What Drives the Outperformance of Fundamental Weights Indices?

Over the last few months many of us received information published jointly by FTSE and Research Affiliates LLC and by FTSE and Global Wealth Allocation Limited highlighting the historic outperformance of indices constructed using *fundamental weights* against the more traditional *market capitalization* weighted benchmarks.

According to the Historic Retrospective, published by Research Affiliates and covering 23 markets over a period of almost 18 years, fundamental indices outperformed capitalization indices by more than 2% per annum for 17 markets and, just as significantly, underperformed nowhere. FTSE GWA analysis covering the past 5 years is even more dramatic. Furthermore, in both studies, the measured volatility of the fundamental indices has not been appreciably higher than the traditional benchmarks (in many cases it is lower), and even with their higher turnover, typical transaction costs only slightly diminish their considerable performance advantage.

According to FTSE, Research Affiliates and Global Wealth Allocation, "…investors' behaviour … and other external factors … lead to over and under pricing around [a] stock's true fair value", and fundamental indices outperform because their composition takes "advantage of price movements by reducing the indices' holdings in constituents whose prices have risen relative to other constituents, and increasing holdings in companies whose prices have fallen behind.". Also, "Fundamentals weighting does not increase exposure to high P/E stocks during episodes of unsustainable P/E expansion. It thereby avoids over-exposure to the more overvalued stocks." This idea was also explored in a recent article in the current issue of the Financial Analysts Journal (Sept/Oct 2005) where Jack Treynor developed the theory relating the potential for such Market Valuation Indifferent (MVI) indices to outperform to the degree of market mispricing.

Style Research considers this historical analysis and the theory supporting the measured results to be interesting and important, particularly since this work also raises a number of key questions regarding the sources of the outperformance.

Our objectives in this short note are the following:

1 To provide independent corroboration of the FTSE/RA/GWA results;
2 To review the patterns of Style exposures and to conduct a number of detailed performance attribution analyses:
   a to see whether the outperformance might be episodic or period specific;
   b to identify any implicit strategies implicit within the weighting process;
   c to see if there are any other significant features characterizing the returns.

---

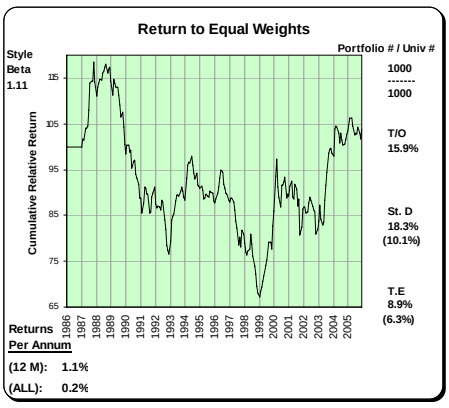
1 Corroborating the FTSE/RA/GWA Results

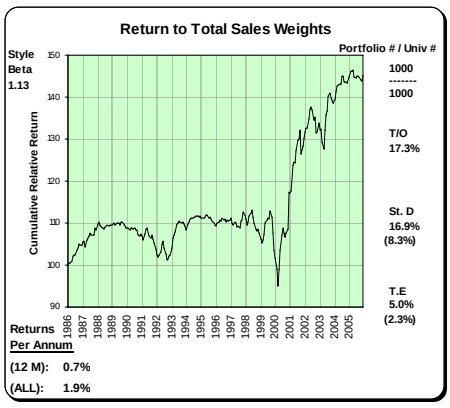
Using a recently added feature of the *Style Research Online* facility, we ran 20 year analyses in the US, UK, Eurozone and Japanese equity markets, calculating the market relative returns of large benchmark portfolios constructed using semi-annually rebalanced Market Valuation Indifferent weights. (We used equal weights as well as

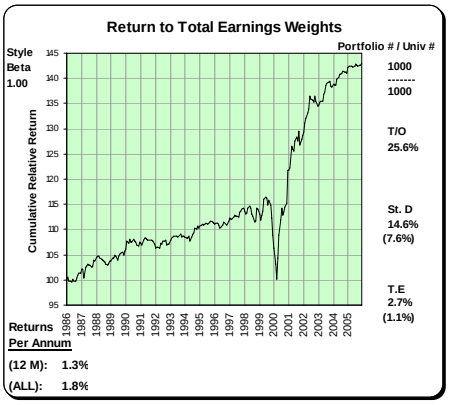
weights based on Sales, Earnings and Book Value, setting the weights for negative factor values to zero, and compared the performance of the MVI portfolios composed from the top 1000, 2550, 2500 and 1350 shares in the UK, US Eurozone, Japan, respectively, against their corresponding capitalization weighted indices.)

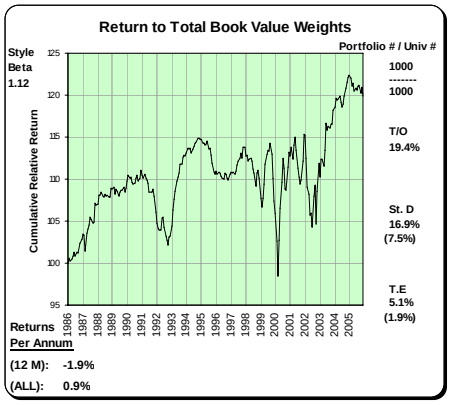
The graphs below show the cumulative market relative returns using each method.

UK

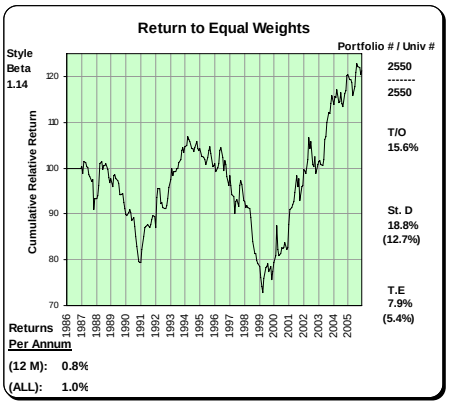


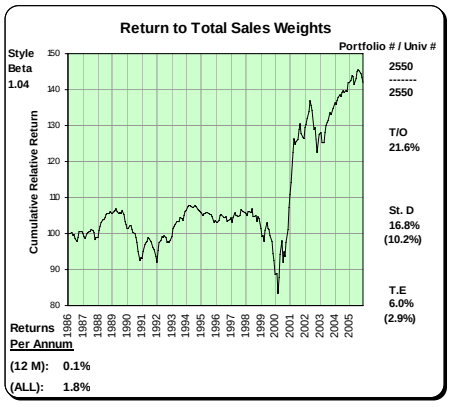


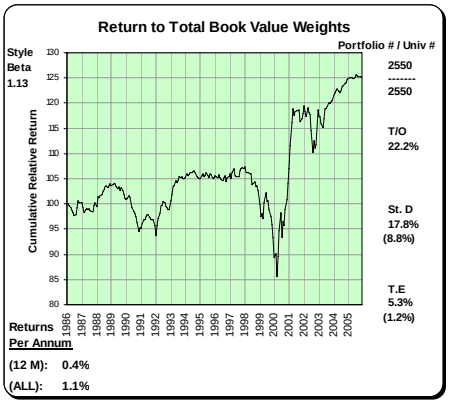




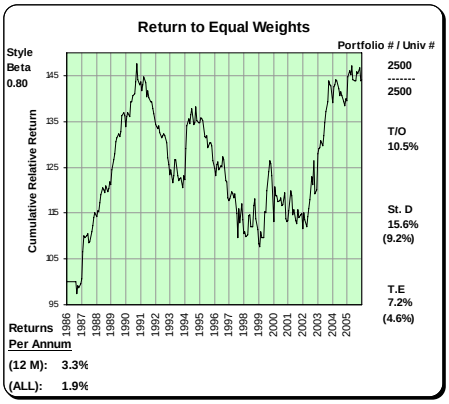
US

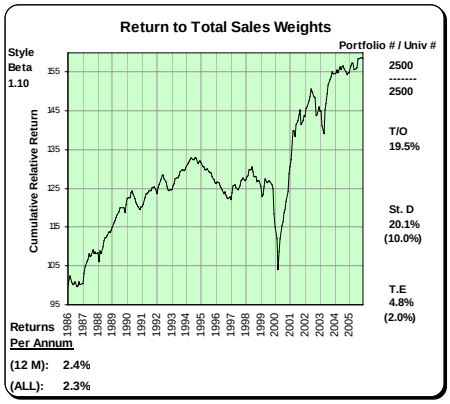


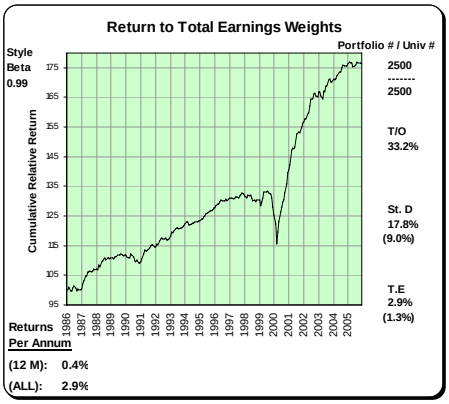


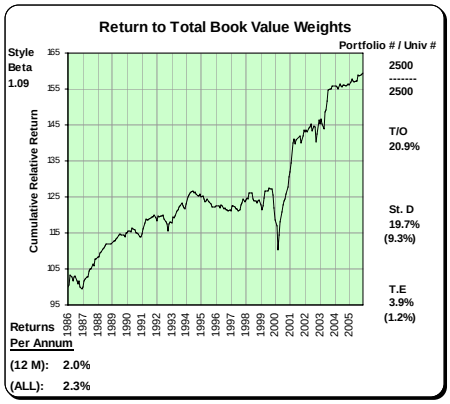


Eurozone

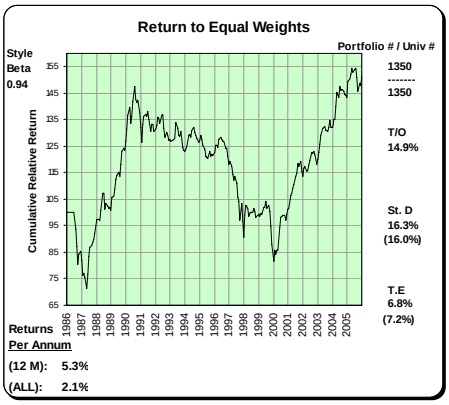


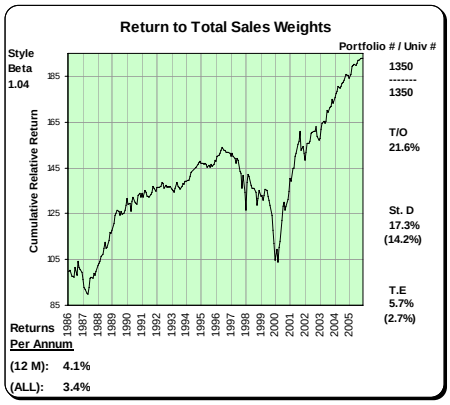


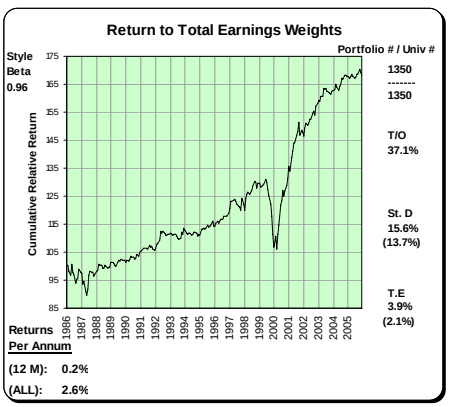


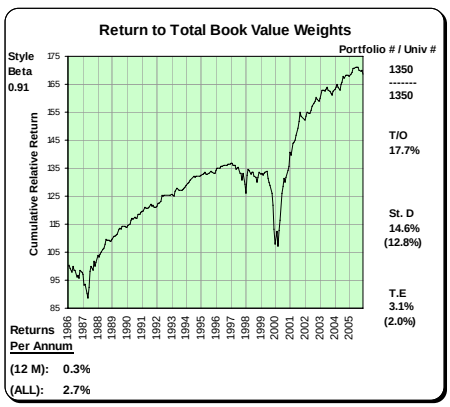


Japan









Some immediate observations:

1 The selected MVI weighing factors do appear to provide the potential to outperform. The 20 year outperformance is of the same order as that of FTSE/RA; and our 5 year record is also very similar to the FTSE/GWA data.

2 The performances of the Book Value and Sales weighted indices appear particularly "jagged" and episodic in the UK and US; they are also awkwardly "wavy" and period specific in Japan and the Eurozone.

3 While equally weighted benchmark portfolios do outperform over the period in most markets, the performances are everywhere the most erratic.

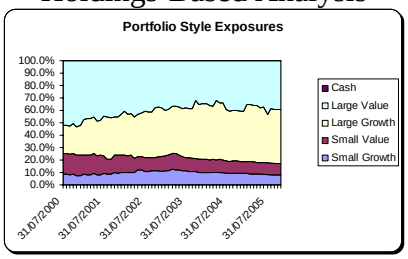
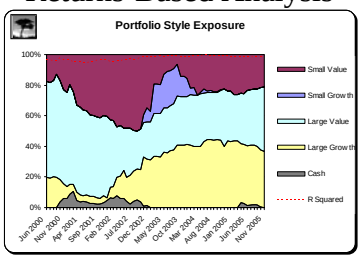
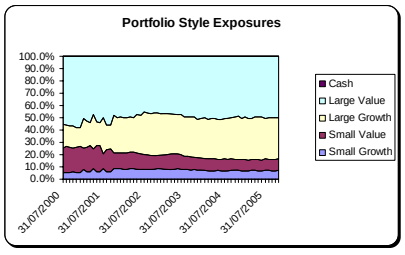
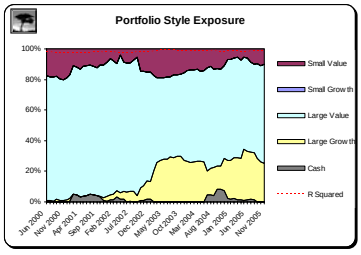
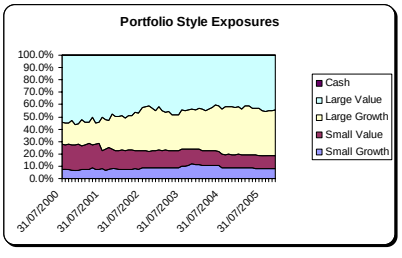
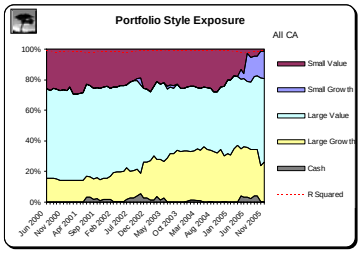
4 The performances of earnings weighted benchmark portfolios appear to be the least erratic and possibly the most reliable.

5 Turnover data are also of the same order of magnitude as in the FTSE/RA results.

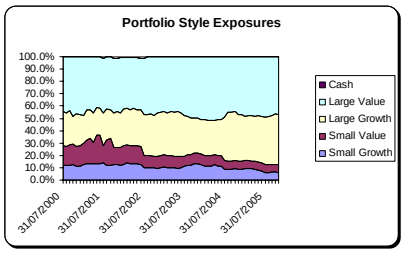
In the subsequent analysis, we will examine only the characteristics of the earnings weighted indices and their performance records. This is not because other factors are considered unimportant; it is just to simplify the analysis and to keep a grounding in intuition. Further research is intended to explore the characteristics of these and other factors, as well as combinations of factors and factor derived portfolios, in defining a variety of market valuation indifferent, MVI, benchmark portfolios.

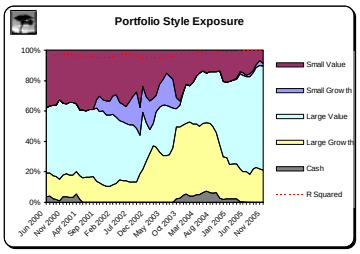
To delve more deeply into the characteristics and performance of the earnings weighted portfolios we proceed first to analyze their basic Style characteristics and then continue to examine corresponding performance attribution analyses.

2 Style Analyses of Earnings Weightings Indices 2000 to 2005

	Holdings-Based Analysis	Returns-Based Analysis
UK		
US		
Eurozone		

Japan





Note: The holdings-based Style exposures are from the monthly analyses of the fundamental weights portfolios using Style distributions based also on market capitalization and book to price. The returns-based analyses have been conducted using rolling 24 month analysis windows incorporating basic Style paradigms based on market capitalization to distinguish large vs. small and book to price to distinguish Value from Growth. While the series were constructed using Country Adjusted Style paradigms for the Eurozone analysis, no Sector Adjustments were applied. All analysis was done using the Style Research Portfolio Analyzer software.

An examination of these charts reveals that:

1 The holdings-based analysis shows a gradual Style shift occurring, in all markets, reducing the exposures to Value and increasing the exposures to Growth. This pattern is not only consistent across all market regions examined, but it is also observable in both the small capitalization and larger companies segments of each market.

2 The high R^2 statistics confirm the relevance of the returns-based analyses which also show (everywhere except in Japan, where the shift develops and subsequently reverses) a gradual Style shift over the period, reducing Value exposures and increasing the exposures to Growth.

This pattern of Style exposure is precisely what should be expected from the Market Valuation Indifferent weighting process, as it ignores pricing noise and focuses rather on more stable measures of company size. During the period of the raging bull market in Growth stocks that ended abruptly in early 2000, these benchmarks would have been conspicuously Value in orientation and, consequently much of the outperformance recorded immediately following the market collapse would have been attributable to the strong Value orientation, just as Value stocks started to rebound dramatically.

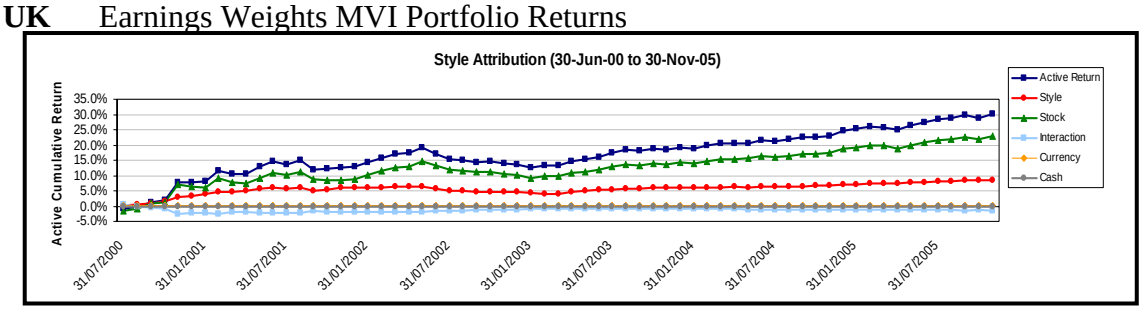
While this was certainly a fortuitous Style shift and one that certainly would make fundamental weightings worthy of serious consideration as a Style rotation signal, without knowing that it contributes more than simply a contrarian Style strategy, it is difficult to see it as offering anything new to investment thinking. To explore how much of the market relative performance is due simply to a disciplined basic Style shift and how much is due to the stock specific weighting detail of the fundamental weights construction process we need to review more detailed performance attribution analyses.

3 Performance Attribution Analysis of Fundamental Weights Benchmarks

The returns of the earnings weighted benchmark portfolios are analyzed below using the Style Research Portfolio Analyzer Performance Attribution software; the analysis is based on the selection of the Brinson Attribution Methodology with Styles as the grouping variable and, in all cases the performance of the MVI portfolios was compared against popular local indices. Analyses against total local markets using

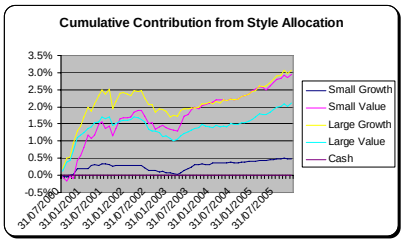
capitalization weights were run and are available from Style Research; but the results were, in all cases, virtually indistinguishable from those reported.

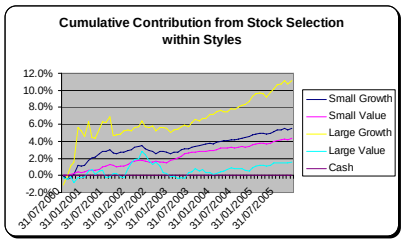
UK Earnings Weights MVI Portfolio Returns



The earnings weighted benchmark portfolio outperformed the UK FTSE All Share Index more as a consequence of stock specific features than because of the rewards to the Style orientations introduced by the earnings weights discipline. The earnings weights strategy contributes more to performance than can be simply attributed to the Style exposures introduced by the weighting strategy. However, the contribution of the Style orientation is significant, particularly since there was only a period of 6 or 7 months where the Style orientation contributed negatively to returns, even as the Style orientation itself was, as we have seen, changing.

Looking in more detail at the sources of outperformance:

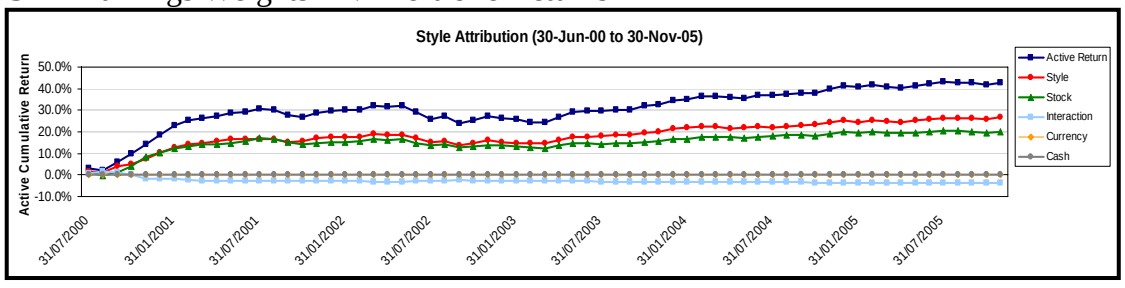




1 The largest contributions to Style Allocation returns are from Large Growth and Small Value.

2 The greatest contribution to the stock selection element of the outperformance of the valuation indifferent portfolio comes from within Large Growth sector.[1]

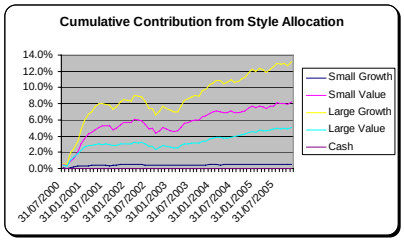
US Earnings Weights MVI Portfolio Returns

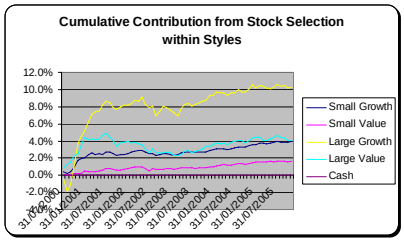


[1] Analysis of the MVI portfolio construction process reveals that about one half of the stock selection outperformance can be attributed to the zero weighting of securities with negative earnings. This is a large concentration of outperformance which, while being consistent with the weightings regime, is nonetheless worthy of further research. It is also interesting to note that had these stocks been held short, owing to their negative factor score, stock selection gains would have been higher.

The results are very similar to the UK, where the MVI benchmark outperformed the Russell 3000 Index, but where both Style and stock specific elements of return have contributed strongly, and broadly, quite consistently over the past 5 years. It is worthwhile noting that even though the strategy employed was not specifically Style orientated, over half of the outperformance could have been replicated by systematically rotating Styles, in market capitalization weighted Style paradigm portfolios, as described in the previous section. This is not in any way to diminish the usefulness of the earnings weighting dictum; it was this discipline that resulted in the Style orientations that supported the outperformance.

Looking in more detail at the sources of outperformance:



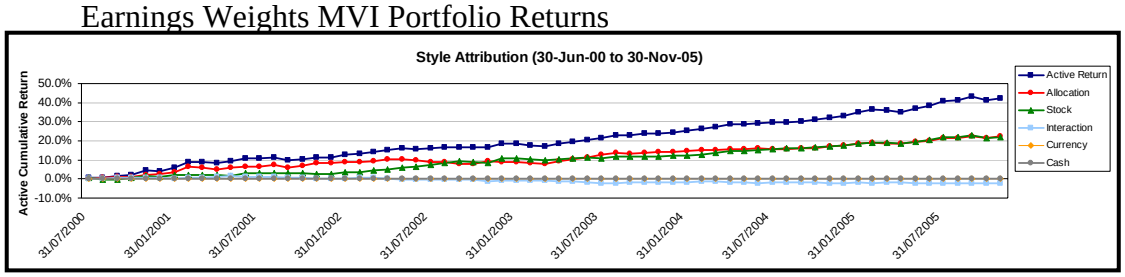


1 As in the UK, the largest contributions to outperformance from Style allocations have come from the weightings in Large Growth and Small Value.

2 Also, as in the UK, the largest contributions from stock selection have come from within the Large Growth sector, with the most significant gains in 2001.

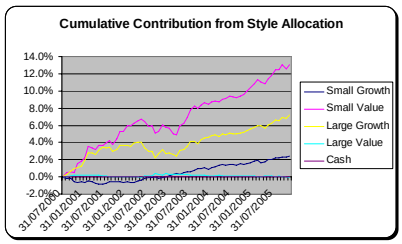
Eurozone

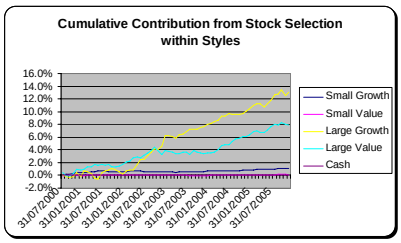
Earnings Weights MVI Portfolio Returns



The earnings weight benchmark appears to have outperformed the FTSE Eurozone Index just as much for the stock specific aspects of the weighting strategy as for the Style orientations it implicitly introduces.

Detailed performance attribution analysis reveals:



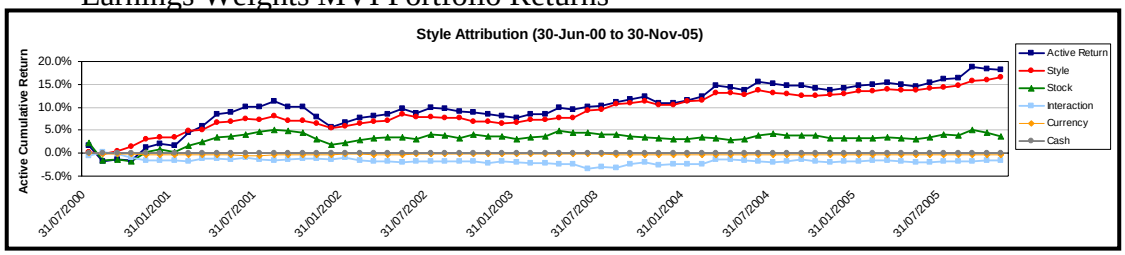


1 Again, the largest contributions to outperformance from Style allocations come from the weightings in Small Value and Large Growth.

2 Again, the largest contributions to stock selection gains come from within the Large Growth sector. And in Europe the gains appear to be more regular than in the US.

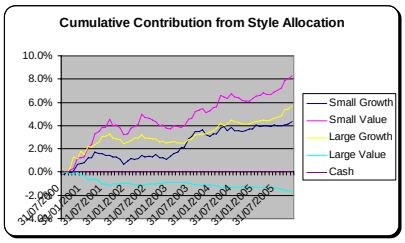
Japan

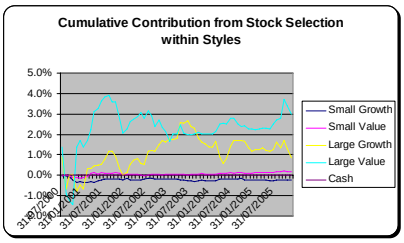
Earnings Weights MVI Portfolio Returns



In Japan, the largest contributor to outperformance (of the FTSE Japan Index) is the Style allocation implicit within the earnings weighting process. While Stock selection does figure in the outperformance of the earning weights benchmark, it is to a much smaller extent than in other markets, it appears to be period specific, and its path is particularly erratic.

Detailed performance attribution analysis reveals:





1 While Small Value and Large Growth allocations are the largest contributors to returns due to Style allocation, the allocation to Small Growth (a uniform underweight position relative to the total market) was also a key contributor.

2 Stock selection gains within the basic Styles were, as could have been expected from the overall pattern of stock selection gains in aggregate, variable and very period specific.

4 Conclusions

Market valuation indifferent portfolios appear to be able to outperform the more traditional market capitalization weighted portfolios significantly over an extended period of time. While many fundamental weighing factors appear to provide only episodic and period specific phases of outperformance, earnings weights do appear to provide a more systematic pattern of outperformance.

The outperformance of earnings weighted benchmark portfolios is, however, a consequence of a variety of contributions. While the consequential Style exposures

are material in all markets and regions, stock specific contributions to return are in many markets at least as significant. There is more to the outperformance of these benchmarks than can be simply attributed to the basic Style allocations.

Regarding the Style contributions to returns, it is also particularly noteworthy that the Style orientations for the earnings weighted portfolios shifted significantly over the 5 year period within which we have been able to conduct the more detailed analysis, changing from Value orientation towards Growth (within both the larger company and smaller company sectors). It is important to highlight that in only a few instances over the period has the Style allocation of the earnings weights benchmark contributed to sustained underperformance.

It would appear that the earnings weighted benchmark discipline may provide a mechanism for the systematic rotation of Styles through a changeable rewards cycle.

Regarding the Stock Selection contributions to returns, while in some markets there was evidence of strong outperformance within the Large Growth sectors during the abrupt market reversal of 2001 (as would be expected given the level of mispricing noise within this sector during the heyday of the previous bull market), the stock selection gains have not been limited to this singular episode. Rather stock selection within Large Growth has, in most areas, provided extended periods of strong and regular outperformance, possibly indicating that mispricings are more frequent or larger within this Style than in others. The returns within Small Growth within the UK and US and Large Value within Europe and the US may also tell of areas of endemic mispricings. Paradoxically, the stock selection patterns within the Japanese Style sectors suggest either that mispricings are small or infrequent in Japan or that there is little historical evidence of their being corrected. And, as in the observations on Style allocations, in most markets (i.e., Japan aside), in only a few instances over the period has the stock selection of the earnings weighted benchmark contributed to sustained underperformance.

Despite the compelling nature of the evidence and the attractive intuition attached to the results of the Style analysis and the performance attribution analysis, further research is required. Even though we have presented long term evidence of the overall outperformance of the earnings weights benchmark, our Style analysis and performance attribution analysis have been limited to the past 5 years. Extended analysis should explore these patterns of returns over longer and more diverse Style reward histories and should also consider a number of different criteria for the definition of the Style decompositions and for the performance attribution analysis (momentum immediately comes to mind). The results of our preliminary analysis indicate that this is likely to be a rewarding area for further research.

Style Research January 2006