

“I’ve been thinking about...can you do your own country allocations for an international portfolio?”

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24 August 2006

This paper describes a strategy for making regional international equities decisions. It has been designed for use by investment advisers who wish to make decisions without the need for market timing or signals based trading. The paper discusses the underlying economic rationale for the strategy, the pro and cons of various methodologies for executing it, and the back tested results which suggest that returns of 1% per annum in excess of the index are quite feasible.

Principles

This strategy has been designed to help advisers to build portfolios for private investors. In doing so, the following principles and ideas have been adopted:

- Superior returns can be achieved simply by avoiding market capitalization weighted portfolios. (This is described as the Arnott Effect in this paper)
- Turnover and transaction costs should be kept low
- The process should not rely on signals and market timing

Avoiding market capitalisation weights- the Arnott Effect

In his 2004 paper, Fundamental Indexation¹, Robert Arnott outlines why market capitalization-weighted portfolios are highly likely to produce poor long-term performance. Essentially, his logic is as follows:

The argument for traditional index management of equities runs along the lines that markets are sufficiently efficient to make consistently outperforming the index after transaction costs highly unlikely. Now, there are two versions of the efficient argument, weak efficiency and strong efficiency. The first says that prices at all times reflect a true estimate of the value of a security and this has been pretty much discredited by the manifestly nonsensical pricing seen during the tech bubble. The second, more commonly held view of efficiency, is that at any time some securities are cheap and some are expensive, but it is impossible to tell which are which with sufficient reliability to consistently outperform the market.

Which is where Arnott comes in with his stunning (and, with the benefit of hindsight, stunningly obvious) insight; if the weak view of market efficiency is true, then any market capitalization weighted portfolio will systematically overweight all the overpriced stocks in the market and systematically underweight all the cheap stocks in the market. A portfolio weighted on almost any other basis is likely to avoid that bias and therefore outperform the index, before fees at least.

Hence the underlying driver of the methodology described in this paper is the idea that making country allocations on a basis other than market capitalization is likely to produce above index

returns. Arnott has shown that applied at a stock level these sorts of passive strategies can produce returns of the order of 2%pa above the index, the aim of this paper is to test whether this approach works at a country or regional level as well as at a stock level.

Research Method

The key variables in the design of this study are the regions or countries chosen to use as the units of investment, the period over which the study was conducted, the methodology for making non market capitalization weighted allocations, and the rebalance period.

Regions and countries chosen for review

The world was divided up into five regions and the relevant MSCI Index (US\$) was used to represent performance of the region: US, Japan, UK, Europe (ex-UK), and Pacific (ex-Japan). The rationale for choosing these regions:

- Data exists for all regions since 1970;
- The MSCI World index has been a long standing benchmark for international equities and is representative of the performance benchmarks that managers generally try to exceed; and,
- All the regions are components of the MSCI World index. That is, no outside assets (i.e. Emerging markets, China) have been included. Hence if we can beat this Index without using outside markets, it is a fair test of the strategy. However, this does not mean that in practice the strategy needs to be confined to these regions.

Review Period

The review period chosen was 31 December 1969 until 31 December 2005 on the basis that:

- MSCI data is available for that period;
- All the potential strategies were likely to be underweight Japan in the late 80's and the US in the late 90's. and were likely to perform well during those periods. To be a property test any period of analysis had to also include the periods where these assets were strong outperformers, the 70's and 80's for Japan, and late 90's for the US. Without the 70's and 80's, it is quite easy to demonstrate that just about any strategy that minimized exposure to Japan would have stellar results; and,
- Over this period, Emerging markets can be left completely out of the analysis, as they were not an area of much investment focus until the 1990s. If the analysis is to include emerging markets, then the timing of their introduction becomes critical. When should they be introduced? Prior to their huge run up in the early 90's, at the peak in 1994 when they really were getting significant attention or some time afterwards when pricing was more reasonable? Clearly the choice of the date of inclusion has the potential to alter the results substantially. The problem is avoided altogether by leaving them out, but as is discussed in the Implementation section, this is not a trivial issue going ahead.

Methodologies and variants

We look at four strategies (chosen for their ability to be implemented by advisers, to capitalise on the Arnott Effect) and compare with conventional capitalization-weighted portfolios:

- Equal weights – the portfolios were divided into five equally weighted regions, and periodically rebalanced;
- GDP weights – the portfolios were divided up according to the relative GDP weights of the countries that made up the region, and periodically rebalanced;
- Earnings weights – the portfolio were divided up according to the value of earnings generated by each region, as measured by Market capitalisation/PE ratio; and,

- Smoothed earnings weights – the portfolios were divided up according to the smoothed earnings generated by each region. Smoothed earnings were generated using Campbell and Shillers² methodology.³

Rebalance timeframe

For each of these methodologies, we tested results using annual rebalancing, rebalancing every two, three, five and seven years.

Transactions costs

Transaction costs were assumed to be 0.7% for buying and 0.7% for selling.

Results

The results suggest there is value to be obtained by adopting a regional approach to international equities allocation. As shown in Figure 1, each of the strategies clearly outperformed the cap-weighted approach over the 35-year test period, and in most of the subperiods reviewed.

Figure 1: Value-add from different methodologies

| | Excess return (%pa) versus MSCI World Index | | | |
|----------|---|-------------|------------------|---------------------------|
| | Equal Weights | GDP Weights | Earnings Weights | Smoothed earnings weights |
| 35 years | 1.9% | 1.4% | 0.9% | 0.7% |
| 30 years | 2.3% | 1.6% | 0.9% | 0.7% |
| 20 years | 1.4% | 1.0% | 0.7% | 0.6% |
| 10 years | 1.4% | 1.4% | 1.3% | 0.9% |
| 10 years | 0.8% | 1.5% | 1.7% | 0.8% |
| 10 years | 0.0% | 2.2% | 2.1% | 1.7% |
| 10 years | 1.9% | 1.4% | 0.8% | 1.0% |
| 10 years | 0.1% | 0.9% | -0.5% | -0.3% |
| 10 years | 1.3% | 0.2% | -0.3% | -0.2% |

Source: farrelly's

In looking at the results, it is useful to consider what the key drivers of the different strategies, and whether or not the results are likely to persist over time.

We see that the first two strategies produce much higher value-adds. In looking for the drivers of this result, one of the keys is bet size, defined as the average departure from the index over time, and calculated by summing each year, the absolute difference between the weights in a particular strategy and the MSCI market capitalised weights and then averaging that difference over the full 35-year review period. It is analogous to tracking error. Figure 2 (overpage) shows average bet size, and the pre- and post-transaction cost impact of each strategy.

Figure 2: Average departure from benchmark. Annual transaction costs (3-year rebalance)

| | Equal Weights | GDP Weights | Earnings weights | Smoothed earnings weights |
|--|----------------------|--------------------|-------------------------|----------------------------------|
| Average bet size (%) | 35.3 | 19.7 | 10.5 | 9.1 |
| Average outperformance – pre costs (%pa) | 1.98 | 1.45 | 0.95 | 0.75 |
| Average transaction costs (%pa) | -0.05 | -0.04 | -0.05 | -0.04 |
| Average outperformance – post costs (%pa) | 1.93 | 1.42 | 0.90 | 0.72 |

Source: farrelly's

From this we can see that, while all four strategies had different bet sizes and results, the level of turnover and therefore transaction costs were similar in each case. In terms of transaction costs, a 0.05% per annum cost corresponds to an annual turnover of around 4% of the portfolio.

If we equalize the bet size of the Earnings Weights and Smoothed Earnings Weights strategies with that of the GP Weights strategy, the outperformance results much come closer together (Figure 3). The methodology for increasing bet size is to measure the size of departure from the capitalisation weighted index for each asset class and increase that by a multiple. For example, if the Earnings Weights approach had a US equity weight of 50% versus 40% for the capitalisation weighted index, then doubling the bet size would result in the final weighting being reduced to 60% (that is, 20% over the market cap weight). Similarly, all the sectors with underweight exposures would have those underweight positions doubled. Also, the bet sizes were aligned with the GDP Weights rather than Equal Weights as to increase bets to be inline with equal weights would have introduced some extreme positions and very high transaction costs in the other strategies. (The results achieved by the other strategies under these conditions were superior to the Equal Weights strategy but not particularly meaningful)

Figure 3: Outperformance results with equalised bet sizes (3-year rebalance)

| | Equal Weights | GDP Weights | Earnings weights | Smoothed earnings weights |
|--|----------------------|--------------------|-------------------------|----------------------------------|
| Average bet size (%) | 35.3 | 19.7 | 19.7 | 19.7 |
| Average outperformance – pre costs (%pa) | 1.98 | 1.46 | 1.51 | 1.34 |
| Average transaction costs (%pa) | -0.05 | -0.04 | -0.11 | -0.10 |
| Average outperformance – post costs (%pa) | 1.93 | 1.42 | 1.40 | 1.24 |

Source: farrelly's

Note: Earnings weights were increased by a factor of 2, Smoothed earnings weights increased by a factor of 2.44.

Under the equalized bet size approach, transaction costs do increase but remain quite low and consistent with portfolio turnover of less than 10% per annum.

Equal Weights

Essentially, this strategy makes two bets:

- That taking price out of the weighting process will add value (that is, the Arnott Effect); and,
- That smaller regions will outperform bigger regions.

Of the two, the Arnott Effect has strong economic justification. On the other hand, it is hard to see why size of the boundaries we draw (somewhat arbitrarily) around different regions should add value over time. Hence, farrelly's views this result as partly due to good luck and partly due to good management. The combination of these two bets is much larger than the other strategies and explains the larger outperformance of this strategy versus the other strategies. If bet size is equalized, this outperformance disappears.

GDP Weights

This strategy makes two key bets

- The Arnott Effect; and,
- That regions with low ratio of listed entities to total economic activity will outperform.

Again, the first seems to have strong economic justification, while it is difficult to argue that the second should persist. The quantum of the bet here is larger than for the Earnings based strategies, but this produces essentially the same returns when equalized for bet size.

Earnings Weights

This strategy makes three bets:

- The Arnott Effect;
- That cyclical earnings movements will not cause artificially low exposures at times of short-term earnings downswings and vice versa; and,
- That the value-add will not be erased by transaction costs which are higher than the other strategies due to the sometimes volatile swings in earnings from region to region.

It turns out that the impact of the more cyclical nature of the Earnings Weights versus Smoothed Earnings Weights does not seem to have a negative impact on returns or transaction costs. In fact, as shown in Figure 3, this strategy produces slightly better returns than the Smoothed Earnings Weights strategy even after adjusting for bet size. Transaction costs are low and essentially not a driver of results.

Smoothed Earnings Weights

This strategy gives probably the purest exposure of the four to the Arnott Effect, and does keep transaction costs at fairly low levels. Unfortunately, the total value-add is fairly modest at 0.5% per annum over the full period – unless the bet size is increased.

Of the four strategies, the first two run the risk that any value-add from the Arnott Effect could be obscured by the outcome of the side bets, which in reality do not have a convincing economic rationale. While no doubt *ex post* justifications are possible, prior to doing the analysis, they were not clear. Having said that, the difference between the results of the Smoothed Earnings Weights strategy and the Earnings Weights strategy were practically indistinguishable once bet size was equalised.

Impact of different rebalance timeframes

Given that the essential logic behind the process is rebalancing towards fundamental weights will reduce overvalued holdings and increase undervalued holdings, it follows that the frequency of rebalancing could be crucial to the success of the process. Five rebalancing timeframes were reviewed as shown in Figure 4 below.

Figure 4: The impact of different rebalancing timeframes

| | Excess return (%pa) versus benchmark | | | |
|-----------------|--------------------------------------|-------------|------------------|-------------------|
| Rebalance after | Equal Weights | GDP Weights | Earnings Weights | Smoothed earnings |

| | | | | |
|---------|------|------|------|------|
| 1 year | 1.69 | 1.26 | 1.20 | 1.06 |
| 2 years | 1.97 | 1.58 | 1.49 | 1.28 |
| 3 years | 1.93 | 1.42 | 1.40 | 1.25 |
| 5 years | 1.93 | 1.48 | 1.04 | 0.82 |
| 7 years | 1.43 | 1.22 | 0.90 | 0.78 |

Source: farrelly's

The highest results were achieved by rebalancing every two years, with three-year rebalancing producing almost as good results. From there on, return enhancement starts to fall away, but useful gains are still achieved. These results do not conclusively point to two years being the optimal rebalancing period, however they do clearly suggest that advisers wanting to adopt two- or three-year rebalancing cycles will not be severely disadvantaged compared to those who rebalance each year, and in fact they may even do better. Further, regardless of rebalancing timeframes, there is merit in at least starting a client out with an asset allocation that pays attention to valuations rather than cap weights.

Implementation issues

For those wanting to implement this style of strategy, a number of observations should be made:

1. There is nothing magical about the choice of countries and regions described in this paper. They were chosen essentially due to data availability and to try and eliminate potential for data mining. Those constructing portfolios should choose their strategies based upon regions that make sense to them and to which they have readily accessible avenues for investment.
2. While this strategy is based on indices, the use of active managers to implement at a country or regional level should enhance returns – if, of course, the managers can produce index outperformance.
3. There are a variety of methods available to make the weighting decision. Four have been analyzed in this paper, but clearly other methods could be considered. In considering different alternatives, it is worthwhile forming a view on exactly what bets are being made in each of those strategies, and being confident about making those bets.

For example, this paper presents a brief analysis of the bets being made in the four strategies. To take the GDP Weights approach, one would have to be comfortable with the notion that a significant part of the bet is that countries with low market capitalisation compared to their GDP are likely to outperform over the next several decades. Further, one must be comfortable with the idea that if this turns out not to be the case, then the negative consequences could outweigh the positive effects of the Arnott Effect.

4. When considering if and when to add new regions, great care is needed to ensure that:
 - a. If the new region has come to the investor's attention after a period of hot returns, it is not added prior to a period of likely underperformance; and,
 - b. The weighting process is not such that new regions automatically get a substantial weight, particularly if they have been strong recent performers.
5. This strategy is unlikely to work if it is subject to regular change in response to changing market conditions (a popular euphemism for underperformance) – hence the critical importance of spending time on points one, two and four, and developing confidence that the final process is economically sound.

Endnotes

1. Arnott, Robert D., Hsu, Jason, and Moore, Philip, (2005), "Fundamental Indexation", *Financial Analysts Journal*, 61/2 March, p 83-99.
2. Campbell, John Y., and Shiller, Roger (1998), "Valuation ratios and the long run market outlook", *The Journal of Portfolio Management*, Winter, p11-26.
3. For each year, average EPS is calculated by dividing the relevant price index by the average PE ratio. This is then averaged over 10 years, to create a smoothed EPS figure. The current price index is then divided by this smoothed earnings number to achieve a smoothed PE ratio. Smoothed earnings for a region is the capitalisation weight divided by smoothed PE.