Active Share in Three Dimensions: New Insights for Equity Managers
Research that expands Active Share from a single dimension (stock-selection relative to benchmark) to a three-dimensional picture, by adding country and sector selection.

Active Share ("AS") provides a simple measure of the degree of stock selection "activeness" within a portfolio. That simplicity has made it popular with consultants and investing institutions and has led to it being promoted by many asset managers in the context of "we have high AS, and that's a pre-requisite for good performance".

Leaving aside the debate over "how high is high", and the tendency to overlook that high AS can increase the chance of performing differently from benchmark in **both** directions, the very simplicity of AS may undermine its effectiveness in differentiating investment products. A manager may claim high AS, but if all its competitors claim likewise, there's no significant information advantage for either the manager or investors.

In this article, we show how AS methodology can be used to create a three-dimensional measure that is a genuine competitive differentiator, by providing insights into what stock, country and sector active decisions are made in a portfolio. This approach is most effective for global and international managers but can also provide some insight for domestic managers as well.

One dimension of this three-dimensional Active Share ("3-D AS") is the existing (stock) AS. The other two dimensions are Country Active Share ("CAS") and Sector Active Share ("SAS"). We have developed CAS and SAS using the same formula as AS to measure the activeness of a portfolio's country and sector selection decisions. Similar to AS, each is a number between 0 and 100.

Exhibit 1: Country Active Share and Sector Active Share for three active international equity portfolios with similar (stock) Active Share, end 2017
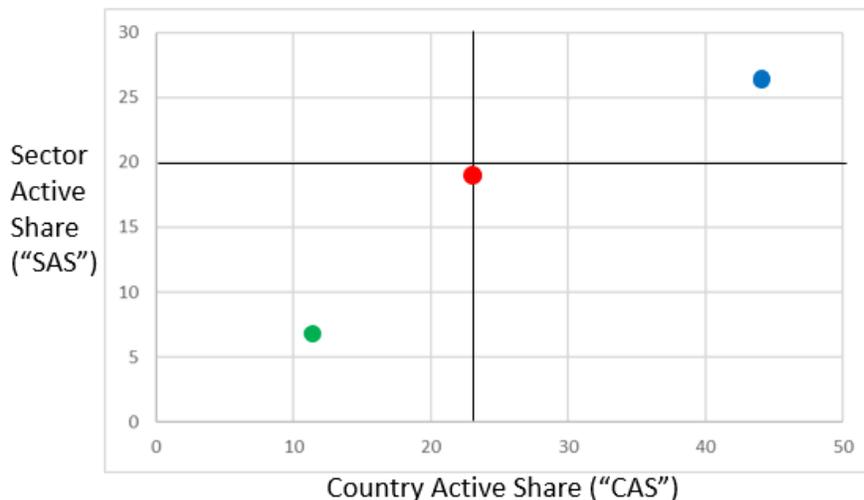
Source: Morningstar Direct, 12/31/2017
Note: expected median AS for EAFE-benchmarked portfolios is 82 and these three portfolios all have AS in the range 82-85; median lines for CAS and SAS added for context

As an example, in Exhibit 1, we show three international equity portfolios from a peer group of EAFE-benchmarked portfolios. They have similar, above-average Active Share, but different CAS and SAS scores.

The portfolio at the top right (blue dot) has both high Country Active Share and high Sector Active Share. This is a typical result for benchmark agnostic "stock-picking" managers. A manager that claims to be indifferent to country and sector benchmark weights might be expected to have portfolios with high CAS and SAS most of the time, although occasionally their CAS and/or SAS may be lower.

Portfolios that have a more traditional "top-down, bottom-up" core approach tend to cluster near the center of the chart, and the red dot is illustrative of these. In contrast, while the portfolio at the bottom left of Exhibit 1 (green dot) has a similar (stock) Active Share to the others, it has low scores for both CAS and SAS. This is typical of portfolios that keep their allocation weights close to benchmark but may still aggressively pick stocks inside each country/sector segment. Often these are quantitative or "benchmark-constrained" portfolios.

As well as verifying that a portfolio's claimed process does appear to be applied, CAS and SAS can help differentiate between competitors with similar investment approaches as well as similar AS. All the portfolios in Exhibit 2 are managed by bottom-up stock pickers and all have top quartile AS: not just above average, but genuinely high. On those criteria, it may be hard for investors to distinguish between them, or for the managers to show differentiation. But when CAS and SAS are considered, the differences become visible. (Note that Exhibit 2 shows only the top right quadrant from Exhibit 1).

Exhibit 2: Country Active Share and Sector Active Share for six bottom-up international equity portfolios all of which had top quartile (stock) Active Share as of end 2017
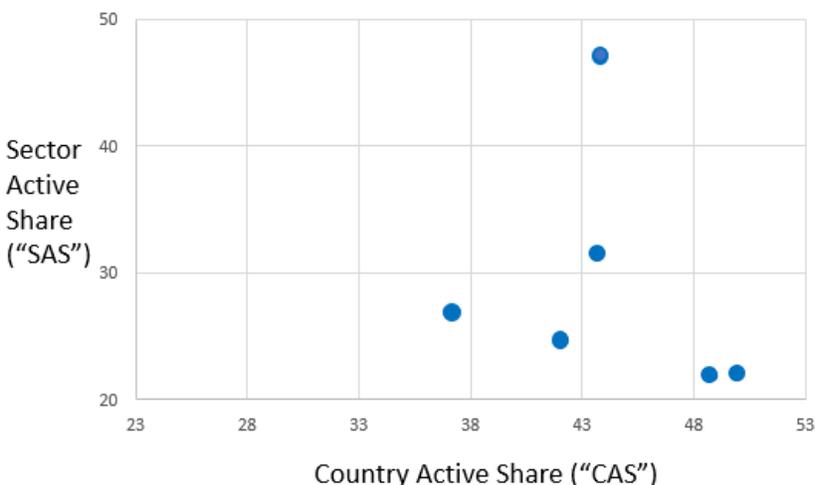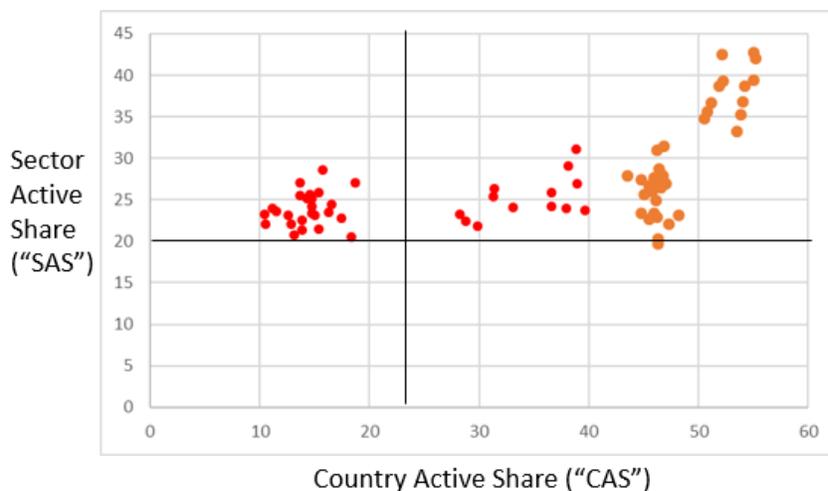

Source: Morningstar Direct, 12/31/2017
Note: chart area is the top right quadrant of Exhibit 1; portfolios are not the same as those in Exhibit 1

To gain the most value from this type of analysis, it is important to view the 3-D AS picture over a reasonable period of time. For a single portfolio this helps determine the persistence of the CAS and SAS scores to evaluate whether a portfolio is managed consistently in the style its manager claims. For comparisons between peer groups of portfolios, it may reveal whether the current scores are representative of past history, or aberrations that will likely occur from time to time.

In this context, CAS and SAS have an important practical advantage over AS. To calculate a portfolio's stock AS, the data requires not only the capitalization weight of all its holdings, but also the weight of all the benchmark holdings. This is quite data intensive and makes it an arduous task to calculate the history of AS for a single portfolio over time, and more so for even a small group of competing portfolios. However, the availability of historical data on country and sector allocations is extensive, and the number of countries (twenty-one in EAFE, for example) or sectors (eleven), makes historical comparisons more practical to calculate for CAS and SAS.

Exhibit 3 shows how this time-series analysis can reveal the extent to which portfolios stay "true-to-style" or are impacted by manager or process changes. The orange dots profile a benchmark-agnostic, bottom-up concentrated portfolio, and the plots over the past ten years seem consistent with that claim, remaining clustered over time with high CAS and high SAS scores. However, the "red dot portfolio" plots appear in two distinct clusters, one with low CAS, and the other with moderately high CAS. It's not marked on the chart, but all the red plots in the top left quadrant occurred after 4Q 2010, and all the ones in the top right quadrant were from before that date. This suggests some significant change at that time, and an examination of the portfolio's history reveals that both manager and process changed around that time.

Exhibit 2: Country Active Share and Sector Active Share over time for two international equity portfolios; plots for each quarter, end 2007 to end 2017

Source: Morningstar Direct, 12/31/2017
Note: median lines for CAS and SAS as of end 2017 are added for context; portfolio plots cover a ten-year period and so actual medians over that time will have varied.

To add some perspective, CAS and SAS scores are generally lower than (stock) AS, which for example frequently produce AS numbers over 90 for global equity portfolios, The majority of CAS and SAS scores tend to cluster in a range of 15-35. The maximum and minimum scores observed over a ten-year period for a peer group of 65 international equity portfolios were 64 (maximum) to 7 (minimum). Interestingly, this range applied to both CAS and SAS, although CAS scores were generally (but not always) higher than SAS scores.

One reason why Sector Active Share scores are generally low in contrast to CAS and AS, is that there is "no place to hide". For (stock) Active Share, one common reason for a high score is that a portfolio owns

equities that are not in the benchmark, and such holdings immediately boost the AS score. This is also a possible way for a portfolio to boost its CAS: by allocating to stocks in countries not in the benchmark. For an EAFE portfolio, for example, owning US or Emerging Market stocks will produce this result. But for Sector Active Share, there is no such escape route to a higher SAS score. Every stock is assigned to a sector, and by definition the portfolio manager cannot own "off-benchmark sectors". With that escape route closed, it is reasonable to expect that SAS scores will typically be lower than CAS scores, and it may well be that high SAS scores are especially worth investigating as they may be very revealing of a manager's style.

While the use of three-dimensional Active Share primarily improves analysis of global and international equity portfolios, there are also benefits for domestic-only investors. It's true that CAS may be of limited value to them, other than revealing when portfolio managers are allocating outside the home country, presumably to try to boost returns by going "off-benchmark". On the other hand, looking at SAS in a domestic-only portfolio may be useful, given that there is no similar "off-benchmark" escape route. In that context, SAS comparisons are statistically rigorous, and a two-dimensional profile (SAS and AS) may well be a useful additional tool for US equity portfolio analysis.

Active Share has fueled much debate in the investment industry over the past decade, much of which has focused on the link between Active Share and performance. We believe that looking at three-dimensions of Active Share will contribute to this discussion, as it provides a significantly improved understanding of what may be driving the portfolio process and outcomes.

In addition, we believe 3-D AS can provide answers to a number of other questions commonly-asked by global investors:
- Is there a simple way to differentiate clearly among a group of portfolios with similar Active Share?
- Does the manager's stated investment process match observable portfolio characteristics (essentially, do they do what they say they do)?
- To what extent has a portfolio manager's process changed over time?
- What level of holdings-based risk is embedded in a portfolio in terms of country and/or sector differences from benchmark?

It is true that all of these questions can be answered using other, existing methods to analyze portfolio characteristics. However, the advantage of 3-D AS is its simple and intuitive numerical framework, which makes it much easier to present understandable information that is useful and actionable by the investor. The next articles in our 3-D AS series will use this approach to provide more detailed analysis of international and global equity peer groups, as well as investigate the link between 3-D AS and performance.

In our opinion, introducing CAS and SAS to bring Active Share analysis into three dimensions is a positive step, allowing asset managers, investment consultants and their clients to gain a new level of understanding into their portfolios.

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