Identifying A Sponsor's Impact on Total Returns

Performance Attribution for the Total Portfolio

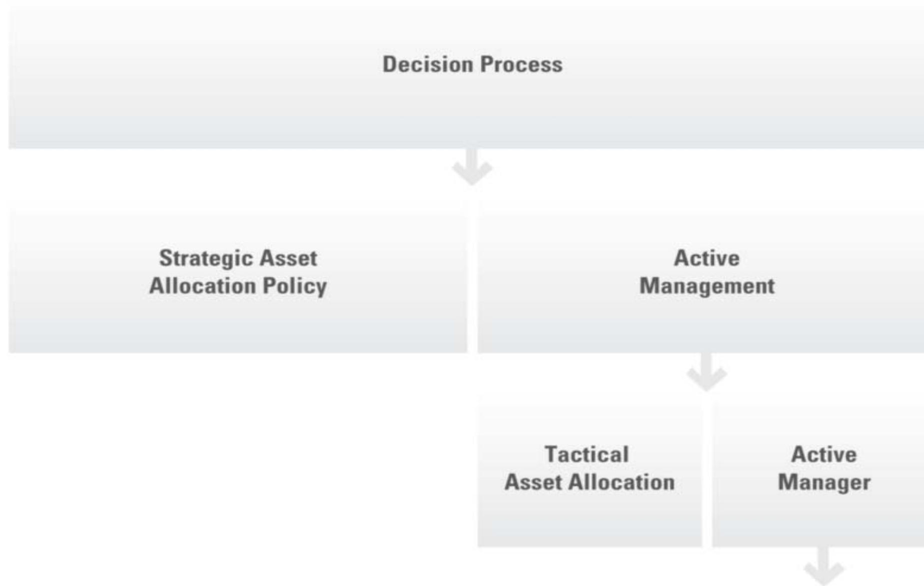
by **Cindy Sin-Yi Tsai, CFA, CAIA**
Senior Research Analyst
Morningstar, Inc.

Performance attribution is a well-recognized quantitative approach to identifying the outcome of investment decisions. Sponsors of pensions, endowments, and foundations view performance attribution as an important tool in their investment manager due diligence process. Some sponsors have applied it to evaluate their own investment decisions and describe the value they add to total returns. The consulting field has also broadened the application of such self-evaluation to wealth advisors and funds of funds (such as target-date funds). This document summarizes our white paper discussing the methodology for conducting total portfolio attribution and outlining seven critical challenges sponsors must consider when evaluating their options The full white paper can be found here.

Decisions in an Investment Portfolio

A sponsor's investment decisions fall into two general categories: strategic asset allocation and active management. The active management portion is further subdivided into tactical asset allocation and manager selection. Total portfolio attribution measures the impact of these investment decisions. The manager selection effect serves as a transition point between total portfolio attribution and micro, or traditional, attribution.

Plan Sponsor Decision
Total Portfolio Attribution



Manager Decision
Micro Attribution

©2010 Morningstar, Inc., All rights reserved. The information in this document is the property of Morningstar, Inc. Reproduction or transcription by any means, in whole or in part, without the prior consent of Morningstar, Inc. is prohibited.

Strategic Asset Allocation

Strategic asset allocation refers to a long-term asset allocation policy based on the investor's objective, risk tolerance, and other constraints. This is usually expressed as target weights in a list of asset classes. In terms of performance evaluation, this is often referred to as the policy benchmark, and it consists of combining policy weights with passive returns from conventional indexes or investable benchmarks. This represents the return an investor receives from passive investing, and it serves as an anchor for evaluating a sponsor's skills in active portfolio management.

Active Management: Tactical Asset Allocation

This refers to a sponsor's intentional deviation from the long-term policy allocation to capitalize on his or her bullish and bearish views on different asset classes. The attribution result that measures the impact of this decision is called weighting or allocation effect. Depending on the attribution model, this term may also be a reflection of the timing of a sponsor's rebalancing decisions. The weighting effect is an informative and intuitive number. Overweighting an asset class that has outperformed the total is a good decision, just as it is a good decision to have been underweight in an asset class that has underperformed. The converse is also true. An attribution analysis pinpoints whether decisions about over- or underweighting particular asset classes added or detracted value. Aggregating weighting effects from all asset classes provides an overall assessment of a sponsor's skills in tactical asset allocation.

Active Management: Manager Selection

Another portfolio decision is manager selection—deciding which managers to hire and fire and the timing of such events. In attribution terms, the manager selection effect represents the portion of excess return attributable to the sponsor's skill in selecting active managers who outperform their benchmarks. Intuitively, the manager selection effect is positive when a manager achieves a positive excess return over the designated benchmark. However, an investment manager's contribution to the portfolio may be small even if he or she significantly outperformed his benchmark if the manager was allocated little money. In this sense, total portfolio attribution is always focusing on the actions of the plan sponsor. Taken in aggregate, the manager selection effect provides an assessment of the sponsor's skill in picking active managers. Aggregating manager selection effects at the asset class level can identify whether the plan sponsor is more effective at picking managers in particular asset classes. It could even suggest asset classes that are better off being passively managed.

Planning for Total Portfolio Attribution

Total portfolio attribution is a largely underserved topic. Due to the scarcity (and expense) of commercial solutions, sponsors who recognize the power of attribution often resort to proprietary spreadsheets. The limitations of spreadsheets are many, and analysis that can be easily accomplished in a software system can be difficult and error-prone using a spreadsheet. The following seven critical areas should be considered when evaluating options for total portfolio attribution:

1. Data Collection

A software system containing public investment data on separate accounts, mutual funds, ETFs, insurance subaccounts, individual securities, etc. offers a considerable advantage over a spreadsheet. In addition, a software system with an easy process to import nonpublic information (such as proprietary funds, private equity, private real estate, etc.) adds value as a central data aggregator even when all the plan's investments are proprietary.

2. Portfolio Changes

A portfolio undergoes changes during a month. Assets might be reallocated among investment managers, the roster of investment managers might change, and cash flow might occur. While midmonth valuation, time-weighted rate of return on subperiods, compounding of attribution results, and manager changes can be easily accomplished in a software system, you risk errors using a spreadsheet.

3. Multiperiod Analysis

Attribution analysis is often calculated on a daily or monthly basis, while the evaluation period usually spans several days, months, or even years. This requires that daily or monthly attribution results be accumulated over the time period. However, the arithmetic method of attribution favored as the industry standard presents a problem when being compounded. Measuring success against a benchmark over several periods does not work arithmetically without using some mathematical-smoothing process (please refer to the full white paper here for detailed explanation). A number of smoothing methodologies have been proposed and debated in the past decade, and below are the cumulative attribution results with six multiperiod arithmetic methodologies for a sample mutual fund. You will immediately notice the discrepancy in results among methodologies:

Cumulative Attribution Results: Jan 1998—Sep 2009

Methodology	Weighting Effect %	Selection Effect %
Frongello/Wilshire (a.k.a. Portfolio Cumulative)	-2.74	8.05
Pro-Rating	-1.95	7.27
Menchero	0.37	4.95
Modified Frongello	1.39	3.93
Cariño	1.45	3.87
Reverse Frongello (a.k.a. Benchmark Cumulative)	4.53	0.79

The weighting effects have different signs, so some of the methods imply that the investment manager has made poor weighting decisions over time while others imply good weighting decisions. This discrepancy should give pause, and can certainly make you wonder which method to select. And, for those who are currently using one of these methods—especially the Frongello/Wilshire method and the Reverse Frongello—it implies potentially arriving at the wrong conclusion.

©2010 Morningstar, Inc., All rights reserved. The information in this document is the property of Morningstar, Inc. Reproduction or transcription by any means, in whole or in part, without the prior consent of Morningstar, Inc. is prohibited.

4. Multiple-Decision Hierarchy

Attribution analysis is more challenging when the sponsor makes tiered decisions, such as first having a broad, 60% equity, 40% fixed-income allocation, then diversifying the equity portion into various domestic and foreign asset classes, followed by allocations to investment styles. In a multilevel hierarchy, it is important to anchor a decision at the correct hierarchical level; otherwise an overweight in the prior decision could make a subsequent decision appear overweight and vice versa, thus arriving at the wrong conclusion. (Please see the full white paper here for an illustration). Make sure that your attribution system has a sufficiently robust methodology to handle the additional mathematical complexity of a hierarchical structure, especially in a multiperiod setting.

5. Premium/Discount in Closed-End and Exchange-Traded Funds

Closed-end and exchange-traded funds have two types of prices, one based on the net asset value (NAV) and the other based on market price. The difference is known as premium/discount. Many funds have NAV-based returns in positive territory while their market-price-based returns are negative and vice versa, and choice of which return to use can change the conclusion about a fund's performance. Each price provides useful information. The NAV-based return reflects the contribution from fund managers while the market-price-based return represents the economic value of the underlying investment. The solution for attribution analysis is to isolate the return attributable to change in premium/discount from the manager selection effect.

6. Distinguishing Between Skill-Based and Non-Skill-Based Numbers

Numbers unrelated to skill should be isolated; for example, costs such as investment management, investment consulting, advisory services, and other fees affect the final take-home return but do not represent investment decisions.

Another statistic that must be isolated is benchmark misfit, also known as style bias. For example, suppose that we have a U.S. large cap value manager within the large cap asset class, and he outperforms his benchmark, the Russell 1000 Value index, but underperforms the asset-class level benchmark of the S&P 500. The underperformance compared to the S&P 500 should be decomposed into two components: a positive manager selection effect for outperforming the style-specific benchmark and a negative benchmark misfit measure to represent that the value style of investing is currently out of favor (indicated by the Russell 1000 Value underperformance relative to the S&P 500).

7. Attribution as Communications Tool

Last but not least, more than being an in-house analytical tool, an attribution report should be an effective communications tool to a sponsor's clients, investment committee, or board. As such, attribution results should be conveyed in combinations of charts and tables designed and labeled to meet the needs of audiences of varying levels of sophistication.

Conclusion

There are many factors to consider when making a build-or-buy decision, or contemplating transition from proprietary spreadsheets to a commercial software application. As you evaluate potential solutions, be sure to include the following in your assessment:

- The extent and flexibility of data management capabilities
- How portfolio changes and multi-period accumulation of attribution results are accommodated
- The ability to support attribution on a portfolio with multiple asset classes, investment mandates, and managers
- Clear and understandable reports, graphics, and other communication materials

©2010 Morningstar, Inc., All rights reserved. The information in this document is the property of Morningstar, Inc. Reproduction or transcription by any means, in whole or in part, without the prior consent of Morningstar, Inc. is prohibited.