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Time-Varying Style Rotation by Small-Cap Mutual Fund Managers: Incentives and Implications

Peter McGaffigan

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The author of this dissertation is:

Peter McGaffigan
J. Mack Robinson College of Business
Georgia State University
Atlanta, GA 30302-4015

The director of this dissertation is:

Vikas Agarwal
J. Mack Robinson College of Business
Georgia State University
Atlanta, GA 30302-4015

Time-Varying Style Rotation by Small-Cap Mutual Fund Managers: Incentives and Implications

by

Peter McGaffigan

A Dissertation Submitted in Partial Fulfillment of the Requirements for the Degree

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ACCEPTANCE

This dissertation was prepared under the direction of the *PETER MCGAFFIGAN* Dissertation Committee. It has been approved and accepted by all members of that committee, and it has been accepted in partial fulfillment of the requirements for the degree of Doctor of Philosophy in Business Administration in the J. Mack Robinson College of Business of Georgia State University.

Richard Phillips, Dean

DISSERTATION COMMITTEE

Dr. Vikas Agarwal (Chair)

Dr. Zhen Shi

Dr. Jeffrey Busse

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TABLE OF CONTENTS

ABSTRACT

Time-Varying Style Rotation by Small-Cap Mutual Fund Managers: Incentives and Implications

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Peter McGaffigan

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Chair: Vikas Agarwal

Major Academic Unit: Finance

This study examines the behavior of small-cap equity mutual fund managers during certain turning points in the economic cycle. Although each recession is unique, there is evidence supporting time variation in equity style performance in and around recession periods. In general, large-cap firms have greater access to capital thereby reducing financial stress during recessions compared to small-cap firms. As a result, some managers may use style rotation as a tool to improve their performance or reduce risk during these turning points in the economic cycle. I show that during the last two NBER cycle recessions, small-cap managers significantly increase holdings in large-cap stocks following the peak in economic activity. I find some evidence of a positive relation between skill and large-cap holdings: skilled small-cap managers are more likely to increase holdings in large-cap stocks in recession periods than unskilled ones. Finally, the evidence that managers reap the reward of style rotation is mixed. During the first recession period, the results indicate improved returns for managers that rotate into large-cap stocks with weaker evidence of improved flows. During the second recession period, flows improve but not returns. One possible explanation for this result is that large-cap stocks did not provide the same boost to performance during the second recession as they did during the first.

INDEX WORDS: Mutual Funds, Small-Cap, Style Drift

I INTRODUCTION

"Small-cap focused funds provide an ideal setting to assess the prevalence and consequences of style drift behavior." (Cao, Iliev, and Velthuis, 2017)

Style-focused equity mutual funds provide investors with an effective means to access professional management and create a diversified portfolio that will achieve their specified return and risk parameters. In carrying out their professional duties, managers may drift from their designated style for any number of reasons. For example, a recent study found evidence that managers seek to exploit certain "informational advantages" such as industry expertise and will concentrate in these holdings (Kacperczyk, Sialm, and Zheng, 2005). Due to time-variation in equity style performance, some managers may use style rotation as a tool to improve their performance or reduce risk during certain phases of the economic cycle. For example, research shows that small-cap equities have a much higher level of risk than large-cap equities (Perez-Quiros and Timmermann, 2000; Roll, 1981). As a result, large-cap stocks tend to outperform small-cap stocks going into a recession and the reverse occurs following the trough of economic activity (Switzer, 2010). This time-variation in equity style performance may provide small-cap managers with an incentive to rotate away from their stated style by increasing large-cap stock holdings prior to a recession as a means of potentially enhancing performance or reducing risk. This idea, which I refer to as time-varying style rotation or TVSR, draws from two related literature streams: namely style drift and time-variation in fund manager behavior. This paper also builds on the work done by Cao, Iliev, and Velthuis (2017), by examining possible motivations for TVSR and the type of manager that is likely to engage in this behavior.

Mutual fund investment style has been of interest to researchers and investment professionals alike for decades due to the dramatic increase in assets managed professionally and

the importance of style to both mutual fund allocation and performance evaluation by retail and institutional investors (Chan, Hsiu-Lang, and Lakonishok, 2002; Qian and Shi, 2018). According to the Investment Company Institute total net assets invested in actively managed domestic equity funds increased approximately $5 trillion to $5.6 trillion from 1993 to 2019, which represents over 40% of the total actively managed fund assets (p 237).[1] While this growth provided investors with a wide assortment of styles to choose from, the proliferation of choices also complicates the mutual fund selection and evaluation process.

The approach many investors use to combine various investment styles within a portfolio has its roots in academic theory. Within the investment industry the term "asset allocation" refers to a portfolio selection methodology based on the mean-variance optimization approach developed by Markowitz (1952), which encourages investors to construct diversified portfolios that seek to maximize the potential expected return for a given level of risk. For example, wealth management firms develop customized capital market assumptions (i.e. expected returns, standard deviations, and correlations) that serve as inputs for constrained optimization techniques, which are used to create recommended asset class weights designed to achieve various combinations of risk and return in a portfolio.[2] Pástor (2000) provides the following example of this "data-based" technique: "sample estimates of the mean and covariance matrix of asset returns can be used to compute the optimal weights in a mean-variance framework."

Another approach to portfolio selection is the use of asset pricing models (Pástor, 2000). One example is the Capital Asset Pricing Model (CAPM), which was developed in the early 1960s to explain how the expected return of an investment should be affected by its risk (Perold, 2004).

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[1] Investment Company Institute Fact Book 2020: *https://www.icifactbook.org*

[2] BNY Wealth Management: *https://www.bnymellonwealth.com/assets/pdfs-strategy/thought_10-year-capital-market-assumptions_f.pdf*

Operating under several simplifying assumptions, CAPM offers investors a framework for assessing risk by delineating between systematic risk and idiosyncratic risk. Since company specific risk can be diversified away, the sole risk factor becomes the market. Subsequent research identified other factors that impact returns, most notably Fama and French (1992) found that firm size and book-to-market ratios largely explain the cross-sectional variation in expected returns. Commenting on a paper written the following year (Fama and French, 1993), Daniel and Titman (1997) point out that the size and value factors serve as "proxies for the firm's loading on priced risk factors." The authors also identify other "characteristics" that explain cross-section returns such as dividends, historical returns, valuation, etc.

Whereas style plays a role in portfolio selection, style drift has important implications for maintaining a portfolio's optimal asset mix. Wermers (2012) incorporates prior findings to identify how researchers measure style drift: "the shift in loadings on priced style factors (e.g., Fama and French (1993)) or style characteristics (e.g., Daniel and Titman (1997))." Although these "returns-based" measures reflect what investors ultimately receive, they do not provide information on fund manager adjustments (Brown, Harlow, and Zhang, 2009). Mutual fund holdings analysis allows researchers and investors to not only develop a deeper understanding of style drift, but to identify and track a mutual fund manager's exposure to certain equity styles. For example, the Morningstar Style Box™ allows investors to evaluate the characteristics of individual stocks held by a manager, based on the asset class (e.g. small-cap vs. large-cap) and/or style (e.g. value vs. growth), to categorize each equity mutual fund within a 3x3 matrix.[3]

[3] Morningstar Style Box Methodology: *https://www.morningstar.com/content/dam/marketing/shared/research/methodology/678263-StyleBoxMethodolgy.pdf*

Researchers recognize the role Morningstar's classification system has played in the institutionalization of equity style, which creates an incentive for mutual fund managers to specialize thereby allowing investors to maintain an optimal portfolio mix (Brown, Harlow, and Zhang, 2009; Wermers, 2012). To declare a style specialization, a manager includes a style designation within the fund's name thereby subjecting herself to compliance with the Names Rule (see Appendix A for a more detailed discussion of the rule and its implications). Even with a 2001 change requiring greater style purity, the rule allows managers to engage in both passive drift (i.e. price appreciation of existing holdings) and active drift (i.e. purchases outside of the style designation) in pursuit of their risk and return objectives. Wermers (2012) found "that a significant amount of style drift results from active manager trades…" The degree to which managers can engage in active drift is a function of their stated investment emphasis and benchmark defined in the fund prospectus. Despite an ostensible manager preference for style specialization, the tendency to drift from their stated emphasis is well documented in the academic literature (Brown, Harlow, and Zhang, 2009; Cao, Iliev, and Velthuis, 2017; Chan, Hsiu-Lang, and Lakonishok, 2002; Wermers, 2012). While there are concerns over the adverse impact to investors (Cao, Iliev, and Velthuis, 2017; Chua and Tam, 2020), investment managers have a fiduciary responsibility to their clients that is enforced by the SEC (Laby, 2018). Therefore, defining what constitutes style drift and identifying the implications of this behavior remains a challenge.

Even though portfolio manager drift may work against an investor's desire to achieve an optimal portfolio allocation, the empirical evidence supports that investors prefer performance over style consistency. In what is arguably the seminal paper on mutual fund manager performance and flows, Berk and Green (2004) present a model that recognizes some managers possess skill and investors reward these managers with positive flows. Subsequent empirical evidence provides

support for an asymmetric performance-flow relationship: managers with good performance are rewarded with positive net flows, yet managers with poor performance are not penalized with negative net flows (Gruber, 1996). Recent research brings this conclusion into question and provides a more nuanced understanding of this relationship. Cashman, Deli, Nardari, and Villupuram (2012) find a symmetric performance-flow relationship: managers with excellent performance are rewarded with positive net flows and managers with bad performance are penalized with negative net flows. The authors also analyze the performance-flow relationship using gross flows and find existing investors increased their withdrawals as performance deteriorates and find both economically and statistically significant results supporting prior research findings that the best performing funds are rewarded with inflows (pp 729, 731).

Another thread in the literature explores the way in which investors evaluate performance. In a perfect world, investors would be aware of the various factors that affect stock returns (e.g. size, value, momentum, and industry to name a few) and would decompose a mutual fund manager's returns to identify her contribution or skill. Barber, Huang, and Odean (2016) find that in the aggregate mutual fund investors do not pay attention to these factors when assessing returns. Consistent with prior research (Teo and Woo, 2004), the authors find a positive relationship between style returns (consistent with the Morningstar classifications) and fund flows. However, they also find that flows respond as much or more to deviations from style category returns and conclude that investors may simply focus on the fund's return derived from its style. Recent research incorporates multiple approaches in a "horse race" to determine which models investors use when determining where to invest (Agarwal, Green, and Ren, 2018; Barber, Huang, and Odean, 2016).

Even though the relationship between mutual fund performance and flows is complex, a manager could use drift as a tool to improve performance and garner flows. However, there are costs and benefits associated with using this tool. From the individual manager perspective, successfully executing a rotation strategy would result in strong relative performance that in turn could lead to the following benefits: higher bonus, reduced career concerns and greater fund assets. On the other hand, a poorly executed rotation strategy would result in weak relative performance that result in the following costs: declining assets under management and increased career concerns. From the individual investor perspective, a successfully executed rotation strategy provides the following benefits: potentially lower overall portfolio risk and improved relative performance over time. Conversely, a poorly executed strategy has the following costs: unanticipated exposures that complicate portfolio construction and poor relative performance.

Wermers (2012) invites researchers to explore labor market pressures that may incentivize managers to engage in active drift. Recent research supports the assertion that mutual fund managers may be motivated to drift by performance and flows, since most receive incentive compensation tied to performance and have some portion of their compensation linked to fund flows (Chua and Tam, 2020; Ma, Tang, and Gómez, 2019). Despite having both implicit and explicit incentives only the most skilled managers are likely to deploy style rotation as a tool given the severe consequences of unsuccessful execution. Moreover, TVSR requires not only the ability to successfully analyze and select small-cap stocks and large-cap stocks, but to do so in the proper proportion at the correct time during an economic cycle. Managers that possess this unique combination of skills may be the most effective at generating higher returns and greater flows.

There are many ways to measure skill. Some of these measures, such as the Sharpe ratio, have been used by investors for decades (Sharpe, 1966). More recently, the mutual fund

performance literature has offered new measures of identifying manager skill (Amihud and Goyenko, 2013; Cremers and Petajisto, 2009). A simple measure created by Amihud and Goyenko (2013) relies on a fund's R^2, which measures how much of a fund's return variance is due to the returns on a set of risk factors. A low R^2 indicates greater selectivity, which is a significant predicter of mutual fund performance. More sophisticated approaches use mutual fund holdings, such as the Characteristic Selectivity (CS) and Characteristic Timing (CT) measures developed by DGTW (Daniel, Grinblatt, Titman, and Wermers, 1997). The former measures a fund manager's ability to pick stocks that outperform, and the latter measures her ability to time portfolio weights across factors.

I.1 Time-Varying Style Rotation and Small-Cap Managers

The mutual fund literature on time-series variation in fund performance describes the changing environment in which mutual fund managers must perform their duties during a business cycle. Within the mutual fund performance literature, Moskowitz (2000) may be the first to consider that managers employ different strategies in recessions and expansions. In a paper responding to Wermers (2000), Moskowitz recomputes the performance measures for two recessions that occurred during the sample period using NBER business cycle dates and finds that active managers do add value during recessions. Moreover, subsequent research also documents similar results (Kacperczyk, Van Nieuwerburgh, and Veldkamp, 2011; Kosowski, 2011).

Managers being able to add value during recessions implies the ability to forecast their onset. Kacperczyk, Van Nieuwerburgh, and Veldkamp (2014), provide an explanation for how a manager can anticipate a recession without foreknowledge of the NBER business cycle dates, which identify each peak and trough in economic activity after the fact. The authors conclude that a manager can forecast macroeconomic variables like GDP by using the same analytical process

used to forecast future expected returns for both the markets and companies. They find the most highly skilled managers successfully time the market during recessions. These results provide additional evidence that mutual fund managers deploy various strategies during different phases of the economic cycle and the extent to which a manager engages in a specific strategy during recessions is a function of skill.

In this study, I use the term time-varying style rotation (TVSR) to describe how certain small-cap managers increase large-cap stock holdings in anticipation of a recession. Time variation in style performance may provide a motivation for this behavior. Perez-Quiros and Timmermann (2000) find that "small firm's risk and expected returns are most strongly affected by variations in the underlying state and the rapid increase in the premium on small over large firms' stock returns as recession periods progress…(P 1259)" Comparing the performance of a small-cap and large-cap index over several periods in and around recessions, Switzer (2010) finds that in the majority of cases from 1926 to 2007 small-caps underperformed large-caps during the 12 months prior to an economic peak. During the three most recent full recession periods, small-cap stocks also posted negative returns. Conversely, in the 12 months following an economic trough small-caps perform significantly better than large-caps.

TVSR could be considered a form of market timing. Bollen and Busse (2001) were the first to provide evidence of significant market timing ability by mutual fund managers using daily data instead of monthly data. More recent research builds on this seminal work by analyzing holdings as well as returns. Jiang, Yao, and Yu (2007) create a new market timing variable by measuring changes in a mutual fund's beta, which is estimated using the weighted average of the stock holdings' betas. This approach allows for the isolation of active market timing from 'artificial timing' effects, which can introduce a source of bias. The authors find evidence of high industry

concentration and a tilt toward small-cap stocks within funds that are active market timers. Based on further tests using industry betas, they conclude managers engage in "industry rotation" from high beta to low beta industries in anticipation of a market decline: "Less cyclical, steadier blue-chip stocks typically have lower betas, and tilting toward these stocks due to pessimistic market views is a textbook example of market timing (p 749)."

Recent evidence suggests that small-cap managers exploit the opportunity provided by the SEC to invest in larger companies. The SEC allows mutual funds to use any "reasonable definition" for styles used in fund names (e.g. small-cap) and suggests funds use resources like industry indices (SEC, 2001a). In practice, most small-cap managers include both a primary benchmark index and the market cap range of that index in the prospectus. Based on my analysis of 399 small-cap mutual funds, there is substantial latitude in the way managers select and define the benchmark index market capitalization range used to demonstrate compliance with the Names Rule (see Appendix B). For example, funds using the Russell 2000 as a benchmark index reflect a mean ranging from a lower limit of $56.6 million to an upper limit of $8.1 billion with a maximum of $27.3 billion. To put this in context, a 2013 study on small-cap market quality indicates a $2 billion dividing line between small- and mid-cap market capitalization (Collver, 2014). A May 2020 calculation by FTSE Russell reflects an upper limit of the Russell 2000 market cap range of $4.4 billion. These results suggest that late in the most recent economic cycle prior to the 2020 recession there was a dramatic increase in the small-cap mutual fund maximum market cap index range, which provided the opportunity for these managers to buy mid- and large-cap stocks while remaining in compliance with the Names Rule. To the extent managers exhibited similar behavior in and around recession periods this could explain how managers engage in TVSR yet avoid the ire of the SEC.

Even though Kacperczyk, Van Nieuwerburgh, and Veldkamp (2014) argue that managers possess the tools to forecast recessions, there is no evidence that small-cap managers can do this with precision based on the analysis done by Cao, Iliev, and Velthuis (2017). In advance of the March 2001 peak, the authors observe that small-cap mutual funds' average allocation to large-cap stocks begin to increase in 1998 and peak in 2003. If these managers were able to predict recessions with certainty, they would execute rotations into large-cap stocks more quickly.

I begin by analyzing how the holdings in large-cap stocks by small-cap managers changes over the last two full recession periods using the NBER cycle dates (i.e. Mar. 2001-Nov. 2001; Dec. 2007-Jun. 2009). The SEC rule change, which reduces the percentage of out of style holdings allowed, should have reduced the opportunity for managers to style drift making it more difficult to find evidence of this behavior. The first validation test is a time series analysis of the average of the large-cap stock holdings across small-cap managers 12 months before and after the peak in economic activity (i.e. Mar. 2001 and Dec. 2007). Next, I compare the percentage of TNA in large-cap stocks held by small-cap managers pre- and post-peak using the monthly average of large-cap holdings for two 24-month periods: prior to the peak in economic activity and following the peak. Due to the inability of small-cap managers to anticipate the onset of a recession with precision, I test both one-year and two-year periods around the peak. Then I test my hypothesis in a three period multi-variate regression framework by regressing the dependent variable percentage of holdings in large-cap stocks against two dummy variables and fund characteristics. The results provide additional confirmatory evidence that small-cap managers increase their large-cap holdings during recessions.

Having established that on average small-cap managers rotate into large-cap holdings in and around recessions, the next question is which managers are likely to do so. Due to the severe

consequences of unsuccessful execution only the most skilled managers are likely to deploy style rotation as a tool. While there are many approaches developed in the literature to measure skill, this study incorporates several measures discussed earlier (i.e. R^2 , Sharpe ratio and DGTW CS and CT measures). I find some evidence of a positive relation between skill and changes in large-cap holdings by small-cap managers.

Using skill as a measure to identify small-cap managers that are likely to rotate into large-cap stocks in and around recessions, I examine whether managers benefit from this strategy. Successfully implementing a rotation strategy means that a manager produces higher returns by increasing the amount of large-cap stock held in the fund. Under normal circumstances, investors would chase these higher returns and reward the manager with greater flows consistent with the well-documented flow-performance relationship. In this situation TVSR acts as an additional signal of manager skill to investors and they respond with higher flows. To examine the relation between future fund returns and rotation to large-cap stocks, I regress the one-month ahead fund return on the change in large-cap holdings in the past. A higher percentage of large-cap holdings results in higher future returns over multiple periods in both recession periods. The test for flows is similar: regress the future fund flows on the percentage change in large-cap holdings in the past. A higher percentage of large-cap holdings results in higher future flows in one period during the first recession period and multiple periods during the second recession period.

My study contributes to the literature in several ways. First, I add to the extant literature focusing on style drift in the size dimension. The extant literature focuses on how style factors change over time across the entire universe of equity mutual funds (Brown, Harlow, and Zhang, 2009, 2015; Wermers, 2012). Similar to Wermers (2012), this paper focuses on portfolio holdings to assess style drift. However, I narrow my scope of analysis to small-cap equity managers'

behavior around recessions. This is consistent with more recent studies like Cao, Iliev, and Velthuis (2017), which focus exclusively on analyzing drift in a single sub asset class (small-cap equity). Their results document time variation in large-cap holdings of small-cap managers showing the highest allocations in 2002 and 2009 (p 43). I show that large-cap holdings by small-cap managers spike following the peak in economic activity during the last two recessions. By focusing solely on small-cap manager drift around recessions I raise awareness to the impact this behavior has on optimal portfolio allocation.

Next, I provide additional evidence of a characteristic exhibited by small-cap managers who drift from their stated styles. Using a transition matrix, Cao, Iliev, and Velthuis (2017) show that top decile holders of large-cap stocks tend to remain in the top decile over time suggesting certain managers regularly employ this strategy (p 43). I show some evidence that managers with greater stock selection skill are more likely to execute this strategy.

By tying time-series variation in equity style performance to the economic cycle, I contribute to the literature on intertemporal variation in mutual fund performance. Much like existing literature on mutual fund style drift, studies that distinguish between recession and expansion periods also include the entire universe of equity mutual funds in their analysis (Kacperczyk, Van Nieuwerburgh, and Veldkamp, 2014; Kosowski, 2011; Moskowitz, 2000). By highlighting that large-cap stocks outperform small-cap stocks going into a recession and the reverse occurs following the trough of economic activity (Switzer, 2010), I provide a motivation for small-cap manager behavior in time-varying style rotation. This hypothesis is supported by my evidence from the 2001-recession that these managers produced higher returns and benefitted from higher flows.

My results also have implications for investors. The investment management industry promotes optimal portfolio allocations based on the Markowitz mean-variance approach (Fisher and Statman, 1997). Yet, there is little evidence that investors consistently follow these recommendations. Instead, ample evidence in the flow-performance literature shows that investors chase past performance. Therefore, investors should be aware how managers are generating this performance over the course of an economic cycle. By highlighting how skilled small-cap mutual fund managers take advantage of the time-series variation in equity style performance by drifting into a higher percentage of large-cap stocks during recessions, my results bring attention to this activity. Normative considerations aside, small-cap investors willing to accept deviations from optimal portfolio allocations during recessions can identify managers that use this technique most effectively. These investors should also be aware, however, that researchers have not yet studied the ability of small-cap manages to rotate out of large-cap stocks once the recession has ended. Switzer (2010) finds that small-cap stocks tend to significantly outperform large-cap stocks during the twelve months following an economic trough. Therefore, small-cap managers that stick to their style and do not drift may outperform managers with higher large-cap holdings during this post-recession period.

I.2 Hypotheses Development

Several researchers have posed the question whether funds are able to perform best when it matters the most, which is during a recession when market declines reduce wealth (Kosowski, 2011; Moskowitz, 2000). Since small-cap stocks tend to underperform large-cap stocks during recessions, investors should be aware of how small-cap managers may rotate into large-cap stocks to improve performance. Kim and Burnie (2002) explore the relationship between the small firm effect and the economic cycle and find during periods of weak economic activity small company

stocks do not perform as well as large company stocks. Small firms are less productive (low ROA) and have higher leverage than large firms, which cause them to struggle during recessions. Switzer (2010) also examines the same relationship between the small firm effect and the economic cycle and finds similar results: small-cap stocks did not perform as well as large-cap stocks in the 12 months prior to the peak in economic activity. Finally, Jiang, Yao, and Yu (2007) show that mutual fund managers rotate out of stocks in high beta industries into stocks in low beta industries, which supports anecdotal evidence these managers do so in expectation of a market decline. This research supports a motivation for small-cap mutual fund managers to engage in TVSR by increasing their large-cap stock holdings in and around recessions.

Hypothesis 1: The peak in small-cap manager large-cap stock holdings will occur following the peak in economic activity.

Due to the risks associated with attempting a TVSR strategy, not every small-cap manager will attempt to use it. Accurately forecasting the duration of economic cycles is difficult and can result in false positives (forecasting a peak that does not occur) or false negatives (failing to forecast a peak when it occurs). The ability to successfully execute this strategy requires that a manager possess two types of skill: first, to forecast the onset of a recession and second, the ability to pick large-cap stocks as well as small-cap stocks. Cao, Iliev, and Velthuis (2017) find a relationship between both the size and age of a small-cap fund and its allocation to large-cap stocks (p 49). These results imply experienced managers that have successfully grown their funds may be inclined to use this strategy. In this study I use several measures found in the literature to serve as a proxy for fund manager skill. By looking at the relationship between these skill measures and

large-cap stock holdings, I test whether the more highly skilled managers are the ones using this drift tool the most.

Hypothesis 2: Skilled small-cap managers are more likely to increase large-cap stock holdings during recession periods.

To the extent that skilled small-cap managers are more likely to engage in TVSR, we should see a relationship between holding higher percentages of large-cap stocks and performance. Despite the risks, these managers respond to the implicit incentive of increased flows.[4] Chua and Tam (2020) study the motivation for intentional style drift and find that funds engaging in drift experience greater inflows. Investors appear to view TVSR as an additional signal of managerial ability and respond with greater flows. Like performance, I expect to find a relationship between flows and rotation into large-cap stocks by skilled managers.

Hypothesis 3: Skilled small-cap managers, on average, are more likely to increase large-cap stocks during recession periods leading to better performance and greater flows.

[4] In addition to implicit incentives, mutual fund managers also have explicit incentives. In a recent study of over 4,500 mutual funds, the majority of these contracts contained a bonus tied to investment performance (Ma, Tang, and Gómez, 2019).

II DATA

II.1 Data Sources

Mutual fund information and holdings data are obtained from the Wharton Research Data Services (WRDS) site and merged using MFLINKS. WRDS provides access to both the Center for Research on Security Prices (CRSP) U.S. Survivor-Bias-Free Mutual Fund Database and the Thomson Reuters s12 database. Following Cao, Iliev, and Velthuis (2017), this study uses two CRSP database search methods to identify domestic small-cap equity mutual funds: CRSP Style Code of EDCS and the term "small" in the name. Since 1998, the style codes are determined by Lipper Objective Codes.[5] The objective codes are assigned based on the investment emphasis language listed in the prospectus. For example, a mutual fund manager that lists small-cap stocks as their investment emphasis in their prospectus has an objective code of SG. Based on the CRSP Style Code methodology, all funds with a Lipper Objective Code of SG are coded EDCS (Equity, Domestic, Cap-based, Small-Cap). Funds that included the term "small" in the name were also selected, which captures those with style codes other than EDCS.

This study also applies filters like Cao, Iliev, and Velthuis (2017) that ensure only actively managed domestic small-cap equity mutual funds are included in the sample. For example, CRSP provides an identifier that captures several approaches (i.e. index-based, pure index and enhanced index), which facilitates filtering out index funds. Even after all filters are applied, a visual examination reveals the need to perform a manual scrub to construct an accurate sample. This process involves several steps as described in Appendix C. Researchers should be aware of the holdings-based codes available to track style changes to determine if manual

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[5] CRSP Survivor-bias-free US Mutual Fund Guide: http://www.crsp.org/products/documentation/crsp-survivor-bias-free-us-mutual-fund-guide-crspsift

adjustments are necessary to identify their topic of interest more accurately. For this study, the EDCS code period was the primary determinant of holdings inclusion.

Classification of holdings into either large-cap or small-cap is based on the initial step of Russell's annual reconstitution methodology prior to 2007: each June the top 1,000 stocks ranked by total market capitalization are classified as large-cap and the next 2,000 stocks by market cap are small-cap. In 2007, Russell changed its methodology to include a process called banding designed to reduce turnover. By using the same simple classification approach for both recession periods, this study avoids any issue associated with changing reconstitution methodologies over the two sample periods.

Following Kacperczyk, Van Nieuwerburgh, and Veldkamp (2014), I use NBER business cycle dating conventions whereby a peak indicates the onset of a recession. My study includes the last two full recession periods that began in March 2001 and December 2007.

Since my focus is on manager behavior around recessions, my final sample period is from March 1999 to March 2003 and from December 2005 to December 2009, during which there exist 639 small-cap mutual funds.

II.2 Variable Construction

For fund characteristics, I aggregate all share classes at the fund level. *TNA* is aggregate total net assets ($mm) across all share classes one month before a filing date. *Age* is the number of years since the fund's oldest share class is launched. I use the natural logarithms of *TNA* and *Age* in the empirical analyses. Return-based variables, turnover ratio (*Turnover*), expense ratio (*Expense*), 12b1 fee (*fee12b1)*, and management fee (*mgmtfee*) are the *TNA*-weighted average across all fund share classes and scaled to percentage points.

Large-cap stocks consist of the top 1,000 stocks ranked by total market capitalization. *Large-Cap Holdings* are the large-cap holdings by small-cap managers in each month. *LC Change Past 1Y (LC Change Past 2Y)* is the change in *Large-Cap Holdings over the past one year (two years)*. *LC Change Next 1Y (LC Change Next 2Y)* is the change in *Large-Cap Holdings over the next one year (two years)*. *AUM* is the natural logarithm of the total net assets. *Expense* is the expense ratio. *#ShareClass* is the number of share classes of each fund. *Past Return* is the monthly fund return in the previous month. *Turnover* is the turnover ratio. *R2_Skill* is $1 - R^2$ where R^2 is calculated from the Fama-French-Carhart four-factor model using returns in the past 24 months. *Past Adj. Return* is peer-adjusted *Past Return. Past Alpha* is the intercept of regressing Fama-French-Carhart four-factor model using returns in the past 24 months. *Sharpe Ratio* is the mean monthly excess return divided by the standard deviation of monthly excess return in the past 24 months. *CS* and CT are characteristic selectivity and characteristic timing measures documented in Daniel et al. (1997). *Risk* is the monthly change in the standard deviation of daily returns in each month. *Systematic Risk* is the monthly change in the beta on the market factor from regressing Fama-French-Carhart four-factor model using daily returns in each month. *Idiosyncratic Risk* is the monthly change in square root of the residual from regressing Fama-French-Carhart four-factor model using daily returns in each month. *Return* is the peer-adjusted return in the next 1, 3, 6, or 12 months. *Flow* is calculated as in Sirri and Tufano (1998): $(TNA_{i,t} - TNA_{i,t-1})*(1+R_{i,t})/ (TNA_{i,t-1})$ and is peer-adjusted in the 1, 3, 6, or 12 months.. *CAPM Alpha/FF3 Alpha/FF4 Alpha* is the difference between the monthly excess return and the expected return, where expected return is calculated using betas from regressing CAPM/Fama-French three-factor model/ Fama-French-Carhart four-factor model using returns in the past 24 months. For all variables using past 24 monthly returns, twelve valid data points are required.

Figures 1A and 1B illustrate the variable measurement periods used to test small-cap manager's style rotation behavior and manager skill, respectively. The first is a three-period comparison test using two dummy variables, which is described in more detail in Section III.1. To test manager skill, I use an event study approach, which is described in more detail Section III.2.

[Insert Figure 1 here]

III RESULTS

My analysis begins with a review of how small-cap mutual fund manager holdings change during recession periods.

III.1 Large-Cap Holdings by Small-Cap Managers Around Recession Peak

Figures 2A and 2B document how small-cap manager allocations to large-cap stocks change around recession periods. For the first recession period (peak=Mar. 2001) small-cap manager allocations to large-cap stocks spiked in June 2001, just three months after the peak in economic activity. During the second recession period (peak=Dec. 2007) the spike occurred in June 2008, which was six months after the peak in economic activity. Cao, Iliev, and Velthuis (2017) also observed similar spikes in small-cap manager allocations to large-cap stocks with the highest allocations in 2002 and 2009 (pp 45-46).

[Insert Figures 2A and 2B here]

The results of the first test of small-cap manager rotation behavior in and around recessions are presented in Table 2. The monthly average of large-cap holdings is compared for two 24-month periods: prior to the peak in economic activity and following the peak. For example, for the first recession period (peak=Mar. 2001) the pre-peak large-cap holdings were 18% and the post-peak large-cap holdings were 23.5% resulting in a 5.5% difference, which is statistically significant. The difference between the pre- and post-peak holdings during the second recession period (peak=Dec. 2007) of 4.9% is also statistically different from zero.

[Insert Table 2 here]

An additional test of small-cap manager rotation behavior in and around recessions incorporates a three-period comparison using two dummy variables. The three 24-month comparison periods consist of the following: a first period covering the 25^{th} to 48^{th} month prior to

the peak in economic activity, a second period covering the 24 months prior to the peak and a third period covering the 24 months following the peak. The variable *Pre-peak* regresses the dependent variable percentage of holdings in large-cap stocks against a post-peak dummy variable to compare the first and second periods. The variable *Post-peak* regresses the dependent variable percentage of holdings in large-cap stocks against a post-peak dummy variable to compare the second and third periods. This three-period comparison provides more clarity regarding when small-cap managers increase their holdings in large-cap stocks. Table 3 Panel A reflects the results using the NBER business cycle peak in March 2001, which indicate that small-cap managers did not rotate into large-cap stocks significantly between the first and second periods. However, there is evidence of this rotation behavior between the second and third periods (before and after the peak in economic activity).

Table 3 Panel B reflect the results of the same regression in Panel A using the NBER business cycle peak in December 2007. The results reflect a different pattern than that observed during the first recession period due to the proximity of the sample recession periods. By starting the first measurement period 48 months prior to the peak in economic activity of the second recession (December 2003), we capture elevated levels of large-cap holdings. Since the first sample recession period ends in November 2001, small-cap managers had not yet begun to substantially rotate back into small-cap stocks. However, since they do reduce large-cap holdings by the end of the first measurement period and then begin to increase large-cap holdings by the end of the second measurement period, we get significant results for the *Pre-peak* regression. The *Post-peak* regression results were qualitatively the same as those from the first regression. The results from these two tests are consistent with my first hypothesis that the peak in small-cap mutual fund managers' holdings in large-cap stocks follows the peak in economic activity.

[Insert Table 3 here]

III.2 Manager Skill and Change in Large-Cap Holdings

Successfully executing a rotation strategy in and around recessions comes with certain costs and benefits. Poor execution of this strategy could result in weak performance relative to peers, declining assets under management, and increased career concerns. Managers who are willing to put their career on the line are more likely to be confident in their ability to successfully execute this strategy. Therefore, we would expect to see a relationship between skill and higher large-cap holdings. I use an event study approach to examine the relationship between skill and drift to large-cap holdings. First, I regress the change in the percentage of holdings in large-cap stocks for both a 12-month and 24-month period following each peak in economic activity on various skill measures estimated 24 months during the Pre-Peak period (see Figure 1B). I interact the change in large-cap holdings with the *Post* dummy variable in two 24-month periods before and after each peak in economic activity.

Overall, the results for the first recession period indicate on average more highly skilled managers hold larger amounts of large-cap stocks after the peak in economic activity compared with the period prior to the economic peak with the CS measure only showing evidence during the one-year future change period. One exception is the CT measure (Table 9), which shows a negative relationship. This result is intuitive in that TVSR involves a manager trading out of an investment style (i.e. size). These results provide evidence to support my second hypothesis that skilled managers engage in this rotation strategy and do so up to 24 months following the peak in economic activity.

The results for the second recession period are mixed with only the *R2_skill* and *Sharpe ratio* skill measures indicating a significant relationship between skill and higher large-cap

holdings. Overall, I find some evidence that, on average, skilled managers are more likely to rotate their holdings into large-cap stocks in and around recession periods. Moreover, this rotation behavior may act as a signal sent by the skilled managers to investors.

[Insert Tables 4-9 here]

III.3 Future Performance, Future Flows and Change in Large-Cap Holdings

Having found some evidence that on average more highly skilled managers hold larger amounts of large-cap stocks after the peak in economic activity compared with the period prior to the economic peak, is there evidence these managers are able to take advantage of the time-series variation in large-cap stocks to improve performance and garner greater flows vis a vis their less skilled counterparts. During the first recession period, there is evidence in most of the performance periods of this relationship. The results in Tables 10 Panel A and 11 Panel A reflect that funds with a greater increase in the percentage of large-cap holdings in the past have both higher future returns and flows over different horizons ranging from one month to twelve months, which confirms my third hypothesis. The economic magnitude is also significant. For example, in the first recession period a 10% drift to large-cap holdings increases performance by 0.3% in the following month. In the second recession period, a 10% drift attracts flows by 7.7% in the following month, after controlling for the contemporaneous return.

However, the results for the second recession period in Tables 10 Panel B and 11 Panel B do not provide consistent evidence in support of these relationships. Even though investors observe the change in large-cap holdings and reward managers with greater flows, the managers do not actually deliver better performance. One possible explanation for why this strategy provided no additional benefit is that unlike the first recession period when large-cap stocks performed well, these stocks may not have performed well during the second recession period. For this strategy to

remain successful, small-cap managers would also need to reduce their holdings in large-cap stocks as the economy improved. If this did not happen, investors in these funds may have experienced poor relative performance and disappointment with funds that were unable to successfully rotate back into small-cap stocks in time.

[Insert Tables 10 and 11 here]

III.4 Robustness Tests

I perform several additional tests to support my conclusions. First, a possible alternative explanation of the observed results is that mutual fund managers use TVSR as a risk management tool. The results in Tables 12-14 do not support a relationship between past shifts into large-cap stocks and future risk taking. The results are consistent across total risk, systematic risk, and idiosyncratic risk. Therefore, these results do not support the argument that small-cap managers are rotating into large-cap stocks for the purpose of risk management.

Another question regarding how small-cap managers use style rotation is whether there is persistence in style drift. Table 15 shows no persistence, which supports the argument that style rotation is deployed in and around recessions by small-cap managers to improve performance. These managers would have an incentive to reduce large-cap holdings post-recession, based on the tendency of small-cap stocks to outperform large-cap stocks following an economic trough (Switzer, 2010).

Next, I perform a time series placebo test to determine if the relationship holds during periods other than recessions. Using a pseudo-peak of Dec. 2005, I compare large-cap holdings before and after the peak. This period was randomly chosen to avoid overlap with the study test periods. The results in Table 16, using a fictitious recession period, show that small-cap managers

did not rotate into large-cap holdings post-peak. This evidence shows that my results are unlikely to be spurious and driven by data snooping.

Finally, to further explore the relation between past changes in large-cap holdings and future performance I consider alternative measures for performance. While Table 10 reflects better future returns during the first recession period compared to the second recession period, Table 17 indicates small-cap managers that rotate into large-cap holdings do not generate alpha during the first recession period. However, these managers do generate positive raw returns and abnormal returns, measured by CAPM alpha, Fama-French three factor alpha, and Fama-French-Carhart four factor alpha during the second recession period. This ostensibly conflicting result could be an artifact of the test design, whereby the results in Table 10 are based on peer adjusted returns and the results in Table 17 are based on raw returns and alphas. Consistent with Table 10, the raw returns in Table 17 are better during the first recession period compared with the second recession period.

[Insert Tables 12-17 here]

IV CONCLUDING REMARKS

The question of how to evaluate whether a mutual fund manager adds value remains unanswered in the mutual fund performance literature. A recent strand argues for conditioning evaluation periods on the economic cycle to determine if mutual fund managers add value during recessions when investors may experience reduced incomes and asset values (Kacperczyk, Van Nieuwerburgh, and Veldkamp, 2011; Kosowski, 2011; Moskowitz, 2000; Wermers, 2000). Time-series variation in equity style performance may provide an incentive for some managers to use style rotation as a tool to improve performance or reduce risk during recessions. An example of this style performance variation is the tendency for small-cap stocks to underperform large-cap stocks in the twelve months prior to an economic peak (Switzer, 2010). It is this specific performance tendency that may motivate small-cap managers to increase their large-cap stock holdings in anticipation of a recession. In this paper, I provide evidence that small-cap managers rotate into large-cap stocks after the peak in economic activity in each of the last two recession periods identified by the NBER cycle dates.

Due to the risks involved with this strategy not all managers will attempt to execute it. While small-cap managers are skilled in selecting small-cap stocks, not every manager is an effective large-cap stock picker as well. I show some evidence that skilled managers rotate their holdings the most into large-cap stocks and do so up to 24 months following the peak in economic activity. Finally, managers are willing to assume the risks associated with this strategy to improve returns and increase flows. We do observe that funds with a greater increase in the percentage of large-cap holdings in the past have both higher future returns and flows during the first recession. During the second recession, managers are again rewarded with higher flows even though they do not deliver higher returns. Having been conditioned in the past, investors respond to increasing levels of large-cap holdings as either a signal of manager skill and/or improved future performance.

The lack of improved returns during the second recession may be due to large-cap stocks not performing as well during the second recession as they did during the first.

This paper investigates the time-varying style rotation of small-cap mutual fund managers around the peak in economic activity during the last two recession periods. The results indicate a relationship between fund manager skill and shifts into large-cap stocks. Future research should investigate small-cap manager behavior beyond the trough in economic activity. Switzer (2010) finds that small-cap stocks outperform large-cap stocks following the trough in economic activity, which provides an incentive for small-cap managers that rotated into large-cap stocks during the recession to rotate back into small-cap stocks. Another opportunity for future research is to include the most recent recession period that began in February 2020, to provide additional confirmatory evidence that the observed relationships are robust.

These findings also have several implications for practitioners. First, portfolio construction techniques designed to create an optimal portfolio allocation should consider the time-varying properties of style drift. Investment professionals are familiar with the need to periodically rebalance portfolios to bring allocations in line with strategic weights. In addition, tactical adjustments away from these strategic weights may also allow investors to capitalize on short-term opportunities. The style drift decisions of individual managers have implications for both rebalancing and tactical adjustment decisions.

Consideration should not only be given to identifying and monitoring changes in manager style drift, but also to strategies designed to adjust misallocations. Investment professionals are trained not to rely exclusively on a manager's declared asset class and style and instead check for style drift by periodically evaluating exposures based on holdings. However, there are costs associated with addressing misallocations by realigning a portfolio with its strategic allocations

(e.g. transactions costs, capital gains, etc.). Therefore, portfolio realignment should be considered in the context of the economic cycle and market environment. For example, the tendency of some small-cap managers to increase large-cap holdings in advance of a recession is consistent with standard industry guidance to reduce overall portfolio exposure to cyclical exposures that perform poorly during a recession. However, these managers may not rotate quickly back into small-cap stocks risking underperformance. As a result, investment professionals may consider the addition of passive strategies to supplement active manager exposures.

APPENDICES

Appendix A – Institutional Details

The SEC refers to a manager's style designation as a fund's "investment emphasis" (SEC, 2001b). If a mutual fund name includes a term that implies a particular investment emphasis, the SEC requires that the majority of that fund's assets must be consistent with the fund name. While the SEC encourages investors not to select a fund based solely on its name, Congress understood the importance of fund name accuracy and gave the SEC authority to police investment company names under the Investment Company Act of 1940. In 2001, due to continued concerns over misleading names, the SEC issued rule 35d-1 ("Names Rule") increasing the percentage of assets an investment company must hold in a manner consistent with the fund name from 65% to at least 80%. However, the SEC provides funds with two exceptions to the 80% requirement: "temporary defensive positions" and "circumstances beyond its control." The former exception relates to the "under normal circumstances" standard whereby funds may deviate from the rule to protect their portfolio from losses caused by significant events such as "market, economic, political or other conditions" or large inflows/outflows but are expected to return to compliance after six months. The latter exception relates to changes in market cap and absolves funds from having to immediately sell a holding as it increases beyond its investment emphasis. In the case of a small-cap fund, this exception allows the manager to hold stocks as the market cap rises into the mid-cap or large-cap range (referred to as passive drift).

Appendix B – Market Capitalization Ranges of Small-Cap Managers

This Appendix shows the results of an analysis of small-cap mutual fund prospectus information for funds with a stated index of Russell 2000, Russell 2000 Growth and Russell 2000 Value. Even though Russell publishes market cap ranges in May of each year following its annual reconstitution, managers choose different dates resulting in a variety of market cap range values. For example, funds using the Russell 2000 as a benchmark index reflect a mean ranging from a lower limit of $56.6 million to an upper limit of $8.1 billion with a maximum of $27.3 billion.

Market-Cap Range Summary Statistics by Benchmark

	Panel A		Panel B		Panel C	
	Russell 2000 Growth		Russell 2000		Russell 2000 Value	
	Upper Limit	Lower Limit	Upper Limit	Lower Limit	Upper Limit	Lower Limit
#Obs	48	30	173	131	65	37
Mean	9.41	22.79	8.11	56.55	6.09	59.11
Std. Deviation	6.19	28.15	3.27	119.67	1.92	119.10
Minimum	2.50	.0022	1.00	.0059	1.00	0.46
25%	5.93	11.73	6.30	11.90	5.05	15.00
50%	8.29	13.00	8.30	13.00	6.20	24.50
75%	10.34	27.98	9.16	39.64	6.80	32.90
Maximum	27.30	152.30	27.30	821.00	16.00	666.00
Range	24.80	152.30	26.30	820.99	15.00	665.54

Appendix C – Manual Data Scrub Process

The following data for Moneta Fund was provided by CRSP with the exclusion of the Morningstar Category classification history. The manual data scrub process includes the following steps. First, spot checking individual funds based on names that did not include "small" or any related term. For example, the name Moneta Fund does not indicate a small-cap investment emphasis, even though it has a style code of EDCS for a portion of its existence. Next, review holdings data to identify funds with multiple companies at the high end of the large-cap range (e.g. Apple and Microsoft). Continuing with the Moneta Fund example, during the latter years of the period when the fund was coded EDCS the holdings reflect a higher percentage of large-cap stocks. To investigate fund changes in investment emphasis over time, CRSP provides code history to facilitate tracking these changes. After 1998, the Lipper Objective Code is the sole determinate of a CRSP Style Code shown in the highlighted section. While Lipper also produces a Classification Code based on a fund's actual holdings, CRSP does not incorporate this code into its style codes. Like the Morningstar Style Box methodology, each fund is categorized based on market-cap and style. With respect to market-cap, the majority (at least 75%) of a fund's weighted equity assets determine the classification. For the Moneta Fund three of four ratings, Lipper Objective Name, CRSP Style Code and Morningstar Category classification, reflect a small-cap focus between 12/31/1998 and 12/30/2001. However, after 12/31/2001 both holdings-based indicators, the Lipper Classification Code and Morningstar Category classification, changed from small-cap growth to mid-cap growth. Yet the prospectus-based Lipper Objective Code remained SG for small-cap stocks and the CRSP Style Code followed suit (EDCS). Again on 06/30/2003, Lipper changed its classification code from mid-cap growth to multi-cap growth. Both the Lipper and Morningstar categories changed on 12/31/2003, from mid-cap growth to multi-cap core and large-cap blend, respectively. The Moneta Fund example illustrates how a fund manager may migrate most of its holdings into another investment emphasis before changing its prospectus. Even though the holdings-based indicators changed from small-cap to mid-cap on 12/31/2001, the Lipper Objective Code remained the same until about 11/15/2013 (indicating a change in the prospectus). One final step in the manual scrub process involved the identification and removal of funds not labelled index funds but contain hundreds of stocks with little active management or tracking error to the index. For example, the DFA (Dimensional Fund Advisors) Investment Group: U.S. Small-Cap Value Portfolio contains approximately 1,000 holdings.

Appendix C (continued) – Coding Example

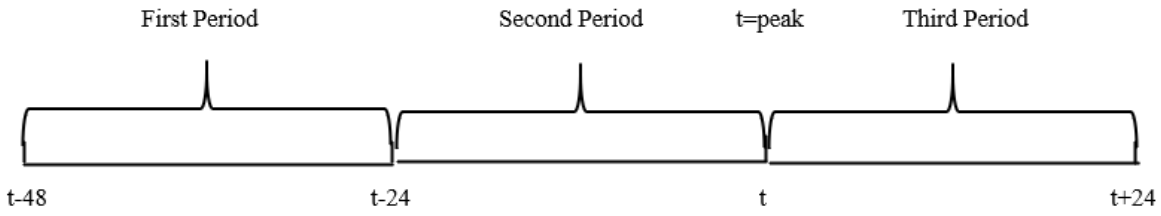
Fund Name	Begin Date	End Date	CRSP Style Code	Lipper Classification Name	CRSP Classification Code	Lipper Classification Code	Lipper Objective Name	CRSP Style Code	Lipper Objective Code	Morningstar Category
Moneta Fund	12/31/1998	12/30/1999	EDCS				Small-Cap Funds	SG		US Fund Small Growth
Moneta Fund	12/31/1999	12/30/2001	EDCS	Small-Cap Growth Funds	SCGE	SCGE	Small-Cap Funds	SG	SG	US Fund Small Growth
Moneta Fund	12/31/2001	6/29/2003	EDCS	Mid-Cap Growth Funds	MCGE	MCGE	Small-Cap Funds	SG	SG	US Fund Mid-Cap Growth
Moneta Fund	6/30/2003	12/30/2003	EDCS	Multi-Cap Growth Funds	MLGE	MLGE	Small-Cap Funds	SG	SG	US Fund Mid-Cap Growth
Moneta Fund	12/31/2003	3/30/2008	EDCS	Multi-Cap Core Funds	MLCE	MLCE	Small-Cap Funds	SG	SG	US Fund Large Blend
Moneta Fund	3/31/2008	6/4/2009	EDCS	Multi-Cap Core Funds	MLCE	MLCE	SMALL-CAP FUNDS	SG	SG	US Fund Large Growth
Moneta Fund	6/5/2009	11/14/2013	EDCS	Multi-Cap Growth Funds	MLGE	MLGE	SMALL-CAP FUNDS	SG	SG	US Fund Large Growth
Moneta Fund	11/15/2013	10/19/2014	EDYG	Large-Cap Growth Funds	LCGE	LCGE	GROWTH FUNDS	G	G	
Moneta Fund	10/20/2014	10/9/2017	EDYG	Large-Cap Core Funds	LCCE	LCCE	GROWTH FUNDS	G	G	
Moneta Fund	10/10/2017	4/9/2018	EDYG	Large-Cap Growth Funds	LCGE	LCGE	GROWTH FUNDS	G	G	
Moneta Fund	4/10/2018	9/16/2018	EDYG	Large-Cap Core Funds	LCCE	LCCE	GROWTH FUNDS	G	G	
Moneta Fund	9/17/2018	5/31/2020	EDYG	Large-Cap Growth Funds	LCGE	LCGE	GROWTH FUNDS	G	G	

Appendix D – Tables and Figures

Variable Measurement Periods

Figure 1A: The Drift to Large-Cap Holdings by Small-Cap Managers

This figure shows the calculation periods for small-cap mutual fund managers' change in large-cap holdings (see Table 3 for variable definitions).

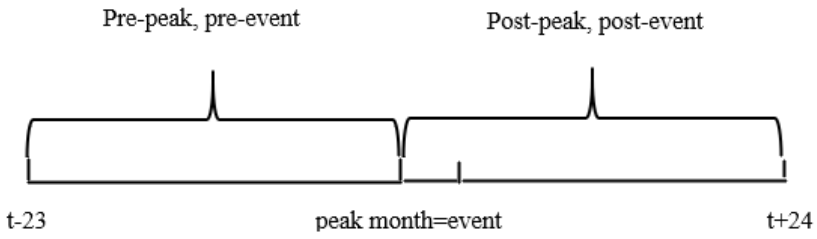


Dummy values:

First Period	post = 0, pre = 1
Second Period	post = 0, pre = 0
Third Period	post = 1, pre = 0

Figure 1B: The Drift to Large-Cap Holdings by Small-Cap Managers: Managers' Stock Selectivity

This figure shows the calculation periods for skill measures: *Past Alpha*, *Past Adj. Return*, *R2_Skill*, *Sharpe Ratio*, *CS*, and *CT* (see Tables 4-9 for variable definitions).



Dummy values:

Pre-peak, pre-event Period	post = 0
Post-peak, post-event Period	post = 1

Figure 2A: Large-Cap Holdings by Small-Cap Managers: First Recession Period

This table reports the mean percentage in large-cap holdings across all 639 small-cap mutual funds in the sample. The observation period encompasses 12 months prior to and 12 months following the NBER economic cycle peak in March 2001.

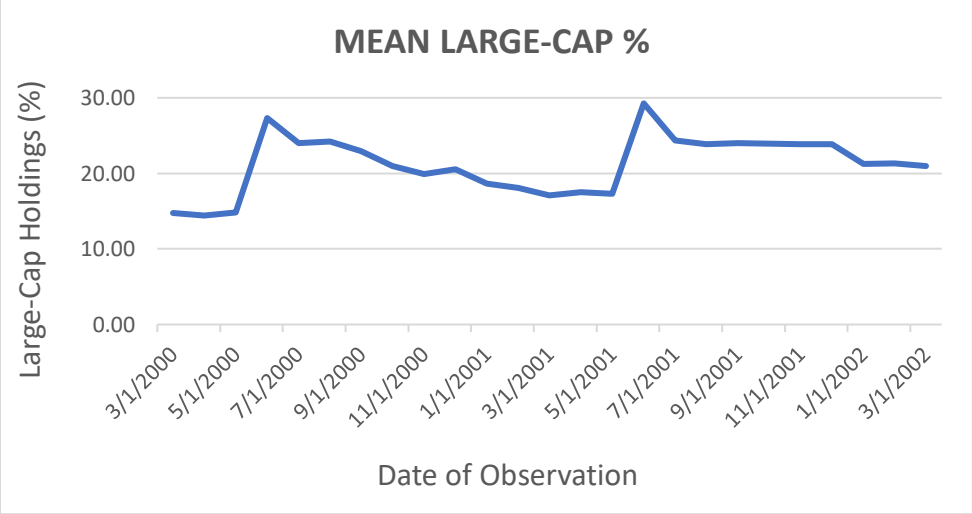


Figure 2B: Large-Cap Holdings by Small-Cap Managers: Second Recession Period

This table reports the mean percentage in large-cap holdings across all 639 small-cap mutual funds in the sample. The observation period encompasses 12 months prior to and 12 months following the NBER economic cycle peak in December 2007.

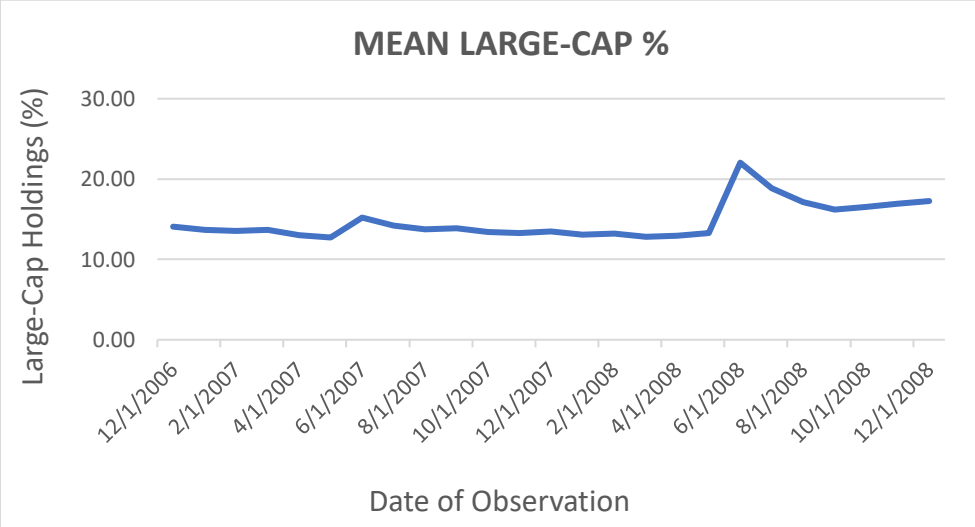


Table 1: Summary Statistics

This table reports the summary statistics of the 639 small-cap mutual funds used in the regressions. The sample period is from March 1999 to March 2003 (first recession) and from December 2005 to December 2009 (second recession). Large-cap stocks consist of the top 1,000 stocks ranked by total market capitalization. *Large-Cap Holdings* are the large-cap holdings by small-cap managers in each month. *LC Change Past 1Y (LC Change Past 2Y)* is the change in *Large-Cap Holdings over the past one year (two years)*. *LC Change Next 1Y (LC Change Next 2Y)* is the change in *Large-Cap Holdings over the next one year (two years)*. *AUM* is the natural logarithm of the total net assets. *Expense* is the expense ratio. *#ShareClass* is the number of share classes of each fund. *Past Return* is the monthly fund return in the previous month. *Turnover* is the turnover ratio. *R2_Skill* is $1 - R^2$ where R^2 is calculated from the Fama-French-Carhart four-factor model using returns in the past 24 months. *Past Adj. Return* is peer-adjusted *Past Return. Past Alpha* is the intercept of regressing Fama-French-Carhart four-factor model using returns in the past 24 months. *Sharpe Ratio* is the mean monthly excess return divided by the standard deviation of monthly excess return in the past 24 months. *CS* and CT are characteristic selectivity and characteristic timing measures documented in Daniel et al. (1997). *Risk* is the monthly change in the standard deviation of daily returns in each month. *Systematic Risk* is the monthly change in the beta on the market factor from regressing Fama-French-Carhart four-factor model using daily returns in each month. *Idiosyncratic Risk* is the monthly change in square root of the residual from regressing Fama-French-Carhart four-factor model using daily returns in each month. *Return* is the peer-adjusted return in the next 1, 3, 6, or 12 months. *Flow* is calculated using the formula found in Sirri and Tufano (1998): $(TNA_{i,t} - TNA_{i,t-1})*(1+R_{i,t})/ (TNA_{i,t-1})$ and is peer-adjusted in the 1, 3, 6, or 12 months.. *CAPM Alpha/FF3 Alpha/FF4 Alpha* is the difference between the monthly excess return and the expected return, where expected return is calculated using betas from regressing CAPM/Fama-French three-factor model/ Fama-French-Carhart four-factor model using returns in the past 24 months.

Variables	(1) Mean	(2) Median	(3) Std	(4) P25	(5) P75	(6) N
Large-Cap Holdings	0.184	0.139	0.173	0.060	0.254	33,503
LC Change Past 1Y	0.020	0.010	0.091	-0.026	0.063	26,597
LC Change Past 2Y	0.027	0.015	0.119	-0.034	0.085	23,927
LC Change Next 1Y	0.016	0.008	0.095	-0.032	0.061	27,072
LC Change Next 2Y	0.019	0.010	0.127	-0.047	0.084	25,560
AUM	5.026	5.130	1.726	3.854	6.221	31,822
Expense	0.014	0.013	0.009	0.011	0.016	30,672
#ShareClass	2.676	2.000	1.791	1.000	4.000	31,828
Past Return	0.000	0.006	0.076	-0.040	0.042	31,828
Turnover	0.700	0.780	6.147	0.470	1.290	30,909
R2_Skill	0.105	0.080	0.091	0.049	0.127	31,997
Past Adj. Return	0.000	0.000	0.014	-0.004	0.003	31,997
Past Alpha	0.001	0.000	0.009	-0.003	0.003	31,997
Sharpe Ratio	0.036	0.056	0.217	-0.130	0.204	31,997
CS	-0.001	0.000	0.028	-0.012	0.011	30,946
CT	0.000	0.000	0.009	-0.003	0.003	23,982
Risk	0.001	0.000	0.136	-0.003	0.002	30,283

Systematic Risk	-0.019	0.000	4.302	-0.122	0.119	30,287
Idiosyncratic Risk	0.001	0.000	0.135	-0.001	0.001	30,273
Return-1 mo.	0.000	-0.001	0.606	-0.015	0.013	32,858
Return-3 mo.	0.000	-0.002	1.068	-0.030	0.023	31,823
Return-6 mo.	0.000	-0.005	1.510	-0.054	0.034	31,823
Return-12 mo.	-0.059	-0.096	1.089	-0.219	0.035	31,823
Flow-1 mo.	0.000	-0.005	3.658	-0.027	0.029	32,808
Flow-3 mo.	0.000	-0.008	5.861	-0.075	0.202	32,851
Flow-6 mo.	0.000	0.007	8.038	-0.138	0.372	32,883
Flow-12 mo.	0.244	0.009	5.888	-0.206	0.657	32,851
Raw Return	0.005	0.006	0.610	-0.038	0.042	32,858
CAPM Alpha	0.003	0.000	0.048	-0.019	0.021	30,791
FF3 Alpha	0.000	-0.001	0.047	-0.014	0.013	30,791
FF4 Alpha	0.000	-0.001	0.049	-0.014	0.013	30,791

Table 2: Large-Cap Holdings by Small-Cap Managers: Pre- and Post-Peak

This table shows the difference between the monthly average of large-cap holdings for two 24-month periods: prior to the peak in economic activity and following the peak. *t*-statistics are in parentheses. ***, **, * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Variable	*Large-cap Holdings*		
	Pre-peak	*Post-peak*	*Post - Pre*
2001 Recession	0.180	0.235	0.055***
			(5.39)
2008 Recession	0.143	0.192	0.049***
			(5.63)

Table 3: The Drift to Large-Cap Holdings by Small-Cap Managers

This table reports the large-cap holdings by small-cap managers for three 24-month periods: a first period covering the 25th to 48th month prior to the peak in economic activity, a second period covering the 24 months prior to the peak and a third period covering the 24 months following the peak. *Post-peak* is an indicator variable equal to one if it is in the third time period and zero otherwise. *Pre-peak* is an indicator variable equal to one if it is in the first time period and zero otherwise. All variables are defined in Table 1. *t*-statistics, in parentheses, are based on standard errors clustered by fund. ***, **, * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Panel A: First recession period (peak=March 2001, trough=November 2001)

	(1)	(2)	(3)	(4)
Variables		*Large Cap Holding*		
Post-peak	0.039***	0.045***	0.039***	0.043***
	(8.62)	(10.22)	(7.69)	(9.44)
Pre-peak	0.011*	-0.001	0.011	0.002
	(1.87)	(-0.28)	(1.44)	(0.35)
AUM			0.018***	-0.002
			(4.79)	(-0.48)
#ShareClass			-0.007*	0.009*
			(-1.73)	(1.85)
Past Return			-0.049***	-0.046***
			(-5.77)	(-7.88)
Turnover			0.000	-0.000
			(0.09)	(-1.08)
Expense			1.218	-0.956
			(1.04)	(-0.74)
Observations	18,377	18,375	15,265	15,263
R-squared	0.018	0.725	0.058	0.742
Fund FE	No	Yes	No	Yes

Panel B: Second recession period (peak= December 2007, trough= June 2009)

	(1)	(2)	(3)	(4)
Variables		*Large Cap Holding*		
Post-peak	0.048***	0.052***	0.061***	0.058***
	(11.85)	(14.96)	(13.44)	(14.84)
Pre-peak	0.034***	0.031***	0.038***	0.033***
	(8.38)	(9.40)	(9.23)	(9.43)
AUM			0.026***	0.011***
			(5.88)	(3.41)
#ShareClass			-0.007*	-0.002
			(-1.95)	(-0.66)

Past Return			0.077**	0.064*
			(2.13)	(1.86)
Turnover			0.000	0.001***
			(0.10)	(3.46)
Expense			3.075***	1.196*
			(8.16)	(1.72)
Observations	28,155	28,146	25,902	25,897
R-squared	0.014	0.841	0.082	0.848
Fund FE	No	Yes	No	Yes

Table 4: The Drift to Large-Cap Holdings by Small-Cap Managers: Managers' Stock Selectivity (using four-factor alpha)

This table examines the relationship between the change in large-cap holdings by small-cap managers and managers' skill in stock selectivity. Each month, the skill variable is measured for the prior 24-month period. The skill measure, *Past Alpha*, is calculated using the four-factor formula found in Carhart (1997). The dummy variable *Post* creates a time series comparison before and after the peak in economic activity for each recession. All variables are defined in Table 1. *t*-statistics, in parentheses, are based on standard errors clustered by fund. ***, **, * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Panel A: First recession period (peak=March 2001, trough=November 2001)

	(1)	(2)	(3)	(4)
Variables	*1Y Future Change*		*2Y Future Change*	
Past Alpha × Post	1.540***	1.319***	2.632***	2.389***
	(5.81)	(5.03)	(8.08)	(7.57)
Post	-0.029***	-0.026***	-0.086***	-0.083***
	(-13.94)	(-11.49)	(-34.80)	(-30.56)
Past Alpha	-0.679***	-0.473***	-1.632***	-1.251***
	(-3.63)	(-2.58)	(-5.60)	(-4.58)
AUM		0.001		-0.015***
		(0.27)		(-5.50)
# Share Class		-0.009***		-0.004
		(-3.61)		(-1.49)
Past Return		0.053***		0.073***
		(4.01)		(4.15)
Turnover		0.000		0.000
		(1.41)		(0.31)
Expense		-0.526		-1.045
		(-0.66)		(-0.97)
Observations	10,171	9,722	9,733	9,332
R-squared	0.231	0.227	0.435	0.445
Fund FE	Yes	Yes	Yes	Yes

Panel B: Second recession period (peak= December 2007, trough= June 2009)

	(1)	(2)	(3)	(4)
Variables	*1Y Future Change*		*2Y Future Change*	
Past Alpha × Post	-0.359	-0.907**	-1.825***	-1.949***
	(-0.98)	(-2.44)	(-3.40)	(-3.50)
Post	0.016***	0.013***	-0.061***	-0.066***
	(10.84)	(7.60)	(-31.20)	(-30.25)
Past Alpha	0.213**	0.308***	0.489	0.494

	(2.13)	(2.91)	(1.44)	(1.45)
AUM		0.005***		-0.001
		(2.64)		(-0.35)
# Share Class		0.002		0.009***
		(1.29)		(5.25)
Past Return		-0.175***		-0.250***
		(-15.45)		(-16.35)
Turnover		-0.000***		-0.000***
		(-2.86)		(-3.06)
Expense		-0.750***		-0.227
		(-3.04)		(-0.88)
Observations	15,164	14,645	14,203	13,699
R-squared	0.131	0.153	0.250	0.263
Fund FE	Yes	Yes	Yes	Yes

Table 5: The Drift to Large-Cap Holdings by Small-Cap Managers: Managers' Stock Selectivity (using peer adjusted performance)

This table examines the relationship between the change in large-cap holdings by small-cap managers and managers' skill in stock selectivity for two 24-month periods: prior to the peak in economic activity and following the peak. The skill measure, *Past Adj. Return*, is peer adjusted for the average return of other funds in the same month. All variables are defined in Table 1. *t*-statistics, in parentheses, are based on standard errors clustered by fund. ***, **, * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Panel A: First recession period (peak=March 2001, trough=November 2001)

	(1)	(2)	(3)	(4)
Variables	*1Y Future Change*		*2Y Future Change*	
Past Adj. Return × Post	0.434**	0.398**	0.555**	0.517*
	(2.36)	(2.07)	(2.14)	(1.93)
Post	-0.026***	-0.023***	-0.080***	-0.078***
	(-12.66)	(-10.44)	(-33.11)	(-29.34)
Past Adj. Return	-0.263**	-0.265**	-0.808***	-0.674***
	(-2.15)	(-2.11)	(-5.02)	(-4.12)
AUM		0.002		-0.010***
		(1.02)		(-3.29)
# Share Class		-0.010***		-0.006**
		(-4.08)		(-2.31)
Past Return		0.057***		0.083***
		(4.32)		(5.32)
Turnover		0.000		0.000
		(1.37)		(0.25)
Expense		-0.739		-1.571
		(-0.92)		(-1.45)
Observations	10,171	9,722	9,733	9,332
R-squared	0.225	0.223	0.430	0.440
Fund FE	Yes	Yes	Yes	Yes

Panel B: Second recession period (peak= December 2007, trough= June 2009)

	(1)	(2)	(3)	(4)
Variables	*1Y Future Change*		*2Y Future Change*	
Past Adj. Return × Post	-1.404***	-1.803***	-4.071***	-4.357***
	(-4.75)	(-5.81)	(-9.30)	(-8.84)
Post	0.017***	0.014***	-0.058***	-0.062***
	(11.18)	(8.46)	(-30.22)	(-28.41)
Past Adj. Return	-0.097	-0.049	0.080	0.119
	(-0.90)	(-0.45)	(0.59)	(0.86)

AUM		0.007***		0.005*
		(3.96)		(1.87)
# Share Class		0.002		0.009***
		(1.20)		(5.02)
Past Return		-0.174***		-0.244***
		(-15.39)		(-16.20)
Turnover		-0.000***		-0.000***
		(-3.10)		(-3.36)
Expense		-0.869***		-0.580**
		(-3.52)		(-2.22)
Observations	15,164	14,645	14,203	13,699
R-squared	0.133	0.155	0.258	0.271
Fund FE	Yes	Yes	Yes	Yes

Table 6: The Drift to Large-Cap Holdings by Small-Cap Managers: Managers' Stock Selectivity (using (1- R^2))

This table examines the relationship between the change in large-cap holdings by small-cap managers and managers' skill in stock selectivity for two 24-month periods: prior to the peak in economic activity and following the peak. The skill measure, *R2_Skill*, is calculated as in Amihud and Goyenko (2013): (1- R^2). All variables are defined in Table 1. *t*-statistics, in parentheses, are based on standard errors clustered by fund. ***, **, * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Panel A: First recession period (peak=March 2001, trough=November 2001)

	(1)	(2)	(3)	(4)
Variables	*1Y Future Change*		*2Y Future Change*	
R2_Skill × Post	0.073***	0.061***	0.055**	0.051**
	(3.96)	(3.11)	(2.32)	(2.01)
Post	-0.037***	-0.033***	-0.089***	-0.086***
	(-10.94)	(-9.21)	(-21.09)	(-18.93)
R2_Skill	0.152***	0.166***	0.167***	0.174***
	(9.65)	(10.16)	(8.36)	(8.34)
AUM		0.002		-0.014***
		(0.73)		(-4.98)
# Share Class		-0.009***		-0.006**
		(-3.92)		(-2.17)
Past Return		0.039***		0.057***
		(2.89)		(3.53)
Turnover		0.000*		0.000
		(1.75)		(0.68)
Expense		-0.528		-1.580
		(-0.66)		(-1.47)
Observations	10,171	9,722	9,733	9,332
R-squared	0.242	0.241	0.437	0.448
Fund FE	Yes	Yes	Yes	Yes

Panel B: Second recession period (peak= December 2007, trough= June 2009)

	(1)	(2)	(3)	(4)
Variables	*1Y Future Change*		*2Y Future Change*	
R2_Skill × Post	0.251***	0.232***	0.098***	0.083***
	(9.00)	(7.99)	(3.48)	(2.74)
Post	-0.001	-0.004*	-0.062***	-0.067***
	(-0.42)	(-1.67)	(-22.41)	(-22.39)
R2_Skill	0.103***	0.114***	0.288***	0.293***
	(5.14)	(5.84)	(11.81)	(11.45)
AUM		-0.001		-0.007***
		(-0.59)		(-2.99)

# Share Class		0.003**		0.010***
		(2.28)		(5.90)
Past Return		-0.170***		-0.235***
		(-15.05)		(-15.70)
Turnover		-0.000		-0.000
		(-1.08)		(-0.87)
Expense		-0.544*		0.354
		(-1.91)		(1.18)
Observations	15,188	14,669	14,227	13,723
R-squared	0.153	0.171	0.269	0.281
Fund FE	Yes	Yes	Yes	Yes

Table 7: The Drift to Large-Cap Holdings by Small-Cap Managers: Managers' Stock Selectivity (using Sharpe ratio)

This table examines the relationship between the change in large-cap holdings by small-cap managers and managers' skill in stock selectivity for two 24-month periods: prior to the peak in economic activity and following the peak. The skill measure, *Sharpe Ratio*, is calculated as in Sharpe (1966): average monthly excess return over the past 24 months divided by the standard deviation of the monthly excess returns for the same period. All variables are defined in Table 1. *t*-statistics, in parentheses, are based on standard errors clustered by fund. ***, **, * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Panel A: First recession period (peak=March 2001, trough=November 2001)

	(1)	(2)	(3)	(4)
Variables	*1Y Future Change*		*2Y Future Change*	
Sharpe Ratio × Post	0.160***	0.166***	0.268***	0.278***
	(10.59)	(10.57)	(15.58)	(15.76)
Post	-0.030***	-0.027***	-0.094***	-0.090***
	(-13.36)	(-10.82)	(-35.25)	(-30.53)
Sharpe Ratio	-0.031***	-0.023**	-0.109***	-0.086***
	(-2.80)	(-2.06)	(-8.74)	(-6.87)
AUM		-0.009***		-0.026***
		(-3.91)		(-9.10)
# Share Class		-0.006***		-0.001
		(-2.62)		(-0.20)
Past Return		0.036***		0.058***
		(2.92)		(3.88)
Turnover		0.000		0.000
		(1.55)		(0.69)
Expense		0.378		0.339
		(0.48)		(0.32)
Observations	10,171	9,722	9,733	9,332
R-squared	0.244	0.242	0.446	0.460
Fund FE	Yes	Yes	Yes	Yes

Panel B: Second recession period (peak= December 2007, trough= June 2009)

	(1)	(2)	(3)	(4)
Variables	*1Y Future Change*		*2Y Future Change*	
Sharpe Ratio × Post	0.049***	0.062***	0.073***	0.092***
	(3.88)	(4.59)	(4.46)	(5.31)
Post	0.053***	0.055***	-0.040***	-0.037***
	(16.96)	(17.86)	(-9.62)	(-8.81)

Sharpe Ratio	0.076***	0.102***	0.028**	0.053***
	(7.23)	(9.63)	(2.03)	(3.70)
AUM		-0.010***		-0.015***
		(-5.04)		(-5.38)
# Share Class		0.005***		0.012***
		(3.88)		(6.79)
Past Return		-0.224***		-0.280***
		(-19.62)		(-18.05)
Turnover		-0.000**		-0.000**
		(-2.27)		(-2.40)
Expense		-0.595***		0.055
		(-2.59)		(0.22)
Observations	15,164	14,645	14,203	13,699
R-squared	0.152	0.182	0.256	0.274
Fund FE	Yes	Yes	Yes	Yes

Table 8: The Drift to Large-Cap Holdings by Small-Cap Managers: Managers' Characteristic Selectivity (using CS Measure)

This table examines the relationship between the change in large-cap holdings by small-cap managers and managers' skill in characteristic selectivity for two 24-month periods: prior to the peak in economic activity and following the peak. The skill measure, *CS*, is calculated as in Daniel et al. (1997). All variables are defined in Table 1. *t*-statistics, in parentheses, are based on standard errors clustered by fund. ***, **, * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Panel A: First recession period (peak=March 2001, trough=November 2001)

	(1)	(2)	(3)	(4)
Variables	*1Y Future Change*		*2Y Future Change*	
CS × *Post*	0.132*	0.149**	0.050	0.087
	(1.88)	(2.04)	(0.62)	(1.05)
Post	-0.025***	-0.023***	-0.081***	-0.077***
	(-12.07)	(-9.80)	(-32.02)	(-26.90)
CS	0.093***	0.066*	0.028	-0.032
	(2.64)	(1.75)	(0.67)	(-0.67)
AUM		0.000		-0.015***
		(0.10)		(-5.27)
# Share Class		-0.010***		-0.004
		(-3.87)		(-1.32)
Past Return		0.034***		0.081***
		(2.60)		(4.09)
Turnover		0.000		-0.000
		(0.62)		(-0.50)
Expense		-0.780		-0.315
		(-0.92)		(-0.27)
Observations	9,695	9,027	9,244	8,626
R-squared	0.223	0.227	0.417	0.430
Fund FE	Yes	Yes	Yes	Yes

Panel B: Second recession period (peak= December 2007, trough= June 2009)

	(1)	(2)	(3)	(4)
Variables	*1Y Future Change*		*2Y Future Change*	
CS × *Post*	-0.053	-0.374***	-0.286**	-0.723***
	(-0.60)	(-4.00)	(-2.35)	(-5.58)
Post	0.017***	0.013***	-0.059***	-0.065***
	(11.18)	(7.89)	(-30.23)	(-29.85)
CS	0.503***	0.714***	0.524***	0.846***
	(6.85)	(9.50)	(5.04)	(7.70)
AUM		0.003*		-0.003

		(1.79)		(-1.12)
# Share Class		0.002		0.009***
		(1.55)		(5.01)
Past Return		-0.166***		-0.256***
		(-13.79)		(-16.26)
Turnover		-0.000***		-0.000**
		(-2.83)		(-2.39)
Expense		-0.676***		-0.050
		(-2.60)		(-0.16)
Observations	14,749	14,095	13,799	13,200
R-squared	0.146	0.165	0.257	0.270
Fund FE	Yes	Yes	Yes	Yes

Table 9: The Drift to Large-Cap Holdings by Small-Cap Managers: Managers' Characteristic Timing (using CT measure)

This table examines the relationship between the change in large-cap holdings by small-cap managers and managers' skill in characteristic timing for two 24-month periods: prior to the peak in economic activity and following the peak. The skill measure, *CT*, is calculated as in Daniel et al. (1997) All variables are defined in Table 1. *t*-statistics, in parentheses, are based on standard errors clustered by fund. ***, **, * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Panel A: First recession period (peak=March 2001, trough=November 2001)

	(1)	(2)	(3)	(4)
Variables	*1Y Future Change*		*2Y Future Change*	
CT × Post	-0.930***	-0.932***	-0.730***	-0.652**
	(-3.89)	(-3.79)	(-2.80)	(-2.45)
Post	-0.024***	-0.021***	-0.077***	-0.073***
	(-9.13)	(-7.09)	(-23.54)	(-20.17)
CT	0.644***	0.612***	0.430**	0.333
	(3.39)	(3.14)	(2.06)	(1.57)
AUM		-0.000		-0.017***
		(-0.13)		(-4.22)
# Share Class		-0.012***		-0.006
		(-3.60)		(-1.62)
Past Return		0.043***		0.072***
		(2.82)		(3.58)
Turnover		-0.000		-0.000
		(-0.76)		(-0.29)
Expense		-1.299		-3.332**
		(-1.13)		(-2.12)
Observations	6,375	6,055	6,067	5,784
R-squared	0.238	0.246	0.430	0.443
Fund FE	Yes	Yes	Yes	Yes

Panel B: Second recession period (peak= December 2007, trough= June 2009)

	(1)	(2)	(3)	(4)
Variables	*1Y Future Change*		*2Y Future Change*	
CT × Post	0.619**	0.552*	0.007	0.082
	(2.11)	(1.89)	(0.02)	(0.21)
Post	0.017***	0.015***	-0.058***	-0.063***
	(10.51)	(8.16)	(-27.36)	(-26.59)
CT	-0.134	-0.211	0.670**	0.467
	(-0.51)	(-0.81)	(2.07)	(1.41)
AUM		0.007***		-0.002

		(3.37)		(-0.68)
# Share Class		0.002		0.007***
		(1.30)		(4.16)
Past Return		-0.162***		-0.233***
		(-13.02)		(-14.12)
Turnover		-0.000		-0.000
		(-1.64)		(-0.29)
Expense		0.018		0.990**
		(0.05)		(2.21)
Observations	12,616	12,086	11,835	11,346
R-squared	0.143	0.160	0.263	0.273
Fund FE	Yes	Yes	Yes	Yes

Table 10: Future Returns and the Drift to Large-Cap Holdings by Small-Cap Managers

This table examines future returns and the change in large-cap holdings by small-cap managers. The dependent variable *Return* is the peer adjusted return in the next 1, 3, 6, or 12 months. All variables are defined in Table 1. *t*-statistics, in parentheses, are based on standard errors clustered by fund. ***, **, * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Panel A: First recession period (peak=March 2001, trough=November 2001)

	(1)	(2)	(3)	(4)
Variables	*Return-1 mo.*	*Return-3 mo.*	*Return-6 mo.*	*Return-12 mo.*
LC Change Past 1Y	0.030***	0.035***	0.021	0.058**
	(4.84)	(2.82)	(1.32)	(2.22)
AUM	-0.011***	-0.038***	-0.075***	0.016***
	(-8.50)	(-14.47)	(-21.99)	(2.96)
# Share Class	0.003**	0.006**	0.009***	-0.015***
	(2.16)	(2.17)	(2.78)	(-2.76)
Past Return	0.019***	0.013	0.067***	0.040
	(2.84)	(0.97)	(3.94)	(1.45)
Turnover	-0.000	-0.000**	-0.001***	-0.000
	(-0.91)	(-2.22)	(-2.84)	(-0.30)
Expense	-1.291***	-4.029***	-5.700***	-11.821***
	(-2.58)	(-4.06)	(-4.46)	(-5.66)
Observations	9,160	9,185	9,185	9,185
R-squared	0.053	0.108	0.169	0.083
Fund FE	Yes	Yes	Yes	Yes

Panel B: Second recession period (peak= December 2007, trough= June 2009)

	(1)	(2)	(3)	(4)
Variables	*Return-1 mo.*	*Return-3 mo.*	*Return-6 mo.*	*Return-12 mo.*
LC Change Past 1Y	0.002	0.010	0.044***	-0.159***
	(0.48)	(1.25)	(3.84)	(-6.98)
AUM	-0.009***	-0.028***	-0.057***	0.046***
	(-10.70)	(-19.99)	(-30.06)	(12.34)
# Share Class	-0.000	-0.003**	-0.004**	0.008**
	(-0.48)	(-2.32)	(-2.17)	(2.47)
Past Return	0.102***	0.041***	0.099***	-0.021
	(18.00)	(4.20)	(7.33)	(-0.79)
Turnover	-0.000**	-0.001***	-0.001***	0.001
	(-2.43)	(-3.16)	(-3.25)	(1.25)
Expense	-0.107	-0.412**	-0.768***	-1.015**
	(-1.13)	(-2.56)	(-3.46)	(-2.31)

Observations	15,311	15,399	15,399	15,399
R-squared	0.042	0.062	0.111	0.039
Fund FE	Yes	Yes	Yes	Yes

Table 11: Future Flows and the Drift to Large-Cap Holdings by Small-Cap Managers

This table examines future flows and the change in large-cap holdings by small-cap managers. The dependent variable *Flow* is the

flow in the next 1, 3, 6, or 12 months. Results control for contemporaneous returns. All variables are defined in Table 1. *t*-statistics, in parentheses, are based on standard errors clustered by fund. ***, **, * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Panel A: First recession period (peak=March 2001, trough=November 2001)

	(1)	(2)	(3)	(4)
Variables	*Flow-1 mo.*	*Flow-3 mo.*	*Flow-6 mo.*	*Flow-12 mo.*
LC Change Past 1Y	0.047***	0.088	0.063	0.070
	(2.90)	(1.38)	(0.72)	(1.08)
Return-1 mo.	-0.187***			
	(-6.80)			
Return-3 mo.		-0.237***		
		(-4.33)		
Return-6 mo.			-0.130**	
			(-2.24)	
Return-12 mo.				0.043
				(1.63)
AUM	-0.032***	-0.113***	-0.200***	-0.109***
	(-9.23)	(-8.30)	(-10.54)	(-8.02)
# Share Class	0.005	0.007	0.015	-0.001
	(1.62)	(0.54)	(0.82)	(-0.08)
Past Return	0.056***	0.229***	0.422***	0.304***
	(3.27)	(3.40)	(4.57)	(4.46)
Turnover	-0.000	-0.001	-0.001	-0.001
	(-1.28)	(-1.05)	(-1.14)	(-0.61)
Expense	-6.149***	-24.358***	-22.431***	-26.324***
	(-4.76)	(-4.77)	(-3.21)	(-5.10)
Observations	15,298	15,312	15,332	15,349
R-squared	0.079	0.245	0.302	0.306
Fund FE	Yes	Yes	Yes	Yes

Panel B: Second recession period (peak= December 2007, trough= June 2009)

	(1)	(2)	(3)	(4)
Variables	*Flow-1 mo.*	*Flow-3 mo.*	*Flow-6 mo.*	*Flow-12 mo.*
LC Change Past 1Y	0.768***	1.546***	2.278***	2.979***
	(2.66)	(3.67)	(3.13)	(6.98)

Return-1 mo.	0.125			
	(0.25)			
Return-3 mo.		0.015		
		(0.04)		
Return-6 mo.			0.245	
			(0.47)	
Return-12 mo.				-0.633***
				(-4.10)
AUM	-0.132***	-0.363***	-0.730***	-0.593***
	(-2.74)	(-5.13)	(-5.87)	(-8.34)
# Share Class	0.034	0.108*	0.162	0.300***
	(0.81)	(1.75)	(1.52)	(4.81)
Past Return	-0.684**	-0.440	1.130	-1.566***
	(-2.00)	(-0.89)	(1.32)	(-3.13)
Turnover	-0.001	0.000	-0.001	-0.005
	(-0.08)	(0.02)	(-0.05)	(-0.52)
Expense	-121.961***	-253.694***	-586.075***	-253.456***
	(-21.49)	(-30.97)	(-41.65)	(-30.62)
Observations	15,298	15,312	15,332	15,312
R-squared	0.079	0.245	0.302	0.247
Fund FE	Yes	Yes	Yes	Yes

Table 12: Total Risk and the Drift to Large-Cap Holdings by Small-Cap Managers

This table examines total risk and the change in large-cap holdings by small-cap managers for two 24-month periods: prior to the peak in economic activity and following the peak. The dependent variable *Risk* is the monthly standard deviation of daily returns. All variables are defined in Table 1. *t*-statistics, in parentheses, are based on standard errors clustered by fund. ***, **, * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Panel A: First recession period (peak=March 2001, trough=November 2001)

	(1)	(2)	(3)	(4)
Variables		*Risk*		
LC Change Past 1Y	-0.002*	-0.001		
	(-1.88)	(-1.01)		
LC Change Past 2Y			-0.001	-0.001
			(-0.86)	(-1.40)
AUM		0.001***		0.001***
		(3.21)		(3.97)
#ShareClass		-0.001**		-0.000*
		(-2.35)		(-1.82)
Past Return		-0.031		0.001
		(-1.18)		(0.38)
Turnover		0.000		0.000*
		(1.50)		(1.91)
Expense		0.002		-0.066
		(0.02)		(-0.49)
Observations	8,723	8,170	7,500	7,042
R-squared	0.006	0.055	0.029	0.032
Fund FE	Yes	Yes	Yes	Yes

Panel B: Second recession period (peak= December 2007, trough= June 2009)

	(1)	(2)	(3)	(4)
Variables		*Risk*		
LC Change Past 1Y	0.010	-0.001***		
	(0.76)	(-3.06)		
LC Change Past 2Y			-0.004***	-0.002***
			(-10.15)	(-4.73)
AUM		0.001***		0.001***
		(7.67)		(7.80)
#ShareClass		-0.000**		-0.000**

		(-2.16)		(-2.28)
Past Return		-0.018***		-0.017***
		(-5.71)		(-5.14)
Turnover		-0.000		0.000
		(-0.06)		(0.50)
Expense		-0.002		0.014
		(-0.11)		(0.49)
Observations	15,509	14,524	14,322	13,444
R-squared	0.067	0.054	0.013	0.054
Fund FE	Yes	Yes	Yes	Yes

Table 13: Idiosyncratic Risk and the Drift to Large-Cap Holdings by Small-Cap Managers

This table examines idiosyncratic risk and the change in large-cap holdings by small-cap managers for two 24-month periods: prior to the peak in economic activity and following the peak. The dependent variable I*diosyncratic Risk* is the residual from regressing daily returns on the Fama-French-Carhart four factors in each month. All variables are defined in Table 1. *t*-statistics, in parentheses, are based on standard errors clustered by fund. ***, **, * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Panel A: First recession period (peak=March 2001, trough=November 2001)

	(1)	(2)	(3)	(4)
Variables		*Idiosyncratic Risk*		
LC Change Past 1Y	-0.001	0.000		
	(-1.28)	(0.50)		
LC Change Past 2Y			-0.000	-0.000
			(-0.30)	(-0.41)
AUM		0.000		0.000
		(1.20)		(1.22)
#ShareClass		-0.000*		-0.000**
		(-1.81)		(-2.34)
Past Return		-0.027		-0.000
		(-1.23)		(-0.09)
Turnover		0.000		0.000
		(0.57)		(1.54)
Expense		-0.063		-0.141
		(-0.94)		(-1.22)
Observations	8,718	8,168	7,500	7,042
R-squared	0.002	0.067	0.032	0.033
Fund FE	Yes	Yes	Yes	Yes

Panel B: Second recession period (peak= December 2007, trough= June 2009)

	(1)	(2)	(3)	(4)
Variables		*Idiosyncratic Risk*		
LC Change Past 1Y	0.013	-0.000		
	(0.97)	(-0.90)		
LC Change Past 2Y			-0.000***	-0.000
			(-5.28)	(-1.18)
AUM		0.000***		0.000***
		(5.06)		(3.58)
#ShareClass		-0.000		-0.000

		(-1.19)		(-1.32)
Past Return		-0.003		-0.003
		(-0.92)		(-0.87)
Turnover		0.000		0.000
		(0.16)		(1.25)
Expense		0.001		-0.001
		(0.15)		(-0.09)
Observations	15,508	14,523	14,321	13,443
R-squared	0.067	0.007	0.002	0.006
Fund FE	Yes	Yes	Yes	Yes

Table 14: Systematic Risk and the Drift to Large-Cap Holdings by Small-Cap Managers

This table examines systematic risk and the change in large-cap holdings by small-cap managers for two 24-month periods: prior to the peak in economic activity and following the peak. The dependent variable *Systematic Risk* is the loading on market factor from regressing daily returns on Fama-French-Carhart four factors in each month. All variables are defined in Table 1. *t*-statistics, in parentheses, are based on standard errors clustered by fund. ***, **, * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Panel A: First recession period (peak=March 2001, trough=November 2001)

	(1)	(2)	(3)	(4)
Variables		*Systematic Risk*		
LC Change Past 1Y	0.622	0.455		
	(1.21)	(0.99)		
LC Change Past 2Y			0.006	0.003
			(0.13)	(0.06)
AUM		0.005		0.016
		(0.25)		(1.51)
#ShareClass		0.006		-0.006
		(0.45)		(-1.25)
Past Return		1.896		-0.270*
		(1.12)		(-1.72)
Turnover		-0.000		-0.001
		(-0.37)		(-1.62)
Expense		8.216		12.852
		(1.22)		(1.41)
Observations	8,724	8,170	7,501	7,042
R-squared	0.167	0.232	0.026	0.029
Fund FE	Yes	Yes	Yes	Yes

Panel B: Second recession period (peak= December 2007, trough= June 2009)

	(1)	(2)	(3)	(4)
Variables		*Systematic Risk*		
LC Change Past 1Y	-0.395	0.013		
	(-0.97)	(0.83)		
LC Change Past 2Y			0.007	0.000
			(0.46)	(0.02)
AUM		-0.000		-0.001
		(-0.18)		(-0.50)

#ShareClass		-0.001		0.000
		(-0.58)		(0.21)
Past Return		-0.178*		-0.154
		(-1.84)		(-1.48)
Turnover		-0.000**		-0.000***
		(-2.48)		(-5.62)
Expense		-3.480***		-5.055***
		(-5.86)		(-4.85)
Observations	15,512	14,526	14,324	13,446
R-squared	0.067	0.013	0.012	0.019
Fund FE	Yes	Yes	Yes	Yes

Table 15: Persistence and the Drift to Large-Cap Holdings by Small-Cap Managers

This table examines the future change in large-cap holdings and the change in large-cap holdings by small-cap managers for two 24-month periods: prior to the peak in economic activity and following the peak. All variables are defined in Table 1. *t*-statistics, in parentheses, are based on standard errors clustered by fund. ***, **, * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Panel A: First recession period (peak=March 2001, trough=November 2001)

	(1)	(2)	(3)	(4)
Variables		*1Y Future Change*		
LC Change Past 1Y	-0.277***	-0.279***		
	(-9.13)	(-8.99)		
LC Change Past 2Y			-0.482***	-0.489***
			(-13.17)	(-13.19)
AUM		0.006		0.009
		(0.96)		(1.03)
#ShareClass		-0.015***		-0.025***
		(-2.75)		(-3.28)
Past Return		0.074***		0.146***
		(4.11)		(8.44)
Turnover		-0.000		-0.001**
		(-0.46)		(-1.97)
Expense		-2.311		-5.828*
		(-1.29)		(-1.72)
Observations	8,018	7,594	6,624	6,316
R-squared	0.274	0.283	0.525	0.545
Fund FE	Yes	Yes	Yes	Yes

Panel B: Second recession period (peak= December 2007, trough= June 2009)

	(1)	(2)	(3)	(4)
Variables		*1Y Future Change*		
LC Change Past 1Y	-0.340***	-0.356***		
	(-11.80)	(-12.41)		
LC Change Past 2Y			-0.683***	-0.685***
			(-21.11)	(-19.95)
AUM		-0.008		-0.004
		(-1.62)		(-0.49)
#ShareClass		0.012***		0.003

		(3.64)		(0.64)
Past Return		-0.176***		-0.153***
		(-12.48)		(-10.54)
Turnover		-0.000*		-0.000**
		(-1.89)		(-2.39)
Expense		-1.268***		-0.799*
		(-4.06)		(-1.79)
Observations	13,711	13,133	11,879	11,408
R-squared	0.209	0.234	0.475	0.478
Fund FE	Yes	Yes	Yes	Yes

Table 16: Time Series Placebo Test and the Drift to Large-Cap Holdings by Small-Cap Managers

This table examines using a Dec. 2005 pseudo-peak and the change in large-cap holdings by small-cap managers for two 24-month periods: prior to the peak in economic activity and following the peak. The variable *Post Peak* represents the period 2006-2007. All variables are defined in Table 1. *t*-statistics, in parentheses, are based on standard errors clustered by fund. ***, **, * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Panel A: Pseudo-recession period (peak=December 2005)

	(1)	(2)	(3)	(4)
Variables		*Large Cap Holding*		
Post Peak	0.002	0.004	0.003	0.004
	(0.09)	(0.21)	(0.13)	(0.27)
AUM			0.026**	0.002
			(5.18)	(0.52)
#ShareClass			-0.008	-0.011**
			(-2.13)	(-3.37)
Past Return			0.025	0.006
			(1.05)	(0.43)
Turnover			-0.004	-0.000
			(-0.98)	(-0.53)
Expense			4.266**	3.575
			(5.37)	(2.25)
Observations	18,594	18,594	17,227	17,221
R-squared	0.000	0.896	0.066	0.902
Fund FE	No	Yes	No	Yes

Table 17: Alpha and the Drift to Large-Cap Holdings by Small-Cap Managers

This table examines the future change in large-cap holdings and the change in large-cap holdings by small-cap managers for two 24-month periods: prior to the peak in economic activity and following the peak. All variables are defined in Table 1. *t*-statistics, in parentheses, are based on standard errors clustered by fund. ***, **, * denote statistical significance at the 0.01, 0.05, and 0.10 levels, respectively.

Panel A: First recession period (peak=March 2001, trough=November 2001)

Variables	(1) *Raw return*	(2) *CAPM Alpha*	(3) *FF3 Alpha*	(4) *FF4 Alpha*
LC Change Past 1Y	0.074***	0.004	0.010	0.005
	(7.70)	(0.70)	(1.60)	(0.79)
AUM	-0.030***	-0.001	0.002	-0.001
	(-14.75)	(-0.99)	(1.63)	(-0.72)
# Share Class	-0.001	0.001	0.000	0.001
	(-0.57)	(0.78)	(0.02)	(0.85)
Past Return	0.029***	0.447***	0.222***	0.246***
	(2.83)	(75.87)	(35.01)	(37.45)
Turnover	-0.000*	0.000	-0.000	-0.000
	(-1.78)	(0.31)	(-0.79)	(-1.31)
Expense	-4.864***	-0.496	-0.451	0.378
	(-6.28)	(-1.12)	(-0.94)	(0.76)
Observations	9,160	9,125	9,125	9,125
R-squared	0.071	0.422	0.165	0.163
Fund FE	Yes	Yes	Yes	Yes

Panel B: Second recession period (peak= December 2007, trough= June 2009)

Variables	(1) *Raw return*	(2) *CAPM Alpha*	(3) *FF3 Alpha*	(4) *FF4 Alpha*
LC Change Past 1Y	-0.011	0.021***	0.000	0.007*
	(-1.62)	(7.68)	(0.04)	(1.83)
AUM	-0.015***	-0.003***	-0.001	-0.002***
	(-13.83)	(-7.45)	(-1.52)	(-3.22)
# Share Class	-0.001	0.002***	0.001	0.001
	(-0.85)	(4.53)	(1.59)	(1.32)
Past Return	0.292***	0.150***	0.096***	0.100***
	(36.86)	(47.03)	(21.50)	(21.06)

Turnover	-0.000	-0.000***	-0.000**	-0.000
	(-0.33)	(-3.38)	(-2.14)	(-0.80)
Expense	-0.203	-0.110**	-0.096	-0.142*
	(-1.53)	(-2.03)	(-1.28)	(-1.77)
Observations	15,311	15,221	15,221	15,221
R-squared	0.106	0.163	0.057	0.047
Fund FE	Yes	Yes	Yes	Yes

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VITA

Dr. Peter McGaffigan is a portfolio manager with 25 years of experience personally managing multi-asset portfolios and 10 of those years also leading investment teams.

Peter is currently a managing director and portfolio manager for Wells Fargo, where he manages over $1.5 billion of investable assets for high-net-worth individuals, foundations, and endowments.

Previously Peter managed a team of portfolio managers as a managing director and investment executive for U.S. Trust. He was responsible for ensuring the proper diversification of client portfolios within the context of each investors risk and return parameters.

Peter has a Doctor of Philosophy in Business Administration from the J. Mack Robinson College of Business at Georgia State University, a Master of Management from the J.K. Kellogg Graduate School of Management at Northwestern University and a BA in Economics from Lawrence University in Appleton, WI.