MORNINGSTAR®

Unattractive Share

A much heralded measure of active management has failed to steer investors into funds with consistently strong performance.

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Contents

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Key Takeaways

- Active share, a popular measure of a portfolio's similarity to an index, is often used to compare different funds, but the degree to which it is context dependent isn't well understood. Establishing a given fund's active share as high or low requires an understanding of the index's composition, with greater index concentration leading to lower median active share.

A year-end 2020 snapshot of open-end funds across all nine U.S.-oriented Morningstar Categories showed:

- Median active share for funds within a given category ranged from 60% in large-growth to 94% in the small- and mid-blend Morningstar Categories. This research defines a fund's active share relative to its peers and compares those ranking in the lowest quintile with the highest.
- A peer group's active share tends to fall as its benchmark concentration increases or vice versa. Indeed, the large-growth category's median active share neared its 18-year low at the same time its index's weighting in its top holdings flirted with an 18-year high.
- Funds with relatively high active share cost 20 to 50 basis points more than those with low active share within the same category, as of year-end 2020, a steep price given high-active-share funds' lackluster results since January 2003.

Across the nine categories, analysis of fund results from Jan. 1, 2003, through Dec. 31, 2020, found:

- Linkages between high active share and superior before-fee returns did not prevail across categories.
- High-active-share funds within the large-value, large-blend, and large-growth Morningstar Categories demonstrated the most significant before-fee performance advantage over respective peers with low active shares, but their much-higher fees substantially eroded their edge.
- Across all categories, high-active-share funds exhibited higher risk than their low-active-share peers.

Across the nine categories, analysis of fund results from Jan. 1, 2011, through Dec. 31, 2020, found:

- Funds with high active share significantly underperformed those with low active share in four categories, both before and net of fees. High-active-share funds failed to deliver superior net-of-fee results in any category.

The bottom line:

- Relative to other category options, since 2003, investors in high-active-share funds have mostly endured more risk while paying steeper fees for mediocre relative returns.

The Backdrop for Active Share's Introduction and Popularity

Investors shopping for exposure to the U.S. stock market, whether in whole or in part, can get it for cheap. Mutual and exchange-traded funds tracking popular indexes such as the S&P 500 (a large-cap-focused index) or Russell 2000 Value Index (small-cap-value oriented) charge less than 0.20% per year. Some are free.[1]

These passively managed products have gained substantial market share in recent decades[2] as active managers—those who attempt to pick the market's best stocks or otherwise strive to outperform relevant indexes—have levied much higher fees and routinely failed to earn their keep.[3]

Part of the problem has been portfolio managers' relatively recent reluctance to distinguish their funds from their benchmarks, as Martijn Cremers and Antti Petajisto detail in their widely cited 2009 study of domestic equity mutual fund performance from 1980 to 2003.[4] After fees and transaction costs, so-called *closet indexers* tend to underperform, they found. Strikingly, the cohort of highly differentiated funds demonstrated the strongest results, suggesting that "the most active stock pickers have enough skill to outperform their benchmarks even after fees and transaction costs." The researchers drew this conclusion from their newly devised tool for measuring fund differentiation: active share.

The Concept of Active Share

Conceptually, an equity portfolio's active share is the portion of its assets that diverge from the index—a portfolio precisely replicating the index has 0% active share, while a long-only portfolio full of nonindex holdings has 100% active share. A fund can achieve active share by owning stocks not found in the index, avoiding stocks in the index, or owning the same stocks as the index but at different weights.[5]

A Justification for Active Management and Rationalizations for Higher Fees

Marketing teams of many asset managers welcomed this landmark study as they touted their "high-conviction," "best-ideas," "focused," or "opportunistic" portfolios, which tend to exhibit high active share. Today, asset owners and investment consultants often use active share as a key criterion for fund-manager selection. Some believe higher is essentially better and have been willing to pay more for the greater opportunity to earn hefty returns.

But an analysis of open-end mutual fund performance across the nine U.S.-focused Morningstar Categories over the period 2003-20 sketches a portrait of high-active-share managers that is far from attractive. For the most part, clients would have been better off in funds with low active shares.

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1 Ptak, J. 2018. "Investing Crosses the Rubicon: Free Index Funds." Available online at https://www.morningstar.com/articles/876891/investing-crosses-the-rubicon-free-index-funds.

2 For the two decades ended Dec. 31, 2020, actively managed U.S. equity mutual and exchange-traded funds had net redemptions of $1.6 trillion, while passively managed funds took in $183 billion.

3 Johnson, B. 2021. "Morningstar's Active/Passive Barometer." Available online at https://www.morningstar.com/lp/active-passive-barometer.

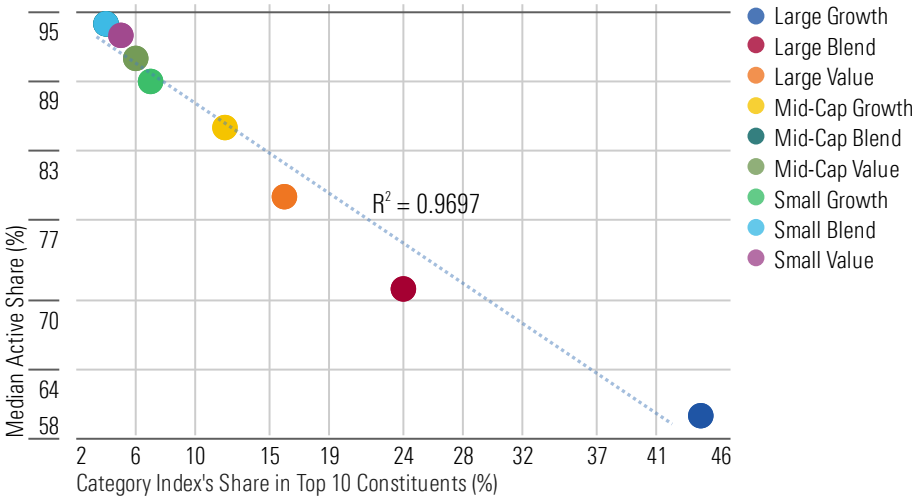
4 Cremers, M., & Petajisto, A. 2009. "How Active Is Your Fund Manager? A New Measure That Predicts Performance." Available online at https://papers.ssrn.com/sol3/papers.cfm?abstract_id=891719. First version 2006.

5 See Exhibit 16 in the Appendix for active share's formula.

Context Is Crucial to Establish Whether a Fund's Active Share Is High or Low

Each Morningstar Category's median active share is closely tethered to the composition and concentration of its benchmark.[6] At year-end 2020, large-growth's 60% median active share ranked lowest of all domestic categories as the combined share of the 10 largest constituents within its category benchmark—the Russell 1000 Growth Index—ranked highest at 44%. All six small- and mid-cap categories are more diffuse and have active shares of 85% and above.

Exhibit 1 Strong Inverse Relationship Between Category's Median Active Share and Benchmark Concentration

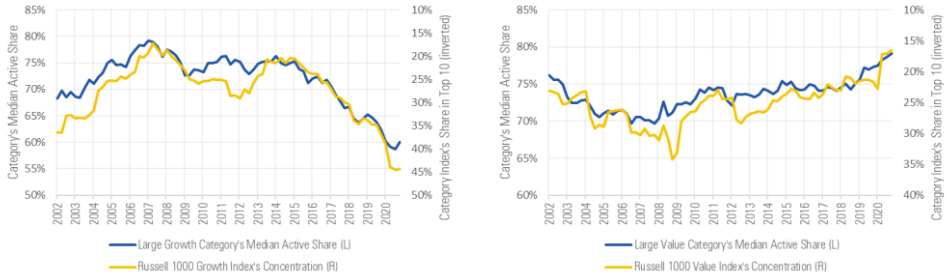


Source: Morningstar Research. Data as of Dec. 31, 2020. Index-tracking ETFs used as proxy for benchmark holdings.
The dots for Mid-Cap Blend and Small Blend overlap; only Small Blend's is visible.

That relationship explains both the current levels of median active share across categories and changes over time. Through 2020, the large-growth category's active share declined nearly 20 percentage points from its 2007 high, when the share of the benchmark's top 10 constituents was 25 percentage points lower. Multiyear outperformance of America's largest growth companies, such as Apple AAPL and Microsoft MSFT, similarly caused the top-10's share of the large-blend benchmark to swell since 2015; the category's active share accordingly declined. On the other hand, large-value's active share since 2007 climbed as the Russell 1000 Value Index became less top-heavy.

6 This also holds globally. See: Chow, W., Caquineau, M., & Möttölä, M. 2021. "Context Is Everything When Using Active Share." Available online at https://www.morningstar.com/en-uk/lp/context-is-everything-when-using-active-share.

Exhibit 2 Changes in Benchmarks' Concentration Help Explain Decline in Average Active Share Within the Large-Growth Category and Its Escalation Within Large-Value Since 2007



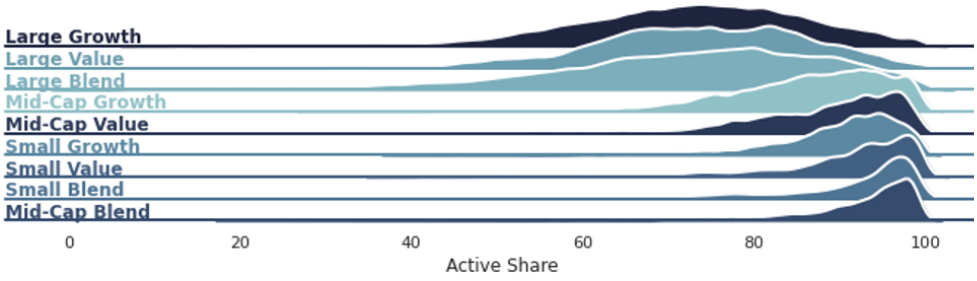
Source: Morningstar Research. Data as of Dec. 31, 2020. Index-tracking ETFs used as proxy for benchmark holdings.

Investment universes circumscribed by top-heavy indexes make it more difficult for active managers to build high-active-share portfolios, at least without taking meaningful out-of-benchmark positions.

The median active shares across the six small- and mid-cap categories have all stayed between 84% and 95% since 2002's year-end. None have drifted more than 6 percentage points.

Varying active-share distributions across categories is another important context for assessing a given fund's active share. Ranges of fund active shares within the large-cap categories are considerably wider than those in the small- and mid-cap categories.

Exhibit 3 Distributions of Active Shares by Category (Height Represents Proportion of Funds)



Source: Morningstar Research. Data as of Dec. 31, 2020.

Proper active-share comparisons across categories are thus more difficult than the simple use of absolute measures often suggests. Indeed, while industry participants often deem active share of 80% or above high, that boundary marks the highest quintile for the large-growth category but the lowest quintile for small-growth.[7] Also, the relatively tight range of active shares within the small- and mid-cap categories raises questions about its relevance as a tool to filter, sort, or select funds.

7 See Exhibit 18 in the Appendix for all categories' active-share quintile breakpoints.

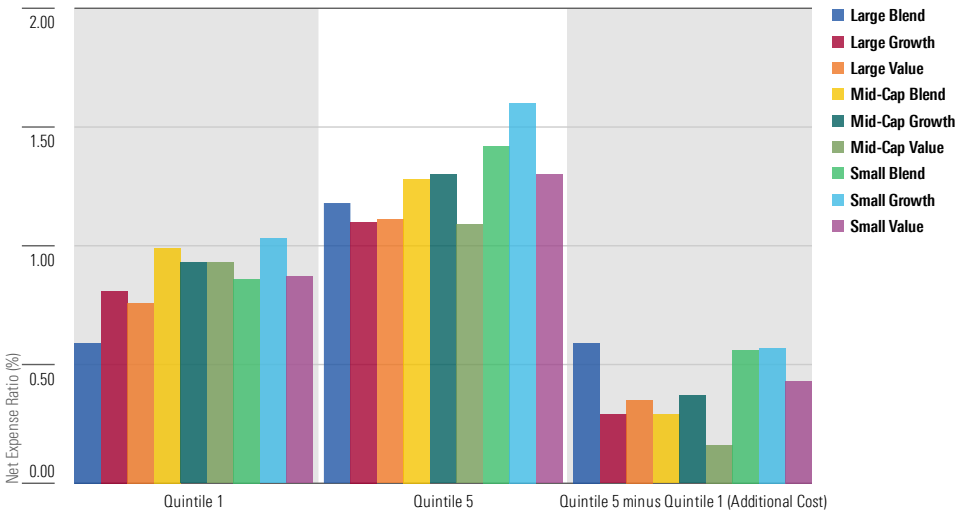
It is better to distinguish various active share levels within a particular context, such as Morningstar Categories. "High" active share here describes a fund ranking in its peer group's top or fifth quintile on that measure. "Low" active share describes the bottom or first quintile.

Higher Active Share, Higher Fees

Industry participants often deride funds with low active shares for charging unjustifiably high fees or for being index doppelgängers. Those critics are onto something, as Morningstar's own research suggests many actively managed stock funds are mispriced.[8] To some, this substantiates a key selling point of high-active-share funds: Since the only way to outperform the index is to differ from it, a portfolio that is starkly different offers substantial opportunity to earn impressive net-of-fee results. But marketers typically sell that opportunity for a substantial premium to category peers.

Across all categories and share classes, a typical low-active-share fund (labeled Q1) can be had for 0.60% to 1.00%, depending on the category. High-active-share funds (labeled Q5) cost 1.10% to 1.60%. The difference between the highest and lowest net expense ratios is statistically significant for all categories.[9]

Exhibit 4 Average Net Expense Ratios at Year-End 2020 by Category and Quintile (Q1 = lowest active share)



Source: Morningstar Research. Data as of Dec. 31, 2020. All fund share classes included and equal-weighted.

The relationship between active share and expenses also mostly holds between the two extremes, suggesting that investors should generally expect to pay more for higher active share.

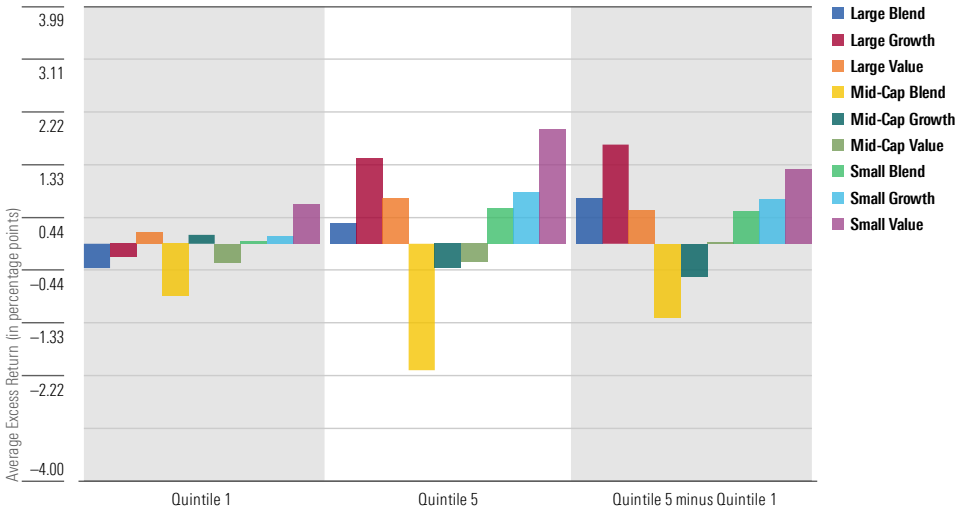
8 Ptak, J. 2017. "Most Funds Are Priced to Fail." Available online at https://www.morningstar.com/articles/795902/most-funds-are-priced-to-fail.

9 See Exhibit 19 in the Appendix for average fees charged across categories and active-share quintiles.

High-Active-Share Funds Have Shown a Discernible Edge in Some Categories, Inferiority in Others

From January 2003 through December 2020, high-active-share funds failed to justify their fee premium in most categories, as measured by their performance over 12-month rolling periods.[10] Stock-pickers deserve some credit: In five of the nine categories,[11] the highest before-fee excess returns came from the most differentiated funds, which on average exceeded their category indexes between 0.35 and 1.93 annualized percentage points.[12] On the other hand, the high-active-share funds within their respective mid-blend and mid-growth categories posted among the poorest (and negative) excess returns. Mid-growth's lowest active-share quintile posted positive excess returns.

Exhibit 5 Average Gross Excess Returns vs. Category Index by Category and Active-Share Quintile From 2003 Through 2020



Source: Morningstar Research. Data as of Dec. 31, 2020. Oldest share classes included only.

The results implying an advantage for high active share come with a caveat: They are statistically significant only for the large-cap categories. (High-active-share funds' underperformance within mid-blend is also statistically significant.)

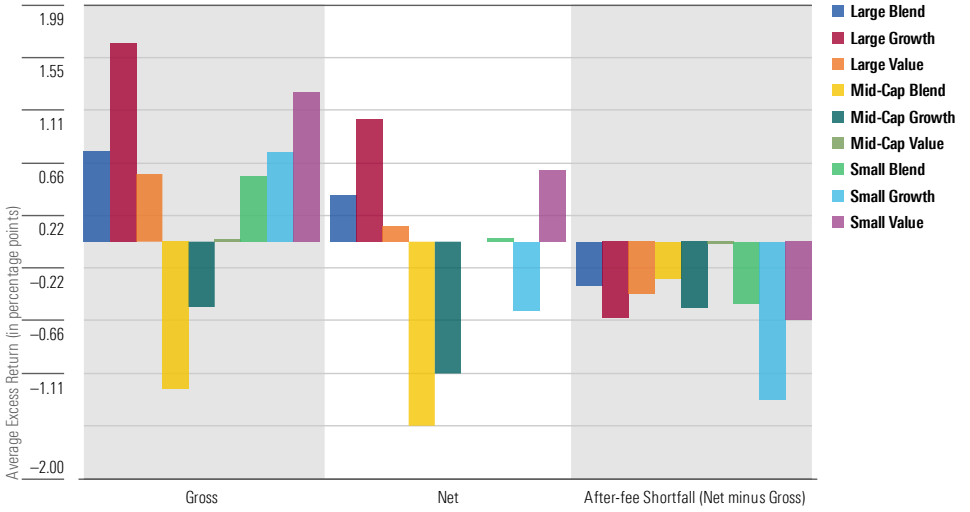
The higher costs of high-active-share cohorts so dull whatever performance edge they may have as to raise doubts about their value-add. From before fees to after them, excess returns of the large-blend and -value categories drop to 0.39 and 0.13, respectively, and become statistically insignificant advantages. Within small-growth, the superior gross returns of high-active-share funds become inferior net returns relative to funds with low active shares. There remained a single category whose highly active managers retained a meaningful edge over their low-active-share peers once expenses were settled: large-growth.

10 See Measuring Performance section in the Appendix for details on methodology.

11 Within four categories, the highest returns came from Quintiles 2, 3, or 4. Exhibit 5 illustrates that Quintile 5 gained more than Quintile 1 in six categories.

12 When conducting this analysis using 36-month rather than 12-month rolling returns, which are featured in the study, the findings are less favorable to high-active-share funds.

Exhibit 6 Average Gross and Net Excess Returns of Highest vs. Lowest Active-Share Quintiles by Category From 2003 Through 2020



Source: Morningstar Research. Data as of Dec. 31, 2020. Oldest share classes only for gross, fund-level averages for net.

As with any analysis applying simple averages (as are shown in Exhibits 5 and 6), the results are potentially skewed by outliers—those funds within a given cohort that perform extraordinarily well or poorly. Success rates, which measure the percentage of funds that both survive and outperform during the measurement window, don't suffer from this problem. They provide an effective gauge of the probability of selecting market-beating funds within each active-share quintile.

The picture looks similar through this lens. High-active-share funds demonstrated the best chance of before-fee outperformance only within the large-growth and -blend categories.[13] But that didn't necessarily suggest that higher active share systematically led to better chances within those categories; large-blend funds whose active shares ranked between the 60th and 80th percentiles (that is, quintile 4) had their category's poorest success rates. High-active-share funds had the weakest success rates in all but one of the small- and mid-cap categories, where active shares below their categories' 40th percentiles had the strongest success rates, as Exhibit 7 shows.

13 Analyses over either 12-month or 36-month rolling windows tell roughly the same stories.

Exhibit 7 Active-Share Quintiles With the Best and Worst Chances of Outperformance (Success Rates) by Category From 2003 through 2020 Based on 12-Month Rolling Gross Returns

Category	Best Chances Found in… (Success Rate)	Slimmest Chances Found in… (Success Rate)	Best Rate minus Slimmest Rate (percentage points)
Large Growth	Quintile 5 (49%)	Quintile 3 (42%)	7.6
Large Blend	Quintile 5 (45%)	Quintile 4 (39%)	6.5
Large Value	Quintile 2 (48%)	Quintile 1 (45%)	3.2
Mid-Cap Growth	Quintile 1 (50%)	Quintile 5 (41%)	9.2
Mid-Cap Blend	Quintile 3 (42%)	Quintile 5 (38%)	3.8
Mid-Cap Value	Quintile 2 (45%)	Quintile 5 (41%)	4.4
Small Growth	Quintile 2 (52%)	Quintile 5 (46%)	5.7
Small Blend	Quintile 1 (51%)	Quintile 4 (48%)	3.0
Small Value	Quintile 3 (55%)	Quintile 5 (51%)	4.5

Source: Morningstar Research. Data as of Dec. 31, 2020.

High-active-share funds extended their lead within large-cap categories net of fees, as seen in Exhibit 8. The relative success rates within the large-growth and -blend categories remained robust. High-active-share large-value funds also showed an advantage over peers. But there was little relationship between success rates and active shares across the small- and mid-cap categories, where the lowest-active-share quintiles were often just as likely as the higher ones to offer the best chance of outperformance.

Exhibit 8 Active-Share Quintiles With the Best and Worst Chances of Outperformance (Success Rates) by Category From 2003 through 2020 Based on 12-Month Rolling Net Returns

Category	Best Chances Found in… (Success Rate)	Slimmest Chances Found in… (Success Rate)	Best Rate minus Slimmest Rate (percentage points)
Large Growth	Quintile 5 (39%)	Quintile 1 (28%)	10.3
Large Blend	Quintile 5 (33%)	Quintile 2 (25%)	8.1
Large Value	Quintile 5 (36%)	Quintile 1 (28%)	8.2
Mid-Cap Growth	Quintile 1 (33%)	Quintile 2 (28%)	5.0
Mid-Cap Blend	Quintile 3 (32%)	Quintile 2 (24%)	7.1
Mid-Cap Value	Quintile 2 (35%)	Quintile 1 (30%)	5.1
Small Growth	Quintile 2 (38%)	Quintile 1 (33%)	5.6
Small Blend	Quintile 3 (36%)	Quintile 2 (31%)	4.7
Small Value	Quintile 4 (44%)	Quintile 1 (38%)	5.9

Source: Morningstar Research. Data as of Dec. 31, 2020.

High Active Share, High Risk

While a fund's category-relative active share level fails to universally foretell its relative performance, it bears a consistent and tight relationship to a variety of risk measures, such as volatility of returns (as measured by standard deviation), tracking error (the volatility of excess returns versus the benchmark), and portfolio concentration (as measured by percentage of holdings in its top 10).

In the context of both gross and net returns, from 2003 through 2020, the highest-active-share funds (quintile 5) in all but one category showed much greater volatility and tracking error than those with low active share (quintile 1).[14] Funds' dispersion of returns typically rises as their active share rises.

Exhibit 9 Average Tracking Error by Active-Share Quintiles Across All Nine Categories, 2003 Through 2020

	Q1	Q2	Q3	Q4	Q5
Tracking error	2.92%	3.67%	4.38%	5.22%	7.19%

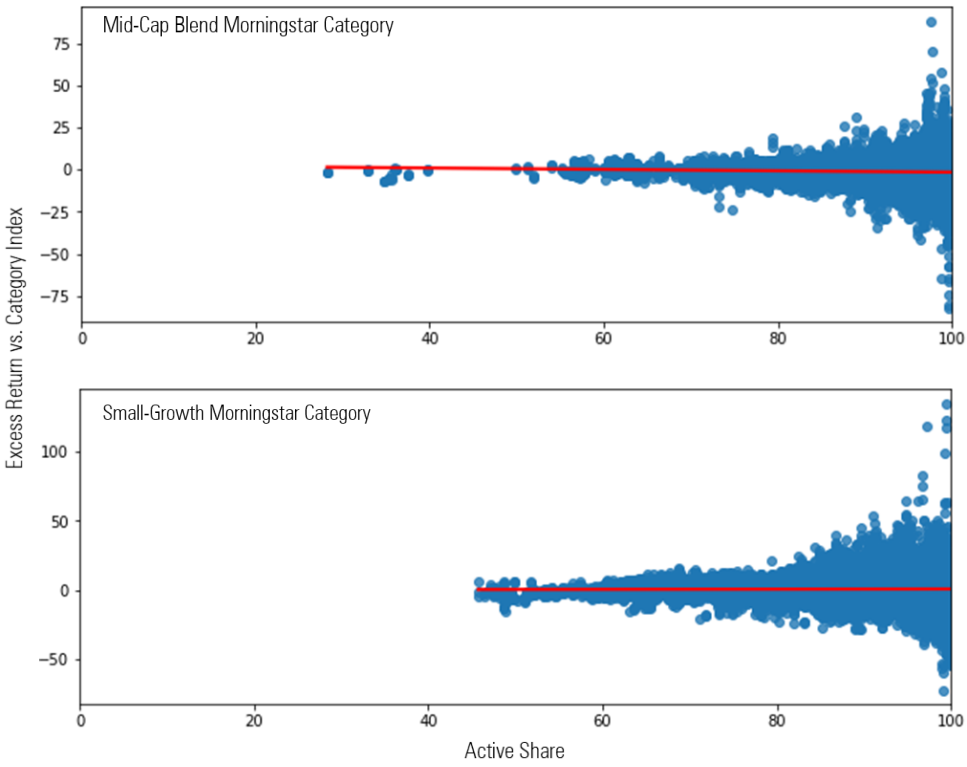
Source: Morningstar Research. Data as of Dec. 31, 2020. Based on gross returns using oldest share class only.

Exhibit 10 shows two categories as an example—large value and small growth—with the excess returns for each fund in its respective peer group plotted against that same fund's active share in rolling 12-month periods from January 2003 through December 2020. High active share clearly sets the stage for each category's biggest successes and failures.[15]

14 The exception was the mid-value Morningstar Category, within which the most active funds had elevated volatility but ranked second-highest on that measure.

15 See Appendix for details across categories and active-share quintiles.

Exhibit 10 Active Share vs. Rolling 12-Month Excess Return, 2003 through 2020



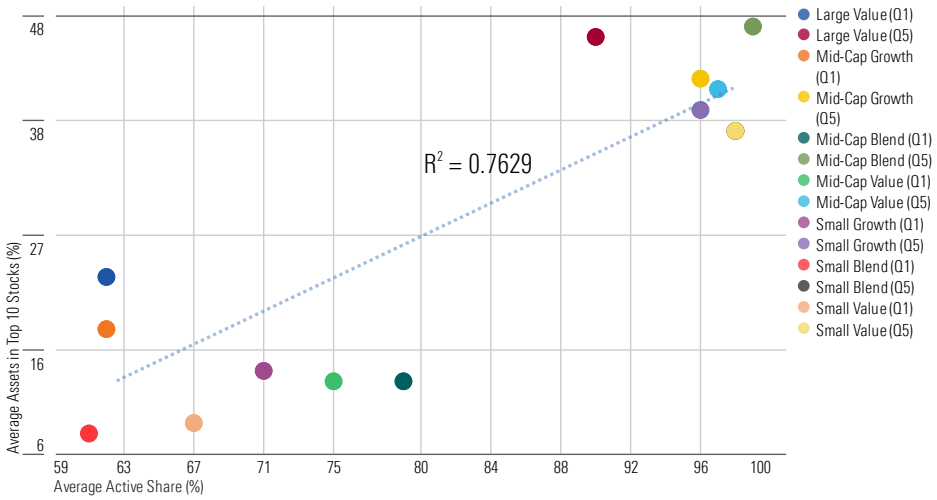
Source: Morningstar Research. Data as of Dec. 31, 2020. Based on gross returns using oldest share class only.

Funds often achieve their high active shares (and higher volatility) by holding relatively few stocks or otherwise devoting a large chunk of their assets to top positions. Across all categories, they typically have the highest levels of portfolio concentration—as measured by the percentage of assets in their top-10 stocks—relative to peers and therefore less stock-level diversification. This magnifies the impact of investment mistakes and the risk of missing out on the market's biggest winners.[16]

Exhibit 11 illustrates the positive relationship between funds' average active shares and concentrations of assets in relatively few stocks. High-active-share funds congregate in the upper-right of the scatter plot, demonstrating their propensity to concentrate their portfolios. The more diffuse portfolios of low-active-share funds leads them all to the bottom left.

16 Bryan, A. 2018. "Why Diversification Beats Conviction." Available online at https://www.morningstar.com/articles/902581/why-diversification-beats-conviction.

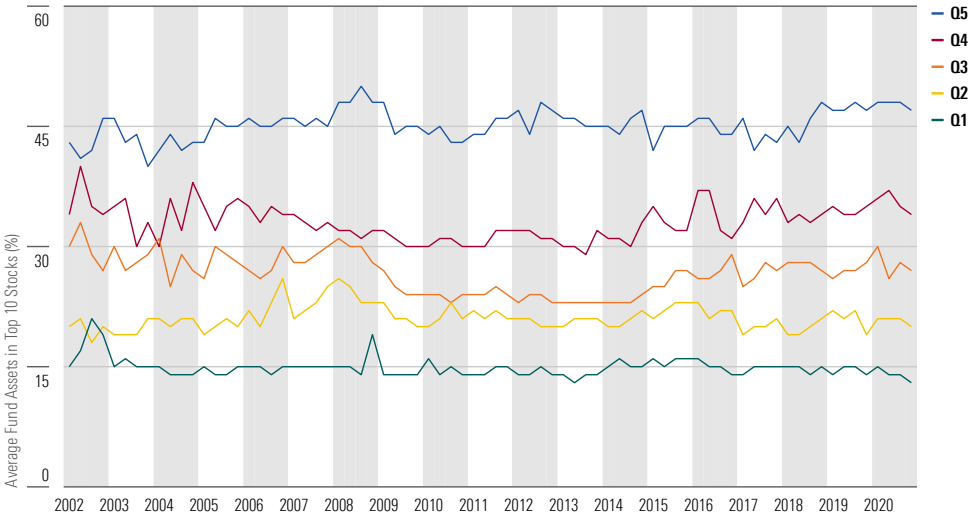
Exhibit 11 Average Active Shares (x-axis) and Average Assets in Largest 10 Stocks (y-axis) by Select Categories and Active-Share Quintiles as of Year-End 2020



Source: Morningstar Research. Data as of Dec. 31, 2020. The dots for Small Blend and Small Value overlap. This illustration excludes large-blend and large-growth categories, given that their respective indexes' unusual top-heaviness in recent years has contributed to a substantial narrowing of the differences between their quintile concentrations. See Exhibit 13.

The relationship between a portfolio's concentration and active share generally holds across all categories since 2002. Exhibit 12 shows the mid-blend category as one example.

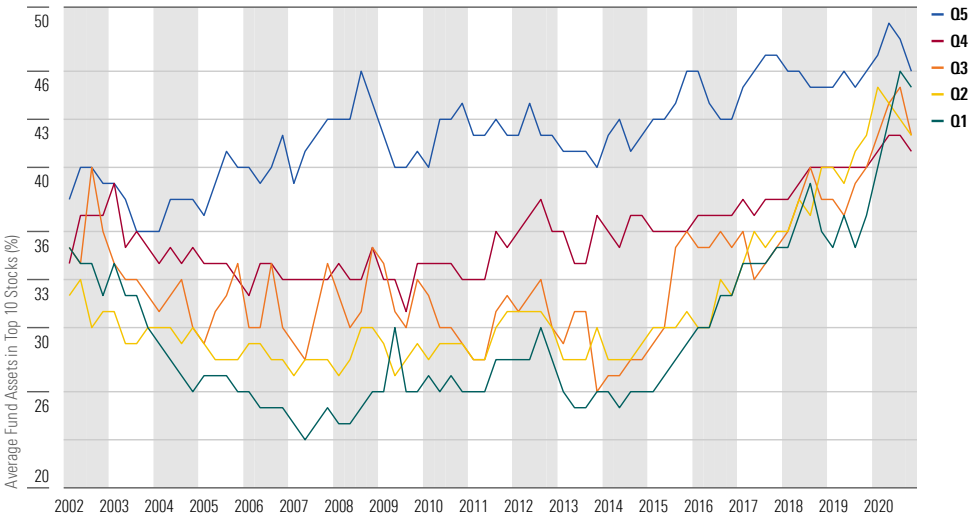
Exhibit 12 Mid-Cap Blend Category, Average Fund Assets in Top 10 Stocks (%) by Active-Share Quintile (Q1 = Lowest Active Share)



Source: Morningstar Research. Data as of Dec. 31, 2020.

Top-10 concentrations within the large-growth category have converged in recent years. In early 2015, the assets held by the most-active managers averaged 18 percentage points more than those hewing closest to the category index. By year-end 2020, that gap had narrowed to just 2 percentage points as the index's concentration increased.

Exhibit 13 Large Growth Category, Average Fund Assets in Top 10 Stocks (%) by Active-Share Quintile (Q1 = Lowest Active Share)

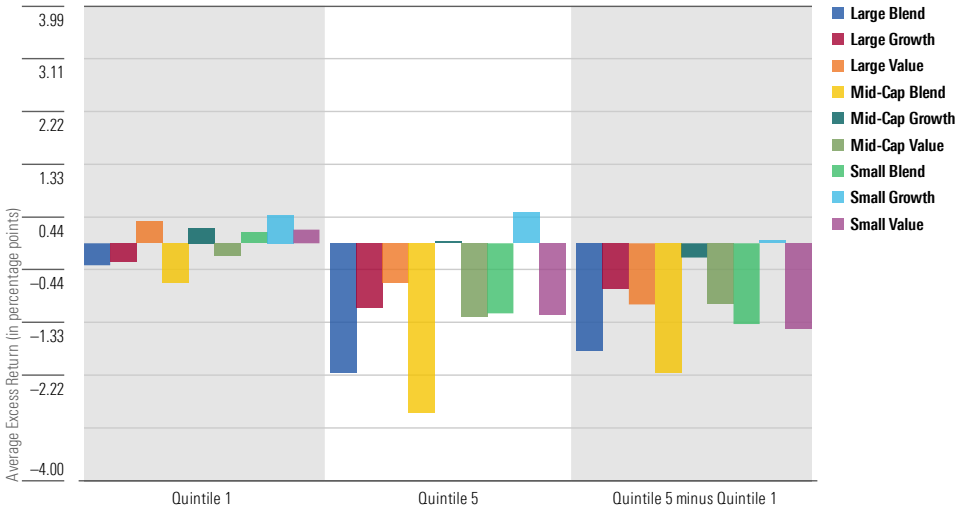


Source: Morningstar Research. Data as of Dec. 31, 2020.

A Lost Decade for Highly Active Managers

While highly active managers demonstrated some skill over the 18-year period through 2020, their superiority was mostly limited to the earlier half of that span. Their results from 2011 through 2020 give them little to brag about. Relative to lower-active-share peers, their before-fee results during that 10-year span were among the worst in seven of the nine categories and dead last in five. Only the high-active-share quintile within the small-growth category showed excess gross returns—0.5 percentage points annualized—while posting excess returns of negative 1.0 percentage points or worse in six categories. The lowest-active-share quintile performed best in four categories.

Exhibit 14 Average Gross Excess Returns vs. Category Index by Category and Quintile From 2011 Through 2020



Source: Morningstar Research. Data as of Dec. 31, 2020. Oldest share classes included only.

High-active-share funds failed to deliver superior net-of-fee results in any category during the 10-year period.

The results as measured by success rates are also ugly for the most differentiated portfolios. Rather than offering their categories' best chance of survival and outperformance, as they had during 2003-20, large-cap funds ranking above the 60th percentile on active share (that is, quintiles 4 and 5) had their respective categories' worst success rates from 2011-20. Relatively low-active-share funds (that is, quintiles 1 and 2) had the strongest success rates in six of the nine categories.

Exhibit 15 Active-Share Quintiles With the Best and Worst Chances of Outperformance (Success Rates) by Category From 2011 Through 2020 Based on 12-Month Rolling Gross Returns

Category	Best Chances Found in… (Success Rate)	Slimmest Chances Found in… (Success Rate)	Best Rate minus Slimmest Rate (percentage points)
Large Growth	Quintile 1 (25%)	Quintile 5 (19%)	5.7 ppts.
Large Blend	Quintile 1 (26%)	Quintile 4 (18%)	7.7 ppts.
Large Value	Quintile 2 (31%)	Quintile 5 (25%)	5.8 ppts.
Mid-Cap Growth	Quintile 4 (27%)	Quintile 3 (21%)	5.4 ppts.
Mid-Cap Blend	Quintile 4 (26%)	Quintile 5 (20%)	5.9 ppts.
Mid-Cap Value	Quintile 2 (31%)	Quintile 4 (25%)	6.2 ppts.
Small Growth	Quintile 2 (35%)	Quintile 5 (26%)	8.9 ppts.
Small Blend	Quintile 1 (34%)	Quintile 5 (26%)	7.7 ppts.
Small Value	Quintile 3 (35%)	Quintile 5 (28%)	6.8 ppts.

Source: Morningstar Research. Data as of Dec. 31, 2020. Oldest share classes included only.

The Bottom Line

Active share isn't without value. The connection between a portfolio's differentiation from its index, its concentration, and volatility can help to classify funds by their investing style and risk level. But it is fraught with pitfalls when used as a tool to identify superior active strategies. High-active-share funds are relatively expensive and have shown an undesirable risk profile over the long run. While it is true that the best-performing funds tend to be those with high active shares, the same is true for the worst performers. There is little use of applying active-share screens—for instance, a minimum threshold—to funds in the small- or mid-cap categories because the high-active-share cohort posted among the weakest results within mid-caps from 2003 through 2020 and its advantage within small caps was statistically insignificant. The before-fee advantage for high-active-share funds has shown to be statistically significant only for large-cap categories, but that has not been the case since 2011.

These findings should not be taken as a signal to swear off highly differentiated funds. Across all domestic categories, there are high-active-share funds whose skilled portfolio managers and strong, risk-minded investment processes make them worthy long-term holdings. Instead, the findings here serve as a cautionary tale for asset owners or advisors tempted to pay more than they should for the funds with second-rate investment teams or poorly devised processes that can lead to volatile and inferior net returns. With higher active share comes a higher risk of disappointment.

Acknowledgements: Thanks to Alec Lucas, Katie Reichart, Dan Culloton, Matias Möttölä, Mathieu Caquineau, and Kathryn Wing for helpful comments, discussions, and technical expertise.

Appendix

Research Design

This study assesses the return, risk, and active shares from 2003-20 of all long-only equity open-end mutual funds sold in the United States with domestic-focused portfolios.

About the Data Set

The data set includes all actively managed funds—surviving and nonsurviving—whose most recent Morningstar Category assignment fell into any of these nine Morningstar Categories:

- U.S. Fund Large Blend
- U.S. Fund Large Growth
- U.S. Fund Large Value
- U.S. Fund Mid-Cap Blend
- U.S. Fund Mid-Cap Growth
- U.S. Fund Mid-Cap Value
- U.S. Fund Small Blend
- U.S. Fund Small Growth
- U.S. Fund Small Value

To ensure that only relevant funds are included, the study ignores funds tagged in the Morningstar database as "index" or "enhanced index." To further filter out potentially erroneously tagged funds, it also excludes funds with an active share below 10% in at least 75% of their quarterly portfolios over the studied period of 2003-20.

Funds whose focus is outside the U.S. have been left out of scope here as they are discussed in multiple Morningstar studies.[17]

About the Morningstar Categories

The Morningstar Category classifications were introduced in 1996 to help investors make meaningful comparisons between mutual funds. The system classifies funds based on several driving principles:

- Individual portfolios within a category invest in similar types of securities and therefore share similar risk factors. Style risk is one example.
- One can generally expect portfolios within a category to behave more similarly to one another than to portfolios outside the category.
- The aggregate performance of each category differs materially over time.
- Categories have enough constituents to form the basis for reasonable peer group comparisons.

The dominant attributes of a fund's holdings determine its category classification; asset classes held, geographic exposures, and stylistic tilts are key considerations over rolling three-year periods.

17 For example, see: Chow, W., Caquineau, M., & Möttölä, M. 2021. "Context Is Everything When Using Active Share." Available online at https://www.morningstar.com/en-uk/lp/context-is-everything-when-using-active-share.

Morningstar evaluates these three-year averages biannually to either reaffirm or alter each fund's category. If a portfolio is new and has no history, Morningstar bases its initial categorization on its holdings' most likely characteristics. When necessary, Morningstar may change a category assignment based on recent changes to the portfolio.[18]

Funds can and do change categories over time, which reveals a limitation of this study. It assumes categorical consistency of all funds within the data set from 2003-20 and recognizes only a fund's most recent category assignment. For example, a fund that was merged or liquidated in 2018 may have ended its life as a large-value fund after spending several years previously categorized as mid-cap value; the study is designed to assess the fund's historical active share relative only to the large-value category index (more accurately, the index's ETF proxy). Were significant style drift of funds common enough to require regular changes to category assignments, a given category's apparent drop in average active share over time could be explained by its constituent funds' misfit in prior periods. However, even if some equity funds become unmoored from their historic style profiles, a separate analysis suggests they're relatively scarce and their impact on this study's results is minor.

The Time Period Studied

The study spans an 18-year period, with the first active shares calculated for December 2002 and the last ones for December 2020. There are several reasons for this study to focus specifically on this period:

- Relevance. The period includes multiple market cycles, thousands of funds, and recent results relative to this study's November 2021 publication.
- Comprehensiveness. The number of months between the period's endpoint and the study's analysis provided for the availability of all relevant portfolio disclosures.
- Feasibility. The 2000 and 2001 inceptions of the indexes' ETF proxies came before the period's starting point, but their portfolios were not available to Morningstar until February 2002.
- Convenience. Although it would have been possible to conduct the study over a period of slightly lengthier than 18 years, using full calendar years provides greater analytical and conversational convenience.

Measuring Performance

Most performance calculations are based on rolling periods with three-month or calendar-year shifts (depending on the metric). Thus, each fund with multiple portfolios will be included in the performance data set many times rather than through a single fixed-period number.

The analysis sorted all the funds into quintiles based on their active share ranks (relative to their category indexes) at the beginning of each rolling period and then calculated the average annualized returns, average excess returns, and average standard deviations for the funds in each active-share quintile. (It includes for the calculation the periods during which they were alive.) It also calculated the average success ratios of each quintile of all categories by measuring the number of funds that both

18 Morningstar, Inc. (2021): Morningstar Category for Funds Definitions. For funds available for sale in the United States. Available online at https://advisor.morningstar.com/Enterprise/VTC/MorningstarCategoryClassificationforFunds_April2021.pdf.

survived and outperformed the respective benchmark during the 12- and 36-month holding periods and dividing that figure (the numerator) by the number of funds at the start of the period (the denominator).

Performance calculations are based on two methodologies: gross returns of each fund's oldest share class in Morningstar's database, as well as the equal-weighted average of all a given fund's living share classes in a particular period; the latter calculation provides a representative net-of-fee result for each fund. Return data for the nine Morningstar Categories ran from January 2003 through December 2020.

Active Share Definitions and Calculations

While active share is a simple measure, its calculation includes some nuances.

At its most basic, active share is a score between 0% and 100% quantifying how much a portfolio differs from a chosen benchmark. A portfolio with an active share of zero is identical with the benchmark, while a score of 100% means there is no overlap. The higher the score, the more differentiated a fund is from a pure stock-picking perspective.

There are, however, multiple ways to calculate active share. This study follows Cremers' simplified formula, which states that active share is 100% minus the overlap of a fund's asset-weighted holdings with those of the benchmark.

Exhibit 16 Active Share Formula

$$\boldsymbol{Active\ Share} = \mathbf{100\%} - \sum_{\boldsymbol{i=1}}^{\boldsymbol{N}} \boldsymbol{Min}\left(\boldsymbol{w_{fund,i}}, \boldsymbol{w_{benchmark,i}}\right) \boldsymbol{x}\ \boldsymbol{d}[\boldsymbol{w_{fund,i}} > \mathbf{0}]$$

N is the total number of stocks included in the fund, while

$$\boldsymbol{d}[\boldsymbol{w_{fund,i}} > \mathbf{0}]$$

is an indicator variable equal to 1 for all positions where the fund is positive (that is, not short) and is zero otherwise, where we also assume that all benchmark weights are non-negative. As long as all weights are positive, the minimum of each stock's weight in the fund ($w_{fund,i}$) and in the benchmark ($w_{benchmark,i}$) is the overlapping weight for the stock.

Source: Cremers, M. 2017. "Active Share and the Three Pillars of Active Management: Skill, Conviction, and Opportunity." In Financial Analysts Journal, Vol. 73, No. 2, P. 61. DOI: 10.2469/faj.v73.n2.4.

This definition implies that all nonequity holdings are considered active positions, including cash, which has been a source of debate, with differing views among market participants, regulators, and researchers. Including cash—as this study does—emphasizes the portfolio level: Having a large cash position is a managerial bet with potentially big consequences. Excluding cash would keep the consideration at the security level.

Category Indexes

The choice of index is crucial in active-share calculations. Using each manager's primary prospectus benchmark is an appealing choice, as it would ensure that funds with differentiated mandates or investment restrictions would be compared with an index that truly represents their proclaimed target universe. But many prospectus-defined benchmark only vaguely represent funds' investment styles, while others show higher holdings overlap (that is, lower active share) and more closely resemble their performance patterns. For these reasons, this study's calculations of fund active shares and assessments of average performance are based on a single benchmark for all funds in a category—the Morningstar-designation category index[19]—which arguably most comprehensively captures the relevant investment opportunities pursued by each category's constituent funds. For active share calculations, the analysis used ETFs that closely track the category indexes:

Exhibit 17 Morningstar Categories, Category Indexes, and ETF Proxies

Category	Category Index	ETF Proxy
Large Blend	Russell 1000 TR	iShares Russell 1000 ETF
Large Growth	Russell 1000 Growth TR	iShares Russell 1000 Growth ETF
Large Value	Russell 1000 Value TR	iShares Russell 1000 Value ETF
Mid-Cap Blend	Russell Mid Cap TR	iShares Russell Mid-Cap ETF
Mid-Cap Growth	Russell Mid Cap Growth TR	iShares Russell Mid-Cap Growth ETF
Mid-Cap Value	Russell Mid Cap Value TR	iShares Russell Mid-Cap Value ETF
Small Blend	Russell 2000 TR	iShares Russell 2000 ETF
Small Growth	Russell 2000 Growth TR	iShares Russell 2000 Growth ETF
Small Value	Russell 2000 Value TR	iShares Russell 2000 Value ETF

Morningstar's Data and Research groups determine the categories' benchmark assignments.

Periodicity of Active Share Calculations

With quarterly calculations, the analysis involved 73 periods, including funds that have been live for at least a part of the period between the study's start and end dates and have provided Morningstar with at least one portfolio.

The study calculated a quarterly active share using the quarter-end portfolio of each fund. To ensure the strongest possible portfolio coverage, the analysis replaced missing quarter-end portfolios with data from the same quarter. As an example, the end of January or February portfolio is used in case of a missing portfolio from the end of March. This is reasonable considering that most portfolios do not change drastically from one quarter to another.

Usage of Historical Portfolios

As mentioned, fund active shares tend to vary modestly through time. An abrupt shift may result from a change in the investment mandate; however, but typically only funds that raise or deploy cash stakes for

19 Morningstar, Inc. (2021): Morningstar Category for Funds Definitions. For funds available for sale in the United States. Available online at https://advisor.morningstar.com/Enterprise/VTC/MorningstarCategoryClassificationforFunds_April2021.pdf.

market-timing or funds with frequent and wholesale style changes show considerable changes month to month. At times, managers tend to become less or more benchmark-aware, but such changes are usually gradual.

The same applies for categories: While some show visible changes in their average active shares, the average level across Morningstar's nine categories evolves gradually. This allows for inclusion of each fund's quarterly portfolio as one data point, rather than reducing calculations to a single average number per fund. This approach allows for detailed distribution charts even for small categories or quantiles. Although some funds are included in the data set more often than others, this is a lesser issue compared with the advantages gained from the larger data set.

Exhibit 18 Level of Active Share at Each Quintile Breakpoint Across Nine Morningstar Categories

Category	20th percentile	40th percentile	60th percentile	80th percentile
Large Growth	49%	57%	60%	74%
Large Blend	56%	67%	74%	84%
Large Value	72%	78%	81%	86%
Mid-Cap Growth	70%	81%	87%	92%
Mid-Cap Blend	88%	93%	96%	97%
Mid-Cap Value	83%	89%	92%	95%
Small Growth	81%	87%	92%	94%
Small Blend	75%	92%	95%	97%
Small Value	84%	90%	94%	97%

Source: Morningstar Research. Data as of Dec. 31, 2020.

Exhibit 19 Average Net Expense Ratios Across All Categories and Active-Share Quintiles

	Q1	Q2	Q3	Q4	Q5	Q5 - Q1	*t*-stat
Large Growth	0.59	0.84	0.95	1.01	1.18	0.59	7.02
Large Blend	0.81	0.90	1.01	1.06	1.10	0.29	5.01
Large Value	0.76	0.89	0.92	1.08	1.11	0.35	4.42
Mid-Cap Growth	0.99	1.13	1.13	1.19	1.28	0.29	2.32
Mid-Cap Blend	0.93	0.97	1.13	1.13	1.30	0.37	4.35
Mid-Cap Value	0.93	0.94	0.98	0.95	1.09	0.16	2.00
Small Growth	0.86	1.02	1.12	1.14	1.42	0.56	4.46
Small Blend	1.03	1.16	1.20	1.22	1.60	0.57	3.37
Small Value	0.87	1.18	1.16	1.22	1.30	0.43	4.69

Source: Morningstar Research. Data as of Dec. 31, 2020.

Exhibit 20 Average 12-Month Rolling Excess Returns From 2003 Through 2020 by Category and Active-Share Quintile (Q1 = Lowest Active Share)

	Gross							Net						
	Q1	Q2	Q3	Q4	Q5	Q5 - Q1	*t*-stat	Q1	Q2	Q3	Q4	Q5	Q5 - Q1	*t*-stat
Large Growth	-0.22	0.01	-0.29	0.31	1.44	1.67	5.06	-1.28	-1.32	-1.69	-1.39	-0.25	1.03	2.99
Large Blend	-0.41	-0.46	-0.34	-0.69	0.35	0.76	2.65	-1.58	-1.85	-1.86	-2.25	-1.19	0.39	1.36
Large Value	0.20	0.44	0.32	0.42	0.77	0.57	1.96	-0.96	-0.95	-1.01	-1.00	-0.82	0.13	0.45
Mid-Cap Growth	0.15	-0.60	-0.26	0.27	-0.41	-0.55	-1.05	-1.51	-2.31	-1.89	-1.59	-2.62	-1.11	-2.09
Mid-Cap Blend	-0.88	-1.01	-0.78	-1.47	-2.13	-1.24	-2.00	-2.21	-2.63	-2.35	-2.68	-3.76	-1.55	-2.30
Mid-Cap Value	-0.32	0.15	-0.06	-0.07	-0.31	0.02	0.02	-1.71	-1.41	-1.69	-1.77	-1.71	0.00	0.00
Small Growth	0.12	1.48	1.40	1.11	0.86	0.75	1.33	-1.36	-0.04	-0.58	-0.85	-1.94	-0.58	-0.91
Small Blend	0.05	0.00	0.24	-0.37	0.60	0.55	1.07	-1.43	-1.60	-1.28	-1.93	-1.40	0.03	0.06
Small Value	0.67	0.86	1.65	1.30	1.93	1.26	1.66	-0.84	-1.06	-0.11	-0.38	-0.24	0.60	0.81

Source: Morningstar Research. Data as of Dec. 31, 2020. For gross: Oldest share classes included only. For net: A given fund's net-of-fee return is calculated by taking an equal-weighted average across all its share classes.

Exhibit 21 Average 36-Month Rolling Excess Returns From 2003 Through 2020 by Category and Active-Share Quintile (Q1 = Lowest Active Share)

	Gross							Net						
	Q1	Q2	Q3	Q4	Q5	Q5 - Q1	*t*-stat	Q1	Q2	Q3	Q4	Q5	Q5 - Q1	*t*-stat
Large Growth	-0.08	0.04	-0.19	0.00	0.69	0.77	4.51	-1.32	-1.46	-1.87	-2.09	-1.83	-0.51	-2.52
Large Blend	-0.10	-0.15	-0.04	-0.46	0.11	0.21	1.19	-1.19	-1.30	-1.36	-2.02	-1.91	-0.73	-4.18
Large Value	0.20	0.65	0.47	0.62	0.32	0.12	0.73	-0.85	-0.63	-0.75	-0.58	-1.12	-0.27	-1.38
Mid-Cap Growth	0.23	-0.06	0.16	0.05	-0.39	-0.63	-2.33	-1.25	-1.49	-1.10	-1.53	-2.16	-0.92	-2.75
Mid-Cap Blend	-0.30	-0.85	-0.77	-1.03	-1.91	-1.61	-3.89	-1.41	-2.27	-2.20	-2.16	-3.18	-1.77	-4.26
Mid-Cap Value	-0.07	0.26	-0.05	-0.14	-0.74	-0.67	-1.52	-1.30	-1.24	-1.68	-1.90	-2.49	-1.19	-2.54
Small Growth	0.44	1.41	1.13	0.91	0.55	0.11	0.33	-1.19	-0.71	-1.00	-1.27	-2.27	-1.08	-2.52
Small Blend	0.47	0.46	0.59	0.21	0.22	-0.25	-0.88	-1.18	-1.16	-0.90	-1.49	-2.25	-1.07	-3.66
Small Value	0.86	1.21	1.30	0.94	1.01	0.15	0.37	-0.94	-0.82	-0.81	-1.36	-1.40	-0.46	-1.18

Source: Morningstar Research. Data as of Dec. 31, 2020. For gross: Oldest share classes included only. For net: A given fund's net-of-fee return is calculated by taking an equal-weighted average across all its share classes.

Exhibit 22 Average 12-Month Rolling Success Rates From 2003 Through 2020 by Category and Active-Share Quintile (Q1 = Lowest Active Share)

	Gross						Net					
	Q1	Q2	Q3	Q4	Q5	Q5 - Q1	Q1	Q2	Q3	Q4	Q5	Q5 - Q1
Large Growth	42%	46%	42%	47%	49%	7	28%	31%	29%	34%	39%	10
Large Blend	41%	41%	42%	39%	45%	5	26%	25%	28%	26%	33%	7
Large Value	45%	48%	46%	47%	47%	3	28%	34%	33%	36%	36%	8
Mid-Cap Growth	50%	44%	41%	46%	41%	-9	33%	28%	29%	33%	32%	-1
Mid-Cap Blend	40%	39%	42%	40%	38%	-2	27%	24%	32%	31%	30%	3
Mid-Cap Value	44%	45%	45%	44%	41%	-4	30%	35%	33%	33%	31%	1
Small Growth	48%	52%	51%	46%	46%	-2	33%	38%	36%	34%	34%	1
Small Blend	51%	49%	51%	48%	48%	-3	33%	31%	36%	35%	36%	3
Small Value	54%	53%	55%	52%	51%	-3	38%	41%	43%	44%	42%	4

Source: Morningstar Research. Data as of Dec. 31, 2020. For gross: Oldest share classes included only. For net: A given fund's net-of-fee return is calculated by taking an equal-weighted average across all its share classes.

Exhibit 23 Average 36-Month Rolling Success Rates From 2003 Through 2020 by Category and Active-Share Quintile (Q1 = Lowest Active Share)

	Gross						Net					
	Q1	Q2	Q3	Q4	Q5	Q5 - Q1	Q1	Q2	Q3	Q4	Q5	Q5 - Q1
Large Growth	35%	39%	34%	39%	46%	11	14%	15%	13%	14%	20%	6
Large Blend	38%	38%	38%	34%	42%	5	13%	16%	18%	13%	18%	5
Large Value	45%	53%	49%	48%	47%	2	22%	26%	25%	29%	27%	5
Mid-Cap Growth	49%	38%	39%	39%	36%	-13	24%	22%	26%	22%	21%	-3
Mid-Cap Blend	34%	31%	35%	30%	35%	1	15%	13%	19%	19%	19%	4
Mid-Cap Value	43%	47%	47%	40%	37%	-5	18%	22%	19%	19%	21%	3
Small Growth	46%	51%	48%	48%	41%	-6	17%	20%	24%	23%	21%	4
Small Blend	54%	52%	53%	46%	44%	-10	22%	26%	31%	25%	21%	-1
Small Value	57%	55%	55%	51%	48%	-9	26%	26%	28%	28%	27%	1

Source: Morningstar Research. Data as of Dec. 31, 2020. For gross: Oldest share classes included only. For net: A given fund's net-of-fee return is calculated by taking an equal-weighted average across all its share classes.

Exhibit 24 Average 12-Month Rolling Annualized Standard Deviation and Tracking Error From 2003 Through 2020 by Category and Active-Share Quintile (Q1 = Lowest Active Share)

	Standard Deviation						Tracking Error					
	Q1	Q2	Q3	Q4	Q5	Q5 - Q1	Q1	Q2	Q3	Q4	Q5	Q5 - Q1
Large Growth	13.5%	13.9%	13.8%	14.1%	15.1%	1.60	2.8%	3.4%	4.0%	4.7%	6.3%	3.56
Large Blend	13.0%	12.8%	13.1%	13.3%	14.5%	1.47	2.0%	2.7%	3.3%	4.0%	5.9%	3.89
Large Value	13.6%	13.2%	13.4%	13.6%	14.0%	0.46	2.3%	2.9%	3.6%	4.3%	5.8%	3.49
Mid-Cap Growth	15.6%	15.7%	16.0%	16.2%	16.9%	1.29	3.4%	4.0%	4.8%	5.4%	7.4%	4.05
Mid-Cap Blend	15.2%	15.5%	15.5%	16.0%	16.9%	1.70	3.2%	4.0%	4.7%	5.7%	7.8%	4.63
Mid-Cap Value	15.5%	15.1%	16.0%	16.5%	16.3%	0.81	3.0%	3.7%	4.4%	5.2%	6.7%	3.69
Small Growth	18.0%	18.1%	18.0%	18.1%	18.5%	0.47	3.7%	4.8%	5.3%	6.1%	8.4%	4.68
Small Blend	18.0%	17.2%	17.6%	17.9%	18.1%	0.12	2.8%	3.9%	4.8%	5.6%	7.3%	4.45
Small Value	18.2%	17.6%	17.7%	18.2%	18.5%	0.28	3.1%	3.8%	4.6%	6.0%	9.1%	5.96

Source: Morningstar Research. Data as of Dec. 31, 2020. Based on gross returns.

Exhibit 25 Average 36-Month Rolling Annualized Standard Deviation and Tracking Error From 2003 Through 2020 by Category and Active-Share Quintile (Q1 = Lowest Active Share)

	Standard Deviation						Tracking Error					
	Q1	Q2	Q3	Q4	Q5	Q5 - Q1	Q1	Q2	Q3	Q4	Q5	Q5 - Q1
Large Growth	14.3%	14.4%	14.5%	14.7%	15.8%	1.51	3.1%	3.6%	4.2%	4.9%	6.5%	3.40
Large Blend	13.5%	13.3%	13.6%	13.7%	15.0%	1.44	2.1%	2.9%	3.5%	4.2%	6.1%	3.93
Large Value	13.9%	13.5%	13.8%	13.9%	14.4%	0.45	2.6%	3.1%	3.7%	4.7%	6.1%	3.53
Mid-Cap Growth	16.3%	16.2%	16.5%	16.8%	17.2%	0.92	3.6%	4.3%	5.1%	5.7%	7.4%	3.76
Mid-Cap Blend	15.6%	15.5%	15.8%	16.4%	17.3%	1.65	3.4%	4.3%	5.1%	6.1%	8.2%	4.79
Mid-Cap Value	15.5%	15.2%	16.3%	16.8%	16.7%	1.13	3.2%	3.9%	4.7%	5.4%	6.8%	3.56
Small Growth	18.5%	18.5%	18.3%	18.4%	18.4%	-0.04	3.9%	4.9%	5.4%	6.3%	8.6%	4.68
Small Blend	17.9%	17.1%	17.9%	18.0%	18.6%	0.66	2.9%	4.0%	5.0%	5.8%	7.6%	4.63
Small Value	17.8%	17.5%	17.7%	18.2%	18.7%	0.87	3.2%	4.0%	4.9%	6.4%	9.4%	6.19

Source: Morningstar Research. Data as of Dec. 31, 2020. Based on gross returns.

Exhibit 26 Average 12-Month Rolling Excess Returns From 2011 Through 2020 by Category and Active-Share Quintile (Q1 = Lowest Active Share)

	Gross							Net						
	Q1	Q2	Q3	Q4	Q5	Q5 - Q1	*t*-stat	Q1	Q2	Q3	Q4	Q5	Q5 - Q1	*t*-stat
Large Growth	-0.37	-0.66	-0.68	-1.86	-2.18	-1.81	-6.03	-1.42	-1.94	-1.93	-3.36	-3.54	-2.12	-7.11
Large Blend	-0.31	-0.32	-1.15	-1.25	-1.08	-0.77	-1.47	-1.32	-1.45	-2.31	-2.48	-2.31	-0.99	-1.78
Large Value	0.37	0.50	0.20	-0.14	-0.66	-1.03	-3.17	-0.60	-0.97	-1.06	-1.51	-2.42	-1.82	-5.50
Mid-Cap Growth	-0.67	-0.85	-1.19	-1.03	-2.85	-2.18	-3.09	-1.96	-2.34	-2.65	-2.51	-4.57	-2.61	-3.51
Mid-Cap Blend	0.26	-0.38	-0.10	1.01	0.03	-0.24	-0.31	-1.38	-2.15	-1.61	-0.53	-2.19	-0.82	-0.99
Mid-Cap Value	-0.21	0.10	-0.19	-0.48	-1.23	-1.02	-1.73	-1.44	-1.33	-1.67	-2.13	-2.51	-1.06	-1.69
Small Growth	0.18	-0.16	-0.35	-1.35	-1.18	-1.36	-2.70	-1.32	-1.85	-1.82	-3.09	-3.04	-1.72	-3.32
Small Blend	0.48	2.45	2.00	1.80	0.52	0.05	0.06	-1.59	0.46	-0.63	-0.61	-1.60	-0.01	-0.01
Small Value	0.23	0.60	0.65	0.50	-1.21	-1.44	-1.82	-1.36	-1.57	-1.37	-1.05	-2.82	-1.47	-1.87

Source: Morningstar Research. Data as of Dec. 31, 2020. For gross: Oldest share classes included only. For net: A given fund's net-of-fee return is calculated by taking an equal-weighted average across all its share classes.

Exhibit 27 Average 12-Month Rolling Success Rates From 2011 Through 2020 by Category and Active-Share Quintile (Q1 = Lowest Active Share)

	Gross						Net					
	Q1	Q2	Q3	Q4	Q5	Q5 - Q1	Q1	Q2	Q3	Q4	Q5	Q5 - Q1
Large Growth	25%	25%	20%	22%	19%	-6	16%	16%	14%	15%	14%	-2
Large Blend	26%	25%	25%	18%	19%	-7	15%	14%	16%	10%	12%	-3
Large Value	29%	31%	28%	28%	25%	-5	18%	21%	19%	19%	17%	-1
Mid-Cap Growth	27%	26%	21%	27%	23%	-4	14%	14%	14%	17%	17%	3
Mid-Cap Blend	26%	26%	24%	26%	20%	-6	18%	16%	16%	17%	15%	-3
Mid-Cap Value	31%	31%	28%	25%	28%	-3	18%	22%	21%	19%	20%	2
Small Growth	27%	35%	31%	27%	26%	-1	16%	23%	18%	19%	17%	1
Small Blend	34%	32%	31%	28%	26%	-8	21%	19%	21%	17%	18%	-2
Small Value	33%	34%	35%	32%	28%	-5	20%	24%	25%	27%	23%	3

Source: Morningstar Research. Data as of Dec. 31, 2020. For gross: Oldest share classes included only. For net: A given fund's net-of-fee return is calculated by taking an equal-weighted average across all its share classes.

Exhibit 28 Average 12-Month Rolling Annualized Standard Deviation and Tracking Error From 2011 Through 2020 by Category and Active-Share Quintile (Q1 = Lowest Active Share)

	Standard Deviation						Tracking Error					
	Q1	Q2	Q3	Q4	Q5	Q5 - Q1	Q1	Q2	Q3	Q4	Q5	Q5 - Q1
Large Growth	13.7%	14.0%	13.7%	13.9%	14.5%	0.80	2.8%	3.1%	3.7%	4.4%	6.0%	3.20
Large Blend	12.8%	12.8%	12.9%	13.2%	13.8%	0.94	1.8%	2.6%	3.0%	3.7%	5.1%	3.24
Large Value	13.3%	12.9%	13.1%	13.3%	13.5%	0.19	2.3%	2.7%	3.4%	4.0%	5.4%	3.13
Mid-Cap Growth	14.7%	15.1%	15.4%	15.5%	16.1%	1.42	3.0%	3.6%	4.6%	5.0%	7.0%	3.92
Mid-Cap Blend	14.3%	14.8%	14.6%	15.3%	16.0%	1.71	3.0%	3.8%	4.2%	5.3%	7.4%	4.40
Mid-Cap Value	14.8%	14.7%	15.2%	15.9%	15.5%	0.67	2.7%	3.3%	4.0%	4.9%	6.2%	3.55
Small Growth	17.3%	17.5%	17.3%	17.6%	18.2%	0.92	3.5%	4.7%	5.2%	5.7%	8.3%	4.80
Small Blend	17.3%	16.6%	17.1%	17.3%	17.1%	-0.22	2.6%	3.5%	4.6%	5.3%	6.5%	3.96
Small Value	18.2%	17.2%	17.2%	17.8%	17.6%	-0.57	3.0%	3.5%	4.0%	5.6%	9.2%	6.21

Source: Morningstar Research. Data as of Dec. 31, 2020. Based on gross returns.

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