Staying the Course: The Role of Investment Style Consistency in the Performance of Mutual Funds

Keith C. Brown*
Department of Finance, B6600
McCombs School of Business
University of Texas
Austin, Texas 78712
(512) 471-6520
E-mail: kcbrown@mail.utexas.edu

W. V. Harlow
Fidelity Investments
82 Devonshire Street
Boston, Massachusetts 02109
(617) 563-2673
E-mail: van.harlow@mac.com

Hanjiang Zhang
Department of Finance, B6600
McCombs School of Business
University of Texas
Austin, Texas 78712
(512) 329-9010
E-mail: hanjiang.zhang@mccombs.utexas.edu

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ABSTRACT

While a mutual fund's investment style influences the returns it generates, little is known about how a manager's execution of the style decision affects portfolio performance. Using both holdings- and returns-based techniques to measure the consistency with which managers approach their investment mandates, we demonstrate that, on average, more style-consistent funds significantly outperform less style-consistent funds on a risk-adjusted basis. This result differs from portfolio turnover and expense ratio effects and is robust with respect to the period and method used to measure future returns. We also show that fund style consistency and risk-adjusted performance persistence over time are distinct influences and demonstrate the potential profitability of trading strategies based on their combined impact. We conclude that deciding to maintain a consistent investment style is an important aspect of the portfolio management process.

JEL Classification: G11, G14

Key Words: style investing, style consistency, performance persistence

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The decision process an investor undertakes before entrusting his or her assets to a professional money manager is at once multi-faceted and extremely complex. At the heart of this judgment, however, is the inherent belief that the investor will be better off with professional management than if he or she had allocated the assets directly. Whether due to better, less costly information or superior investment skill, it is axiomatic that an investor will ultimately benefit from external management if the incremental returns produced exceed the costs of acquiring the manager's services. Not surprisingly, the investment performance of professional fund managers has been of considerable interest to both the academic and practitioner communities for several decades.

An interesting aspect of the contracting relationship between investors and managers is that the latter are seldom left unconstrained to pursue the superior risk-adjusted returns necessary to justify their existence. In fact, these contracts often involve myriad investment restrictions, which can take at least two forms. First, as Almazan, Brown, Carlson, and Chapman (2004) note, investors often impose direct investment restrictions (e.g., short sale or margin trading prohibitions) on the manager's actions. Second, money managers also frequently find their strategic alternatives confined to a narrow range of investment styles, either across asset classes or within a specific asset class. One consequence of such style restrictions is that performance evaluation can become a relative endeavor; it may not be valid to compare two portfolios based on different styles if the respective managers were not free to adopt each other's strategy.

Of course, investment style can also have a direct impact on how fund returns are produced in the first place. Since Basu (1977) and Banz (1981), portfolio managers have been well aware of the benefits of forming portfolios of stocks that emphasize various firm-related attributes (such as price-earnings ratios and market capitalization, respectively). The work of Fama and French (1992, 1993), who espouse a multi-factor asset pricing model that accounts for these attributes, has served to deepen the interest in the role they play in explaining the cross-section of equity returns. In fact, the pervasiveness of these findings has been such that it is now commonplace to define both investment portfolios and equity indexes along just two dimensions: (i) firm size and (ii) value-growth characteristics, with the former defined by the market value of the company's outstanding equity and the latter often defined by the relative price-earnings and price-book ratios of the fund's holdings.[1]

There is ample evidence that a fund's investment style has become deeply ingrained in how the fund itself is identified and the returns it produces. Morningstar, Inc., an independent provider of mutual fund investment information, routinely classifies funds into the cells of a 3 x 3 grid defined by firm size and fundamental valuation attributes for the purpose of performance evaluation. Further, several recent studies have demonstrated that a portfolio's chosen investment style appears to affect the ex post wealth of the investor in a material way. Capaul, Rawley, and Sharpe (1993), Lakonishok, Shleifer, and Vishny (1994), Fama and French (1998), and Chan and Lakonishok (2004) all show that portfolios of value stocks outperform portfolios of growth stocks on a long-term, risk-adjusted basis and that this "value premium" is a pervasive feature of global capital markets, despite some disagreements as to why this premium occurs.[2]

In this study, we consider an aspect of the investment management performance debate that has received little attention in the literature. Specifically, we address the following question: Do investors benefit from managers who maintain their designated investment strategy on a more consistent or a less consistent basis? That is, regardless of what the particular investment mandate happens to be, does a manager who keeps a portfolio that is more closely connected with the designated benchmark add value relative to a manager that allows the portfolio's style to drift over time? Using two different measures based on both the holdings and the returns of a portfolio, we investigate the impact that the *temporal consistency* of a manager's investment style choice has on absolute and relative fund performance, as well as the persistence of that performance over time. The underlying premise of this investigation is that a manager's decision to maintain a portfolio that is highly correlated with its designated investment mandate *should* be related to the returns the fund produces.

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1 Interestingly, Loughran (1997) documents that the book-to-market factor itself exhibits strong seasonal and size-based components. Also, Daniel and Titman (1997) argue that abnormal returns produced by portfolios of small capitalization and high book-to-market stocks are due to those characteristics directly rather than their loadings in a multi-attribute factor model.

2 A growing body of research is devoted to explaining why a value premium exists. Conrad, Cooper, and Kaul (2003) argue that much of the connection between firm characteristics and stock returns can be explained by data snooping biases while Cohen, Polk, and Vuolteenaho (2003) focus on the link between book-to-market ratios and expected firm profitability. Ali, Hwang, and Trombley (2003) show that the book-to-market effect is greater for firms with higher unsystematic risk; Phalippou (2007) documents that the value premium might disappear entirely after controlling for institutional stock ownership.

What is not necessarily clear, however, is the probable direction of this relationship. On one hand, there are several potential reasons why, ceteris paribus, portfolios with a greater degree of style consistency should produce superior returns. First, it is likely that more style-consistent funds exhibit less portfolio turnover and, hence, have lower transaction costs than funds that allow their style to drift. Second, regardless of relative turnover, managers who commit to a more consistent investment style are less likely to make asset allocation and security selection errors than those who attempt to time their style decisions in the sense of Barberis and Shleifer (2003). Third, it is possible that managers who act opportunistically will end up altering the risk of their portfolios in a way that leads to suboptimal performance, as shown by Huang, Sialm, and Zhang (2008). Finally, it is also likely that managers with consistent styles are easier for market participants outside the fund to evaluate accurately. Therefore, since better managers will want to be evaluated more precisely, maintaining a style-consistent portfolio is one way that they can signal their superior skill to potential investors.

Conversely, it is also possible that managers who adopt a strategy designed to remain close to a style benchmark or factor model loading could underperform (or at least fail to outperform) their peer group. Asness, Friedman, Krail, and Liew (2000) document that, while a consistent value-oriented strategy might produce superior returns over an extended time, portfolios formed around growth characteristics have outperformed value-oriented portfolios by almost 30 percent in given holding periods. Thus, although a more style-consistent portfolio might reduce the potential for underperformance, it is also unlikely to capture the benefits that accrue to a manager who possesses the ability to accurately time these style rotations in the market; see, for example, Swinkels and Tjong-a-Tjoe (2007). It may also be true that fund managers have different capture ratios (i.e., the proportion of an index return the active manager produces in up and down market conditions) and that this skill is related to the style consistency decision. If so, less style-consistent managers might outperform more consistent ones during certain market cycles and, further, the same manager might be able to add value by switching between high- and low-consistency strategies given the prevailing conditions in the market.

As the concept of evaluating the stability of a mutual fund manager's investment strategy is fairly new to the literature, we begin our investigation by describing two separate approaches to measuring style consistency.[3] First, we argue that the best way to assess the consistency with which the manager executes the fund's style mandate involves a direct examination of changes in the portfolio's holdings. Specifically, as our initial style consistency proxy, we create a new measure based on the volatility in the portfolio's style characteristic rankings induced by how the security positions were altered over time. The chief advantage of this *holdings-based* approach is that it captures the essence of the actual adjustments the manager made to the portfolio's composition in response to changing market conditions. On the other hand, these portfolio holdings are typically observed infrequently and often with a considerable time lag. Consequently, as a secondary assessment of style consistency, we adapt the coefficient of determination from the return factor model used to infer the fund's investment style. Although by its nature an indirect and potentially noisy proxy, the advantage of this *returns-based* approach to measuring style consistency is that returns are frequently observable and represent the ultimate "bottom line" to the investor.

Using these consistency statistics in conjunction with a survivorship bias-free universe of mutual funds over the period from January 1980 to December 2006, we show that, on average, those funds that are the most consistent in their investment styles over time produce better absolute and relative performance than those funds demonstrating less style consistency. Specifically, after demonstrating that high style-consistent funds tend to have both lower portfolio turnover and lower expense ratios than low style-consistent funds, we document that current estimates for both consistency statistics are significantly correlated with future risk-adjusted fund returns measured over periods ranging from one month to one year. Importantly, we also show that this connection between style consistency and future fund performance is distinct from the influences provided by other established factors, such as turnover, expenses, assets under management, and past risk-adjusted performance (i.e., performance persistence effects).

This main result proves to be robust to a wide variety of methodological assumptions regarding how fund styles are classified and expected returns are estimated, as well as the market conditions confronting the fund manager. The findings indicate that

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[3] While the notion of style consistency as a potential driver of fund performance has been largely overlooked in the traditional asset management industry, there is related research for managers of alternative asset portfolios. Specifically, Gibson and Gyger (2007) use a "fuzzy clustering" methodology to examine hedge fund style consistency over time, while Cumming, Fleming, and Schwienbacher (2009) examine the conditions under which style drift occurs in private equity portfolios.

the predictive relationship between a fund's style consistency and its future returns holds even after making it conditional on whether the return to the affiliated style benchmark increased or decreased in the period immediately prior to the style consistency decision. However, while the strength of this connection remained stable over time, it does appear to vary somewhat across style categories. Finally, to document the economic significance of our proposition, we also show that the consistency measures can be used by investors to increase the ex ante probability of identifying a superior fund manager as well as form profitable risk-adjusted trading strategies. Collectively, our results support the conclusion that investment style consistency does indeed matter and that the ability of a manager to maintain a style-consistent portfolio is a skill valued in the marketplace.

The study is organized as follows. To provide the proper context for evaluating the style consistency decision, the next section summarizes the relevant literature on the role that investment style analysis plays in classifying funds and assessing performance. Section 2 develops our measures for determining how consistently managers follow their mandated investment style and states our hypotheses regarding the relationship between fund performance and style consistency. In Section 3, we discuss the data and empirical methodology used to test these hypotheses and then present our principal results in the following two sections. Section 6 documents the potential profitability of style consistency-based trading strategies while Section 7 concludes the paper.

1. Investment Style, Fund Classification, and Performance Persistence in Fund Returns: An Overview

1.1 Investment Style and the Classification of Mutual Funds

Mutual funds have long attempted to inform potential investors about their intended investment strategy by committing to a specific objective classification. These investment objectives, which include such categories as aggressive growth, growth and income, balanced, and global, have been used historically as surrogates for the risk-expected return tradeoff a fund was likely to produce. An early indication that investment style might play a significant role in portfolio performance comes from McDonald (1974), who finds that measures of both risk and return increased as the fund objective became more aggressive and that the risk-adjusted performance of the more aggressive funds dominated that of the more conservative funds. More recently, Malkiel

(1995) offers evidence that a fund's ability to outperform a benchmark (e.g., S&P 500) was also related to its objective classification.

Despite their documented connections with risk and performance, traditional fund objective categories appear to have fallen out of favor as methods of classifying funds. One reason is that this classification process can be quite subjective and might not always be representative of a fund's actual holdings. More typical of current fund categorization methods is to define a portfolio's investment style directly by a decomposition of its security characteristics, as in Roll's (1995) examination of risk premiums for portfolios sorted by market capitalization, price-earnings, and price-book ratios. A consequence of such efforts has been the finding that funds are often classified improperly using traditional categories. Brown and Goetzmann (1997) develop a new classification system based on style factors that is superior to the conventionally defined categories in predicting future fund returns. Further, diBartolomeo and Witkowski (1997) use a multi-factor decomposition of portfolio holdings to conclude that 40 percent of the 748 equity funds in their sample were misclassified, a problem they attribute to the ambiguity of the prevailing classification system.[4] Conversely, Ainsworth, Fong, and Gallagher (2008) document that Australian equity fund managers appear to alter their security holdings specifically to avoid drifting too far away from their self-stated investment styles.

1.2 Investment Style and Performance Persistence

A recurring question in the fund performance literature has been the extent to which a manager's ability to generate abnormal returns that persist over time. Following Jensen's (1968) original finding that managers are not able to sustain superior performance, current research is more likely to report data supporting persistence. For instance, Hendricks, Patel, and Zeckhauser (1993) and Brown and Goetzmann (1995) document a short-run, positive correlation between abnormal returns produced in successive years. This phenomenon is attributed to managers with "hot hands," but the evidence in both studies appears to be driven by funds sustaining poor performance (i.e., "icy hands").[5]

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[4] diBartolomeo and Witkowski (1997) also note that the nature of compensation contracting in the fund industry leads to the potential for "gaming" the category listing. This is consistent with Brown, Harlow, and Starks (1996), who show that managers of different funds in the same objective class have different incentives to adjust portfolio risk depending on relative performance.

[5] Brown and Goetzmann (1995) also show that funds with persistently poor performance are the ones most likely to disappear from the industry, thus linking the persistence and survivorship literatures; see Brown, Goetzmann, Ibbotson, and Ross (1992).

Additionally, Grinblatt and Titman (1992) and Elton, Gruber, and Blake (1996) find that past risk-adjusted performance is predictive of future performance for periods as long as three years. Finally, Carhart (1997) and Wermers (2003) document that the dominance of past winner funds over past losers is largely due to momentum investing and is most pronounced in growth-oriented portfolios.

Obviously, an important issue in establishing persistence is how abnormal performance is measured and this is where a fund's investment style comes into play. In these studies, risk-adjusted performance (i.e., alpha) is typically measured with a multi-factor return generating process designed to capture the essence of the fund's style. Some use variations of the Fama-French characteristic-based model while others, such as Grinblatt and Titman (1992), use a multiple benchmark portfolio model. Christopherson, Ferson, and Glassman (1998) extend this literature in two interesting ways while corroborating the finding that bad performance persists. First, they calculate abnormal performance directly against returns to specific (i.e., Russell) style indexes. Second, the authors exploit a statistical technique developed in Ferson and Schadt (1996) that allows them to assess performance conditioned on the myriad macroeconomic information that was publicly available at the time the returns were generated.

Ibbotson and Patel (2002) note that the appearance of alpha persistence for a given fund could result from using benchmarks that do not properly account for the fund's investment style as well as the possibility that this style can change over time. They eliminate these problems by constructing a dynamic set of customized benchmarks from a group of seven style-defined indexes. Calculating style-adjusted alphas over successive one-year holding periods, the authors find that funds with positive alphas in an initial period repeat their performance more than half the time, with the degree of persistence rising dramatically with the level of the initial outperformance.

Finally, Teo and Woo (2004) use a sample of style-adjusted returns (i.e., fund returns in excess of the returns of the average fund in a given style group) to demonstrate that portfolios of past winners and losers continue to mimic their previous behavior. They conclude that investors might profit from attempting to time style movements, but it remains unclear how this effect relates to the consistency with which managers execute their respective investment mandates.

2. Investment Style Analysis and Style Consistency

2.1 Analyzing Investment Style: Returns- vs. Characteristic-Based Approaches

Before considering the consistency of a manager's investment style, it is first necessary to describe how that style mandate is established. As developed by Sharpe (1992), returns-based style analysis attempts to explain the systematic exposures that a managed fund have compared to a series of benchmark portfolios designed to capture the essence of a particular security characteristic. This process involves using the past returns to a manager's portfolio and a set of indexes representing different investment styles to determine the relationship between the two. Generally, the more highly correlated a fund's returns are with a given style index, the greater the weighting that style is allotted.

Formally, returns-based style analysis can be viewed as a straightforward application of an asset class factor model:

$$R_{jt} = \left[b_{j0} + \sum_{k=1}^{K} b_{jk} F_{kt} \right] + e_{jt} \qquad (1)$$

where R_{jt} is the t-th period return to the portfolio of manager j, F_{kt} is the t-th period return to the k-th style factor, b_{jk} is the sensitivity of portfolio j to style factor k, b_{j0} is the "zero-beta" component of fund j's returns, and e_{jt} is the portion of the period t return to fund j not explained by variability in the set of style factors. Using (1), the set of style factor sensitivities, $\{b_{jk}\}$, are established by standard constrained least squares methods with two restrictions: (i) the estimated factor loadings sum to one, and (ii) all of the loadings must be non-negative.

The coefficient of determination (i.e., r-squared or, for notational convenience, RSQ) for (1) is defined as RSQ = $1 - [\sigma^2(e_j)/\sigma^2(R_j)]$ and can be interpreted as the percentage of fund j's return variability due to the fund's style decision. Critical to this interpretation is the proper specification of the benchmark portfolios representing the style factors, which should ideally reflect the fund's investment universe and be orthogonal to one another. In practice, three general designations of the factor structure in (1) are typically used: (i) a single-index market model (e.g., Jensen (1968)), (ii) multi-factor models based on pre-formed style indexes (e.g., Sharpe (1992), Elton, Gruber, and Blake (1996)), and (iii) multi-factor models based directly on portfolios created by characteristic-based stock sorts (e.g., Fama and French (1993), Carhart (1997)).

A useful alternative to this returns-based method of style analysis is a characteristic-based approach, which involves a direct examination of the individual security positions held in a portfolio. Based on Grinblatt and Titman's (1989, 1992) pioneering work, Daniel, Grinblatt, Titman, and Wermers (1997) show that when the actual holdings of a portfolio are known, it is possible to decompose fund returns into three dimensions: average style, characteristic selectivity, and characteristic timing. They calculate a fund's average style component, at time t, by matching *every* security held in a fund at t-n with the proper characteristic-based control portfolio at t-n and then applying each security weight at t-n to the matching control portfolio at t. In their analysis, they construct their matching benchmarks to focus on the market capitalization, book-to-market ratios, and prior-year return (i.e., momentum) characteristics of their sample stock portfolios.

There are both advantages and disadvantages with analyzing issues related to a portfolio's investment style using either its underlying holdings or the characteristics of its total returns. As Daniel et al (1997) note, a benefit of the holdings-based approach is that it allows for the development of set of benchmarks that better capture the nature of the style decision. Further, the portfolio's holdings can be used to construct hypothetical returns that permit a more direct assessment of a manager's selection and timing skills, absent the conflicting influence of fees and trading costs that are embedded in actual returns. However, this method can only be calculated when fund holdings are available, which also means that it can produce "stale" style measures when these holdings are reported with a lag (e.g., mutual funds are only required to report holdings on a quarterly basis). Additionally, by observing holdings only at infrequent intervals, characteristic-based measures might be subject to window dressing effects that could bias the analysis; Lakonishok, Shleifer, Thaler, and Vishny (1991) document the potential severity of this problem.

On the other hand, while the returns-oriented approach offers a more aggregated view of fund style based on the "fingerprints" (i.e., returns) of the whole portfolio, it does frame the problem in terms of the actual benefit an investor receives from owning the fund. Additionally, returns can typically be measured over much shorter time periods than holdings (e.g., daily) and more currently, which is a great advantage to an investor trying to discriminate between the actual and self-reported style of a given fund. Also, as returns reflect the cumulative impact of the holdings in place over the measurement period, they are not as prone to window dressing biases. Because of the advantages and disadvantages associated with each approach, in this study we will define style consistency using both holdings- and returns-based proxies.

2.2 Defining Style Consistency

2.2.1 A Holdings-Based Style Consistency Measure

The most direct way to assess a fund’s style consistency involves an examination of how the characteristics of the securities held in the portfolio vary over time. However, as no existing metric is suitable for this purpose, we create a new holdings-based consistency measure employing the following multi-step procedure. First, based on Daniel et al (1997), each year during the sample period (i.e., at the end of June) we used a (5 x 5 x 5) sorting procedure to classify every potential stock position into quintiles according to three characteristics: market capitalization, book-to-market ratio, and past return momentum. Consistent with that earlier work, for each characteristic we assign a score of 5 to a stock falling in the quintile containing the highest values of that characteristic (i.e., largest stocks, highest book-to-market ratios, highest prior-year returns) and a score of 1 to a stock in the lowest quintile.

With these characteristic rankings, our second step was then to look at a fund’s most recent holdings and compute the value-weighted average size, book-to-market, and momentum scores across the entire portfolio based on the procedure developed by Kacperczyk, Sialm, and Zheng (2005). For each fund, these three average characteristic-rank scores were computed on a monthly basis using the most recently reported holdings available (e.g., holdings reported at the end of September were used to calculate rankings for the portfolio in October, November and December). For example, a manager placing two-thirds of her assets in the largest stocks (quintile 5) and one-third of her positions in quintile 4 stocks would have a size characteristic ranking of 4.67. Notice that there are three ways in which this ranking variable can change over time: (i) the relative values of the existing holdings change, which can occur monthly; (ii) the manager explicitly alters the composition of the portfolio, which can be observed quarterly; or (iii) an existing stock holding has its characteristic ranking reclassified, which can occur annually.

With these monthly indications of a manager’s investment style, the essence of the holding-based measure of style consistency is to see how the characteristic rankings vary over time. Therefore, the third step in the process is to calculate the standard deviation of the manager's average ranking to each characteristic using the most recent 36 months of data. Specifically, for fund manager j in month t, we calculate for each characteristic c:

$$\sigma_{c,j,t} = \left\{ \sum_{n=0}^{35} \frac{(\text{Rank}_{c,j,t\text{-}n} - \text{MRank}_{c,j})^2}{(36-1)} \right\}^{1/2} \quad (2)$$

where $\text{Rank}_{c,j,t\text{-}n}$ is the weighted average characteristic ranking in month t-n and $\text{MRank}_{c,j}$ is the mean of these monthly rankings during the 36-month measurement period. Finally, the holdings-based style consistency measure (HSC) associated with the j-th manager in month t is computed as the equally weighted average of the set of $\{\sigma_{c,j,t}\}$ given in (2), or:

$$\text{HSC}_{j,t} = \sum_{c=1}^{3} \frac{\sigma_{c,j,t}}{3} \;. \quad (3)$$

From this formulation, it is apparent that *more* style consistent managers will produce *lower* HSC values over time.[6]

The intuitive appeal of (3) as a proxy for a manager's ability to remain consistent to an investment style is that it is based on the extent to which the actual characteristics of the underlying portfolio holdings migrate on a monthly basis. That is, it is not portfolio turnover per se that causes a fund's style to drift—although these variables may well be related, as we investigate below—but whether a manager replaces one stock holding with another having very different attributes. Further, by its construction, (3) allows for a more precise delineation of the source for the style drift (e.g., active rebalancing by the manager of a particular investment characteristic). Of course, the caveats associated with using any holdings-based measure (e.g., infrequent and lagged observability), represent a potential limitation to its use in practice.

Figure 1 illustrates the way that changes in investment style over time can be measured with this holdings-based approach. At any given point, a fund can have its position plotted in a 3 x 3 style grid by using available return data to estimate the optimal combinations of the mimicking style indexes in a factor model such as (1). As more performance data become available, additional plot points can be calculated and overlaid

6 Wermers (2002) has proposed an alternative style drift which for each investment attribute takes the absolute difference in a fund's characteristic ranking at two different points of time (i.e., the current date and the previous year) and sums those absolute differences across the three attributes. Thus, his statistic views style drift over a single year whereas HSC measures the total volatility generated by the manager's style decisions over a three-year period, which makes it more comparable to how fund style is defined by (1). Meier and Rombouts (2008) examine a related concept involving how fund style rotates over time using the proprietary scores that Morningstar began producing for funds in May 2002. However, since their measure is not directly based on the fund holdings themselves, it is difficult to compare it with (3).

in the same grid to indicate how the fund's style either drifts or remains relatively constant. Figure 1 shows the connected plot points (or "snail trails") for two existing large-cap value funds, with circles of increasing size highlighting the most recent plot points. For comparison, the average positions of several different style and market indexes are shown as well.

The fund in the left-hand panel of the display (Fund A) has an HSC value of 0.11 while the Fund B in the right-hand panel has HSC = 0.23.[7] Clearly, Manager A has maintained the portfolio's designated investment style position to a greater degree than Manager B, who exhibits substantially more style drift. Accordingly, we define Fund A as being more style consistent than Fund B. Whether such differences in the decision to stay consistent to a given investment style are associated with measurable differences in fund return performance is the focus of the empirical work that follows.

2.2.2 A Returns-Based Style Consistency Measure

While the metric in (3) is arguably the most natural way to assess the manager's style consistency decision, the challenges with using any holdings-based measure suggest that examining the issue with the portfolio's returns might provide a useful supplement. Unfortunately, no returns-based statistic can be as directly adapted for this purpose as HSC was for the holdings-based approach. From the specification of (1), however, it is clear that the statistic [1–RSQ] captures the portion of fund j's return variability that is *not* systematically related to co-movements in the returns to the style benchmarks. Accordingly, [1-RSQ] serves as a proxy for the extent to which the manager is unable to produce returns consistent with a tractable investment style. There are three plausible reasons why RSQ measured from (1) for any given fund might be less than one. First, assuming that the designated factor model correctly summarizes the universe of securities from which the manager forms the portfolio, [1-RSQ] might simply indicate that the fund has not diversified all company-specific risk elements. Second, it is also possible that the manager is employing an investment style that the factor model is not capable of capturing; this is the benchmark error problem discussed in Lehman and Modest (1987). Finally, if (1) is estimated with the additional constraint that $b_{j0} = 0$, as in Kahn and Rudd (1995), [1-RSQ] can be interpreted as a measure related to the manager's security selection skill.

[7] The model and analytical specifications that produced these examples are detailed in the next section.

Neither the first nor the third of the preceding explanations ultimately presents a challenge for using RSQ as a cross-sectional returns-based measure of style consistency. That is, as long as the basic factor structure fairly represents the style universe confronting the manager, the component of that fund's returns *not* explained by the model must be related to non-style elements.[8] Conversely, if the empirical form of (1) is an incomplete representation of the manager's investment style, then [1-RSQ] might artificially understate his or her ability to maintain a style-consistent portfolio. With this caution in mind, we use RSQ as our second proxy for the relative consistency of a fund's observed investment style, subject to robustness checks on the specification of the underlying factor model used to generate expected returns.[9]

Given its indirect nature, it is entirely possible that RSQ will produce a noisier measure of style consistency than its holdings-based counterpart, HSC. Still, we would expect HSC and RSQ to be highly correlated across any given cross-section of funds. For example, in Figure 1, the high-consistency portfolio (Fund A) has a substantially larger RSQ statistic with respect to the same factor model—0.93 versus 0.73—than the low-consistency portfolio (Fund B), which coincides with the way HSC evaluated those managers as well.

2.3 Testable Hypotheses

There are three specific hypotheses that we will test in the subsequent sections. First, the style position patterns illustrated in Figure 1 suggest that Manager B is more likely than Manager A to attempt to add value through security-specific selection skills or tactical style adjustments. In either case, it is quite possible that Fund B requires a higher degree of portfolio turnover (measured as the dollar level of fund sales divided by the average market value of the fund's total assets) than Fund A. Note, however, that style consistency does not imply a buy-and-hold portfolio; matching the movements in oft-volatile benchmark returns in order to maintain constant style factor loadings may require frequent rebalancing. Nevertheless, to the extent that these adjustments are systematic in

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[8] Although this interpretation is ultimately valid whether or not b_{j0} is included in (1), the cleanest specification of the model constrains the intercept to be zero because this forces *all* non-style return components (i.e., noise and security selection skills) into the error term.

[9] As with *any* returns-based measure, RSQ is only capable of assessing changes in a manager's style consistency decision in an indirect manner. Further, it is also a statistic that can be adapted for other purposes (e.g., Amihud and Goyenko's (2009) examination of how a fund's coefficient of determination is related to its return performance). Nevertheless, inasmuch as it captures cross-sectional deviations from the style model, it does serve as a potentially useful supplement to HSC.

nature, as in Lo and Wang (2000) and Cremers and Mei (2007), they may be fewer in number than the trading patterns required to execute a more active portfolio strategy.

Hypothesis One: Style-consistent (i.e., low HSC, high RSQ) funds have lower portfolio turnover than style-inconsistent (i.e., high HSC, low RSQ) funds.

The second hypothesis we test examines the relationship between style consistency and fund performance. There are two reasons why more style-consistent portfolios should exhibit superior risk-adjusted returns. First, related to the last supposition, several studies establish a significant negative correlation between fund expense ratios and returns (e.g., Carhart (1997), Bogle (1998)). More active management, with its attendant higher degree of information processing and trading, could increase fund expenses to the point of diminishing relative performance. Second, regardless of whether style-inconsistent funds have higher portfolio turnover, it may also be that managers of these portfolios are chronically underinvested in the "hot" sectors of the market through their more frequent tactical portfolio adjustments.[10] There is, in fact, a long-standing literature suggesting that professional asset managers generally possess negative market and style timing skills; see, for example, Kon (1983), Chang and Lewellen (1984), and Coggin, Fabozzi, and Rahman (1993).[11] Thus, if the value lost through poor timing decisions is sufficient to offset the marginal addition of the manager's selection skills, we would expect managers demonstrating less style consistency to perform relatively worse than their more disciplined peers. On the other hand, it is also possible that there are certain environments in which managers are rewarded for deviating from their investment mandates (e.g., rapidly declining equity markets). If so, less style-consistent portfolios could have periods of outperformance even if the long-term trend runs the opposite way.

Hypothesis Two: On average, style-consistent funds generate higher total and relative risk-adjusted returns than style-inconsistent funds.

[10] Barberis and Shleifer (2003) have modeled an economy where some investors shift assets between style portfolios in an attempt to exploit perceived contrarian and momentum opportunities. The authors demonstrate that prices in such a market can deviate from long-term fundamental values so as to look like bubbles. However, without knowledge of which style is currently in favor, they argue that arbitrage is not a riskless proposition and that there are no consistent profits available. Wahal and Yavuz (2009) document the empirical relationship that exists between momentum profits in a stock portfolio and comovement with its investment style; see also Barberis, Shleifer, and Wurgler (2005).

[11] More recent evidence in Bollen and Busse (2001) suggests that mutual fund managers may exhibit significant positive timing skills when measured using daily returns.

Our final hypothesis involves the relationship between style consistency and the persistence of fund performance. In particular, we want to test whether the two effects are truly distinct from one another in how they influence future returns. That is, after accounting for how a fund's risk-adjusted returns are correlated over time, does the consistency of the manager's style decision still have a significant impact on future performance? Further, even if they constitute separable, stand-alone effects, it is possible that the interaction between the two also contributes meaningfully to explaining how subsequent returns are produced. As noted earlier, it is often bad performance that persists from one period to the next (e.g., Brown and Goetzmann (1995), Christopherson, Ferson, and Glassman (1998)). While style-consistent funds—which, by definition, are closely correlated with a benchmark or specific style exposure—may or may not generate superior performance, it is unlikely either that they will regularly produce inferior relative returns. Managers of portfolios that rely more on security selection or market/sector timing than style discipline to justify their active management fees may generate less reliable performance relative to the benchmark. If these return deviations tend to be more negative than positive—as might occur if they require a larger number of portfolio transactions—then style-inconsistent funds may be connected with the adverse performance persistence phenomenon.[12] Conversely, better managers might decide to maintain a more style-consistent portfolio as a means of conveying their investment prowess to the market.

Hypothesis Three: A fund's style consistency and its past risk-adjusted performance represent distinct influences on its future risk-adjusted performance.

3. Data, Methodology and Preliminary Analysis

3.1 Sample Construction

The data for this study were obtained from two primary sources: The CRSP Mutual Fund database and the CDA/Spectrum Mutual Fund Holding database. The period covered by the investigation is January 1980 to December 2006. From the CRSP survivorship bias-free database, we collected monthly information for each eligible fund on total net-of-fee

[12] In fact, Gallo and Lockwood (1999) have shown that about two-thirds of funds that changed poor-performing managers subsequently changed their investment styles, as determined by a shift in the primary factor loading in an equation similar to (1), following the installation of the new manager.

returns (i.e., capital gain plus income distribution, less expenses), total net assets (TNA) under management, expense ratio, and portfolio turnover. For every fund meeting the screening criteria outlined below and for which a complete set of CRSP data was available, the CDA/Spectrum database was then used to obtain on a quarterly basis the equity holdings (i.e., share name, total shares held) in the portfolio. Since our focus is on actively managed equity funds, we excluded from consideration index funds, fixed-income funds, as well as specialty funds such as balanced, sector and life-cycle/asset allocation funds. Also, for funds with multiple share classes, we compute all of our fund-level variables by aggregating the relevant information across the different tranches. Finally, funds managing less than $5 million were excluded from consideration as were funds that had less than the three years of prior return history required for the estimation process explained below. Collectively, these data filters reduced the set of candidate funds from an initial level of 4,907 to 2,621 across the entire sample period.

While CRSP offers various classification schemes that provide information about a particular fund's investment style (e.g., Wiesenberger, Lipper), they do not include the system popularized by Morningstar that has become the industry standard and allows each fund to be placed into one of nine style categories: large-cap value (LV), large-cap blend (LB), large-cap growth (LG), mid-cap value (MV), mid-cap blend (MB), mid-cap growth (MG), small-cap value (SV), small-cap blend (SB), and small-cap growth (SG).

Morningstar began this classification approach in 1992, roughly half way through our sample period. Thus, to classify the investment style for our funds, we adopt a multi-step sorting procedure that captures the essence the process they used at that time. At the beginning of each calendar year, we use fund returns for the previous 36 months to estimate the parameters of an empirical specification of (1) based on the four-factor version of the Fama-French model that includes Jegadeesh and Titman's (1993) return momentum variable:

$$(R_{jt}\text{-}RF_t) = a_j + b_{jM}(R_{Mt}\text{-}RF_t) + b_{jSMB}SMB_t + b_{jHML}HML_t + b_{jUMD}UMD_t + e_{jt.} \qquad (4)$$

Equation (4) employs the following factor definitions: (i) $(R_{jt}\text{-}RF_t)$ and $(R_{Mt}\text{-}RF_t)$ are the month t returns to fund j and the CRSP value-weighted index, respectively, in excess of the corresponding one-month U.S. Treasury bill yield; (ii) SMB_t is the difference in month t returns between small cap and large cap portfolios; (iii) HML_t is the difference in month t returns between portfolios of stocks with high and low book-to-market ratios; and (iv) UMD_t is the difference in month t returns between portfolios of stocks with high and low stock return performance over the preceding year.[13]

Since market capitalization and relative valuation are the characteristics defining the classification scheme, the estimated values of b_{SMB} and b_{HML} from (4) were the relevant parameters to consider. Using these factor loading estimates, fund investment style was determined as follows: (i) at the beginning of every year, each fund was ranked by its b_{SMB} coefficient from most negative (i.e., large-cap orientation) to most positive (i.e., small-cap orientation); (ii) based on this ranking, funds were divided into large-, mid- and small-cap categories so that they account for 58%, 23% and 19%, respectively, of the size distribution; (iii) within each of these three firm size groupings, funds were further divided into value, blend and growth categories in the respective proportions of 30%, 33%, and 37% by a ranking of their b_{HML} parameters from most positive (i.e., value orientation) to most negative (i.e., growth orientation); and (iv) the entire sorting process, starting with a re-estimation of (4) for every available fund, is repeated each January during the sample period as new funds satisfy the selection criteria.[14, 15]

3.2 Descriptive Statistics

Table 1 summarizes the number of funds in each style category for every year of the sample period, the total funds in the sample listed annually, and the average number of

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[13] We thank Eugene Fama and Ken French for furnishing the return data for the four risk factors in (4). When using the estimated parameters on SMB and HML to sort funds into style classes (as explained below), we used both the three-factor and four-factor versions of the model (i.e., without or with UMD). The inclusion of UMD made virtually no difference in the relative values of the coefficients for SMB and HML and hence made no difference in the way funds were classified. The results reported in subsequent sections are based on style group categorizations from the three-factor model.

[14] The percentages used in this classification process reflect the *actual* style cell proportions for those funds in our sample that Morningstar did classify during the 1992-2006 subperiod. To insure that this approach did not bias the findings in the study, we also replicated all of our analysis after sorting fund style by two different schemes. First, we classified funds into style groups each year according to the proportions that Morningstar employs for classifying *their* sample: (70%, 20%, 10%) for the market capitalization dimension and equal weightings for the relative valuation dimension. (Notice, however, that applying these proportions on an ex-post basis to a *different* sample would be more likely to lead to an arbitrary outcome if the characteristics inherent in that sample did not coincidentally match.) Second, for the subperiod starting in 1992, we also used Morningstar's *actual* style group assignments for the funds in our sample. Neither of these alternative classification schemes produced results that are materially different in any way from those reported herein and they are available upon request.

[15] Chan, Chen, and Lakonishok (2002) present a style classification scheme that can be seen as a variation on this approach. They rank funds by their exposure to a characteristic (e.g., firm size) or factor loading and then scale them to fall between zero and one. In their sample, the correlation of a fund's past and future style averages between 70 and 80 percent, indicating a broad degree of agreement over time

funds that existed in each category over two non-overlapping subperiods. Given the classification process, the earliest style category year possible is 1983, with all funds reported for this period having returns dating to January 1980. The final column of the display documents the steady increase in the total number of funds available for style classification; from 232 separate portfolios in 1983, the sample grew at an annual rate of about nine percent to 1,684 funds in 2006.

Table 2 captures the myriad differences that exist between the funds in these style categories. Panel A lists descriptive statistics over various periods for several average characteristics, including annual total return, return standard deviation, fund assets under management, expense ratio, and portfolio turnover. Panel B then displays differences in those characteristics across "extreme" categories (e.g., [LV-LG] for the valuation dimension, [LV-SV] for the size dimension), along with the associated p-values.

The results in Table 2 confirm much of the conventional wisdom about investment style and fund performance. For instance, Panel B shows that, controlling for market capitalization, value-oriented funds produced average annual returns that were consistently higher than those for growth-oriented portfolios during the decades of the 1980s and 1990s, but that this trend was not present after 2000. Further, the average value fund standard deviations are substantially lower than the total risk level of comparably sized growth funds. Alternatively, controlling for value-growth characteristics, small-cap funds outperformed large-cap funds by an average of between 1.34 and 2.90 percent per year, albeit with higher total volatility.

This display reveals that portfolios in different style categories are indeed managed differently. Over the entire sample period, growth funds have higher turnover ratios than value funds (e.g., SG turnover exceeds SV turnover by 35.72 percentage points) and large-cap funds have lower turnover ratios than small cap funds (e.g., LG turnover is 23.09 percentage points lower than SG turnover). Consistent with this pattern of higher trading, Panel B also documents that small-cap and growth funds have higher expense ratios than large-cap and value funds, respectively. While these comparative findings are robust over time, it does appear that all investment styles had higher turnover and higher expense ratios during the latter half of the sample period. Finally, large-cap funds consistently hold more assets than small-cap funds; there is no clear pattern for the TNA of value versus growth funds, controlling for firm size.

An important implication of these results is that it may be quite difficult to compare directly the return performance of two funds that have contrasting investment styles. Said differently, fund investment prowess is more appropriately viewed on a relative basis within style categories; this is the tournament approach adopted by Brown, Harlow, and Starks (1996) and Chevalier and Ellison (1997), where a manager's performance and compensation are determined compared to peers within a style class or a style-specific benchmark. Further, Khorana (1996) showed that managers who exhibit higher portfolio turnover and higher expense ratios relative to their style-matched peers are more likely to be replaced. Of course, these industry practices are likely driven by the tendency for investors to concentrate on a fund's past total returns when making their investment decisions within a given style class (e.g., Sirri and Tufano (1998), Capon, Fitzsimons, and Prince (1996)). Consequently, in the subsequent analysis, we will consider the issue of investment style consistency in the context of the nine style tournaments defined by the size- and valuation-based categories.

3.3 Style Consistency Behavior

As noted earlier, the consistency of a fund's investment style can be measured either by changes in the composite characteristics of the portfolio's actual security holdings or with the r-squared coefficient relative to a return-generating model. To calculate the former (i.e., HSC), our holdings-based measure of the volatility of a fund's style attributes was calculated according to (3) based on how the fund's portfolio positions were rebalanced during the previous 36-month period. For the latter (i.e., RSQ), we used the four-factor version of (4) to estimate the underlying parameters as well as account for return momentum as a source of systematic variation.[16]

For this initial analysis, we calculated both HSC and RSQ values each year for all nine style classes, using returns for the prior three years (e.g., consistency measures for 2002 are calculated using returns and holdings from 1999-2001). Funds are then rank ordered in separate listings by both statistics and sorted into "high consistency" (i.e., low HSC or high RSQ) and "low consistency" (i.e., high HSC or low RSQ) subsamples by

[16] We estimated two other versions of (4) as well, including the basic three-factor version of the Fama-French model and Elton, Gruber, and Blake's (1996) variation of that model that includes as risk factors excess returns to a bond index and a global stock index. The relative RSQ rankings produced by these alternative specifications were quite similar and are not reproduced here; they are available upon request.

median value for the objective class. Separate consistency subgroups are maintained for the HSC and RSQ sorts and we then reclassify these fund consistency portfolios annually.

Panel A of Table 3 summarizes the characteristics of funds split into consistency bins using holdings, while Panel B separates the funds by the returns-based criterion. Each panel lists sub-group median values for the following statistics: HSC, RSQ, annual tracking error (TE) relative to a style-specific benchmark portfolio, peer group ranking (i.e., the fund's relative position in the annual performance tournament, based on total return), annual total return, return standard deviation, portfolio turnover, and expense ratio.[17] In both panels, the numbers reported represent aggregated values of these statistics; the funds were sorted annually into consistency groups to produce the base levels of the various statistics and these values were then averaged to produce the display.

Regardless of whether funds are sorted by HSC or RSQ, large-cap funds demonstrate more investment style consistency than do small- or mid-cap funds. For instance, the median HSC value for the high consistency portion of the three large-cap style categories is 0.48 while the median RSQ for this grouping is 0.95. By contrast, the high-consistency portions of the small- and mid-cap objectives yield a median HSC value of 0.61 and a "typical" RSQ of 0.91. Comparable results obtain for the low-consistency groupings: Median large-cap HSC and RSQ values are 0.90 and 0.87, respectively, with the analogous values for the other two size-based categories were in the range of 1.04 and 0.82. Additionally, for both definitions of consistency, the median high-consistency fund always has a lower tracking error to its benchmark than its low-consistency counterpart. Although not shown, the findings from 1983-1994 and 1995-2006 subperiods confirm all of these patterns.

Table 3 also provides indirect evidence supporting our first two behavioral hypotheses. Specifically, the first hypothesis maintained that high-consistency funds would have lower portfolio turnover than low-consistency funds. Based on a simple comparison of median turnover ratios, this is true for all nine style groups in both panels. Further, high-consistency funds have lower average expense ratios; all of the style

[17] A fund's tracking error is defined as the volatility over time of the difference between its return and that to the style class benchmark; see Ammann and Zimmerman (2001). We estimated TE using 36 months of past returns and the following style-specific indexes: Russell 1000-Value (LV), Russell 1000-Blend (LB), Russell 1000-Growth (LG), Russell Mid-Cap-Value (MV), Russell Mid-Cap-Blend (MB), Russell Mid-Cap-Growth (MG), Russell 2000-Value (SV), Russell 2000-Blend (SB), and Russell 2000-Growth (SG). The return data for these indexes was obtained directly from Frank Russell Company.

categories in each panel support this conjecture. Next, the second hypothesis predicted that high-consistency funds will produce higher total and relative returns than low-consistency funds. The median annual fund returns using both the HSC and RSQ criteria support this supposition, but somewhat more tenuously; the high-consistency groups generated higher absolute return statistics in six style classes using HSC (i.e., MB, MG and SV being the exceptions) but in all nine cases using the returns-based measure. Additionally, the managers of more style-consistent portfolios produced a higher median style group ranking with roughly the same frequency (i.e., eight and nine, respectively). More formal tests of these propositions are developed in the next section.

Given the similarity of the findings for the consistency measures just described, it is reasonable to ask whether HSC and RSQ generate unique rank orderings of funds in a given style class. However, while the rankings produced by the holdings-based and returns-based consistency measures are comparable, they are not identical. The Pearson correlation coefficient between the fund-specific level of HSC and RSQ is –0.517, which is significant at the 0.01 percent level. (Since high consistency is defined by low HSC values but high RSQ values, a negative correlation level between these variables would be expected.) The Spearman correlation coefficient of the rankings produced by these measures is –0.497, which is also highly statistically significant. Thus, we conclude that HSC and RSQ provide complimentary but distinct methods for calculating the temporal consistency of a mutual fund's investment style decision.

4. Main Empirical Results

4.1 Basic Correlation Tests

More direct tests of the first two hypotheses are possible by considering how the pattern of correlation between the style consistency measures and certain fund management and performance variables evolved over time. The proposition that consistency and turnover are negatively related can be judged by the cross-sectional correlation between a fund's HSC or RSQ measures and its portfolio turnover ratio. Similarly, the correlation between HSC (or RSQ) and future risk-adjusted fund returns provides direct evidence on whether consistency and future performance are positively related.

Table 4 reports these Pearson correlation statistics for the entire 1983-2006 sample period as well as for each year individually. Panel A of the display defines consistency by HSC while Panel B focuses on the returns-based statistic. In both cases, the consistency measures are correlated with the following five variables: annual portfolio turnover, annual fund expense ratio, actual annual fund return, risk-adjusted "tournament" fund return (i.e., actual returns standardized by year within a fund's style classification), and the fund's peer ranking of the tournament return. As before, the consistency statistics are measured out-of-sample; that is, HSC and RSQ are based on fund returns and holdings for the 36-month period *preceding* the interval for which the management and performance variables are produced.

Hypothesis One is tested with the correlation between a given consistency measure and fund turnover, with positive values predicted for HSC (i.e., low HSC, low turnover) and negative ones for RSQ (i.e., high RSQ, low turnover). The results in both panels support the notion that more style consistent funds have lower portfolio turnover, with the evidence from the former being substantially stronger. While the correlation coefficients for the overall period are statistically significant in the predicted direction for both measures (i.e., 0.260 for HSC, -0.028 for RSQ), there is not a single year in which the holdings-based consistency measure provides contrary evidence. On the other hand, the correlation between RSQ and fund turnover is negative in 16 or the 24 annual cross-sections and the years with positive correlation are seldom statistically reliable.

While not formally part of the first hypothesis, Table 4 also indicates that funds with stricter adherence to their investment style tend to have lower expense ratios. In fact, the evidence of this connection is even stronger than that for fund turnover; every yearly correlation coefficient between fund expenses and either HSC or RSQ has the correct sign and, with two exceptions, is significant. This suggests the possibility that managers who charge higher fees (i.e., have higher expense ratios) are more likely to be active investors who seek to obscure their performance by letting their investment style drift. Taken together, these findings also imply an interesting extension of Khorana's (1996) conclusion reported earlier: Managers who remain more consistent to their designated style mandate may be able to reduce the probability that they will be replaced.

To test Hypothesis Two fully, we need to define both absolute and relative fund future returns. As noted, although investors often focus on actual returns when selecting funds, it is also true that fund complexes and managers act as if they compete in more narrowly defined style-specific tournaments. Accordingly, in addition to using a fund's total return during a particular sample year, we also convert this value to a z-score by standardizing within the fund's style classification.[18] We refer to this value as the fund's *risk-adjusted tournament return* and it is one of two relative return measures we employ, the other being peer rankings based on these standardized returns. This adjustment also allows for aggregating performance statistics across time and investment styles, facilitating the analysis in the next section.

The evidence presented in Panel A of Table 4 confirms the proposition that more style consistent funds tend to produce higher absolute and relative future returns over time. Under this hypothesis, the correlation coefficient between HSC and each of the return metrics is expected to be negative. This is indeed the case for the entire sample period as well as 18 of the 24 individual sample years. Overall, the correlation between HSC and both the unadjusted total returns and the relative risk-adjusted return measures are quite strong, with the coefficients of -4.2%, -4.6% and -5.1%, respectively, all being statistically meaningful. Further, in the six annual cross sections when the correlation coefficients run opposite to the predicted direction, only three of the years (i.e., 1993, 1999 and 2003) prove to be significant across the various return measures.

The findings in Panel B for the RSQ consistency measure tell a similar, if more modest, story. The correlation coefficients for this statistic should be positive and, for the entire sample period, they are; each of the respective values for the return variables (i.e., 3.4%, 4.2% and 5.6%) is significant in the predicted direction. However, behavior in the separate yearly subsamples reveals that the relationship between style consistency and fund performance may be somewhat more complex. In particular, the correlation between RSQ and absolute returns is positive in 14 of 24 years in the sample period, with the respective numbers for the two relative return measures being 16 and 18 years. Interestingly, 2001 and 2002—a period of highly negative stock returns—were two years when the correlation ran in the contrary direction.

Beyond broadly confirming the first two hypotheses, the findings in Table 4 suggest two notable implications. First, the relationship between style consistency and portfolio

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[18] As detailed in the Appendix, we have replicated our entire set of results using three separate measures of future risk-adjusted fund returns, which differ primarily in the way that fund risk is estimated. Chiefly because of its out-of-sample nature, throughout the study we report findings based on the following design: Each fund's total return was normalized within its relevant style class (i.e., tournament) by subtracting from it the return to its style-specific benchmark portfolio and then dividing this difference by the cross-sectional standard deviation of the funds in that style class. The Appendix summarizes replicative tests using the two alternatives to this risk-adjustment process; our main findings are invariant to these adjustments.

turnover is quite strong, particularly when consistency is measured with the holdings-based proxy. So strong, in fact, that it may be that style consistency is merely a surrogate for low turnover and, hence, low transaction costs. Second, it is now more apparent that HSC and RSQ produce measurably different indications of style consistency, especially when it comes to helping to explain a fund's absolute and relative future performance. We investigate both of these topics in greater detail in the following sections.

4.2 Style Consistency and Future Fund Performance: Unconditional Tests

4.2.1 Pooled Regression Results

Collectively, the final two hypotheses specified earlier hold that (i) the consistency of a fund's investment style will be positively related to the manager's ability to produce superior risk-adjusted returns in the future, and (ii) this consistency effect is distinct from the impact associated with the persistence of past fund performance. As a formal test of this combined prediction over the entire sample period, we estimate a series of pooled regression equations by altering our earlier methodology as follows:

(i) Starting at the beginning of our sample period (in January 1983), for each available fund we estimate the parameters of (4) using the previous 36 months of returns. This estimation produces the returns-based consistency measure (RSQ) as well the intercept term—i.e., ALPHA—which we use as our proxy for past abnormal investment performance for the purpose of assessing the return persistence effect. The holdings-based consistency (HSC) statistic is calculated over this same 36-month window according to (3).

(ii) At this same point in time, we calculate each fund's standardized tournament return over the *subsequent* n-month period. Three values of n are employed: one (i.e., the fund's next month return), three (i.e., the fund's next quarter return), and 12 (i.e., the fund's next year return). We refer to these performance statistics as risk-adjusted future returns because they are calculated over a different time period than the style consistency and past performance variables we use to explain them (e.g., a fund's one-month tournament return for January 1983 will be compared with its HSC, RSQ, and ALPHA measures calculated over January 1980-December 1982.)

(iii) To create a complete time series of data for each fund, we repeat the previous steps by sequentially rolling the 36-month estimation window forward n months at a time, where the value for n once again defines the length of the future return forecast period. That is, the next one-month future return forecast will be for February 1983, which will correspond to HSC, RSQ, and ALPHA values estimated over February 1980 to January 1983; by contrast, the forecast period for the three-month return will be rolled forward to April 1983, with the parameters of (3) and (4) estimated over April 1980 to March 1983.

(iv) In separate estimations, we then regress the one-, three-, or 12-month tournament returns on the prior levels of ALPHA and either HSC or RSQ using all available data for each sample fund. To assess their combined influence on future risk-adjusted returns, we also consider an interaction term defined as the product of ALPHA and the respective consistency measure (labeled CONS for notational convenience). In various forms of this regression, we also include the following control variables: portfolio turnover (TURN), fund size (TNA), measured by the market value of its assets under management at the end of the estimation period, and fund expense ratio (EXPR). To aggregate these data across different style tournaments into a single calculation, all of the variables just described were standardized by period and style group.

Table 5 reports results for these regressions. The findings in Panels A, B, and C use one-, three-, and 12-month future risk-adjusted returns as a dependent variable, respectively. We estimated parameters for 13 different combinations of the independent variables, starting with a simple model involving ALPHA alone (Model 1). Models 2-7 then include HSC as a regressor in various combinations with the interaction term and other control variables, while Models 8-13 present comparable findings using RSQ as the style consistency proxy.

The findings in Table 5 lead to several general conclusions. Most broadly, the overall level of future return predictability is low, as indicated by the adjusted coefficient of determination values reported in the next-to-last row of each panel. Within this context, longer-term (i.e., 12 month) out-of-sample performance appears to be marginally more predictable than shorter-term future returns. Despite these small regression-wide statistics, however, the individual parameters on all of the independent variables except TNA and [ALPHA*CONS] are highly significant at conventional levels. This is clearly a by-product of the large sample sizes created by the pooling of data across time and investment style groups.[19] Nevertheless, the reported parameters are useful for the information they contain about the direction and magnitude of the various relationships, as well as the comparative connections they suggest.

Model 1, which regresses future returns on past fund performance alone, provides a baseline analysis of the persistence phenomenon. The positive coefficient values in all three panels of the display indicate that relative performance did indeed persist throughout the sample period. Interestingly, this alpha persistence effect proves to be reliable despite the fact that the return-generating model used to measure risk-adjusted returns includes a return momentum factor, despite Carhart's (1997) finding that alpha persistence largely disappears when this exposure is considered directly.

The remaining 12 models represented in Table 5—six using HSC and six using RSQ—examine the role that investment style consistency plays in predicting future risk-adjusted fund performance. Overall, the results strongly support the conclusion that these two variables are meaningfully related. Whether defined with holdings or returns, the coefficients in question always obtain the direction predicted by Hypothesis Two (i.e., negative for HSC, positive for RSQ) and are virtually always statistically significant. For instance, in Models 2 and 8 the simplest form of the relationship between subsequent returns and either HSC or RSQ, respectively, is tested. Looking across the three panels, all of the return forecast periods produce highly significant coefficient values of the appropriate sign: -0.014 (HSC) and 0.017 (RSQ) for one-month returns, -0.022 and 0.034 for three-month returns, and -0.020 and 0.023 for 12-month returns. Additionally, notice that like ALPHA, the influence of HSC and RSQ appears to peak for the three-month future return prediction period.

Hypothesis Three holds that this relationship between style consistency and future fund performance is distinct from the influence exerted by the persistence phenomenon. Indeed, the findings for the three variations of Models 3 and 9—which include HSC or RSQ, respectively, with ALPHA as regressors—show that the consistency variable is not a simple surrogate for ALPHA. In fact, the coefficient levels for both HSC and RSQ remain statistically significant and either do not change in value or actually increase with the addition of the past performance metric. Further, there is little evidence that the

[19] In subsequent sections, we examine these relationships controlling for cross-sectional aggregation issues as well as within the context of separate investment style groups.

consistency and persistence variables combine in a way that produces a meaningful effect; the various coefficients for the [ALPHA*CONS] interaction term in Models 4 and 10 are largely insignificant (with the 12-month return predictions using RSQ being the only exception) and the inclusion of this term has virtually no impact on the influence exerted by either ALPHA or the consistency variables measured by themselves. As such, these results sustain the uniqueness of the style consistency decision as a determinant of future risk-adjusted returns.

Models 5-7 and 11-13 explore these relationships further by controlling for other mitigating influences. The results for Models 5-6 and 11-12, which include TURN and TNA, allows this conclusion to be extended with respect to portfolio turnover and fund size; that is, adding either TURN or TNA also does nothing to diminish the magnitude of the style consistency variable.[20] Therefore, it also appears that neither HSC nor RSQ are mere proxies for TURN either. Finally, the connection between style consistency and future risk-adjusted performance is adversely affected once fund expense ratios are added as a regressor (i.e., Models 7 and 13), with the respective parameters on HSC and RSQ diminishing in magnitude but remaining statistically significant for one-month and three-month future returns. Viewed collectively, the findings in Table 5 provide strong and wide-ranging support for the proposition that the consistency of a fund's investment style does impact its future performance in a unique manner, a conclusion that is robust to the way in which style consistency is defined.

4.2.2 Fama-MacBeth Cross-Sectional Results

In the pooled regression tests just presented, it is possible that the residuals are correlated across funds during a given time period. To attenuate this concern, we also test for the roles that style consistency and performance persistence play in predicting future returns on a cross-sectional basis. Specifically, we adopt a three-step procedure based on the methodology of Fama and MacBeth (1973). As before, for every sample fund on a given month, we first estimate the return-generating model in (4) using the prior 36 months of data, which produces values of past performance (ALPHA) and the returns-based style consistency measure (RSQ) for each fund as of that date. At the same point in time, we

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[20] An interesting related finding documented in Table 5 is the positive coefficient defining the relationship between future fund returns and portfolio turnover. Wermers (2000) documents this same connection and interprets it as supporting the value of active fund management.

also estimate the fund's holdings-based consistency score (HSC). Second, we calculate the risk-adjusted tournament return for each fund over the subsequent one-, three-, and 12-month periods. These future returns then become the dependent variables in a three separate cross-sectional regressions in which ALPHA and either HSC or RSQ, along with controls for portfolio turnover, fund size, expense ratio and the interaction term, are the regressors. Finally, repeating the first two steps for a series of different months that are rolled forward on a periodic n-month basis generates a time series of parameter estimates that summarize the various relationships between future returns, ALPHA, style consistency, and the controls.

For each of the respective sets of future returns, Panels A-C of Table 6 list the average of the time series of estimated coefficients produced by the preceding estimation process, along with p-values based on the means of those coefficients. All three panels, which summarize a nested series of regressions comparable to those in Table 5, confirm the general conclusions discussed above. First, the positive correlation between past and future risk-adjusted fund returns suggests the existence of performance persistence in the fund sample. Second, there is also a strong connection between a fund's style consistency, as measured by either past holdings or past returns, and its future risk-adjusted performance, although this connection is somewhat less reliable when the sample size shrinks to it smallest level (i.e., 12-month future returns for RSQ). Indeed, the strongest relationship between consistency and subsequent performance continues to occur for the three-month future return sample. Third, [ALPHA*CONS] remains insignificant and its inclusion does little to reduce the influence of the past performance and style consistency variables taken separately. Fourth, TNA is still an unreliable explanatory variable, whereas the coefficient on TURN remains significantly positive, albeit at attenuated levels. Finally, the fund's expense ratio is still strongly negatively correlated with future risk-adjusted performance and this relationship dissipates the impact of ALPHA and HSC or RSQ to some extent. Overall, however, these findings support the conclusion that the ability of a fund manager's past alpha and investment style consistency skills to help predict future returns is neither spurious nor driven by large sample sizes.

4.3 Style Consistency and Future Fund Performance: Conditional Market Tests

The unconditional regression results just discussed made no attempt to exploit knowledge of general market conditions in explaining subsequent fund returns, despite the fact that Ferson and Schadt (1996) and Glode, Hollifield, Kacperczyk, and Kogan (2008) have shown such efforts to be useful. The possibility exists that style-consistent portfolios might find their relative performance depends on whether the overall stock market or their specific style group benchmark is increasing or decreasing in value.

In this section, we reproduce the findings for Models 7 and 13 in Table 5 while allowing for differential effects on ALPHA and the style consistency proxies in rising or falling markets. That is, we calculate separate parameters for those variables conditioned on whether returns to the style-specific benchmark were positive (i.e., an up market) or negative (i.e., a down market) in a given period. Table 7 contains these results, measuring up and down style benchmark returns over the 12-month period *immediately prior* to the calculation of the future returns. In this way, the conditional market movement is fully out-of-sample and predictive in the sense that—like past performance and past style consistency—investors have this information in their possession before the period over which future fund returns are measured.

The findings in the display confirm that the benefit to the investor of knowing ALPHA and either HSC or RSQ in advance is *not* a function of the conditions that existed in the market at the time of the prediction. In particular, the parameters on the conditional style consistency measures are of the appropriate sign— negative for HSC-Up and HSC-Down, positive for RSQ-Up and RSQ-Down—and are highly significant, irrespective of the direction of the lagged market return. (The only exceptions are the 12-month HSC-Down value of -0.002, which has the proper sign but is insignificant, and the insignificant RSQ-Up value of -0.013 for 12-month returns.) This implies that an investor having observed, say, the past year's returns in a particular style group to be positive can rely on the fact that style-consistent managers in that group are more likely to produce better future performance. Further, notice that this outcome is not sensitive to whether style consistency is defined by a fund's security holdings or its returns. Thus, the results in Table 7 substantiate of our earlier conclusion based on the unconditional findings concerning the value to investors of having their managers follow a stable approach when executing their stated investment style.[21]

5. Additional Robustness Tests

5.1 Style Consistency and Future Fund Performance in Style Tournaments

In this section, we extend the preceding analysis by estimating the parameters of the regression of future risk-adjusted fund returns on ALPHA, the style consistency measures, and the various control variables within each of the nine separate investment style groups. For this analysis, we computed future tournament returns over the three months following the estimation interval. After standardizing the variables on a quarterly basis only, we then calculated the coefficients of the unconditional version of Model 7 (for HSC) and Model 13 (for RSQ) for each style group over the entire 1983-2006 sample period. These models, which include all four control variables, were chosen as they represent the most severe test for the style consistency hypotheses. The findings are reported across the nine columns of Panel A in Table 8, which for convenience do not list the estimated parameters for the intercept or the control variables.[22] Panel B then lists regression results for funds aggregated across the various segments of each style dimension (i.e., large-, mid-, and small-cap; value, blend, and growth).

The first thing to notice is that the persistence and consistency effects described above remain strong, but not completely uniform, across the various style groups. The parameter on ALPHA is positive and statistically significant at conventional levels in eight of nine style classes when HSC defines style consistency (with MB being the lone exception) and all nine groups for RSQ, confirming that performance persistence was a pervasive feature of the mutual fund industry during this sample period. The reported connections between style consistency and future returns show a similar, although more tenuous, pattern. Specifically, the estimated HSC coefficients are in the direction predicted by Hypothesis Two for six of the nine style classes, with four of those six being statistically significant. For the returns-based consistency measure, seven of the nine

[21] We also estimated a comparable set of Fama-MacBeth cross-sectional regressions for these conditional market data. Although not shown, these results replicate the direction of the findings of Table 7 although at somewhat reduced levels of statistical significance.

[22] Although not presented here, for every style tournament we also calculated the parameter estimates for all 13 model formats of both the unconditional and conditional forms of the regression equation employed earlier. These data confirm the conclusions discussed below and are available upon request.

HSC parameters have the predicted positive sign with five being significant. Thus, it now appears that meaningful overall relationship between style consistency and future returns is attributable to most, but not all, of the individual style groups.

Panel B presents regression results for funds aggregated within style dimensions and provides a somewhat broader view than the tournament-specific findings just described. Generally speaking, the data in this display provide even stronger confirmation of our conclusions about the ability of past performance and investment style consistency to help investors predict future fund performance. The coefficient on ALPHA is positive and significant for all six broad style groups regardless of how style consistency is defined. Additionally, the signs of the estimated consistency coefficients are as predicted in every case— negative for HSC, positive for RSQ—and they are statistically reliable in three and six of those cases, respectively.

The primary implication that can be drawn from the findings in Table 8 is that, beyond the quality of a fund's past performance, the manager's commitment to running a style-consistent portfolio can signal his or her chances to produce superior future risk-adjusted returns. As noted, this style consistency effect remains in place even after accounting for other mitigating influences documented elsewhere in the literature, such as return momentum, past performance, portfolio turnover, and fund expenses. It is now also evident, however, that this relationship is not totally pervasive, but rather is more likely to hold for certain investment styles than others.

5.2 Logit Analysis Results

The preceding analysis documents the effect that past performance, style consistency, portfolio turnover, assets under management, and expense ratios have on future fund returns. However, there is evidence (e.g., Brown, Harlow, and Starks (1996)) to suggest that compensation contracting among fund managers may depend on an even more basic level of fund performance: Are managers above or below average compared to their peer groups? Consequently, a related question worth exploring is whether these same factors influence where a manager ranks relative to the median competitor within a particular style tournament. To examine this issue, we re-estimate the unconditional regression equations in Table 5 using a logit model with a dependent variable that equals one if a fund's tournament return exceeds the median for its particular style group in a given quarter (i.e., three-month future returns) and zero otherwise. We then use these logit regressions to assess the probability of finishing as an above-median manager in a two-way classification involving the relative levels of a fund's past alpha and style consistency statistics. In this way, we can quantify the economic significance of the connection between style consistency and return persistence.

Specifically, we estimated logit regressions using the same set of explanatory factors and control variables described previously. Although the estimated parameters are not reported here, the conclusions that can be drawn from these models are qualitatively comparable to those suggested by Panel B of Table 5. Both the alpha persistence and style consistency effects continue to have distinct and meaningful impacts on future performance. Further, the effect that style consistency has on a manager's ability to generate returns falling in the upper half of his or her peer group remains strong even after controlling for portfolio turnover, fund size, fund expenses, and the interaction with ALPHA. This supports the earlier contention that managers with the best past performance can signal their prowess to investors by maintaining a more consistent investment style over time.

These logit regressions also allow a better sense of how performance persistence and managing a style-consistent portfolio can combine to improve an investor's chance of receiving superior quarterly returns in the future. Table 9 lists the probability of beating the median peer manager when ALPHA and either HSC or RSQ fall within a particular cohort cell while holding the other explanatory variables constant. For this exercise, the levels of TURN, EXPR and TNA are set equal to their standardized mean values of zero in Panel A, while Panel B focuses on the set of funds with the lowest expense ratios. Funds within a style group and year are sorted into cohorts delineated by the number of standard deviations each variable falls from its mean (e.g., a fund in the (-2, +1) cohort produced an HSC or RSQ value at least two standard deviations below the average and an ALPHA statistic at least one standard deviation above the norm). The columns of the display represent the differential effect of style consistency for a given level of ALPHA, while reading across a row shows how past abnormal performance increases the probability of being an above-average future manager given a certain level of investment consistency. The final row and column report the difference in proportions for the highest and lowest ALPHA and HSC/RSQ effects, respectively, controlling for the other influences.

Notice in the RSQ section of Panel A that funds in the (0,0) cohort—those producing average past alpha and style consistency levels—essentially have an equal chance (i.e., a reported proportion of 0.5026) of finishing above the average in a subsequent annual style tournament. With that as a benchmark, there are two effects that are particularly noteworthy. First, looking at the first numerical column of the display, it appears the impact that past performance has on future outperformance is, in part, a function of the manager's style consistency decision. For instance, in the low ALPHA group (i.e., ALPHA two standard deviations below the mean), the difference between the lowest and highest RSQ cohorts is only 0.0069, meaning that the most style-consistent managers have only a 69 basis point probability advantage over the least style-consistent managers in terms of being an above-median performer in the future. However, if both types of style-consistent managers are from the high-ALPHA group, this advantage increases to 8.89 percent. Second, looking from the other direction, the last column of Panel A shows an even more pronounced degree of asymmetry when judging the effect that ALPHA has for a given RSQ cohort. For the group of least style-consistent managers (i.e., RSQ two standard deviations below the mean), moving from the lowest to highest ALPHA class changes the probability of future outperformance by 6.75 percent. Within the set of high style-consistent managers (RSQ of +2 standard deviations), however, the high ALPHA subsample is an impressive 14.95 percent more likely to produce above-median future returns than the low past performance subgroup.

The findings in the HSC section of Panel A tell a similar story at slightly reduced levels of probability gain. The probability of future outperformance between low- and high-ALPHA cells is 13.16 percent if the managers come from the high-HSC group, but only 6.62 percent for low-HSC managers. Conversely, the probability of being an above-median manager in the future increases by 532 basis points across the consistency cells for high-ALPHA funds, but actually falls slightly (i.e., -1.22 percent) for the low-past performance cohort. Nevertheless, these holdings-based style consistency results corroborate the findings for the returns-based measure.

Finally, given the connection between a fund's expense ratio and its future performance documented throughout the study, Panel B of Table 9 replicates the preceding analysis assuming the manager's EXPR falls two standard deviations below the mean (i.e., the lowest expense funds). Beyond showing a dramatic increase in the probability of future success when the fund has low expenses to begin with (e.g., for HSC, the probability in the (-2, +2) cell increases from 57.73 to 61.37 percent), the results confirm the general patterns just discussed. Combined with Panel A, these findings again support the conclusion that a manager's commitment to the fund's investment style is positively related to its future outperformance and that the best past managers benefit the most from maintaining a style-consistent portfolio.

6. Style Consistency-Based Trading Strategies

In this section, we ask the following question: Controlling for portfolio expenses and past performance, would investors be able to exploit the return differential (if any) generated by style-consistent and style-inconsistent portfolios? To address this issue, we calculate the returns to several hypothetical portfolios sorted by combinations of fund expense ratio (EXPR), past fund performance (ALPHA), and past style consistency (HSC or RSQ). At the beginning of the sample period in January 1983, the available funds were divided into one of two portfolios according to high and low values of the relevant sorting variables. These portfolios were then rebalanced on a quarterly basis throughout the sample period and investment performance statistics were calculated through December 2006.

The two panels of Table 10, which again differ by how style consistency is defined, document the investment performance for six different pairs of portfolios formed with the rebalancing technique just described. For the first three of these portfolio pairs, funds were defined using just one of the sorting variables at a time. This allows for a comparison of the differential economic impact that expense ratios, past performance, and past style consistency have when considered separately. The next two—[Lo EXPR, Hi Consistency] vs. [Hi EXPR, Lo Consistency] and [Hi ALPHA, Hi Consistency] vs. [Lo ALPHA, Lo Consistency]—provide comparisons that facilitate an evaluation of the synergy that exists when investors select managers that have either low expense ratios or superior past performance along with a more style-consistent investment approach. The final comparison examines the difference between [Lo EXPR, Hi ALPHA, Hi Consistency] and [Hi EXPR, Lo ALPHA, Lo Consistency] managers, indicating the magnitude of the benefits possible when investors select managers who control for all three factors. In all cases, high and low values of the sorting variables were defined by the upper and lower quartiles of the respective distributions.[23]

Panel A lists results using HSC to define style consistency. The first thing to notice is that without regard to past performance or style consistency issues, investing with managers who run low-expense portfolios generated an annual return premium of more than 125 basis points (i.e., 12.12 vs. 10.85 percent) and with a lower level of portfolio volatility. Further, investments based just on past fund performance levels show an even more pronounced increase in annual return (i.e., 12.48 to 10.64 percent) with a roughly comparable level of volatility in the Hi ALPHA and Lo ALPHA portfolios. Finally, portfolios sorted unconditionally on the style consistency variable produce a 42 basis point return premium for the Hi Consistency investment, but with a risk level that was almost a full percentage point *lower* than that for Lo Consistency portfolio. The comparative Sharpe ratios listed in the last column are always larger for the respective upper quartile sort, showing that lower expense, higher past performance, and more style consistent investments always outperformed their counterparts on a risk-adjusted basis.[24]

The last three pairwise comparisons shown in Panel A document how the performance advantage associated with the style consistency decision is embellished by managers with low expense, high past performance operations. When Hi Consistency and Lo Consistency portfolios based on HSC are modified to include extreme values of ALPHA in the sorting procedure, the return premium increases from 42 basis points to 161 basis points (i.e., 12.45 vs. 10.84 percent). The synergy between EXPR and HSC is larger still; adding this variable to the portfolio formation process increases the Hi Consistency vs. Lo Consistency return premium from 42 to 228 basis points. Lastly, when funds are sorted on extreme values of all three variables, the result is a return differential of 349 basis points with a reduction in overall risk. As before, the Sharpe ratios for each of the Hi Consistency-based portfolios exceed those for the comparable Lo Consistency portfolios by a sizeable margin.

[23] We also duplicated the results in Table 10 using portfolios formed with high and low variable values defined relative to their respective medians. These findings, while somewhat less pronounced, are nevertheless consistent with every point discussed below and are not reported here.

[24] Sharpe ratios were calculated for each portfolio as the difference between its average annual return and the average annual risk-free rate divided by the portfolio's annualized standard deviation. The average annual risk-free rate for the 1983-2006 sample period was 5.004%, which was established by annualizing the average of the monthly Treasury bill yields listed in the Fama-French database.

Panel B of Table 10 replicates these findings using RSQ to sort portfolios. It not only remains the case that greater style consistency led to enhanced performance, the improvement is even more dramatic than with the HSC metric. For instance, the outperformance of the unconditional Hi Consistency is 108 basis points, although this was obtained with somewhat higher volatility. Additionally, the incremental return contribution of adding EXPR and ALPHA to a consistency-based portfolio appears to vary; when those sorting variables are added to the portfolio formation process, the return premium enjoyed by Hi Consistency portfolios changes from the 186 and 119 basis point levels discussed above to 223 (= 331 – 108) and 56 basis points, respectively. Also, the average annual return associated with the [Lo EXPR, Hi ALPHA, Hi RSQ] portfolio is 13.44 percent, which is 475 basis points higher than its [Hi EXPR, Lo ALPHA, Lo RSQ] counterpart. Once again, the risk-adjusted performance of the Hi Consistency portfolios always exceeds that of the Lo Consistency portfolios.

The main conclusion implied by these findings is that each of the contributions of a fund manager that we have considered—running a low-expense operation, demonstrating superior performance, and managing in a style-consistent manner—appears to have the potential to add value to investors. Further, beyond the independent contributions they might make, there also appears to be a considerable amount of synergy possible between these effects. Of course, given that the benefits of investing with managers who control their expense ratios and persistently produce superior risk-adjusted returns are well documented, the extension provided by these results is to offer some perspective on the economic consequences of the manager's style consistency choice.

7. Concluding Comments

One of the more intriguing developments in professional asset management during the past few decades has been the evolution in how a portfolio's investment style is defined and the role that this style decision plays in determining fund returns. Both theory and practice appear to have settled on two salient dimensions that define a portfolio's style: the market capitalization of the typical fund holding (i.e., the "size" dimension) and the fundamental attributes of that composite holding (i.e., the "value-growth" dimension). While considerable effort has been put toward establishing whether a manager's selection of a particular set of style characteristics influences performance, relatively little is known about whether the manager's ability to consistently execute that style mandate—whatever it may be—also has a significant impact on investment returns.

Does investment style consistency matter? The results of this study strongly suggest that the answer is "yes." Using two different measures of consistency linked to both fund holdings and returns, we test three specific hypotheses related to this issue, namely that: (i) a negative relationship exists between portfolio style consistency and portfolio turnover, (ii) a positive relationship exists between a fund's style consistency and the future actual and risk-adjusted returns it subsequently produces, and (iii) while a positive relationship may exist between them, the consistency of a portfolio's investment style and the persistence of its performance over time represent distinct influences. Based on a survivorship bias-free sample of several thousand mutual funds drawn from nine distinct style groups over 1983-2006, the data provide support for all three propositions under a wide variety of test conditions and alternative possibilities.

Regardless of whether the definition of style consistency is holdings-based (i.e., HSC) or returns-based (i.e., RSQ), high-consistency funds do indeed tend to have lower portfolio turnover and expense ratios than low-consistency funds. This undoubtedly contributes to the more compelling result that greater style consistency is positively associated, on average, with both higher overall returns as well as higher risk-adjusted returns within a given investment style class. Second, we also confirm that this connection between consistency and future fund returns is distinct from—and of comparable magnitude to—those related to past performance (i.e., alpha), fund turnover, fund size, return momentum, and fund expense ratio. Further, we show that the relationship between style consistency and future fund returns does not change in different market environments, when changes in overall market conditions are measured coincidently with fund performance. Third, the style consistency measures proved useful in predicting which managers are likely to generate future superior investment returns relative to the style-specific peer groups. Finally, the dominant performance of simulated consistency-based trading strategies suggests that these effects are economically as well as statistically significant.

These findings evoke several implications and extensions. Most notably, it appears that the ability for portfolio managers to sustain a preferred degree of consistency to their designated investment styles is a valuable skill. In fact, maintaining an observable level of consistency in their investment style is one of the ways in which superior managers can signal their skills to investors. Further, there is some evidence to suggest consistency is a more valuable talent within some style classes (e.g., mid-cap value) than others (e.g., small-cap value). Also, although our results do not negate the possibility that managers who follow an explicit tactical style timing strategy can be successful, they do suggest that unintentional style drift can lead to inferior relative performance; indeed, the decision to remain style consistent may be more useful in helping managers avoid chronically poor performance than in creating an environment that fosters persistent superior relative returns. Lastly, given the related research in this area, it also may be true that the ability to maintain a style-consistent portfolio increases the likelihood that the manager will remain employed at the end of an evaluation period. At a minimum, it seems clear that style consistency is another element that must be factored into the on-going debate of whether mutual fund performance is predictable over time.

Appendix: Measuring Future Risk-Adjusted Returns

The primary goal of the empirical analysis in this study is to assess the extent to which current measures of a fund's past risk-adjusted performance, style consistency (and other controls) are able to explain subsequent risk-adjusted returns over a future time horizon. Of course, how these future risk-adjusted returns are measured is a critical aspect of this effort. A logical parameter to use for this future performance variable would be the intercept estimated for a return-generating model (i.e., future alpha). Unfortunately, the parameters of a model such as (4) are impossible to estimate over a future return forecast periods as short as either one or three months, meaning that a fund's risk and return components cannot be estimated contemporaneously as they were in the pre-forecast period. Further, as Cremers, Petajisto, and Zitzewitz (2008) caution, attempting to approximate "forward-looking" alphas calculated using factor estimates obtained from prior periods can create noisy measures that lead to inferior inference. Additionally, it is possible that style class-specific elements of risk change over time in ways that factor models do not capture, making it necessary to consider a given fund's performance in the context of that typical for its effective investment style category.

To address these concerns, we consider three different ways of measuring future risk-adjusted returns for a fund relative to its specific style class. In each case, the approach we adopt involves standardizing the return to a fund relative to the return to the benchmark representing its style category. The main difference in the three measures is the way the fund's risk level is proxied in the risk-adjustment process. In particular, each statistic we calculate focuses on the total volatility of the fund, rather than just its systematic exposures relative to a given factor model. Specifically, on a given month t, for each fund j in style class s we calculate the following statistics over the subsequent n month period (for n = one, three, and 12 months):

$$\frac{\left(R_{j,s,(t+1,\ldots,t+n)} - R_{b,s,(t+1,\ldots,t+n)}\right)}{\sigma_{s,(t+1,\ldots,t+n)}} \tag{A1}$$

$$\frac{\left(R_{j,s,(t+1,\ldots,t+n)} - R_{b,s,(t+1,\ldots,t+n)}\right)}{\sigma_{j,(t-35,\ldots,t)}} \tag{A2}$$

$$\frac{\left(R_{j,s,(t+1,\ldots,t+n)} - R_{b,s,(t+1,\ldots,t+n)}\right)}{\left(\sigma_{j,(t-35,\ldots,t)} \div \sigma_{s,(t-35,\ldots,t)}\right)} \tag{A3}$$

In each of these specifications, $R_{j,s,(t+1,\ldots,t+n)}$ and $R_{b,s,(t+1,\ldots,t+n)}$ represent, respectively, the return to the fund and the average return of the style group (i.e., the benchmark) over the n-month period following month t. In (A1), the risk for fund j is estimated by the cross-sectional standard deviation of the returns to each fund in style class s (including fund j) during the same n-month period during which the future returns are measured. Alternatively, risk in (A2) is measured by the historical standard deviation of fund j's returns over the 36-month period ending just before month t (i.e., the three-year interval immediately prior to the future return estimation period). Finally, the measure in (A3) adjusts the procedure in (A2) by indexing fund j's historical standard deviation to the historical standard deviation of the benchmark for style class s.

The primary advantage of the risk measure in (A1) is that it is estimated over the same interval as the returns to fund j and its benchmark. The importance of this construction is that (A1) is fully out-of-sample as a measure of future risk-adjusted performance, which minimizes the myriad interpretative problems discussed above. On the other hand, $\sigma_{s,(t+1,\ldots,t+n)}$ is an indirect measure of fund j's volatility based on the implicit assumption that $\sigma_{j,(t+1,\ldots,t+n)}$ is approximately equal to the average volatility level in the style class. By contrast, the volatility statistics used in the other two risk-adjusted return measures account for fund j's volatility more directly—(A2) on an absolute basis, (A3) on a relative basis compared to the style class benchmark—but must do so using data from a period disconnected from the return-forecast interval. Thus, both measures are subject to the criticism that they are not completely forward-looking in their construction.

Throughout the study, we have reported findings using (A1) as our measure of future risk-adjusted returns, reasoning that the benefit of having a consistent, completely out-of-sample measure outweighed the potential "cost" of possibly evaluating specific fund volatility with noise. However, to insure that our overall conclusions are not sensitive to this assumption, we have reproduced all of the relevant findings using both (A2) and (A3) as well. Table A1 summarizes a portion of this additional robustness analysis, focusing on the Fama-MacBeth cross-sectional regression tests using three-month future risk-adjusted returns as the dependent variable. Panels A, B, and C report results for measures (A1), (A2), and (A3), respectively. (Note that Panel A of Table A1 replicates Panel B of Table 6 for convenience in the juxtaposition.)

A comparison of the results across the three panels of Table A1 indicates that none of the substantive conclusions we reach in the study change in any material way when we alter the manner in which future risk-adjusted returns are estimated. Most importantly, the influence that both the past performance and past style consistency variables have on future risk-adjusted returns remain statistically significant in the predicted directions. Further, the interaction term between the past performance and consistency variables remains statistically insignificant, underscoring the separate and distinctive nature of the explanatory power provided by these two metrics. Consequently, we once again conclude that style consistency matters when judging the skill set of an investment manager.

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Table 1

Mutual Fund Style Sample By Year

This table reports the number of mutual funds included in each style objective category by year for the sample period spanning January 1983 to December 2006. The numbers listed represent those funds with at least 36 months of return history prior to the given date. The following style classifications are used: large-cap value (LV), large-cap blend (LB), large-cap growth (LG), mid-cap value (MV), mid-cap blend (MB), mid-cap growth (MG), small-cap value (SV), small-cap blend (SB), small-cap growth (SG). Averages (rounded to the nearest fund) are also listed for two non-overlapping subsets of the 24-year sample period. The compound annual growth rates for the number of funds in each style category are reported in the last row.

	Mutual Fund Style Category:									
Year	LV	LB	LG	MV	MB	MG	SV	SB	SG	Total
1983	40	45	50	15	18	20	13	14	17	232
1984	41	46	52	16	18	21	13	15	17	239
1985	45	49	56	17	20	22	14	16	19	258
1986	49	55	62	19	22	25	16	18	20	286
1987	53	59	66	21	23	26	17	19	22	306
1988	60	66	75	24	26	30	19	21	25	346
1989	68	75	84	27	29	34	22	24	28	391
1990	71	78	88	27	31	35	23	25	29	407
1991	73	81	92	29	32	36	24	26	30	423
1992	75	84	94	30	33	37	24	27	31	435
1993	75	84	94	30	33	37	24	27	31	435
1994	76	85	95	30	33	38	24	28	31	440
1995	93	102	115	36	40	46	30	33	38	533
1996	110	122	137	43	48	55	36	39	45	635
1997	121	134	151	48	53	60	39	44	50	700
1998	144	159	179	57	63	71	47	51	59	830
1999	175	193	217	69	77	86	57	63	71	1008
2000	207	228	257	82	91	102	67	75	84	1193
2001	233	256	288	92	102	114	76	84	94	1339
2002	254	279	314	100	111	124	83	91	103	1459
2003	272	300	336	107	119	133	89	98	110	1564
2004	279	306	345	110	122	137	91	100	113	1603
2005	286	315	353	113	125	140	93	103	116	1644
2006	293	322	362	116	128	144	95	105	119	1684
Averages:										
83-94	61	67	76	24	27	30	19	22	25	---
95-06	206	226	255	81	90	101	67	74	84	---
% Annual Growth:	9.00%	9.04%	8.93%	8.99%	9.30%	8.90%	8.96%	9.03%	9.16%	8.83%

Table 2

Mutual Fund Style Sample: Descriptive Statistics

This table reports descriptive statistics for the mutual fund sample, broken down by style classification and time period. Reported in Panel A for each style category are: the average fund annual total return (i.e., capital gain and income distribution), average fund return standard deviation, average total net assets (TNA) held in the fund, average fund expense ratio, and average annual fund turnover (defined as the ratio of fund sales to total fund holdings, measured in dollar volumes). Panel B provides the numerical differences in each characteristic between extreme category pairs, with p-values summarizing the statistical significance of those differences listed parenthetically.

Panel A. Characteristics of Mutual Funds by Style

Style Group	Period	Avg. Annual Fund Return (%)	Avg. Fund Std. Dev. (%)	Avg. Fund TNA ($MM)	Avg. Fund Expense Ratio (%)	Avg. Fund Turnover (%)
Large Value	1983-2006	12.56	13.34	1,416	1.16	74.59
(LV)	1983-1994	13.63	13.18	728	1.10	71.93
	1995-2006	11.49	13.50	2,103	1.22	77.25
Large Blend	1983-2006	11.42	13.53	1,292	1.10	84.15
(LB)	1983-1994	12.41	13.57	652	1.04	77.13
	1995-2006	10.42	13.50	1,932	1.16	91.17
Large Growth	1983-2006	11.43	16.21	1,185	1.19	88.90
(LG)	1983-1994	12.57	15.91	417	1.11	82.56
	1995-2006	10.29	16.51	1,954	1.27	95.23
Mid Value	1983-2006	13.22	14.96	782	1.26	81.02
(MV)	1983-1994	13.52	14.44	661	1.16	78.32
	1995-2006	12.93	15.49	903	1.35	83.73
Mid Blend	1983-2006	12.14	15.49	760	1.25	87.79
(MB)	1983-1994	11.64	15.43	407	1.19	80.75
	1995-2006	12.64	15.54	1,114	1.32	94.83
Mid Growth	1983-2006	13.44	19.24	744	1.29	103.46
(MG)	1983-1994	12.67	18.71	352	1.19	93.84
	1995-2006	14.20	19.77	1,137	1.39	113.09
Small Value	1983-2006	13.90	17.59	395	1.38	76.27
(SV)	1983-1994	14.27	16.69	290	1.33	63.64
	1995-2006	13.53	18.48	501	1.42	88.90
Small Blend	1983-2006	13.73	18.21	437	1.31	93.58
(SB)	1983-1994	12.63	17.12	289	1.22	81.56
	1995-2006	14.83	19.30	586	1.39	105.59
Small Growth	1983-2006	14.33	22.31	568	1.43	111.99
(SG)	1983-1994	12.84	21.64	291	1.38	101.85
	1995-2006	15.83	22.98	844	1.48	122.13

Table 2 (cont.)

Mutual Fund Style Sample: Descriptive Statistics

Panel B. Differences in Characteristics

Style Group Comparison	Period	Avg. Annual Fund Return (%)	Avg. Fund Std. Dev. (%)	Avg. Fund TNA ($MM)	Avg. Fund Expense Ratio (%)	Avg. Fund Turnover (%)
Ratio-Based:						
LV - LG	1983-2006	1.13 (0.61)	-2.87 (0.00)	230.11 (0.18)	-0.03 (0.11)	-14.30 (0.00)
	1983-1994	1.07 (0.64)	-2.73 (0.01)	311.16 (0.00)	-0.01 (0.71)	-10.62 (0.06)
	1995-2006	1.20 (0.77)	-3.01 (0.00)	149.06 (0.66)	-0.05 (0.00)	-17.98 (0.00)
MV - MG	1983-2006	-0.22 (0.94)	-4.28 (0.00)	37.70 (0.71)	-0.03 (0.18)	-22.44 (0.00)
	1983-1994	0.84 (0.77)	-4.27 (0.00)	308.75 (0.00)	-0.03 (0.43)	-15.52 (0.03)
	1995-2006	-1.28 (0.83)	-4.29 (0.06)	-233.35 (0.16)	-0.03 (0.26)	-29.36 (0.01)
SV - SG	1983-2006	-0.43 (0.91)	-4.72 (0.00)	-172.31 (0.03)	-0.05 (0.04)	-35.72 (0.00)
	1983-1994	1.43 (0.71)	-4.95 (0.00)	-0.95 (0.99)	-0.04 (0.21)	-38.21 (0.00)
	1995-2006	-2.29 (0.72)	-4.50 (0.08)	-343.68 (0.01)	-0.06 (0.10)	-33.23 (0.01)
Size-Based:						
LV - SV	1983-2006	-1.34 (0.56)	-4.25 (0.00)	1020.37 (0.00)	-0.22 (0.00)	-1.68 (0.75)
	1983-1994	-0.64 (0.84)	-3.51 (0.01)	438.69 (0.00)	-0.24 (0.00)	8.29 (0.21)
	1995-2006	-2.05 (0.57)	-4.99 (0.00)	1602.05 (0.00)	-0.20 (0.00)	-11.65 (0.15)
LB - SB	1983-2006	-2.31 (0.34)	-4.68 (0.00)	854.66 (0.00)	-0.21 (0.00)	-9.42 (0.18)
	1983-1994	-0.21 (0.94)	-3.56 (0.00)	363.23 (0.01)	-0.18 (0.00)	-4.43 (0.56)
	1995-2006	-4.41 (0.26)	-5.80 (0.00)	1346.09 (0.00)	-0.23 (0.00)	-14.41 (0.24)
LG - SG	1983-2006	-2.90 (0.32)	-6.10 (0.00)	617.95 (0.01)	-0.23 (0.00)	-23.09 (0.00)
	1983-1994	-0.27 (0.93)	-5.73 (0.00)	126.58 (0.02)	-0.26 (0.00)	-19.29 (0.01)
	1995-2006	-5.53 (0.28)	-6.48 (0.01)	1109.31 (0.01)	-0.20 (0.00)	-26.89 (0.05)

Table 3

Mutual Fund Style Consistency by Category

This table reports style consistency statistics for the mutual fund sample over the period January 1983 - December 2006. Funds within a style objective are grouped by two measures related to investment style consistency: (i) average style characteristic volatility of the fund's security holdings (HSC), as calculated by equation (3); and (ii) average r-squared (RSQ), measured relative to the multi-factor return-generating model in equation (4). For each measure and style group, funds are separated into "high" consistency and "low" consistency groups relative to the category-wide median values of HSC (Panel A) or RSQ (Panel B). Consistency rankings are based on holdings and fund returns for the 36-month period preceding the year for which the reported characteristics are produced. Results are shown for the following statistics: HSC, RSQ, annual tracking error (TE) relative to a style-specific benchmark portfolio, peer group ranking (i.e., the fund's relative position in the annual performance tournament, based on total return), annual total return, return standard deviation, portfolio turnover, and expense ratio. The numbers reported represent aggregated values of these statistics; the funds were sorted annually into consistency groups to produce the base levels of the various statistics and these values were then averaged to produce the display.

Panel A. Style Consistency Defined by Fund Holdings

Style Group	Style Consistency	*Median HSC*	Median RSQ	Median Tracking Error (%)	Median Peer Group Ranking	Median Annual Fund Return (%)	Median Fund Std. Dev. (%)	Median Fund Turnover (%)	Median Fund Expense Ratio
Large Value	Low	*0.91*	0.81	8.79	44.48	11.54	13.76	67.45	1.25
(LV)	High	*0.48*	0.92	5.46	51.56	12.57	12.50	46.14	0.99
Large Blend	Low	*0.76*	0.90	6.54	48.75	11.50	13.80	74.21	1.11
(LB)	High	*0.44*	0.95	4.57	51.56	11.97	13.18	46.85	0.94
Large Growth	Low	*0.90*	0.90	7.13	48.67	11.12	16.07	81.08	1.16
(LG)	High	*0.57*	0.94	5.18	50.52	11.30	14.98	57.89	1.03
Mid Value	Low	*1.05*	0.81	9.05	47.21	12.37	14.85	77.22	1.31
(MV)	High	*0.61*	0.89	6.55	51.75	12.97	13.61	46.63	1.05
Mid Blend	Low	*0.98*	0.85	8.81	48.79	12.27	15.78	88.89	1.26
(MB)	High	*0.59*	0.89	6.41	49.15	12.19	15.23	57.62	1.11
Mid Growth	Low	*1.04*	0.87	9.53	47.46	12.95	19.50	106.27	1.26
(MG)	High	*0.67*	0.90	7.87	49.77	12.56	18.19	67.40	1.11
Small Value	Low	*1.35*	0.65	16.52	50.96	13.95	20.38	68.18	1.46
(SV)	High	*0.60*	0.89	7.19	50.94	13.94	14.51	52.06	1.24
Small Blend	Low	*0.98*	0.86	9.50	46.04	12.56	18.50	97.50	1.37
(SB)	High	*0.58*	0.90	7.26	50.29	13.79	17.12	61.87	1.10
Small Growth	Low	*1.06*	0.87	10.78	46.44	12.89	22.73	102.75	1.40
(SG)	High	*0.71*	0.91	8.16	49.48	13.53	20.93	74.38	1.26

Table 3 (cont.)

Mutual Fund Style Consistency by Category

Panel B. Style Consistency Defined by Fund Returns

Style Group	Style Consistency	*Median RSQ*	Median HSC	Median Tracking Error (%)	Median Peer Group Ranking	Median Annual Fund Return (%)	Median Fund Std. Dev. (%)	Median Fund Turnover (%)	Median Fund Expense Ratio
Large Value	Low	*0.77*	0.87	9.44	44.83	11.71	13.43	60.30	1.24
(LV)	High	*0.93*	0.52	5.16	53.38	12.77	12.56	49.81	1.01
Large Blend	Low	*0.88*	0.69	6.95	44.54	10.81	13.44	62.01	1.13
(LB)	High	*0.96*	0.49	4.33	52.04	12.06	13.32	57.23	0.95
Large Growth	Low	*0.87*	0.84	8.00	47.63	10.84	15.98	76.96	1.22
(LG)	High	*0.95*	0.63	4.87	50.38	11.33	15.11	67.21	1.05
Mid Value	Low	*0.77*	0.98	9.94	46.71	12.15	14.80	60.44	1.30
(MV)	High	*0.91*	0.70	6.49	52.06	13.20	14.03	57.19	1.11
Mid Blend	Low	*0.82*	0.88	8.82	44.44	11.09	15.00	72.42	1.23
(MB)	High	*0.91*	0.67	6.63	53.02	12.89	15.59	69.45	1.16
Mid Growth	Low	*0.84*	0.92	10.08	48.75	12.90	19.03	95.88	1.27
(MG)	High	*0.92*	0.75	7.57	51.27	13.16	18.87	82.36	1.17
Small Value	Low	*0.65*	1.31	16.11	49.40	13.58	18.89	57.54	1.43
(SV)	High	*0.90*	0.68	7.25	50.25	13.64	15.01	56.27	1.26
Small Blend	Low	*0.82*	0.97	10.00	46.48	12.70	18.28	83.33	1.38
(SB)	High	*0.92*	0.65	7.39	51.71	13.73	17.81	71.83	1.17
Small Growth	Low	*0.85*	0.98	11.17	48.96	13.95	21.99	104.98	1.45
(SG)	High	*0.92*	0.76	8.31	49.29	14.34	21.30	83.42	1.30

Table 4

Style Consistency Correlation Coefficients

This table lists Pearson correlation coefficients between the two measures of investment style consistency (i.e., HSC in Panel A and RSQ in Panel B) and variables related to fund management and performance. Fund management variables include annual portfolio turnover and annual fund expense ratio. Fund performance variables include actual annual return, risk-adjusted "tournament" annual return (i.e., standardized by year within a fund's particular style classification), and the peer ranking of that tournament return. Consistency measures are based on holdings and fund returns for the 36-month period preceding the year for which the management and performance variables are produced. Separate correlation coefficients are reported for: (i) the entire 1983-2006 sample period, and (ii) each individual year in the sample period. P-values are listed parenthetically beside each correlation statistic.

Panel A. Correlation with HSC

	Variable:									
Period	Fund Turnover		Fund Expense Ratio		Actual Fund Return		Tournament Fund Return		Tournament Return Ranking	
1983-2006	0.260	(0.00)	0.257	(0.00)	-0.042	(0.00)	-0.046	(0.00)	-0.051	(0.00)
1983	0.299	(0.00)	0.327	(0.00)	-0.223	(0.01)	-0.221	(0.01)	-0.209	(0.01)
1984	0.249	(0.00)	0.293	(0.00)	-0.277	(0.00)	-0.211	(0.00)	-0.200	(0.00)
1985	0.261	(0.00)	0.343	(0.00)	-0.384	(0.00)	-0.301	(0.00)	-0.251	(0.00)
1986	0.274	(0.00)	0.391	(0.00)	-0.209	(0.00)	-0.157	(0.02)	-0.131	(0.06)
1987	0.204	(0.00)	0.343	(0.00)	0.115	(0.08)	0.002	(0.97)	0.002	(0.97)
1988	0.284	(0.00)	0.229	(0.00)	-0.283	(0.00)	-0.162	(0.01)	-0.165	(0.01)
1989	0.257	(0.00)	0.348	(0.00)	0.057	(0.35)	0.029	(0.63)	0.043	(0.48)
1990	0.247	(0.00)	0.341	(0.00)	-0.201	(0.00)	-0.067	(0.25)	-0.088	(0.13)
1991	0.286	(0.00)	0.376	(0.00)	-0.209	(0.00)	-0.334	(0.00)	-0.238	(0.00)
1992	0.223	(0.00)	0.296	(0.00)	-0.201	(0.00)	-0.213	(0.00)	-0.205	(0.00)
1993	0.260	(0.00)	0.277	(0.00)	0.465	(0.00)	0.288	(0.00)	0.145	(0.01)
1994	0.329	(0.00)	0.300	(0.00)	-0.055	(0.31)	-0.075	(0.16)	-0.065	(0.23)
1995	0.335	(0.00)	0.357	(0.00)	-0.125	(0.01)	-0.150	(0.00)	-0.080	(0.11)
1996	0.335	(0.00)	0.264	(0.00)	-0.059	(0.21)	-0.029	(0.54)	-0.021	(0.65)
1997	0.236	(0.00)	0.342	(0.00)	-0.401	(0.00)	-0.182	(0.00)	-0.139	(0.00)
1998	0.279	(0.00)	0.410	(0.00)	-0.192	(0.00)	-0.052	(0.19)	-0.049	(0.22)
1999	0.262	(0.00)	0.302	(0.00)	0.283	(0.00)	0.140	(0.00)	0.082	(0.02)
2000	0.328	(0.00)	0.268	(0.00)	-0.126	(0.00)	-0.039	(0.24)	-0.084	(0.01)
2001	0.315	(0.00)	0.279	(0.00)	-0.038	(0.24)	-0.114	(0.00)	-0.125	(0.00)
2002	0.342	(0.00)	0.280	(0.00)	-0.105	(0.00)	-0.041	(0.18)	-0.146	(0.00)
2003	0.326	(0.00)	0.243	(0.00)	0.186	(0.00)	0.197	(0.00)	0.232	(0.00)
2004	0.241	(0.00)	0.251	(0.00)	-0.088	(0.00)	-0.155	(0.00)	-0.091	(0.00)
2005	0.235	(0.00)	0.305	(0.00)	0.063	(0.03)	0.038	(0.18)	0.000	(0.99)
2006	0.144	(0.00)	0.255	(0.00)	-0.056	(0.05)	-0.031	(0.27)	-0.046	(0.10)

Table 4 (cont.)

Style Consistency Correlation Coefficients

Panel B. Correlation with RSQ

Period	Variable: Fund Turnover		Fund Expense Ratio		Actual Fund Return		Tournament Fund Return		Tournament Return Ranking	
1983-2006	-0.028	(0.00)	-0.199	(0.00)	0.034	(0.00)	0.042	(0.00)	0.056	(0.00)
1983	-0.069	(0.30)	-0.095	(0.15)	0.241	(0.00)	0.327	(0.00)	0.287	(0.00)
1984	0.051	(0.43)	-0.109	(0.10)	0.084	(0.20)	0.125	(0.05)	0.065	(0.31)
1985	0.113	(0.07)	-0.191	(0.00)	0.273	(0.00)	0.181	(0.00)	0.139	(0.03)
1986	0.056	(0.34)	-0.204	(0.00)	-0.389	(0.00)	-0.196	(0.00)	-0.153	(0.01)
1987	0.029	(0.62)	-0.174	(0.00)	-0.377	(0.00)	-0.120	(0.04)	-0.141	(0.01)
1988	-0.026	(0.65)	-0.152	(0.00)	0.405	(0.00)	0.133	(0.01)	0.116	(0.03)
1989	0.049	(0.37)	-0.166	(0.00)	0.046	(0.37)	0.031	(0.54)	0.010	(0.84)
1990	-0.103	(0.04)	-0.238	(0.00)	0.326	(0.00)	0.175	(0.00)	0.160	(0.00)
1991	-0.037	(0.45)	-0.259	(0.00)	0.494	(0.00)	0.573	(0.00)	0.450	(0.00)
1992	0.000	(1.00)	-0.307	(0.00)	0.267	(0.00)	0.267	(0.00)	0.279	(0.00)
1993	0.021	(0.67)	-0.280	(0.00)	-0.637	(0.00)	-0.477	(0.00)	-0.292	(0.00)
1994	-0.019	(0.70)	-0.259	(0.00)	0.132	(0.01)	0.114	(0.02)	0.113	(0.02)
1995	-0.070	(0.11)	-0.298	(0.00)	0.418	(0.00)	0.378	(0.00)	0.283	(0.00)
1996	-0.072	(0.08)	-0.306	(0.00)	0.167	(0.00)	0.151	(0.00)	0.145	(0.00)
1997	-0.099	(0.01)	-0.295	(0.00)	0.513	(0.00)	0.335	(0.00)	0.251	(0.00)
1998	-0.106	(0.00)	-0.261	(0.00)	0.284	(0.00)	0.124	(0.00)	0.136	(0.00)
1999	-0.086	(0.01)	-0.247	(0.00)	-0.031	(0.33)	-0.063	(0.05)	0.012	(0.71)
2000	-0.005	(0.86)	-0.218	(0.00)	-0.031	(0.29)	0.006	(0.84)	0.041	(0.17)
2001	-0.086	(0.00)	-0.195	(0.00)	-0.333	(0.00)	-0.100	(0.00)	-0.075	(0.01)
2002	0.010	(0.71)	-0.087	(0.00)	-0.401	(0.00)	-0.183	(0.00)	-0.130	(0.00)
2003	-0.082	(0.00)	-0.128	(0.00)	-0.119	(0.00)	-0.014	(0.60)	0.014	(0.59)
2004	-0.105	(0.00)	-0.195	(0.00)	-0.071	(0.01)	0.066	(0.01)	0.083	(0.00)
2005	-0.147	(0.00)	-0.285	(0.00)	-0.200	(0.00)	-0.118	(0.00)	-0.018	(0.49)
2006	-0.045	(0.08)	-0.233	(0.00)	0.073	(0.00)	0.111	(0.00)	0.123	(0.00)

Table 5

Style Consistency and Fund Performance Regression Results: Unconditional Tests

This table reports results for the 1983-2006 sample period of the regression of future fund returns on past abnormal returns (ALPHA) and past style consistency (HSC or RSQ). ALPHA and RSQ are estimated over a 36-month period by Carhart's four-factor version of equation (4); HSC is estimated over a comparable period by equation (3). Future risk-adjusted returns are measured for the n-month period following a given 36-month estimation window; Panels A, B and C report future return values for n=1, n=3, and n=12, respectively. HSC is used in Models 2-7 with RSQ used in Models 8-13. Also used as a regressor is an interaction variable formed by the product of ALPHA and the respective consistency measure (CONS). Additional control regressors include portfolio turnover (TURN), total net fund assets (TNA), and fund expense ratio (EXPR). All variables are standardized by year and fund style class. P-values are listed parenthetically beneath each coefficient.

Panel A. One-Month Future Returns as Dependent Variable

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13
Intercept	0.000	-0.002	-0.001	-0.001	-0.001	-0.001	-0.002	0.000	0.000	-0.000	-0.001	-0.001	-0.000
	(1.00)	(0.52)	(0.69)	(0.69)	(0.72)	(0.63)	(0.52)	(1.00)	(1.00)	(1.00)	(0.72)	(0.72)	(0.90)
ALPHA	0.037		0.036	0.036	0.037	0.037	0.034		0.039	0.039	0.040	0.040	0.037
	(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
HSC		-0.014	-0.014	-0.014	-0.016	-0.015	-0.011						
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)						
RSQ								0.017	0.020	0.020	0.020	0.020	0.014
								(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
[ALPHA * CONS]				0.000			0.001			-0.000			0.001
				(0.91)			(0.69)			(0.95)			(0.95)
TURN					0.008	0.009	0.012				0.004	0.005	0.007
					(0.00)	(0.00)	(0.00)				(0.05)	(0.04)	(0.00)
TNA						0.003	-0.001					0.002	-0.002
						(0.12)	(0.66)					(0.26)	(0.41)
EXPR							-0.023						-0.020
							(0.00)						(0.00)
Adj. R^2	0.001	0.001	0.000	0.001	0.001	0.001	0.002	0.000	0.002	0.002	0.002	0.002	0.002
# of Obs.	225010												

Table 5 (cont.)

Style Consistency and Fund Performance Regression Results: Unconditional Tests

Panel B. Three-Month Future Returns as Dependent Variable

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13
Intercept	-0.000	-0.002	-0.001	-0.001	-0.001	-0.001	-0.002	-0.000	-0.000	-0.000	-0.001	-0.001	-0.000
	(0.95)	(0.67)	(0.78)	(0.77)	(0.81)	(0.72)	(0.59)	(0.99)	(0.94)	(0.95)	(0.78)	(0.77)	(0.97)
ALPHA	0.053		0.052	0.051	0.053	0.052	0.048		0.056	0.057	0.057	0.057	0.056
	(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
HSC		-0.022	-0.022	-0.022	-0.023	-0.023	-0.016						
		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)						
RSQ								0.034	0.038	0.038	0.038	0.037	0.029
								(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
[ALPHA * CONS]				0.002			0.002			0.001			0.005
				(0.61)			(0.57)			(0.53)			(0.03)
TURN					0.011	0.012	0.016				0.010	0.010	0.014
					(0.02)	(0.01)	(0.00)				(0.01)	(0.27)	(0.00)
TNA						0.006	-0.001					0.004	-0.002
						(0.13)	(0.76)					(0.01)	(0.52)
EXPR							-0.036						-0.029
							(0.00)						(0.00)
Adj. R^2	0.003	0.000	0.003	0.003	0.003	0.003	0.004	0.001	0.004	0.004	0.004	0.004	0.005
# of Obs.	73862												

Panel C. 12-Month Future Returns as Dependent Variable

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13
Intercept	-0.001	-0.003	-0.003	-0.003	-0.003	-0.004	-0.005	-0.000	-0.001	0.001	-0.003	-0.003	-0.003
	(0.94)	(0.72)	(0.71)	(0.73)	(0.75)	(0.66)	(0.54)	(0.99)	(0.92)	(0.90)	(0.74)	(0.72)	(0.72)
ALPHA	0.028		0.031	0.031	0.035	0.035	0.037		0.030	0.048	0.033	0.032	0.047
	(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
HSC		-0.020	-0.021	-0.020	-0.026	-0.023	-0.013						
		(0.02)	(0.02)	(0.02)	(0.01)	(0.01)	(0.16)						
RSQ								0.023	0.025	0.025	0.025	0.024	0.009
								(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.26)
[ALPHA * CONS]				-0.012			-0.010			0.025			0.027
				(0.09)			(0.15)			(0.00)			(0.00)
TURN					0.025	0.026	0.032				0.019	0.020	0.029
					(0.xxx)	(0.12)	(0.00)				(0.02)	(0.01)	(0.00)
TNA						0.012	0.002					0.013	0.000
						(0.01)	(0.82)					(0.09)	(0.97)
EXPR							-0.054						-0.055
							(0.00)						(0.00)
Adj. R^2	0.001	0.000	0.001	0.001	0.002	0.002	0.004	0.000	0.001	0.003	0.001	0.002	0.006
# of Obs.	17588												

Table 6

Style Consistency and Fund Performance Regression Results: Fama-MacBeth Regressions

This table reports mean time-series values for a series of regression parameters estimated cross-sectionally using the three-step Fama-MacBeth procedure. In the first step, values for past fund performance (ALPHA) and investment style consistency (HSC or RSQ) are estimated for each fund on a given date, starting in 1983, using equations (3) and (4). Second, three different sets of subsequent (n=1, n=3, and n=12) risk-adjusted returns are calculated for each fund by style tournament. This cross section of future returns is regressed against the estimated values of ALPHA, either HSC or RSQ, the interaction between past performance and style consistency (ALPHA*CONS), and controls for portfolio turnover (TURN), fund size (TNA), and expense ratio (EXPR). Third, the first two steps are repeated by rolling the estimation month forward on a periodic basis through the end of 2006. P-values are listed parenthetically beneath each reported parameter estimate. Panels A, B, and C report results for one-, three-, and 12-month future returns, respectively; Models 2-7 (8-13) use HSC (RSQ) to define the style consistency variable.

Panel A. One-Month Future Returns as Dependent Variable

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13
ALPHA	0.039		0.036	0.038	0.037	0.037	0.036		0.039	0.042	0.041	0.041	0.042
	(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
HSC		-0.021	-0.018	-0.017	-0.022	-0.021	-0.016						
		(0.02)	(0.03)	(0.04)	(0.01)	(0.01)	(0.05)						
RSQ								0.029	0.030	0.028	0.031	0.031	0.026
								(0.01)	(0.01)	(0.01)	(0.00)	(0.01)	(0.02)
[ALPHA * CONS]				-0.002			-0.001			0.002			0.005
				(0.74)			(0.76)			(0.59)			(0.28)
TURN					0.015	0.015	0.017				0.012	0.012	0.015
					(0.05)	(0.05)	(0.02)				(0.09)	(0.07)	(0.02)
TNA						0.004	-0.001					0.002	-0.003
						(0.27)	(0.83)					(0.49)	(0.41)
EXPR							-0.021						-0.019
							(0.00)						(0.00)
Adj. R^2	0.020	0.019	0.036	0.043	0.047	0.048	0.056	0.032	0.049	0.059	0.060	0.062	0.073
# of Obs.	288												

Table 6 (cont.)

Style Consistency and Fund Performance Regression Results: Fama-MacBeth Regressions

Panel B. Three-Month Future Returns as Dependent Variable

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13
ALPHA	0.051 (0.00)		0.046 (0.00)	0.050 (0.00)	0.048 (0.00)	0.047 (0.00)	0.046 (0.00)		0.054 (0.00)	0.062 (0.00)	0.056 (0.00)	0.055 (0.00)	0.061 (0.00)
HSC		-0.039 (0.01)	-0.033 (0.02)	-0.031 (0.02)	-0.040 (0.01)	-0.038 (0.01)	-0.030 (0.04)						
RSQ								0.061 (0.00)	0.062 (0.00)	0.056 (0.02)	0.064 (0.00)	0.063 (0.00)	0.050 (0.01)
[ALPHA * CONS]				-0.003 (0.69)			-0.002 (0.83)			0.005 (0.48)			0.008 (0.31)
TURN					0.024 (0.06)	0.024 (0.05)	0.026 (0.03)				0.020 (0.07)	0.021 (0.06)	0.024 (0.02)
TNA						0.006 (0.27)	-0.001 (0.81)					0.004 (0.51)	-0.005 (0.43)
EXPR							-0.034 (0.00)						-0.032 (0.00)
Adj. R^2	0.023	0.020	0.036	0.043	0.046	0.047	0.057	0.035	0.053	0.064	0.064	0.065	0.077
# of Obs.	96												

Panel C. 12-Month Future Returns as Dependent Variable

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13
ALPHA	0.027 (0.45)		0.033 (0.00)	0.041 (0.19)	0.038 (0.00)	0.038 (0.00)	0.038 (0.23)		0.036 (0.29)	0.061 (0.05)	0.041 (0.23)	0.040 (0.25)	0.057 (0.06)
HSC		-0.048 (0.01)	-0.044 (0.02)	-0.040 (0.12)	-0.058 (0.00)	-0.056 (0.01)							
RSQ							-0.041 (0.13)	0.061 (0.11)	0.069 (0.07)	0.065 (0.08)	0.074 (0.05)	0.072 (0.07)	0.053 (0.16)
[ALPHA * CONS]				-0.011 (0.53)			-0.013 (0.38)			0.028 (0.05)			0.029 (0.03)
TURN					0.045 (0.06)	0.046 (0.05)	0.051 (0.05)				0.034 (0.11)	0.036 (0.10)	0.046 (0.03)
TNA						0.011 (0.27)	-0.002 (0.82)					0.013 (0.26)	-0.003 (0.76)
EXPR							-0.064 (0.01)						-0.063 (0.00)
Adj. R^2	0.026	0.020	0.036	0.044	0.046	0.047	0.058	0.034	0.057	0.066	0.065	0.066	0.078
# of Obs.	24												

Table 7

Style Consistency and Fund Performance Regression Results: Conditional Tests

This table reports results for the 1983-2006 sample period of the regression of future risk-adjusted fund returns on past abnormal returns (ALPHA) and past style consistency (HSC or RSQ), with differential parameters measured in up and down markets for the respective style-specific benchmark. The display shows the relationship when the style benchmark moved up or down during the period 12 months prior to the predicted return. ALPHA and RSQ are estimated over a 36-month period by (4), with HSC measured over a comparable period by (3). Future fund tournament returns are measured for one-, three-, and 12-month intervals following a given 36-month estimation window. Also used as a regressor is an interaction variable formed by the product of ALPHA and the respective consistency measure (CONS). Additional control variables include portfolio turnover (TURN), total net fund assets (TNA), and fund expense ratio (EXPR). All variables are standardized by year and fund style class. P-values are listed parenthetically beneath each coefficient.

Variable	One-Month Predicted Returns		Three-Month Predicted Returns		12-Month Predicted Returns	
Intercept	-0.001 (0.56)	-0.000 (0.93)	-0.002 (0.60)	-0.000 (0.98)	-0.006 (0.47)	-0.001 (0.86)
ALPHA-Up Market	0.045 (0.00)	0.048 (0.00)	0.050 (0.00)	0.058 (0.00)	-0.010 (0.38)	0.001 (0.90)
ALPHA-Down Market	0.004 (0.40)	0.010 (0.03)	0.044 (0.00)	0.052 (0.00)	0.138 (0.00)	0.138 (0.00)
HSC-Up Market	-0.008 (0.00)		-0.014 (0.01)		-0.020 (0.06)	
HSC-Down Market	-0.016 (0.00)		-0.021 (0.01)		-0.002 (0.91)	
RSQ-Up Market		0.015 (0.00)		0.019 (0. 00)		0.021 (0.03)
RSQ-Down Market		0.013 (0.00)		0.056 (0.00)		-0.013 (0.35)
[ALPHA * CONS]	0.001 (0.69)	0.002 (0.13)	0.002 (0.57)	0.006 (0.02)	-0.009 (0.19)	0.023 (0.00)
TURN	0.012 (0.00)	0.007 (0.00)	0.016 (0.00)	0.014 (0.00)	0.031 (0.00)	0.027 (0.00)
TNA	-0.001 (0.68)	-0.002 (0.41)	-0.001 (0.76)	-0.002 (0.52)	0.002 (0.82)	0.000 (0.96)
EXPR	-0.022 (0.00)	-0.019 (0.00)	-0.036 (0.00)	-0.030 (0.00)	-0.057 (0.00)	-0.057 (0.00)
Adj. R^2	0.002	0.002	0.004	0.005	0.008	0.010
# of Observations	225010		73862		17588	

Table 8

Style Consistency and Fund Performance Regression Results: Evidence From Style Tournaments

This table reports results for the 1983-2006 sample period of the regression of future risk-adjusted fund returns on past abnormal returns (ALPHA) and past style consistency (HSC or RSQ), with three other regressors included as control variables: portfolio turnover (TURN), total net fund assets (TNA), fund expense ratio (EXPR), and an interaction term between ALPHA and style consistency. Panel A lists parameters estimates for each of the nine investment style groups separately. Panel B lists parameter estimates for six aggregated style groups: three size-based (Large-, Mid-, Small-Cap) and three relative value-based (Value, Blend, Growth). ALPHA and RSQ are estimated for each fund over a rolling 36-month period by (4), with HSC estimated over the period by (3). Future returns are measured within each style group for the three-month period following a given 36-month estimation window. All variables are standardized by year. P-values are listed parenthetically beneath each reported parameter estimate. Regression intercept and control variable values are suppressed for expositional convenience.

Panel A. Individual Style Groups

	Style Group:																	
Variable:	Large Value		Large Blend		Large Growth		Mid Value		Mid Blend		Mid Growth		Small Value		Small Blend		Small Growth	
Alpha	0.037	0.029	0.032	0.045	0.035	0.042	0.045	0.052	0.024	0.059	0.075	0.065	0.057	0.064	0.060	0.082	0.129	0.131
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.02)	(0.01)	(0.17)	(0.00)	(0.00)	(0.00)	(0.01)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
HSC	-0.017		-0.021		0.015		-0.063		-0.034		-0.004		0.029		0.015		-0.073	
	(0.11)		(0.04)		(0.12)		(0.00)		(0.04)		(0.81)		(0.14)		(0.42)		(0.00)	
RSQ		0.015		0.059		0.018		0.062		0.021		-0.019		-0.009		0.041		0.053
		(0.11)		(0.00)		(0.05)		(0.00)		(0.14)		(0.17)		(0.58)		(0.01)		(0.00)
Control Variables?	Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes		Yes	
Adj. R^2	0.006	0.006	0.004	0.006	0.003	0.003	0.005	0.008	0.004	0.004	0.006	0.006	0.004	0.005	0.007	0.007	0.025	0.021
# of Obs.	14153		15884		12842		5599		6324		5059		4611		5232		4158	

Panel B. Aggregated Style Groups

	Market Capitalization:						Relative Value:					
Variable:	Large		Mid		Small		Value		Blend		Growth	
Alpha	0.035	0.038	0.047	0.061	0.084	0.094	0.041	0.043	0.035	0.056	0.065	0.067
	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
HSC	-0.005		-0.035		-0.016		-0.021		-0.019		-0.011	
	(0.36)		(0.00)		(0.13)		(0.01)		(0.01)		(0.12)	
RSQ		0.029		0.017		0.031		0.021		0.049		0.020
		(0.00)		(0.03)		(0.00)		(0.00)		(0.00)		(0.00)
Control Variables?	Yes		Yes		Yes		Yes		Yes		Yes	
Adj. R^2	0.003	0.004	0.004	0.004	0.010	0.009	0.004	0.004	0.003	0.005	0.005	0.005
# of Obs.	42879		16982		14001		22059		24363		27440	

Table 9

Style Consistency and Performance Persistence: Logit Analysis

This table reports the findings for a logit analysis over the period 1983-2006 of the relationship between a fund manager's tournament performance and several potential explanatory factors. Listed in Panel A are coefficient estimates for logit regressions involving a future performance indicator variable and various combinations of the following explanatory variables: past abnormal returns (ALPHA), past style consistency (HSC or RSQ), portfolio turnover (TURN), total net fund assets (TNA), fund expense ratio (EXPR), and an interaction term between ALPHA and style consistency. The dependent variable assumes the value of one if a manager's out-of-sample quarterly return is above the median for the relevant style group and period, 0 otherwise. Panel A lists the average probability of producing above-median future performance given the manager's cell location in a two-way classification involving past alpha and style consistency. Cell cohorts are determined by the standard deviation rankings of ALPHA and HSC or RSQ within a manager's peer group and tournament year (i.e., -2, -1, 0, +1, and +2 standard deviations from median value). The value for the other explanatory variables equal to their standardized mean values of zero (i.e., TURN = 0, TNA = 0, EXPR = 0). Panel B repeats this probability analysis assuming (TURN = 0, TNA = 0, EXPR = -2).

Panel A. Probability of Being an Above-Median Manager, by ALPHA and Style Consistency for Median-Expense Funds
(Controls: TURN = 0, TNA = 0, EXPR = 0)

Style Consistency Measure	Std. Dev. Group	ALPHA: -2 (Low)	-1	0	+1	+2 (High)	(High – Low)
HSC:	-2 (High)	0.4457	0.4786	0.5117	0.5447	0.5773	0.1316
	-1	0.4487	0.4775	0.5065	0.5354	0.5641	0.1154
	0	0.4518	0.4765	0.5013	0.5261	0.5508	0.0991
	+1	0.4548	0.4754	0.4961	0.5168	0.5375	0.0827
	+2 (Low)	0.4579	0.4744	0.4909	0.5075	0.5241	0.0662
	(High – Low)	-0.0122	0.0042	0.0207	0.0371	0.0532	
RSQ:	-2 (Low)	0.4447	0.4615	0.4783	0.4952	0.5122	0.0675
	-1	0.4464	0.4684	0.4905	0.5126	0.5347	0.0883
	0	0.4481	0.4753	0.5026	0.5299	0.5571	0.1089
	+1	0.4498	0.4822	0.5148	0.5472	0.5792	0.1294
	+2 (High)	0.4515	0.4892	0.5269	0.5643	0.6010	0.1495
	(High – Low)	0.0069	0.0277	0.0486	0.0691	0.0889	

Panel B. Probability of Being an Above-Median Manager, by ALPHA and Style Consistency for Low-Expense Funds
(Controls: TURN = 0, TNA = 0, EXPR = -2)

Style Consistency Measure	Std. Dev. Group	ALPHA: -2 (Low)	-1	0	+1	+2 (High)	(High – Low)
HSC:	-2 (High)	0.4833	0.5164	0.5494	0.5819	0.6137	0.1304
	-1	0.4864	0.5154	0.5442	0.5728	0.6009	0.1145
	0	0.4895	0.5143	0.5391	0.5637	0.5879	0.0985
	+1	0.4926	0.5133	0.5339	0.5545	0.5749	0.0823
	+2 (Low)	0.4956	0.5122	0.5288	0.5453	0.5617	0.0660
	(High – Low)	-0.0123	0.0042	0.0206	0.0366	0.0521	
RSQ:	-2 (Low)	0.4777	0.4946	0.5115	0.5284	0.5452	0.0676
	-1	0.4794	0.5015	0.5236	0.5457	0.5675	0.0881
	0	0.4811	0.5085	0.5357	0.5628	0.5895	0.1084
	+1	0.4828	0.5154	0.5478	0.5798	0.6112	0.1283
	+2 (High)	0.4846	0.5223	0.5598	0.5966	0.6324	0.1478
	(High – Low)	0.0069	0.0278	0.0483	0.0682	0.0872	

Table 10

Risk and Return Characteristics of Style Consistency-Sorted Portfolios, 1983-2006

This table reports the cumulative value of a one dollar investment in various portfolios of mutual funds established in January 1983 and then rebalanced on a quarterly basis through the end of 2006. Also listed are the average annual return, standard deviation and Sharpe ratio of those portfolios. Portfolios were formed based on fund expense ratio (EXPR), past risk-adjusted fund performance (ALPHA), and past fund style consistency. Panel A reports findings using HSC as the consistency measure while Panel B uses RSQ. Statistics are given for portfolios formed with the following characteristics: (i) Lo EXPR vs. Hi EXPR; (ii) Hi ALPHA vs, Lo ALPHA; (ii) Hi Consistency vs. Lo Consistency; (iv) [Lo EXPR, Hi Consistency] vs. [Hi EXPR, Lo Consistency]; (v) [Hi ALPHA, Hi Consistency] vs. [Lo ALPHA, Lo Consistency]; and (vi) [Lo EXPR, Hi ALPHA, Hi Consistency] vs. [Hi EXPR, Lo ALPHA, Lo Consistency]. Portfolios were formed with high and low values defined relative to the upper and lower quartiles, respectively, of each variable.

Panel A. Portfolio Formed with Holdings-Based Style Consistency Measure (HSC)

Portfolio Formation Variables:			Cumulative Value of $1 Invested	Average Annual Return (%)	Return Differential (bp)	Annual Standard Deviation (%)	Sharpe Ratio
EXPR	ALPHA	Consistency					
Lo	---	---	13.904	12.12	127	14.72	0.484
Hi	---	---	10.106	10.85		15.15	0.386
---	Hi	---	14.855	12.48	184	15.12	0.494
---	Lo	---	9.575	10.64		15.42	0.365
---	---	Hi	12.930	11.77	42	14.46	0.468
---	---	Lo	11.260	11.35		15.44	0.411
Lo	---	Hi	15.580	12.50	228	14.24	0.526
Hi	---	Lo	8.741	10.22		15.31	0.341
---	Hi	Hi	15.152	12.45	161	14.39	0.518
---	Lo	Lo	9.814	10.84		15.80	0.369
Lo	Hi	Hi	17.394	12.97	349	14.16	0.563
Hi	Lo	Lo	7.269	9.48		15.30	0.293

Panel B. Portfolio Formed with Returns-Based Style Consistency Measure (RSQ)

Portfolio Formation Variables:			Cumulative Value of $1 Invested	Average Annual Return (%)	Return Differential (bp)	Annual Standard Deviation (%)	Sharpe Ratio
EXPR	ALPHA	Consistency					
Lo	---	---	15.131	12.46	101	14.62	0.510
Hi	---	---	11.726	11.45		15.04	0.429
---	Hi	---	16.289	12.87	190	15.26	0.516
---	Lo	---	10.409	10.98		15.18	0.393
---	---	Hi	14.930	12.46	108	14.96	0.498
---	---	Lo	11.755	11.38		14.47	0.441
Lo	---	Hi	19.277	13.53	331	14.97	0.570
Hi	---	Lo	8.864	10.22		14.66	0.356
---	Hi	Hi	15.956	12.70	164	14.73	0.523
---	Lo	Lo	10.598	11.06		15.24	0.397
Lo	Hi	Hi	19.225	13.44	475	14.43	0.584
Hi	Lo	Lo	6.158	8.69		14.62	0.252

Table A1

Fama-MacBeth Regressions with Alternative Measures of Future Risk-Adjusted Returns

This table reports mean time-series values for a series of regression parameters estimated cross-sectionally using the three-step Fama-MacBeth procedure. In the first step, values for past fund performance (ALPHA) and investment style consistency (HSC or RSQ) are estimated for each fund on a given date, starting in 1983, using equations (3) and (4). Second, risk-adjusted returns over the subsequent three-month period are calculated for each fund by style tournament. This cross section of future returns is regressed against the estimated values of ALPHA, either HSC or RSQ, the interaction between past performance and style consistency (ALPHA*CONS), and controls for portfolio turnover (TURN), fund size (TNA), and expense ratio (EXPR). Third, the first two steps are repeated by rolling the estimation month forward on a periodic basis through the end of 2006. Models 2-7 (8-13) use HSC (RSQ) to define the style consistency variable; P-values are listed parenthetically beneath each reported parameter estimate. Panels A, B, and C report results using the following definitions of future risk-adjusted returns:

$$\text{(A1): } \frac{\left(R_{j,s,(t+1,...,t+n)} - R_{b,s,(t+1,...,t+n)}\right)}{\sigma_{s,(t+1,...,t+n)}}\text{; (A2): } \frac{\left(R_{j,s,(t+1,...,t+n)} - R_{b,s,(t+1,...,t+n)}\right)}{\sigma_{j,(t-35,...,t)}}\text{; and (A3): } \frac{\left(R_{j,s,(t+1,...,t+n)} - R_{b,s,(t+1,...,t+n)}\right)}{\left(\sigma_{j,(t-35,...,t)} \div \sigma_{s,(t-35,...,t)}\right)}$$

where $R_{j,s,(t+n)}$ and $R_{b,s,(t+n)}$ represent the respective returns to fund j and its benchmark for style class s over the n-month period beginning at month t (n = 3).

Panel A. Future Risk-Adjusted Returns Measured with (A1)

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13
ALPHA	0.051 (0.00)		0.046 (0.00)	0.050 (0.00)	0.048 (0.00)	0.047 (0.00)	0.046 (0.00)		0.054 (0.00)	0.062 (0.00)	0.056 (0.00)	0.055 (0.00)	0.061 (0.00)
HSC		-0.039 (0.01)	-0.033 (0.02)	-0.031 (0.02)	-0.040 (0.01)	-0.038 (0.01)	-0.030 (0.04)						
RSQ								0.061 (0.00)	0.062 (0.00)	0.056 (0.02)	0.064 (0.00)	0.063 (0.00)	0.050 (0.01)
[ALPHA * CONS]				-0.003 (0.69)			-0.002 (0.83)			0.005 (0.48)			0.008 (0.31)
TURN					0.024 (0.06)	0.024 (0.05)	0.026 (0.03)				0.020 (0.07)	0.021 (0.06)	0.024 (0.02)
TNA						0.006 (0.27)	-0.001 (0.81)					0.004 (0.51)	-0.005 (0.43)
EXPR							-0.034 (0.00)						-0.032 (0.00)
Adj. R^2	0.023	0.020	0.036	0.043	0.046	0.047	0.057	0.035	0.053	0.064	0.064	0.065	0.077
# of Obs.	96												

Table A1 (cont.)

Fama-MacBeth Regressions with Alternative Measures of Future Risk-Adjusted Returns

Panel B. Future Risk-Adjusted Returns Measured with (A2)

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13
ALPHA	0.022		0.018	0.019	0.018	0.017	0.017		0.022	0.026	0.022	0.022	0.024
	(0.01)		(0.00)	(0.02)	(0.02)	(0.02)	(0.03)		(0.00)	(0.00)	(0.00)	(0.00)	(0.00)
HSC		-0.025	-0.023	-0.022	-0.026	-0.025	-0.023						
		(0.00)	(0.02)	(0.01)	(0.01)	(0.01)	(0.02)						
RSQ								0.034	0.035	0.034	0.037	0.037	0.032
								(0.01)	(0.00)	(0.01)	(0.00)	(0.00)	(0.02)
[ALPHA * CONS]				-0.001			-0.001			0.003			0.003
				(0.84)			(0.79)			(0.50)			(0.41)
TURN					0.010	0.010	0.012				0.006	0.007	0.009
					(0.20)	(0.18)	(0.11)				(0.30)	(0.27)	(0.14)
TNA						0.001	-0.002					0.001	-0.003
						(0.72)	(0.48)					(0.78)	(0.31)
EXPR							-0.014						-0.014
							(0.00)						(0.00)
Adj. R^2	0.018	0.021	0.036	0.041	0.045	0.046	0.054	0.044	0.058	0.066	0.066	0.067	0.078
# of Obs.	96												

Panel C. Future Risk-Adjusted Returns Measured with (A3)

Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 8	Model 9	Model 10	Model 11	Model 12	Model 13
ALPHA	0.189		0.156	0.155	0.156	0.156	0.144		0.182	0.209	0.187	0.185	0.199
	(0.01)		(0.02)	(0.02)	(0.01)	(0.01)	(0.03)		(0.01)	(0.00)	(0.00)	(0.00)	(0.00)
HSC		-0.167	-0.148	-0.148	-0.175	-0.173	-0.160						
		(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.02)						
RSQ								0.221	0.228	0.218	0.241	0.240	0.211
								(0.01)	(0.01)	(0.01)	(0.01)	(0.01)	(0.03)
[ALPHA * CONS]				0.006			0.003			0.024			0.028
				(0.84)			(0.92)			(0.50)			(0.41)
TURN					0.079	0.080	0.091				0.058	0.060	0.076
					(0.17)	(0.15)	(0.10)				(0.24)	(0.22)	(0.10)
TNA						0.007	-0.012					0.007	-0.022
						(0.70)	(0.48)					(0.72)	(0.26)
EXPR							-0.094						-0.108
							(0.00)						(0.00)
Adj. R^2	0.017	0.020	0.034	0.040	0.044	0.045	0.052	0.039	0.054	0.062	0.062	0.063	0.074
# of Obs.	96												

Fund A: High Style Consistency
(HSC = 0.11, RSQ = 0.93)

Fund B: Low Style Consistency
(HSC = 0.23, RSQ = 0.73)

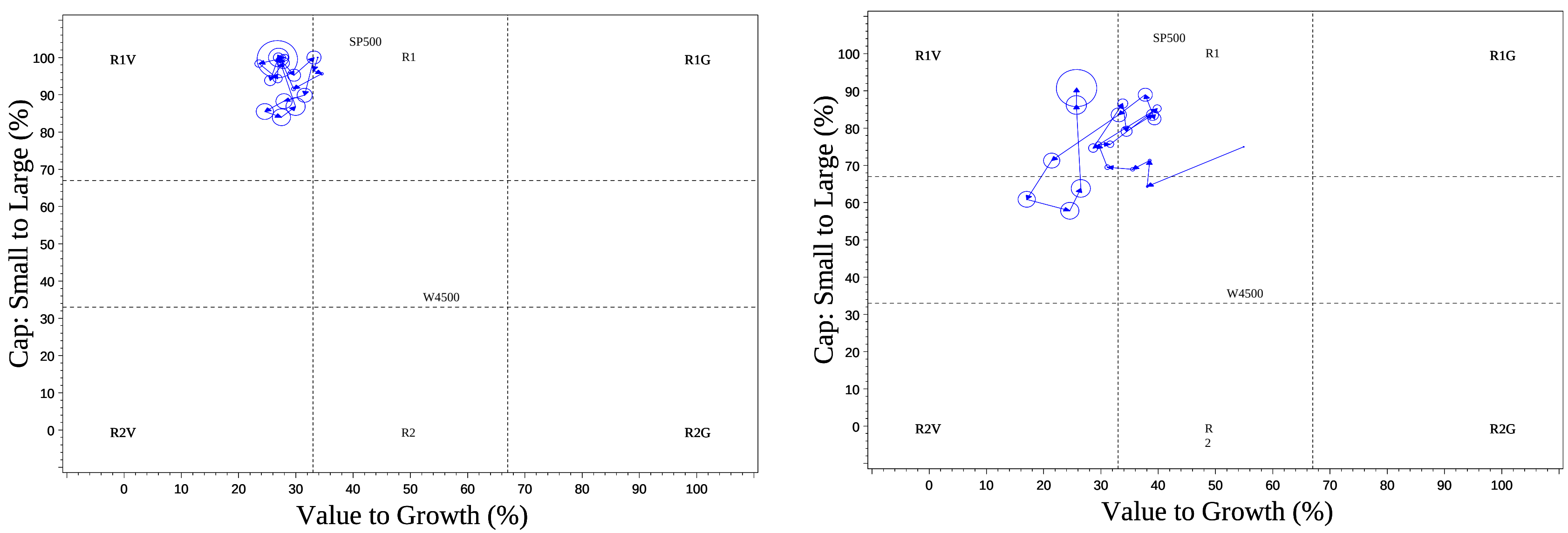

Figure 1. Style Grids, Style Consistency and Changes in Mutual Fund Style Over Time. This figure plots the relative investment style positions for two existing mutual fund portfolios and indicates how those positions have changed over time. Style positions and the returns-based style consistency measure (RSQ) were calculated relative to a variation of the multifactor style factor model in equation (4); the holdings-based consistency measure (HSC) was calculated by equation (3). Also plotted are the investment style positions of several popular style and market benchmarks: Standard & Poor's 500 (SP500), Russell 1000 (R1), Russell 2000 (R2), Russell 1000 Value and Growth (R1V and R1G), Russell 2000 Value and Growth (R2V and R2G), and Wilshire 4500 (WIL4500).