Schroders
Portfolio construction: The case for small caps
by David Wanis, Senior Portfolio Manager, Smaller Companies

Looking solely at passive returns available to investors from large cap and small cap strategies, the initial conclusion an investor may draw is why bother with small caps at all. Over the ten years to June 2012 the S&P ASX Small Companies Accumulation Index returned 6.7% p.a compared with the S&P ASX 200 Accumulation Index which returned 7.0% p.a. The S&P ASX Small Companies Index was significantly more volatile over the same period with standard deviation of annual returns of 19.1% p.a for small caps compared with 13.5% p.a for the S&P ASX 200 Index. Expressed as a Sharpe ratio (the ratio of return realised per unit of risk), the passive small cap outcome of 0.08 is materially worse than the 0.14 for the large cap index.

Fortunately for investors, over the same 10 year period the value added through active management of small company portfolios has more than compensated for the poor passive starting point and created enough value for the risk adjusted returns to be competitive with large cap returns.

Over the past decade an even more niche strategy has emerged in the small cap market, microcap investing. Whilst using some of the same alpha drivers available to active small cap strategies such as research inefficiency relative to large cap stocks, microcaps have one distinct difference – liquidity (or the lack thereof). Based on percentage of market capitalisation traded in a given year, the maturing of the small cap market has reduced the liquidity difference to large caps – although liquidity is still lower, and spreads and market impact both remain larger. Microcap stocks, however, still trade at significantly lower levels of liquidity than both small and large cap stocks, and this is an important consideration both in the source of alpha in the micro cap market (illiquidity premium) and the investment strategy pursued (long term, low turnover). With an increasing number of managers offering a dedicated micro cap strategy (Schroders included) we have also included the active results from this strategy to our analysis.

We are conscious that many of the numbers presented in this analysis may fail to accurately match up to the institutional multi manager experience over the past decade, even in the most mature data set of large cap active managers. Factors such as the money weighted return and impacts of survivor bias on realised returns change the actual experience relative to the statistical analysis. As important to us as the results is the reconciliation of the underlying reasons these differences exist such as value from active management, the small cap effect and the premium required to accept illiquid investments. We also recognise that there are strengths and weaknesses in the various statistical methods we have used, however the intention is to highlight broad trends and confirm them using a combination of statistical methods and reconcile them with the underlying fundamental drivers we observe as investors across the equity market cap spectrum.

Table 1: Ten year large cap Australian equity returns

<table>
<thead>
<tr>
<th>10 yrs to June 30, 2012</th>
<th>S&amp;P/ASX 200 Accum Index</th>
<th>Median Large cap Active Manager</th>
<th>Active Value Added</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return (% p.a)</td>
<td>7.0%</td>
<td>7.8%</td>
<td>+0.9%</td>
</tr>
<tr>
<td>Risk (St Dev % p.a)</td>
<td>13.5%</td>
<td>13.4%</td>
<td>-0.1%</td>
</tr>
<tr>
<td>Sharpe Ratio</td>
<td>0.1</td>
<td>0.2</td>
<td>+0.1</td>
</tr>
</tbody>
</table>

Median includes all managers in the survey at each month to avoid survivor bias. 59 Large cap funds have a 10 year record, 218 funds had some period of performance in the survey. Assumes 5.11% risk free rate.

Table 2: Ten year Small cap Australian equity returns

<table>
<thead>
<tr>
<th>10 yrs to June 30, 2012</th>
<th>S&amp;P/ASX Small Ords Accum Index</th>
<th>Median Small cap Active Manager</th>
<th>Active Value Added</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return (% p.a)</td>
<td>6.7%</td>
<td>12.4%</td>
<td>+5.7%</td>
</tr>
<tr>
<td>Risk (St Dev % p.a)</td>
<td>19.1%</td>
<td>17.0%</td>
<td>-2.1%</td>
</tr>
<tr>
<td>Sharpe Ratio</td>
<td>0.1</td>
<td>0.4</td>
<td>+0.35</td>
</tr>
</tbody>
</table>

Median includes all managers in the survey at each month to avoid survivor bias. 19 small cap funds have a 10 year record, 50 funds had some period of performance in the survey. Assumes 5.11% risk free rate.
Table 3: Ten year Micro cap Australian equity returns

<table>
<thead>
<tr>
<th></th>
<th>S&amp;P/ASX Emerging Companies Index*</th>
<th>Median Micro cap Active Manager</th>
<th>Active Value Added</th>
</tr>
</thead>
<tbody>
<tr>
<td>Return (% p.a)</td>
<td>7.9%</td>
<td>18.4%</td>
<td>+10.5%</td>
</tr>
<tr>
<td>Risk (St Dev % p.a)</td>
<td>22.6%</td>
<td>20.0%</td>
<td>-2.6%</td>
</tr>
<tr>
<td>Sharpe Ratio</td>
<td>0.12</td>
<td>0.66</td>
<td>+0.5</td>
</tr>
</tbody>
</table>

Median includes all managers in the survey at each month to avoid survivor bias. Only 1 micro cap fund has a 10 year record, 8 funds had some period of performance in the survey. Assumes 5.11% risk free rate. S&P EC Index from June 2007, prior dates used Small Ords Index due to lack of history. Source: Schroders. Monthly returns from Mercer – before fees.

Starting from a position that passive small caps add no value relative to the large cap index, we can now refer to the results achieved in the past decade to see how active strategies have fared. For this analysis we exclude any value added (or subtracted) from manager selection and assume that the naive investor is able to access and realise the median manager return. We provide real world scenario analysis later in this paper to test the robustness of this assumption.

The median large cap manager monthly return over the past ten years delivered better than index returns, with lower risk and net managed to provide a Sharpe ratio improvement from 0.14 to 0.20.

The median small cap manager monthly return over the past ten years delivered better than index returns, with lower risk and net managed to provide a Sharpe ratio improvement from 0.08 to 0.43. Importantly, not only did active management result in a risk adjusted return that is better than both the passive and median active large cap manager, the absolute level of return achieved (12.37% p.a) was also greater than that realised for the passive and active large cap strategies (6.98% p.a and 7.84% p.a respectively) – suggesting there are absolute returns to be gained from adding active small cap strategies to a large cap equity portfolio.

Finally, the median micro cap manager monthly return over the past ten years also delivered better than index returns, albeit with higher risk but net still managed to provide a Sharpe ratio improvement on the S&P/ASX Emerging Companies Accumulation Index from 0.12 to 0.66. Once again, the absolute level of returns delivered of 18.39% suggests there is also absolute returns for be gained from adding active micro cap strategies to a large cap equity portfolio.

Note that as a relatively new strategy, the number of microcap managers in this survey is limited and may bias the results to an extent. Investors may be keen to screen out the relevance of the microcap results due to the limited number of fund in total (eight) and that there is only a single fund with a ten year track record. We believe that despite the relatively young state of microcap active strategies, as a niche way of adding alpha to portfolios it is every bit as valid as the private equity and hedge fund allocations which have swelled in recent years – albeit perhaps offering a less crowded opportunity for investors willing to investigate the merits of the opportunity. We also note that this strategy is severely capacity constrained with probably only A$500m to A$1bn of capacity available across existing managers. This limits the availability to smaller institutional investors that can make a meaningful allocation to the strategy and may provide a comparative advantage for smaller funds.

Why active small cap median alphas are high and persistent

One question this analysis raises is the structural inefficiency in the small cap market that allows for the median manager to deliver such a significant Sharpe ratio improvement over the benchmark. Although this requires more detailed analysis beyond the primary scope of this paper, there are factors that are consistent across geographies that drive this structural inefficiency, highlighted in a recent study by JP Morgan¹ that include:

- Sell side analyst coverage: Average large cap stock has between 13 and 16 analysts providing coverage, where in small caps this drops away to between four and nine. Microcap coverage then drops to less than four analysts per stock – with many microcaps having no analyst coverage at all.
- Media coverage: the average large cap stock receives between 1.5 and 2.5 average daily mentions in the major news outlets, where the average small cap stock receives less than 0.5 daily mentions.
- Institutional ownership: Outside the top 20 (where large privatisations such as Telstra and CBA skew the numbers), in general institutions have a greater ownership percentage of large cap stocks relative to small caps. If nothing else, this means that the institutional survey results are more representative of average investor returns for large caps.
- Liquidity: This is a very important source of alpha for micro cap stocks, which remain significantly less liquid than both large and small caps. There remains a liquidity difference between small and large

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caps although it is less pronounced. Velocity of turnover differences between small and large cap stocks have gone, however higher spreads (50bps for small caps vs 20bps for large) and market impact (80bps for small caps vs 30-40bps for large) remain.

- Capacity optimization: Analysis done by JP Morgan suggests that the average large cap manager chooses to optimise at a different point in the capacity / alpha curve than the average small cap manager. In their analysis, greater FUM eventually inhibits alpha potential in any strategy but is expressed on a curve – where a manager (or their clients) can theoretically choose the trade-off between FUM and alpha potential. Small cap managers according to the JP Morgan analysis have chosen to manage smaller levels of FUM in exchange for preserving higher prospective alpha.

- Benchmark Composition: The structure of the small cap benchmark is less concentrated than for large caps. Within the ASX/S&P 200, 53% of the benchmark can be covered in a portfolio of only 10 holdings of the largest benchmark weights. For the ASX/S&P Small Ords, the same number of holdings in the largest weights would only cover 15% of the index. Benchmark composition is likely to mean the active share (a measure of the potential for alpha) for small cap managers is higher than that of large cap managers. In addition, the small cap benchmark has greater sector diversification than the ASX200, the implications of which we explored in our paper A fundamental view of risk in small cap portfolios2 published November 2008.

- Off benchmark holdings: Although the data is difficult to confirm without detailed holdings data for all small cap managers through time, it is likely that the average small cap manager holds a greater percentage of their portfolio in names not in the benchmark than the average large cap manager. This would include both stocks that have migrated upward into the top 100 and have yet to be sold (most funds can hold these positions for between six and 12 months) as well as stocks outside the index for either size or liquidity reasons. This will again contribute to higher active share, the ability to optimise a portfolio over a broader opportunity set and the potential for better risk and return through time.

One potential criticism of any point-in-time analysis is the assumption of persistence for an outcome that is circumstantial. To test the robustness of the persistence of the small cap effect, the following three charts using three year rolling returns highlight:

a) the persistence in small cap alpha relative to the benchmark (refer Chart 1),
b) the persistence in large cap alpha relative to the benchmark (refer Chart 2), and
c) most importantly to our premise of adding value to large cap portfolios through active small cap management, the persistence of active small cap returns relative to active large cap returns (chart 3).

**Chart 1: Rolling 3 year small cap active fund excess returns relative to small cap benchmark**

Source: Mercers, Schroders. Performance before fees.
Chart 2: Rolling 3 year large cap active fund excess returns relative to large cap benchmark

Source: Mercers, Schroders. Performance before fees.

Chart 3: Rolling 3 year small cap active fund excess returns relative to active large cap funds

Source: Mercers, Schroders. Performance before fees.

Improving the efficient frontier of risk and return

Our hypothesis given the above facts is whether in combining these strategies there is an improvement in the risk return frontier available to equity investors relative to that from either the passive large cap index, or of more relevance the frontier of median large cap active returns. Intuitively, although all classes of equities, large, small
and micro cap are domestically domiciled some differences in sector composition and beta drivers should result in correlations that allow for some modest diversification benefits to result in combining these strategies. The evidence in the Australian market highlighted above is that the median active equity manager adds value through time relative to the benchmark. As access to the median manager is available to all investors we believe it is representative of the returns available to investors through time. Put another way, randomly selecting a manager, the probability is just as high that a top quartile as a bottom quartile manager would be selected. Assuming lots of investors selecting lots of managers, we would expect the median manager outcome to be most representative across the group. However individual managers, whilst achieving similar outcomes at the conclusion of a ten year period, may deliver a series of returns through time which are quite different driven by style biases unique to each manager. This is true between each of the three equity strategies we are combining, as well as within each group.

To create portfolios that are more representative of the actual return experience from each strategy we have run a Monte Carlo analysis where we have chosen a number of actual managers at or either side of the median outcome for each strategy and then run multiple combinations of each manager in each strategy to get a statistically significant distribution of combined portfolio outcomes. We have used eight large cap managers, seven small cap managers and in the more immature micro cap universe, only two managers here.

We then construct a blended portfolio of large cap, small cap and micro cap managers in a series of weights between large cap, small cap and micro cap allocations – starting with large cap only, then 90% large cap, 10% small cap and 0% microcap and through a series of discrete portfolios all the way through to a 40% large cap, 35% small cap and 25% micro cap portfolio.

The combination of managers used and the strategy weights applied to the combined portfolio yields 672 portfolio combinations (six combinations times eight large cap managers times seven small cap managers times two micro cap managers). The results of these scenarios are presented in Chart 4 below.

**Chart 4: Scenario Analysis of multi strategy portfolios**

With so many combinations of managers and strategies, the chart highlights the wide range of outcomes that would have been realised under each strategy. Even though we have chosen managers who over the ten year period produced the closest to median outcome of the peer group, manager selection still does skew the outcome of any strategy choice.
What this does provide, however, is a richer selection of possible risk return combinations that an investor may consider with respect to their own portfolio objectives. An investor who invests solely in large cap equities has a couple of degrees of freedom at the moment, largely around active vs passive and large cap manager selection within the active universe. What we highlight here is that there are additional opportunities to improve outcomes even if the median manager is the only option available (ie: naïve manager selection).

Because of the high correlation between strategies, it is not clear that there are pure diversification benefits from adding small or micro cap strategies to large cap, as may be found in other asset classes such as fixed income. That is, there are no portfolio outcomes that through adding small or microcap exposures can actually add enough uncorrelated return to decrease the absolute volatility of return. However, there is enough diversification by combining these three strategies such that per unit of incremental risk added, there is a big payoff in return achieved. We can observe this in the rising Sharpe ratios of the blended portfolios, relative to the index or large cap only portfolios.

The range of outcomes realised by the various portfolio combinations is measured along the single dimension of Sharpe ratios – the ratio of return to risk. This consolidates into one number the two axes from chart one. Chart 5 highlights a couple of implications for risk adjusted returns. Firstly, the average Sharpe ratio outcome improves as active small and microcap portfolios are added to the active large cap base portfolio, indicating that increased risk is more than being compensated for with increased return. Secondly the range of outcomes due to the greater return variance in small and micro cap returns could mean the possible outcome of the small cap blended portfolio could either be anything from slightly worse to significantly better than the base large cap portfolio dependent upon the level of small and micro cap investment.

**Chart 5: Multi strategy portfolios – Sharpe ratio outcomes (Min, Max, Average)**

How the outcome compares with large cap manager selection

Within the Mercer database, there are 59 large cap Australian equity managers with ten year performance track records. To be a top quartile fund, total returns needed to be over 8.73% per annum over the decade, or 175 bps above the S&P/ASX 200 benchmark. When the Sharpe ratios of these funds are calculated, to be top quartile a ratio of 0.27 would be required – a significant improvement on the 0.14 for the benchmark.

We can see from the charts above, that to generate ~8.7% p.a returns and a Sharpe ratio of around 0.27 we could use the median small and microcap managers for 10% and 5% of our portfolio respectively and we would average returns and Sharpe ratios of 8.6% and 0.25.
This is in no way suggesting that manager selection is not an important source of value add to an equity investment portfolio. It is simply highlighting that to focus only on large cap manager selection at the exclusion of small and microcap strategies reduces the number of opportunities investors have to realise their investment objectives.

References

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