Invesco White Paper Series on the Active/Passive Debate

This white paper was generated in conjunction with Invesco's global Investors Forum, based on research conducted by Invesco's US Product & Market Research group. The Investors Forum brings together each of Invesco's 750-plus investment professionals from around the world to discuss issues that are critical to global investors.

Think Active Can't Outperform? Think Again

Examining the historical outperformance of active management

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Questions routinely arise about the value of active investing: Can active managers beat their benchmarks? Should investors abandon active strategies? Invesco conducted an extensive study of approximately 3,000 equity mutual funds over the past 20 years – covering five distinct market cycles – to investigate the true value of active management. Our study focused on active share, which measures the difference between a fund's holdings and the holdings of its benchmark index.

Our results show that during these five market cycles, in aggregate, more than 60% of high active share fund assets outperformed their benchmarks, after fees, in a variety of measures – excess returns, downside capture and risk-adjusted returns. The current market cycle is ongoing. Despite significant headwinds – a beta rally with low-quality stocks outperforming, an unprecedented three phases of quantitative easing, and higher correlations across individual stocks and sectors – active management remains competitive across these three measures. Moreover, these results were seen in a wide variety of equity asset classes and cap sizes – even after accounting for fees.

Notably, benchmark-beating performance was not limited to only the funds with the very highest active share levels. We used 60% as the dividing line between high and low active share, and approximately 70% of the fund assets studied (representing 90% of the funds) had an average active share score above this threshold.

Because the drivers behind active share can vary so dramatically, as we discuss later in the paper, we believe this measure is best viewed in combination with other factors such as investment process and philosophy, manager experience and other qualitative measures. While investors have many factors to consider, our study displays that during the past two decades, active management in general has delivered better performance over passive options that stick more closely to market-cap-weighted benchmarks.

Invesco's perspective on the active/passive debate

At Invesco, we believe the greatest opportunity for investors to achieve their unique objectives is through a well-constructed portfolio that spans asset classes and considers both truly active and strategic beta strategies.

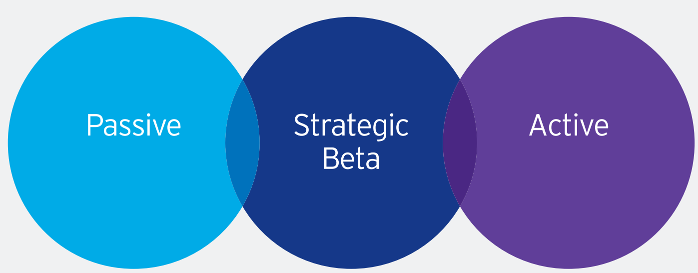
In this white paper series, we will present the results of our research into truly active management, discuss how strategic beta strategies help investors move beyond market-cap-weighted results and explore the benefits of combining index-based and active approaches in strategic portfolios.

Defining 'active' and 'passive'

Individual investors often reduce "active" and "passive" to their simplest terms – active funds have portfolio managers who make investment decisions, and passive funds simply seek to replicate the holdings of an index. But as a way to gauge performance, those definitions are much too simple.

- Some active management teams may not stray very far from their benchmark.
- And some passive funds take a "strategic beta"[1] approach, tracking innovative indexes that are constructed very differently than traditional, market-cap-weighted benchmarks.
- Other active managers may also take a strategic beta approach by managing quantitatively enhanced index funds that seek added benefits for investors.

Strategic Beta Within Active and Passive Strategies



1 Strategic beta is an alternative, index-based selection methodology that may outperform a market-cap-weighted benchmark or mitigate portfolio risk, or both, through active or passive vehicles. Strategic beta funds may underperform cap-weighted benchmarks and increase portfolio risk. There is no assurance that an investment strategy will outperform or achieve its investment objectives.

While we recognize that there are multiple factors that contribute to active management, for the purposes of this study, we used a metric called active share. Active share measures the difference between a fund's holdings and the holdings of its benchmark index. A fund has a higher active share when it:

- Holds stocks that are not in the benchmark.
- Leaves out stocks that are in the benchmark.
- Holds the same companies as the benchmark, but in different weights.

If a fund held completely different stocks than its benchmark, it would have an active share of 100%. A fund that perfectly mirrored its benchmark would have an active share of 0%.

About the study

"High" and "low" active share levels can vary based on the benchmark used for a given asset class. For example, large-cap funds that are benchmarked to the more concentrated S&P 500 Index will tend to have lower active share scores — i.e., more overlap — as a group than small-cap funds that are benchmarked to the more diversified Russell 2000 Index. Simply put, it's easier to deviate from an index when it has thousands of holdings versus hundreds.

For the purposes of our study, we refer to "high active share" as a proxy for active management, and we use the common threshold first used by Cremers/Petajisto[1] and others — an active share level of 60% or greater. We define "low active share" at below 60%, and this category includes several types of strategies that are listed below. We use market-cap-weighted benchmarks as a proxy for products that track market-cap-weighted indexes.

With our measurement chosen, we executed a research project to investigate the relationship between active management and performance. We gathered performance — net of fees[2] — and active share measures for approximately 3,000 mutual funds representing $6.8 trillion across 17 different equity categories, as shown in **Figure 1**. (While exchange-traded fund performance could also be evaluated in a similar way, we focused our initial research on the mutual fund market. Please see the Appendix for more details on our methodology.)

- Approximately 90% of the funds studied (or 70% of fund assets) had an average active share score above 60%. These high active share funds were typically bottom-up, fundamentally managed strategies. But some strategic beta portfolios fell into this range also, mainly those that tracked non-market-cap-weighted indexes — for example, indexes that are weighted by company fundamentals.
- The remaining 10% were low active share funds. These included passive funds that track market-cap-weighted benchmarks, some strategic beta funds and some very benchmark-oriented fundamental managers.

We examined these funds for five distinct full market cycles over the past 20 years, shown in **Figure 2**. Market cycles are defined as time periods of S&P 500 Index returns from peak to peak or from trough to trough. While other indexes may have slightly different peak and trough dates than the S&P 500, we do not believe the differences in timeline are material to our results.

Commonly, fund performance is examined on a trailing basis, such as one year, three years or five years. However, we believe full market cycles provide the proper context in which to evaluate long-term performance, versus snapshots in time. This is because full market cycles capture all of the ups, downs and inflection points that impact overall performance. Snapshots in time may only reflect one particular market environment (e.g., a long bull market) rather than a truly comprehensive view. In short, individuals typically don't invest in one-, three- and five-year increments, so we believe the market cycle view better represents the investor experience. Please note that during the time frame of our study, there are time periods where active management did underperform the passive benchmark. The study focuses on the time periods stated below, as we believe they represent five distinct, full market cycles over the past 20 years.

1 How Active Is Your Fund Manager? A New Measure That Predicts Performance, K.J. Martijn Cremers and Antti Petajisto, March 31, 2009.
2 Mutual fund sales loads were not included in the calculations for the analysis. High active share funds may potentially be more expensive than low active share funds, which may affect performance.
The S&P 500 Index is an unmanaged index considered representative of the US stock market.
The Russell 2000 Index is an unmanaged index considered representative of small-cap stocks.

Figure 1: Results Were Examined Across 17 Morningstar Equity Categories

US Equities	Foreign Equities
Large Growth	World Stock
Large Blend	Foreign Large Growth
Large Value	Foreign Large Blend
Mid-Cap Growth	Foreign Large Value
Mid-Cap Blend	Foreign Small/Mid Growth
Mid-Cap Value	Foreign Small/Mid Blend
Small Growth	Foreign Small/Mid Value
Small Blend	Diversified Emerging Markets
Small Value	

Figure 2: Results Were Examined Over Five Distinct Market Cycles Over the Past 20 Years
Cumulative return of the S&P 500 Index, December 1994–December 2014

Source: S&P 500 Index

From this data, we were able to measure the outperformance of active management in terms of excess returns (outperformance over the benchmark), downside capture (how a manager performed in relation to a falling benchmark), and risk-adjusted returns (the amount of risk involved in generating a return). We present our results on both an asset-weighted and equal-weighted basis. Why both? We believe it's instructive to see what percentage of investors' assets outperformed benchmarks, so asset-weighted results are critical, in our opinion. But we also recognize that some investors may be interested in knowing the number of funds that outperformed, so we show the equal-weighted results as well.

Because we only examined funds that were available as of Dec. 31, 2014, our study does not take into account the performance of funds that may have been merged or liquidated prior. However, our overall results align with other studies that did incorporate merged and liquidated funds into their analysis, such as Cremers/Petajisto.

Past performance is not a guarantee of future performance. An investment cannot be made directly into an index.

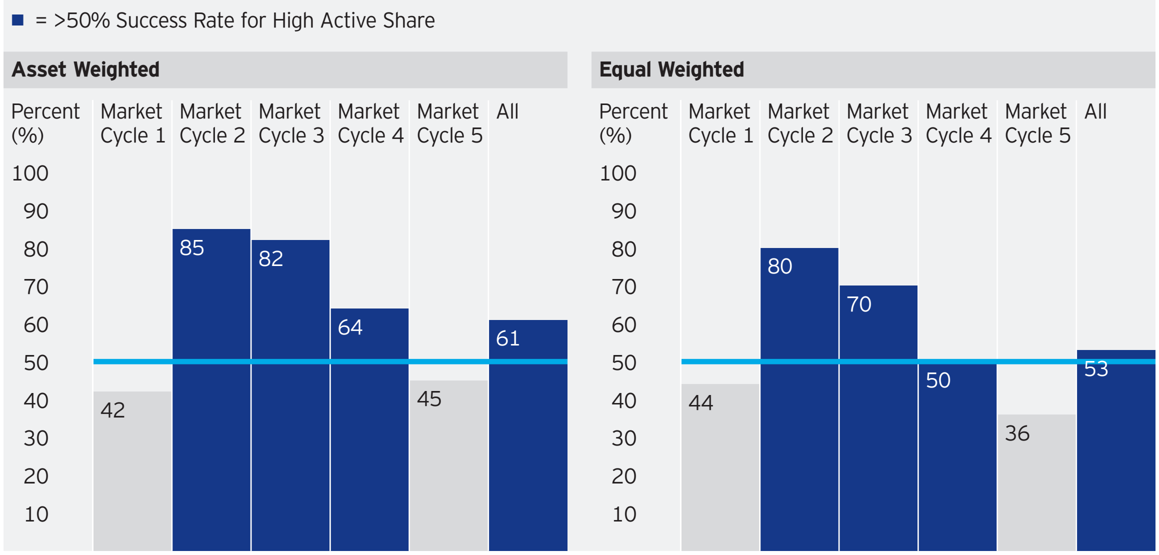
Key takeaways

Over the entire universe studied (including US/foreign, growth/core/value and small/mid/large), active management typically delivered greater value relative to passive benchmarks in terms of excess return, downside capture and risk-adjusted returns.

- **Excess return.** Over the study's time period, active management outperformed passive benchmarks over multiple market cycles as illustrated in **Figure 3**. On an asset-weighted basis, 61% of high active share fund assets beat their benchmarks (after fees) across all market cycles. On an equal-weighted basis, 53% of high active share funds beat their benchmarks (after fees) across all market cycles.

Figure 3: % of High Active Share Assets and Funds That Outperformed Their Benchmarks

Asset-weighted and equal-weighted results by market cycle



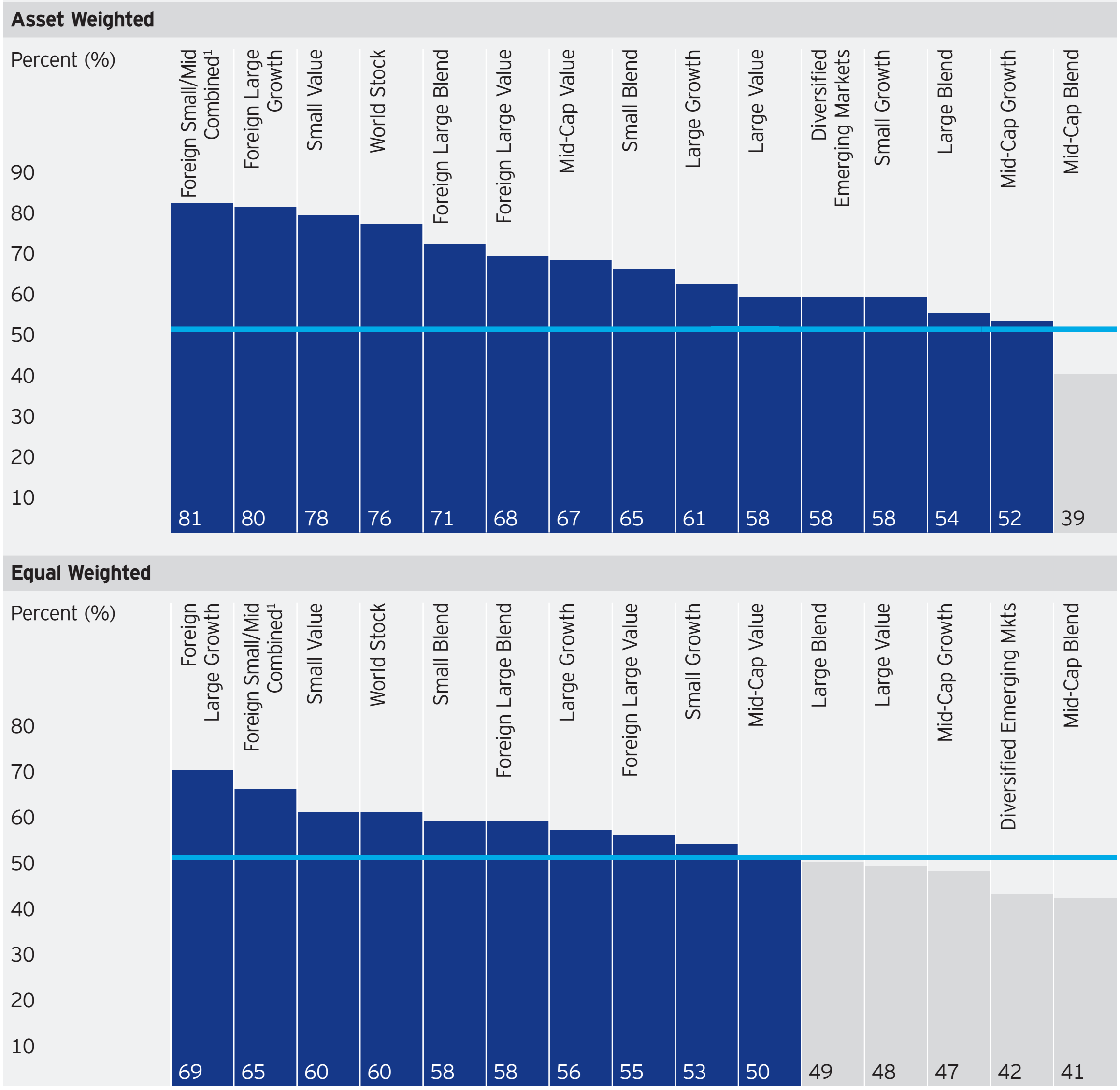
Market Cycle 1: Peak to Peak (7/98-3/00)
Market Cycle 2: Trough to Trough (10/98-9/02)
Market Cycle 3: Peak to Peak (4/00-10/07)
Market Cycle 4: Trough to Trough (10/02-2/09)
Market Cycle 5: Peak to Present (11/07-12/14)
All: Aggregate of All Five Market Cycles (7/98-12/14)

Source: FactSet Research Systems, Inc.

Figure 4 breaks down active management excess return figures by asset class. The percentage of high active share fund assets outperforming their respective equity category benchmarks ranged from 39% (Mid-Cap Blend) to 81% (Foreign Small/Mid) – across all market cycles.

Figure 4: % of High Active Share Assets and Funds That Outperformed Their Benchmarks Across Equity Categories
During the last five full market cycles (7/98-12/14)

■ = >50% Success Rate for High Active Share



Source: FactSet Research Systems, Inc.

- **Downside capture.** Active management displayed significant outperformance in this area as well, as shown in **Figure 5**: 64% of high active share fund assets had a better downside capture than their benchmarks across all market cycles (62% on an equal-weighted basis). This evidence helps support our belief that active managers are better able to weather negative return environments than cap-weighted portfolios.

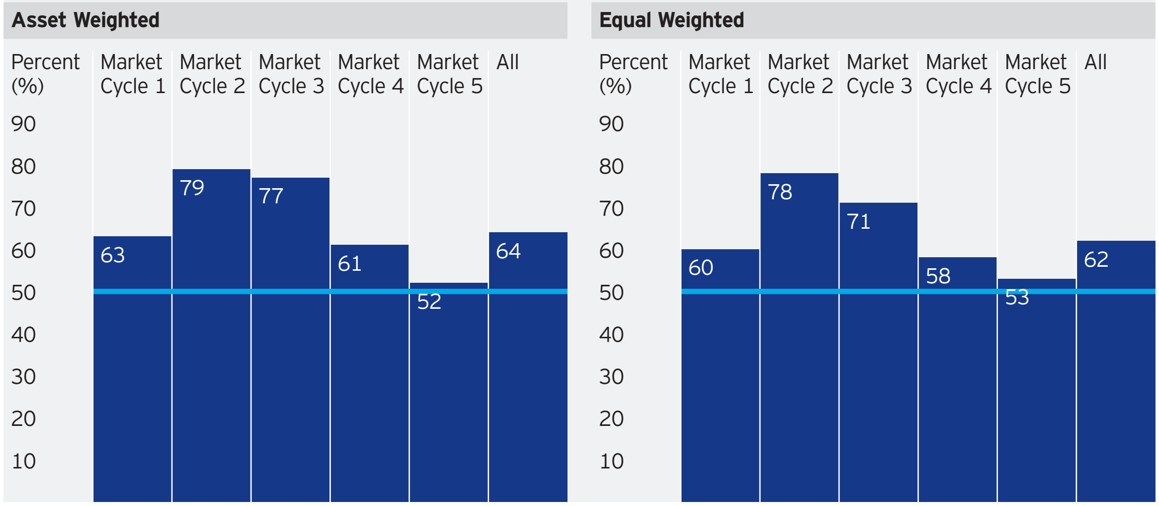
  The relative downside protection that active management may provide is important to building long-term wealth for multiple reasons.

  - First, the impact of losses isn't easy to erase — a 50% loss requires a 100% gain just to get back to even.
  - Second, many risk-averse investors find it difficult to remain invested during times of volatility, and they may choose to sell their investments at precisely the wrong time when the market is undergoing dramatic swings. Relative downside protection may help these investors stay focused on their long-term time horizon as they pursue their financial goals.

1 Foreign Small/Mid Combined is comprised of the Foreign Small/Mid Value, Foreign Small/Mid Blend and Foreign Small/Mid Growth categories.

Figure 5: % of High Active Share Assets and Funds that Captured Less of the Downside Than Their Benchmarks
Asset-weighted and equal-weighted results by market cycle

■ = >50% Success Rate for High Active Share



Market Cycle 1: Peak to Peak (7/98-3/00)
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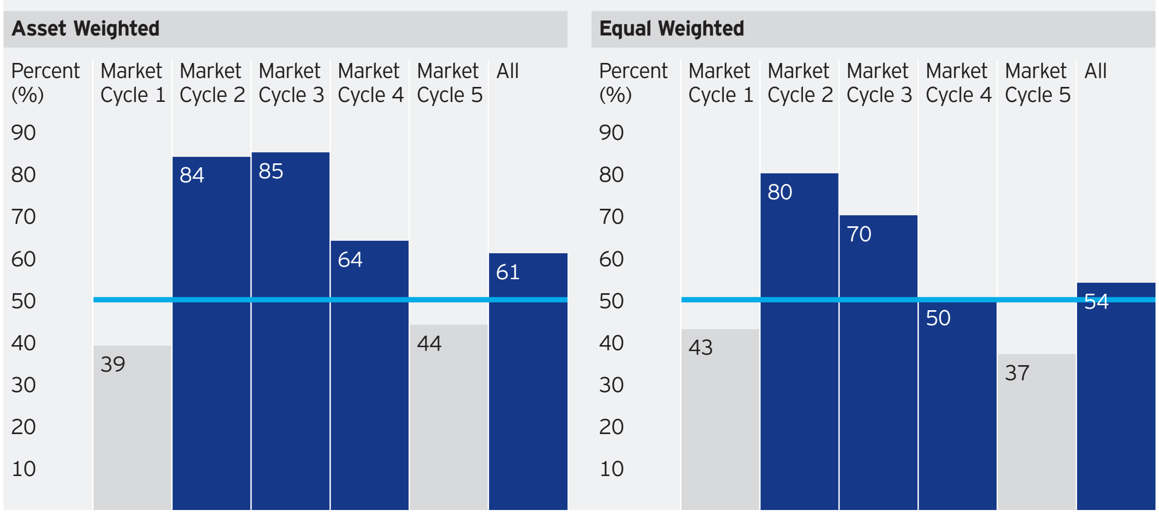
Market Cycle 4: Trough to Trough (10/02-2/09)
Market Cycle 5: Peak to Present (11/07-12/14)
All: Aggregate of All Five Market Cycles (7/98-12/14)

Source: FactSet Research Systems, Inc.

- **Risk-adjusted returns.** When historical returns were adjusted for risk, active continued to outperform passive benchmarks, as shown in **Figure 6**: 61% of high active share fund assets had a better Sharpe ratio (providing more return per unit of risk) than their benchmarks (54% on an equal-weighted basis). Even after adjusting for risk, actively managed portfolios performed better in aggregate compared to the results of passive benchmarks.

Figure 6: % of High Active Share Assets and Funds That Outperformed Their Benchmarks on a Risk-Adjusted Basis
Asset-weighted and equal-weighted results by market cycle

■ = >50% Success Rate for High Active Share



Market Cycle 1: Peak to Peak (7/98-3/00)
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All: Aggregate of All Five Market Cycles (7/98-12/14)

Source: FactSet Research Systems, Inc.

Applying active share to your portfolio decisions

- **Manager selection.** Our research displays that active management has historically delivered benchmark-beating performance in a wide variety of equity asset classes — even after accounting for fees. But applying this knowledge to a portfolio isn't as easy as simply selecting funds with the highest absolute active share. Achieving investor outcomes requires a deeper understanding of what you own and the drivers behind performance.

  There are reasons for important differences between high active share funds:

  - A good reason for high active share is that an investment manager has a clearly articulated process and philosophy that leads him or her toward a differentiated portfolio. This means that the manager's results are the product of skill and are repeatable. It also means that investors have a clear window into the mind of that manager, and can draw their performance expectations accordingly.
  - A not-so-good reason for high active share is if an investment manager participates in style drift — perhaps a large-cap fund manager is moving more into the mid-cap space. While that might help performance under certain market conditions, it may also mean that an investor in that fund is unintentionally overweighted toward mid-cap stocks — and may be unpleasantly surprised if large caps return to favor and their portfolio unexpectedly misses out. In addition, it's possible that high active share funds are mapped to an incorrect benchmark.

Because the drivers behind active share can vary so dramatically, we believe this metric should not be used in isolation to select one strategy over another. Investment process and philosophy, manager experience and other qualitative measures are important components of the decision-making process. Additionally, there are other metrics that, when crossed with active share, can identify more differentiated results among the high active share funds and aid with manager selection (a subject for further research).

- **Time horizon.** We believe performance and the drivers behind that performance should be evaluated across full market cycles. A single point in time may not be indicative of the longer-term tendencies of a manager — for example, a manager who overweights mega caps when he or she believes they are undervalued will often generate results that appear to be more benchmark-like in the short term than they truly are over a full market cycle.

  If active management overall does undergo some form of cyclicality, as our data strongly suggests, the worst time to abandon it would be when it has meaningfully underperformed passive strategies and cap-weighted benchmarks (unless you believe that the market conditions leading to this underperformance will continue for a long time). The most successful investors are those who stay focused on their goals — when short term results drive decisions, long-term outcomes are often not achieved.

Conclusion

The results of our study found that across multiple market cycles, active management has posted a history of benchmark-beating results in a variety of metrics, including excess returns, downside capture and risk-adjusted returns. Furthermore, the benefits of active management were not limited to small caps and emerging markets (which many seem to believe is generally the case); distinct periods of historical outperformance can be seen in US large caps, which have been portrayed as an asset class that's better accessed through traditional benchmark-tracking strategies.

Before investors make a decision to invest, it's imperative that they know the drivers behind a strategy's past performance. Some high active share funds are built that way by design — but other managers may let style drift influence their holdings, which can lead to unexpected results. Having a clearly articulated process and philosophy means that investors can draw their performance expectations accordingly and can have confidence that their portfolio results are a product of active skill.

Appendix

Methodology

- **Fund selection.** We analyzed 17 US open-end mutual fund Morningstar categories, which encompass all of the major US and foreign equity capitalization styles defined by Morningstar. About 3,300 total funds resulted from this primary screen. Net-of-fee performance from the oldest share class was used to provide the longest available return history for each fund. Mutual fund sales loads were not included in the calculations for the analysis. High active share funds may potentially be more expensive than low active share funds, which may affect performance. Funds of funds were excluded from the analysis (64 funds/$64.2 billion in AUM as of Dec. 31, 2014). All performance data was sourced from Morningstar.
- **Benchmark selection.** At least one widely used benchmark was assigned to each Morningstar category for the active share calculation. In several categories, active share scores were calculated against multiple common benchmarks to determine best fit. The lowest active share score, representing the highest commonality fund-benchmark relationship, was the used in the analysis.
- **Active share calculation.** Active share measures the percentage of equity holdings in a fund that differ from the benchmark index. Higher active share indicates lower holdings similarity between a fund and a particular index. A fund and an index that have no commonality would yield an active share of 100%. Funds that hold derivatives may actually generate an active share score above 100% due to financial leverage. Holdings data from FactSet Research Systems, Inc. was used to calculate annual active share in each of the previous six calendar years. An average of the annual active share statistic was used throughout the analysis. Only funds with at least four years of active share scores were included. Funds with incomplete holdings data were excluded from the analysis (259 funds/$117.8 billion in AUM as of Dec. 31, 2014).

$$\text{Active Share} = \tfrac{1}{2} \sum_{i=1}^{N} \left| W_{fund,i} - W_{index,i} \right|$$

- **Equal-weighted calculations.** Equal-weighted figures represent the number of funds that outperformed a specified benchmark/value in each period relative to the total number of funds with calculable data in that period.
- **Asset-weighted calculations.** Asset-weighted figures represent the percentage of assets of funds that outperformed a specific benchmark/value in each period relative to the total assets of funds with calculable data in that period. For market cycles and trailing periods, assets were averaged using beginning- and end-of-period data.

Data limitations

- **Backcasting.** Due to the limited availability of historical holding data, this analysis was based on average active share scores calculated from 2009 to 2014. Those scores were used to calculate historical equal- and asset-weighted success rates for periods as far back as 1998. It is possible that some funds may have had dramatically higher or lower active share measures prior to 2009, which our approach would not capture, though we observed a high degree of consistency in funds' active share weights in the examined time period.
- **Annual active share data.** Due to the complexity and time-intensive nature of the active share calculations, active share was measured once a year rather than building a quarterly or monthly data set.
- **Lack of holdings data.** A small number of funds (even smaller by weight) was excluded from the analysis due to a lack of holdings data available in FactSet Research Systems, Inc.

Challenges/biases

- **Survivorship bias.** This analysis looks at only the funds that existed and traded as of Dec. 31, 2014. This bias exists in the long-term trailing data.
- **Market cycle.** The active share scores were calculated during one of the strongest equity bull markets in history. Market conditions were considerably different in each of the remaining market cycles and long-term trailing periods.
- **Oldest share class.** The oldest share class for a majority of the funds is a lower expense share class (e.g., A, I or Y), but for a select few, the oldest share class represents the most or more expensive share class of the fund, thereby further diluting performance. An asset-weighted expense ratio was not used.
- **End-point style.** Active share scores for each fund were calculated against the hand-picked benchmarks based on its Morningstar categorization as of Dec. 31, 2014. The historical style of a fund may have differed from its current Morningstar categorization.
- **Portfolio manager turnover/strategy change.** The analysis looks at only the return series generated by the fund and does not take into account headcount turnover or significant investment process changes.

About risk

Derivatives may be more volatile and less liquid than traditional investments and are subject to counterparty and leverage risk.

A value style of investing is subject to the risk that the valuations never improve or that the returns will trail other styles of investing or the overall stock markets.

Foreign Securities Risk. The fund's foreign investments may be affected by changes in a foreign country's exchange rates, political and social instability, changes in economic or taxation policies, difficulties when enforcing obligations, decreased liquidity, and increased volatility. Foreign companies may be subject to less regulation resulting in less publicly available information about the companies.

Growth Investing Risk. Growth stocks tend to be more expensive relative to their earnings or assets compared with other types of stock.
As a result they tend to be more sensitive to changes in their earnings and can be more volatile.

Management Risk. The investment techniques and risk analysis used by the fund's portfolio managers may not produce the desired results. Market Risk. The prices of and the income generated by the fund's securities may decline in response to, among other things, investor sentiment, general economic and market conditions, regional or global instability, and currency and interest rate fluctuations.

Small- and Mid-Capitalization Risks. Stocks of small- and mid-sized companies tend to be more vulnerable to adverse developments and may have little or no operating history or track record of success, and limited product lines, markets, management and financial resources. The securities of small- and mid-sized companies may be more volatile due to less market interest and less publicly available information about the issuer. They also may be illiquid or restricted as to resale, or may trade less frequently and in smaller volumes, all of which may cause difficulty when establishing or closing a position at a desirable price.