Active share: A blessing and a curse*

Brandon Cline

Mississippi State University

Collin Gilstrap

The University of Toledo

Abstract

We examine the implications of active mutual fund management across manager skill levels. We find that funds in the highest active share quintile outperform funds in the lowest active share quintile on a risk-adjusted basis. When sorted on both active share and capture ratio, only managers with high skill and high active share experience positive future performance. Funds with high active share and low skill experience negative future risk-adjusted returns, and these funds underperform all funds with low active share. We conclude that only funds with both high active management and high manager skill are preferable to index funds.

JEL Classification: G2, G23

1 INTRODUCTION

The ability of active mutual fund managers to create value for their clients after fees has been hotly debated in the academic literature for the last half century (Jensen, 1968). The preponderance of evidence suggests that after taking into account management fees (Gruber, 1996) and systemic risk

We appreciate the helpful comments and suggestions from Anwar Boumosleh, Caleb Houston, Junnatun Naym, Alex Petkvich, Valeriya Posylnaya, Eli Sherrill, Kainan Wang, and participants at the 2018 Eastern Finance Association Conference. We are especially thankful for the insights offered by Stephen Atkins and Stan Moss at Polen Capital. All errors and omissions are our own.

exposure (Carhart, 1997; Cornell et al., 2017; Daniel et al., 1997), most actively managed mutual funds post negative performance relative to both standard benchmarks and modern risk-adjusted performance models.

This research has contributed to the heuristic that individual investors should allocate their portfolios to low-cost, passively managed funds. As a result, the market has witnessed a dramatic decrease in passive fees (French, 2008) and an increase in the proportion of passively managed mutual funds over the last 2 decades (Cremers & Petajisto, 2009). Theoretically linking active and passive management, Brown and Davies (2017) model the moral hazard problem faced by active fund managers and illustrate that innovations that reduce the fees associated with passively managed funds also reduce the incentive for active managers to outperform their benchmarks.

There is, however, a significant amount of research highlighting subsets of mutual funds that exhibit positive benchmark or risk-adjusted returns net of fees. These subsets consist of funds with high fund flows (Gruber, 1996; Zheng, 1999), high portfolio turnover (Wermers, 2000), and growth-focused funds (Chen et al., 2000). Empirical evidence also suggests that mutual fund performance is persistent over time (Brown & Goetzmann, 1995; Grinblatt & Titman, 1989, 1992; Hendricks et al., 1993). Kosowski et al. (2006) find that mutual funds with annual performance in the top 10% of funds exhibit net positive risk-adjusted returns for the subsequent 3 years. Similarily, Berk and van Binsbergen (2015) find that manager skill is persistent for up to 10 years. A consistent theme among these studies is that an investor who can identify skilled managers ex ante can expect to earn net positive risk-adjusted returns.

Fundamentally, a mutual fund manager's ability to create value for his/her clients depends on the manager's ability to deviate from their benchmark in a way to capture positive (avoid negative) returns relative to the benchmark. Cremers and Petajisto (2009) introduce *Active Share*

as a metric to measure manager deviance from the fund's stated or implied benchmark. They find that the funds that deviate from their benchmarks the most on average generate positive risk-adjusted returns of about 100 basis points (bps) annually. They also illustrate the usefulness of *Active Share* in identifying funds that are closet indexers (funds that simply track the benchmark and collect fees as though they were actively managed) versus those that pursue proprietary investment strategies that could lead to positive benchmark-adjusted returns.

However, as pointed out by Cremers and Petajisto (2009) and Rowley and Kwon (2015), *Active Share* alone is not sufficient to separate funds with inferior proprietary strategies (unskilled managers) from funds with superior proprietary strategies (skilled managers). Brown and Davies (2017) also warn that with the prevalent use of *Active Share* by investors, the signal provided by *Active Share* may become distorted. Specifically, fund managers can anticipate the importance of signaling active management through *Active Share* and simply adjust their holdings to appear as though they have skill. In this respect, not only does the market for mutual funds face the problem of closet indexers, but it must filter out funds that create variance with the benchmark simply for the purpose of appearing to be truly actively managed.

Employing the *Active Share* measure from Cremers and Petajisto (2009) to categorize managers as active or passive, we examine the level of manager activity and the skill of mutual fund managers as predictors of future performance. Our overarching hypothesis is that subsequent positive risk-adjusted performance is concentrated in funds with active managers who have historically exhibited skill, whereas funds with unskilled active managers experience negative future risk-adjusted performance. In addition, like Brown and Davies (2017), we predict that this association has intensified following Cremers and Petajisto's discovery of the significance of *Active Share*.

Kacperczyk et al. (2014) find that based on market conditions, fund strategies change. They further show that funds that are willing to alter strategies outperform. It is therefore plausible that the skills necessary for the development and implementation of good strategies to avoid losses in down markets differ from those necessary to outperform in up markets. Consistent with this logic, Peskin (2018) shows that fund evaluation should differ depending on whether the market is rising or falling and specifies *Capture* as an ideal mechanism for this identification. Likewise, Marlo and Stark (2019) demonstrate empirically that *Capture Ratios* are effective proxies for the skill of mutual fund managers and that investors respond to these ratios when allocating capital to mutual funds.[1] We therefore parse skilled and unskilled active managers, using the *Upside Capture Ratio* and *Downside Capture Ratio*, as well as the composite *Capture Spread*.

Upside Capture measures the ability of a manager to outperform the fund benchmark when the benchmark has positive returns. Conversely, *Downside Capture* measures the ability of a manager to outperform the fund benchmark (avoid losses) when the benchmark experiences negative returns. *Capture Spread* is *Upside Capture Ratio* minus *Downside Capture Ratio,* which combines the two measures.

Thus, our primary hypothesis is that both *Active Share* and *Capture Spread*, along with its individual components, significantly predict future risk-adjusted returns. To test our hypotheses, we construct a panel of 25,216 annual equity-focused mutual fund observations from 1990 through 2016. Our initial analysis sorts the funds by *Active Share, Downside Capture, Upside Capture,* and *Capture Spread*. We find that funds in the lowest *Downside Capture* quintile outperform funds

[1]Other studies find that Morningstar measures in general affect investor flows (e.g., Armstrong et al., 2019; Blake & Morey, 2000; Del Guercio & Tkac, 2008).

in the highest *Downside Capture* quintile by 500 bps in the subsequent year.[2] Funds in the highest *Upside Capture* quintile outperform funds in the lowest *Upside Capture* quintile by 210 bps. Funds in the highest *Capture Spread* quintile outperform funds in the lowest *Capture Spread* quintile by 720 bps.

These initial findings support the literature on the persistence of mutual fund performance (Brown & Goetzmann, 1995; Grinblatt & Titman, 1989, 1992; Hendricks et al., 1993); however, in independent double sorts of *Active Share* and *Capture,* we find that high *Active Share* managers exhibit future positive risk-adjusted performance only when they are in the two lowest *Downside Capture* quintiles and highest *Upside Capture* quintile. Funds in the high *Active Share*/low *Downside Capture* quintile have an average risk-adjusted return of 250 bps, and funds in the high *Active Share*/high *Upside Capture* quintile have an average risk-adjusted return of 210 bps. High *Active Share* funds in the highest *Capture Spread* quintile have an average alpha of 370 bps. Interestingly, funds with high *Active Share* in the highest (lowest) quintile of *Downside* (*Upside*) *Capture* perform worse than all low *Active Share* quintiles (index strategy funds).

These results suggest that although active management on average contributes to future abnormal performance, active management alone is not sufficient. In fact, we show that among the funds that demonstrate poor historical performance, as measured by *Capture, Active Share* is detrimental to future performance. Thus, investors benefit from having high *Active Share* funds only when they can differentiate between funds with good and bad proprietary strategies.

[2]Low values of *Downside Capture* indicate that a fund has outperformed during months the benchmark was down.

These initial findings are supported in continuous regression models where we control for fund size, expenses, portfolio turnover, fund age, and manager tenure. Higher levels of *Active Share, Upside Capture,* and *Capture Spread* predict positive future risk-adjusted performance, and lower levels of *Downside Capture* predict negative future risk-adjusted performance. Our results are robust to using 1-, 3-, and 5-year estimations of *Capture Spread* and its components.

To test the prediction that unskilled managers have adapted their strategies to avoid detection following the discovery of *Active Share* by Cremers and Petajisto (2009), we split our sample into pre- and post-2009, the year in which these findings were published. We consider two hypotheses related to Brown and Davies (2017). First, we test the signal jamming hypothesis, where unskilled managers increase their level of activity to capitalize on rents associated with active management. Second, we test the shirking hypothesis, where the downward pressure on management fees reduces the incentives for truly skilled active managers to perform. We find support for both hypotheses. In the post-2009 subsample, we find that unskilled high-active managers in fact increase their activity relative to the pre-2009 sample. We also document that high-skill, high-active managers' future returns significantly deteriorate relative to the post-2009 sample.

In addition to these primary findings, we document that there is little overlap between managers that excel in up markets (high *Upside Capture*) and mangers that excel in down markets (low *Downside Capture*). The percentage of overlap of the extreme quintiles ranges from 5% to 30% over our sample. We further illustrate that the ability to outperform in down markets is relatively more important than the ability to outperform in up markets. We therefore examine the differences in portfolio characteristics within *Downside Capture* and *Upside Capture* quintiles and between the high *Upside Capture* and low *Downside Capture* portfolios. We find that low

Downside Capture funds are predominately value firms (high book-to-market ratios) with higher dividend yields, lower idiosyncratic volatility, and short interest relative to high *Downside Capture* funds. High *Upside Capture* portfolios primarily consist of glamour firms (low book-to-market ratios) with lower dividend yields and higher standardized unexpected earnings relative to low *Upside Capture* portfolios. When contrasting high *Upside Capture* fund portfolios with low *Downside Capture* fund portfolios we find that the high *Upside Capture* portfolios consist of smaller, younger, glamour firms with lower dividend yields, higher short interest, and a higher propensity to beat analyst expectations.

Collectively, our findings reveal that although *Active Share* on average correlates with future outperformance, the level of outperformance critically depends on a manager's skill. Specifically, we show that for unskilled mutual fund managers, *Active Share* can negatively affect performance. The implications of these results suggest that both blessings and curses come with *Active Share.* To achieve returns above a stated benchmark, an investor should select funds that have demonstrated high levels of active management coupled with a successful proprietary strategy. Our findings also suggest that in accordance with the predictions of Brown and Davies (2017), the signal from *Active Share* has become more distorted.

Our work contributes to both the active management and return persistence literatures. Although older studies generally find that active management does not create value for investors, more recent studies show that high active management predicts future returns. We blend this literature by illustrating that high active management can be a blessing or a curse. High active management and high skill predict economically large gains for mutual fund investors, whereas high active management and low skill predict economically large losses for investors. Our

measures of skill, *Capture Ratios* and *Capture Spread,* show that prior manager success alone over the past 1, 3, or 5 years also predicts economically large after-fee returns.

2 METHODOLOGY AND DATA

Following Cremers and Petajisto (2009), we calculate quarterly *Active Share* for each mutual fund–index pair in our sample using the following equation:

$$Active\ Share = \frac{1}{2}\sum_{i=1}^{N}\left|w_{i,fund} - w_{i,index}\right|, \quad (1)$$

where $w_{i,fund}$ is the portfolio weight of stock i in a fund and $w_{i,index}$ is the weight of stock i of the fund's potential benchmark index.

Quarterly mutual fund holdings data are collected from Thompson's database of U.S. Securities and Exchange (SEC) S12 filings (formerly CDA/Spectrum). The weights of a fund's holdings are determined by merging the s12 data with Center for Research in Security Prices (CRSP) prices to calculate the portfolio weights for each position. Monthly benchmark index components are gathered from Bloomberg, including the S&P 500, 400, and 600, and Russel 1000, 2000, and 3000, along with the growth and value variations for a total of 18 benchmark indices.[3] The monthly components for each index are then merged with CRSP to calculate the value weight for each index component. Next, we calculate the average of annual *Active Share* over the sample for each fund–index pair and assign the index with the lowest *Active Share* to that fund as a benchmark.

After assigning benchmarks to each fund, the 1-, 3-, and 5-year *Downside Capture Ratio* and *Upside Capture Ratio* are calculated using fund returns net of fees and matched index monthly

[3]Coverage for the S&P 500, 400, and 600 begins in 1990. Coverage for the value and growth versions of the S&P funds begins in 2001. Coverage for all the Russell indices begins in 1994.

return data for each panel year. *Downside Capture* is the annualized geometric average of monthly fund returns over the last 1, 3, or 5 years for the months in which the benchmark returns are negative, scaled by the annualized geometric average of monthly index returns over the last 1, 3, or 5 years for the months the benchmark returns are negative. Consequently, *Downside Capture Ratio* less than 1 indicates that a fund manager outperformed the benchmark during periods in which the benchmark was negative:

$$Downside\ Capture\ Ratio = \frac{\prod(1+ret_{f,t,neg})-1}{\prod(1+ret_{i,t,neg})-1}. \quad (2)$$

Upside Capture is the annualized geometric average of monthly fund returns over the last 1, 3, or 5 years for the months the benchmark returns are positive, scaled by the annualized geometric average of monthly index returns over the last 1, 3, or 5 years for the months the benchmark returns are positive. *Upside Capture Ratio* greater than 1 indicates that the managers outperformed the benchmark during periods in which the benchmark was positive:

$$Upside\ Capture\ Ratio = \frac{\prod(1+ret_{f,t,pos})-1}{\prod(1+ret_{i,t,pos})-1}. \quad (3)$$

Managers with lower *Downside Capture* have historically lost less than the index in down markets. Managers with higher *Upside Capture* historically profited more than the index in up markets. *Capture Spread* is measured as the difference between *Upside Capture Ratio* and *Downside Capture Ratio*. Higher values of *Capture Spread* indicate historical outperformance by a manager relative to the matched index:

$$Capture\ Spread = Upside\ Capture\ Ratio - Downside\ Capture\ Ratio. \quad (4)$$

To calculate *Capture Ratio* and *Capture Spread*, we collect monthly fund return data net of fees from CRSP Mutual Fund and monthly index return data from Morningstar Direct.[4] The

[4]All return data begin in 1990.

CRSP fund objective code EQ is used to filter funds with an equity focus. Additionally, we exclude funds with fewer than 10 equity holdings and funds with less than $5 million in assets under management (Kacperczyk et al., 2008). The holdings data are then matched with fund return data using MFLINKS from WRDS. Fund characteristic controls are calculated using data from CRSP Mutual Fund.

Our primary measure of risk-adjusted mutual fund performance in the subsequent year is the Carhart (1997) four-factor alpha. The benefit of using an alpha over a simple benchmark-adjusted return is that it controls for a fund's exposure to systemic risk factors. Specifically, the Carhart four-factor alpha controls for equity market exposure (*MKT*), growth exposure (*HML*), size exposure (*SMB*), and momentum exposure (*MOM*) using the following regression model:

$$r_{fund} - r_{risk\ free} = a + b_1 \times (MKT) + b_2 \times (HML) + b_3 \times (SMB) + b_4 \times (MOM) + e. \quad (5)$$

Similar to Carhart, monthly alphas are calculated using a 3-year regression window over monthly return observations. We then calculate future alpha as the annualized monthly alpha of the subsequent year.

We present the summary statistics of our sample in Panel A of Table 1. The annual panel spans calendar years 1990 to 2016 and contains 25,216 annual equity-focused mutual fund observations after filtering out observations with any missing variables. The average alpha for our sample is −80 bps. This is consistent with prior research, which suggests that on average, after fees, fund managers do not create value for their clients. The 3-year average *Downside Capture, Upside Capture,* and *Capture Spread* are 0.915, 0.927, and 0.011, respectively. This suggests that on average fund managers tend to slightly outperform their benchmarks in down markets and underperform their benchmarks up markets. Average total net assets for the funds in our sample

are $1.026 billion, average expense ratio is 120 bps, average portfolio turnover is 0.855, average fund age is 14.77 years, and average manager tenure is 7.38 years.

To examine the univariate associations between future alpha and contemporaneous *Active Share, Capture Ratio,* and *Capture Spread,* we first conduct single-sort analysis for fund-year observations grouped into quintiles. Cells in Panel B of Table 1 report the average 1-year future risk-adjusted return within each quintile. Below the main cells we report the difference between the highest and lowest quintiles along with Newey–West (1987) autocorrelation-adjusted test statistics that allow for 3 years of lag. We make this correction to address potential autocorrelation issues introduced from estimating the factor model and capture measures over the same return series. For brevity, we discuss *Capture Ratio* and *Capture Spread* only for the 3-year measures, though results for the 1- and 5-year measures are similar.

We find that the difference between the high and low *Active Share* quintiles is not statistically significant. The 3-year *Downside Capture Ratio* is negatively related to future alpha, indicating that managers who are skilled at avoiding losses in down markets appear to generate positive alpha in the subsequent year. The magnitude of the difference between the lowest and highest *Downside Capture* quintiles is a statistically and economically significant 500 bps. The 3-year *Upside Capture Ratio* is positively related to future alpha, indicating that managers who are skilled at outperforming the benchmark in positive years generate positive alpha in the subsequent year. The magnitude of the difference between the highest and lowest *Upside Capture* quintiles is a statistically and economically significant 210 bps. The 3-year *Capture Spread* is also positively related to future alpha, with a statistically significant difference of 720 bps between the highest and lowest quintiles. These results suggest that managers who display their skill through successful historic capture measures generate positive alpha in the subsequent year. The analysis also reveals

that in the univariate, *Upside Capture* is relatively less important than *Downside Capture* when predicting the magnitude of future alpha.

One interesting question is whether funds that fall within each high-skill group (low *Downside Capture*, high *Upside Capture*) are overlapping or distinct. According to Peskin (2018), a manager's strategy may be highly dependent on the direction of the market. It is possible that the skill set enabling a manager to outperform in an upward-trending market differs from those needed to avoid losses in a downward-trending market. To determine whether the low *Downside Capture* and high *Upside Capture* groups tend to overlap, we count the number of firms in both high-skill quintiles each year and scale by the number of firms in the low *Downside Capture* quintile and high *Upside Capture* quintile. The time series of this analysis is presented in Figure 1. The overlap between the two skill quintiles ranges from approximately 5% to 30% over our sample period, with an average overlap of approximately 16%. This suggests that managers who are better at avoiding losses in down markets on average differ from those who capture excess gains in up markets.

3 ANALYSIS

3.1. Bivariate sorts

We begin the investigation of our main hypothesis by performing independent double sorts to analyze the associations between future alpha and both *Active Share* and the three capture measures. For each calendar year in our sample, we independently sort funds by *Active Share* and the capture measures into quintiles. These sorts are then grouped into 1 of 25 possible cells. We report the results in Table 2. The interior cells report the equal-weighted average future alpha and the average number of funds within each quintile combination per year. The differences between the extreme groups are reported according to both columns and rows with the associated three-lag

Newey–West (1987) *t*-statistic from a difference-in-means tests. We report the results for the *Downside Capture* measure in Panel A, *Upside Capture* in Panel B, and *Capture Spread* in Panel C.

Recall from Panel B of Table 1 that future performance is generally increasing in *Active Share.* However, when examining future alpha conditional on both *Active Share* and *Downside Capture* in Panel A of Table 2, we find that high *Active Share* alone does not uniformly predict positive alpha. For example, high *Active Share*/high *Downside Capture* (managers who do not avoid downside losses) is the worst performing group in the subsequent year at −640 bps. However, high *Active Share*/low *Downside Capture* (managers who are historically successful in avoiding downside losses) is the best performing group in the subsequent year at 250 bps. Individually, these portfolios are significant at the 1% level. The difference in future alpha between these two cells is a statistically and economically significant 890 bps. Another interesting finding emerges from a comparison of the high *Active Share*/high *Downside Capture* cell (high active management but low skill) with all the low *Active Share* cells (index type strategies). The future risk-adjusted return for each low *Active Share* group is significantly higher than that of the high *Active Share*/high *Downside Capture* cell. This suggests that an investor would be better off investing in a manager who chooses an indexing strategy rather than an active manager who has not demonstrated historically that he/she can outperform during down markets.

We observe a similar, albeit less extreme, analog in the *Active Share/Upside Capture* analysis presented in Panel B of Table 2. The high *Active Share*/low *Upside Capture* group (managers who historically underperform in up markets) has a future alpha of −220 bps, whereas the high *Active Share*/high *Upside Capture* cell has a future alpha of 210 bps. The difference is a statistically and economically significant 430 bps. All five of the low Active Share cells (index

strategy) are preferable to the high *Active Share*/low *Upside Capture* group (high active management but low skill). The *Capture Spread* analysis reported in Panel C captures both results. The difference between the high *Active Share*/high *Capture Spread* (managers historically better at beating the market) and the high *Active Share*/low *Capture Spread* groups is a statistically and economically significant 1150 bps. These results highlight that managerial ability is an important component when analyzing high *Active Share* funds.

In Figure 2, we present the performance results from a $1 investment in three portfolios: high *Active Share*, low *Downside Capture*, and high *Downside Capture*. Each portfolio is rebalanced annually and earns the respective risk-adjusted rate (Carhart alpha). The first portfolio is the high *Active Share* portfolio, which invests an equal weight in funds that are in the highest *Active Share* quintile at the beginning of the calendar year. The second and third portfolios are grown at the risk-adjusted, equal-weighted returns for funds falling into the independent double-sort high *Active Share*/low *Downside Capture* quintile, and high *Active Share*/high *Downside Capture* quintile, respectively. Over our sample period, the returns to the high *Active Share*/low *Downside Capture* (skilled) portfolio are notably higher than the returns to the high *Active Share*/high *Downside Capture* (unskilled) portfolio. In Figures 3 and 4, we replicate this analysis for the *Upside Capture Ratio* and *Capture Spread,* respectively, and find that active, skilled managers significantly outperform active, unskilled managers.

3.2 Multivariate analysis

In this section, we explore the relation between future alpha and the capture measures employing fund-year fixed-effects models on the continuous, discrete, and interaction terms of the *Active Share* and *Capture* measures. Because of the nature of fund-level data, we suspect that our error terms experience both autocorrelation and heteroskedasticity at the fund level. To address this, we

report robust standard errors that allow for clustering across both fund and time dimensions. All models also include controls for fund size, squared fund size, expense ratio, portfolio turnover, fund age, and manager tenure.

Our first analysis considers the predictive power of continuous measures of manager activity and skill. For brevity, we discuss the results only for 3-year *Capture* variables; however, the 1- and 5-year measures are presented in Appendix Tables A1 and A2.

In the first four columns of Table 3, we report estimates of the predictive ability of *Active Share, Downside Capture, Upside Capture,* and *Capture Spread* on future alpha separately. The coefficient on *Active Share* in Model 1 is 0.018 and is significant at the 1% level. This suggests that for a 10 percentage point increase in *Active Share,* a fund is expected to increase alpha in the subsequent year by 18 bps at the mean. This result is consistent with Cremers and Petajisto (2009). The coefficient on *Downside Capture* in Model 2 is −0.043 and is significant at the 1% level. This suggests that for a 10 percentage point decrease in *Downside Capture Ratio,* a fund increases alpha in the subsequent year by 43 bps. The coefficient of *Upside Capture* in Model 3 is 0.046 and is significant at the 1% level. This suggests that a 10 percentage point increase is associated with a 46 bps increase in alpha the subsequent year. The coefficient on *Capture Spread* in Model 4 is 0.045 and is significant at the 1% level. Marginal effects imply that a 10 percentage point increase is associated with a 45 bps increase in alpha the subsequent year.

Models 5–7 in Table 3 report estimates of the effect of *Active Share* and the capture measures on future alpha simultaneously. Model 5 shows that the individual effects of neither *Active Share* nor *Downside Capture* subsumes the other, and both coefficients remain significant at the 1% level. This suggests that both *Active Share* and *Downside Capture* independently have a significant impact on future alpha. In Model 6, *Active Share* and *Upside Capture* retain their

positive sign and significance at the 5% and 1% levels, respectively. Finally, when we include the full *Capture Spread* (Model 7) and simultaneously include the individual components of *Capture Spread* (Model 8), the significance of *Active Share* is subsumed by our measure of manager skill. Collectively, the results of Models 5–8 suggest that *Active Share, Downside Capture,* and *Capture Spread* are each important in predicting future returns.

Although our analysis in Table 3 informs us about the return predictability at the average level of active share and skill, it can mask what is happening at the extreme values of these variables. In our next analysis we parse out the marginal information of our measures across varying levels of manager activity and manager skill. To that end, we create quintile indicator variables for all funds based on the *Active Share, Downside Capture, Upside Capture,* and *Capture Spread* sorts. Each fund is placed into a quintile for a given year according to each measure; thus, funds are allowed to change quintiles as their measures change year over year. Like our analysis in Table 3, we employ firm-year fixed-effects models including the same battery of controls and allow for fund and time error clustering to estimate future alpha. The constant, however, is omitted from this analysis due to perfect multicollinearity with the vector of quintile indicators. The results of this predictive analysis are presented in Table 4.

Column 1 of Table 4 reports the results of our analysis for *Active Share*. We observe a monotonically increasing association between return predictability and level of *Active Share*. As expected, we find a similar pattern among the quintile coefficients of our capture measures. Return predictability is monotonically decreasing in *Downside Capture* (where lower levels indicate higher skill) and monotonically increasing in *Upside Capture* and *Capture Spread*. The results of this test are consistent with the results from the models in Table 3.

Given the parabolic association between active management and manager skill observed from our double sorts reported in Table 2, next we consider the marginal effect of active management within the managerial skill level in a multivariate setting. Building on our previous test, where we examine return predictability across manager skill quintiles, in Table 5 we present a similar analysis but interact the *Downside Capture, Upside Capture,* and *Capture Spread* indicators with the continuous *Active Share* measure. Thus, the models measure the marginal effect of *Active Share* within each manager skill quintile. We estimate these predictive models with fund-year fixed effects and report robust standard errors clustered by fund and year.

The coefficient loadings of Model 1 reveal that in Quintile 1 of *Downside Capture* (high skill), a 10 percentage point increase in manager activity leads to a 44 bps increase in the subsequent year's risk-adjusted returns. However, in Quintile 5 of *Downside Capture* (low skill), we find that an *Active Share* increase of 10 percentage points is expected lead to a 22 bps decline in subsequent risk-adjusted returns. These results indicate that if a manager is skilled at avoiding losses in a down market, higher active management positively predicts subsequent returns. However, if a manager is not skilled at avoiding losses in a down market, higher manager activity negatively predicts subsequent returns. These findings support the results from our univariate, double-sort analysis.

In Model 2 we find a similar result for *Upside Capture,* although the coefficients suggest the effect of *Active Share* on future returns is smaller across the *Upside Capture* spectrum. At the highest level of *Upside Capture* (Quintile 5), a 10 percentage point increase in *Active Share* is associated with a 38 bps increase in future returns. At the lowest level of *Upside Capture* (Quintile 1), a 10 percentage point increase in *Active Share* is associated with a 10 bps decrease in future returns. Given the results for the individual components of *Capture Spread,* it is not surprising that

the *Capture Spread* results in Model 3 also show this asymmetry throughout the quintiles. At the highest level of *Capture Spread* (Quintile 5), a 10 percentage point increase in *Active Share* leads to a 42 bps increase in future risk-adjusted returns, and at the lowest level (Quintile 1) of *Capture Spread,* a 10 percentage point increase in Active Share leads to a 33 bps decrease in future risk-adjusted returns. Collectively, these results support the hypothesis that high active management amplifies the positive returns of a successful proprietary strategy, whereas high *Active Share* also amplifies the negative returns of an unsuccessful proprietary strategy.

3.3 Signal jamming

In the model proposed by Brown and Davies (2017), as investors' opportunities in passively managed funds increase, rents to active managers decrease. One of the effects of these decreasing fees is less incentive to expend effort to pursue truly active strategies. The reduced effort is compounded by the fact that less effort also leads to less assets under management for all funds; consequently, strategies that are applied to truly active funds are applied to smaller asset bases, rendering them less effective. This in turn incentivizes more shirking and less true effort by skilled managers pursuing proprietary investment strategies. Brown and Davies extend their model to incorporate shirking managers' choice to introduce noise into the active management signal by simply increasing portfolio variance. They call this taking of bets simply to generate a false sense of true active management "signal jamming." Their model implies that signals of moral hazard based on measures such as *Active Share* are less effective as shirking managers strategically adjust their portfolios to avoid detection.

To motivate this idea in the univariate, we split our sample into two periods based on the publication year of Cremers and Petajisto (2009): pre-2009, which consists of calendar years 1990−2008, and post-2009, which consists of calendar years 2009–2016. We then perform our

bivariate sorting procedure across *Active Share* and *Capture Spread* for each year in each subsample and calculate the equal-weighted average of future alpha and *Active Share* for each subsample. The results of this analysis are reported in Table 6.

In general, we observe that the return patterns in the subperiods are consistent with the full sample reported in Panel C of Table 2. Namely, the return gap between skilled and unskilled managers is larger when active management is high relative to when it is low. However, when we consider the differences between the two subsample periods, several things are apparent. First, the return gap between the high- and low-skill managers decreased for the two highest activity quintiles since 2009, for which much of the difference is attributable to the decrease in returns for the high-skilled managers. Second, the average level of *Active Share* across the two highest quintiles of *Active Share* (reported in italics in Table 6) has fallen since 2009. These differences lend cursory support to the Brown and Davies (2017) hypothesis regarding low-skilled managers taking on *Active Share* to appear to be truly actively managed, and this camouflaging of activity results in weaker performance and a deterioration of the signal provided by *Active Share*.

Next, we formally test both the signal jamming and shirking hypotheses in a multivariate setting. Under the signal jamming hypothesis, we expect low-skilled managers to increase their active management in the post-2009 sample. Under the shirking hypothesis, we expect high-skilled active manager returns to decrease in the post-2009 sample.

We create 25 indicator variables that represent the 25 possible portfolios for which a fund can be assigned through our bivariate sorting on *Active Share* and one of the capture measures. For each subsample, we then regress the portfolio indicators and our battery of controls on contemporaneous *Active Share* and future alpha. Our goal is to test the four corner portfolio coefficients between the pre- and post-2009 subsample models. We therefore estimate nested

models and perform a χ^2 test on the coefficients from different regressions. Because of this limitation, we are not able to include firm-year fixed effects in these models. Because of perfect multicollinearity with the portfolio coefficients, we omit the "neutral" portfolio. This is the portfolio that represents the Quintile 3 *Active Share* and Quintile 3 capture measure portfolio. Thus, the portfolio coefficients are relative to this neutral portfolio. We present the results of this analysis in Table 7.

Similar to our previous analysis, we present the results for the *Downside Capture* measure of manager skill in Panel A, *Upside Capture* in Panel B, and *Capture Spread* in Panel C of Table 7. In each panel, we present the portfolio coefficients and robust standard errors for the four "corner" portfolios, or the portfolios that represent the low *Active Share*/low skill, low *Active Share*/high skill, high *Active Share*/low skill, and high *Active Share*/high skill portfolios. Below the coefficients and standard errors we also report the χ^2 statistic and associated *p*-value on the difference between the post- and pre-2009 subsamples run on identical models. On the left-hand side of Table 7 we report results from the model where the dependent variable is contemporaneous *Active Share*, and on the right-hand side we report results where the dependent variable is future alpha.

We first consider the signal jamming hypothesis. Here we are interested in observing whether the *Active Share* level of the low-skill, active managers increases in the post-2009 sample. When skill is measured by *Downside Capture* and *Capture Spread,* we find that the low-skill, active managers do in fact increase their *Active Share* levels in the post-2009 sample. The pre- and post-2009 difference in coefficients for this group increases relative to the neutral group by 100 bps (.056 − .046) of *Active Share* and this difference is significant at the 1% level for *Downside Capture*. Likewise, for *Capture Spread,* we find that the difference in coefficients is 110 bps (.058

− .047) of *Active Share.* For *Upside Capture,* we find that the point estimate difference increases by 20 bps (.058 − .056); however, the χ^2 test is insignificant. Although one may argue that low-activity, low-skill managers may also attempt to "signal jam," this group is composed primarily of indexing funds, where increased levels of activity could be detrimental to demand for their fund. Overall, the results from this test support the signal jamming hypothesis.

Next, we consider the shirking hypothesis. This hypothesis predicts that high-skill, high-activity managers reduce their efforts following the increase in passive management. We therefore consider the change in future alpha for the high-activity, high-skilled managers. In Panel B of Table 7, we find that the future risk-adjusted performance relative to the neutral portfolio decreases by 610 bps (.051 − (−.014)) in the post-2009 sample, a difference that is significant at the 1% level. Likewise, in Panel C we find that the future risk-adjusted performance relative to the neutral portfolio decreases by 130 bps (.031 − .018)) in the post-2009 sample, a difference that is also significant at the 1% level. In Panel A, we find that the point estimates of future performance increase by 120 bps; however, the χ^2 test is significant only at the 10% level. Collectively, these results generally support the idea that high-skill, active managers reduce their efforts, which is reflected in their future performance post-2009.

3.4 Portfolio composition

Given the small overlap between funds in the low *Downside Capture* quintile and high *Upside Capture* quintile, it is natural to question how the portfolios of these two groups differ. In this section, we investigate the portfolio characteristics across *Upside Capture* and *Downside Capture* and compare the differences in characteristics between the low *Downside Capture* quintile and high *Upside Capture* quintile. For each fund-quarter in the S12 database, we calculate average firm assets, book-to-market ratio, prior-quarter return, dividend yield, firm age, institutional

ownership level, interest ratio, illiquidity (Amihud, 2002), idiosyncratic volatility (Ang et al., 2009), and next-quarter standardized unexpected earnings. We then aggregate the quarterly statistics to the calendar year by taking the average across each fund-quarter.

Table 8 presents single-sort means of each characteristic across the *Downside Capture* quintile (Panel A) and *Upside Capture* quintile (Panel B). We also report the difference-in-means test for the extreme quintiles. We observe several characteristics that appear to be monotonically related to downside capture. For instance, book-to-market and dividend yield are both increasing as *Downside Capture* decreases, whereas short interest and idiosyncratic volatility are both decreasing as *Downside Capture* decreases. These results suggest that managers who are better at avoiding downside risk tend to hold value and high-yield stocks, bet less against short interest, and take on less idiosyncratic risk. Contrasting the high and low *Downside Capture* quintiles, we also find that firm size and age (institutional ownership) are significantly higher (lower) for low *Downside Capture* funds. However, these differences appear to be driven only by the differences in the extreme quintiles.

Across the *Upside Capture* quintiles, we also find characteristics that are generally monotonically related to *Upside Capture*. Book-to-market and dividend yield are both decreasing as *Upside Capture* increases, and standardized unexpected earnings is increasing as *Upside Capture* increases. These results suggest that funds that outperform in up markets hold growth and low-dividend-yield stocks, and they are better at picking stocks that beat analyst forecasts. Contrasting the high and low *Upside Capture* quintiles, we find that size, age, and illiquidity are lower for the high *Upside Capture* quintile. Institutional ownership and short interest are higher for the high *Upside Capture* quintile. Again, these results are driven by the extreme quintiles of *Upside Capture*.

Finally, we consider the difference in portfolio characteristics between the low *Downside Capture* portfolio in Panel A and high *Upside Capture* portfolio in Panel B of Table 9. We report the difference in means in Panel C. Relative to the high *Upside Capture* quintile funds, the low *Downside Capture* funds hold firms that are larger, have higher book-to-market ratios, have higher dividend yields, and are older.

3.5 Robustness

3.5.1 Alternative measures of manager activity

Researchers have used alternative measures to define manager activity. For example, tracking error captures the deviation between a fund and its benchmark index. Tracking error differs from *Active Share* in that it captures a manager's deviation from the benchmark index through differing the systemic factor loadings of the portfolio, as opposed to capturing the variation of individual holdings weights. Following Cremers and Petajisto (2009), we measure tracking error as the standard deviation of errors from a regression of excess fund returns on matched index excess returns over a 36-month window:

$$r_{fund,t} - r_{risk\,free,t} = a + b \times (r_{index,t} - r_{risk\,free,t}) + e_{fund,t}$$

$$Tracking\ Error = Stdev(e_{fund,t}), \tag{6}$$

where higher levels of tracking error are used to proxy for manager activity. We also collect the R^2s from the model as an additional measure of manager activity.

In Table 10, we replicate the results of our continuous model in Table 3, replacing *Active Share* with these alternative measures of manager activity. In Columns 1 and 2 we find that the R^2 is negatively related to future alpha, suggesting that higher active management is positively related to future alpha. In Columns 3 and 4, we show that higher levels of tracking error (higher active management) are predictive of future alpha. In each of these models, the signs and significance

levels of *Downside Capture, Upside Capture,* and *Capture Spread* are identical to those in our main results.

In Table 10, we consider the marginal effect of manager activity in each quintile of tracking error or R^2. This table is similar to Table 5 of our main analysis. In each model we interact the continuous measure of tracking error and R^2 with an indicator for each skill quintile. In Table 5, we show that the coefficients of our interaction terms are increasing with the skill level, suggesting that when higher levels of activity are paired with higher skill levels, future risk-adjusted returns are higher. In Table 10, we find similar results for our two alternative measures of activity. In Panel A, the coefficients on the interaction terms of continuous R^2 are monotonically decreasing (increasing) with the quintiles of *Downside Capture* (*Upside Capture, Capture Spread*). We find the same monotonic association among coefficients in Panel B, where our active share measure is R^2.

3.5.2 Alternative calculations of capture measures

As shown in the summary statistics, 3-year *Downside Capture* has a mean of 0.915 and a standard deviation of 0.514. The measure can vary substantially because over any 3-year window there may be few months in which the benchmark is negative, such as during prolonged bull markets. We therefore replicate the double-sort analysis reported in Table 2 for both 1- and 5-year *Downside Capture, Upside Capture,* and *Capture Spread.* The results provided in Appendix Tables A1 and A2 reveal statistically and economically similar results.

We also replicate our regression analysis on the continuous measures of *Active Share* and manager skill from Table 3 using the 1- and 5-year specifications of *Capture Ratio* and *Capture Spread*. These results are reported in Appendix Tables A3 and A4, respectively, and are statistically and economically similar to our main analysis. We replicate the regression of *Active*

Share and capture measures from Table 4 for 1- and 5-year specifications of the capture measure in Appendix Table A5 and find similar results. Finally, we replicate the interaction models from Table 6 for the 1- and 5-year specifications in Appendix Table A6 and find results similar to our main analysis. Collectively, these results show that our capture measures are robust to multiple period specifications.

4 CONCLUSION

Cremers and Petajisto (2009) document that the level of *Active Share* exhibited by a mutual fund positively relates to future returns. However, *Active Share* alone is merely a measure of the deviance of a fund manager from his/her benchmark portfolio. It measures a manager's willingness to engage in proprietary strategies, but not the quality of these strategies.

We build from this literature and introduce *Downside Capture, Upside Capture,* and *Capture Spread* as measures of fund manager skill. We hypothesize that future positive fund performance is concentrated in funds with active managers who have historically exhibited skill. In independent double sorts and regression analysis, we find support for this hypothesis and illustrate that high *Active Share* alone is not sufficient to parse skilled managers from unskilled managers. In fact, funds with high *Active Share* and low skill (high *Downside Capture* or low *Capture Spread*) are the worst performing groups, and their returns are dominated by all low *Active Share* funds, regardless of skill level. However, selecting managers with both high *Active Share* and high skill (low *Downside Capture* or high *Capture Spread*) can lead to the selection of funds with high future returns.

Brown and Davies (2017) warn that with the prevalent use of *Active Share* following its discovery by Cremers and Petajisto (2009), the signal provided from active management may be distorted. Our empirical evidence supports this prediction. Comparing pre- and post-2009 samples,

we find support for their signal jamming hypothesis, where unskilled active managers increase their activity level following the discovery of *Active Share*. We also find that skilled active managers reduce their efforts in the post-2009 sample. Thus, not only do investors face the problem of closet indexers, but they must sort actively managed funds that deviate from the stated benchmark simply to appear to be truly actively managed. Furthermore, even returns to skilled active managers have fallen since the discovery of *Active Share*.

The implications from this analysis suggest both blessings and curses accompany *Active Share.* To achieve returns above a stated benchmark, an investor should select funds that have demonstrated high levels of active management coupled with a past record of a successful proprietary strategy.

REFERENCES

Amihud, Y. (2002). Illiquidity and stock returns: Cross-section and time-series effects. *Journal of Financial Markets*, *5*(1), 31–56.

Ang, A., Hodrick, R. J., Xing, Y., & Zhang, X. (2009). High idiosyncratic volatility and low returns: International and further US evidence. *Journal of Financial Economics, 91*(1), 1–23.

Armstrong, W. J., Genc, E., & Verbeek, M. (2019). Going for gold: An analysis of Morningstar Analyst Ratings. *Management Science, 65*(5), 2310–2327.

Berk, J. B., & van Binsbergen, J. H. (2015). Measuring skill in the mutual fund industry. *Journal of Financial Economics, 118*(1), 1–20.

Blake, C., & Morey, M. (2000). Morningstar ratings and mutual fund performance. *Journal of Financial and Quantitative Analysis, 35*(3), 451–483.

Brown, D. C., & Davies, S. W. (2017). Moral hazard in active asset management. *Journal of Financial Economics, 125*(2), 311–325.

Brown, S. J., & Goetzmann, W. N. (1995). Performance persistence. *Journal of Finance, 50*(2), 679–698.

Carhart, M. M. (1997). On persistence in mutual fund performance. *Journal of Finance*, *52*(1), 57–82.

Chen, H. L., Jegadeesh, N., & Wermers, R. (2000). The value of active mutual fund management: An examination of the stockholdings and trades of fund managers. *Journal of Financial and Quantitative Analysis, 35*(3), 343–368.

Cornell, B., Hsu, J., & Nanigian, D. (2017). Does past performance matter in investment manager selection? *Journal of Portfolio Management, 43*(4), 33–43.

Cremers, M., & Petajisto, A. (2009). How active is your fund manager? A new measure that predicts performance. *Review of Financial Studies*, *22*(9), 3329–3365.

Daniel, K., Grinblatt, M., Titman, S., & Wermers, R. (1997). Measuring mutual fund performance with characteristic-based benchmarks. *Journal of Finance, 52*(3), 1035–1058.

Del Guercio, D., & Tkac, P. (2008). Star power: The effect of Morningstar Ratings on mutual fund flow. *Journal of Financial and Quantitative Analysis,43*(4), 907–936.

French, K. R. (2008). Presidential address: The cost of active investing. *Journal of Finance, 63*(4), 1537–1573.

Grinblatt, M., & Titman, S. (1989). Mutual fund performance: An analysis of quarterly portfolio holdings. *Journal of Business, 62*(3), 393–416.

Grinblatt, M., & Titman, S. (1992). The persistence of mutual fund performance. *Journal of Finance*, *47*(5), 1977–1984.

Gruber, M. J. (1996). Another puzzle: The growth in actively managed mutual funds. *Journal of Finance*, *51*(3), 783–810.

Hendricks, D., Patel, J., & Zeckhauser, R. (1993). Hot hands in mutual funds: Short-run persistence of relative performance, 1974–1988. *Journal of Finance*, *48*(1), 93–130.

Jensen, M. C. (1968). The performance of mutual funds in the period 1945–1964. *Journal of Finance, 23*(2), 389–416.

Kacperczyk, M., Nieuwerburgh, S. V., & Veldkamp, L. (2014). Time-varying fund manager skill. *Journal of Finance, 69*(4), 1455–1485.

Kacperczyk, M., Sialm, C., & Zheng, L. (2008). Unobserved actions of mutual funds. *Review of Financial Studies, 21*(6), 2379–2416.

Kosowski, R., Timmermann, A., Wermers, R., & White, H. (2006). Can mutual fund "stars" really pick stocks? New evidence from a bootstrap analysis. *Journal of Finance, 61*(6), 2551–2595.

Marlo, T., & Stark, J. R. (2019). Capture Ratio: Seizing market gains, avoiding losses, and attracting investors' funds. *Journal of Investing, 29*(1), 80–94.

Newey, W. K., & West, K. D. (1987). A simple, positive semi-definite, heteroskedasticity and autocorrelation consistent covariance matrix. *Econometrica, 55*(3), 703–708.

Peskin, K. S. (2018). Evaluating multi-asset strategies. *Journal of Portfolio Management, 44*(2), 40–49.

Rowley, J. J., Jr., & Kwon, D. T. (2015). The ins and outs of index tracking. *Journal of Portfolio Management, 41*(3), 35–45.

Wermers, R. (2000). Mutual fund performance: An empirical decomposition into stock-picking talent, style, transactions costs, and expenses. *Journal of Finance, 55*(4), 1655–1695.

Zheng, L. (1999). Is money smart? A study of mutual fund investors' fund selection ability. *Journal of Finance, 54*(3), 901–933.

FIGURE 1 Overlap of high-skill portfolios. This figure presents the overlap of low *Downside Capture* (DC) and high *Upside Capture* (UC) groups. "Overlap Pct" is the percentage of overlap between the two groups from a count of firms in both high-skill quintiles each year scaled by the number of firms in the low DC quintile and high UC quintile. [Color figure can be viewed at wileyonlinelibrary.com.]

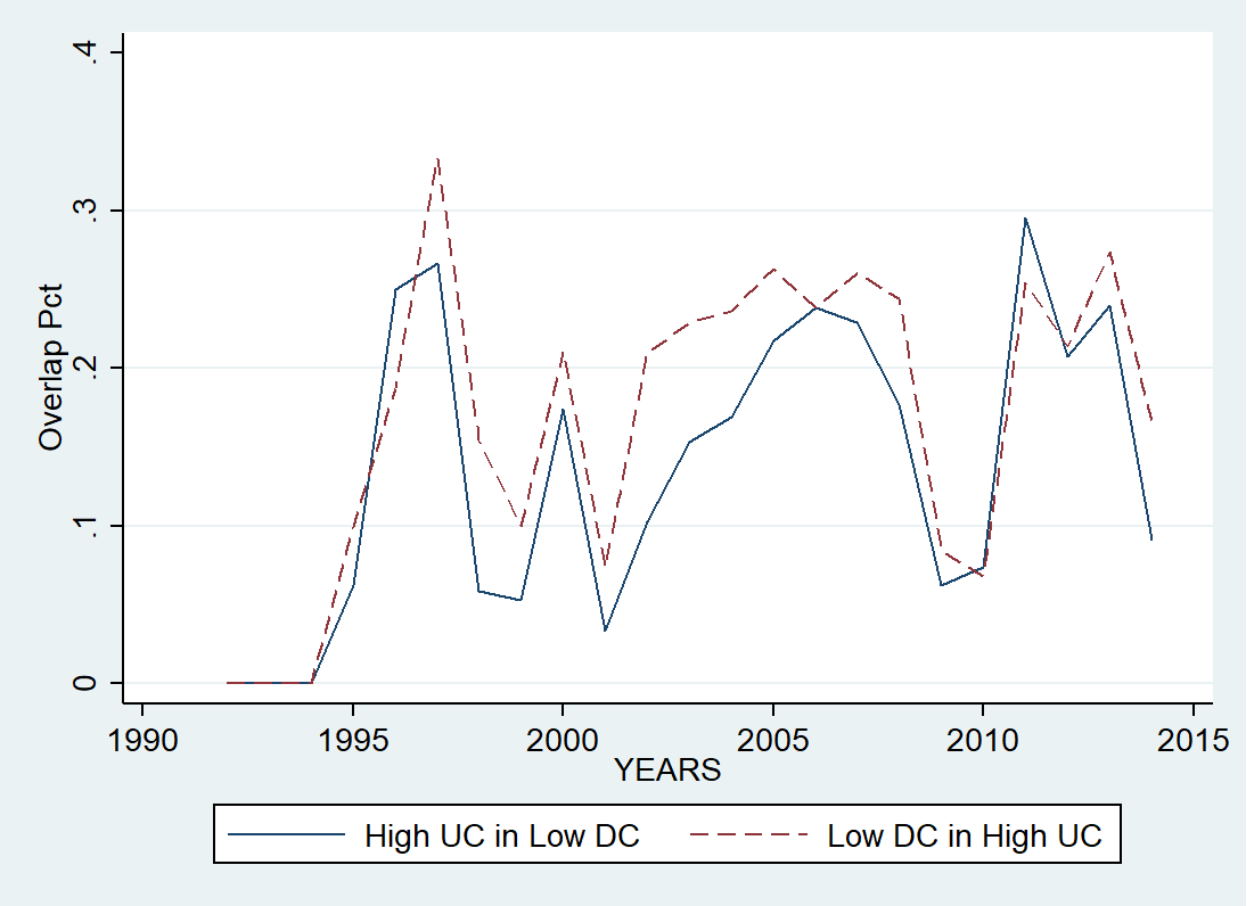

FIGURE 2 Investment in high *Active Share* and high/low *Downside Capture* (DC) portfolios. This figure presents performance results from a $1 investment in three portfolios: high *Active Share,* low DC, and high DC. The first portfolio is the high *Active Share* portfolio, which invests an equal weight in funds that are in the highest *Active Share* quintile at the beginning of the calendar year. The second and third portfolios are grown at the risk-adjusted, equal-weighted returns for funds falling into the independent double-sort high *Active Share*/low DC quintile and high *Active Share*/high DC quintile, respectively. [Color figure can be viewed at wileyonlinelibrary.com.]

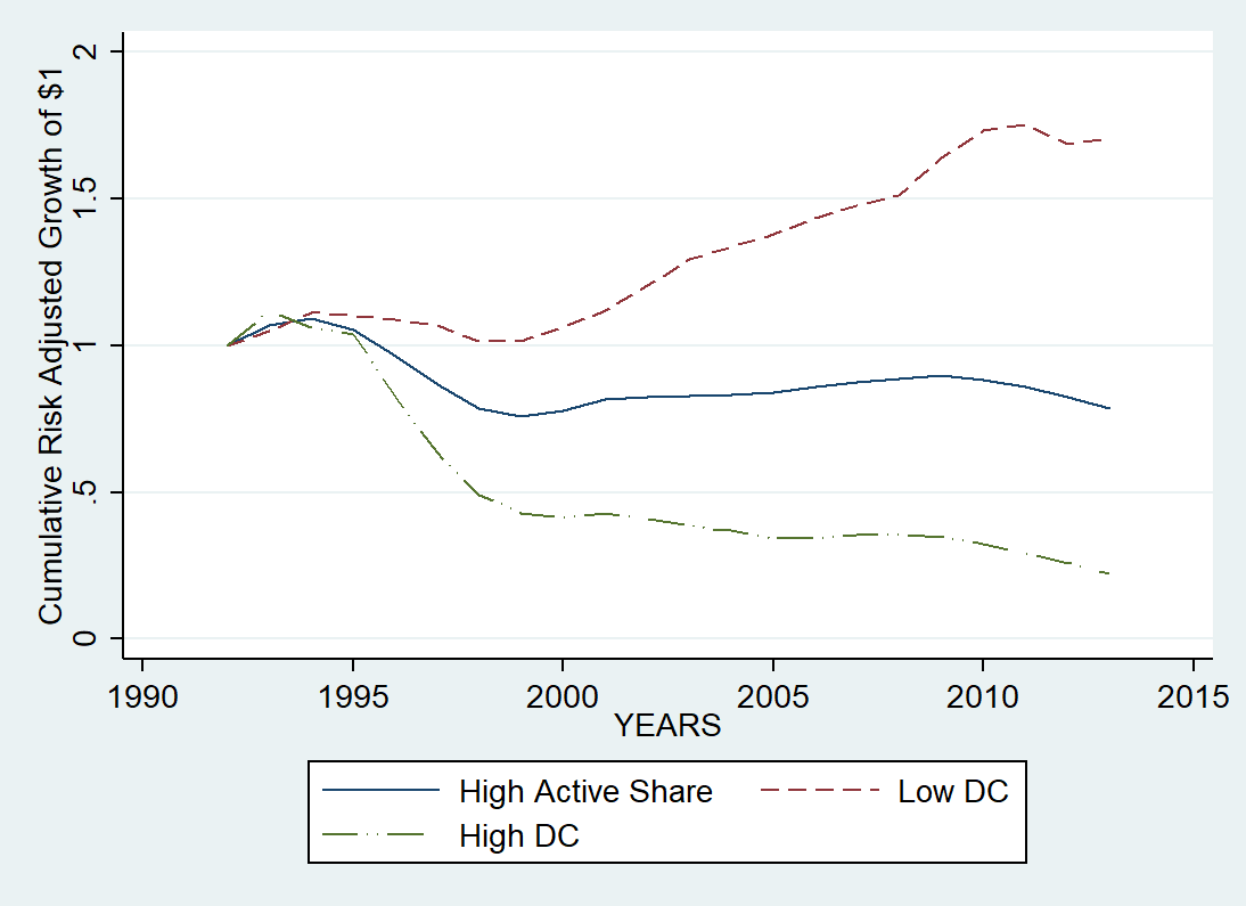

FIGURE 3 Investment in high *Active Share* and high/low *Upside Capture* (UC) portfolios. This figure presents performance results from a $1 investment in three portfolios: high *Active Share,* low UC, and high UC. The first portfolio is the high *Active Share* portfolio, which invests an equal weight in funds that are in the highest *Active Share* quintile at the beginning of the calendar year. The second and third portfolios are grown at the risk-adjusted, equal-weighted returns for funds falling into the independent double-sort high *Active Share*/low UC quintile and high *Active Share*/high UC quintile, respectively. [Color figure can be viewed at wileyonlinelibrary.com.]

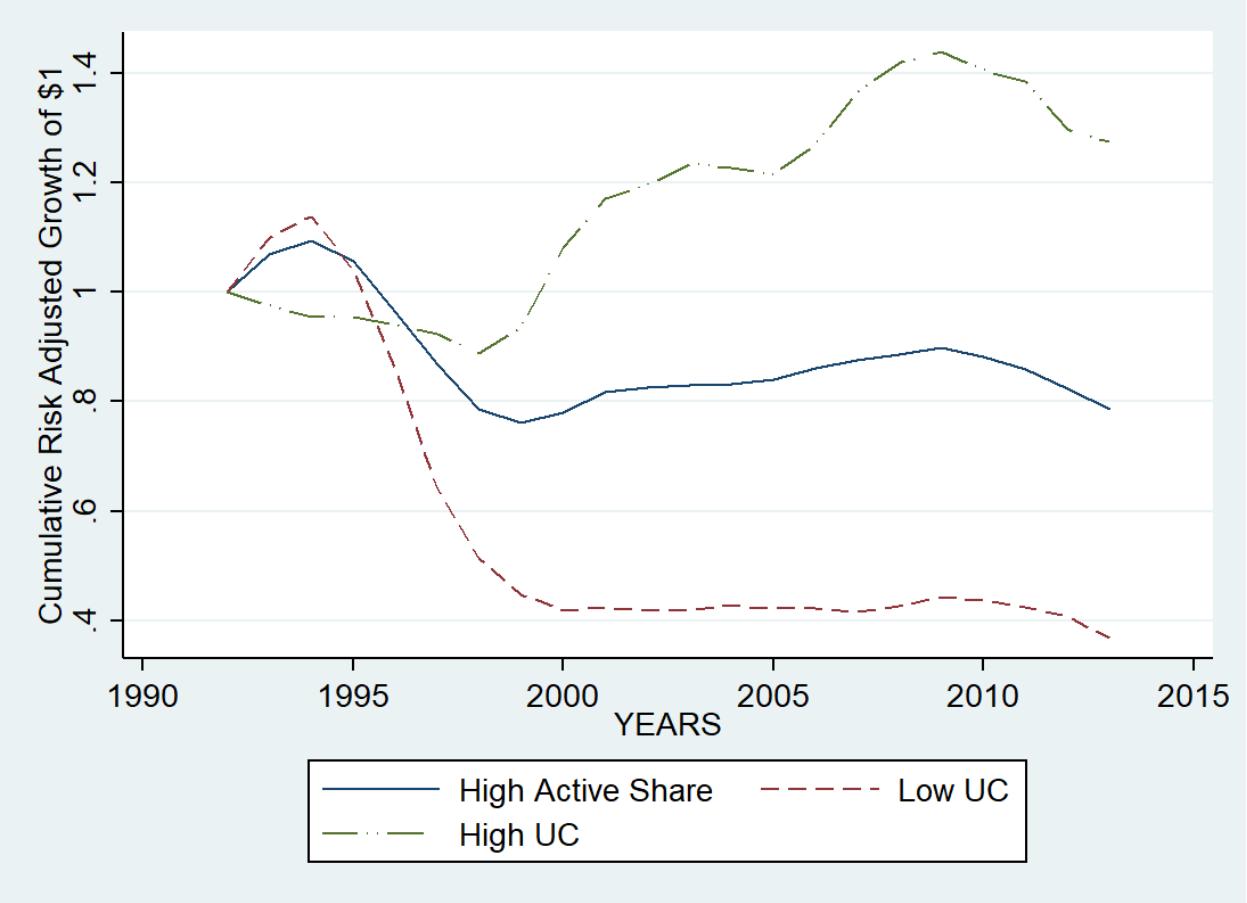

FIGURE 4 Investment in high *Active Share* and high/low *Capture Spread* (CS) portfolios. This figure presents performance results from a $1 investment in three portfolios: high *Active Share,* low CS, and high CS. The first portfolio is the high *Active Share* portfolio, which invests an equal weight in funds that are in the highest *Active Share* quintile at the beginning of the calendar year. The second and third portfolios are grown at the risk-adjusted, equal-weighted returns for funds falling into the independent double-sort high *Active Share*/low CS quintile and high *Active Share*/high CS quintile, respectively. [Color figure can be viewed at wileyonlinelibrary.com.]

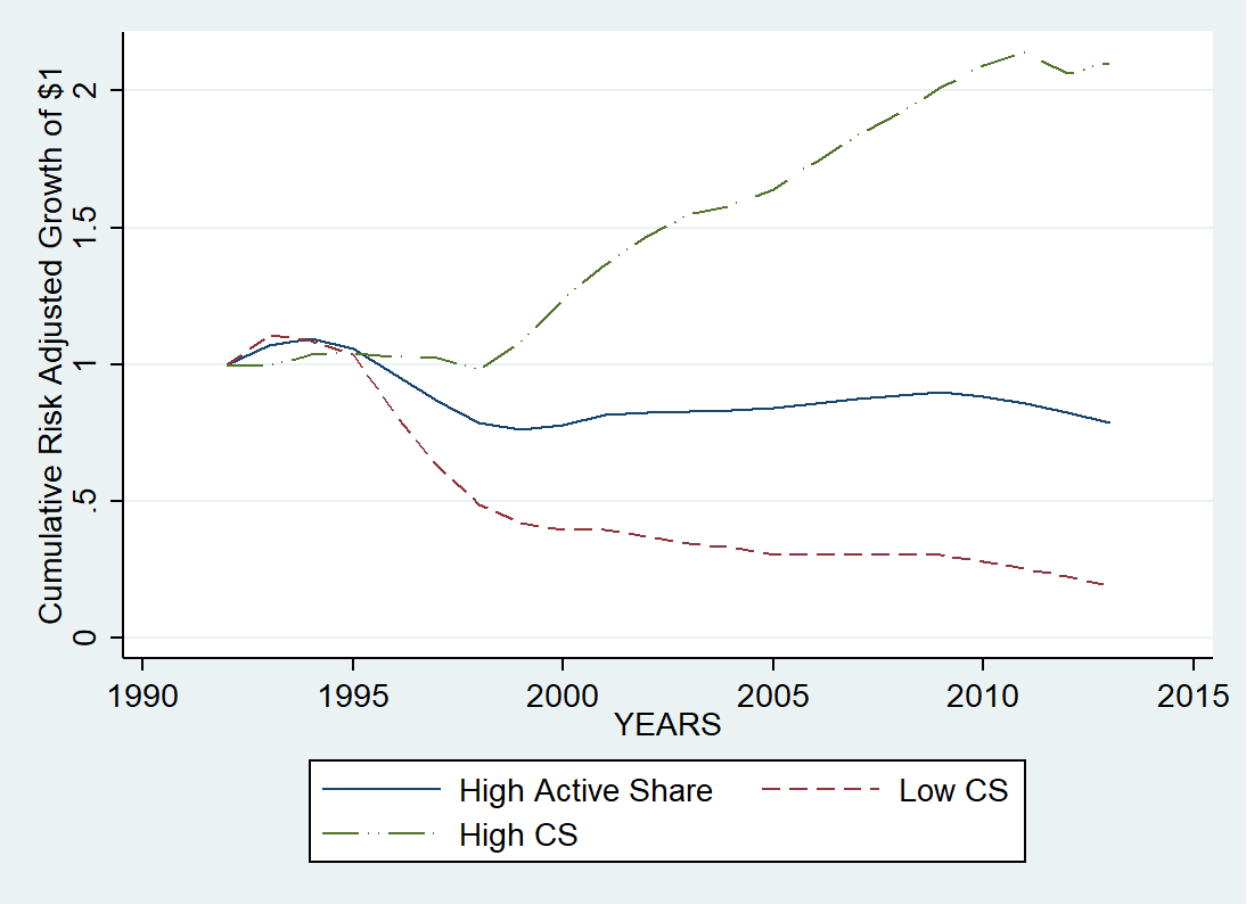

TABLE 1 Summary statistics and single sorts

Panel A. Summary statistics

Variable	*N*	Mean	Std. dev.	10th perc.	25th perc.	50th perc.	75th perc.	90th perc.
Alpha	25,216	-0.008	0.057	-0.068	-0.033	-0.007	0.017	0.052
Active Share	25,216	0.801	0.215	0.552	0.712	0.866	0.961	0.999
Downside Capture (3-year)	25,216	0.915	0.514	0.331	0.687	0.958	1.143	1.425
Upside Capture (3-year)	25,216	0.927	0.369	0.498	0.744	0.938	1.072	1.287
Capture Spread (3-year)	25,216	0.011	0.518	-0.455	-0.191	-0.007	0.194	0.474
TNA (millions)	25,216	1026.230	2463.402	18.300	59.700	216.100	795.300	2507.300
Expense Ratio	25,216	0.012	0.005	0.007	0.009	0.012	0.015	0.019
Turnover Ratio	25,216	0.855	0.928	0.150	0.307	0.600	1.070	1.750
Fund Age	25,216	14.774	12.413	4.422	6.932	11.312	17.805	28.011
Manager Tenure	25,216	7.377	5.358	1.997	3.671	6.000	10.003	15.005

Panel B. *Alpha* (*t*+1)

		Downside Capture			*Upside Capture*			*Capture Spread*		
Quintile	***Active Share***	**1-year**	**3-year**	**5-year**	**1-year**	**3-year**	**5-year**	**1-year**	**3-years**	**5-year**
Low	-0.010	0.015	0.015	0.011	-0.019	-0.017	-0.011	-0.040	-0.048	-0.038
2	-0.011	-0.001	0.002	0.000	-0.018	-0.014	-0.011	-0.021	-0.019	-0.017
3	-0.010	-0.010	-0.009	-0.009	-0.013	-0.010	-0.011	-0.009	-0.007	-0.008
4	-0.004	-0.018	-0.016	-0.014	-0.005	-0.008	-0.010	0.003	0.002	-0.001
High	-0.009	-0.031	-0.035	-0.032	0.008	0.004	-0.002	0.021	0.024	0.015
High–low	0.001	-0.046***	-0.050***	-0.042***	0.027***	0.021***	0.009***	0.060***	0.072***	0.053***
t-statistic	0.170	-31.153	-30.346	-25.174	18.182	12.575	4.877	42.681	45.686	31.510

Note. Panel A reports summary statistics for the primary variables in the sample. The sample is an annual panel of equity-focused mutual funds spanning 1990 to 2016. *Alpha* is the factor-adjusted fund return using the Carhart (1997) four-factor model. *Downside* (*Upside*) *Capture* is the 3-year downside (upside) capture of the fund. Statistics for the 1- and 5-year upside/downside capture are similar, thus omitted. *Capture Spread* is a fund's *Upside Capture* (3-year) minus *Downside Capture* (3-year). *TNA* is the fund's total net assets in millions. *Expense Ratio* includes all expenses incurred for holding the fund as a percentage of total assets held in the fund. *Turnover Ratio* is the percentage turnover of the portfolio for the calendar year. *Fund Age* is the number of years since the initial fund offering. *Manager Tenure* is the number of years since the beginning of the current manager's tenure. Panel B reports the average alpha 1 year following portfolio formation over *Active Share,* and our capture measures created over the 1-, 3-, and 5-year periods preceding portfolio formation. In the final two rows we report, respectively, the mean difference of the high and low quintiles of the specified measure and the Newey–West (1987) *t*-statistic allowing for three lags.

*** denotes significance at the 1% level.

TABLE 2 Mutual fund alpha: Double sorts on *Active Share* and *Downside Capture*

Panel A. *Downside Capture* (3-year)

	Downside Capture					
Active Share	**High Skill**	**2**	**3**	**4**	**Low Skill**	**High − Low Skill**
Low	0.001	-0.006	-0.009	-0.013	-0.027	0.028***
	24	30	68	57	19	(10.056)
2	0.001	-0.007	-0.009	-0.016	-0.022	0.023***
	31	45	48	49	38	(10.798)
3	0.008	0.000	-0.010	-0.015	-0.027	0.036***
	33	52	39	44	56	(14.143)
4	0.017	0.010	-0.003	-0.013	-0.029	0.046***
	47	57	39	40	60	(15.564)
High	0.025	0.008	-0.013	-0.029	-0.064	0.089***
	87	36	22	25	52	(21.165)
High − Low	0.024***	0.014***	-0.004***	-0.016	-0.037***	
Active Share	(13.605)	(5.123)	(-3.694)	(-0.321)	(-11.840)	

Panel B. *Upside Capture* (3-year)

	Upside Capture					
Active Share	**Low Skill**	**2**	**3**	**4**	**High Skill**	**High − Low Skill**
Low	-0.006	-0.013	-0.010	-0.009	-0.011	-0.005***
	19	37	59	55	28	(-3.418)
2	-0.013	-0.015	-0.015	-0.011	-0.003	0.01***
	27	43	46	54	42	(2.724)
3	-0.015	-0.016	-0.011	-0.011	-0.002	0.013***
	32	46	47	43	54	(2.766)
4	-0.017	-0.009	-0.003	-0.002	0.007	0.024***
	45	54	41	41	61	(7.287)
High	-0.022	-0.022	-0.014	-0.007	0.021	0.043***
	87	32	22	26	54	(11.686)
High − Low	-0.016***	-0.009	-0.004***	0.002***	0.032***	
Active Share	(-8.317)	(-1.673)	(-3.319)	(2.619)	(8.347)	

Panel C. *Capture Spread* (3-year)

	Capture Spread					
Active Share	**Low Skill**	**2**	**3**	**4**	**High Skill**	**High − Low Skill**
Low	-0.034	-0.018	-0.007	-0.002	0.005	0.039***
	17	51	66	46	17	(14.034)
2	-0.032	-0.018	-0.012	-0.004	0.008	0.04***
	32	47	47	50	35	(17.213)
3	-0.038	-0.019	-0.008	-0.001	0.016	0.055***
	48	45	40	45	45	(22.063)
4	-0.041	-0.015	-0.001	0.010	0.026	0.067***
	56	45	39	44	58	(23.549)
High	-0.078	-0.030	-0.004	0.013	0.037	0.115***
	58	25	22	37	80	(32.089)
High − Low	-0.044***	-0.012	0.003***	0.015***	0.032***	
Active Share	(-17.772)	(-1.913)	(5.768)	(6.452)	(18.782)	

Note. This table presents double sorts of the *Active Share* and *Downside Capture* (Panel A), *Upside Capture* (Panel B), and *Capture Spread* (Panel C) quintiles for the full January 1990 to December 2016 sample. Interior cells report the subsequent 1-year alpha using the Carhart (1997) four-factor model and the average number of mutual funds in each cell per year. The borders of each panel report the return difference for a portfolio that takes a long position in the lowest (highest) *Downside Capture* (*Upside Capture, Capture Spread*) portfolio. Newey–West (1987) *t*-statistics adjusted for three lag periods are reported in parentheses. See Table 1 for variable definitions.
*** denotes significance at the 1% level.

TABLE 3 Continuous active share and capture measures on future alpha

	Dependent variable: *Alpha* (*t*+1)							
Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Active Share	0.018***				0.011***	0.009**	0.002	0.003
	(0.004)				(0.004)	(0.004)	(0.004)	(0.004)
Downside Capture		-0.043***			-0.043***			-0.043***
		(0.001)			(0.001)			(0.001)
Upside Capture			0.046***			0.045***		0.044***
			(0.002)			(0.002)		(0.002)
Capture Spread				0.045***			0.045***	
				(0.001)			(0.001)	
ln(*TNA*)	0.478***	0.307**	0.245*	0.126	0.310**	0.247*	0.126	0.086
	(0.137)	(0.124)	(0.128)	(0.117)	(0.124)	(0.128)	(0.117)	(0.117)
$\ln(TNA)^2$	-0.532	-0.821	-0.667	-1.286	-0.751	-0.607	-1.270	-0.822
	(1.270)	(1.158)	(1.184)	(1.087)	(1.159)	(1.184)	(1.087)	(1.092)
Expense Ratio	-0.268	-0.056	-0.212	0.020	-0.056	-0.212	0.019	-0.004
	(0.213)	(0.194)	(0.204)	(0.184)	(0.194)	(0.204)	(0.184)	(0.185)
Turnover Ratio	-0.003***	-0.002**	-0.003***	-0.002**	-0.002**	-0.003***	-0.002***	-0.002***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Fund Age	-0.017**	-0.021***	-0.011	-0.016**	-0.021***	-0.011	-0.016**	-0.015**
	(0.009)	(0.008)	(0.008)	(0.007)	(0.008)	(0.008)	(0.007)	(0.008)
Manager Tenure	-0.029***	-0.026***	-0.030***	-0.025***	-0.026***	-0.030***	-0.025***	-0.026***
	(0.011)	(0.010)	(0.010)	(0.009)	(0.010)	(0.010)	(0.009)	(0.009)
Constant	-0.030***	0.031***	-0.038***	0.010	0.022***	-0.045***	0.008	0.007
	(0.008)	(0.007)	(0.006)	(0.006)	(0.007)	(0.007)	(0.007)	(0.007)
Observations	25,216	25,216	25,216	25,216	25,216	25,216	25,216	25,216
R^2	12.4%	23.1%	18.0%	29.0%	23.1%	18.0%	29.0%	28.4%
Fund-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fund-year SE clusters	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note. This table presents within-fund fixed-effects regressions of future alpha on continuous measures of *Active Share, Downside Capture, Upside Capture,* and *Capture Spread* for the full January 1990 to December 2016 sample period. All capture measures are calculated over the 3 years preceding portfolio formation. Models include controls for fund size, fund expenses, fund turnover, fund age, and current manager tenure. Fund-year fixed effects are included, and two-way (fund and year) robust clustered standard errors (SEs) are reported in parentheses. See Table 1 for variable definitions.
***, **, and * denote significance at 1%, 5%, and 10%, respectively.

TABLE 4 Quintile regressions on future alpha

	Dependent variable: *Alpha* (t+1)			
	Active Share	***Downside Capture***	***Upside Capture***	***Capture Spread***
	(1)	**(2)**	**(3)**	**(4)**
Quintile 1	-0.021***	0.013**	-0.030***	-0.041***
	(0.007)	(0.007)	(0.006)	(0.006)
Quintile 2	0.003***	-0.016***	0.014***	0.023***
	(0.001)	(0.001)	(0.001)	(0.001)
Quintile 3	0.003**	-0.030***	0.022***	0.034***
	(0.001)	(0.001)	(0.001)	(0.001)
Quintile 4	0.007***	-0.038***	0.027***	0.044***
	(0.002)	(0.001)	(0.001)	(0.001)
Quintile 5	0.010***	-0.057***	0.042***	0.064***
	(0.002)	(0.002)	(0.002)	(0.001)
ln(*TNA*)	0.477***	0.354***	0.271**	0.169
	(0.137)	(0.128)	(0.131)	(0.120)
$\ln(TNA)^2$	-0.537	-0.612	-0.271	-1.450
	(1.271)	(1.185)	(1.211)	(1.117)
Expense Ratio	-0.245	-0.210	-0.181	-0.155
	(0.214)	(0.202)	(0.206)	(0.192)
Turnover Ratio	-0.002***	-0.001**	-0.002***	-0.001*
	(0.001)	(0.001)	(0.001)	(0.001)
Fund Age	-0.018**	-0.019**	-0.013	-0.014*
	(0.009)	(0.008)	(0.008)	(0.008)
Manager Tenure	-0.030***	-0.029***	-0.031***	-0.021**
	(0.011)	(0.010)	(0.010)	(0.010)
Observations	25,216	25,216	25,216	25,216
R^2	12.5%	20.3%	16.7%	26.7%
Fund-year fixed effects	Yes	Yes	Yes	Yes
Fund-year SE clusters	Yes	Yes	Yes	Yes

Note. This table presents within-fund fixed-effects regressions of future alpha on the *Active Share, Downside Capture, Upside Capture,* and *Capture Spread* quintiles for the full January 1990 to December 2016 sample period. All capture measures are calculated over the 3 years preceding portfolio formation. Models include controls for fund size, fund expenses, fund turnover, fund age, and current manager tenure. Fund-year fixed effects are included, and two-way (fund and year) robust clustered standard errors (SEs) are reported in parentheses. The constant is omitted due to multicollinearity with the quintile indicators. See Table 1 for variable definitions.

***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

TABLE 5 Quintile interaction estimates on future alpha

	Dependent variable: *Alpha* (*t*+1)		
	Downside Capture	***Upside Capture***	***Capture Spread***
	(1)	**(2)**	**(3)**
Active Share × Quintile 1	0.044***	-0.010**	-0.033***
	(0.004)	(0.004)	(0.004)
Active Share × Quintile 2	0.026***	0.006	-0.007*
	(0.004)	(0.004)	(0.004)
Active Share × Quintile 3	0.011***	0.016***	0.006
	(0.004)	(0.004)	(0.004)
Active Share × Quintile 4	-0.000	0.021***	0.019***
	(0.004)	(0.004)	(0.004)
Active Share × Quintile 5	-0.022***	0.038***	0.042***
	(0.004)	(0.004)	(0.004)
ln(*TNA*)	0.328***	0.287**	0.140
	(0.127)	(0.131)	(0.120)
ln(*TNA*)^2	-0.336	-0.388	-1.256
	(1.179)	(1.209)	(1.109)
Expense Ratio	-0.205	-0.190	-0.155
	(0.200)	(0.206)	(0.190)
Turnover Ratio	-0.001**	-0.002***	-0.001**
	(0.001)	(0.001)	(0.001)
Fund Age	-0.020**	-0.012	-0.013
	(0.008)	(0.008)	(0.008)
Manager Tenure	-0.028***	-0.032***	-0.021**
	(0.010)	(0.010)	(0.010)
Constant	-0.024***	-0.019**	-0.009
	(0.007)	(0.007)	(0.007)
Observations	25,216	25,216	25,216
R^2	21.1%	16.9%	27.7%
Fund-year fixed effects	Yes	Yes	Yes
Fund-year SE clusters	Yes	Yes	Yes

Note. This table presents within-fund fixed-effects regressions of future alpha on the interaction term of *Active Share* on each quintile of *Downside Capture, Upside Capture*, and *Capture Spread* for the full January 1990 to December 2016 sample period. All capture measures are calculated over the 3 years preceding portfolio formation. Models include controls for fund size, fund expenses, fund turnover, fund age, and current manager tenure. Fund-year fixed effects are included, and two-way (fund and year) robust clustered standard errors are reported in parentheses. See Table 1 for variable definitions.
***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

TABLE 6 Pre- and post-2009 discovery of *Active Share*

	Capture Spread					
Active Share	**Low**	**2**	**3**	**4**	**High**	**High − low alpha**
Panel A. Pre-2009						
Low	-0.032	-0.018	-0.007	-0.001	0.004	0.036
	0.522	*0.462*	*0.384*	*0.423*	*0.490*	
2	-0.031	-0.017	-0.011	-0.003	0.008	0.040
	0.732	*0.721*	*0.718*	*0.717*	*0.725*	
3	-0.038	-0.017	-0.006	0.002	0.020	0.058
	0.851	*0.847*	*0.846*	*0.846*	*0.848*	
4	-0.039	-0.013	0.001	0.015	0.035	0.074
	0.943	*0.940*	*0.941*	*0.940*	*0.944*	
High	-0.074	-0.026	0.005	0.019	0.046	0.120
	0.996	*0.995*	*0.993*	*0.995*	*0.997*	
High − low *Active Share*	*0.474*	*0.533*	*0.609*	*0.572*	*0.507*	
Panel B. Post-2009						
Low	-0.039	-0.019	-0.007	-0.004	0.006	0.045
	0.433	*0.474*	*0.346*	*0.542*	*0.568*	
2	-0.033	-0.020	-0.013	-0.007	0.007	0.040
	0.746	*0.738*	*0.741*	*0.737*	*0.744*	
3	-0.038	-0.024	-0.012	-0.007	0.007	0.046
	0.855	*0.856*	*0.857*	*0.853*	*0.854*	
4	-0.044	-0.017	-0.006	-0.003	0.010	0.054
	0.935	*0.934*	*0.933*	*0.931*	*0.933*	
High	-0.084	-0.038	-0.022	-0.008	0.015	0.099
	0.992	*0.989*	*0.990*	*0.991*	*0.992*	
High − low *Active Share*	*0.559*	*0.515*	*0.644*	*0.449*	*0.424*	

Note. This table presents the results of independent bivariate quintile sorting of our sample over *Active Share* and the *Capture Spread*. Panel A reports the results for the pre-2009 subsample, and Panel B reports the results for the post-2009 subsample. The interior cells report the subsequent 1-year alpha using the Carhart (1997) four-factor model and average *Active Share*. In the border cells, we report the risk-adjusted return difference between high *Capture Spread* and low *Capture Spread* for each *Active Share* quintile, and the difference in *Active Share* between the high and low *Active Share* portfolio for each *Capture Spread* quintile.

TABLE 7 Multivariate pre- and post-2009 discovery of *Active Share*

	***Active Share* (*t*)**					***Alpha* (*t*+1)**			
	Low *Active Share*		**High *Active Share***			**Low *Active Share***		**High *Active Share***	
	Low skill	**High skill**	**Low skill**	**High skill**		**Low skill**	**High skill**	**Low skill**	**High skill**
Panel A. *Downside Capture*									
Pre-2009	-0.420***	-0.450***	0.046***	0.058***	Pre-2009	-0.016***	0.002	-0.040***	0.032***
	(0.007)	(0.006)	(0.005)	(0.004)		(0.004)	(0.003)	(0.003)	(0.003)
Post-2009	-0.519***	-0.385***	0.056***	0.061***	Post-2009	-0.012***	0.025***	-0.055***	0.040***
	(0.008)	(0.008)	(0.006)	(0.006)		(0.004)	(0.004)	(0.003)	(0.003)
χ^2	22.544	24.626	17.516	0.940	χ^2	1.056	36.486	4.326	3.116
p-value	0.000	0.000	0.000	0.332	*p*-value	0.304	0.000	0.038	0.078
Panel B. *Upside Capture*									
Pre-2009	-0.419***	-0.562***	0.056***	0.052***	Pre-2009	-0.020***	-0.021***	-0.028***	0.051***
	(0.006)	(0.006)	(0.004)	(0.005)		(0.004)	(0.003)	(0.003)	(0.003)
Post-2009	-0.393***	-0.497***	0.058***	0.056***	Post-2009	0.011**	-0.010**	0.001	-0.014***
	(0.009)	(0.008)	(0.006)	(0.007)		(0.005)	(0.004)	(0.003)	(0.003)
χ^2	3.260	10.764	1.599	3.607	χ^2	58.061	7.173	32.115	151.956
p-value	0.071	0.001	0.206	0.058	*p*-value	0.000	0.007	0.000	0.000
Panel C. *Capture Spread*									
Pre-2009	-0.413***	-0.439***	0.047***	0.055***	Pre-2009	-0.046***	-0.013***	-0.083***	0.031***
	(0.007)	(0.006)	(0.005)	(0.004)		(0.004)	(0.004)	(0.003)	(0.002)
Post-2009	-0.491***	-0.353***	0.058***	0.060***	Post-2009	-0.037***	0.005	-0.080***	0.018***
	(0.009)	(0.009)	(0.006)	(0.006)		(0.004)	(0.004)	(0.003)	(0.003)
χ^2	12.405	35.934	27.632	5.829	χ^2	5.948	23.455	0.355	10.712
p-value	0.000	0.000	0.000	0.016	*p*-value	0.015	0.000	0.551	0.001

Note. This table presents regressions of *Active Share* and future alpha on 25 portfolio indicators formed based on double sorts over *Active Share* and the *Downside Capture* (Panel A), *Upside Capture* (Panel B), and *Capture Spread* (Panel C) quintiles. Models are estimated over two sample periods: 1990–2008 and 2009–2016. In each cell we report the coefficient and standard error for the portfolio indicator variable that corresponds to the corner portfolios of our double sort analysis reported in Table 2 (i.e., (1,1;1,5;5,1;5,5)). The baseline portfolio omitted from the regression is the neutral portfolio (3,3); thus, the coefficients are relative to this neutral portfolio. Models include controls for fund size, fund expenses, fund turnover, fund age, and current manager tenure. We report robust standard errors in parentheses and *p*-values from a χ^2 test. See Table 1 for variable definitions.

*** and ** denote significance at the 1% and 5% levels, respectively.

Table 8. Portfolio characteristics

	SIZE	***BM***	***MOM***	***DYLD***	***AGE***	***IO***	***SIR***	***ILLIQ***	***IV***	***SUE***
Panel A. *Downside Capture* quintile characteristics										
1	18.13	0.48	3.37	1.65	25.68	63.12	3.43	0.73	2.84	0.96
2	19.57	0.45	3.38	1.56	25.88	64.8	3.54	0.39	2.72	1.03
3	18.05	0.46	3.4	1.53	26.06	65.31	3.62	0.32	2.75	1.03
4	19.07	0.43	3.52	1.34	24.84	65.65	3.64	0.36	3.02	1.11
5	15.13	0.43	3.51	1.05	21.94	64.37	4.11	0.77	4.08	1.06
Diff	-2.99***	-0.05***	0.14	-0.59***	-3.73***	1.25**	0.67***	0.04	1.24***	0.09
Panel B. *Upside Capture* quintile characteristics										
1	17.87	0.50	2.93	1.58	25.16	61.46	3.58	0.97	3.33	0.86
2	19.74	0.45	3.41	1.54	25.78	64.86	3.60	0.40	2.73	1.04
3	18.70	0.44	3.46	1.49	25.85	65.48	3.64	0.33	2.76	1.07
4	18.72	0.44	3.65	1.42	25.40	65.84	3.57	0.32	2.82	1.09
5	14.93	0.42	3.72	1.11	22.22	65.57	3.95	0.56	3.78	1.14
Diff	-2.94***	-0.08***	0.78	-0.48***	-2.94***	4.12***	0.37***	-0.42**	0.46	0.28***
Panel C. *Downside Capture* Q1 (DC1) − *Upside Capture* Q5 (DC5)										
DC1− UC5	3.20**	0.06**	-0.35	0.54***	3.46***	-2.45	-0.52	0.17	-0.94	-0.18

Note. This table examines the portfolio composition across *Downside Capture* (Panel A) and *Upside Capture* (Panel B) quintiles. Cells report the equal-weight average portfolio characteristics of funds that fall within each quintile. All firm characteristics are measured at portfolio formation. *SIZE* is the market capitalization in billions of dollars. *BM* is the equity book-to-market ratio. *MOM* is the return over the past 6 months. *DYLD* is the dividend yield. *AGE* is the number of years since initial public offering (IPO). *IO* is the percentage of institutional ownership. *SIR* is the short interest ratio. *ILLIQ* is the illiquidity measure from Amihud (2002). *IV* is the idiosyncratic volatility from the Carhart (1997) four-factor model. *SUE* is the average standardized unexpected earnings over the past calendar year. Means of the characteristics are reported in the cells. Diff in Panel A and Panel B reports the difference between the high and low quintiles of the respective panels. Panel C reports the difference between the low *Downside Capture* quintile and high *Upside Capture* quintile.
*** and ** denote significance at the 1% and 5% levels, respectively.

TABLE 9 Continuous model robustness

	Dependent variable: *Alpha* (*t*+1)			
Variable	**(1)**	**(2)**	**(3)**	**(4)**
R^2	-0.030***	-0.027***		
	(0.003)	(0.003)		
Tracking Error			0.199***	0.204***
			(0.069)	(0.064)
Downside Capture	-0.041***		-0.043***	
	(0.001)		(0.001)	
Upside Capture	0.046***		0.043***	
	(0.002)		(0.002)	
Capture Spread		0.044***		0.045***
		(0.001)		(0.001)
ln(*TNA*)	0.090	0.135	0.101	0.138
	(0.116)	(0.116)	(0.117)	(0.116)
ln(*TNA*)^2	-0.684	-1.141	-1.031	-1.478
	(1.086)	(1.084)	(1.087)	(1.082)
Expense Ratio	0.003	0.027	-0.012	0.010
	(0.185)	(0.184)	(0.185)	(0.184)
Turnover Ratio	-0.002***	-0.002***	-0.002***	-0.002***
	(0.001)	(0.001)	(0.001)	(0.001)
Fund Age	-0.014*	-0.015**	-0.014*	-0.015**
	(0.008)	(0.008)	(0.008)	(0.007)
Manager Tenure	-0.024***	-0.023**	-0.025***	-0.024***
	(0.009)	(0.009)	(0.009)	(0.009)
Constant	0.027***	0.028***	0.007	0.006
	(0.007)	(0.006)	(0.006)	(0.006)
Observations	25,216	25,216	25,216	25,216
R^2	28.7%	29.3%	28.4%	29.1%
Fund-year fixed effects	Yes	Yes	Yes	Yes
Fund-year SE clusters	Yes	Yes	Yes	Yes

Note. This table presents within-fund fixed-effects regressions of future alpha on continuous measures of *Tracking Error*, R^2, and our capture measures. All capture measures are calculated over the 3 years preceding portfolio formation. Models include controls for fund size, fund expenses, fund turnover, fund age, and current manager tenure. Fund-year fixed effects are included, and two-way (fund and year) robust clustered standard errors (SEs) are reported in parentheses. See Table 1 for variable definitions.
***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

TABLE 10 Quintile interaction robustness

	Dependent variable: *Alpha* (*t*+1)					
	Panel A. *Tracking Error*			**Panel B. R^2**		
	Downside Capture	***Upside Capture***	***Capture Spread***	***Downside Capture***	***Upside Capture***	***Capture Spread***
Activity Measure × Quintile 1	-0.012***	-0.076***	-0.086***	1.606***	-0.601***	-0.744***
	(0.004)	(0.004)	(0.004)	(0.083)	(0.114)	(0.084)
Activity Measure × Quintile 2	-0.032***	-0.062***	-0.059***	1.294***	-0.241**	-0.144*
	(0.004)	(0.004)	(0.004)	(0.075)	(0.097)	(0.083)
Activity Measure × Quintile 3	-0.047***	-0.054***	-0.047***	0.856***	0.027	0.176**
	(0.004)	(0.004)	(0.004)	(0.079)	(0.087)	(0.079)
Activity Measure × Quintile 4	-0.056***	-0.048***	-0.036***	0.519***	0.068	0.533***
	(0.004)	(0.004)	(0.004)	(0.075)	(0.084)	(0.080)
Activity Measure × Quintile 5	-0.078***	-0.036***	-0.012***	0.060	0.545***	1.064***
	(0.004)	(0.004)	(0.004)	(0.066)	(0.074)	(0.071)
ln(*TNA*)	0.444***	0.347***	0.281**	0.321**	0.289**	0.131
	(0.130)	(0.132)	(0.125)	(0.125)	(0.132)	(0.123)
$\ln(TNA)^2$	-1.137	0.087	-1.479	-0.118	-0.690	-0.993
	(1.207)	(1.231)	(1.160)	(1.167)	(1.213)	(1.128)
Expense Ratio	-0.269	-0.197	-0.285	-0.182	-0.128	-0.030
	(0.207)	(0.209)	(0.200)	(0.199)	(0.205)	(0.190)
Turnover Ratio	-0.002***	-0.002***	-0.002**	-0.003***	-0.003***	-0.002***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Fund Age	-0.017*	-0.015*	-0.011	-0.016*	-0.012	-0.012
	(0.009)	(0.009)	(0.008)	(0.008)	(0.008)	(0.008)
Manager Tenure	-0.024**	-0.026**	-0.019*	-0.026***	-0.031***	-0.019**
	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.009)
Constant	0.016**	0.024***	0.021***	-0.024***	-0.006	-0.003
	(0.007)	(0.007)	(0.007)	(0.006)	(0.007)	(0.006)
Observations	25,216	25,216	25,216	25,216	25,216	25,216
R^2	19.1%	15.5%	23.1%	21.7%	17.1%	28.0%
Fund-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Fund-year SE clusters	Yes	Yes	Yes	Yes	Yes	Yes

Note. This table reports within-fund fixed-effects regressions of future alpha on the interaction of *Tracking Error* (Panel A) and R^2 (Panel B) on each capture measure quintile. Models include controls for fund size, fund expenses, fund turnover, fund age, and current manager tenure. Fund-year fixed effects are included, and two-way (fund and year) robust clustered standard errors (SEs) are reported in parentheses. See Table 1 for variable definitions.
***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

APPENDIX

Table A1 Mutual fund alpha: Double sorts on *Active Share* (1-year capture)

Panel A. *Downside Capture* (1-year)

	Downside Capture					
Active Share	**High Skill**	**2**	**3**	**4**	**Low Skill**	**High − Low Skill**
Low	0.000	-0.006	-0.009	-0.013	-0.027	0.027***
	22	34	68	54	20	10.405
2	0.001	-0.007	-0.009	-0.016	-0.021	0.022***
	31	46	44	48	43	12.429
3	0.006	-0.001	-0.010	-0.020	-0.023	0.029***
	35	50	40	45	52	12.451
4	0.019	0.006	-0.006	-0.016	-0.025	0.045***
	51	53	37	43	57	15.915
High	0.025	0.002	-0.020	-0.032	-0.056	0.081***
	88	35	20	27	52	21.492
High − low	0.025***	0.007***	-0.011***	-0.019	-0.03***	
Active Share	13.687	2.773	-2.512	-1.464	-10.951	

Panel B. *Upside Capture* (1-year)

	Upside Capture					
Active Share	**Low Skill**	**2**	**3**	**4**	**High Skill**	**High − Low Skill**
Low	-0.009	-0.013	-0.011	-0.008	-0.011	-0.002***
	20	34	57	59	28	-2.204
2	-0.012	-0.017	-0.015	-0.011	0.000	0.012***
	31	45	46	49	41	4.824
3	-0.016	-0.020	-0.015	-0.006	0.002	0.018***
	35	46	45	46	50	5.892
4	-0.019	-0.013	-0.005	0.002	0.010	0.03***
	45	50	44	43	60	9.985
High	-0.026	-0.027	-0.024	0.003	0.026	0.052***
	79	36	22	26	59	15.290
High − low	-0.017***	-0.014***	-0.013	0.01***	0.037***	
Active Share	-9.616	-4.693	-1.086	5.664	10.650	

Panel C. *Capture Spread* (1-year)

	Capture Spread					
Active Share	**Low Skill**	**2**	**3**	**4**	**High Skill**	**High − Low Skill**
Low	-0.030	-0.017	-0.008	-0.003	0.000	0.03***
	17	45	71	46	20	11.239
2	-0.026	-0.019	-0.012	-0.003	0.007	0.033***
	41	44	43	49	35	17.639
3	-0.030	-0.024	-0.010	0.001	0.013	0.043***
	46	50	38	45	44	17.909
4	-0.034	-0.017	-0.004	0.010	0.024	0.057***
	54	48	38	45	57	21.633
High	-0.066	-0.033	-0.010	0.011	0.034	0.100***
	58	28	22	35	79	29.989
High − low	-0.037***	-0.016	-0.002***	0.014***	0.034***	
Active Share	-16.182	-1.475	-4.654	7.013	17.228	

Note. This table presents double sorts of *Active Share* and the *Downside Capture* (Panel A), *Upside Capture* (Panel B), and *Capture Spread* (Panel C) quintiles, where all capture measures are calculated over the 1 year preceding portfolio formation. Interior cells report the subsequent 1-year alpha and the average number of mutual funds in each cell per year. Border cells of each panel report the return difference for a portfolio that takes a long position in the lowest (highest) *Downside Capture*

(*Upside Capture, Capture Spread*) portfolio. We report Newey–West (1987) *t*-statistics adjusted for three lag periods in parentheses.
*** denotes significance at the 1% level.

TABLE A2 Mutual fund alpha: Double sorts on *Active Share* (5-year capture)

Panel A. *Downside Capture* (5-year)

	Downside Capture					
Active Share	**High Skill**	**2**	**3**	**4**	**Low Skill**	**High − Low Skill**
Low	0.000	-0.007	-0.009	-0.012	-0.025	0.025***
	26	28	64	61	19	10.405
2	-0.001	-0.008	-0.010	-0.016	-0.018	0.017***
	32	45	48	48	39	12.429
3	0.005	-0.002	-0.010	-0.015	-0.023	0.029***
	33	49	43	41	57	12.451
4	0.015	0.007	-0.004	-0.006	-0.029	0.043***
	45	60	39	39	59	15.915
High	0.018	0.005	-0.009	-0.025	-0.061	0.078***
	89	38	23	24	48	21.492
High − low	0.017***	0.012***	0.001***	-0.013	-0.036***	
Active Share	9.219	3.373	4.051	-1.299	-10.614	

Panel B. *Upside Capture* (5-year)

	Upside Capture					
Active Share	**Low Skill**	**2**	**3**	**4**	**High Skill**	**High − Low Skill**
Low	-0.005	-0.010	-0.011	-0.012	-0.011	-0.006***
	19	37	56	57	30	-2.204
2	-0.010	-0.013	-0.014	-0.011	-0.006	0.005***
	25	43	46	55	42	4.824
3	-0.010	-0.012	-0.010	-0.012	-0.009	0.001***
	31	46	49	42	55	5.892
4	-0.010	-0.004	-0.003	-0.005	0.001	0.011***
	45	55	41	41	61	9.985
High	-0.014	-0.019	-0.017	-0.008	0.011	0.025***
	90	35	22	23	52	15.290
High − low	-0.009***	-0.009***	-0.006***	0.003***	0.021***	
Active Share	-5.483	-2.178	-2.301	4.173	4.601	

Panel C. *Capture Spread* (5-year)

	Capture Spread					
Active Share	**Low Skill**	**2**	**3**	**4**	**High Skill**	**High − Low Skill**
Low	-0.028	-0.016	-0.009	-0.003	0.003	0.031***
	18	51	65	46	19	2.204
2	-0.026	-0.017	-0.011	-0.007	0.003	0.029***
	30	47	47	53	34	4.824
3	-0.028	-0.018	-0.010	-0.002	0.007	0.035***
	45	47	42	45	44	5.892
4	-0.031	-0.012	-0.002	0.005	0.019	0.05***
	56	44	39	46	57	9.985
High	-0.062	-0.026	-0.003	0.006	0.025	0.087***
	57	25	22	33	84	15.290
High − low	-0.033***	-0.01	0.006***	0.01***	0.022***	
Active Share	-13.545	-1.576	6.559	3.970	11.611	

Note. This table presents double sorts of *Active Share* and the *Downside Capture* (Panel A), *Upside Capture* (Panel B), and *Capture Spread* (Panel C) quintiles, where all capture measures are calculated over the 5 years preceding portfolio formation. Interior cells report the subsequent 1-year alpha and the average number of mutual funds in each cell per year. Border cells of each panel report the return difference for a portfolio that takes a long position in the lowest (highest) *Downside Capture* (*Upside Capture, Capture Spread*) portfolio. We report Newey–West (1987) *t*-statistics adjusted for three lag periods in parentheses.

*** denotes significance at the 1% level.

TABLE A3 Continuous *Active Share* and capture measures on future alpha (1-year capture)

	Dependent variable: *Alpha* (*t*+1)							
Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Active Share	0.018***				0.018***	0.019***	0.018***	0.019***
	(0.004)				(0.004)	(0.004)	(0.004)	(0.004)
Downside Capture		-0.001***			-0.001***			-0.001***
		(0.000)			(0.000)			(0.000)
Upside Capture			0.007***			0.007***		0.007***
			(0.001)			(0.001)		(0.001)
Capture Spread				0.001***			0.001***	
				(0.000)			(0.000)	
ln(*TNA*)	0.478***	0.450***	0.469***	0.444***	0.455***	0.474***	0.448***	0.450***
	(0.137)	(0.136)	(0.134)	(0.135)	(0.136)	(0.135)	(0.135)	(0.134)
ln(*TNA*)^2	-0.532	-0.437	-0.944	-0.446	-0.325	-0.821	-0.332	-0.615
	(1.270)	(1.261)	(1.246)	(1.255)	(1.262)	(1.247)	(1.256)	(1.238)
Expense Ratio	-0.268	-0.261	-0.242	-0.254	-0.261	-0.241	-0.253	-0.234
	(0.213)	(0.212)	(0.210)	(0.211)	(0.212)	(0.210)	(0.211)	(0.209)
Turnover Ratio	-0.003***	-0.002***	-0.002***	-0.002***	-0.003***	-0.003***	-0.003***	-0.003***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Fund Age	-0.017**	-0.018**	-0.018**	-0.018**	-0.017**	-0.017**	-0.018**	-0.018**
	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)	(0.009)
Manager Tenure	-0.029***	-0.029***	-0.028***	-0.029***	-0.029***	-0.028***	-0.029***	-0.027***
	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.011)	(0.010)
Constant	-0.030***	-0.015**	-0.020***	-0.015**	-0.029***	-0.036***	-0.030***	-0.035***
	(0.008)	(0.007)	(0.007)	(0.007)	(0.008)	(0.008)	(0.008)	(0.008)
Observations	25,216	25,216	25,216	25,216	25,216	25,216	25,216	25,216
R^2	12.4%	13.1%	13.8%	13.5%	13.1%	13.8%	13.5%	14.5%
Fund-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fund-year SE clusters	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note. This table presents within fund fixed effects regressions of future alpha on continuous measures of *Active Share, Downside Capture, Upside Capture,* and *Capture Spread* for the full January 1990 to December 2016 sample period. All capture measures are calculated over the 1 year preceding portfolio formation. Models include controls for fund size, fund expenses, fund turnover, fund age, and current manager tenure. Fund-year fixed effects are included, and two-way (fund and year) robust clustered standard errors (SEs) are reported in parentheses. See Table 1 for variable definitions.

*** and ** denote significance at the 1% and 5% levels, respectively.

TABLE A4 Continuous *Active Share* and capture measures on future alpha (5-year capture)

	Dependent variable: *Alpha* (*t*+1)							
Variable	**(1)**	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Active Share	0.018***				0.015***	0.015***	0.012***	0.012***
	(0.004)				(0.004)	(0.004)	(0.004)	(0.004)
Downside Capture		-0.051***			-0.051***			-0.051***
		(0.002)			(0.002)			(0.002)
Upside Capture			0.033***			0.033***		0.033***
			(0.002)			(0.002)		(0.002)
Capture Spread				0.046***			0.046***	
				(0.002)			(0.002)	
ln(*TNA*)	0.478***	0.268**	0.363***	0.162	0.272**	0.367***	0.166	0.161
	(0.137)	(0.125)	(0.132)	(0.120)	(0.126)	(0.132)	(0.120)	(0.122)
$\ln(TNA)^2$	-0.532	-0.952	-1.067	-1.710	-0.858	-0.967	-1.630	-1.290
	(1.270)	(1.177)	(1.223)	(1.130)	(1.177)	(1.224)	(1.131)	(1.142)
Expense Ratio	-0.268	0.073	-0.182	0.163	0.073	-0.181	0.163	0.158
	(0.213)	(0.200)	(0.209)	(0.196)	(0.200)	(0.210)	(0.196)	(0.197)
Turnover Ratio	-0.003***	-0.001**	-0.003***	-0.002***	-0.002**	-0.003***	-0.002***	-0.002**
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Fund Age	-0.017**	-0.019**	-0.015*	-0.015*	-0.019**	-0.015*	-0.015*	-0.016**
	(0.009)	(0.008)	(0.009)	(0.008)	(0.008)	(0.009)	(0.008)	(0.008)
Manager Tenure	-0.029***	-0.019*	-0.032***	-0.023**	-0.019*	-0.032***	-0.023**	-0.022**
	(0.011)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)	(0.010)
Constant	-0.030***	0.039***	-0.034***	0.008	0.027***	-0.046***	-0.002	0.011
	(0.008)	(0.007)	(0.007)	(0.006)	(0.008)	(0.007)	(0.007)	(0.007)
Observations	25,216	25,216	25,216	25,216	25,216	25,216	25,216	25,216
R^2	12.4%	19.2%	14.2%	20.9%	19.2%	14.3%	21.0%	21.1%
Fund-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fund-year SE clusters	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note. This table presents within fund fixed effects regressions of future alpha on continuous measures of *Active Share, Downside Capture, Upside Capture,* and *Capture Spread* for the full January 1990 to December 2016 sample period. All capture measures are calculated over the 5 years preceding portfolio formation. Models include controls for fund size, fund expenses, fund turnover, fund age, and current manager tenure. Fund-year fixed effects are included, and two-way (fund and year) robust clustered standard errors (SEs) are reported in parentheses. See Table 1 for variable definitions.

***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

TABLE A5 Quintile regressions on future alpha (1- and 5-year capture)

	Dependent variable: *Alpha* (*t*+1)							
	1-year capture measures				5-year capture measures			
	Active Share	*Downside Capture*	*Upside Capture*	*Capture Spread*	*Active Share*	*Downside Capture*	*Upside Capture*	*Capture Spread*
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
Quintile 1	-0.021***	0.003	-0.028***	-0.040***	-0.021***	0.009	-0.025***	-0.032***
	(0.007)	(0.007)	(0.006)	(0.006)	(0.007)	(0.007)	(0.007)	(0.006)
Quintile 2	0.003***	-0.014***	0.007***	0.014***	0.003***	-0.013***	0.009***	0.014***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Quintile 3	0.003**	-0.023***	0.016***	0.023***	0.003**	-0.024***	0.013***	0.021***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.002)	(0.001)	(0.001)
Quintile 4	0.007***	-0.030***	0.024***	0.033***	0.007***	-0.031***	0.016***	0.029***
	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.001)
Quintile 5	0.010***	-0.041***	0.037***	0.048***	0.010***	-0.050***	0.024***	0.043***
	(0.002)	(0.001)	(0.001)	(0.001)	(0.002)	(0.002)	(0.002)	(0.001)
ln(*TNA*)	0.477***	0.460***	0.331**	0.373***	0.477***	0.350***	0.390***	0.286**
	(0.137)	(0.131)	(0.129)	(0.126)	(0.137)	(0.129)	(0.134)	(0.127)
$\ln(TNA)^2$	-0.537	-0.494	-0.245	-0.754	-0.537	-1.286	-0.902	-2.186*
	(1.271)	(1.216)	(1.199)	(1.164)	(1.271)	(1.202)	(1.243)	(1.189)
Expense Ratio	-0.245	-0.356*	-0.281	-0.311	-0.245	-0.100	-0.173	-0.091
	(0.214)	(0.206)	(0.203)	(0.194)	(0.214)	(0.207)	(0.210)	(0.204)
Turnover Ratio	-0.002***	-0.002**	-0.002***	-0.001**	-0.002***	-0.001**	-0.003***	-0.002***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Fund Age	-0.018**	-0.020**	-0.017**	-0.021**	-0.018**	-0.016*	-0.016*	-0.013
	(0.009)	(0.009)	(0.008)	(0.008)	(0.009)	(0.009)	(0.009)	(0.008)
Manager Tenure	-0.030***	-0.025**	-0.029***	-0.018*	-0.030***	-0.023**	-0.032***	-0.023**
	(0.011)	(0.010)	(0.010)	(0.010)	(0.011)	(0.010)	(0.011)	(0.010)
Observations	25,216	25,216	25,216	25,216	25,216	25,216	25,216	25,216
R^2	12.5%	18.1%	17.8%	22.7%	12.5%	17.2%	13.5%	17.6%
Fund-year fixed	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Fund-year SE	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes

Note. This table presents within-fund fixed-effects regressions of future alpha on the *Active Share, Downside Capture, Upside Capture*, and *Capture Spread* quintiles. Capture measures are calculated over the 1 and 5 years preceding portfolio formation. Fund-year fixed effects are included, and two-way (fund and year) robust clustered standard errors (SEs) are reported in parentheses. The constant is omitted due to multicollinearity with the quintile indicators. See Table 1 for variable definitions.

***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.

TABLE A6 Quintile interaction estimates on future alpha (1- and 5-year capture)

	Dependent variable: *Alpha* (*t*+1)					
	1-year capture measures			**5-year capture measures**		
	Downside Capture	***Upside Capture***	***Capture Spread***	***Capture Spread***	***Capture Spread***	***Capture Spread***
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
Active Share × Quintile 1	0.039***	-0.008*	-0.016***	0.041***	0.002	-0.011***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Active Share × Quintile 2	0.023***	0.000	0.000	0.027***	0.013***	0.005
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Active Share × Quintile 3	0.012***	0.010**	0.012***	0.015***	0.017***	0.014***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Active Share × Quintile 4	0.004	0.021***	0.024***	0.006	0.022***	0.023***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
Active Share × Quintile 5	-0.009**	0.035***	0.041***	-0.018***	0.030***	0.039***
	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)	(0.004)
ln(*TNA*)	0.448***	0.345***	0.369***	0.319**	0.401***	0.264**
	(0.131)	(0.130)	(0.125)	(0.128)	(0.134)	(0.126)
$\ln(TNA)^2$	-0.321	-0.395	-0.671	-0.957	-0.882	-2.058*
	(1.213)	(1.199)	(1.159)	(1.195)	(1.244)	(1.183)
Expense Ratio	-0.355*	-0.302	-0.311	-0.082	-0.176	-0.077
	(0.205)	(0.202)	(0.193)	(0.206)	(0.210)	(0.204)
Turnover Ratio	-0.002***	-0.002***	-0.002**	-0.002**	-0.003***	-0.002***
	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)	(0.001)
Fund Age	-0.021**	-0.016**	-0.020**	-0.017**	-0.015*	-0.012
	(0.008)	(0.008)	(0.008)	(0.009)	(0.009)	(0.008)
Manager Tenure	-0.024**	-0.030***	-0.018*	-0.022**	-0.032***	-0.022**
	(0.010)	(0.010)	(0.010)	(0.010)	(0.011)	(0.010)
Constant	-0.031***	-0.019***	-0.025***	-0.025***	-0.025***	-0.020***
	(0.008)	(0.007)	(0.007)	(0.007)	(0.007)	(0.007)
Observations	25,216	25,216	25,216	25,216	25,216	25,216
R^2	18.7%	18.2%	23.6%	17.8%	13.6%	18.1%
Fund-year fixed effects	Yes	Yes	Yes	Yes	Yes	Yes
Fund-year SE clusters	Yes	Yes	Yes	Yes	Yes	Yes

Note. This table presents within-fund fixed-effects regressions of future alpha on the interaction term of *Active Share* on each of the *Downside Capture, Upside Capture*, and *Capture Spread* quintiles for the full January 1990 to December 2016 sample period. All capture measures are calculated over the 1 and 5 years preceding portfolio formation. Fund-year fixed effects are included, and two-way (fund and year) robust clustered standard errors (SEs) are reported in parentheses. See Table 1 for variable definitions.

***, **, and * denote significance at the 1%, 5%, and 10% levels, respectively.