Why Managers Put Marks on Benches

An Investor's Guide to Past and Future

by PAUL SCULLY

In setting performance goals, investment managers could — and perhaps should — apply benchmarking processes as a risk-control technique as well as an aid to adding value.

It is becoming almost a commonplace for managers to specify "benchmarks" for their investment funds. It is not certain, however, what all managers mean by the term, although a common theme is that of setting a performance objective — be it in terms of a market index, a percentage rate of return or the earnings generated by a particular fixed asset allocation.

This article focuses on the structure underlying the third of the above performance objectives and suggests that, if that structure is intended to convey to an intending investor more than mere signposting of the miles passed, and to impart topography and direction as well, the structure can (and perhaps should) be used in a forward as well as historical sense. The article shows how this might be done in the context of the capital asset pricing model (CAPM).

Discussion in this article is confined to actively managed funds.

Benchmarks are specified, first, as the proportions of the total fund to be held in the asset sectors into which investment will be made and, second, in terms of relevant market indices (preferably accumulation) for the particular asset sectors.

Implicit in this description is a model of the investment process as shown in Figure 1.

For the first level of the investment process, it is assumed that it is always possible to invest into a relevant sectoral market index.

In practice, even the decisions within a particular component of the investment process may be more complicated than the simple representation in Figure 1. For example, if the manager decides to maintain the end proportions from the previous period (second level — asset allocation) and the values of the assets in the various sector proportions move at different rates, there may be a need for intra-period re-weighting if cashflow provides insufficient scope for the purpose.

The process itself is obviously iterative.

The intention of the benchmark proportions

Benchmarks are said to express a neutral asset allocation but it is not clear what the word "neutral" is meant to imply or by what methodology a neutral asset allocation finds its way into the actual asset allocation decisions made by the manager.

One meaning ascribed to the word "neutral" is that of a default asset allocation to which the manager reverts when it has no strong views about the likely relative movements of asset sectors. Although helpful, this descrip-

Paul Scully is assistant general manager, research and planning, with Mercantile Mutual. He thanks Michael Sherris, Bao Nguyen and Bridget So for assistance and discussions. Some of the information in this article is taken from a paper co-authored with Nguyen.
tion does not necessarily imply anything about the character of the fund by which an intending investor can judge its likely suitability in fulfilling the investor’s needs.

The benchmarks should express the risk/return context in which active allocation decisions will be made. The benchmarks should be tested for appropriateness against fund investment policy objectives and liability characteristics. Policy objectives might include growth, with a corresponding focus on value movements rather than income; liability characteristics might include tax treatment, the degree of risk transfer from manager to investor, the existence and strength of guarantees given to the investor and funding relative to such guarantees. “Appropriateness” is used here in the context of the “longer” term, which itself needs to be specified.

In any shorter (ie, shorter than the “longer term”) period in which a decision needs to be made about departing from the benchmark proportions, the risk/return estimates for the fund according to the benchmark proportions should define the points of departure. It may be possible, for example, to achieve the benchmark risk or return with higher return or lower risk, as the case may be, with a different asset allocation.

The chosen asset allocation would presumably be constrained by sector movement ranges defined around the benchmark proportions as part of the benchmarking process.

In this way, the mapping of an intending investor’s utility function, even if this is done only implicitly or notionally, becomes a relevant exercise. It also gives meaning to the use of the benchmarks in defining the strategic performance objective for the fund.

In terms of the investment process discussed earlier, the strategic performance objective becomes the return generated by investing according to the benchmark sector proportions into the benchmark indices. The manager aims to add value above this objective, either as return value, therefore higher return, or as risk value, therefore lower risk.

The benchmarking process becomes part of a risk-control system for the fund as well as a performance objective-setting exercise.

**Benchmark “compliance”**

Define \( d(s) = w(p,s) - w(b,s) \), where the \( w \) terms are as defined in the section of this article entitled Attribution analysis. The \( d(s) \) represent the deviations by sector from the benchmark proportions. By definition, \( \sum d(s) = 0 \) in a single time period, where the summation is over all sectors.

A quick way of seeing how closely the actual asset allocations mirror the benchmarks is to calculate \( d(s) \), the average deviation by sector, over a period long enough to reflect the horizon according to which the benchmarks were set.

The \( d(s) \) are more useful than the active proportions as they automatically adjust to changes in the benchmarks.

It might also be interesting to investigate the \( d(s) \) for skewness as a means of illustrating possible implicit biases in asset allocation strategies and as a useful complement to what else is known of a manager’s style characteristics.

Begg has labelled the portfolio represented by the \( d(s) \) as the “swing portfolio”. He has proposed that it, rather than the actual portfolio, is the portfolio for which an optimum asset allocation should be sought.

### An aside on risk

Risk is a broad concept which can be applied to anything from the creditworthiness of an issuer to aspects of the actuarial management of a life office.

Here it is applied to the pattern of returns generated over time by the fund and is meant to capture the flavour of a downswing in return which exposes the investor to some undesirable vulnerability.

It is necessary to distinguish between notions which may be confused because of the way terminology is used: variability, volatility and risk.

Variability refers to the movement in returns about the mean and is measured by standard deviation. Volatility refers to movements in short time periods and is more properly measured by the slope of the variability curve. This sort of distinction is not new. Officer, for example, refers to the Sharpe risk-adjusted return measure as a “reward to variability” measure and the Jensen measure as a “reward to volatility” measure.

The measure of risk chosen for a fund should identify a level of criticality. In general terms, the risk measure would be sensitive, *inter alia*, to:

- analytical perspective — whether investor or manager;
- investment horizon;
- type of fund (eg, pooled vs indi-
### Attribution analysis

The added values sought by a manager are measured by attribution analysis. Attribution analysis seeks to break down overall return into the components identified in the first level representation of the investment process described earlier.

### Asset sector

<table>
<thead>
<tr>
<th>Sectorial securities</th>
<th>Benchmark Portfolio</th>
<th>Total return</th>
</tr>
</thead>
<tbody>
<tr>
<td>w[h,s] . r[h,s]</td>
<td>w[p,s] . r[p,s]</td>
<td>1 + Σ w[p,s] . r[p,s]</td>
</tr>
</tbody>
</table>

- w refers to the proportions of total assets held in an asset sector. r refers to return within an asset sector.
- The argument b refers to investment according to the benchmark proportions or into the relevant sectoral index, as the case requires. Similarly, the argument p refers to investment according to the actual portfolio sector proportions or the actual combination of stocks or securities in a particular asset sector, as the case requires.
- The argument s refers to a particular asset sector. Summations are over all asset sectors.

The measurement of the various investment skills within a single time period can be represented as:

- **Skill**: Benchmark selection x Timing x Securities selection
- **Measure**: 1 + Σ w[h,s] . r[h,s]

### Investment Process

- **Correspondent**: Asset allocation

### A capital asset pricing model application of the forward use of benchmarks

It is assumed that the CAPM is well known and details of the use and derivation of the model are not provided here. For readers unfamiliar with those details, see, for example, Harrington.

The proxy for risk used by the CAPM is variability, measured by standard deviation. The application requires the following:

- Identification of asset sectors;
- Identification of forward period;
- Specification of the benchmark and asset sector proportions;
- Specification of sector movement ranges; and
- Specification of return, variability and correlative estimates for each asset sector over the forward period.

An efficient frontier, representing total portfolio return and risk measures, is constructed from the above data by using the optimisation procedure built into the CAPM. Portfolio return and risk are also measured for the benchmark asset sector proportions.

The asset allocations along the efficient frontier which most nearly approximated page 36
proximate benchmark portfolio return and risk are identified. The sector proportions of the two asset allocations then define effective control subranges of the sector movement ranges for the forward period for the purpose of active asset allocation decision-making. Care is required in the interpretation and practical use of the control subranges. A process of review throughout the period is required to incorporate and adjust strategy to emerging sectoral results. The process is shown in diagrammatic form in Figure 3.

**Single sector applications**

While this article has been drafted with multiple-sector funds in mind, it is, of course, possible to apply the ideas to single-sector funds.

A single sector can be considered as comprising subsectors. For example, the domestic equities sector might be decomposed into listed industrial, listed resource and unlisted stock subsectors. Alternatively, blue and green chip distinctions might be used. The benchmarking process is then applied as if the subsectors were sectors in their own right.

**REFERENCES**


**Figure 3: Review and adjustment process**

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<tr>
<th>INPUTS</th>
<th>CALCULATE</th>
<th>RESULT</th>
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<tbody>
<tr>
<td>Identify Sectors: $S_1$, $S_2$, $S_3$, up to $S_n$</td>
<td>Benchmark portfolio return and variability: $p_{f, j}$ and $p_{t, j}$</td>
<td>Effective control subranges: $(w_i, w_i)$</td>
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<tr>
<td>Specify return, variability and correlated estimates over forward period</td>
<td>Series of $w_{ef}$, $r_{ef}$ and $v_{ef}$</td>
<td>$(w_{ef}, w_{ef})$</td>
</tr>
<tr>
<td>Set sector benchmarks: $w_1$, $w_2$, $w_3$, up to $w_n$</td>
<td>Series of $w_{ef}$ which most closely approximate $p_{t, j}$, designate as $w_{ef}$</td>
<td>$(w_{ef}, w_{ef})$</td>
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<tr>
<td>Set sector movement ranges: $(w_{1f}, w_{1h}), (w_{2f}, w_{2h}), (w_{3f}, w_{3h}), \ldots, (w_{nf}, w_{nh})$</td>
<td>Series of $w_{ef}$ which most closely approximate $p_{t, j}$, designate as $w_{ef}$</td>
<td>$(w_{ef}, w_{ef})$</td>
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**Affiliate Members**

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<td>Ernst &amp; Young</td>
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<td>R &amp; I Bank of WA Limited</td>
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