 2003 marked a recent low for the average market P/E, which reached a level last seen in 1977. However, note that the data were read as at 1st May 2003, only a few weeks into the market recovery of that year, so the average P/E for 2004 would be higher.

Sector Effects on the P/E

Each company's FTSEA industrial classification is held in field G17 in the LSPD. We calculated the average P/E across all years for each G17 value with more than ten company/year returns. There were 132 of these, ranging from a P/E of 29.2 for 'oil and gas exploration and production', to 6.2 for Steel. Note that these averages are for the G17 value across all years.

Size Effects on the P/E

It is widely believed that larger companies tend to have higher P/E' s than smaller companies. Liquidity constraints suffered by large fund managers may account for a significant proportion of this premium since only the largest companies can offer the necessary liquidity in their shares if the fund manager is not to move the market price adversely. Large fund managers therefore naturally gravitate towards investing in larger companies.

To test this conjecture, we calculated average P/E's for different sizes of companies by dividing them into categories. For each year, we divided the companies into 20 categories by market value, and calculated the average P/E and average returns for each category. Note that we averaged the P/E's and returns over all 29 years, but the category limits are specific to each base year, as the average capitalisation changes considerably from year to year. The average P/E's for each category are shown in Exhibit 3. The P/E's increase almost monotonically, from 8.68 for the smallest 5% of companies to 18.63 to the largest 5%[iii].

The Idiosyncratic P/E

We can now calculate the idiosyncratic E/P (hereafter, IdioEP) by removing the effects of the three other E/P influences from the base E/P. Unlike the other E/P influences, the idiosyncratic part of the E/P cannot be independently observed: it is merely that part of the overall E/P as yet unexplained by the year, market value and industry factors. IdioEP is simply a way of relating what the E/P would be expected to be, given the year, company size and industry, to what was actually observed. For a company with uniformly average characteristics, the actual, year, market cap and sector terms would be unity, so the idiosyncratic E/P term would also be unity. On the other hand, a company with a low observed E/P (high P/E) with average year, market cap and sector EP's would be assigned a low idiosyncratic E/P, and this term would make it less attractive as an investment. The various influences on the E/P can be disentangled as follows:

$$\frac{ActualEP_i}{AverageEP} = \frac{YearEP_i}{AverageEP} \times \frac{SizeEP_i}{AverageEP} \times \frac{SectorEP_i}{AverageEP} \times \frac{IdioEP_i}{AverageEP} \qquad (2)$$

Rearranging (2), we calculated the idiosyncratic E/P for each company/year return as

$$IdioEP_i = \frac{ActualEP_i \times AverageEP^3}{YearEP_i \times SizeEP_i \times SectorEP_i} \qquad (3)$$

This idiosyncratic E/P ratio is used in subsequent analysis to rank the stocks and to sort them into value and growth portfolios.

A Small Portfolio P/E Statistic

What weights should we apply to the decomposed E/P's in order to optimise the discrimination between the extreme value and glamour ends of the E/P spectrum? We initially employ a portfolio size of ten shares, and we then examine a range of portfolio sizes in the next section.

In order to get some idea of the relative importance of the size, sector and idiosyncratic influences on the P/E, we assigned each separate influence in turn a weight of zero. The difference between the resolutions without the influence, and with it, shows the predictive power of each individual influence. Unfortunately we cannot assess the weights for market cap or sector E/P alone, because there are only twenty different market cap E/P's and 132 different sector E/P's, so there would be no basis for creating portfolios of exactly a given number of shares. The idiosyncratic E/P, on the other hand, is different for every company, so we can assess it individually, and the returns are shown in Exhibit 4. The year E/P is excluded from this procedure since we are sorting within each year, and hence this makes no difference to the outcome of the sort.

There is a wide gap of 17% in annual returns between the value and glamour portfolios. Excluding the market cap and sector effects make little difference to simply using equal weights. Excluding IdioEP, however, reduces the resolution between value and growth portfolio returns by almost 10%. Clearly, the most powerful effect on small portfolio returns is the idiosyncratic E/P, and at the extreme ends of the P/E spectrum the company size and sector have little information to give us on future returns. Indeed, the best resolution by a margin of 4% comes from using IdioEP alone. It appears that there is little to be gained by researching more complex weights, and we invoke Occam's razor and use IdioEP on its own. This can be seen as the 'naked' P/E, shorn of its influences of the year in which the P/E was measured, the size of the company and its sector.

It is often suggested that the apparent advantages of value-based portfolios would be much reduced if the effect of bid-ask spreads were taken into account[iv]. Is the wide difference in returns between the glamour and value portfolios here appreciably reduced by the effect of the bid-ask spread? Since the sort statistic being used is the idiosyncratic E/P alone, with the effect of company size on the E/P excluded, it is likely that there is much less difference between the average company size for the value and glamour deciles here than if we were sorting by the traditional E/P. The average returns for the ten-share portfolios with and without the effect of the bid-ask spread on returns, and their average MV categories, are shown in Exhibit 5. Average returns for the value portfolio are reduced by 3.72%, and for the glamour portfolio by 1.96%. There is a small differential effect of spreads on returns between the two portfolios, but this is much smaller than the size of the value premium. Unexpectedly, the glamour shares are on average *smaller* than the market average – 8.55 corresponds to a market capitalisation of £85m in 2003, versus £146m for the average of the market. The value portfolio, on the other hand, is made up of companies with almost exactly the market average capitalisation, which with 20 categories is by definition 10.5.[v]

What Size of Portfolio is best?

Having decided to use equal weights for the past eight years of earnings and the idiosyncratic E/P alone in our E/P statistic for small portfolios, we now examine the optimal number of shares to hold. This should be of particular interest to private investors who, unlike institutional investors, do not suffer lower limits on the number of stocks they are allowed to hold, and are less likely to be affected by liquidity problems when buying small company shares.

We calculated the eight-year idiosyncratic E/P described above for each company/year return, and sorted the data by year and the new statistic. We then formed glamour and value portfolios of the *n* companies each year with the lowest and highest values of the new statistic, varying *n* from 5 to 50, and calculated returns, standard deviations and Sharpe Ratios for these portfolios and for the arbitrage portfolio. The returns for a one-year

holding period are given in Exhibit 6. The returns and Sharpe Ratios for a one-year holding period are presented graphically in Exhibits 7 and 8 respectively.

It is immediately clear that, for value shares, the best bargains are to be found at the extreme end of the spectrum. The highest returns are for the smallest value portfolios, and despite having very high standard deviations, their Sharpe Ratios are nevertheless the highest. The returns on the glamour portfolio do not vary so much, but also seem to have the worst performing shares at the extremes. Their standard deviation is still quite high, however, giving extremely poor Sharpe Ratios. The arbitrage portfolio for five shares takes advantage of the extremely high returns on the value portfolio and poor returns on the glamour portfolio to give excellent results.

Very Small Portfolios

It is clear from Exhibit 7 that the most interesting returns are available in the 5-10 share portfolio range. We therefore investigated this area more fully, by varying the portfolio size from 1 to 15. First, the returns for the three types of portfolio with a one-year holding period are given in Exhibit 9. The one-year returns and Sharpe Ratios for very small portfolios are shown in Exhibits 10 and 11 respectively.

For the value portfolio, average returns rise strongly from 30% to over 40% as one moves from fifteen shares down to five, and then the one-share ‘portfolio’ returns on average over 60% per annum. The extremely high standard deviation for the value portfolio again affects the standard deviation of the arbitrage portfolio. The Sharpe Ratio reduces for fewer than six value shares, so holding portfolios of less than six value shares seems unwise on this measure. However, the Sharpe ratio is then quite similar all the way up to portfolios of twelve value shares. For fewer than four shares, the glamour portfolio returns get worse and worse. This is not compensated for by lower standard deviations, meaning that the Sharpe Ratio of very small glamour portfolios is extremely poor.

An Extreme Portfolio Illustration

This example takes one of the best value portfolios so far identified, with six shares. It is the largest portfolio that still has average returns over 40% per annum, and the Sharpe ratios are lower for smaller portfolios. Its matching glamour portfolio would be six shares also with a one-year holding period. However, as Exhibit 12 shows, for small portfolios of glamour shares, returns are relatively good for a one-year holding period, but decline sharply for longer holding periods. We therefore hold our short position in six glamour shares over eight years, the longest holding period for which we calculated returns. The glamour portfolios thus run from 1975-1983, 1983-1991, 1991-1999 and a final five-year period from 1999-2004, and we hold only 24 companies overall.

The results assume an initial investment of £1,000 respectively in the value and glamour portfolios, and matching initial positions of +/- £1,000 for the arbitrage portfolio. The values of the portfolios are shown in Exhibit 13, and the progress of the three portfolios is shown graphically in Exhibit 14. For comparison, we also show the returns for an equally weighted investment in all companies in the market. We use a logarithmic scale due to the extreme divergence in returns. The value portfolio turns £1,000 in 1975 into £15m in 2004, at an annual compound rate of 39.34%. Despite the high variability due to using only six shares, its only significant loss is 20% in 2002-3. The share prices in 2003 were as at 1st May, within two months of the depths of the bear market following the dot.com bubble, and the value portfolio more than doubled in the following year. The very high standard deviations calculated for small value portfolios, and the resultant lower Sharpe ratios, do seem to overstate the risk here, because the returns are varying around such a high mean. A portfolio that in 29 years gives returns of over 100% three times, and returns of over 50% ten times, whilst losing money significantly only once, does not seem to be particularly risky in any practical sense of the word.

The glamour portfolio gives a compound return of 5.73%, when simply holding treasury bills over the 29 years would have yielded an average of 8.59%. It also incurred a much higher risk, with losses recorded in 12 of the 29 years. The arbitrage portfolio, despite requiring no start-up capital, has turned two matching £1,000 positions in 1975 into £600,000 in 2004, at a compound annual rate of 24.69%. This is considerably less than the value

portfolio because it suffered a near-catastrophe in 1999-2000. In this year the glamour shares that formed the short side of the arbitrage more than doubled in value, leading to an 86% loss in the value of the arbitrage portfolio as a whole. The standard deviations of the three portfolios are quite similar, with the highest standard deviation being for the arbitrage portfolio. This indicates that combining the extreme value and glamour portfolios in a long/short relationship has no dampening effect on shocks to the market as a whole.

Conclusions

One objective of this study was to determine whether the outperformance of value shares is due to a small group at the extreme end of the P/E range, and similarly for the underperformance of glamour shares. We showed this to be the case: the best returns of 40%+ are obtainable by holding less than ten value shares, and at the glamour end of the spectrum, the worst performance is also when holding fewer than ten of the highest P/E shares. The standard deviations, however, are not symmetrical, with the outstanding performance of small value portfolios being marred by very high standard deviations. Glamour shares also have a slightly higher standard deviation for small portfolios, but their performance does not compensate. Such results have not been observed in previous studies since they have almost invariably examined much larger portfolios comprising at least 100 shares.

The final extraordinary example shows the power of the deconstructed P/E statistic when applied to extreme value shares: £1,000 in 1975 is turned into £15m in 2004, at a compound rate of 39.34%. For the glamour share portfolio, £1,000 is turned into £5,000, at a compound rate of 5.73%, returning considerably less than the risk-free rate but at considerably greater risk. Although we deliberately chose these portfolios to maximise the difference in returns, we constructed them using a handful of data items, all publicly available, and simple periodic portfolio rebalancing. These results constitute a much more serious challenge to ideas of efficient markets than was previously thought to be posed by the P/E effect.

Finally, it is worth emphasising that we may legitimately be accused of data mining since the same set of data was used both to select the best rules (e.g. in terms of the holding period and number of shares in the portfolio)

and to evaluate them. However, we would counter this by making two statements. First, the returns are so large that data mining is unlikely to be able to explain them entirely. Second, much larger value premia than commonly reported are available for a wide range of trading strategies, so that an arbitrary selection of portfolio size and history of earnings to use in the P/E calculation is still likely to lead to considerable returns.

An obvious extension to our findings would be to try to replicate the results in other markets, and most notably in the US. The main London market consists of around 1,700 shares. Extreme value portfolios in the much larger US markets may consist of twenty or thirty shares, and therefore not suffer from the high variability of returns that mars such portfolios in the UK. The liquidity problems that would affect large institutional funds following an extreme value strategy might also be eased in the more liquid US markets.

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Exhibit 1: One-year average returns for decile portfolios, 1975-2003, calculated using 1 to 8 years of earnings history

	EP1	EP2	EP3	EP4	EP5	EP6	EP7	EP8
Highest P/E	18.28%	18.20%	18.62%	16.65%	17.84%	17.83%	18.15%	16.26%
Decile 2	19.25%	19.36%	16.41%	17.98%	16.94%	17.42%	16.16%	16.71%
Decile 3	18.38%	17.32%	18.92%	18.68%	17.78%	17.51%	17.05%	16.43%
Decile 4	16.44%	18.96%	19.45%	18.42%	19.49%	17.81%	18.61%	18.42%
Decile 5	17.96%	18.06%	17.73%	18.58%	17.62%	19.11%	18.34%	19.54%
Decile 6	18.53%	18.73%	19.32%	18.98%	19.97%	19.69%	19.81%	19.81%
Decile 7	21.59%	19.53%	19.86%	20.77%	19.61%	20.18%	19.86%	19.39%
Decile 8	20.86%	20.55%	21.33%	22.11%	21.81%	20.42%	20.58%	21.11%
Decile 9	22.47%	21.75%	22.00%	22.08%	22.48%	22.88%	22.48%	23.05%
Lowest P/E	24.26%	22.82%	21.89%	22.18%	24.27%	25.51%	27.57%	27.87%
D10 – D1	5.98%	4.62%	3.28%	5.52%	6.44%	7.67%	9.42%	11.62%

Exhibit 2: Market average P/E's for each year 1975-2003

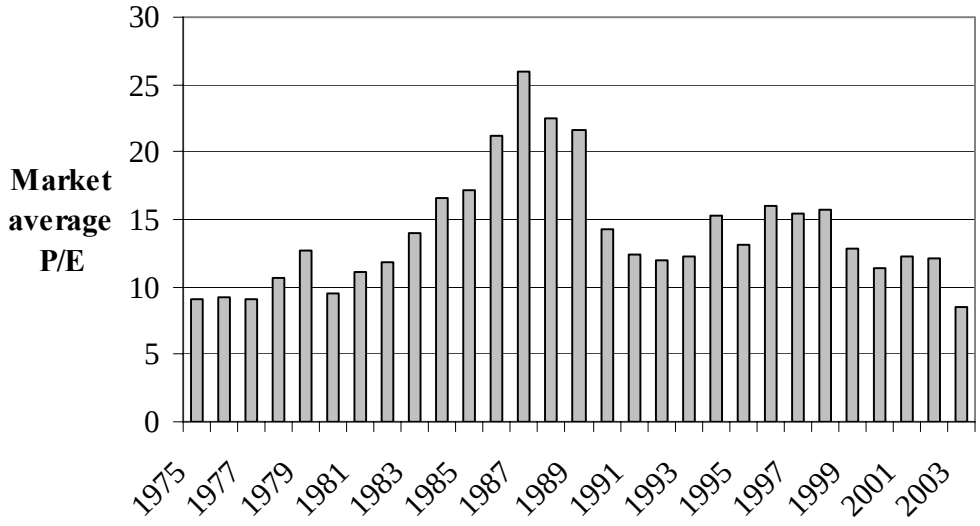


Exhibit 3: Average P/E's by market value category, 1975-2003

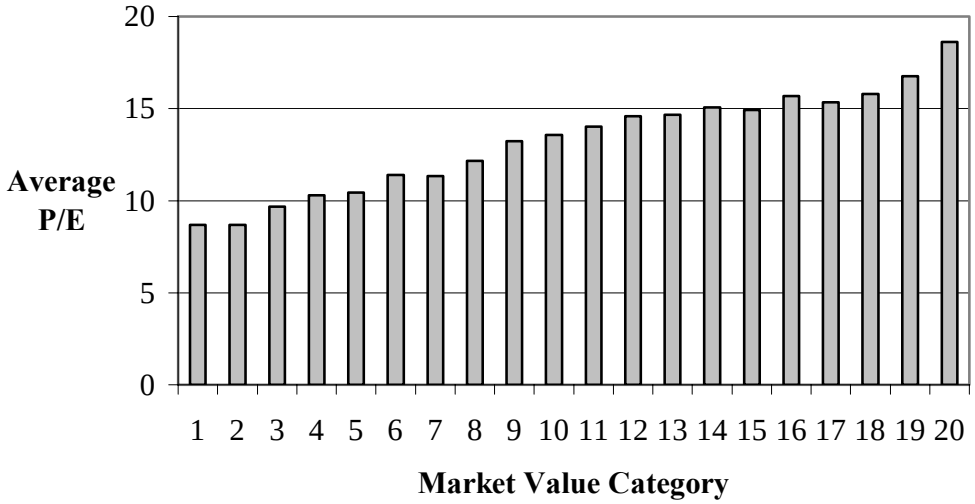


Exhibit 4: Average one-year returns on portfolios of ten glamour and ten value stocks, and on the arbitrage portfolio, 1975-2003

	EP8	No market CAP E/P	No Sector E/P	No IdioE/P	IdioE/P alone
Weights assigned					
MVEP	1	0	1	1	0
G17EP	1	1	0	1	0
IdioEP	1	1	1	0	1
One-Year Returns					
Glamour	14.89%	16.24%	15.38%	19.48%	12.24%
Value	32.33%	34.07%	33.25%	27.34%	33.68%
Arbitrage	17.45%	17.84%	17.86%	7.85%	21.44%

Exhibit 5: Compound annual returns for ten-share extreme glamour and value portfolios, 1975-2003

	1-year return	1-year return after spread	Average market value category
Glamour	12.24%	10.28%	8.55
Value	33.68%	29.96%	10.43
Arbitrage	21.44%	19.67%	

Exhibit 6: Average one-year returns for portfolios of 5-50 shares using IdioEP to rank stocks, 1975-2003

No. of Shares	5	10	15	20	25
Glamour	12.98%	12.24%	14.98%	13.59%	15.67%
Value	43.43%	33.68%	31.01%	29.25%	27.69%
Arbitrage	30.45%	21.44%	16.03%	15.67%	12.02%
No. of Shares	**30**	**35**	**40**	**45**	**50**
Glamour	16.67%	17.20%	16.98%	16.98%	17.03%
Value	27.13%	27.86%	27.06%	27.21%	26.64%
Arbitrage	10.46%	10.65%	10.08%	10.23%	9.61%

Exhibit 7: Annual returns on value, glamour and arbitrage small portfolios 1-year holding period, 1975-2003

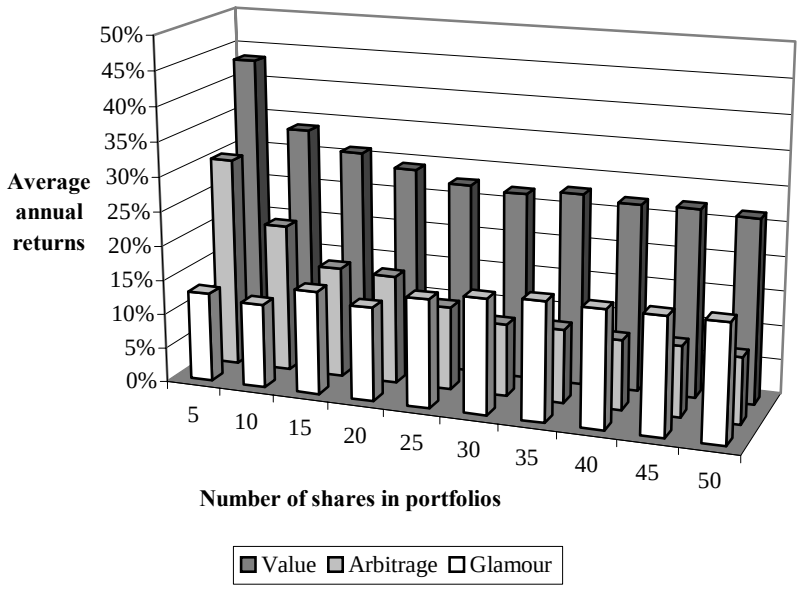


Exhibit 8: Sharpe Ratios of value, glamour and arbitrage small portfolios, 1-year holding period, 1975-2003

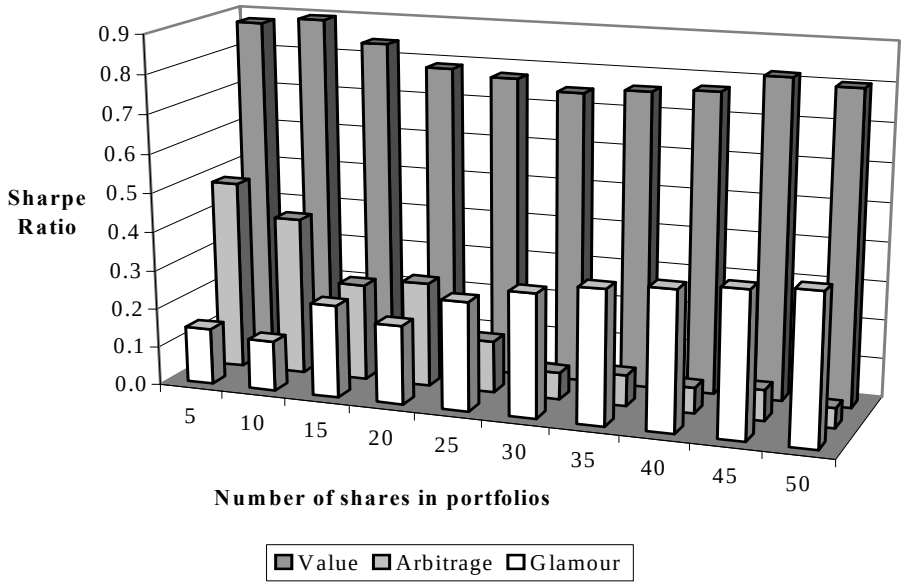


Exhibit 9: Average one-year returns for portfolios of 1-15 shares, 1975-2003

No. of Shares	1	2	3	4	5
Glamour	4.76%	10.15%	13.27%	15.53%	12.98%
Value	61.51%	43.80%	39.84%	44.20%	43.43%
Arbitrage	56.75%	33.65%	26.58%	28.68%	30.45%
No. of Shares	**6**	**7**	**8**	**9**	**10**
Glamour	13.91%	14.33%	13.81%	13.19%	12.24%
Value	43.57%	40.03%	37.88%	34.92%	33.68%
Arbitrage	29.66%	25.69%	24.07%	21.73%	21.44%
No. of Shares	**11**	**12**	**13**	**14**	**15**
Glamour	12.11%	13.00%	13.19%	14.31%	14.98%
Value	33.89%	32.66%	31.74%	30.95%	31.01%
Arbitrage	21.78%	19.66%	18.55%	16.64%	16.03%

Exhibit 10: One-year returns for very small value, glamour and arbitrage portfolios, 1975-2003

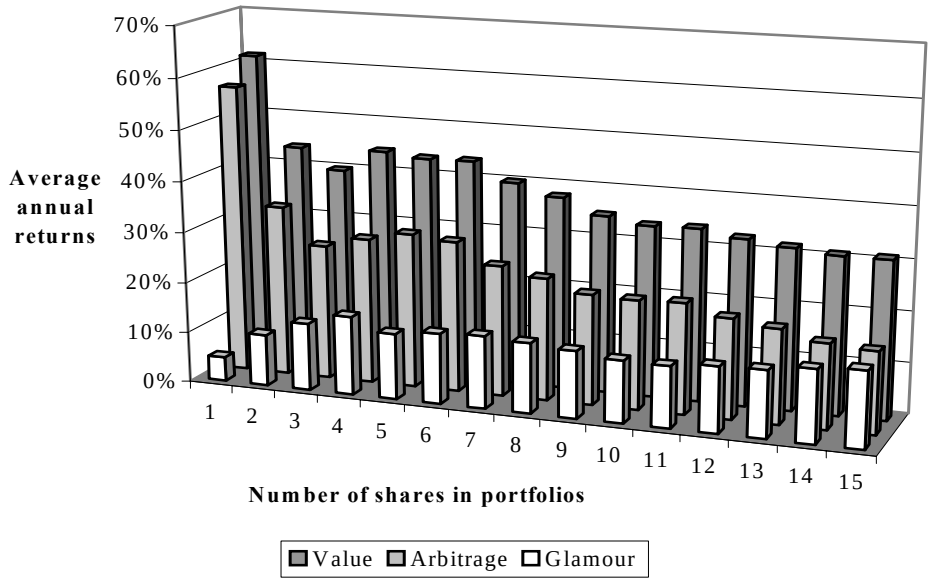


Exhibit 11: Sharpe Ratios of very small value, glamour and arbitrage portfolios, 1975-2003

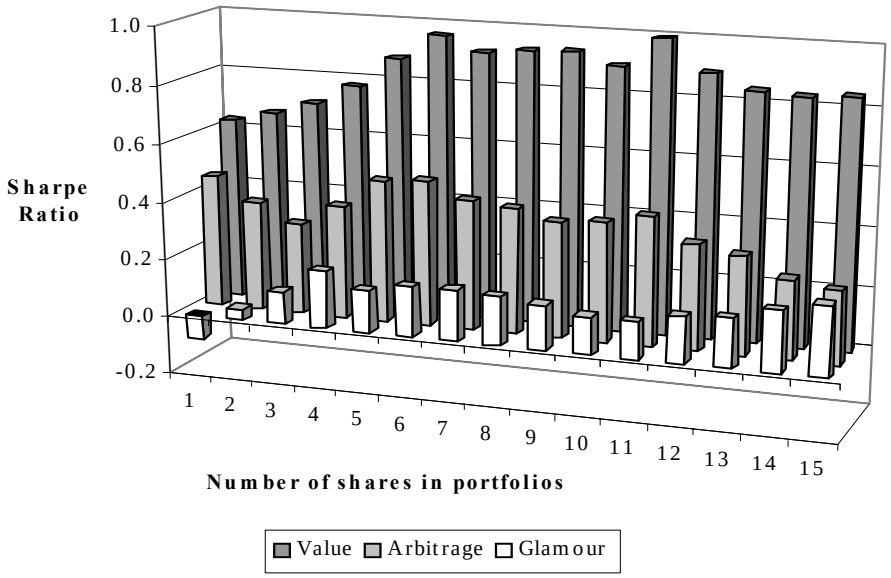


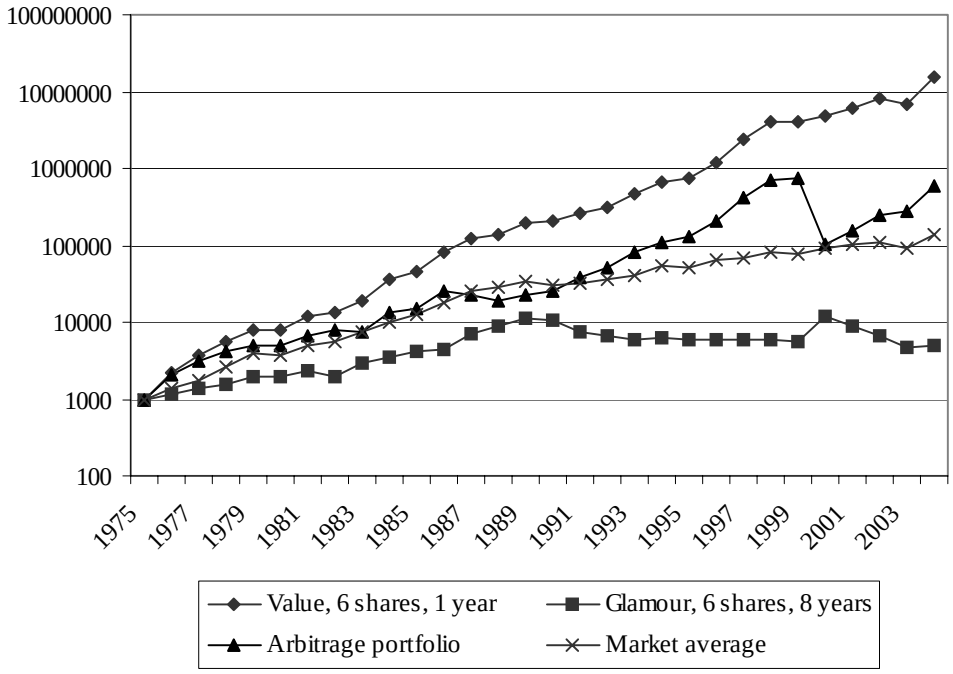
Exhibit 12: Average returns over holding periods of one to eight years for six-share extreme value and glamour portfolios, 1975-2003

	1-year	2-year	3-year	4-year	5-year	6-year	7-year	8-year
Glamour	13.91%	10.51%	9.35%	8.16%	7.63%	6.72%	5.21%	4.90%
Value	43.57%	33.09%	29.27%	30.10%	27.40%	25.62%	25.46%	25.90%

Exhibit 13: Portfolio values for extreme value and glamour portfolios

	Value, 6 shares, 1 year		Glamour, 6 shares, 8 years		Arbitrage portfolio	
Year	**Value**	**Return**	**Value**	**Return**	**Value**	**Return**
1975	£1,000	123.86%	£1,000	18.08%	£1,000	105.78%
1976	£2,239	69.42%	£1,181	16.06%	£2,058	53.36%
1977	£3,793	43.31%	£1,370	12.79%	£3,156	30.52%
1978	£5,435	44.97%	£1,546	26.94%	£4,119	18.04%
1979	£7,880	0.01%	£1,962	-0.33%	£4,862	0.34%
1980	£7,880	51.72%	£1,956	18.97%	£4,878	32.75%
1981	£11,956	9.98%	£2,327	-15.17%	£6,476	25.15%
1982	£13,150	44.87%	£1,974	50.73%	£8,105	-5.86%
1983	£19,050	91.61%	£2,975	18.64%	£7,629	72.96%
1984	£36,500	27.91%	£3,530	14.92%	£13,196	12.98%
1985	£46,686	75.24%	£4,057	6.48%	£14,909	68.76%
1986	£81,813	49.21%	£4,320	59.28%	£25,160	-10.07%
1987	£122,074	11.07%	£6,880	26.89%	£22,627	-15.82%
1988	£135,586	43.37%	£8,730	25.16%	£19,048	18.20%
1989	£194,384	8.42%	£10,927	-5.27%	£22,515	13.69%
1990	£210,752	22.76%	£10,351	-27.61%	£25,597	50.37%
1991	£258,721	18.92%	£7,493	-11.84%	£38,491	30.75%
1992	£307,668	55.91%	£6,606	-10.86%	£50,328	66.77%
1993	£479,700	38.33%	£5,889	8.46%	£83,934	29.88%
1994	£663,590	9.90%	£6,387	-6.08%	£109,009	15.99%
1995	£729,313	63.98%	£5,999	0.54%	£126,436	63.44%
1996	£1,195,896	104.42%	£6,031	0.58%	£206,645	103.84%
1997	£2,444,623	66.43%	£6,066	-3.94%	£421,229	70.37%
1998	£4,068,684	-0.10%	£5,827	-1.48%	£717,657	1.38%
1999	£4,064,718	15.97%	£5,740	102.04%	£727,595	-86.07%
2000	£4,714,006	32.86%	£11,598	-22.79%	£101,353	55.65%
2001	£6,263,143	32.95%	£8,955	-24.92%	£157,758	57.87%
2002	£8,327,114	-20.05%	£6,723	-31.05%	£249,059	11.00%
2003	£6,657,886	126.22%	£4,636	8.56%	£276,457	117.66%
2004	£15,061,675		£5,033		£601,742	
Compound annual return		**39.34%**		**5.73%**		**24.69%**
Standard Deviation		**0.3628**		**0.2782**		**0.4211**

Exhibit 14: £1,000 invested in the six extreme value shares, rebalanced annually, the six extreme glamour shares rebalanced every eight years, the arbitrage portfolio and an equally weighted market average, all UK shares with eight years of positive earnings, 1975-2003



[i] See, for example, Fama and French [1998], for a comprehensive study involving 13 countries.

[ii] We also calculated returns for holding periods of up to eight years, but since our story is usually told sufficiently well by one-year returns, in most cases we do not report them.

[iii] There are also sector-effects at work here since the companies in some sectors are likely to be exclusively large (e.g., pharmaceuticals).

[iv] A recent study by Lesmond *et al*. [2004] suggested that returns to momentum portfolios may be almost entirely eaten up by high transactions costs in both the long and short parts of the strategies.

[v] We also checked whether the limited liquidity of some shares would have caused problems for investors following this strategy. The LSPD has monthly turnover figures for most companies since 1992. For private investors or institutional investors with modest sums to invest, the market is sufficiently deep to accommodate the required trades, but for larger investments, it is likely that the trades would have to be spread over several days to avoid significant price impacts. Given that the value strategies that we examine are based on long-term valuations, such a lack of immediacy is unlikely to affect returns significantly.