Staying the Course: Mutual Fund Investment Style Consistency and Performance Persistence

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First Draft: November 29, 2001
This Draft: April 2, 2004

* Corresponding Author. We are grateful to William Goetzmann, Russ Wermers, Sheridan Titman, Dave Chapman, Andres Almazan, Mark Carhart, Robert Litterman, Bob Jones, as well as the participants at the University of Texas Finance seminar, the Goldman Sachs Asset Management seminar, the 2001 Columbine/Instinet Investment Conference, the 2003 Barra Conference, and the 2003 IAFE Hedge Fund Conference. We also thank Xuehai En and Andras Marosi for computational assistance and research support. The opinions and analyses presented herein are those of the authors and do not necessarily represent the views of Fidelity Investments.

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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 might affect performance. Using multivariate techniques for measuring the consistency of a portfolio's investment mandate, we demonstrate that more style-consistent funds tend to produce higher total and relative returns than less consistent funds, after controlling for past performance and portfolio turnover. These findings are robust across fund investment style classifications, the return measurement period, and the model used to calculate expected returns. We document a positive relationship between measures of fund style consistency and the persistence of its future performance, net of momentum and past performance effects. We conclude that the decision to maintain a consistent investment style is an important aspect of the portfolio management process.

1. Introduction

The return performance of public investment companies has for decades been one of the most widely studied topics in all of finance. Given the tremendous volume of products and assets under management represented by the mutual fund industry, there is little wonder why this should be the case. For instance, a recent survey by the Investment Company Institute (2003), a trade association of mutual fund companies, revealed that by year-end 2002 there were more than 8,200 funds with net asset values totaling approximately $6.39 trillion held in more than 250 million shareholder accounts. Moreover, roughly $2.7 trillion of these assets were controlled by the 4,756 separate investment companies composed exclusively of equity investments. Without question, this scale and scope of activity makes fertile ground for financial economic research.

Sharpe (1966) and Jensen (1968) were among the first to examine the performance of mutual fund managers. Those studies, both of which compare individual fund performance to that of the overall stock market, reach the conclusion that the average fund manager does not possess superior skill and what positive performance that did exist does not persist. Carlson (1970), on the other hand, argues that conclusions about relative fund performance depend on which market benchmark is used in the comparison. In particular, he shows that most fund groups outperformed the Dow Jones Industrial Average, but were unable to match the returns posted by the Standard & Poor's 500 and

NYSE Composite indexes. To the extent that these various indicators of market performance represent portfolios containing securities with substantively different characteristics, Carlson's work stands as one of the first suggestions that investment style can have a significant impact on how investment performance is measured.[1]

Of course, investment style can also have a direct impact on how fund returns are produced in the first place. Since the pioneering analysis of 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 supplements the standard market risk premium with factors correlated to firm size and book-to-market ratios, has served to deepen the interest in the role that these attributes play in explaining the cross-section of equity returns.[2] In fact, the pervasiveness of these findings has been such that it is now commonplace to define investment portfolios 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.[3]

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 ultimately produces. Most notably, Morningstar, Inc., a leading provider of independent mutual fund investment information, routinely classifies funds into the cells of a 3 x 3 grid defined by firm size (small-, mid-, and large-cap) and fundamental attributes (value, blend, and growth) for the purpose of performance evaluation. Further, several recent studies have demonstrated that a portfolio's chosen investment style appears to materially affect the *ex post* wealth of the investor. For example, Capaul, Rawley, and Sharpe (1993), Lakonishok, Shleifer, and

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[1] Subsequent studies by Lehman and Modest (1987) and Brown and Brown (1987) confirm the result that different benchmarks can produce substantial differences in the conclusions about fund performance.

[2] Two recent studies have added an interesting twist to this debate. First, Loughran (1997) documents that the book-to-market factor itself exhibits strong seasonal and size-based components. Second, Daniel and Titman (1997) argue that abnormal returns produced by portfolios consisting of small capitalization and high book-to-market stocks are due to those characteristics directly rather than their loadings in a Fama-French-type factor model.

[3] For instance, the S&P/BARRA growth and value indexes are formed by sorting the S&P 500 companies by their price-book ratios while the Salomon growth and value indexes sort stocks on several additional variables including dividend yields and price-earnings ratios; see Sorenson and Lazzara (1995).

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.[4]

In this study, we consider an aspect of the mutual fund performance debate that has received little attention in the literature. Specifically, using two measures of explanatory power commonly employed in practice, we investigate the impact that the *temporal consistency* of a manager's investment style has on both absolute and relative fund performance, as well as the persistence of that performance. 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 positively related to the returns he or she produces. There are potentially three reasons for this hypothesized relationship. 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 also likely that managers with consistent styles are easier for those 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.

Using a survivorship bias-free universe of mutual funds classified by Morningstar over the period from January 1991 to December 2000, we show that those funds that are the most consistent in their investment styles over time repeatedly produce better absolute and relative performance than those funds demonstrating less style consistency. This result proves to be generally robust to the fund's investment style category, the time period over which performance is measured, and the return-generating process used to

[4] A growing body of recent research is devoted to explaining the existence of the value premium. Conrad, Cooper, and Kaul (2003) argue that as much as half 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 levels and Phalippou (2004) documents that the value premium might disappear entirely after controlling for the level of institutional ownership in a stock.

measure the fund's expected returns. Further, the evidence presented is also strongly supportive of the hypothesis that high style-consistent funds have lower portfolio turnover than low style-consistent funds and that, controlling for turnover as well as fund expenses, style consistency is still a dominant explanatory factor. Finally, we document the positive relationship that exists between the consistency of a fund's investment style and the persistence of its return performance, even after accounting for momentum and past abnormal performance effects. This finding provides an interesting counterpoint to the work of Chan, Chen, and Lakonishok (2002) who show that style drift is more likely to occur in funds with poor past performance. Taken as a whole, our results support the conclusion that the ability of a manager to maintain a consistent investment style is a skill valued in the marketplace.[5]

The remainder of the paper is organized as follows. In the next section, we present briefly summarize the academic and practitioner literature on mutual fund performance measurement as well as the role that investment style analysis has played in how funds are classified and evaluating the persistence of fund performance. Section 3 reviews the analytics for determining a mutual fund's investment style and develops hypotheses about the relationship between fund performance and style consistency. In the next two sections, we discuss the data and empirical methodology used to test these hypotheses and then present our results. Section 6 documents the potential profitability of style consistency-based trading strategies while Section 7 concludes the study.

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

2.1. Investment Style and the Classification of Mutual Funds

From the inception of the industry, mutual funds have attempted to inform potential investors about their intended investment strategy by committing to a specific objective classification. These investment objectives, which currently number 33 according to the Investment Company Institute, are listed in the fund's prospectus and include such categories as aggressive growth, growth, growth and income, balanced, global, and

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[5] One other study that also makes intra-objective class comparisons of fund performance is Bogle (1998). However, he does not consider the issue of style consistency, concentrating instead on the relationship between fund returns and expenses ratios.

income. Prior to the advances that have been made in defining investment style during the last several years, researchers and investors alike often used these objective classes as surrogates for the risk-expected return tradeoff a given fund was likely to produce. In fact, one of the earliest indications that investment style might play a significant role in portfolio performance comes from McDonald (1974), who examines the returns generated by a sample of mutual funds segmented by their stated objectives. In particular, he 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 during the sample period. More recently, Malkiel (1995) offers evidence that a fund's ability to outperform a benchmark such as the S&P 500 was also related to its objective classification.[6]

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 for this is that the selection process for these objectives can be subjective and might not always represent a fund's actual holdings very well. More typical of current fund classification methods is the effort to define a portfolio's investment style directly by a decomposition of its security characteristics. This is the approach taken in the work of Fama and French cited earlier as well as that of Roll (1995), who examines the risk premiums produced by portfolios sorted on factors such as market capitalization, price-earnings, and price-book ratios. Not surprisingly, a consequence of such efforts has been the finding that funds are often classified improperly using the traditional categories. Brown and Goetzmann (1997) develop an entirely 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 fund security holdings to conclude that 40 percent of the 748 equity funds in their sample were misclassified, a problem they attribute primarily to the ambiguity of the current objective classification system.[7]

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[6] Malkiel (1995) further indicates that the survivorship bias phenomenon introduced by Brown, Goetzmann, Ibbotson, and Ross (1992) differs across his equity fund sample by objective class, with capital appreciation and growth funds affected the most severely.

[7] diBartolomeo and Witkowski (1997) also note that competitive pressure and the nature of compensation contracting in the fund industry also lead to the potential for "gaming" the category listing. This is consistent with the tournament hypothesis of Brown, Harlow, and Starks (1996), who show that managers

2.2. Investment Style and Performance Persistence

Although analyzing overall performance has been the primary focus of the fund performance literature, a related topic that has received considerable recent attention has been the persistence of that performance—whether good or bad—over time. Against the backdrop of Jensen's (1968) original finding that managers generally are not able to sustain superior performance, much of the more current research reports data supporting persistence. Some of these studies, such as Hendricks, Patel, and Zeckhauser (1993) and Brown and Goetzmann (1995), document a short-run, positive correlation between abnormal returns in successive years. This phenomenon is attributed to managers with "hot hands", but the evidence in both studies appears to be driven by those funds sustaining poor performance (i.e., "icy hands").[8] Additionally, Grinblatt and Titman (1992) and Elton, Gruber, and Blake (1996) find that past risk-adjusted performance is predictive of future performance over periods as long as three years, although Malkiel (1995) stresses that these results are sample-period dependent. Finally, Carhart (1997) and Wermers (2001) document that the dominance of past winner funds over past losers is largely driven by 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 one point where a fund's investment style comes into play. In these studies, risk-adjusted performance is typically measured in terms of a multi-factor return generating process designed to capture the essence of the fund's style in either an implicit or explicit fashion. Some use variations of the Fama-French characteristic-based model while others, such as Grinblatt and Titman (1992), use a multiple benchmark portfolio model. While nominally a study of the performance of private asset managers rather than the public fund industry, Christopherson, Ferson, and Glassman (1998) extend this literature in two interesting ways while corroborating the

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of different funds in the same objective class have different incentives to adjust portfolio risk depending on relative performance.

[8] Brown and Goetzmann (1995) also show that those funds with persistently poor performance are the one most likely to disappear from the industry, thus linking the persistence and survivorship literatures.

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 an improper benchmark to measure that portfolio's expected return. In particular, they argue that benchmarks that do not account for the fund's investment style as well as the possibility that this style can change over time might lead to erroneous inference about performance. To eliminate these problems, they construct a dynamic set of customized benchmarks from a group of seven underlying style-defined indexes against which they measure the performance of their sample funds. Calculating these style-adjusted alphas over successive one-year holding periods, Ibbotson and Patel find that (i) funds with a positive alphas in an initial period repeat their performance about 55 percent of the time, and (ii) the degree of persistence rises dramatically with the level of the initial outperformance.

Finally, Teo and Woo (2003) also provide evidence that investment style and performance persistence may be connected. Based on their sample of style-adjusted returns (i.e., fund returns in excess of the returns of the average fund in a given style group), they demonstrate that portfolios of past winners and losers continue to mimic their previous behavior. They also note that this persistence effect declines slowly as the length of the initial period for measuring style-adjusted past returns increases. Although Teo and Woo suggest that investors might profit from attempting to "time" style movements, it remains unclear how the performance persistence phenomenon relates to the consistency with which managers execute their respective investment mandates.

3. Investment Style Analysis and Style Consistency

3.1. Measuring Investment Style: Returns- vs. Characteristic-Based Approaches

As developed by Sharpe (1992), *returns-based* style analysis is an attempt to explain the systematic exposures that the observed returns on a security portfolio have to the returns on 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 along with those to a series of indexes representing different investment styles in an effort to determine the relationship between the fund and those specific styles. Generally speaking, the more highly correlated a fund's returns are with a given style index, the greater the weighting that style is given in the statistical assessment.

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

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 that define a given fund (i.e., $\{b_{jk}\}$) are established by standard constrained least squares methods, with at least two constraints usually employed: (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^2) for (1) is defined as $R^2 = 1 - [\sigma^2(e_j)/\sigma^2(R_j)]$ and can be interpreted as the percentage of fund j's return variability due to the fund's style decision. Of course, critical to this interpretation is the proper specification of the benchmark portfolios representing the style factors, which should ideally reflect the fund's entire 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)).[9]

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 contained 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 (AS), characteristic selectivity (CS), and characteristic timing (CT). In particular, they calculate a fund's AS 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 on the basis of the market capitalization, book-to-market ratios, and prior-year return (i.e., momentum) characteristics of the stocks held in the evaluated portfolios.

There are both advantages and disadvantages associated with an attempt to measure a portfolio's investment style using either its total returns or the characteristics of its underlying holdings. As Daniel, et al (1997) note, a benefit of the holdings-based approach is that it allows for the design of a set of benchmarks that better capture the investment style of a fund. Further, the portfolio's holdings can be used to construct a hypothetical set of 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, a major drawback of this method is that it can only be calculated when fund holdings are available, which also means that it will produce "stale" style measures when these holdings are reported with a considerable lag (e.g., mutual funds are only required to report holdings on a semi-annual basis). Additionally, by observing holdings only at infrequent intervals, characteristic-based measures are subject to window dressing effects that could bias the analysis; Lakonishok, Shleifer, Thaler, and Vishny (1991) document the potential severity of this problem,

9 BARRA, Inc., which produces a popular set of style factors, uses portfolios formed around 13 different security characteristics, including variability in markets, success, size, trading activity, growth, earnings to price ratio, book to price ratio, earnings variability, financial leverage, foreign income, labor intensity, yield, and low capitalization. See Dorian and Arnott (1995) for a more complete description of these factors are defined and used to make tactical investment decisions.

particularly with regard to managers who liquidate their losing positions before a reporting date.

Conversely, while the returns-based approach can only offer a more limited 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. More importantly, though, returns can typically be measured more currently and over much shorter time periods than holdings (e.g., daily), 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 will reflect the cumulative impact of the holdings in place over the measurement period, they are not as prone to window dressing biases. Thus, since a primary goal of this study is test for a link between the stability of a portfolio's investment style and the persistence of its performance, we will adopt a returns-based approach to defining style consistency.

3.2. Defining Style Consistency

With a returns-based style definition, there are two ways that a manager's investment style consistency can be defined and measured in practice. First, from the specification of (1), it is clear that the statistic $[1–R^2]$ 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, $[1-R^2]$ 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 R^2 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 his or her portfolio, $[1-R^2]$ 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 earlier. Finally, if (1) is estimated with the additional constraint that $b_{j0} = 0$, as in Sharpe (1992) and Kahn and Rudd (1995), $[1-R^2]$ can be interpreted as a measure of the manager's security selection skill.

While each of the preceding explanations differ in its interpretation of [1-R^2], neither the first nor the third ultimately present a challenge for using R^2 as a cross-sectional 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.[10] Conversely, if the empirical form of (1) is an incomplete representation of the manager's investment style, then [1-R^2] might artificially understate his or her ability to maintain a style-consistent portfolio. With this caveat in mind, we use R^2 as our first 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.[11]

A second way in which a fund's style consistency can be measured involves the calculation of the portfolio's tracking error. Tracking error can be estimated as the volatility of the difference between the fund's returns and those to a corresponding benchmark portfolio summarizing the style universe. To define this more precisely, let:

$$\Delta_{jt} = \sum_{i=1}^{N} x_{ji} R_{jit} - R_{bt} = R_{jt} - R_{bt} \qquad (2)$$

where x_{ji} is the weight in managed fund j for security i and R_{bt} is the period t return to the style benchmark portfolio. Notice two things about the return differential defined in (2). First, given the returns to the N assets in the managed portfolio and the benchmark, Δ is a function of the investment weights that the manager selects (i.e., $\Delta = f(\{x_i\} \mid \{R_i\}, R_b)$). Second, Δ can be interpreted as the return to a hedge portfolio long in the managed fund and short in the benchmark (i.e., $x_b = -1$).[12]

From (2), periodic tracking error can be measured by the standard deviation of Δ (σ_Δ) so that annualized tracking error (TE) can be calculated:

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[10] 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.

[11] Chan, Chen, and Lakonishok (2002) present a style classification scheme that can be seen as a variation on this approach. Specifically, 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. Using this approach, they show that the correlation of a fund's past and future style averages between 70 and 80 percent, indicating a broad degree of style consistency in their sample.

[12] For more discussion of this development, see Grinold and Kahn (1995) who also refer to tracking error as the fund's *active risk* relative to the benchmark.

$$TE = \sigma_{\Delta} \sqrt{P} \quad (3)$$

where P is the number of return periods in a year. TE represents a second measure of the extent to which a manager is able to deliver an investment style consistent with that implied by a style benchmark. It differs fundamentally from the R^2 statistic generated from (1) in that it does not involve the specification of explicit functional form for the style-based return-generating model. However, (3) does require the selection of a benchmark portfolio whose returns adequately capture the relevant style characteristics of the security universe from which the manager chooses $\{x_{ji}\}$. Naturally, this selection may be fraught with the same sort of peril as the designation of the style factor structure in (1). Thus, the earlier robustness caveat regarding the use of R^2 as a cross-sectional measure of style consistency applies to TE as well.[13]

Figure 1 illustrates the way that changes in investment style over time can be measured. At any given point, any 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 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 representative 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.

[Insert Figure 1 About Here]

The fund in the left-hand panel of the display (Fund A) has an R^2 value of 0.92 while the Fund B in the right-hand panel has an R^2 value of 0.78 with respect to the same factor model.[14] Clearly, Manager A has maintained the portfolio's investment style position to a greater degree than Manager B, who exhibits substantially more style drift. Accordingly, we will define Fund A as being more style consistent than Fund B.

[13] Ammann and Zimmerman (2001) note that while (3) is used frequently in practice, tracking error can also be estimated as the standard deviation of the residuals of a linear regression between the returns to the managed and benchmark portfolios. However, as this approach essentially relies on a single-factor version of (1), it will be considered as a special case of the R^2-based style consistency measure.

[14] The model specifications and return analysis that produced these examples will be detailed in the next section.

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 purpose of the empirical work that follows.[15]

3.3. 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 superior stock selection skills or tactical style adjustments. In either case, it is quite possible that Fund B requires a higher degree of portfolio turnover (measured in a given period 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; indeed, matching the movements in oft-volatile benchmark returns in order to maintain constant style factor loadings may require frequent rebalancing. Nevertheless, these adjustments may be fewer in number than the trading required to execute a more active portfolio strategy.

Hypothesis One: Style-consistent (i.e., high R^2, low TE) funds have lower portfolio turnover than style-inconsistent (i.e., low R^2, high TE) funds.

Related to the last supposition, it is possible that more frequent trading leads in turn to inferior return performance. There are two reasons why this could be true. First, 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 portfolio turnover, 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 the case the managers of these portfolios are chronically underinvested in the "hot" sectors of the market through their more

[15] As an alternative to the methods outlined above, Wermers (2002) develops a style consistency measure based on the characteristics of a fund's individual holdings. Consistent with the earlier discussion, the advantage of this holdings-based consistency measure is that it allows for a more precise delineation of the reason for the style drift (e.g., active trading by the manager vs. passive holding in face of a changing benchmark). However, like any characteristic-based approach, it is subject to the availability of holdings information, which is often reported with a considerable lag.

frequent tactical portfolio adjustments.[16] 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), and Daniel, Grinblatt, Titman, and Wermers (1997).[17] 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.

Hypothesis Two: Style-consistent funds have higher total and relative returns than style-inconsistent funds.

The final hypothesis we test involves the relationship between style consistency and the persistence of fund performance. From the literature on performance persistence reviewed earlier, a finding that appears with some regularity is that it is usually bad performance that persists from one period to the next (e.g., Brown and Goetzmann (1995), Christopherson, Ferson, and Glassman (1998)), especially when fund returns are adjusted for a momentum effect (e.g., Carhart (1997), Wermers (2001)). In the present context, while style-consistent funds—which, by definition, produce returns that are closely correlated with a benchmark or specific style exposure—may or may not produce superior performance, it is unlikely either that they will regularly produce inferior relative returns. On the other hand, managers of portfolios that rely more on security selection or market/sector timing than style discipline to justify their active management fees will 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 responsible for the adverse performance persistence phenomenon.[18] Conversely, better managers might decide to

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[16] 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.

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

[18] 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.

maintain a more style-consistent portfolio as a means of conveying their investment prowess to the market.

Hypothesis Three: There is a positive correlation between the consistency of a fund's investment style and the persistence of its future performance.

4. Data, Methodology, and Preliminary Analysis

4.1. Sample Construction and Descriptive Statistics

The data for this study consist of monthly returns to a collection of equity mutual funds over the thirteen-year period spanning January 1988 to December 2000. The source of these returns is a Morningstar mutual fund database. Investment category classifications for each fund as well as portfolio turnover and expense ratio statistics were obtained from the Morningstar database and the Center for Research in Security Prices (CRSP) mutual fund database. Following industry conventions, Morningstar classifies funds along two dimensions: average firm size, based on median market capitalization, and "value-growth" characteristics, based on an asset-weighted composite ranking of the relative price-earnings and price-book ratios of the stocks in the portfolio. Separating each dimension into three parts places each fund in the sample universe 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).[19] This database is also constructed so as to be free of the sort of survivorship bias problems documented by Brown, et al (1992). Finally, notice that by using these style categories we create a sample that includes index funds, but excludes specialty funds such as sector, balanced, and asset allocation funds.

[19] Morningstar began using this style classification system in 1992. For the purpose of classifying the investment style of funds in the first year of our forecast period (i.e., 1991), we use Morningstar's initial assessments made in 1992. To test whether this decision, which was made to create a ten-year forecast period that could be split into two five-year subperiods, affected the analysis, we also replicated the study using data from just the 1992-2000 time frame. Additionally, we reproduced the study using alternative style classification and objective groups (e.g., Lipper Analytical). All of these modifications generated highly similar findings and are therefore not reported here.

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, as well as the average number of funds that existed in each category over two non-overlapping subperiods. The numbers reported represent those funds with at least 36 months of return history prior to a given classification year. Thus, with this inclusion criterion, the earliest style category year possible is 1991, with all funds reported for this period having returns dating to January 1988. The final column of the display documents the dramatic increase in the total number of funds eligible for style classification and hence included in the study. Starting with a collection of 698 separate portfolios in 1991, the sample grew at a year-over-year rate of more than 18 percent to its terminal level of 3,177 in 2000.

[Insert Table 1 About Here]

This display also indicates that the distribution of funds across the various style classes is not uniform, nor has the growth of each category over time been comparable. In particular, consistent throughout the entire sample period, the biggest collection of funds fall into the three large-cap categories, with the large-cap blend classification (which includes, among others, funds based on the Standard & Poor's 500 benchmark) being the most popular in every individual year. At the other extreme, small-cap funds were the least well represented for the majority of the sample period, although the gap between small- and mid-cap funds narrowed over time; in fact, the SB category surpassed the MB class in the later years of the sample. Further, the small-cap categories were the fastest growing over the classification period, followed by the large-cap and mid-cap style classes.

[Insert Table 2 About Here]

Table 2 provides several initial indications of the myriad practical differences that exist between the Morningstar style categories. Panel A lists descriptive statistics over various periods for several category-wide average characteristics, including annual total return (i.e., capital gain plus income distribution, net of expenses), standard deviation, firm size, expense ratio, and portfolio turnover (i.e., the ratio of fund sales to total fund holdings, measured in dollar volumes). Panel B then displays differences in those characteristics across "extreme" categories (e.g., [LV-LG] for the value-growth dimension, [LV-SV] for the size dimension), along with the associated p-values summarizing the statistical significance of those differences.

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 over the entire sample period, value-oriented funds produced average annual returns as much as 5.24 percent higher than those for growth-oriented portfolios. Further, the average large- and small-cap value fund standard deviation are more than seven percentage points lower than the total risk level of comparably sized growth funds. These results are consistent with the existence of a risk-adjusted value premium reported by Capual, Rawley, and Sharpe (1993) and Fama and French (1998). Alternatively, controlling for value-growth characteristics, small-cap funds outperformed large-cap funds by an average of between 6.10 and 9.98 percent, but with total risk that was commensurately higher, which is consistent with the findings of first published by Banz (1981).

This display also reveals important differences about the manner in which portfolios in different style categories are managed. Specifically, over the entire sample period, there were substantial differences between style groups in portfolio turnover and expense ratios. Generally, the data show that growth funds have higher turnover ratios than value funds (e.g., MG turnover exceeds MV turnover by 48.23 percent) and large-cap funds have lower turnover ratios than small cap funds (e.g., LG turnover is 26.96 percent lower than SG turnover). The only deviation from these conclusions is that the [LV – SV] turnover ratio is positive, although not always significantly so. Consistent with this pattern of higher trading, the results in Panel B also support the conclusion that small-cap and growth funds have higher expense ratios than large-cap and value funds, respectively. Finally, while these findings are relatively robust over time, it does appear that most all investment styles had higher turnover and higher expense ratios in the latter half of the sample period.

An important implication of the preceding results is that it may be quite difficult to directly compare 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*—rather than across—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 in comparison with their peers within a style class or a style-specific benchmark. Further, Khorana (1996) shows that managers exhibiting 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 Morningstar categories.

4.2. Style Consistency Behavior

As noted earlier, the returns-based consistency of a fund's investment style can be measured either with the coefficient of determination relative to a return-generating model or by tracking error compared to a style-specific benchmark portfolio. To calculate the former (i.e., R^2), we adopt as an empirical specification of equation (1) Carhart's (1997) extension of the Fama-French three-factor model that includes Jegadeesh and Titman's (1993) return momentum factor:

$$R_{jt} = a_j + b_{jM}R_{Mt} + b_{jSMB}R_{SMBt} + b_{jHML}R_{HMLt} + b_{jPR1YR}R_{PR1YRt} + e_{jt} \qquad (4)$$

Equation (4) employs the following factor definitions: (i) R_{Mt} is the month t excess return on the CRSP value-weighted portfolio of all NYSE, AMEX, and NASDAQ stocks; (ii) R_{SMBt} is the difference in month t returns between small cap and large cap portfolios; (iii) R_{HMLt} is the difference in month t returns between portfolios of stocks with high and low book-to-market ratios; and (v) R_{PR1YRt} is the difference in month t returns between portfolios of stocks with high and low stock return performance over the preceding year. Return data for the first three factors were obtained from Eugene Fama and Ken French while the momentum factor was constructed using Carhart's procedure with return data from constituents of the Russell 3000 index. Finally, individual fund returns and returns to the market risk factor are computed in excess of the corresponding one-month U.S.

Treasury bill yield, which allows for usual interpretation of a_j (i.e., alpha) as an abnormal performance measure for fund j.[20]

In order to estimate the consistency of a fund's investment style using the tracking error measure in (2), it is necessary to designate style category-specific indexes to represent the benchmark portfolio in each of the nine style classes. One challenge in this effort is to select a set of indexes that is uniform in its construction and meaning. For that reason, we adopted the following benchmarks for each of the cells in the 3 x 3 style grid: 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.

We calculate both R^2 and TE values on an annual basis for all nine style classes, using returns for the prior three years (e.g., consistency measures for 1999 are calculated using returns from 1996-98). Funds are then rank ordered in separate listings by both statistics and sorted into "high consistency" (i.e., high R^2 or low TE) and "low consistency" (i.e., low R^2 or high TE) subsamples according to where their consistency measure falls relative to the median for the objective class. Separate consistency subgroups are maintained for the R^2 and TE sorts and we then reclassify these fund consistency portfolios on a year-to-year basis.

Panel A of Table 3 summarizes the characteristics of the fund sample split into high and low consistency groupings by R^2, while Panel B separates the funds by the TE criterion. Each panel lists median values for the following statistics: R^2, annual TE, 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. In both panels, the numbers reported represent aggregated values of these statistics; the funds were sorted into consistency groups on an annual basis to produce the base levels of the various statistics and then these annual values were then averaged to produce the display.

[20] 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 R^2 rankings produced by these alternative specifications were quite similar and are not reproduced in full here. They are, however, available upon request.

[Insert Table 3 About Here]

Several relevant observations can be made about the results listed in Table 3. First, regardless of whether funds are sorted by R^2 or TE, it appears that large-cap funds demonstrate more investment style consistency than do small- or mid-cap funds. For instance, the median R^2 value for the high consistency portion of the three large-cap style categories is 0.93 while the median TE for this grouping is 3.70%. By contrast, the high-consistency portions of the small- and mid-cap objectives yield a median R^2 value of 0.87 and a "typical" TE of around 5%. Comparable results obtain for the low-consistency groupings: median large-cap R^2 and TE values are 0.86 and 5.27%, respectively, with the analogous values for the other two size-based categories were in the range of 0.77 and 8.30%. Although not shown, the findings from each of the five-year subperiods of the sample confirm these patterns.

Table 3 also provides indirect evidence supporting the first two hypotheses listed in the previous section. 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 Panel A and eight of the nine (MV being the exception) in Panel B. Further, it is also the case that high-consistency funds have lower average expense ratios; all of the 18 style categories across the two panels support this conjecture. As to the second hypothesis, which held that high-consistency funds should produce higher total and relative returns than low-consistency funds, the median annual fund return is larger for the former grouping in seven of nine cases using both the R^2 and TE ranking criteria (MV and MB excepted). Additionally, the managers of more style-consistent portfolios produced a higher median peer group ranking eight out of nine times in both Panels A and B, with MG being the non-conforming category in each case. Thus, while more formal tests of these propositions will be developed in the next section, this initial evidence corroborates the view that investment style consistency matters.

Given the similarity of the findings for the consistency measures just described, it is reasonable to ask whether the R^2 and TE statistics generate unique rank orderings of funds in a given style class. For instance, for every style category it is true that when consistency is defined by R^2, the median TE values for the resulting low- and high-consistency groupings are supportive (and vice versa). Nevertheless, while the rankings produced by the model-based and benchmark-based consistency measures are indeed comparable, they are not identical. The Pearson correlation coefficient between the fund-specific level of R^2 and TE is –0.582, which is significant at the 0.01% level. (Recall that high consistency is defined by high R^2 values, but low TE values; thus, a negative correlation level between these variables would be expected.) The Spearman correlation coefficient of the rankings produced by these measures is –0.629, which is also highly statistically significant. Thus, we conclude that R^2 and TE provide alternative methods for calculating the temporal consistency of a mutual fund's investment style.

5. Extended Empirical Results

5.1. Basic Correlation Tests

A more direct test of the first two consistency hypotheses is possible by considering how the pattern of correlation between the style consistency measures and certain fund management and performance variables evolved over the sample period. Specifically, the proposition that consistency and turnover are negatively related can be judged by the cross-sectional correlation between a fund's R^2 or TE measure and its portfolio turnover ratio. Similarly, the correlation between R^2 (or TE) and future fund returns provides direct evidence on the proposition that consistency and subsequent performance are positively related.

[Insert Table 4 About Here]

Table 4 reports these Pearson correlation statistics for the 1991-2000 sample period as a whole as well as for each year individually. Panel A of the display defines consistency with respect to the coefficient of determination while Panel B focuses on tracking error. In both cases, the consistency measures are correlated with the following five variables: annual portfolio turnover, annual fund expense ratio, actual annual fund return, "tournament" fund return (i.e., actual returns standardized by year within a fund's style classification), and peer ranking of the tournament return. As before, the consistency statistics are measured out-of-sample; that is, R^2 and TE are based on fund returns for the 36-month period preceding the year for which the management and performance variables are produced.

Hypothesis One is tested with the correlation between a particular consistency measure and fund turnover. By the way that consistency is defined, this correlation is predicted to be negative for R^2 (i.e., high R^2, low turnover) and positive for TE (i.e., low TE, low turnover). The results from both panels of the display unambiguously support the notion that more style consistent funds have lower portfolio turnover. In fact, there is not a single year in which either consistency measure provides contrary evidence and the sample period-wide absolute correlation value is just under 0.25. Further, although not formally part of the first hypothesis, Table 4 also indicates that funds with stricter adherence to their investment style also tend to have lower expense ratios. 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 the second hypothesis fully, it is necessary to define both absolute and relative fund returns. As noted, although investors often focus on actual returns when selecting funds (e.g., Capon, Fitzsimons, and Prince (1996)), it is also true that fund complexes and managers act as if they compete in more narrowly defined style-specific tournaments (e.g., Brown, Harlow, and Starks (1996)). Accordingly, in addition to calculating 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 Morningstar investment classification. We refer to this standardized value as the fund's "tournament" return and it is one of two relative return measures we employ, the other being peer ranking (i.e., tournament ranking) based on these standardized returns. This adjustment also allows for the aggregation of performance statistics across time and investment styles, which facilitates the analysis in the next section.

The evidence presented in Panel A of Table 4 strongly supports the proposition that more style consistent funds produce higher absolute and relative returns. Under this hypothesis, the correlation coefficient between R^2 and each of the return metrics is expected to be positive. This is indeed the case for the entire sample period as well as during eight of the ten individual sample years. Overall, the correlation between R^2 and the relative return measures is stronger—11.0% for tournament returns and 9.2% for tournament ranking—than with unadjusted total returns (i.e., 2.9%), although the latter is still statistically significant. Further, the correlations are particularly strong during the middle years of the sample (i.e., 1994-1998) for all of the return statistics.

The findings in Panel B for the TE consistency measure tell a similar, if more modest, story. The expected correlation coefficient for this statistic should be negative and, for the entire sample period, the findings support this conclusion. However, the absolute coefficient values for the relative returns—9.1% for tournament returns and 7.8% for tournament rankings—are lower than those for the R^2 consistency measure and the correlation between TE and actual returns is not statistically significant. Further, for the relative return measures, six of the ten annual tournaments produce coefficients that conform to second consistency hypothesis, with the strongest values once again being generated in the middle years of the sample. Interestingly, despite not producing a significant decade-wide relationship, the correlation coefficient between TE and actual returns is in the predicted direction in seven of the ten individual years.

In addition, to confirming the first two hypotheses concerning the value of maintaining a consistent investment style, the findings in Table 4 suggest two notable implications. First, regardless of how consistency is measured or when it is assessed, the relationship between style consistency and portfolio turnover is remarkably strong. So strong, in fact, that it may be the case that style consistency is merely a surrogate for low turnover and, hence, low transaction costs. We investigate this possibility in the following sections. Second, while suggested previously, it is now more apparent that R^2 and TE produce measurably different indications of style consistency and that the model-based metric is a more reliable indicator of subsequent return performance. One possible explanation for this is that while TE measures consistency relative to a single benchmark, depending on the model R^2 can tie the consistency measure to a more expansive definition of the investment mandate. This appears to be a useful expansion when judging performance on a total, rather than a relative, basis.

5.2. Style Consistency and Return Persistence: Initial Tests

The final hypothesis specified earlier holds that the consistency of a fund's investment style should be positively related to the manager's ability to produce consistently superior relative returns. To test this notion, we first need to define a fund-specific measure of past successful (or unsuccessful) investment performance. Given our out-of-sample methodological design, the intercept term from the excess return-generating model in (4)—i.e., alpha—serves this purpose. In fact, to facilitate comparisons, for each fund in a given year we compute an alpha statistic using two forms of (4): the conventional Fama-French three-factor model and an extension of this model that includes a return momentum factor. As we discuss below, the reason for measuring past performance with two different models lies in Carhart's (1997) finding that any performance persistence present with the three-factor model largely disappears when return momentum is added as a fourth explanatory factor.

We test for performance persistence in the following manner. Using a 36-month return window at a given point in time, we estimate (4) for each fund in the sample. This estimation yields estimates for both alpha and R^2, which becomes our main measure of style consistency.[21] We then calculate the fund's tournament (i.e., standardized) return during the t-month period immediately following the end of the model estimation window. Two values of t are employed: three (i.e., the fund's next quarter return) and 12 (i.e., the fund's next year return). Repeating this process for each fund throughout sample period by rolling the 36-month estimation window forward as necessary produces a full set of data for three-year past performance (and consistency) as well as t-month subsequent performance.

To examine the dynamics of the various relationships between future performance, past performance, and investment style consistency, we regress the three- or 12-month standardized return on the prior levels of fund alpha and R^2. In various forms of this regression, we also include the following control variables: portfolio turnover (TURN), fund expense ratio (EXPR), and fund size (TNA), as measured by the market value of its

[21] Given the analysis in Table 4, the regression results produced below will be reported for just the model-based consistency measure. We have replicated these findings using TE as well, which generates a largely comparable set of conclusions to those we offer for R^2. These supplementary results are available upon request.

assets under management at the end of the 36-month estimation period. In order to aggregate these data across different annual style tournaments into a single calculation, all of the variables just described were standardized by year and style group. This normalization process also allows for the direct comparability of the magnitude and significance of the various parameter estimates.

[Insert Table 5 About Here]

Table 5 reports the results for several different versions of the performance regression over the entire 1991-2000 sample period. The findings in Panel A use three-month future returns as a dependent variable while Panel B lists results for one-year out-of-sample returns. In each panel of the display, a duplicate set of coefficient estimates are reported for past performance (ALPHA) and style consistency (RSQ) measured by the Fama-French three-factor version of (4) (i.e., FF) and Carhart's momentum-supplemented extension (i.e., FFC). For both return-generating models, we estimated parameters for six different combinations of the independent variables, starting with simple models involving ALPHA or RSQ alone and ending with one that includes all five regressors.

The findings in Table 5 support 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 last row of each panel. Within this context, longer-term (i.e., twelve month) out-of-sample performance appears to be marginally more predictable than short-term future returns. Despite these small regression-wide statistics, however, the individual parameters on the independent variables are all 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.[22] 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

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[22] In the next section, we examine these relationships within the context of each of the nine investment style groups.

four versions of this model indicate that relative performance did indeed persist throughout the sample period. More interestingly, however, is that it is also the case that the inclusion of a momentum factor to the return-generating process (i.e., moving from FF to FFC) substantially reduces the magnitude of the relationship between ALPHA and future returns. For instance, looking at the three-month subsequent returns in Panel A, the coefficient value declines by more than two-thirds, from 0.075 to 0.021; the comparable decline for twelve-month future return sample is from 0.091 to 0.056. These reductions confirm, at least partly, the contention that persistence is actually explained by return momentum.

The remaining five models represented in Table 5 examine the role that investment style consistency plays in predicting future fund performance. In Model 2, the simplest form of the relationship between RSQ and subsequent returns is tested. All four versions produce positive coefficient values: 0.050 (FF) and 0.049 (FFC) for three-month returns versus 0.109 (FF) and 0.110 (FFC) for twelve-month returns. The direction of this relationship is in line with that implied by Hypothesis Three. Additionally, notice that unlike ALPHA, the inclusion of the momentum factor in the expectations model has no effect on the strength of the relationship between RSQ and future fund returns.

Models 3-6 explore this relationship further by controlling for other mitigating influences. Most importantly, the four forms of Model 3 show that the consistency variable is not a simple surrogate for ALPHA. In fact, the coefficient level for RSQ does not change appreciably with the addition of the past performance metric. The results for Model 4, which includes TURN in addition to ALPHA and RSQ, allows this conclusion to be extended with respect to portfolio turnover; that is, adding TURN also does nothing to diminish the magnitude of the style consistency variable.[23] Thus, it also appears that RSQ is not a proxy for TURN either. Finally, the connection between RSQ and future performance remains strong, although at a somewhat reduced level, after adding fund expense ratios and total net asset values (i.e., Models 5 and 6) as regressors. Viewed collectively, the findings in Table 5 provide strong, broad support for the proposition that

[23] 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.

the consistency of a fund's investment style and its future performance are positively related.

All of the results presented thus far have been based on our full sample of mutual funds that includes index funds. This permits the possibility that the effects we have documented are actually being driven by a large passive investment element where the "consistency" of the style is mandated rather than voluntary. One fact that makes this unlikely, however, is that indexed portfolios represent a relatively small percentage of the collection of funds included in the study; for instance, in 2000 there were only 140 index funds a total sample of 3,177 (i.e., 4.4 percent). Nevertheless, to test more formally the possibility that style consistency is driven by a passive investment mandate, we replicated the findings in Table 5 excluding index funds. Although not reproduced in full here, the estimated regression parameters are virtually identical whether or not index funds are included in the sample. Typical of this outcome are the results for FFC-Model 6 using 12-month future returns as the dependent variable. The coefficients calculated with (without) index funds are: Intercept: 0.000 (0.000); ALPHA: 0.038 (0.038); RSQ: 0.077 (0.076); TURN: 0.062 (0.062); EXPR: -0.145 (-0.141); and TNA: -0.019 (-0.018).[24] Thus, we conclude that the style consistency phenomenon is not related to active versus passive management issues.

5.3. Style Consistency and Return Persistence: Cross-Sectional Tests

As a supplement to the testing approach just presented, we also test for performance persistence and the role that style consistency plays in that process on a cross-sectional basis. Specifically, we adopt a three-step procedure, based on the methodology popularized by Fama and MacBeth (1973). First, for every fund in the sample on a given month, we estimate two forms of the return-generating model (i.e., FF and FFC) using the prior 36 months of data. These regressions, which begin in 1991, produce two sets values of past performance (ALPHA) and style consistency (RSQ) for each fund in the sample as of that data. Second, we calculate the return for each fund over the subsequent three-month period, which is once again standardized within the relevant style tournament.

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[24] The comparable set of estimated parameters for FFC-Model 6 using three-month future returns is: Intercept: 0.000 (0.000); ALPHA: 0.011 (0.012); RSQ: 0.030 (0.030); TURN: 0.033 (0.034); EXPR: -0.082 (-0.080); and TNA: -0.008 (-0.007).

This future return then becomes the dependent variable in a cross-sectional regression in which ALPHA and RSQ, along with controls for portfolio turnover, expense ratio, and fund size, are the regressors. By varying the model used to produce ALPHA and RSQ, two sets of estimated parameters are produced for the cross section corresponding to a given estimation month. Finally, repeating the first two steps for a series of different months that are rolled forward on a quarterly basis generates a time series of parameter estimates that summarize the various relationships between future returns, ALPHA, RSQ, and the control variables.

[Insert Table 6 About Here]

Table 6 lists the average of the time series of estimated coefficients produced by the preceding estimation process, along with p-values based on t-statistics computed from the means of those coefficients. Panel A reports parameter estimates based on the FF return-generating model definition of ALPHA and RSQ while Panel B lists comparable values for the FFC model. Both panels confirm the general conclusions of the earlier findings. In particular, the positive correlation between past and future fund risk-adjusted performance suggests the existence of performance persistence in the fund sample, although this persistence is mitigated somewhat by the inclusion of a momentum factor in the return-generating model. Further, there is also a strong connection between a fund's style consistency, as measured by past RSQ, and its future performance and this effect is do not dissipated by measuring consistency with a four-factor model. Finally, unlike Table 5, the control variable for portfolio turnover is insignificant in the cross-sectional regressions summarized in Table 6.[25]

5.4. Style Consistency and Return Persistence: Style Tournaments

In this section, we extend the preceding analysis by estimating the parameters of the regression of future fund returns on ALPHA, RSQ, and the various control variables within each of the nine Morningstar investment style groups. Specifically, we used the four-factor (i.e., FFC) version of (4) to generate the two main regressors and computed future returns over the 12 months following the estimation interval. After standardizing

[25] Although not shown in Table 6, Fama-MacBeth results were also produced using 12-month future returns as the dependent variable. These findings differ from those for three-month future returns in a comparable fashion to that indicated in Table 5 and support the same conclusions discussed above.

the variables by year only, we then calculated the coefficients of Model 6 for each style group over the entire 1991-2000 sample period. Model 6, which includes all five independent variables, was chosen as it represents the most severe test for the style consistency hypotheses. These findings are reported across the nine rows of Panel A in Table 7.[26] Panel B then reports regression results for funds aggregated across the three divisions of each style dimension (i.e., large-, mid-, and small-cap for the firm size dimension; value, blend, and growth for the firm characteristic dimension).

[Insert Table 7 About Here]

The first thing to notice is that, consistent with the demographic data reported in Table 1, there are far more observations for large-cap funds than for mid- or small-cap funds. In the Growth category, for instance, the numbers in the first column of the first panel in Table 7 indicate that large-, mid-, and small-cap portfolios accounted for 2003, 1,230, and 982 returns, respectively. Thus, it is reasonable to conclude that the pooled results of the last section were weighted more heavily toward large-cap funds than the other two size-based categories. This becomes an important consideration because the data in Table 7 suggest that the persistence and consistency effects described above are not completely uniform across the various style groups.

In particular, the parameter on RSQ is statistically significant at conventional levels in the direction predicted by Hypothesis Three for six of the nine style classes, with LV, MB, and MG being the exceptions. For two of these exceptions (LV and MB), the coefficient on the style consistency variable is positive. The RSQ parameter estimates for all three small-cap styles are particularly strong. By contrast, the estimated parameter values for ALPHA are statistically insignificant in five of nine cases and, in one of the four groups where the parameter is significant (i.e., SV), it has the wrong sign to support the notion that past return performance persists in subsequent periods. Additionally, of the control variables, only fund expense ratios proves to have a consistently reliable effect on the generation of future returns; in fact, the coefficient on EXPR is significantly negative in eight of the nine style group regressions.

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[26] Although not presented in the display, for every style tournament we also calculated the parameter estimates for each of other five forms of the regression equation employed earlier. These data support the conclusions discussed below and are available from the authors upon request.

The regression results for funds aggregated within style dimensions in Panel B underscore these tournament-specific findings. In particular, TURN and EXPR are statistically significant for all six broad style groups. Importantly, though, the significance of these control factors does not diminish the influence that style consistency has on future fund returns; the estimated parameter on RSQ is positive and statistically significant in five of the six cases, with the mid-cap group producing an insignificantly positive coefficient. Conversely, the relationship between ALPHA and future returns is only significant for three of the six dimension divisions.

The primary conclusion that can be drawn from the findings in Table 7 is that a manager's commitment to running a style-consistent portfolio will tend to signal his or her chances to produce superior future returns. As noted, this style consistency effect remains in place even after accounting for other mitigating influences documented elsewhere in the literature, such as past performance, portfolio turnover, and fund expenses. It is now also apparent, however, that this relationship is more likely to hold for certain investment styles than others. The connection is particularly strong for small-cap funds and far less meaningful for mid-cap funds. Further, the aggregated evidence from value, blend, and growth groups strongly supports Hypothesis Three, even though one of the three size-based cells in each of these classes is not statistically significant. Thus, while not pervasive, style consistency does appear to play a tractable role in future fund performance.

5.5. Style Consistency and Return Persistence: Logit Analysis

The results of the preceding two subsections document the effect that variables such as past performance, style consistency, portfolio turnover, and expense ratios have on the level of future fund returns. While providing a clear picture of how these factors are connected, there is some 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. We examine this issue in two ways. First, to provide a comparison with the continuous dependent variable results just presented, we re-estimate the regression equations in Table 5 using a logit model with a dependent variable that takes a value of one if a fund's annual return exceeds the median for a particular style group in a given year and zero otherwise. Second, we 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 alpha and style consistency statistics. In this way, we can attempt to quantify the economic significance of the connection between style consistency and return persistence.

[Insert Table 8 About Here]

Table 8 reports estimated coefficient values for a logit regression using the same six combinations of explanatory variables explained previously, as well as a seventh model that adds a term capturing the interaction between ALPHA and RSQ to Model 6. To document the effect that the inclusion of a momentum factor has on return persistence, we once again estimate ALPHA and RSQ with both the FF (i.e., three-factor) and FFC (i.e., four-factor) forms of the return-generating model in (4). The conclusions that can be drawn from these data are, if anything, more dramatic than those suggested by Panel B of Table 5. In particular, while the alpha persistence effect exists in isolation, its magnitude is: (i) reduced substantially when measured net of a return momentum factor, and (ii) virtually eliminated when all additional control variables are added as regressors using the FFC definitions of ALPHA and RSQ (i.e., ALPHA becomes statistically insignificant in Models 5 and 6). On the other hand, style consistency continues to have a positive impact on future performance, regardless of how RSQ was estimated or what other variables are included as explanatory variables. Further, the effect that style consistency has on a manager's ability to generate returns in the upper half of his or her peer group, while reduced somewhat, remains strong even after controlling for portfolio turnover and fund expenses. Finally, the interaction between ALPHA and RSQ is, at best, only marginally significant and appears to be highly dependent on how the two variables are measured.

[Insert Table 9 About Here]

To get a better sense of how alpha persistence and managing a style consistent portfolio can indicate an improvement in an investor's chance of delivering superior future returns, Table 9 lists the probability of beating the median peer manager when ALPHA and RSQ fall within a particular cohort cell while holding the other explanatory variables constant. Specifically, Panel A sets the levels of TURN, EXPR and TNA equal to their standardized mean values of zero while Panel B modifies these controls by setting EXPR two standard deviations below its mean (i.e., the lowest expense ratio cohort with average turnover and average assets under management). In both panels, funds within a style group and year are sorted into cohorts delineated by the number of standard deviations each variables falls from its mean (e.g., a fund in (-2, +1) cohort produced an ALPHA at least two standard deviations below the average and a RSQ at least one standard deviation above the norm). The columns of the display represent the differential effect of ALPHA for a given level of RSQ, while reading across a row shows how style consistency increases the probability of being an above-average manager given a certain level of past abnormal performance. The final row and column report the difference in proportions for the highest and lowest ALPHA and RSQ effects, controlling for the other effect, respectively. The FFC form of Model 7 was used to calculate these probabilities.

For the base case in Panel A, the first effect to notice is 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 0.5010) of finishing above the average in a subsequent annual style tournament. With that as a benchmark, notice also that funds falling in the two extreme cohorts have markedly different possibilities of future success: a 44.67 percent probability for the (-2, -2) cohort and a 60.24 percent probability for the (+2, +2). More importantly, however, it appears that remaining consistent to a particular style mandate appears to improve the chance of future outperformance more than producing superior past performance does. For instance, looking down the first column of data, for the most style-inconsistent cohort, the probability of being an above-median manager is less than 50 percent regardless of what past alpha level the manager generated. Conversely, across the lowest ALPHA cohort, the probability of producing above-average future returns increases from less than 45 percent to more than 51 percent as style consistency improves. At the other extreme, although higher alpha levels increase the chance of outperformance in the highest RSQ cohort—from 51.27 to 60.24 percent—the effect in the other direction is even larger; the difference between the least and most style-consistent funds in the highest alpha cohort is over 16 percent. Panel B of Table 9 indicates that these differential effects remain relatively stable when the base case is changed to include those managers in the lowest expense cohort, although the specific cell levels are uniformly higher (e.g., the probability in the (+2, +2) cell increases from 60.24 to 69.33 percent). Thus, these findings again support the conclusion that a fund's investment style is positively related to its future outperformance, even after accounting for past abnormal returns.

6. Style Consistency-Based Trading Strategies

The findings presented thus far mainly emphasize the strong degree of statistical significance that defines the relationship between the ability of a fund manager to maintain a consistent investment style and that fund's subsequent return performance. In this section, we extend this analysis by examining another perspective of the economic impact of style-consistent investing. Specifically, 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 portfolios sorted by various combinations of fund expense ratios (EXPR), past fund performance (ALPHA), and style consistency (RSQ). In particular, at the beginning of each quarter during the 1991-2000 period, the total sample of funds was sorted into quintile portfolios based on their EXPR levels. The following different sample universes were then defined using funds from all style groups to quantify the return impact of style consistency: (i) the whole sample divided into the "extreme" combinations of expense control quintiles: [low expense quintile (Lo EXPR); high expense quintile (Hi EXPR)], (ii) the sample divided into expense control quintiles and above or below median RSQ [high consistency and low expenses (Hi RSQ, Lo EXPR); low consistency and high expenses (Lo RSQ, Hi EXPR)], (iii) the sample divided into extreme combinations of expense-alpha control quintiles [low expense and high alpha (Lo EXPR, Hi ALPHA); high expense and low alpha (Hi EXPR, Lo ALPHA)], and (iv) the sample divided into expense-alpha control quintiles and above or below median RSQ [high consistency, low expense and high alpha (Hi RSQ, Lo EXPR, Hi ALPHA); low consistency, high expense and low alpha (Lo

RSQ, Hi EXPR, Lo ALPHA)]. With each sorting procedure, returns for every quintile portfolio were calculated for the subsequent three-month period, at which time all portfolios were rebalanced by rolling the 36-month estimation interval forward one quarter.

[Insert Figure 2 About Here]

Figure 2 illustrates the investment performance for the various portfolios just described. The data displayed indicate the cumulative impact of remaining invested (with rebalancing) in a given portfolio over the entire ten-year period. Performance is scaled relative to an initial January 1991 value of 1.00 and then continues through December 2000. Panel A compares the cumulative performance differential of investing in high and low style-consistent funds that have first been segmented into extreme control quintile cross-sections based on expenses. Panel B then illustrates this return differential using similar control quintile portfolios sorted using both expenses and alphas.

Panel A shows the cumulative performance of four separate portfolios. To set a benchmark for the value added by a style-consistent investment mandate, the first set of portfolios compare investments in a low expense portfolio (i.e., Lo EXPR) and high expense portfolio (i.e., Hi EXPR) without regard to a fund's RSQ level. The respective terminal values of a one dollar investment are $4.1024 and $3.4202, which correspond to average annual returns of 15.58 and 13.44 percent. The second set of portfolios modifies the first by adding the style consistency dimension to the mix. Specifically, the solid lines in the chart highlight the effect of isolating: (i) the high RSQ portion of the (Lo EXPR) quintile and (ii) the low RSQ portion of the (Hi EXPR) quintile. The terminal wealth levels for these two modifications are $4.1747 and $3.3203, respectively, with corresponding average annual returns of 15.79 and 13.10 percent. Notice that the 2.69 percent differential in annual returns between the latter set of portfolios—which can be interpreted as the return to a hypothetical hedge fund that is long in high style consistency and short in low consistency—is greater than the 2.14 percent difference between the two control portfolios. This 55 basis point differential can be thought of as a "consistency premium" across all individual tournaments with comparable expense ratios.[27]

[27] It is worth noting that this 55 basis point return differential very likely understates the true consistency premium. To see why, notice that the 214 basis point difference in average annual returns between the low

Panel B shows the performance of style-based strategies controlling for expenses as well as prior performance. The two control portfolios are based on low expense and high alpha quintiles (Lo EXPR, Hi ALPHA) and high expense and low alpha quintiles (Hi EXPR, Lo ALPHA). The terminal values of these portfolios are $4.1019 and $2.9262, respectively. This corresponds to average annual returns of 15.58 and 11.64 percent. The second set of portfolios includes high and low style consistency as part of the rebalancing strategy. The high consistency, low expense and high alpha portfolio (Hi RSQ, Lo EXPR, Hi ALPHA) has a terminal value of $4.2782 while the low consistency, high expense and low alpha strategy (Lo RSQ, Hi EXPR, Lo ALPHA) has a terminal value of $2.5639. The respective annual returns are 16.08 and 10.14 percent. This latter trading strategy, which controls both for expenses and past performance, produces a much higher "consistency premium" of 200 basis points (3.94 percent return differential for the control groups versus 5.94 percent for the style-based strategies). Thus, it appears that style consistency does add economic value with respect to expense and alpha-based trading strategies.[28]

7. Conclusion

One of the more interesting intellectual developments in the investment management area during the past few decades has been the evolution in the way in which a portfolio's investment style is defined and the role that this style subsequently 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

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and high expense subsamples is actually a larger effect than can be explained by expense ratio differentials alone, which according to the descriptive statistics in Table 2 only ranged on average from about 1.25 to 1.65 percent depending on the style group. As importantly, however, Table 4 reported a strong negative correlation between a fund's style consistency measures and its expense ratio. Consequently, even before the Lo EXPR and Hi EXPR subsamples are further segmented by RSQ, we would expect that part of the return differential between them owes to style consistency effects rather than fund expense differentials per se. This is in turn suggests that what we label a "consistency premium" is a downward-biased measure of the true, total impact that consistency exerts on returns.

[28] Recognize that the consistency premium just described is an average across all the individual style tournaments. Although not shown in Figure 2, we also calculated a similar methodological design within each of the nine separate style groups. This experiment produced an advantage for the Hi RSQ portfolio in eight cases. Specifically, after the controlling for expenses and past performance, the consistency premium in each of the style tournaments (i.e., average annual return for Hi RSQ partition minus average annual return for Lo RSQ partition) is as follows: LV: 3.07%, LB: 0.85%, LG: 1.89%, MV: 2.40%, MB: 0.54%, MG: 0.19%, SV: -1.80%, SB: 7.16%, and SG: 4.60%.

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 over another matters, relatively little is known about whether the manager's ability to consistently execute his or her style mandate—whatever that may be—also has a significant impact on investment performance.

Does investment style consistency matter? The results of this study strongly suggest that the answer is "yes". Using two different statistical measures of consistency linked to fund 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 relative returns it produces, and (iii) a positive relationship exists between the consistency of a portfolio's investment style and the persistence of its performance over time. Based on a survivorship bias-free sample of several thousand mutual funds drawn from nine distinct style groups over the period 1991-2000, the data provide support for all three propositions under a wide variety of different conditions and alternative possibilities.

Regardless of whether the definition of style consistency is model-based (i.e., R^2) or benchmark-based (i.e., tracking error), high-consistency funds do indeed tend to have lower portfolio turnover and expense ratios than low-consistency funds. This undoubtedly contributes to the additional result that greater style consistency is positively associated with both higher overall returns as well as higher relative returns within a given investment class. Importantly, however, style consistency is not simply a surrogate for portfolio turnover; even after controlling for the latter, the relationship between a portfolio's style consistency and its future returns remains significant. Thirdly, we also confirm the positive correlation between consistency and the persistence of fund returns and show that this connection is distinct from—and of comparable magnitude to—past performance (i.e., alpha) and fund expense ratio. The inclusion of a momentum factor in the measurement of expected returns does nothing to diminish this consistency effect, nor does the exclusion of index funds from the sample. Finally, the 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 a portfolio manager to remain consistent to his or her designated investment style is a valuable skill. It may, in fact, be the case that maintaining an observable level of consistency in their investment style is one of the ways in which superior managers attempt to signal their skills to investors. Further, there is some evidence to suggest consistency is a more valuable talent within some style classes (e.g., large- and small-cap) than others (e.g., mid-cap). On the other hand, while these results do not appear to be time dependent, our sample period (i.e., 1991-2000) contains only one year in which the equity market produced an annual loss. It is possible, therefore, that remaining consistent to an investment style is more important in rising markets than in falling ones. 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 consistently poor performance than creating an environment that fosters persistent superior relative returns. Lastly, given related research in this area, it also may be the case 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 persists over time.

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Table 1

Mutual Fund Style Sample By Year

This table reports the number of mutual funds included in each Morningstar style objective category by year for the sample period spanning January 1991 to December 2000. The numbers listed represent those funds with at least 36 months of return history prior to the given date. Morningstar uses the following objective classifications: 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 10-year sample period. The compound annual growth rate for the number of funds in each style category are reported in the last row.

	Morningstar Mutual Fund Style Category:									
Year	LV	LB	LG	MV	MB	MG	SV	SB	SG	Total
1991	135	163	118	60	47	79	25	29	42	698
1992	140	172	120	60	49	78	28	30	44	721
1993	156	184	126	65	54	78	31	30	49	773
1994	169	203	139	67	54	82	38	37	59	848
1995	215	245	178	69	62	106	47	52	78	1052
1996	273	314	233	87	71	150	62	71	113	1374
1997	350	382	297	102	99	183	79	97	152	1741
1998	410	446	355	127	104	221	97	123	206	2089
1999	504	584	425	167	125	289	121	147	262	2624
2000	564	729	549	199	138	333	162	194	309	3177
Averages:										
91-95	136	161	114	54	44	71	28	30	45	---
96-00	350	409	310	114	90	196	87	105	194	---
% Annual Growth:	17.22%	18.11%	18.63%	14.25%	12.71%	17.33%	23.08%	23.51%	24.82%	18.34%

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 (i.e., capital gain and income distribution) return, average fund return standard deviation, average market capitalization of fund holdings, 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 Firm Size ($MM)	Avg. Fund Expense Ratio (%)	Avg. Fund Turnover (%)
Large Value	1991 -2000	12.09	15.21	25,298	1.38	67.57
(LV)	1991-1995	16.90	9.37	9,909	1.19	60.28
	1996-2000	12.01	15.85	26,913	1.38	67.65
Large Blend	1991 -2000	7.76	16.47	44,611	1.22	69.14
(LB)	1991-1995	16.64	9.54	13,058	1.10	69.30
	1996-2000	7.63	17.40	46,969	1.22	68.83
Large Growth	1991 -2000	6.85	22.39	45,381	1.45	92.93
(LG)	1991-1995	15.80	11.98	10,622	1.33	83.77
	1996-2000	6.89	23.43	48,034	1.44	93.20
Mid Value	1991 -2000	18.06	16.00	5,731	1.43	84.73
(MV)	1991-1995	16.91	9.88	3,641	1.36	73.66
	1996-2000	17.93	17.07	5,887	1.42	85.45
Mid Blend	1991 -2000	11.74	17.63	6,782	1.45	79.39
(MB)	1991-1995	13.82	11.25	2,392	1.37	56.35
	1996-2000	11.97	19.13	7,044	1.45	80.23
Mid Growth	1991 -2000	14.94	31.04	4,917	1.55	132.96
(MG)	1991-1995	18.25	14.15	1,882	1.37	106.92
	1996-2000	14.69	33.36	5,109	1.55	133.79
Small Value	1991 -2000	20.60	17.64	643	1.48	61.43
(SV)	1991-1995	20.26	11.29	456	1.28	54.52
	1996-2000	19.33	18.18	657	1.47	60.80
Small Blend	1991 -2000	17.74	21.71	1,283	1.50	82.17
(SB)	1991-1995	16.86	12.09	2,644	1.55	69.43
	1996-2000	17.39	22.49	1,297	1.49	81.72
Small Growth	1991 -2000	12.95	34.69	1,057	1.64	119.89
(SG)	1991-1995	19.71	15.17	800	1.49	89.93
	1996-2000	12.33	35.80	1,069	1.64	120.54

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 Firm Size ($MM)	Avg. Fund Expense Ratio (%)	Avg. Fund Turnover (%)
Ratio-Based:						
LV - LG	1991-2000	5.24 (0.00)	-7.18 (0.00)	-20,083 (0.00)	-0.08 (0.10)	-25.36 (0.00)
	1991-1995	1.10 (0.18)	-2.60 (0.00)	-713 (0.45)	-0.14 (0.21)	-23.49 (0.00)
	1996-2000	5.13 (0.00)	-7.59 (0.00)	-21,121 (0.00)	-0.07 (0.15)	-25.55 (0.00)
MV - MG	1991 -2000	3.12 (0.19)	-15.05 (0.00)	814 (0.01)	-0.12 (0.01)	-48.23 (0.00)
	1991-1995	-1.33 (0.45)	-4.27 (0.00)	1,759 (0.00)	-0.01 (0.92)	-33.26 (0.00)
	1996-2000	3.24 (0.20)	-16.29 (0.00)	778 (0.02)	-0.13 (0.01)	-48.34 (0.00)
SV - SG	1991 -2000	7.65 (0.00)	-17.05 (0.00)	-413 (0.00)	-0.16 (0.01)	-58.46 (0.00)
	1991-1995	0.55 (0.86)	-3.88 (0.00)	-343 (0.05)	-0.21 (0.13)	-35.41 (0.00)
	1996-2000	7.00 (0.00)	-17.63 (0.00)	-412 (0.00)	-0.17 (0.01)	-59.74 (0.00)
Size-Based:						
LV - SV	1991 -2000	-8.51 (0.00)	-2.44 (0.00)	24,655 (0.00)	-0.10 (0.15)	6.14 (0.10)
	1991-1995	-3.36 (0.04)	-1.92 (0.00)	9,453 (0.00)	-0.09 (0.65)	5.76 (0.43)
	1996-2000	-7.31 (0.00)	-2.33 (0.00)	26,256 (0.00)	-0.09 (0.21)	6.85 (0.07)
LB - SB	1991 -2000	-9.98 (0.00)	-5.24 (0.00)	43,328 (0.00)	-0.28 (0.00)	-13.03 (0.01)
	1991-1995	-0.22 (0.85)	-2.55 (0.00)	10,414 (0.00)	-0.46 (0.00)	-0.14 (0.99)
	1996-2000	-9.76 (0.00)	-5.09 (0.00)	45,672 (0.00)	-0.28 (0.00)	-12.89 (0.01)
LG - SG	1991 -2000	-6.10 (0.00)	-12.31 (0.00)	44,324 (0.00)	-0.19 (0.00)	-26.96 (0.00)
	1991-1995	-3.91 (0.01)	-3.20 (0.00)	9,822 (0.00)	-0.16 (0.17)	-6.16 (0.51)
	1996-2000	-5.44 (0.01)	-12.37 (0.00)	46,966 (0.00)	-0.19 (0.00)	-27.34 (0.00)

Table 3

Mutual Fund Style Consistency by Category

This table reports style consistency statistics for the mutual fund sample over the period January 1991 - December 2000. Funds within a style objective are grouped by two measures related to investment style consistency: (i) average R^2, measured relative to the multi-factor return-generating model in equation (4); and (ii) average annual tracking error relative to the style-specific benchmark, as calculated by equation (3). For each measure and style group, funds are separated into "high" consistency and "low" consistency groups relative to the category-wide median values of R^2 (Panel A) or TE (Panel B). Consistency rankings are based on fund returns for the 36-month period preceding the year for which the reported characteristics are produced. Average values of R^2, annual TE, annual peer rankings, annual portfolio returns, return standard deviations, portfolio turnover, and expense ratios are aggregated across the ten-year sample period (1991-2000) used to rank fund consistency.

Panel A. Style Consistency Defined by R^2

Style Group	Style Consistency	Median R^2	Median Tracking Error (%)	Median Peer Group Ranking	Median Annual Fund Return (%)	Median Fund Std. Dev. (%)	Median Fund Turnover (%)	Median Fund Expense Ratio
Large Value (LV)	Low	0.86	5.23	47.10	11.10	10.40	47.50	1.22
	High	0.93	3.75	52.17	13.05	10.15	45.50	1.02
Large Blend (LB)	Low	0.88	4.93	38.01	16.69	11.57	77.00	1.25
	High	0.96	2.85	59.17	20.04	11.15	38.00	0.93
Large Growth (LG)	Low	0.83	7.44	47.79	18.55	15.00	68.00	1.36
	High	0.92	4.94	53.31	19.86	13.18	60.50	1.07
Mid Value (MV)	Low	0.77	7.46	41.41	17.30	9.90	63.00	1.40
	High	0.87	5.07	54.84	13.58	10.33	60.00	1.16
Mid Blend (MB)	Low	0.75	8.24	46.02	12.95	12.58	63.00	1.41
	High	0.87	4.89	52.84	12.86	12.05	39.59	1.23
Mid Growth (MG)	Low	0.80	8.72	54.86	13.90	17.68	115.00	1.40
	High	0.88	5.92	49.44	15.44	15.88	76.00	1.29
Small Value (SV)	Low	0.75	7.85	46.67	15.83	11.66	50.00	1.39
	High	0.87	5.02	55.26	16.65	12.43	44.82	1.15
Small Blend (SB)	Low	0.77	8.40	45.95	14.28	13.20	84.50	1.50
	High	0.89	5.85	54.23	15.62	13.93	47.00	1.12
Small Growth (SG)	Low	0.81	8.74	43.44	12.78	16.75	89.00	1.46
	High	0.90	6.60	55.94	14.21	18.66	78.00	1.33

Table 3 (cont.)

Mutual Fund Style Consistency by Category

Panel B. Style Consistency Defined by Tracking Error

Style Group	Style Consistency	Median Tracking Error (%)	Median R^2	Median Peer Group Ranking	Median Annual Fund Return (%)	Median Fund Std. Dev. (%)	Median Fund Turnover (%)	Median Fund Expense Ratio
Large Value	Low	5.27	0.86	46.69	11.86	11.07	50.00	1.19
(LV)	High	3.70	0.93	52.63	13.28	9.91	43.00	0.96
Large Blend	Low	5.06	0.88	38.42	16.93	12.12	76.00	1.24
(LB)	High	2.85	0.96	55.92	20.12	11.09	38.00	0.94
Large Growth	Low	7.52	0.85	46.36	16.85	15.57	77.00	1.29
(LG)	High	4.55	0.91	52.57	20.94	12.96	48.50	1.09
Mid Value	Low	7.63	0.77	48.68	14.65	10.45	63.00	1.33
(MV)	High	4.99	0.86	53.64	12.57	10.00	66.00	1.22
Mid Blend	Low	8.31	0.75	42.71	15.82	14.52	58.00	1.39
(MB)	High	4.89	0.87	55.11	10.74	11.35	51.00	1.20
Mid Growth	Low	9.17	0.82	53.63	11.27	19.07	118.50	1.46
(MG)	High	5.78	0.87	49.72	15.69	14.93	76.50	1.22
Small Value	Low	7.91	0.75	41.07	14.05	11.66	50.00	1.39
(SV)	High	5.02	0.87	55.36	18.05	12.03	47.00	1.14
Small Blend	Low	8.52	0.77	41.38	14.30	13.22	85.00	1.44
(SB)	High	5.58	0.89	58.62	14.66	13.89	45.00	1.19
Small Growth	Low	9.18	0.81	43.90	9.32	17.88	93.00	1.41
(SG)	High	6.51	0.89	57.32	15.78	18.50	82.00	1.38

Table 4

Style Consistency Correlation Coefficients

This table lists Pearson correlation coefficients between the two measures of investment style consistency (i.e., R^2 and TE) 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, "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 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 1991-2000 sample period, and (ii) each individual year in the sample period. P-values are listed parenthetically beside each correlation statistic.

Panel A. Correlation with R^2

	Variable:				
Period	Fund Turnover	Fund Expense Ratio	Actual Fund Return	Tournament Fund Return	Tournament Return Ranking
1991-2000	-0.216 (0.000)	-0.318 (0.000)	0.029 (0.000)	0.110 (0.000)	0.092 (0.000)
1991	-0.185 (0.000)	-0.254 (0.000)	0.034 (0.411)	0.031 (0.449)	0.057 (0.170)
1992	-0.246 (0.000)	-0.305 (0.000)	0.108 (0.006)	0.110 (0.006)	0.094 (0.018)
1993	-0.195 (0.000)	-0.330 (0.000)	-0.058 (0.128)	-0.054 (0.160)	-0.031 (0.417)
1994	-0.260 (0.000)	-0.410 (0.000)	0.159 (0.000)	0.170 (0.000)	0.077 (0.037)
1995	-0.277 (0.000)	-0.369 (0.000)	0.240 (0.000)	0.278 (0.000)	0.236 (0.000)
1996	-0.240 (0.000)	-0.394 (0.000)	0.291 (0.000)	0.301 (0.000)	0.241 (0.000)
1997	-0.180 (0.000)	-0.345 (0.000)	0.265 (0.000)	0.329 (0.000)	0.240 (0.000)
1998	-0.166 (0.000)	-0.329 (0.000)	0.089 (0.000)	0.147 (0.000)	0.141 (0.000)
1999	-0.246 (0.000)	-0.313 (0.000)	-0.088 (0.000)	-0.082 (0.000)	-0.043 (0.058)
2000	-0.233 (0.000)	-0.250 (0.000)	0.044 (0.030)	0.035 (0.083)	0.025 (0.217)

Panel B. Correlation with TE

	Variable:				
Period	Fund Turnover	Fund Expense Ratio	Actual Fund Return	Tournament Fund Return	Tournament Return Ranking
1991-2000	0.238 (0.000)	0.364 (0.000)	-0.012 (0.177)	-0.091 (0.000)	-0.078 (0.000)
1991	0.213 (0.000)	0.303 (0.000)	0.110 (0.008)	0.155 (0.000)	0.097 (0.020)
1992	0.242 (0.000)	0.328 (0.000)	-0.002 (0.960)	0.024 (0.543)	0.014 (0.731)
1993	0.197 (0.000)	0.358 (0.000)	0.184 (0.000)	0.171 (0.000)	0.120 (0.002)
1994	0.279 (0.000)	0.392 (0.000)	-0.174 (0.000)	-0.181 (0.000)	-0.120 (0.001)
1995	0.289 (0.000)	0.431 (0.000)	-0.146 (0.000)	-0.177 (0.000)	-0.125 (0.000)
1996	0.304 (0.000)	0.465 (0.000)	-0.341 (0.000)	-0.340 (0.000)	-0.273 (0.000)
1997	0.256 (0.000)	0.439 (0.000)	-0.358 (0.000)	-0.426 (0.000)	-0.341 (0.000)
1998	0.199 (0.000)	0.392 (0.000)	-0.098 (0.000)	-0.166 (0.000)	-0.148 (0.000)
1999	0.235 (0.000)	0.350 (0.000)	0.181 (0.000)	0.226 (0.000)	0.177 (0.000)
2000	0.247 (0.000)	0.280 (0.000)	-0.116 (0.000)	-0.116 (0.000)	-0.106 (0.000)

Table 5

Style Consistency and Fund Performance Regression Results

This table reports results for the 1991-2000 sample period of the regression of future fund returns on past abnormal returns (ALPHA) and past style consistency (RSQ). ALPHA and RSQ are estimated over a 36-month period by two different versions of equation (4): the Fama-French three-factor model (i.e., FF) and Carhart's extension that includes a return momentum factor (i.e., FFC). Future returns are measured for the t-month period following a given 36-month estimation window; Panels A and B report values for t=3 and t=12, respectively. Additional control regressors include portfolio turnover (TURN), fund expense ratio (EXPR), and total net fund assets (TNA). All variables are standardized by year and fund style class. P-values are listed parenthetically beneath each coefficient.

Panel A. Three-Month Future Returns as Dependent Variable

	FF Three-Factor Model:						FFC Four-Factor Model:					
Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	0.000 (1.000)	0.000 (1.000)	0.000 (1.000)	0.000 (1.000)	0.000 (1.000)	0.000 (1.000)	0.000 (1.000)	0.000 (1.000)	0.000 (1.000)	0.000 (1.000)	0.000 (1.000)	0.000 (1.000)
ALPHA	0.075 (0.000)		0.073 (0.000)	0.073 (0.000)	0.057 (0.000)	0.058 (0.000)	0.021 (0.000)		0.019 (0.000)	0.020 (0.000)	0.011 (0.012)	0.011 (0.011)
RSQ		0.050 (0.000)	0.047 (0.000)	0.053 (0.000)	0.034 (0.000)	0.034 (0.000)		0.049 (0.000)	0.048 (0.000)	0.054 (0.000)	0.030 (0.000)	0.030 (0.000)
TURN				0.026 (0.000)	0.032 (0.000)	0.032 (0.000)				0.026 (0.000)	0.034 (0.000)	0.033 (0.000)
EXPR					-0.067 (0.000)	-0.068 (0.000)					-0.081 (0.000)	-0.082 (0.000)
TNA						-0.011 (0.012)						-0.008 (0.093)
Adj. R^2	0.006	0.002	0.008	0.008	0.012	0.012	0.000	0.002	0.003	0.003	0.009	0.009
# of Obs.	50,709	50,709	50,709	50,709	50,709	50,709	50,709	50,709	50,709	50,709	50,709	50,709

Table 5 (cont.)

Style Consistency and Fund Performance Regression Results

Panel B. 12-Month Future Returns as Dependent Variable

	FF Three-Factor Model:						FFC Four-Factor Model:					
Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6
Intercept	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000	0.000
	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)	(1.000)
ALPHA	0.091		0.090	0.090	0.059	0.060	0.056		0.050	0.052	0.038	0.038
	(0.000)		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)	(0.000)
RSQ		0.109	0.108	0.119	0.080	0.081		0.110	0.108	0.119	0.076	0.077
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
TURN				0.047	0.060	0.060				0.048	0.062	0.062
				(0.000)	(0.000)	(0.000)				(0.000)	(0.000)	(0.000)
EXPR					-0.130	-0.134					-0.142	-0.145
					(0.000)	(0.000)					(0.000)	(0.000)
TNA						-0.021						-0.019
						(0.022)						(0.038)
Adj. R^2	0.008	0.012	0.020	0.022	0.036	0.036	0.003	0.012	0.015	0.017	0.034	0.034
# of Obs.	11,804	11,804	11,804	11,804	11,804	11,804	11,804	11,804	11,804	11,804	11,804	11,804

Table 6

Style Consistency and Return Persistence: 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 (1973) procedure. In the first step, values for past fund performance (ALPHA) and investment style consistency (RSQ) are estimated for each fund on a given date, starting in 1991. Separate estimates are calculated using the Fama-French (FF) three-factor return-generating model and the Fama-French-Carhart (FFC) four-factor model. Second, subsequent three-month returns are calculated for each fund and then normalized by style tournament. This cross section of future returns are regressed against the estimated values of ALPHA, RSQ, and controls for portfolio turnover (TURN), expense ratio (EXPR) and fund size (TNA). Third, the first two steps are repeated by rolling the estimation month forward on a quarterly basis through the end of 2000. P-values are listed parenthetically to the right each reported parameter estimate.

	Panel A: FF Three-Factor Model		*Panel B: FFC Four-Factor Model*	
Variable	Parameter Estimate	P-Value	Parameter Estimate	P-Value
ALPHA	0.087	0.000	0.040	0.029
RSQ	0.067	0.000	0.068	0.000
TURN	0.001	0.970	0.001	0.970
EXPR	-0.099	0.000	-0.099	0.000
TNA	0.018	0.030	0.018	0.030

Table 7

Style Consistency and Return Persistence: Evidence From Style Tournaments

This table reports results for the 1991-2000 sample period of the regression of future fund returns on past abnormal returns (ALPHA) and past style consistency (RSQ), with three other regressors included as control variables: portfolio turnover (TURN), fund expense ratio (EXPR), and total net fund assets (TNA). Panel A lists parameters estimates for each of the nine Morningstar investment style groups separately. Panel B lists parameter estimates for six aggregated style groups: three size-based (Large-, Mid-, Small-Cap) and three characteristic-based (Value, Blend, Growth). ALPHA and RSQ are estimated over a 36-month period by Carhart's extension of the Fama-French return-generating model in (4) that includes a return momentum factor. Future returns are measured within each style group for the 12 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.

Panel A. Individual Style Groups

	Independent Variable Estimated Parameter:						Coefficient of Determination
Style Group	Intercept	ALPHA	RSQ	TURN	EXPR	TNA	
Large Value (LV) n = 2353	0.000 (1.000)	0.006 (0.753)	0.026 (0.226)	0.011 (0.601)	-0.251 (0.000)	0.006 (0.763)	0.068
Large Blend (LB) n = 2616	0.000 (1.000)	0.019 (0.328)	0.143 (0.000)	0.086 (0.000)	-0.130 (0.000)	0.006 (0.759)	0.050
Large Growth (LG) n = 2003	0.000 (1.000)	0.106 (0.000)	0.043 (0.072)	0.085 (0.000)	-0.132 (0.000)	-0.041 (0.071)	0.038
Mid Value (MV) n = 798	0.000 (1.000)	0.027 (0.439)	0.076 (0.033)	0.232 (0.000)	-0.192 (0.000)	-0.050 (0.168)	0.073
Mid Blend (MB) n = 650	0.000 (1.000)	-0.001 (0.971)	0.031 (0.446)	-0.043 (0.276)	-0.144 (0.000)	-0.000 (0.999)	0.028
Mid Growth (MG) n = 1260	0.000 (1.000)	0.017 (0.551)	-0.026 (0.393)	0.022 (0.462)	-0.020 (0.484)	-0.057 (0.048)	0.005
Small Value (SV) n = 528	0.000 (1.000)	-0.119 (0.006)	0.110 (0.015)	0.061 (0.165)	-0.092 (0.043)	0.017 (0.711)	0.037
Small Blend (SB) n = 606	0.000 (1.000)	0.112 (0.007)	0.125 (0.005)	0.034 (0.400)	-0.200 (0.000)	-0.084 (0.047)	0.093
Small Growth (SG) n = 982	0.000 (1.000)	0.061 (0.057)	0.199 (0.000)	0.062 (0.053)	-0.066 (0.056)	-0.024 (0.456)	0.058

Table 7 (cont.)

Style Consistency and Return Persistence: Evidence From Style Tournaments

Panel B. Aggregated Style Groups

Style Group	Independent Variable Estimated Parameter: Intercept	ALPHA	RSQ	TURN	EXPR	TNA	Coefficient of Determination
Large-Cap n = 6974	0.000 (1.000)	0.043 (0.000)	0.070 (0.000)	0.061 (0.000)	-0.173 (0.000)	-0.008 (0.504)	0.044
Mid-Cap n = 2710	0.000 (1.000)	0.022 (0.2577)	0.026 (0.200)	0.071 (0.000)	-0.094 (0.000)	-0.038 (0.055)	0.011
Small-Cap n = 2118	0.000 (1.000)	0.031 (0.154)	0.159 (0.000)	0.049 (0.025)	-0.113 (0.000)	-0.029 (0.186)	0.047
Value n = 3681	0.000 (1.000)	0.001 (0.964)	0.057 (0.001)	0.069 (0.000)	-0.205 (0.000)	-0.004 (0.807)	0.048
Blend n = 3874	0.000 (1.000)	0.030 (0.056)	0.117 (0.000)	0.054 (0.001)	-0.145 (0.000)	-0.008 (0.613)	0.045
Growth n = 4247	0.000 (1.000)	0.073 (0.000)	0.061 (0.000)	0.066 (0.000)	-0.090 (0.000)	-0.039 (0.011)	0.021

Table 8

Style Consistency and Return Persistence: Logit Analysis

This table reports the findings for a logit analysis of the relationship between a fund manager's tournament performance and several potential explanatory factors over the period 1991-2000. Listed 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 (RSQ), portfolio turnover (TURN), fund expense ratio (EXPR), total net fund assets (TNA), and an interaction term with ALPHA and RSQ. ALPHA and RSQ are estimated over a 36-month period by two different versions of equation (4) using 12-month future returns: the Fama-French three-factor model (i.e., FF) and Carhart's extension that includes a return momentum factor (i.e., FFC). The dependent variable assumes the value of one if a manager's out-of-sample annual return is above the median for the relevant style group and period, 0 otherwise. P-values are listed parenthetically beneath each coefficient.

	FF Three-Factor Model:							FFC Four-Factor Model:						
Variable	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7	Model 1	Model 2	Model 3	Model 4	Model 5	Model 6	Model 7
Intercept	0.008	0.008	0.007	0.007	0.005	0.005	0.005	0.008	0.007	0.007	0.007	0.005	0.005	0.004
	(0.679)	(0.703)	(0.711)	(0.713)	(0.789)	(0.794)	(0.788)	(0.679)	(0.703)	(0.705)	(0.709)	(0.782)	(0.785)	(0.821)
ALPHA	0.075		0.074	0.076	0.041	0.042	0.048	0.045		0.039	0.042	0.027	0.027	0.043
	(0.000)		(0.000)	(0.000)	(0.038)	(0.033)	(0.029)	(0.014)		(0.036)	(0.023)	(0.161)	(0.154)	(0.039)
RSQ		0.147	0.147	0.164	0.115	0.116	0.115		0.147	0.145	0.163	0.112	0.112	0.115
		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)		(0.000)	(0.000)	(0.000)	(0.000)	(0.000)	(0.000)
TURN				0.073	0.092	0.092	0.093				0.074	0.094	0.094	0.096
				(0.000)	(0.000)	(0.000)	(0.000)				(0.000)	(0.000)	(0.000)	(0.000)
EXPR					-0.189	-0.193	-0.194					-0.195	-0.200	-0.200
					(0.000)	(0.000)	(0.000)					(0.000)	(0.000)	(0.000)
TNA						-0.021	-0.022						-0.019	-0.020
						(0.270)	(0.257)						(0.314)	(0.304)
ALPHA x RSQ							0.008							0.024
							(0.548)							(0.064)

Table 9

Style Consistency and Return Persistence: Logit Analysis

This table 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 RSQ within a manager's peer group and tournament year (i.e., -2, -1, 0, +1, and +2 standard deviations from median value). Panel A sets the value for the other explanatory variables equal to their standardized mean values of zero (i.e., TURN = 0, EXPR = 0, TNA = 0). Panel B changes this base case by setting the value of EXPR to be two standard deviations below its mean. ALPHA and RSQ are estimated over a 36-month period by the FFC version of equation (4) using 12-month future returns (11,804 observations).

Panel A. Probability of Being an Above-Median Manager, by ALPHA and RSQ Cohort (TURN = 0, EXPR = 0, TNA = 0)

		RSQ:					
	Std. Dev. Group	-2 (Low)	-1	0	+1	+2 (High)	(High – Low)
	-2 (Low)	0.4467	0.4631	0.4796	0.4962	0.5127	0.0660
	-1	0.4453	0.4678	0.4903	0.5129	0.5355	0.0902
ALPHA:	0	0.4440	0.4725	0.5010	0.5296	0.5580	0.1140
	+1	0.4427	0.4771	0.5118	0.5463	0.5804	0.1377
	+2 (High)	0.4414	0.4818	0.5225	0.5628	0.6024	0.1610
	(High – Low)	-0.0053	0.0187	0.0429	0.0666	0.0897	

Panel B. Probability of Being an Above-Median Manager, by ALPHA and RSQ Cohort (TURN = 0, EXPR = -2, TNA = 0)

		RSQ:					
	Std. Dev. Group	-2 (Low)	-1	0	+1	+2 (High)	(High – Low)
	-2 (Low)	0.5464	0.5628	0.5790	0.5951	0.6110	0.0646
	-1	0.5451	0.5674	0.5895	0.6111	0.6324	0.0873
ALPHA:	0	0.5438	0.5720	0.5998	0.6269	0.6533	0.1095
	+1	0.5425	0.5766	0.6100	0.6425	0.6736	0.1312
	+2 (High)	0.5412	0.5812	0.6202	0.6577	0.6933	0.1522
	(High – Low)	-0.0053	0.0184	0.0412	0.0626	0.0824	

Fund A (R^2 = 0.92): High Style Consistency *Fund B (R^2 = 0.78): Low Style Consistency*

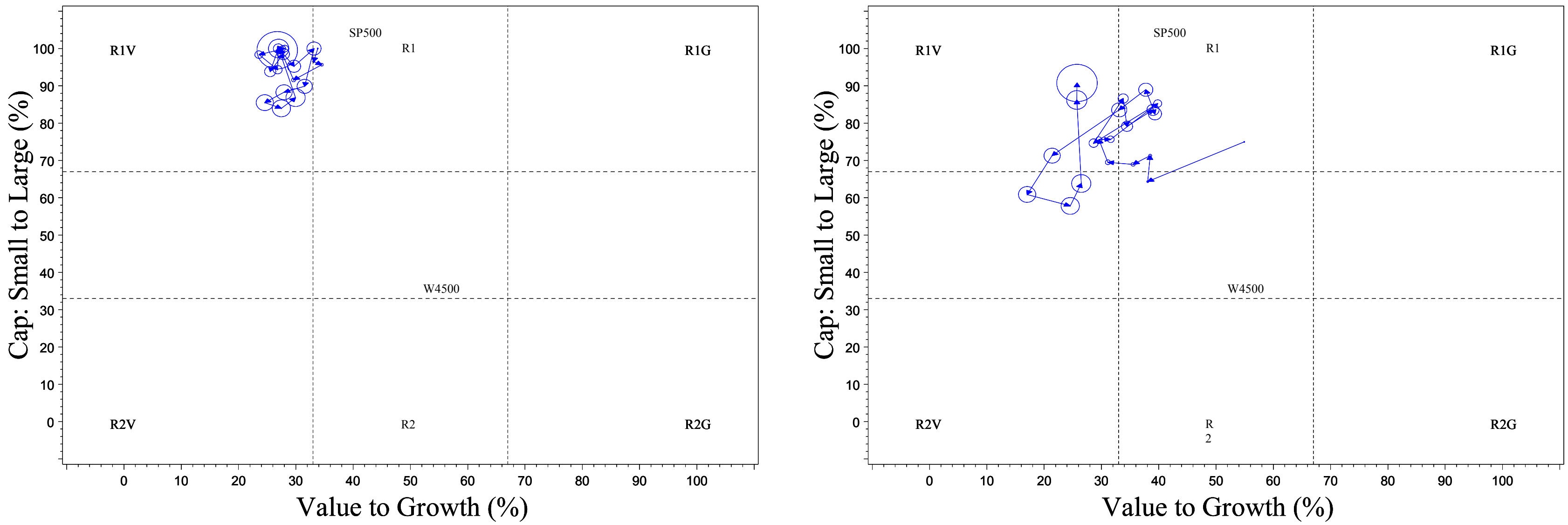
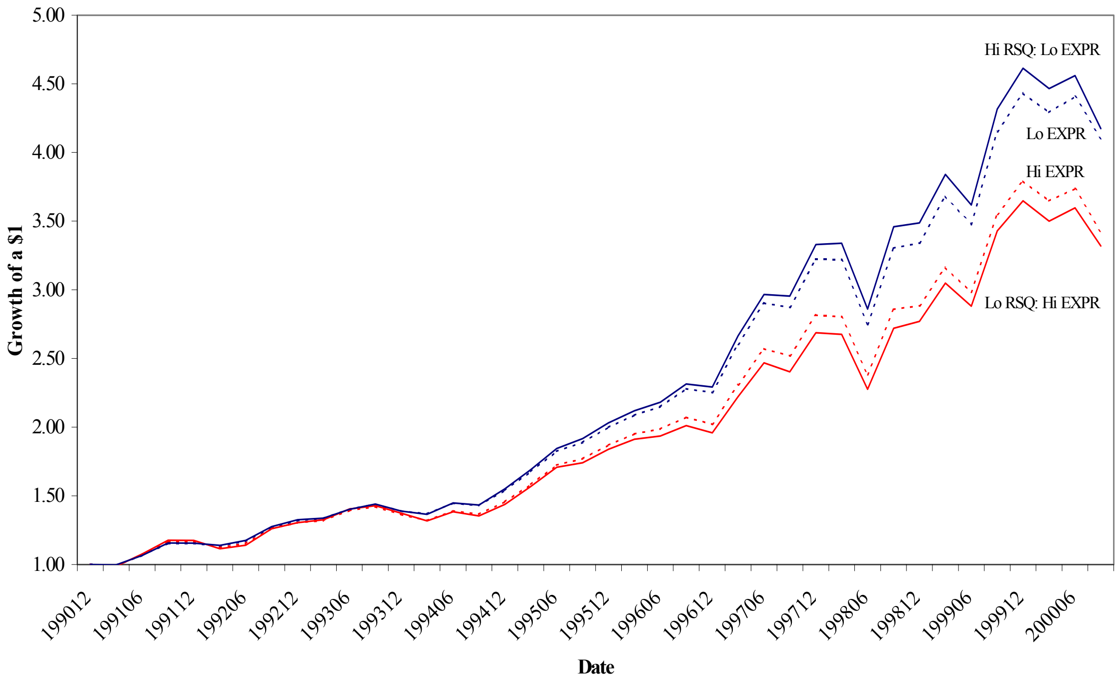


Figure 1. Style Grids, R^2, and Changes in Mutual Fund Style Over Time. This figures plots the relative investment style positions for two portfolios and indicates how those positions have changed over time. Style positions and style consistency (i.e., R^2) were calculated relative to a variation of the multifactor style factor model in equation (4). 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).

Panel A. High Consistency vs. Low Consistency with Expense Control Samples



Panel B. High Consistency vs. Low Consistency with Expense and Alpha Control Samples

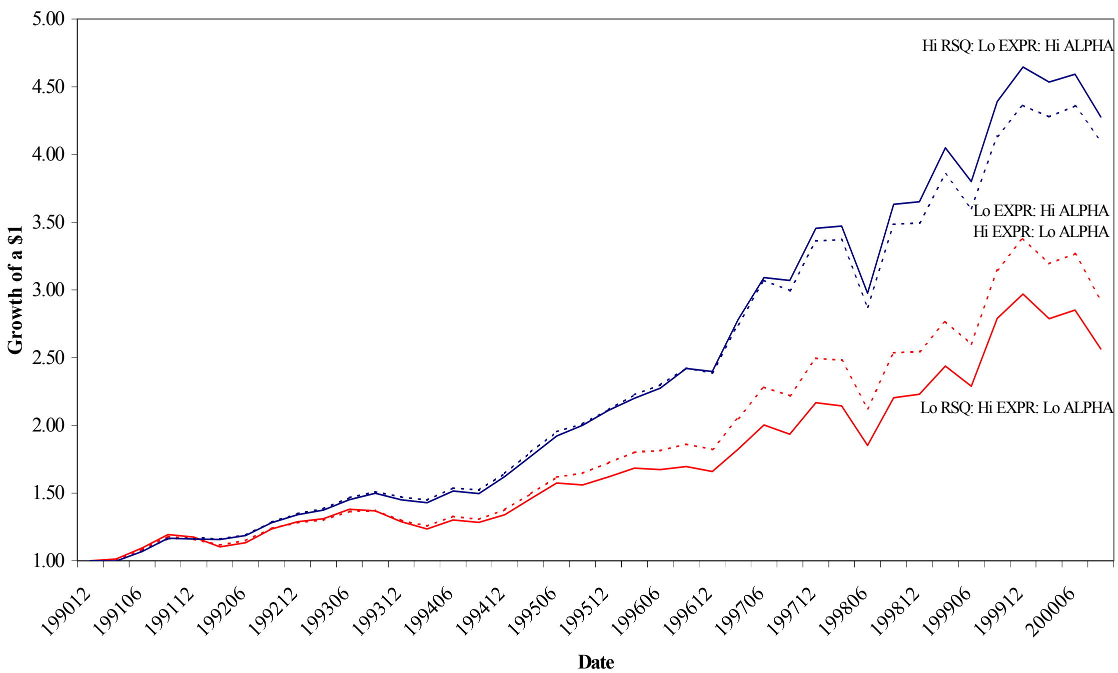


Figure 2. Cumulative Returns for Style Consistency-Sorted Portfolios, 1991-2000. This figures shows the cumulative performance of one dollar investments in portfolios formed by dividing the fund sample by three control factors: fund expense ratio (EXPR), past performance (ALPHA), and style consistency (RSQ). Panel A illustrates the performance of two control portfolios based on the lowest (Lo EXPR) and highest (Hi EXPR) expense quintiles and two portfolios additionally controlling for fund style consistency ((Hi RSQ, Lo EXPR) and (Lo RSQ, Hi EXPR)). Panel B displays the performance of two control portfolios ((Lo EXPR, Hi ALPHA) and (Hi EXPR, Lo ALPHA)) without regard to fund style consistency and two with ((Hi RSQ, Lo EXPR, Hi ALPHA) and (Lo RSQ, Hi EXPR, Lo ALPHA)).