Active Share

Looks like a lion, manages like a lamb

Looks like a lion, manages like a lamb[1]

It has long been said that past performance is not an indicator of future performance. As such, allocating assets to a new manager requires some degree of forecasting in order to estimate how probable it is that they will outperform in the future. It goes without saying that investors would only want to select managers with the best chance of outperforming.

In the search for meaningful ways to gauge a manager's chance of future success, investors have been focusing on active share, a metric showing the extent to which a manager's portfolio differs from an underlying benchmark. Some interpret this as the manager's conviction in their portfolio – by extension, a manager with high active share looks like a lion.

Today active share is much talked about, often misunderstood and occasionally misused. There is a danger, caused perhaps by our deeply-ingrained behavioural biases that drive us to believe we are more capable of predicting the future than we actually are, that this single metric could be considered to be *the* measure of expected future performance. Far from it. That would be a gross oversimplification. Active share indicates how extensively a fund manager's portfolio differs from their assigned benchmark, but provides no insight into their level of investment skill. It can only really be considered in the context of other factors, such as tracking error, to gauge how skilled a manager is and, therefore, how they might be expected to perform in the future. Without the presence of skill, a manager that looks like a lion based on their active share might actually manage like a lamb.

Recent research has also raised questions about how applicable active share really is in today's world, as some of the relationships revealed by analysing older data sets appear to break down in the more recent past.

In this paper, we will review the original academic work that brought active share to light, and then consider some research updates on the topic. We will also have an opportunity to look at some of the key assumptions and considerations which must be taken into account when using this metric, and then analyse the individual elements upon which active share is based. Finally we will consider some additional metrics which would serve equally well in an investor's toolbox.

The original research

Active share simply shows how far a portfolio deviates from its benchmark, and in some sense can indicate a manager's conviction in their holdings. It measures the degree of deviation from a passive index from a holdings-based perspective. It can be compared to actual tracking error, which largely fulfils a similar function from a returns-based point of view.

Active share is calculated as the sum of the absolute value of the differences between the weights of the securities in a portfolio and the weights of stocks in the fund's benchmark, divided by two:

$$\text{Active Share} = \tfrac{1}{2} \sum_{i=1}^{N} |w_{portfolio,i} - w_{benchmark,i}|,$$

where $w_{portfolio,i}$ is the weight of stock i in the portfolio, $w_{benchmark,i}$ is the weight of the same stock in the benchmark index, and the sum is computed over the universe of all assets.

Ex-post tracking error is typically given as the standard deviation of excess returns generated by a portfolio over its benchmark:

$$\text{Tracking Error} = \sigma(R_{portfolio} - R_{benchmark}).$$

Clearly, active share and tracking error measure different specific data points. The former is a point-in-time metric and taken by some as a reasonable proxy for stock selection, whereas the latter is a historic time-series measure.

Alternatively, ex-ante, or forecasted, tracking error offers a forward-looking measure of the amount of risk a manager would take with respect to a benchmark – as with any forecast, though, it is vulnerable to the assumptions underlying the risk model used to calculate it. A portfolio of concentrated stock picks with all its holdings in one industry, for example, will exhibit high ex-ante tracking error. By contrast a more diversified portfolio that holds a single position in each industry covered by the index could well also have high active share, but would more likely have low tracking error as most of the risk in its active positions would be better mitigated through diversification. In that sense, we can think of high active share as being more indicative of a manager's propensity to pick stocks whereas tracking error could be a better proxy for their factor exposures.

A more complete picture of an actively managed portfolio would be given by using a combination of both measures (see figure 1). Setting pure passive indexation to one side, academic duo Cremers and Petajisto identify four sub-groups within the active management universe. Closet indexers show low tracking error and low active share, while concentrated stock pickers would score highly on both measures. Factor timers would likely combine high tracking error with low active share, and vice-versa for diversified stock pickers. Appropriate cut-offs in the data permit a fairly clean segmentation of the universe of US equity mutual funds, such that the authors can meaningfully distinguish between different styles on these two measures alone. At Hermes, we can plot our own funds on a similar basis at the end of January 2015 (see figure 2). The Hermes equity portfolios naturally classify themselves as diversified stock pickers.

Figure 1: Different styles of active management

Source: Cremers and Petajisto, 2009

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1 Rekenthaler, J, 2014, 'Active Share: What You Need to Know', *Morningstar research paper*

In their original study, Cremers and Petajisto explored the relationship between the different fund sub-groups and other variables of interest such as fund size, fees, flows and past performance. Critically, they found that "funds with the highest active share exhibit some skill and pick portfolios which outperform their benchmarks by 1.51-2.40% per year." This relationship held even after the inclusion of fees and transaction costs, and was in stark contrast to funds with the lowest active share. They found no such similar relationships, however, between ex-post tracking error and historical performance. Further still, their benchmark-relative results were robust even when considered in the context of the four-factor Carhart model of equity returns, offering evidence that beta, value, size and momentum exposures did not lie behind their results. Finally, they concluded that, for the group of US equity mutual funds whose 1980-2003 performance they analysed, "active management, as measured by active share, significantly predicts fund performance relative to the benchmark."

Figure 2: Hermes funds categorised
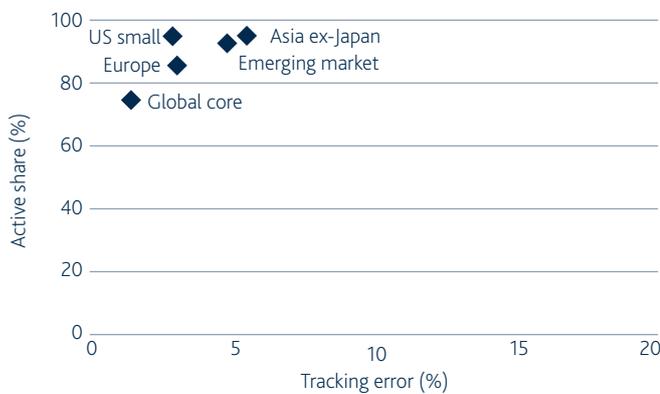
Source: Hermes, BARRA

A limited study of global and global ex-US fund universes by Lazard Asset Management covering a shorter time period, from 2007-2011, revealed a broadly similar pattern (see figure 3). Does this provide further compelling evidence, or is this simply a sample-specific result?

Figure 3: Active share and performance for Global and International Funds

Active share quintile	Average active share (%)	Gross return (%)	Net return (%)
High	92.8	2.33	1.17
	86.2	1.69	0.44
	81.1	1.52	0.37
	75.1	1.26	0.17
Low	59.3	0.10	-0.95

Source: Lazard

Further research

Subsequent studies conducted by Petajisto again, by Schlanger et al, and most recently by Mezrich and Ishikawa, either on expanded or different data sets, weakened the original proposition.

Petajisto expanded the data set he originally studied with Cremers by six years, and although he found a statistically significant relationship between active share and future returns, it was strongest for small-cap funds, a point we will return to later in this paper. He also suggested that "stock-level dispersion can be used to identify market conditions favourable to stock pickers", and that diversified stock pickers exhibited the greatest level of persistence among the different categories.

Using five pre-determined metrics, Schlanger et al split their data window into an evaluation period and a separate performance period. Three measures describe the portfolio's positioning – active share, portfolio concentration and style drift – and two show historical performance – excess return and tracking error (see figure 4).

Figure 4: Schlanger study

Evaluation period	Performance period
Active share	Excess return
Concentration	Tracking error
Style drift	
Excess return	
Tracking error	
Jan 1, 2001	Dec 31, 2005 Dec 31, 2011

Source: Vanguard

They found very low correlations between their five predictive measures throughout the evaluation period and the excess returns in the performance period, and near-symmetrical dispersion of excess return above and below the benchmark index for all levels of active share. They concluded that "the portfolio manager's bets must also be accompanied by manager skill, and the overweights must be in the outperforming stocks. Thus active share by itself does not indicate whether a fund will outperform."

With a data history focused more on recent years – from 2004-2014 – and a slightly broader universe of US equity funds, Mezrich and Ishikawa found no particular performance benefit associated with high active share. They also suggested that earlier results must have been driven by the pre-2003 period, which is supported by research by Cohen et al for Fidelity and our own work (see figure 5). In the last decade, the authors find that active share has been a less reliable indicator of fund manager success than it was previously believed to be.

**Figure 5:** Top three active share deciles rolling average excess return

Source: Hermes, CRSP, Bloomberg, www.petajisto.net. Returns are net of fees

Assumptions and considerations

However, there are a number of considerations with Active Share that must also be taken into account.
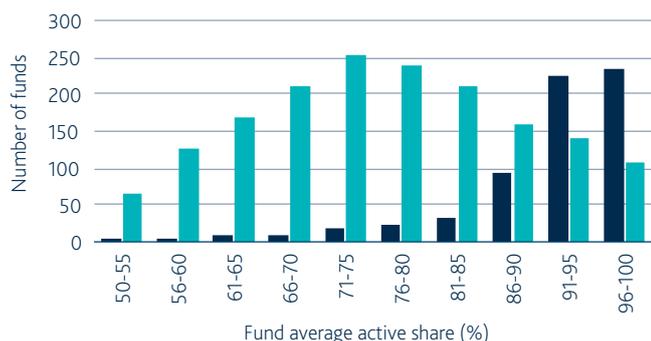
We can also demonstrate that the distribution of active share levels is clearly linked to the size classification of a portfolio (see figure 6 and 7).

Figure 6: Active share distribution
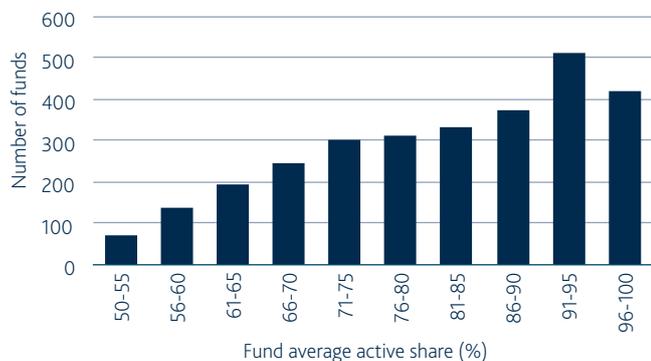
Source: Hermes, CRSP, Bloomberg, www.petajisto.net as at 31 December 2009

Figure 7: Active share distribution

Source: Hermes, CRSP, Bloomberg, www.petajisto.net as at 31 December 2009

We found that small-cap funds tend to have a disproportionately high active share: the effect of the small-cap funds in the sample skews the entire distribution.

This significant exposure to small caps could well be one of the reasons for the outperformance of higher active share managers in the original study. As opportunistic investment in outperforming small caps should provide evidence of manager skill, one would expect to see some variability in active share levels in common with the success of small-cap exposures. However, the data show the relationship between active share and small cap performance is less dynamic than might be expected.

We must also consider the nature of the benchmark index when looking at active share numbers. The majority of benchmark indices are capitalisation-weighted, and the more top-heavy an index is, the lower the active share that funds competing against it will tend to have, relative to other indices in which stock weights are more evenly dispersed. This arises quite simply as a result of potential neutral weights being given to the larger constituents of the benchmark – a top-heavy index will necessitate muted active share, unlike a flatter benchmark. This makes comparison of active share across funds a more subtle exercise.

Consider, single-country indices that are dominated by a small handful of securities accounting for more than half of the benchmark's total market capitalisation. Managers running portfolios against such indices naturally find it harder to generate a high active share – particularly since a holding in the dominant firms is almost essential for controlling risk.

Active share doesn't involve any consideration of portfolio risk, when, either explicitly or implicitly, one would imagine that a core duty of a fund manager is to run a portfolio in accordance with a desired level of risk. Indeed, this concept underpins the relationship between tracking error and active share (see figure 8). The correlation between active share and information ratio – the excess return per unit of active risk – is also marginally positive, but there is also a similarly strong (and undesirable) relationship between active share and downside risk[2] (see figure 9). This suggests there is no guarantee that managers with high active share universally have the skill to match their levels of conviction.

Figure 8: Active share decile excess return and tracking error
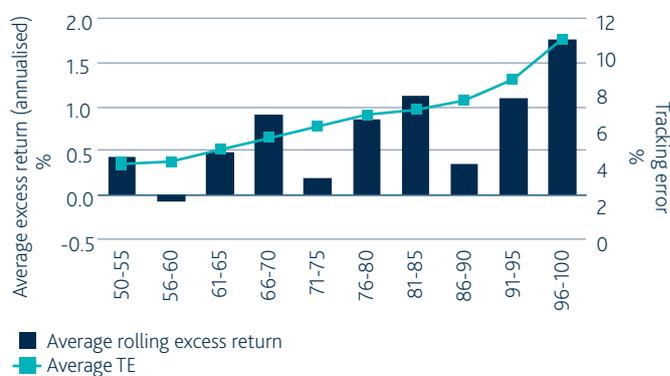
Source: Hermes, CRSP, Bloomberg, www.petajisto.net as at 31 December 2009

Figure 9: Active share decile IR and downside risk

Source: Hermes, CRSP, Bloomberg, www.petajisto.net as at 31 December 2009

More generally, there are concerns about the metric being a single-point-in-time figure, where a study of an active share trend over a long-term period might be more meaningful.

2 Downside risk is defined as the standard deviation of negative relative returns

Generating active share

Active share can simply be increased by off-benchmark holdings (for example, if a large-cap manager bought small-cap stocks). In many instances, off-benchmark exposures may reflect the manager's skill in selecting investments opportunistically, but there is no guarantee that they will be winning positions. Where an investor achieves their equity exposure from multiple managers, an understanding of the true nature of active share is an absolute necessity.

It is instructive to think about the source of a manager's active share, and whether there is consistency between how it is created and the manager's investment philosophy and mandate.

More precisely, we can make an attempt to decompose returns into the component pieces that arise from deeper analysis of active share. This allows us to gain a greater understanding of the evolution of active share and its time-series interaction with other informative metrics.

We can think of four ways in which a manager can vary their portfolio holdings relative to the benchmark: by simply over- or underweighting positions relative to their benchmark weights, or by holding off-benchmark weights, which can be separated into positions that maintain the structure of factor bets relative to the benchmark of the portfolio as a whole, versus those that introduce additional factor exposures (cash would be a simple example of this latter effect).

The relative success of over- and under-weights offers some insight into where the strengths of a particular manager lie: do their best ideas manifest as 'long' or 'short' positions relative to the benchmark? However, a very broad benchmark might impede realistic research coverage, and potentially increase the number of indirect underweights. Similarly, shorting restrictions might impact the asymmetry between the number of over- and underweight positions in a portfolio.

Introducing off-benchmark holdings without altering the overall portfolio's relative factor exposure may, in some sense, be a true representation of a manager's stock-picking ability. Equally, off-benchmark holdings that take no account of factor tilts may simply indicate the most unconstrained of mandates, and using the widest opportunity set may be exactly the right thing to do. Whatever the intention, off-benchmark holdings will require the most dynamic risk management techniques in order to avoid the potential for significant drawdowns. A detailed understanding of the risks involved becomes a prerequisite.

Thinking about active share in terms of its component pieces should also allow the concept to be applied to fixed income and multi-asset strategies.

Additional metrics

What other metrics might an investor want to consider when investing with a particular manager? Setting aside forward-looking risk measures, which involve some dependence on models, there is an array of summary statistics that might offer some guidance as to the nature of the manager – their process, what makes them tick and where their strengths and weaknesses lie, for instance – that can be considered.

We can split portfolio activity into different tasks – finding winning stocks, selling losing securities, and knowing when to recycle or hold on to a particular name. In terms of the first skill, a percentage hit rate will provide an indication regarding the subsequent performance of a manager's buying decisions (see figure 10). Values greater than 50% illustrate that more than half of a manager's buying decisions were correct – consistency is also pleasing, and by looking at different time horizons, one can begin to discern how sustainable a particular manager's strategy is over the long term.

Figure 10: Hit rate
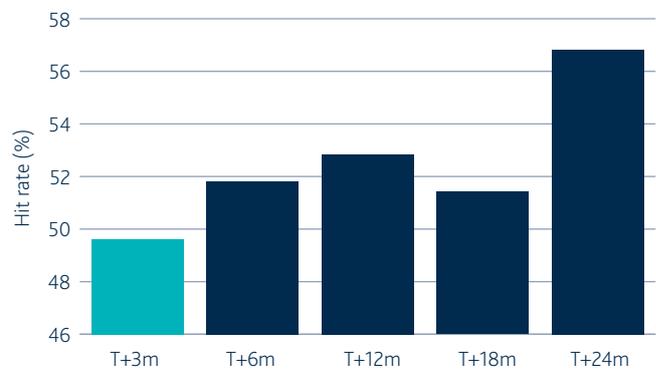
Source: Hermes, Inalytics, based on Sourcecap portfolios June 2009-January 2015

Of course, not all of a manager's investments will be good decisions, and we can also analyse this across different time horizons by considering their returns ratio. This simply compares the outperformance of the manager's good decisions against the underperformance of those that weren't so successful (see figure 11). Values greater than 100 are ideal as they show the winning stock picks have exerted a greater impact than the losers.

Figure 11: Returns ratio
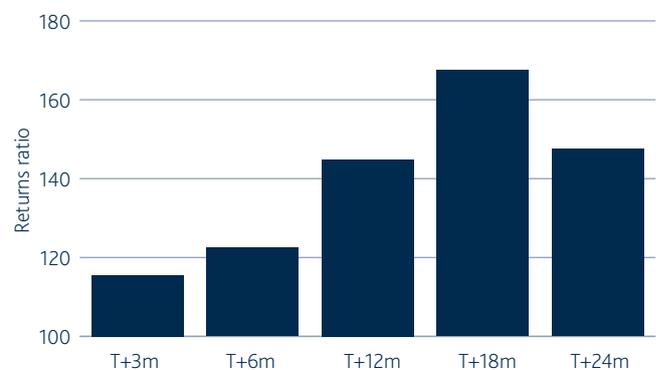
Source: Hermes, Inalytics, based on Sourcecap portfolios June 2009-January 2015

We can, of course, go beyond average measures and gain a more detailed look at how certain metrics have evolved over time. We might choose, for example, to examine the time series of the manager's average return post trade for a particular time horizon, such as, 12 months (see figure 12). This would demonstrate a degree of persistency in their ability to find winners within a particular timeframe that they might claim is their 'sweet spot', and we can check whether the numbers support that claim.

Figure 12: Timing history
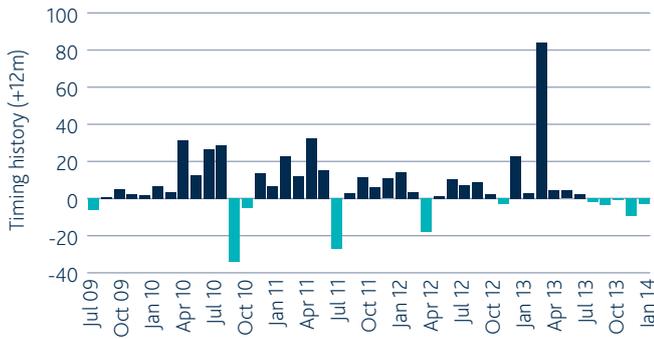
Source: Hermes, Inalytics, based on Sourcecap portfolios June 2009-January 2015

The ability to know when to sell a particular position is the second skill that we can seek evidence of, and we can examine similar measures as before (see figure 13). This time, we are studying the percentage of a manager's selling decisions that subsequently proved correct as the stocks went on to underperform – as before, values greater than 50% are desirable as these indicate that more than half of the selling decisions were good ones. Other metrics can be applied to selling as they are to buying. The danger we seek to avoid is that a manager spends too much time looking for their next big idea and that selling simply becomes a means of raising cash rather than crystallising profits.

Figure 13: Hit rate
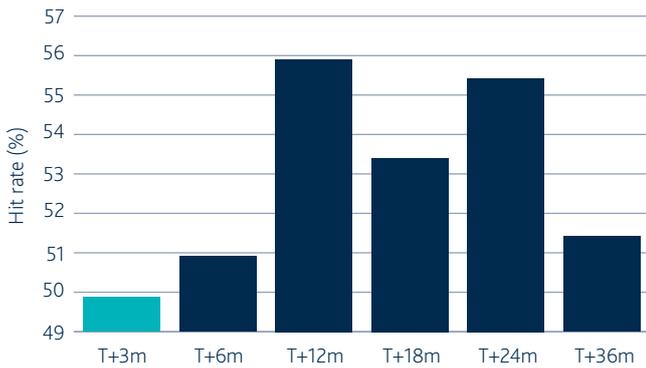
Source: Hermes, Inalytics, based on Global Equities portfolios June 2010-January 2015

The third metric that investors could examine in more detail is the actual holdings themselves, and to do this we can compare the performance of the over- and underweight positions relative to the benchmark (see figure 14). We can also link the periods of cumulative value added with days when the market rose or fell, or to particular periods that might have favoured a particular style or sector over another.

Figure 14: Total value added

Source: Hermes, Inalytics, based on Global Equities portfolios June 2010-January 2015

Lastly, we can take a closer look at a manager's appetite for risk (see figure 15) by gauging how a manager sought to vary their active share over time, and how many stocks they felt they needed to own to display their level of conviction at different periods in time.

Figure 15: Risk appetite

Source: Hermes, Inalytics, based on Global Equities portfolios June 2010-January 2015

This is just a small selection of the metrics available to an investor that, in addition to active share and tracking error, provide a more complete picture of a particular manager's ability to outperform. These measures serve to provide detailed information about their consistency of process, portfolio construction and level of conviction. Track records alone can be poor guides to the future because they yield little information about the skills that generated the outcomes, nor any inference about the likelihood that they will be repeated. A more granular approach to understanding performance is required.

Conclusion

We have seen that active share is a measure of how much a portfolio's holdings differ from the benchmark. It provides one insight into the level of active management in a portfolio, and although higher active share may represent the potential for generating excess returns, there cannot be any guarantee that outperformance will be delivered unless it is combined with another key ingredient: skill.

It is not sufficient only to have the skill to identify opportunities. That must be allied with an ability to construct portfolios so that the size of individual positions will be commensurate with the size of the opportunity and the risk taken. A portfolio picked by an unskilled manager with high active share will be more likely to significantly underperform. This conclusion was reached by Cohen et al: "Without perfect foresight as to a manager's level of skill – and given the fact that even skilled managers do not have completely consistent batting averages – an investor must again weigh the trade-offs implicit in choosing managers with higher levels of active share".

For that very reason, the Hermes Investment Office, which analyses the processes and performance of our fund managers on behalf of clients, promotes a focus throughout the organisation on strong and consistent risk-adjusted returns. In seeking this, other measures of forward-looking risk and a deeper level of understanding about a manager's strengths and weaknesses form an important consideration alongside active share. Active share holds a great deal of practical utility for assessing active managers, but cannot be used in isolation and will be one in a set of tools available for investors trying to identify managers that are capable of delivering desired outcomes.

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