Sentimental Mutual Fund Flows[☆]

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Abstract

Sentiment-driven investors tend to trade more aggressively but are more inexperienced and naïve. Using mutual fund flows, we examine investor behavior during high and low sentiment periods. Our results show that retail investors move money toward funds with smaller size, higher market exposure, higher past returns, and more visibility during high sentiment period. On the other hand, retail investors are more sensitive to fund expenses, fund portfolio styles, and reputation of fund managers during low sentiment period. We further show that in contrast to retail investors, institutional investor behavior does not vary significantly between high and low sentiment periods. Finally, we show that the performance of new money flows is consistent with implications of investment sentiment on stock valuations. Specifically, new money inflows to retail funds earn significantly higher abnormal returns than outflows during low sentiment periods.

Key words: Investment Sentiment; Mutual Fund Flows; Fund Characteristics; Marketing and Fund Visibility; Star Managers; Performance of New Money Flows

I. Introduction

Investors' trading is driven by their sentiment, i.e., their subjective view of asset valuation and market conditions. Growing body of literature documents that investor sentiment has a significant effect on market and individual security returns (e.g., De Long, Shleifer, Summers and Waldmann, 1990; Lee, Shleifer, and Thaler, 1991; Barberis, Shleifer, and Vishny, 1998; Baker and Wurgler, 2006, 2007; Baker, Wurgler, and Yuan, 2012). For example, Karlsson, Loewenstein, and Seppi, (2005) and Yuan (2008) find that speculative investors participate more in stock market and tend to trade more aggressively during the high-sentiment periods. Because the sentiment-driven traders tend to be naïve and inexperienced, they are, in aggregate, behave less rationally and exhibit stronger behavioral biases during the high-sentiment periods. Consistent with this argument, recent studies show that investor sentiment affects cross-section of stock returns, a broad set of anomalies, and mean-variance tradeoff (e.g., Baker and Wurgler, 2006; Yu and Yuan, 2011, Stambaugh, Yu and Yuan, 2012).

Overall, aforementioned studies underline the clear differences in the impact of investor sentiment on future market and stock returns. Surprisingly, no systematic analysis has been performed regarding the behaviors of individual investors across different sentiment periods. In this paper, we fill this gap and study the behavioral differences in individual investors across different sentiment periods via the examination of mutual fund flow data. Mutual funds provide an ideal setting in examining investors' behavior. First of all, mutual funds represent a very substantial component of U.S. household portfolios.[1] That is, retail investors as a group exert a significant influence on stock prices (Frazzini and Lamont (2008) and Ben-Rephael, Kandel, and Wohl (2012)). Second, since fund investors delegate their investment management to fund

[1] According to 2013 Investment Company Institute Fact Book, the median amount invested in mutual funds was $100,000.

managers, mutual fund investors in general are perceived as the least informed in the market, and are likely to prone to investor sentiment (Indro (1994) and Warther (1995)). Thirdly, since we can classify mutual funds as either individual funds or institutional funds, our analysis further examines the differences in behaviors between institutional versus individual investors.

In this study, we examine how different mutual fund investors behave during the high- and low-sentiment periods. To do so, we broadly group funds' characteristics into four main fund categories: (i) style and risk, (ii) costs, (iii) past performance, and (iv) marketing and visibility. These categorizations help us to pinpoint behavioral similarities and differences in mutual fund investors across different sentiment periods. Specifically, using data on mutual fund flows, we examine the following questions. Do investors exhibit the same preferences for investment objectives, as measured by fund style and fund portfolio risk, during different sentiment periods? Our hypothesis is that during high sentiment periods, investors tend to trade more aggressively and have more risk exposure in their portfolios. As such, mutual fund investors are expected to select funds with more aggressive style and higher portfolio exposure to market risk. Do investors pay the same attention to fund attributes, such as expense ratios, that have adverse effects on fund performance during different sentiment periods? Since sentiment-driven investors are less experienced and more naïve, fund flows are expected to be less sensitive to costs of investing in mutual funds during the high-sentiment periods. Do investors exhibit the same rationality or behavioral biases in selecting funds during different sentiment periods? Due to the higher presence and trading of sentiment-driven investors, we expect that mutual fund investors are expected to show stronger behavioral biases during high sentiment periods. In particular, during high sentiment periods mutual fund investors are more attracted to funds with better past performance, and higher fund visibility. Finally, do institutional investors behave similarly as

individual investors during high and low sentiment periods? Compared to retail mutual fund investors, institutional investors are typically viewed as being relatively sophisticated investors with better understanding of the funds' performance unrelated characteristics. If institutional investors are more rational and less sentiment driven, then they are expected to exhibit less variation in terms of preferences for fund risk characteristics, sensitivity to costs of investing, and rationality or behavioral biases in fund selection during different sentiment periods.

We next examine the impact of investor sentiment on fund performance, particularly the performance of new money flows. Previous literature extensively investigates the predictive power of investor flows for future fund return and documents that fund investors have an ability to identify superior fund managers and invest accordingly (Gruber (1996) and Zheng (1999)). This finding is referred to as the "smart money" effect in the literature. While Sapp and Tiwari (2004) challenge return predictability of fund flows and document that the smart money effect is explained by the momentum effect in stock returns, using monthly fund flows over more recent sample period Keswani and Stolin (2008) show the there is a significant smart money effect even after controlling for momentum factor. Existing studies also document that that investor sentiment has a significant effect on the cross-section of stock returns. Existing literature also documents that investor sentiment has a significant effect on the cross-section of stock returns. In particular, stocks tend to overvalued during high sentiment periods but undervalued during low sentiment periods. This leads to prediction that new money inflows to mutual funds are expected to outperform new money outflows during low sentiment periods. In addition, new money flows to mutual funds during low sentiment periods outperform new money flows during high sentiment periods. However, new money inflows to mutual funds do not necessarily underperform new money outflows during high sentiment periods.

Our results highlight the significant differences in mutual fund investors' behavior and preferences for the mutual fund characteristics between the high- and low-sentiment periods. More specifically, we document that fund investors are more likely to invest in funds with more speculative and riskier style during the high sentiment periods. Interestingly, while flowing into more speculative funds, fund investors during the high-sentiment periods seem to select funds with less active fund management. In addition, while fund investors, on average, seem to pay attention total costs of their investment during the whole sample period, we find the negative association between fund flows and expense ratio is driven solely during the low-sentiment periods. This finding suggests that increased presence and trading of sentiment-driven investors during the high-sentiment periods undermine otherwise negative relation between fund flows and fund expenses documented in the previous literature. Finally, we also show that fund flows sensitivity to past performance is significantly more pronounced during the high-sentiment periods, consistent with the notion that inexperienced and naïve investors put more weight on past performance during the high-sentiment periods.

When we examine the relation between fund flows and performance unrelated fund characteristics including marketing and fund characteristics that enhance the fund visibility, our findings further show a clear difference in the relation between fund flows and these characteristics. For example, marketing efforts are more impact on investors purchasing decision during the high-sentiment periods. In sharp contrast, we find a negative relation between fund flows and fund's marketing efforts during the low sentiment periods. More importantly, brand recognition and star family affiliation attracts greater investor flows during the high-sentiment periods. These results are consistent with the notion that naïve and inexperienced fund investors during the high-sentiment periods put more weight on visibility characteristics of mutual funds

when selecting funds. Surprisingly, the relation between fund flows and stellar performance (as opposed to past performance) is more pronounced during the low-sentiment periods. This finding suggests that the stellar performance is more important assurance about the quality of fund management during the high-sentiment periods. Further, while institutional investors seem to prefer more speculative and riskier funds during the high sentiment period compared to the low-sentiment periods, we show that significant variation in fund flows sensitivity to fund characteristics is mainly driven by retail investors. This result suggests that retail fund investors are more prone to investor sentiment.

We next examine the impact of investor sentiment on fund performance. Once again, our analysis shows clear differences in predictive ability of money flows for subsequent fund performance between different sentiment periods. In specific, we find that while fund flows during the low-sentiment periods predict future fund performance even after controlling for momentum factor, there is no relation money flows and fund performance during the high-sentiment periods. These findings suggest that not only fund investors exhibit behavioral differences in preferences for fund characteristics, but also the predictive power of investor flows for subsequent fund performance significantly vary across different sentiment periods. Further, our findings suggest that the so-called “smart money” effect is entirely driven by fund flows during the low sentiment periods.

Our paper makes a number of contributions to mutual fund literature and more generally growing literature on the role of investor sentiment in asset pricing. First of all, we note that our study is distinct from the previous literature that uses aggregate fund flows as a measure of investors sentiment (Frazzini and Lamont (2008), Ben-Rephael, Kandel, and Wohl (2012)) and examines the relation between aggregate fund flows and the subsequent market or stock returns. Similarly, Baker and Wurgler (2007) also document that changes in the sentiment index is

positively correlated with a prevailing “greed” versus “fear” or “bullish” versus “bearish” notion of aggregate fund flows. These studies provide an indirect channel which retail fund investors could affect stock prices and support the notion of “noise” in aggregate market prices induced by investor sentiment. By examining cross-sectional differences, our analysis extends the literature and allows us to directly compare the behavioral differences in mutual fund investors between the high- and low-sentiment periods. Further, the sentiment index constructed by Baker and Wurgler (2006) is not based on aggregate mutual fund flows. This, in turn, helps us to examine the similarities and differences of investors’ behavior during the low and high sentiment periods. Second, our paper complements the literature on how consumers make product choices in mutual fund market (Sirri and Tufano (1998), Capon Fitzsimons, Prince (1996), Wilcox (2003), Jain and Wu (2000)). Unlike these studies, our paper exploits time varying nature of investor sentiment, and documents that investors’ fund selection is also influenced by the investor sentiment. Moreover, this paper is the first study to examine fund flows of both individual and institutional investors, providing contrasting evidence on the behavior of individual versus institutional investors. By examining the performance of new money flows during the high- vs. low-sentiment periods, this paper is further the first study to explore the effect of investor sentiment on mutual fund performance. Finally, the recent study of Massa and Yadav (2014) provide evidence of a trade-off between performance and marketing in mutual funds. They show that during the high sentiment periods, fund managers tilted their portfolios toward high sentiment stocks to attract investors, as a consequence sacrifice performance. The implicit assumption of their paper is that investors have ability to identify the stock held in the mutual fund portfolio and strong preferences for “high sentiment” (hot) socks. Unlike their study, we analyze investor’s preferences for salient fund characteristics and show that fund investors do not have

ability to avoid high marketing expenses and are attracted to funds with performance-unrelated attention grapping characteristics.

The rest of the paper is organized as follows. Section II describes our data and investor sentiment index. Main empirical results are presented in Section III. Section IV presents the performance of new money flows across different sentiment periods. Concluding remarks are presented in Section V.

II. Data

II.A. Sample Description and Fund Flows

The data used in this study is obtained from the CRSP Survivor-Bias Free U.S. Mutual Fund Database. We exclude international funds, sector funds, specialized funds, and balanced funds to focus on actively managed U.S. equity mutual funds. In this study, we rely on *monthly* mutual fund flows for the following reasons. First, the main sentiment measure used in this study is the monthly time series constructed by Baker and Wurgler (2006) (BW hereafter). To better examine the fund investors' behavior during high- versus low-sentiment periods, we match the monthly investor money flows with BW sentiment index. Second, we further investigate the performance of fund flows across different sentiment episodes. As pointed out in Keswani and Stolin (2008) and Jiang and Yuksel (2014), using monthly fund flows provides more power in detecting fund return predictability of mutual fund investor flows. Finally, we contrast the behavior of mutual fund investors and the performance of fund flows for different groups of mutual fund investors (i.e., retail and institutional investors) during the low versus high sentiment periods. While the CRSP database provides monthly TNA for mutual funds since 1991, there are relatively few institutional funds prior to 1993 in the database. For the purpose of our study, the sample period starts from January 1993 to December 2010.

Using monthly total net asset values from CRSP, we compute the monthly net flow to fund *i* during month *t* as follows:

$$FLOW_{i,t} = TNA_{i,t} - TNA_{i,t-1} \times (1 + r_{i,t}) - MGTNA_{i,t} \quad (1)$$

where $TNA_{i,t}$ and $TNA_{i,t-1}$ refer to the total net asset (TNA) of fund *i* at the end of the month *t* and *t-1*, respectively. An implicit assumption in (1) is that new money flow to a fund is invested in the end of the month. $MGTNA_{i,t}$ is the increase in TNA due to mergers during the month *t*. The typical approach in the literature is to use the last NAV report date of the target fund to identify the approximate merger date. However, this procedure produces noticeable mismatches. We employ the following procedure suggested by Lou (2012) to identify merger date. That is, we match a target to its acquirer from *t* - 1 to *t* + 5 where *t* is the last report date of the target fund, then we pick the month in which the acquirer has smallest absolute percentage flow as the event month. We also measure investor cash flows in percentage terms (normalized cash flows). In particular, normalized cash flow is defined as monthly cash-flow divided by total net asset (TNA) at the beginning of the month.

Table I reports summary statistics of the mutual fund sample. For each fund characteristic, we calculate the time-series average of the cross-sectional means and medians. As shown in Table I, the average number of mutual funds per month in our sample is 2,592 with an average of 534 institutional funds and 1,998 retail funds per month. For whole sample of mutual funds, the mean and median family size is $45.38 billion and $8.72 billion respectively. The average size in asset under management, as measured by Total Net Asset (*TNA*), is $782 million. Retail funds are on average bigger than institutional funds. The average expense ratio for all funds in our sample is 1.31%. As expected, institutional investors have the lowest annual expense ratio at 0.85% compared to 1.40% charged by retail funds. Similarly, relative to institutional funds, retail funds charge higher marketing expenses (calculated as 12b-1 fees plus

one-seventh front-end loads) and operating expenses. The average portfolio turnover ratio is 79.96%. Portfolio turnover ratio is measured as the minimum of aggregated sales or purchases of securities, divided by the 12-month TNA of the fund. Retail funds on average have higher turnover ratio (81.10%) then institutional funds (66.25%), suggesting that retail funds tend to be more actively managed. Retail funds in our sample tend to older than institutional funds. Finally, while the average fund return is 0.73% per month, four factor alpha (α^{4F}) is -0.05% for whole sample of mutual funds. Consistent with the extant literature (Carhart (1997), Gruber (1996), Jensen (1968), and Malkiel (1995)), the average fund in our sample does not outperform the stock market. In addition we note that both net return and α^{4F} of institutional funds are higher than those of retail funds. This return difference is mainly driven by the higher expense ratio charged by retail mutual funds.

II.B. Investor Sentiment

Investor sentiment is broadly market participants' optimism or pessimism about future cash flows and investment risk, and overall market's prospects. Previous literature finds that individual investors are subject to different cognitive biases and their trading is likely to be driven by their subjective view of market conditions rather than the facts at hand (Lewellen, Lease, and Schlarbaum (1977), Sherfin and Statman (1985), DeLong, Shleifer, Summers, and Waldmann (1990), Lee, Shleifer, and Thaler (1991), Barber and Odean (2000, 2008), and Yuan (2008)). Moreover, recent studies underline the critical role for investor sentiment in stock valuation, mean-variance relation, and market anomalies. For example, Baker and Wurgler (2006) show that a wave of investor sentiment has larger effect on securities whose valuations are highly subjective and difficult to arbitrage. Similarly, Yu and Yuan (2011) find that during high sentiment periods, the higher presence of sentiment-driven investors weakens an otherwise

positive mean-variance tradeoff. Finally, Stambaugh, Yu, and Yuan (2012) document that investor sentiment plays an important role in a broad set of anomalies in cross-sectional stock returns. More specifically, they find that each anomaly is stronger following high levels of sentiment. Overall, these findings are consistent with the notion that during the high sentiment periods the most optimistic views about many stocks tend to be overly optimistic, and many stocks tend to be overpriced. On the other hand, during the low sentiment periods the most optimistic views about many stocks tend to be those of rational investors, thus mispricing during these periods is less likely (Baker and Wurgler (2006), Yu and Yuan (2011), and Stambaugh, Yu, and Yuan (2012)).

Previous literature offers a number of proxies that reflect investors' optimism and pessimism about future market's prospect. These methods of measures include surveys; mood proxies; retail investor trades (Barber, Odean, and Zhu (2006) and Kumar and Lee (2006)); trading volume (Baker and Stein (2004) and Scheinkman and Xiong (2003)); dividend premium (Baker and Wurgler (2004a, b); closed-end fund discounts (Zweig (1973), Lee, Shleifer, and Thaler (1991), and Neal and Wheatley (1998)); option implied volatility (Whaley (2000)); the number of and first-day returns on initial public offerings (Stigler (1964) and Ritter (1991)); volume of initial public offerings; new equity issues (Baker and Wurgler (2000)); and insider trading (Seyhun (1998)). Baker and Wurgler (2006) form a composite sentiment index that is the first principal component of the six proxies of investor's sentiment. This analysis filters out idiosyncratic noise in the six measures and captures their common component. Since some sentiment proxies reflect economic fundamentals to some extent, Baker and Wurgler (2006) first regress each of the raw sentiment measures on a set of macroeconomic variables including industrial production index growth, durable consumption growth, nondurable consumption growth, service consumption growth, and a dummy variable for NBER recessions, and then use the residuals to build the

sentiment index.[2] We note that their sentiment index is not based on fund flows. This, in turn, helps us to examine the behavioral differences of fund investors across different sentiment periods.

Each month, we classify our sample period from January 1993 to December 2010 (a total of 216 months) into the high- and low-sentiment periods based on the sign of the BW sentiment index. A high-sentiment month is one in which the value of the BW sentiment index is positive, and the low-sentiment months are those with BW sentiment index is negative. More specifically, we identify 113 months as high-sentiment months and 103 months as low-sentiment months. The composite sentiment index during our sample period is plotted in Fig. 1. We first examine the characteristics of mutual fund flows during the high- and low-sentiment periods. In specific, we compute the mean and median normalized fund flows across all funds in our sample. Table II reports the time-series averages of mean and median normalized fund flows across all funds in our sample during whole sample period, and separately for the high- and low-sentiment periods. To compare the normalized fund flows during the high-sentiment periods with those during the low-sentiment periods, the last column of Table II reports the differences in the normalized fund flows of each fund between the high- and low-sentiment periods. The average normalized fund flows over our sample period is 0.223%. As expected, normalized fund flows are significantly higher during the high-sentiment period (0.324%) than during the low-sentiment periods (0.113%). As indicated in the last column of Panel A, the difference in normalized fund flows between the high- and low-sentiment periods is 0.210% with *t*-statistics of 1.89. Consistent with Baker and Wurgler (2007), Karlsson, Loewnstein, and Seppi (2005), and Yuan (2008), investors participate in market more actively during the high-sentiment periods than the low-sentiment periods.

To better understand the differences and similarities in mutual fund flows during the high- and low-sentiment periods, we further investigate normalized investor flows in fund objective level. Unfortunately, since mutual funds' stated objective provided by CRSP is too

[2] Baker and Wurgler (2006) sentiment index spans over 50 years, from July 1965 to December 2010. We obtained the investor sentiment data from Jeffrey Wurgler's Web site (http://people.stern.nyu.edu/jwurgler/).

vague to be very informative, we classify mutual funds into Small versus Large and Growth versus Value categories based on fund's past four-factor loadings (Nanda, Wang, and Zheng (2004)). More specifically, for each fund and each month, we employ the Carhart (1997) four-factor model.

$$r_{i,t} = \alpha_i + \beta_{1,i} MKT_t + \beta_{2,i} SMB_t + \beta_{3,i} HML_t + \beta_{4,i} UMD_t + \varepsilon_t^{4F} \quad (2)$$

where $r_{i,t}$ is the monthly return of fund *i* in excess of 1-month T-bill rate; *MKT* is the excess return on a value-weighted market portfolio; *SMB HML* and *UMD* are, respectively, returns on zero-investment factor mimicking portfolios for size, book-to-market, and 1-year momentum in stock returns. The factor loadings are estimated from the preceding 36 monthly fund returns. To ensure the accuracy of estimation, we require a minimum 30 monthly return observations during the estimation period. Each month, we group all funds into two groups based on the median level of SMB and HML loadings. Mutual funds ranked in the top halve with the higher SMB (HML) loading are classified as Small- (Value-) Style and those ranked in the bottom halve are classified as Large- (Growth-) Style.

Panel B of Table II shows that, for whole sample period, the percentage flows into Large- and Small-Style categories are 0.101% and 0.326% respectively. Not surprisingly, both Large- and Small-Style Funds experience higher flows during the high-sentiment periods than the low-sentiment periods. In particular, while the difference in mean fund flows between high and low-sentiment periods is 0.255% with *t*-statistics of 2.33, this difference is 0.142% with *t*-statistics of 1.03 for Small-Style funds. The average fund flows for Growth- and Value-Style Funds are 0.094% and 0.333% for whole sample of funds in Panel C. Similarly, Both Growth- and Value-Style experience higher percentage flows during the high sentiment periods. For example the difference in average percentage flows between high- and low-sentiment periods is 0.425% (*t*-statistic = 3.20) for Growth-Style and 0.016% (*t*-statistic = 0.11). Finally, we examine the

relation between percentage fund flows and 2 x 2 Size-Value Style Categories in Panel D. During the high sentiment periods, the fund flows to Large-Growth and Small-Growth Style Categories are significantly higher than those during the low-sentiment periods. While the difference in average percentage fund flows between different sentiment periods are 0.620 (*t*-statistic = 4.41) for Large-Growth Style and 0.271 (*t*-statistic = 1.71) for Small-Growth Style, there is no significant difference in average percentage fund flows for Large-Value and Small-Value Categories between different sentiment periods.

These results suggest that while mutual fund investors prefer for funds with value-style categories regardless of investor sentiment, they tend to flow more into speculative fund style during the high-sentiment periods, in particular Growth-Style. Similarly, controlling for the overall equity fund demand, Baker and Wurgler (2007) show the negative relation between fund flows in speculative fund investment categories (i.e., Aggressive Growth, Growth) and those in less speculative fund investment categories (i.e., Income Mixed and Asset Allocation). Further, they show that sentiment changes is highly correlated with investor's preferences into higher or lower speculative fund categories.[3] Overall Table II underlines the differences in fund investors' style preferences when selecting mutual funds across different sentiment periods.

III. High vs. Low Sentiments: Mutual Fund Flows

III.A. Investor Sentiment and Determinants of Mutual Fund Flows

Since mutual funds represent a very substantial component of U.S. household portfolios, they provide an ideal setting in examining investors' behavior (Warther (1995), Cooper, Gulen, and Rau (2005), and Baker and Wurgler (2007)). Further, retail investors as a group exert a significant influence on stock prices (Frazzini and Lamont (2008) and Ben-Rephael, Kandel, and Wohl (2012)). In this study, we exploit the varying presence of inexperienced and naïve

[3] Baker and Wurgler (2007) use aggregate fund flows data from the Investment Company Institute.

investors across different sentiment periods, and examine the differences in preferences and behaviors of fund investors between the high- and low-sentiment periods. Previous literature investigates the relation between a wide variety of fund attributes and investor flows. In this study, we categorize funds' characteristics into four groups: (i) style and risk, (ii) costs, (iii) past performance, and (iv) marketing and visibility.

Previous studies find that investors tend to trade more aggressively (Karlsson, Loewenstein, and Seppi (2005) and Yuan (2008)) and seek higher expected returns during the high-sentiment periods. Thus, we expect that fund investors are more likely to select funds with more speculative and riskier style during the high sentiment periods. On the other hand, due to their high risk aversion during the low sentiment periods, fund investors avoid riskier mutual funds. To measure the riskiness of mutual funds, we use fund's beta measured as the loadings of excess return on market portfolio in equation (2). Similarly, to capture style preferences of mutual fund investors across different sentiment periods, we include fund's SMB and HML loadings measured based on Carhart (1997) four factor model in equation (2). Finally, there is a growing literature that demonstrates that more active funds have superior investment ability (Kacperczyk, Sialm, and Zheng (2005) and Cremers and Petajisto (2009)). However, we should also expect differences in the relation between fund flows and activeness of fund investment strategy across different sentiment periods. For example, due to their naïve investing approach, sentiment investors are less likely to identify active fund management during the high-sentiment periods. On the other hand, during the low-sentiment periods, fund investors are likely to put more weight on active fund management and invest accordingly. To examine this hypothesis, we further include the four-factor tracking error (ε^{4F}) measured as standard error obtained from equation (2).

Sirri and Tufano (1998), Gallaher, Kaniel, and Starks (2006), and Casavecchia and Scotti (2009) find that investors pay attention to total cost of their investment document a negative relation between fund flows and total fund expenses. These results suggest that fund's operating expenses seem to be important determinant of fund flows. In addition, both academic finance and practitioner journals advice fund investors that low fund fees are preferable to high fees. Inexperienced and naive investors are more likely to have poor understanding of the impact of high fund expenses on their fund's performance, and hence are unlikely to avoid funds with higher expense ratio. This, in turn, suggests that increased presence and trading of sentiment-driven investors during the high-sentiment periods should undermine the negative relation between fund flows and fund expenses documented in the previous literature.

It is well documented that there is a strong positive relation between mutual fund past performance and subsequent fund inflows (Ippolito (1992), Gruber (1996), Goetzman and Peles (1997), Chevalier and Ellison (1997), Sirri and Tufano (1998), Zheng (1999), Barber, Odean, and Zheng (2000), Del Guercio and Tkac (2002), and Lynch and Musto (2003)). Although past performance is at best a poor predictor of future fund performance (Carhart (1997)), it also serves as one of the attention grabbing fund characteristics. When selecting mutual funds, investors are more likely to interpret past fund performance differently across different sentiment periods. In specific, due to the large influx of sentiment-driven investors during the high sentiment periods, inexperienced and naïve investors are likely to put more weight on past performance and fund's momentum loading. This leads to prediction that the relation between fund flows and past performance is more pronounced during the high sentiment periods than the low-sentiment periods.

To empirically test these hypotheses, we estimate the following regression:

$$FLOW_{i,t}^{\%} = \beta_1 \alpha_{i,t-1}^{4F} + \beta_2 Expense\ Ratio_{i,t-1} + \beta_3 Fund\ Size_{i,t-1} + \beta_4 Fund\ Age_{i,t-1}$$
$$+\beta_5 \beta_{i,t-1}^{MKTRF} + \beta_6 \beta_{i,t-1}^{SMB} + \beta_7 \beta_{i,t-1}^{HML} + \beta_8 \beta_{i,t-1}^{UMD} + \beta_9 \varepsilon_{i,t-1}^{4F} + \epsilon_{i,t} \quad (3)$$

where the dependent variable, $FLOW_{i,t}^{\%}$, is normalized cash-flows expressed as a proportion of fund TNA at the beginning of the month. The explanatory variables include past performance ($\alpha_{i,t-1}^{4F}$) measured as the four-factor alpha in equation (2); fund's expense ratio ($Expense\ Ratio_{i,t-1}$); $Fund\ Size_{i,t-1}$ is the logarithm fund's TNA; and $Fund\ Age_{i,t-1}$ is the logarithm of one plus fund age. We also include funds past loadings based on four-factor model. $\beta_{i,t-1}^{MKTRF}$, $\beta_{i,t-1}^{SMB}$, $\beta_{i,t-1}^{HML}$, and $\beta_{i,t-1}^{UMD}$, are the funds factor loadings on excess market return (*MKTRF*), size (*SMB*), value (*HML*), and momentum (*UMD*) factors. Finally, $\varepsilon_{i,t-1}^{4F}$ is the four-factor tracking error measured as standard error obtained from equation (2). Throughout the paper, we estimate the above regressions following the Fama-MacBeth (1973) procedure. The reported results are time-series averages of coefficient estimates obtained from monthly cross-sectional regressions. The *t*-statistics are computed from standard errors that are adjusted for heteroskedasticity and autocorrelations following Newey and West (1987). The magnitude of an ordinary regression coefficient depends on the scale of both the dependent variable and independent variables. Further, there might be potential time effect in fund characteristics that leads cross-sentiment comparison of the coefficients meaningless. To overcome these issues, we standardize all variables to have a mean of 0 and a standard deviation of one each month based on cross-sectional observations. Similar procedures are used in Amihud and Mendelson (1986) to address the time effect in firm characteristics. The interpretation of such standardized regression coefficients is the expected standard deviation change in the dependent variable given a one standard deviation change in the independent variable. Further, we use two independent samples *t*-test and compare the means of

the coefficients during the high- and low-sentiment periods.[4] Table III reports the results the regression above for all mutual funds across different sentiment periods.

We begin our analysis by examining the relation between fund flows and risk characteristics of mutual funds. For whole sample period, specification (1) of Table III shows that there is no significant relation between fund flows and fund return volatility and β^{MKTRF}. However, when we examine this relation across different sentiment periods, Table III underlines the systematic differences in fund flows sensitivity to fund's systematic risk characteristic. In particular, specification (2) shows that the coefficient of β^{MKTRF} is positive and highly significant (0.027 with *t*-statistics of 2.94) during the high-sentiment period. In a stark contrast, we find no relation between fund flows and β^{MKTRF} during the low-sentiment periods in specification (3). Moreover, specification (4) shows that the difference of the coefficient of β^{MKTRF} between the high- and low-sentiment periods is 0.048 (*t*-statistics = 3.77). This finding suggests that sentiment-driven investors are more likely to select funds with riskier style. Finally, consistent with our earlier results, Table III documents that fund investors prefer stronger preferences for funds with higher HML loadings. Further, the positive sensitivity of fund flows to Small-Style fund category is more pronounced during the low-sentiment periods. Finally, the negative relation between fund flows and four-factor tracking error (ε^{4F}) suggests that investors flows away from funds with active investment strategy in specification (1). However, this result is entirely driven fund flows during the high-sentiment periods. In specific, while the coefficient of ε^{4F} is -0.024 with *t*-statistics of -3.44 during the high-sentiment periods in specification (2), there is no significant relation between fund flows and four-factor tracking error during the low sentiment period in specification (3). Once again, the difference in coefficient of ε^{4F} between the high- and low-sentiment period is -0.030 (*t*-statistics = -3.68). Overall, our findings suggest that fund investors exhibit systematic differences in risk and fund style across different sentiment periods. More importantly, consistent with the notion that fund investors are less likely to

[4] Although not reported, we also use Wilcoxon ranked-sum test of the null hypothesis that the coefficient estimates in the low-sentiment periods equal to the coefficient in the high-sentiment period.

identify active fund management during the high sentiment periods, we find a significant negative relation between fund flows and four-factor tracking error only during the high-sentiment periods.

Consistent with Sirri and Tufano (1998), Gallaher, Kaniel, and Starks (2006), and Casavecchia and Scotti (2009), specification (1) also shows that fund investors, on average, pay attention to the cost of their investment. The relation between fund flows and fund's expenses is significantly negative (-0.024 with *t*-statistics of -2.63) as shown in specification (1). However, specification (2) and (3) reveal substantial variation in the relation between fund flows and fund expenses. While the coefficient of $Expense\ Ratio$ is -0.042 (*t*-statistics = 3.38) during the low-sentiment periods in specification (3), specification (2) finds no relation between fund flows and $Expense\ Ratio$ during the high-sentiment periods. More importantly, specification (4) shows that the difference in the coefficient of $Expense\ Ratio$ between the high- and low-sentiment periods is -0.034 with *t*-statistics of 3.38. Consistent with our hypothesis, this finding suggests that increased presence and trading of sentiment-driven investors during the high-sentiment periods are likely to undermine the negative relation between fund flows and fund expenses documented in the previous literature. Overall, the negative association between fund flows and expense ratio is entirely driven during the low-sentiment periods.

Specification (1) also shows that fund investors are naïve-trend chaser (Ippolito (1992), Chevalier and Ellison (1997), Sirri and Tufano (1998), Capon, Fitzsimon, and Prince (1996), and Goetzmann and Peles (1997)). In particular, the fund flows are strongly positively associated with both fund's past performance (0.241 with *t*-statistics of 37.06) and fund's momentum loading (0.089 with *t*-statistics of 8.81). Not surprisingly, the positive relation between investor flows and fund past performance is significant both for the high-sentiment periods in specification (2) and the low-sentiment periods in specification (3). However, as expected, this relation is significantly more pronounced during the high-sentiment periods than the low-sentiment periods. Specifically, specification (4) shows that the differences in coefficients on α^{4F} and β^{UMD} between the high- and

low-sentiment periods are 0.016 with *t*-statistic of 1.73 and 0.068 with *t*-statistic of 5.47, respectively. These findings are consistent with the notion that fund investors rely more on past fund performance during the high-sentiment periods, when selecting mutual funds.

Thus far, our analysis reveals substantial variation among behavior and preferences of investors for risk, costs, and past performance between the high- and low-sentiment periods. A further question of interest is whether the differences in fund investors' behavior vary across different groups of fund investors. More specifically, actively managed mutual funds serve different investor clientele, including both institutional and retail investors. Many mutual funds emerged with a focus on institutional investors in the early 1990s (James and Karceski (2006) and Jiang and Yuksel (2014)). Previous studies also document that retail investors differ substantially from institutional investors in investment objectives, financial background, and more importantly, the level of sophistication in terms of fund manager evaluation and fund selection process (Del Guercio and Tkac (2002), Keswani and Stolin (2008), and Jiang and Yuksel (2014)). Further, Capon, Fitzsimons, and Prince (1996) find that fund investors have little knowledge of investment strategies and they are in general uninformed about their mutual fund investments.[5] Similarly, based on 1.85 million individual investor transactions, Kumar and Lee (2006) find that systematic factors in the investors' trades are consistent with the influence of investor sentiment. Thus, it is necessary to distinguish various groups of fund investors and to examine their behavior across different investor sentiment periods.

Compared to institutional investors, retail fund investors use less sophisticated fund evaluation criteria exhibit various behavioral biases in investment decisions, such as the disposition effect (Odean, 1998). As a result, retail fund investors might be more prone to investor sentiment. However, Lakonishok, Shleifer, and Vishny (1992) point out that institutional investors

[5] Based on the survey of 3,386 fund investors, Capon, Fitzsimons, and Prince (1996) find that 39.3% of the survey participants do not know whether investments were in load funds or no-load funds; 72.3% does not know whether their funds focus on domestic or international investments; and 75% does not know the style of their mutual funds.

are affected by various agency conflicts in their decision making. For example, they may choose funds mainly based on past track record to avoid being responsible for poor investment performance in the future. This also suggests that we might also observe larger influence of investor sentiment on institutional investors during the high sentiment periods. To test the above conjectures, we divide our sample of mutual funds into institutional funds versus retail funds.

Table IV presents the relation between fund flows and fund characteristics separately for retail funds in Panel A and institutional funds in Panel B. Consistent with Table III, specifications (1) through (3) in Panel A show that flow sensitivities to past performance and β^{MKTRF} are strongly higher during the high-sentiment periods, while the relation between fund flows and $Expense\ Ratio$ is negative only during the low-sentiment periods. Further, retail fund investors do not seem to identify active fund management during the high-sentiment periods. Similarly, in Panel B, while institutional investors flows tilted toward funds with higher systematic risk exposure and momentum loading during the high-sentiment periods. There is no systematic difference in preferences for fund expenses and four-factor tracking error. Altogether these findings suggest that our earlier results are mainly driven by retail fund investors and support the notion that retail investors are more prone to investor sentiment.

To sum up, in this section we establish two key findings. First, we show significant differences in fund investors' behavior and preferences for (i) style and risk, (ii) costs, and (iii) past return of funds across different sentiment periods. In particular, fund flows are positively associated with higher systematic risk, past return, and momentum loadings during the high sentiment periods. On the other hand, during the low-sentiment periods, fund investors seem to avoid funds with higher expenses. Further, when selecting funds, funds investors are unable to identify activeness of fund's investment strategy during the high-sentiment periods. Second, consistent with the notion that retail investors are more prone to investor sentiment than the

institutional investors; our findings are particularly pronounced in the case of retail funds, compared to the institutional investors.

III.B. Investor Sentiment and the Effect of Marketing on Fund Flows

Previous section shows a significant difference in fund flows to fund's expenses. Specifically, the negative relation between fund flows and expense ratio is mainly driven by the low-sentiment periods. On the other hand, we find that fund investors fail to pay attention to total cost of their investment during the high-sentiment periods. Fund expenses primarily play two important roles in mutual fund industry. First, some part of fund expenses serves as fund's marketing expenses (12b-1 fees) that significantly reduce investors' information gathering costs (Sirri and Tufano (1998) and Huang, Wei, and Yan (2007)). Second, fund expenses also used to cover fund's operating expenses including portfolio management, fund administration, daily fund accounting and pricing etc. In addition, fund investors directly pay load fees as a commission to broker for some mutual funds. Sirri and Tufano (1998) document a negative relation between fund flows and total fund expenses (amortized front-end-load fees and operating expenses). On the other hand, Barber, Odean, and Zheng (2005) argue that fund investors are influenced by salient and attention-grabbing information. They find no relation, between fund flows and fund expenses. However, when they disaggregate fund's expenses into 12b-1 fees and other operating expenses for limited sample period, they find that investors do not prefer to buy mutual funds with high operating expenses, but they buy finds that attract their attention through advertising and distribution.

Advertising or marketing expenses have mixed effects on fund flows. On one hand, the more a fund expends resources in marketing effect, the easier or less costly for investors to identify funds (Sirri and Tufano (1998), Barber, Odean, and Zheng (2005), Elton, Gruber, and Busse (2004) and Huang, Wei, and Yan (2007)). That is, fund advertising serves to reduce search

costs for investors and provides investors information about the fund such as its investment strategy and, very often, past performance. Consistent with this notion that investors appear to allocate their wealth to funds that have caught their attention through marketing, Jain and Wu (2000) document that advertised funds attract significantly more money flows. Gualtieri and Petrella (2005), Gallaher, Kaniel, and Starks (2006), and Kaniel, Starks, and Vasudevan (2009) also find that media coverage (news articles) can affect fund flows both higher and lower, depending on whether the coverage is positive or negative. On the other hand, fund expenses are a steady drain on a fund's performance. Recognizing the negative effect on fund performance, rational investors may be deterred to put their money in funds with high marketing expenses. Regarding the benefits and costs of 12b-1 fees, Walsh (2004) finds that while funds with 12b-1 plans grow faster than funds without them; shareholders are not obtaining benefits in the form of lower average expenses or lower flow volatility. Fund shareholders are paying the costs to grow the fund, while the fund advisor is the primary beneficiary of the fund's growth. In addition, Gil-Bazo and Ruiz-Verdu (2009) document that targeting less sophisticated investors requires a more intensive marketing effort, which leads to an increase in marketing costs that are transferred to investors in the form of higher marketing fees.

To the extent that more inexperienced and naïve fund investors participate in the market during the high-sentiment periods, one would expect to find that fund flows are more likely to attracted to the marketing efforts of mutual funds. In other words, naïve fund investors are more likely to be attracted to funds with higher marketing efforts. On the other hand, during the low sentiment periods, fund investors are less likely to be influenced by funds' marketing efforts. This leads to prediction that marketing expenses are more (less) impact on their fund purchasing decisions during the high- (low-) sentiment periods. To test these conjectures, we decompose

fund's expense ratio further into marketing expenses and operating expenses. More specifically, following previous studies (Sirri and Tufano (1998) and Huang, Wei, and Yan (2007)), we use 12b-1 fees plus one seventh of the front-end loads as a measure of marketing expenses and remaining part of expense ratio (i.e. management fee) as fund's operating expenses.

Table V reports the effects of marketing and operating expenses on fund flows. Specification (1) documents that the negative relation between fund flows and fund expenses in Table III is mainly driven by operating expenses. In particular, fund flows are significantly negatively related to the operating expenses (-0.029 with *t*-statistic of -7.22). However, there is no relation between marketing expenses and fund flows for whole sample period. When we examine the effect of marketing expenses separately for the high- and low-sentiment periods, once again, Table V documents a stark difference in fund flows sensitivity to marketing expenses. In specification (2), fund flows are positively related to marketing expenses (0.016 with *t*-statistic of 1.38) during the high-sentiment periods. In contrast, this relation is significantly negative during the low-sentiment periods in specification (3) (-0.019 with *t*-statistic of -1.99). More importantly, the difference in the coefficient on marketing between during the high- and low-sentiment periods is 0.035 with the *t*-statistics of 4.00 in specification (4). This result supports the notion that the inexperienced and naïve investors during the high-sentiment periods are more likely to buy funds that attract their attention through advertising. On the other hands, we do not see any differences in fund flows- operating expenses relation across different sentiment periods. In specification 4 shows the difference in the coefficient of $Operting\ Epenses$ between the high- and low-sentiment periods is insignificant (0.004 with *t*-statistic of 0.83).

Finally, in Table VI, we extend our investigation and examine the relation between fund flows and marketing expenses separately for retail in Panel A and institutional investors in Panel B. Consistent with the findings in the previous section, Table VI shows that the significant variation in fund flows sensitivity in Table V is mainly driven by the retail funds. For example, specification (4) of Panel A indicates that the difference in the coefficient of $Marketing$ is -0.031 (*t*-statistic = -3.49) for retail funds. On the other hand, this difference becomes insignificant (0.010 with *t*-statistic of 0.60) for institutional funds in Panel B. These results suggest that marketing efforts of mutual funds attract significantly more retail investors during the high-sentiment periods, compared to institutional investors.

III.C. Investor Sentiment and the Effect of Star Manager and Visibility on Fund Flows

Previous section shows that expending resources in marketing efforts, fund management increase investor awareness of their fund. In particular, we find evidence consistent with the notion that inexperienced and naïve investors during the high-sentiment periods are attracted to the funds that caught their attention through marketing efforts. Given that most investors have no formal training in what factors to weight when selecting funds, naïve and inexperienced investors are more likely to be attracted to characteristics that increase mutual fund visibility. In this section we further examine the effect of fund visibility on fund flows across different sentiment periods.

It is well documented in literature that brand recognition plays an important role on investors' fund selection decision. Sirri and Tufano (1998), Capon, Fitzsimons, and Prince (1996), Goetzman and Peles (1997), and Huang, Wei, and Yan (2007) show that funds with larger families receive greater inflows. This finding suggests that fund investors pay attention with large and established fund families. Brand recognition is not the only source that influences investors when selecting mutual funds. Stellar fund performance significantly affects fund flows. Del Guercio and Tkac (2008) show that the change in Morningstar mutual fund star rating attracts abnormal investor cash flows. To extent that fund families actively publicize their star funds to promote

their reputation, fund families attract greater cash inflows, whereby other funds in the same family also enjoy increased fund flows. Consistently, Khorana and Servaes (2004), and Nanda, Wang, and Zheng (2004) show that presence of a star fund has a positive and significant impact on both family market share and other funds in the family.

While star, star family affiliation, and family size promote visibility and result in greater cash inflows to the fund and to other funds in the family, we expect fund investors' response to these characteristics might vary across different sentiment periods. Similar to marketing efforts of the mutual funds, due to the increasing presence of naïve and inexperienced investors during the high-sentiment periods, fund flows are more likely to be attracted fund characteristics that enhance fund visibility. This leads to prediction of a stronger relation between fund flows and both star family affiliation and family size during the high sentiment periods. However, fund flow sensitivity to star fund is ambiguous. On one hand, star ratings are publicly available by independent investment research firms such as Morningstar. Naïve and inexperienced investors easily access the information about the funds with stellar performance, suggesting higher sensitivity of fund flows to "star" funds. On the other hand, one might argue that naive and inexperienced investors are less likely to understand and follow the star funds from financial investment research firms. As such, fund flows are expected to be less sensitive during the periods where naïve and inexperienced investors participate more. In addition, it is also possible that stellar performance might be more important assurance about the quality of fund management during the low-sentiment periods.

To test these conjectures, we include $Star$ and $Star\ Affiliation$ dummies in our main regression. In particular, in each month a fund is assigned a score based on four-factor alpha during the past three years. Within each fund category, funds then ranked according to their four-factor alpha. Funds that are ranked in the top 10% of each category are assigned $Star$ funds. The procedure is similar in sprit to Nanda, Wang, and Zheng (2004), except that we further control for

momentum factor. $Star\ Affiliation$ is a dummy variable that is equal to one if a fund is affiliated with a star family but is not a star itself, and zero otherwise. Finally, fund's family size is measured as the logarithm of the fund family's total TNAs at the beginning of the month. To overcome the high correlation between family size and both $Fund\ Size$ and $Star$, each month we regress the logarithm of family size on both $Fund\ Size$ and $Star$, and use residual from this regression as a proxy for $Family\ Size$. Results are presented in Table VII.

Consistent with the previous literature, for a whole sample periods, specification 1 of Table VII documents a significant positive relation between fund flows and both $Star$, $Star\ Affiliation$, and $Family\ Size$. Of the greater interest, when we examine these relations across different sentiment episodes, Table VII emphasis the systematic differences between fund flows and funds' visibility characteristics and star dummy. First of all, fund flows is significant and positively related to $Family\ Size$ both during the high- and low-sentiment periods, suggesting that brand recognition seems to be important determinants for investors across different sentiment periods. While this relation is 0.070 with *t*-statistic of 9.18 during the high-sentiment periods in specification (2), during the low sentiment periods the coefficient of $Family\ Size$ is about 0.033 with the *t*-statistic of 3.71 in specification (3). More importantly, the difference in the coefficient of $Family\ Size$ between the high- and low-sentiment periods is 0.037 (*t*-statistic = 5.08). This finding suggests that brand recognition is more important for fund investors during the high-sentiment periods, compared to low-sentiment periods. Similarly, funds affiliation with star producing families result in greater cash inflows during the high-sentiment periods. The coefficients of $Star\ Affiliation$ are 0.097 (*t*-statistic = 9.22) during the high-sentiment periods in Specification (2), and 0.067 (*t*-statistic = 4.91). Once again, specification (4) shows the difference in the coefficient of $Star\ Affiliation$ between the high- and low-sentiment periods is 0.030 (*t*-statistics = 2.54). In sharp contrast, consistent with notion that the naïve investors are unable to follow the "star" funds from financial research firms, the sensitivity of fund flows to $Star$ is

significantly lower during the high-sentiment periods than the low-sentiment periods. More specifically, the difference in the coefficient on $Star$ between the high- and low-sentiment periods is -0.046 with *t*-statistic of -2.31. Interestingly, Some studies including Blake and Morey (2000) and Del Guercio and Tkac (2008) show that strategies investing in only Morningstar five-star rated funds produces positive risk-adjusted performance.

Finally, we examine the relation between fund flows and marketing expenses separately for retail in Panel A and institutional investors in Panel B of Table VIII. Our results show that the significant variation in fund flows to visibility characteristics are driven by retail investors in Panel A. On the other hand, there is no significant difference in the coefficients of visibility characteristics between the high- and low-sentiment periods in Panel B.

IV. Investor Sentiment and Performance of New Money Flows

Overall, our findings overwhelmingly support the behavioral differences in mutual fund investors across different sentiment periods. During the high-sentiment periods, investors seem to prefer funds with riskier style, and are unable to avoid funds with higher expenses. Further, consistent with notion that naïve and inexperienced investors participate more during the high-sentiment periods, marketing and characteristics that enhance funds visibility attracts more inflows during the high sentiment periods, compared to the low-sentiment periods. In this section we further examine the performance of new money flows across different sentiment periods. Previous literature extensively investigates the predictive power of investor flows for future fund return and documents that fund investors have an ability to identify superior fund managers and invest accordingly (Gruber (1996) and Zheng (1999)). This finding is referred to as the "smart money" effect in the literature. While Sapp and Tiwari (2004) challenge return predictability of fund flows and document that the smart money effect is explained by the momentum effect in stock returns, using monthly fund flows over more recent sample period Keswani and Stolin

(2008) show the there is a significant smart money effect even after controlling for momentum factor. In a recent study, Lou (2012) provides a fund-flow based explanation to both fund return predictability and stock price momentum. Lou (2012) provides evidence that expected fund flows positively forecast mutual fund and stock returns. Further, existing literature document that investor sentiment has a significant effect on the cross-section of stock returns. In particular, stocks tend to overvalued during high sentiment periods but undervalued during low sentiment periods. This leads to prediction that new money inflows to mutual funds are expected to outperform new money outflows during low sentiment periods. In addition, new money flows to mutual funds during low sentiment periods outperform new money flows during high sentiment periods. However, new money inflows to mutual funds do not necessarily underperform new money outflows during high sentiment periods.

With monthly cash flow for each fund, we form positive and negative cash-flow portfolios based on the sign of the net cash-flow experienced by each fund during the previous month. Specifically, the positive cash-flow portfolio includes all funds that realized investor inflows and negative cash-flow portfolio includes those that realized investor outflows during the previous month. Finally, we employ the "follow the money" approach of Elton, Gruber and Blake (1996) and Gruber (1996) to deal with merged funds. This approach assumes that investors in merged funds put their money in the surviving fund and continue to earn the return on the surviving fund and helps to mitigate the survivorship bias. Each month, returns of new-money portfolios are computed for both equal-weighted and cash-flow-weighted portfolios. The latter uses the cash flows realized during the previous month for each fund within the portfolio. To evaluate the performance of the positive and negative cash-flow portfolios, we employ the

Carhart (1997) four-factor model. The four-factor model extends the Fama and French (1993) three-factor model with a momentum factor and is specified as follows:

$$r_{p,t} = \alpha_p + \beta_{1,p} RMRF_t + \beta_{2,p} SMB_t + \beta_{3,p} HML_t + \beta_{4,p} UMD_t + \varepsilon_p \quad (4)$$

where $r_{p,t}$ is the monthly return on a portfolio of funds in excess of the 1-month T-bill rate; *RMRF* is the excess return on a value-weighted market portfolio; *SMB HML* and *UMD* are, respectively, returns on zero-investment factor mimicking portfolios for size, book-to-market, and 1-year momentum in stock returns.

IV.A. Performance of New Money Flows: Portfolio Approach

Table IX reports the corresponding performance of average, positive, and negative cash-flow portfolios based on the four-factor model. The results are reported for both equal-weighted portfolios (left panel) and cash-flow-weighted portfolios (right panel). Unlike equal-weighted portfolios, cash-flow-weighted portfolios place greater emphasis on funds that experience the largest absolute investor money flows. As such, the cash-flow-weighted portfolios capture more accurately the performance of new money in and out of mutual funds. To examine the performance of investor inflows and outflows, Table IX also reports the difference in factor alpha between positive cash-flow portfolios and negative cash-flow portfolios. Positive abnormal returns between these portfolios indicate investors' overall ability to predict future performance of mutual funds. Since the informational contents of inflow and outflow may be different, we also report the difference in factor alpha between positive (negative) cash-flow portfolios and average portfolios. Investors may withdraw money out of funds due to behavioral bias, such as disposition effect (Odean, 1998), or liquidity needs and tax purposes (Keswani and Stolin, 2008). Thus, outflows of mutual funds may be less informative about investors' ability of fund selection.

Panel A shows that fund inflows outperform outflows for whole sample period. The difference between equal-weighted positive cash-flow portfolios and negative cash-flow portfolios is 0.070% per month (0.840% annually). However, this result is not significant at any

conventional level. On the other hand, the difference between cash-flow-weighted positive cash-flow portfolios and negative cash-flow portfolios is 0.103% per month (1.236% annually) and is significant at the 10% level. Consistent with Keswani and Stolin (2008) and Jiang and Yuksel (2013), these findings suggest that while it is weak, fund flows predict future fund performance.

Consistent with our predictions, the fund flows predictability for future fund performance is significantly different between the high-sentiment periods in Panel B and the low-sentiment periods of Table IX. During the high-sentiment periods , difference in four-factor alpha between positive and negative cash-flow portfolios is not statistically significant for neither equal-weighted nor cash-flow weighted portfolios in Panel B. In sharp contrast, in Panel C this difference between positive and negative cash-flow portfolios is significantly positive. For example, during the low-sentiment periods, the difference between equal-weighted positive and negative money flows portfolios is 0.121% monthly (1.452% annually). Similarly, the difference in cash-flow weighted portfolios is 0.192% monthly (2.304% annually). In both cases, the differences are significant at the 1% level. These findings suggest that not only fund investors exhibit behavioral differences in preferences for fund characteristics, but also the predictive power of investor flows for subsequent fund performance significantly vary across different sentiment periods. Further, our findings suggest that the so-called “smart money” effect is entirely driven by fund flows during the low sentiment periods.

IV.B. Performance of New Money Flows: Fama-MacBeth Regressions

Although our portfolio analysis overwhelmingly supports the differential predictability of fund flows between the high- and low-sentiment periods, we test our findings in a multivariate frame work. Specifically, we perform cross-sectional regressions of fund returns on investors’ cash-flows and wide variety control variables that are potentially affect future fund performance. Specifically, for each month *t*, we estimate the following regression:

$$\alpha_{i,t}^{4F} = intercept_{i,t} + \beta_1 Flow_{i,t-1}^{\%} + \beta_2 R_{i,t-3,t-1} + \beta_3 Expense\ Ratio_{i,t-3,t-1}$$
$$+\beta_4 Fund\ Size_{i,t-1} + \beta_5 Fund\ Age_{i,t-1} + \beta_7 Turnover_{i,t-1} + \beta_9 Star_{i,t-1}$$
$$+\beta_8 Star\ Affiliation_{i,t-1} + \beta_9 Family\ Size_{i,t-1} + \beta_5 \beta_{i,t-1}^{MKTRF}$$
$$+\beta_6 \beta_{i,t-1}^{SMB} + \beta_7 \beta_{i,t-1}^{HML} + \beta_8 \beta_{i,t-1}^{UMD} + \beta_9 \varepsilon_{i,t-1}^{4F} + \epsilon_{i,t} \quad (5)$$

where the dependent variable, $\alpha_{i,t}^{4F}$, is the four-factor alpha estimated from the Carhart (1997) model. Specifically, the fund alpha is obtained as the fund excess return less the sum of the products of each of the four-factor realizations and corresponding factor loadings in equation (2). The explanatory variables include normalized cash-flow at previous month expressed as a proportion of fund TNA ($Flow_{i,t-1}^{\%}$); prior three-month return ($R_{i,t-3,t-1}$); fund's expense ratio ($Expense\ Ratio_{i,t-1}$); the logarithm of fund TNA at the previous month ($Fund\ Size_{i,t-1}$); the logarithm of fund's age ($Fund\ Age_{i,t-1}$); fund's portfolio turnover ($Turnover_{i,t-1}$); family size measured as the residual of the logarithm of the fund family's total TNAs at the beginning of the month on fund size and star dummy ($Family\ Size_{i,t-1}$); Star dummy that is assigned one if funds that are ranked in the top 10% of each category, and zero otherwise ($Star_{i,t-1}$); and Star Affiliation that is equal to one if a fund is affiliated with a star family but is not a star itself, and zero otherwise ($Star\ Affiliation_{i,t-1}$). We also include funds past loadings based on four-factor model. $\beta_{i,t-1}^{MKTRF}$, $\beta_{i,t-1}^{SMB}$, $\beta_{i,t-1}^{HML}$, and $\beta_{i,t-1}^{UMD}$, are the funds factor loadings on excess market return (*MKTRF*), size (*SMB*), value (*HML*), and momentum (*UMD*) factors. Finally, $\varepsilon_{i,t-1}^{4F}$ is the four-factor tracking error measured as standard error obtained from equation (2). We standardize regression coefficients and estimate the above regressions following the Fama-MacBeth (1973) procedure. The reported results are time-series averages of coefficients obtained from monthly cross-sectional regressions. The *t*-statistics are computed from standard errors that are adjusted for heteroskedasticity and autocorrelations following Newey and West (1987).

Table X reports the results of the regression above. For whole sample period, specifications (1) and (2) show that fund flows is positively associated with the future fund performance. The coefficient of $Flow$ (%) is 0.008 (*t*-statistic=1.89) in specification (1) and 0.010 (*t*-statistic=2.70) respectively. When we examine this relation for the high- and low-sentiment periods respectively, one again, Table X shows significant differences in the predictability of fund flows for future fund performance across different sentiment periods. During the high sentiment periods, there is no relation between fund flows and future fund performance in specifications (3) and (4). The coefficients of $Flow$ (%) are 0.000 with *t*-statistic of 0.10 and 0.005 with *t*-statistic of 1.64. In sharp contrast, both specifications (5) and (6) show that the relation between future fund performance and $Flow$ (%) is significant and positive. The coefficient of $Flow$ (%) is 0.015 with *t*-statistic of 2.49 in specification (5) and 0.015 with *t*-statistic of 2.41 in specification (6). These results complement our earlier portfolio analysis and suggest that fund investors have ability to predict superior fund performance only during the low-sentiment periods.

Interestingly, previous three-month return ($R_{i,t-3,t-1}$) is also positively associated with future fund performance in specifications (1) and (2). Table X finds that this relation is driven entirely by the high-sentiment periods. While $R_{i,t-3,t-1}$ is significant and positive in specifications (2) and (3) during the high-sentiment periods, there is no relation between future fund performance and previous fund return in specifications (5) and (6) during the low-sentiment periods. On the other hand, $Expense\ Ratio$ is significantly negatively associated with future fund performance across all specifications. In addition, fund characteristics that enhance fund visibility ($Star$, $Star\ Affiliation$, and $Family\ Size$) have also predictive power for future fund performance for whole sample periods as indicated in specifications (1) and (2). However, once again, the positive relation between future performance and these characteristics are pronounced only during the low-sentiment periods. Table X also indicates that β^{MKTRF} is negatively associated

with future fund performance for whole sample period in specifications (1) and (2). While the coefficients of β^{MKTRF} is negative both for the high- and low-sentiment periods, this negative relation is more pronounced during the low-sentiment periods in specifications (5) and (6). Finally, the activeness of the fund management measured by the four-factor tracking error (ε^{4F}) has predictive ability for future fund performance only during the low-sentiment periods in specifications (5) and (6). On the other hand, there is no relation between future fund performance and ε^{4F} during the high-sentiment periods.

V. Conclusion

Investor sentiment reflects the view of the market condition by all market participants at any point of time. Recent studies document that investors exhibit clear differences in their behavior and preference during the high- and low-sentiment episodes. Further, existing studies show that investor sentiment affects cross-section of stock returns, a broad set of anomalies, and mean-variance tradeoff (Baker and Wurgler, 2006; Yu and Yuan, 2011, Stambaugh, Yu and Yuan, 2012). Motivated by varying nature of investor sentiment, in this research we investigate the behavior of mutual fund investors during the different sentiment periods. Our results highlight the significant differences in mutual fund investors' behavior and preferences for the mutual fund characteristics between the high- and low-sentiment periods. More specifically, we document that fund investors are more likely to invest in funds with more speculative and riskier style during the high sentiment periods. Interestingly, while flowing into more speculative funds, fund investors during the high-sentiment periods seem to select funds with less active fund management. In addition, while fund investors, on average, seem to pay attention total costs of their investment during the whole sample period, we find the negative association between fund flows and expense ratio is driven solely during the low-sentiment periods. This finding suggests that increased presence and trading of sentiment-driven investors during the high-sentiment

periods undermine otherwise negative relation between fund flows and fund expenses documented in the previous literature. Finally, we also show that fund flows sensitivity to past performance is significantly more pronounced during the high-sentiment periods, consistent with the notion that inexperienced and naïve investors put more weight on past performance during the high-sentiment periods.

When we examine the relation between fund flows and performance unrelated fund characteristics including marketing and fund characteristics that enhance the fund visibility, our findings further show a clear difference in the relation between fund flows and these characteristics. For example, marketing efforts are more impact on investors purchasing decision during the high-sentiment periods. In sharp contrast, we find a negative relation between fund flows and fund's marketing efforts during the low sentiment periods. More importantly, brand recognition and star family affiliation attracts greater investor flows during the high-sentiment periods. These results are consistent with the notion that naïve and inexperienced fund investors during the high-sentiment periods put more weight on visibility characteristics of mutual funds when selecting funds. Surprisingly, the relation between fund flows and stellar performance (as opposed to past performance) is more pronounced during the low-sentiment periods. This finding suggests that the stellar performance is more important assurance about the quality of fund management during the high-sentiment periods. Further, while institutional investors seem to prefer more speculative and riskier funds during the high sentiment period compared to the low-sentiment periods, we show that significant variation in fund flows sensitivity to fund characteristics is mainly driven by retail investors. This result suggests that retail fund investors are more prone to investor sentiment.

We next examine the impact of investor sentiment on fund performance. Once again, our analysis shows clear differences in predictive ability of money flows for subsequent fund

performance between different sentiment periods. In specific, we find that while fund flows during the low-sentiment periods predict future fund performance even after controlling for momentum factor, there is no relation money flows and fund performance during the high-sentiment periods. These findings suggest that not only fund investors exhibit behavioral differences in preferences for fund characteristics, but also the predictive power of investor flows for subsequent fund performance significantly vary across different sentiment periods. Further, our findings suggest that the so-called “smart money” effect is entirely driven by fund flows during the low sentiment periods.

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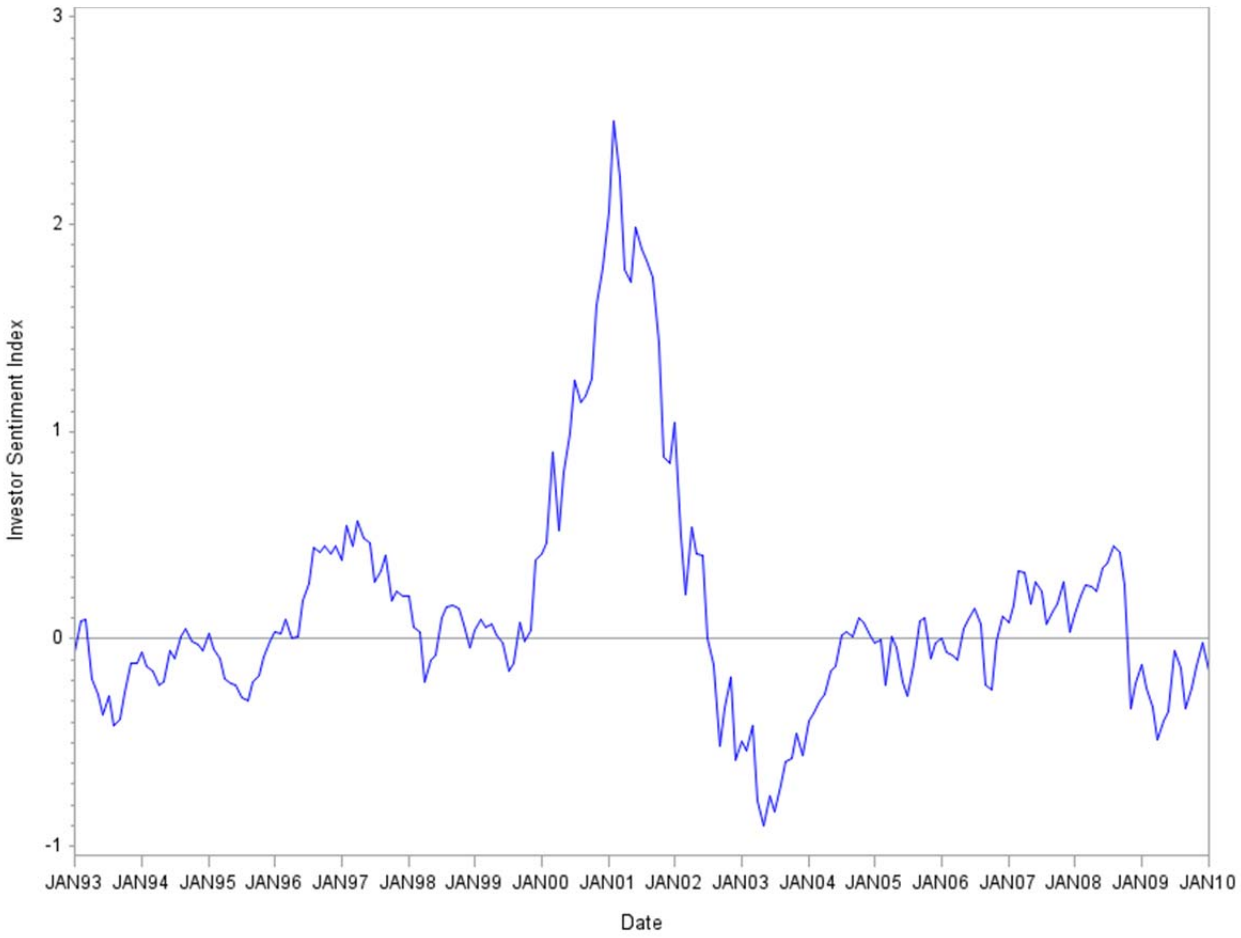

Figure 1.

The Baker and Wurgler (2006) monthly investor sentiment index from 1993 to 2010. The sentiment index is the first principal component of the six measures. The six measures are the closed-end fund discount, the NYSE share turnover, the number of and the average first-day returns on initial public offerings (IPOs), the equity share in new issues, and dividend premium. To control for macro-conditions, Baker and Wurgler (2006) regress the six raw sentiment measures on the growth of industry production, the growth of durable consumption, the growth of nondurable consumption, the growth of service consumption, the growth of employment, and a dummy variable for National Bureau of Economic Research (NBER) recession.

Table I
Summary Statistics of Mutual Funds

This table reports time-series averages of monthly cross-sectional means and medians of fund characteristics for all mutual funds, retail funds, and institutional funds. $Fund\ Size$ is the logarithm of *TNA* at the beginning of the month*;* $Family\ Size$ is the logarithm of fund family size at the beginning of the month; $Expense\ Ratio$ is the percentage of total investment that shareholders pay for fund's marketing and operating expenses; $Marketing\ Expenses$ are calculated as 12b-1 fees plus one-seventh front-end loads; $Operating\ Expenses$ are fund's operating expenses; $Turnover$ is defined as the minimum of aggregate purchases or sales of securities during the year, divided by the average *TNA*; and $Fund\ Age\ (log)$ is the logarithm of one plus fund age. $Return$ is fund's monthly net return. Fund alpha (α^{4F}) is the intercept of the four-factor model which regresses monthly fund excess returns on market excess return (*MKTRF*) and returns of mimicking portfolios for size (*SMB*), book-to-market (*HML*), and momentum (*UMD*) factors: $r_{i,t} = \alpha^{4FF} + \beta_i^{MKTRF} MKT_t + \beta_i^{SMB} SMB_t + \beta_i^{HML} HML_t + \beta_i^{UMD} UMD_t + \varepsilon_{i,t}$. The model is estimated each month for each fund based on preceding 36 monthly fund returns with a minimum requirement of 30 monthly observations. *N* denotes the average number of funds per month. The sample period is from 1993 to 2010

	All Mutual Funds		**Retail Funds**		**Institutional Funds**	
	Mean	**Median**	**Mean**	**Median**	**Mean**	**Median**
N	2,592	2,968	1,998	2,344	534	585
$Fund\ Size$ ($million)	782	133	879	133	361	133
$Family\ Size$ ($billion)	45.38	8.72	46.36	8.77	40.06	8.26
$Expense\ Ratio$	1.31%	1.23%	1.40%	1.33%	0.85%	0.85%
$Marketing\ Expenses$	0.51%	0.36%	0.58%	0.61%	0.16%	0.13%
$Operting\ Expenses$	0.94%	0.93%	0.98%	0.97%	0.68%	0.70%
$Turnover$	79.96%	62.15%	81.10%	62.55%	66.25%	53.65%
$Fund\ Age\ \ (log)$	4.68	4.60	4.72	4.64	4.39	4.36
$Return$	0.73%	0.68%	0.72%	0.68%	0.75%	0.70%
α^{4F}	-0.05%	-0.06%	-0.06%	-0.07%	-0.03%	-0.05%

Table II
Fund Flows during Low- versus High-Sentiment Periods

This table reports time-series averages of monthly cross-sectional mean and median of Normalized Fund Flows (*Fund Flow* (%)), and separately for low- and high sentiment periods. *Fund Flow* (%) is equal to fund flow divided by the *TNA* at the beginning of the month. Panel A reports the results of all funds for whole sample period and separately for high- and low-sentiment periods. Each month, our sample period is classified into high- and low-sentiment periods based on the sign of the BW sentiment index. Panel B (Panel C) reports the results based on funds' Size- (Value-) style categories. Mutual funds are classified into Size- (Value-) style categories based on fund's past four-factor loadings. At the beginning of the month, for each month, four-factor model is computed as the monthly time series regression of fund excess return on the market excess return (RMRF) and mimicking portfolios for size (SMB), book-to-market (HML), and momentum (UMD) factors. Each month, all funds are grouped into two groups based on their median level of SMB (HML) loadings. Mutual funds ranked in the top halve with higher SMB (HML) loadings are classified as Small- (Value-) Style and those in the bottom halve are classified as Large- (Growth-) Style. Finally, Panel D reports the results using 2x2 Size-Value Style. Each panel also reports the difference in mean *Fund Flow* (%) between the high- and low-sentiment periods. The sample period is from 1993 and 2010.

	All Periods		High Sentiment		Low Sentiment		Difference
	Mean	Median	Mean	Median	Mean	Median	H-L
Panel A) Fund-Level							
All Funds (%)	0.223	-0.277	0.324	-0.246	0.113	-0.311	0.210*
							(1.89)
Panel B) Size-Style Categories							
Large-Style (%)	0.101	-0.314	0.222	-0.256	-0.033	-0.379	0.255**
							(2.33)
Small-Style (%)	0.326	-0.247	0.393	-0.255	0.251	-0.238	0.142
							(1.03)
Panel C) Value-Style Categories							
Growth-Style (%)	0.094	-0.352	0.296	-0.227	-0.129	-0.490	0.425***
							(3.20)
Value-Style (%)	0.333	-0.199	0.340	-0.256	0.324	-0.135	0.016
							(0.11)
Panel D) Size x Value-Style Categories							
Large-Growth Style (%)	-0.047	-0.397	0.247	-0.230	-0.373	-0.583	0.620***
							(4.41)
Large-Value Style (%)	0.213	-0.241	0.200	-0.281	0.228	-0.197	-0.028
							(-0.22)
Small-Growth Style (%)	0.190	-0.302	0.319	-0.207	0.048	-0.407	0.271*
							(1.71)
Small-Value Style (%)	0.435	-0.168	0.435	-0.268	0.434	-0.057	0.001
							(0.01)

Table III
Determinants of Fund Flows

This table reports cross-sectional regressions of monthly normalized fund flows ($Fund\ Flow$ (%)) on fund performance (α^{4F}), expense ratio ($Expense\ Ratio$), fund family size ($Family\ Size$), fund size ($Fund\ Size$), fund age ($Fund\ Age$), four factor loadings (β^{MKTRF}, β^{SMB}, β^{HML}, and β^{UMD}), and four-factor tracking error (ε^{4F}) for whole sample period and separately for high- and low-sentiment periods. The high- and low-sentiment months are classified as in Table II. $Fund\ Flow$ (%) is computed as the monthly dollar cash flow divided by the *TNA* at the beginning of the month. For definitions of all other variables, please refer to Table I. Both dependent and independent variables are standardized each month to have a mean zero and standard deviation of one. The table reports time-series averages of the coefficient estimates of the monthly cross-sectional regressions as well as their Newey-West (1987) *t*-statistics (in parentheses). The last column reports the difference in the mean of the coefficients between the high-sentiment and low-sentiment periods. ***, **, * denote significant at the 1%, 5%, or 10% level. The sample period is from 1993 and 2010.

	All Funds			
	All Periods	**High Sentiment**	**Low Sentiment**	**Difference H-L**
	(1)	**(2)**	**(3)**	**(4)**
α^{4F}	0.241***	0.249***	0.232***	0.017**
	(37.06)	(28.03)	(26.16)	(2.02)
$Expense\ Ratio$	-0.025***	-0.011	-0.041***	0.030***
	(-2.82)	(-0.82)	(-3.79)	(3.16)
$Fund\ Size$	-0.021***	-0.032***	-0.009	-0.023***
	(-4.48)	(-5.49)	(-1.49)	(-4.16)
$Fund\ Age$	-0.091***	-0.091***	-0.092***	0.001
	(-24.78)	(-18.31)	(-18.16)	(0.16)
β^{MKTRF}	0.006	0.027***	-0.018	0.045***
	(0.62)	(2.94)	(-0.11)	(4.22)
β^{SMB}	0.001	-0.020	0.024	-0.044***
	(0.04)	(-1.00)	(1.53)	(-3.01)
β^{HML}	0.080***	0.087**	0.072***	0.015
	(4.99)	(3.51)	(4.01)	(0.88)
β^{UMD}	0.089***	0.109***	0.067***	0.043***
	(8.81)	(8.45)	(5.01)	(3.83)
ε^{4F}	-0.010*	-0.024***	0.006	-0.030***
	(-1.67)	(-3.44)	(0.71)	(-3.68)
$Average\ N$	2,592	2,623	2,562	
$Adj.R^2$	0.105	0.118	0.090	

Table IV
Determinants of Fund Flows: Retail versus Institutional Funds

This table reports cross-sectional regressions of monthly normalized fund flows ($Fund\ Flow$ (%)) on fund performance (α^{4F}), expense ratio ($Expense\ Ratio$), fund size ($Fund\ Size$), fund age ($Fund\ Age$), four factor loadings (β^{MKTRF}, β^{SMB}, β^{HML}, and β^{UMD}) , and four-factor tracking error (ε^{4F}) for whole sample period and separately for high- and low-sentiment periods. The high- and low-sentiment months are classified as in Table II. Panel A reports the results for Retail Funds and Panel B reports the results for Institutional Funds. $Fund\ Flow$ (%) is computed as the monthly dollar cash flow divided by the *TNA* at the beginning of the month. For definitions of all other variables, please refer to Table I. Both dependent and independent variables are standardized each month to have a mean zero and standard deviation of one. The table reports time-series averages of the coefficient estimates of the monthly cross-sectional regressions as well as their Newey-West (1987) *t*-statistics (in parentheses). The last column reports the difference in the mean of the coefficients between the high-sentiment and low-sentiment periods. ***, **, * denote significant at the 1%, 5%, or 10% level. The sample period is from 1993 to 2010.

	Panel A: Retail Funds				Panel B: Institutional Funds			
	All Periods	High Sentiment	Low Sentiment	Difference H-L	All Periods	High Sentiment	Low Sentiment	Difference H-L
	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)
α^{4F}	0.250***	0.259***	0.241***	0.018**	0.202***	0.203***	0.200***	0.003
	(35.52)	(26.79)	(25.05)	(2.06)	(18.82)	(15.03)	(14.50)	(0.18)
$Expense\ Ratio$	-0.031***	-0.019	-0.045***	0.026***	-0.018*	-0.014*	-0.023	0.009
	(-3.53)	(-1.52)	(-3.87)	(2.61)	(-1.75)	(-1.94)	(-1.10)	(0.69)
$Fund\ Size$	-0.017***	-0.031***	-0.003	-0.028***	-0.051***	-0.054***	-0.047**	-0.007
	(-3.19)	(-4.42)	(-0.40)	(-4.38)	(-3.57)	(-3.52)	(-2.17)	(-0.35)
$Fund\ Age$	-0.096***	-0.096***	-0.097***	0.001	-0.068***	-0.081***	-0.053***	-0.028*
	(-22.71)	(-15.15)	(-17.91)	(0.22)	(-6.79)	(-8.49)	(-3.21)	(-1.85)
β^{MKTRF}	-0.001	0.023**	-0.026	0.049***	0.014	0.033**	-0.010	0.043**
	(-0.05)	(2.04)	(-1.51)	(4.06)	(1.13)	(2.11)	(-0.49)	(2.25)
β^{SMB}	0.006	-0.016	0.030*	-0.046***	-0.030**	-0.046**	-0.009	-0.036*
	(0.38)	(-0.73)	(1.76)	(-2.88)	(-2.00)	(-2.08)	(-0.49)	(-1.78)
β^{HML}	0.085***	0.094***	0.075***	0.019	0.057***	0.063***	0.049**	0.014
	(5.03)	(3.52)	(4.15)	(1.03)	(3.71)	(2.84)	(2.63)	(0.74)
β^{UMD}	0.093***	0.113***	0.070***	0.043***	0.086***	0.102***	0.066**	0.036*
	(8.52)	(8.10)	(4.89)	(3.55)	(6.20)	(6.58)	(2.86)	(1.84)
ε^{4F}	-0.006	-0.023***	0.014	-0.037***	0.007	0.001	0.014	-0.013
	(-0.79)	(-3.00)	(1.42)	(-3.95)	(0.55)	(0.05)	(0.80)	(-0.71)
$Average\ N$	1,998	2,044	1,951		594	533	670	
$Adj.R^2$	0.118	0.133	0.102		0.072	0.077	0.067	

Table V
The Effect of Marketing and Operating Expenses on Fund Flows

This table reports cross-sectional regressions of monthly normalized fund flows (*Fund Flow* (%)) on marketing and operating expenses of fund and various fund characteristics for whole sample period and separately for high- and low-sentiment periods. The high- and low-sentiment months are classified as in Table II. In addition to those variables in Table III, fund's expense ratio (*Expense Ratio*) is decomposed into fund's marketing expenses (*Marketing Expenses*) which is calculated as 12b-1 fees plus one-seventh front-end loads and fund operating expenses (*Operating Expenses*). *Fund Flow* (%) is computed as the monthly dollar cash flow divided by the *TNA* at the beginning of the month. For definitions of all other variables, please refer to Table I. Both dependent and independent variables are standardized each month to have a mean zero and standard deviation of one. The table reports time-series averages of the coefficient estimates of the monthly cross-sectional regressions as well as their Newey-West (1987) *t*-statistics (in parentheses). The last column reports the difference in the mean of the coefficients between the high-sentiment and low-sentiment periods. ***, **, * denote significant at the 1%, 5%, or 10% level. The sample period is from 1993 to 2010.

	All Funds			
	All Periods	**High Sentiment**	**Low Sentiment**	**Difference H-L**
	(1)	**(2)**	**(3)**	**(4)**
$MarketingExpenses$	-0.000	0.016	-0.019**	0.035***
	(-0.06)	(1.38)	(-1.99)	(4.00)
$Operting\ Epenses$	-0.029***	-0.028***	-0.030***	0.002
	(-7.22)	(-4.52)	(-5.88)	(0.24)
α^{4F}	0.243***	0.251***	0.233***	0.017**
	(37.47)	(28.71)	(26.29)	(2.01)
$Fund\ Size$	-0.024***	-0.036***	-0.011*	-0.025***
	(-4.36)	(-4.65)	(-1.69)	(-4.10)
$Fund\ Age$	-0.092***	-0.091***	-0.092***	0.000
	(-25.05)	(-18.71)	(-18.57)	(0.07)
β^{MKTRF}	0.005	0.025***	-0.018	0.043***
	(0.53)	(2.81)	(-1.13)	(4.10)
β^{SMB}	0.003	-0.017	0.025	-0.042***
	(0.20)	(-0.86)	(1.66)	(-2.91)
β^{HML}	0.081***	0.089***	0.073***	0.016
	(5.07)	(3.57)	(4.52)	(0.90)
β^{UMD}	0.090***	0.111***	0.068***	0.043***
	(8.80)	(8.43)	(3.12)	(3.82)
ε^{4F}	-0.006	-0.017**	0.006	-0.023***
	(-1.05)	(-2.25)	(0.73)	(-2.88)
$Average\ N$	2,592	2,623	2,562	
$Adj.R^2$	0.106	0.119	0.091	

Table VI

The Effect of Marketing and Operating Expenses on Fund Flows: Retail versus Institutional Funds

This table reports cross-sectional regressions of monthly normalized fund flows (*Fund Flow* (%)) on marketing and operating expenses and various fund characteristics for whole sample period and separately for high- and low-sentiment periods. The high- and low-sentiment months are classified as in Table II. In addition to those variables in Table III, fund's expense ratio (*Expense Ratio*) is decomposed into fund's marketing expenses (*Marketing Expenses*) which is calculated as 12b-1 fees plus one-seventh front-end loads and fund operating expenses (*Operating Expenses*). *Fund Flow* (%) is computed as the monthly dollar cash flow divided by the *TNA* at the beginning of the month. For definitions of all other variables, please refer to Table I. Panel A reports the results for Retail Funds and Panel B reports the results for Institutional Funds. Both dependent and independent variables are standardized each month to have a mean zero and standard deviation of one. The table reports time-series averages of the coefficient estimates of the monthly cross-sectional regressions as well as their Newey-West (1987) *t*-statistics (in parentheses). The last column reports the difference in the mean of the coefficients between the high-sentiment and low-sentiment periods. ***, **, * denote significant at the 1%, 5%, or 10% level. The sample period is from 1993 to 2010.

	Panel A: Retail Funds				Panel B: Institutional Funds			
	All Periods	**High Sentiment**	**Low Sentiment**	**Difference H-L**	**All Periods**	**High Sentiment**	**Low Sentiment**	**Difference H-L**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
$Marketing$	-0.004	0.011	-0.020**	0.031***	0.022**	0.011	0.035**	-0.024
	(-0.49)	(0.97)	(-2.04)	(3.49)	(2.54)	(0.98)	(2.79)	(-1.53)
$Operting\ Epenses$	-0.026***	-0.028***	-0.024***	-0.004	-0.032***	-0.031***	-0.032*	0.001
	(-6.26)	(-4.39)	(-4.25)	(-0.70)	(-3.44)	(-4.89)	(-1.81)	(0.02)
α^{4F}	0.252***	0.261***	0.242***	0.019**	0.203***	0.204***	0.202***	0.002
	(35.88)	(27.37)	(25.18)	(2.03)	(17.74)	(14.73)	(12.93)	(0.12)
$Fund\ Size$	-0.019***	-0.034***	-0.002	-0.032***	-0.043***	-0.046***	-0.040*	-0.006
	(-2.80)	(-3.59)	(-0.24)	(-4.35)	(-3.02)	(-2.91)	(-1.87)	(-0.34)
$Fund\ Age$	-0.096***	-0.095***	-0.097***	0.002	-0.074***	-0.084***	-0.061***	-0.023
	(-22.29)	(-15.43)	(-17.89)	(0.32)	(-6.63)	(-8.18)	(-3.24)	(-1.39)
β^{MKTRF}	-0.002	0.021**	-0.026	0.047***	0.014	0.034**	-0.011	0.045**
	(-0.15)	(2.23)	(-1.54)	(3.97)	(1.17)	(2.12)	(-0.51)	(2.29)
β^{SMB}	0.006	-0.014	0.029	-0.043***	-0.025	-0.042*	-0.004	-0.037*
	(0.43)	(-0.66)	(1.80)	(-2.78)	(-1.60)	(-1.81)	(-0.19)	(-1.73)
β^{HML}	0.087***	0.096***	0.077***	0.019	0.058***	0.064***	0.051***	0.012
	(5.12)	(3.57)	(4.24)	(1.03)	(3.83)	(2.86)	(2.78)	(0.63)
β^{UMD}	0.094***	0.114***	0.071***	0.043***	0.085***	0.102***	0.063***	0.039**
	(8.50)	(8.07)	(4.89)	(3.52)	(6.25)	(6.65)	(2.82)	(2.04)
ε^{4F}	-0.002	-0.017**	0.014	-0.0311***	0.010	0.004	0.018	-0.014
	(-0.34)	(-2.03)	(1.37)	(-3.24)	(0.86)	(0.28)	(1.03)	(-0.77)
$Average\ N$	1,998	2,044	1,951		594	533	670	
$Adj.R^2$	0.119	0.134	0.102		0.072	0.081	0.063	

Table VII
The Effect of Star Fund and Family Star Affiliation on Fund Flows

This table reports cross-sectional regressions of monthly normalized fund flows (Fund Flow (%)) on fund visibility characteristics and various fund characteristics for whole sample period and separately for high- and low-sentiment periods. The high- and low-sentiment months are classified as in Table II. In addition to those variables in Table III, star fund dummy (Star), star fund affiliated family dummy (Star Affiliation), and family size (Family Size) are included. Each month, funds are ranked according to their performance (α^{4F}) during the past 36 months within each fund category (Size-Value Style Categories). Star is a dummy variable with a value of 1 for funds ranked in the top 10% of each category and zero otherwise. Star Affiliation is a dummy variable with a value of 1 for funds with a star fund in the same family (excluding the star fund itself) and zero otherwise. Family Size is the residual of monthly cross sectional regression logarithm of family size on fund size (Fund Size) and Star Dummy (Star) For definitions of all other variables, please refer to Table I. Both dependent and independent continuous variables are standardized each month to have a mean zero and standard deviation of one. The table reports time-series averages of the coefficient estimates of the monthly cross-sectional regressions as well as their Newey-West (1987) t-statistics (in parentheses). The last column reports the difference in the mean of the coefficients between the high-sentiment and low-sentiment periods. ***, **, * denote significant at the 1%, 5%, or 10% level. The sample period is from 1993 to 2010.

	All Funds			
	All Periods	**High Sentiment**	**Low Sentiment**	**Difference H-L**
	(1)	**(2)**	**(3)**	**(4)**
$Star$	0.101***	0.079***	0.125***	-0.046**
	(7.49)	(4.50)	(6.49)	(-2.31)
$Star\ Affiliation$	0.082***	0.097***	0.067***	0.030***
	(9.40)	(9.22)	(4.91)	(2.54)
$Family\ Size$	0.053***	0.070***	0.033***	0.037***
	(8.28)	(9.18)	(3.71)	(5.08)
α^{4F}	0.226***	0.239***	0.211***	0.028***
	(36.85)	(30.03)	(25.92)	(3.39)
$Expense\ Ratio$	-0.032***	-0.019	-0.045***	0.025***
	(-3.80)	(-1.61)	(-4.36)	(2.82)
$Fund\ Size$	-0.031***	-0.046***	-0.016*	-0.030***
	(-5.86)	(-6.64)	(-2.42)	(-4.86)
$Fund\ Age$	-0.083***	-0.079***	-0.086***	0.007
	(-24.75)	(-17.32)	(-19.59)	(1.52)
β^{MKTRF}	0.002	0.022***	-0.022	0.044***
	(0.17)	(2.46)	(-1.42)	(4.28)
β^{SMB}	0.005	-0.015	0.028*	-0.043***
	(0.41)	(-0.74)	(1.88)	(-2.96)
β^{HML}	0.080***	0.086***	0.072***	0.014
	(5.04)	(3.51)	(4.09)	(0.82)
β^{UMD}	0.088***	0.108***	0.066***	0.042***
	(8.54)	(7.94)	(4.94)	(3.75)
ε^{4F}	-0.012**	-0.023***	-0.000	-0.023***
	(-2.40)	(-3.64)	(-0.03)	(-3.04)
$Intercept$	-0.037***	-0.040***	-0.034***	-0.006
	(-12.28)	(-10.46)	(-7.51)	(-1.39)
$Average\ N$	2,592	2,623	2,562	
$Adj.R^2$	0.113	0.128	0.097	

Panel VIII

The Effect of Star Fund and Family Star Affiliation on Fund Flows: Retail versus Institutional Funds

This table reports cross-sectional regressions of monthly normalized fund flows (Fund Flow (%)) on fund visibility characteristics and various fund characteristics for whole sample period and separately for high- and low-sentiment periods. The high- and low-sentiment months are classified as in Table II. In addition to those variables in Table III, star fund dummy (Star), star fund affiliated family dummy (Star Affiliation), and family size (Family Size) are included. Each month, funds are ranked according to their performance (α^{4F}) during the past 36 months within each fund category (Size-Value Style Categories). Star is a dummy variable with a value of 1 for funds ranked in the top 10% of each category and zero otherwise. Star Affiliation is a dummy variable with a value of 1 for funds with a star fund in the same family (excluding the star fund itself) and zero otherwise. Family Size is the residual of monthly cross sectional regression logarithm of family size on fund size (Fund Size) and Star Dummy (Star) For definitions of all other variables, please refer to Table I. Panel A reports the results for Retail Funds and Panel B reports the results for Institutional Funds. Both dependent and independent continuous variables are standardized each month to have a mean zero and standard deviation of one. The table reports time-series averages of the coefficient estimates of the monthly cross-sectional regressions as well as their Newey-West (1987) t-statistics (in parentheses). The last column reports the difference in the mean of the coefficients between the high-sentiment and low-sentiment periods. ***, **, * denote significant at the 1%, 5%, or 10% level. The sample period is from 1993 to 2010.

	Panel A: Retail Funds				Panel B: Institutional Funds			
	All Periods	**High Sentiment**	**Low Sentiment**	**Difference H-L**	**All Periods**	**High Sentiment**	**Low Sentiment**	**Difference H-L**
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**	**(7)**	**(8)**
Star	0.114***	0.089***	0.141***	-0.053**	0.021	0.013	0.032	-0.019
	(8.18)	(4.79)	(7.26)	(-2.50)	(0.68)	(0.31)	(0.74)	(-0.34)
Star Affiliation	0.073***	0.093***	0.050***	0.043***	0.109***	0.091***	0.131***	-0.040
	(7.17)	(6.81)	(3.82)	(3.30)	(5.47)	(4.13)	(3.78)	(-1.32)
Family Size	0.037***	0.059***	0.014	0.045***	0.085***	0.092***	0.078***	0.014
	(4.71)	(5.63)	(1.34)	(5.20)	(7.98)	(8.00)	(4.04)	(0.93)
α^{4F}	0.234***	0.250***	0.216***	0.033***	0.193***	0.189***	0.197***	-0.008
	(34.24)	(28.09)	(24.01)	(3.65)	(21.43)	(15.61)	(19.43)	(-0.51)
Expense Ratio	-0.039***	-0.029*	-0.049***	0.019**	-0.004	-0.004	-0.004	-0.000
	(-4.83)	(-2.04)	(-4.56)	(2.12)	(-0.39)	(-0.49)	(-0.19)	(-0.05)
Fund Size	-0.029***	-0.047***	-0.009	-0.038***	-0.044***	-0.048***	-0.040*	-0.008
	(-4.46)	(-5.53)	(-1.18)	(-5.26)	(-3.04)	(-3.10)	(-1.79)	(-0.40)
Fund Age	-0.088***	-0.083***	-0.093***	0.010*	-0.081***	-0.088***	-0.073***	-0.015
	(-22.33)	(-14.67)	(-19.10)	(1.76)	(-7.87)	(-7.96)	(-4.49)	(-0.90)
β^{MKTRF}	-0.003	0.019*	-0.027	0.046***	0.010	0.030**	-0.015	0.045**
	(-0.26)	(1.92)	(-1.65)	(4.01)	(0.83)	(2.23)	(-0.76)	(2.49)
β^{SMB}	0.009	-0.012	0.032**	-0.045***	-0.024*	-0.036*	-0.009	-0.027
	(0.62)	(-0.56)	(2.00)	(-2.85)	(-1.66)	(-1.69)	(-0.48)	(-1.33)
β^{HML}	0.085***	0.093***	0.075***	0.018	0.061***	0.065***	0.056***	0.020
	(5.03)	(3.51)	(4.14)	(0.99)	(4.03)	(2.95)	(3.00)	(0.74)
β^{UMD}	0.092***	0.113***	0.069***	0.044***	0.086***	0.094***	0.075***	0.009
	(8.30)	(7.74)	(3.85)	(3.57)	(6.02)	(6.80)	(2.85)	(0.44)
ε^{4F}	-0.011*	-0.025***	0.005	-0.030***	0.011	0.006	0.017	-0.011
	(-1.73)	(-3.43)	(0.53)	(-3.29)	(-0.98)	(0.47)	(1.07)	(-0.57)
Intercept	-0.035***	-0.039***	-0.029***	-0.012**	-0.042***	-0.035***	-0.054***	0.021*
	(-10.47)	(-8.31)	(-7.47)	(-2.45)	(-5.23)	(-4.11)	(-3.87)	(1.79)
Average N	1,998	2,044	1,951		594	533	670	
$Adj.R^2$	0.127	0.143	0.109		0.088	0.089	0.086	

Table IX
Performance of New-Money Flows

This table reports the performance of average mutual funds and new-money portfolios formed on previous month fund flows for all sample period, high- and low-sentiment periods. Each month, mutual funds are grouped to form a positive cash-flow portfolio and a negative cash-flow portfolio based on the sign of net cash flow of each fund during the previous month. Performance is measured by the four-factor alpha based on monthly returns of portfolios. The table reports estimates of alphas (in percentage term) and factor loadings for equal- and cash-flow-weighted portfolios for whole sample periods in Panel A, for the high-sentiment periods in Panel B, and for the low-sentiment periods in Panel C. The difference in alphas between the positive cash-flow portfolio and the negative cash-flow portfolio is also reported. *, **, and *** denote statistical significance at the 10%, 5% and 1% levels, respectively, where the inference is based on Newey-West (1987) *t*-statistics. The sample period is from 1993 to 2010.

	Equal-Weighted Portfolios					Cash-Flow-Weighted Portfolios				
	Alpha	MKT	SMB	HML	UMD	Alpha	MKT	SMB	HML	UMD
Panel A: All Sample Period										
Average	-0.107**	0.966***	0.137***	0.061***	0.008	-0.077**	0.940***	0.043***	0.018	0.009
Positive Cash-Flow	-0.069*	0.969***	0.193***	0.022	0.055***	-0.039	0.958***	0.186***	-0.037*	0.085***
Negative Cash-Flow	-0.139**	0.962***	0.090***	0.091***	-0.028	-0.142**	0.956***	0.022	0.093***	-0.051***
Positive-Negative	0.070					0.103*				
Panel B: High Sentiment Periods										
Average	-0.115*	0.995***	0.124***	0.096***	0.011	-0.130***	0.954***	0.034**	0.032**	0.018
Positive Cash-Flow	-0.102*	0.995***	0.179***	0.040*	0.085***	-0.121*	0.974***	0.177***	-0.039	0.133***
Negative Cash-Flow	-0.121	0.993***	0.077***	0.138***	-0.046*	-0.136	0.987***	0.007	0.143***	-0.081***
Positive-Negative	0.018					0.016				
Panel C: Low Sentiment Periods										
Average	-0.111***	0.930***	0.220***	0.015	0.001	-0.025	0.916***	0.082***	0.002	-0.001
Positive Cash-Flow	-0.049	0.919***	0.241***	0.011	0.013*	0.039	0.906***	0.182***	-0.011	0.022**
Negative Cash-Flow	-0.170***	0.936***	0.205***	0.020	-0.007	-0.153***	0.932***	0.153***	0.017	-0.015*
Positive-Negative	0.121***					0.192***				

Table X
Fund Performance, Money Flows, and Other Attributes

This table reports cross-sectional regressions of fund performance (α^{4F}) on previous month's normalized cash f ($Fund\ Flow$ (%) and various fund characteristics for whole sample period and separately for the high- and l sentiment periods. The high- and low-sentiment months are classified as in Table II. Fund performance is meas by the four-factor alpha (α^{4F}) which is obtained from the fund excess return less the sum of the products of eac the four factor realizations and corresponding estimates of factor loadings based on the preceding 36 monthly returns. $Fund\ Flow$ (%) is computed as the monthly dollar cash flows divided by the *TNA* at the beginning o month. For definitions of all other variables, please refer to Table I and Table VI. Both dependent and indepen continuous variables are standardized each month to have a mean zero and standard deviation of one. The t reports time-series averages of the coefficient estimates of the monthly cross-sectional regressions as well as Newey-West (1987) t-statistics (in parentheses). The last column reports the difference in the mean of coefficients between the high-sentiment and low-sentiment periods. ***, **, * denote significant at the 1%, 5% 10% level. The sample period is from 1993 to 2010.

	All Funds					
	All Periods		**High Sentiment**		**Low Sentiment**	
	(1)	**(2)**	**(3)**	**(4)**	**(5)**	**(6)**
$Flow$ (%)	0.008*	0.010***	0.000	0.005	0.015**	0.015*
	(1.89)	(2.70)	(0.10)	(1.64)	(2.49)	(2.41
$R_{t-3,t-1}$	0.043***	0.051***	0.072***	0.085***	0.011	0.014
	(3.32)	(2.93)	(3.85)	(3.94)	(0.64)	(0.55
$Expense\ Ratio$	-0.018***	-0.018***	-0.020***	-0.021***	-0.015***	-0.014*
	(-5.21)	(-6.49)	(-4.41)	(-6.42)	(-3.03)	(-3.09
$Fund\ Size$	-0.002	0.002	-0.012**	-0.006	0.009	0.011*
	(-0.46)	(0.56)	(-2.47)	(-1.54)	(1.51)	(2.15
$Fund\ Age$	0.002	-0.002	-0.000	-0.002	0.004	-0.00
	(0.80)	(-0.74)	(-0.01)	(-0.53)	(1.20)	(-0.56
$Turnover$	-0.003	0.005	-0.005	0.011*	-0.001	-0.00
	(-0.48)	(1.05)	(-0.56)	(1.87)	(-0.10)	(-0.27
$Star$	0.062***	0.033**	0.044	0.020	0.081***	0.047*
	(3.23)	(2.45)	(1.61)	(1.07)	(3.24)	(2.69
$Star\ Affiliation$	0.017***	0.016**	0.014	0.011	0.022**	0.022*
	(2.72)	(2.47)	(1.56)	(1.27)	(2.48)	(2.56
$Family\ Size$	0.008**	0.011***	0.005	0.005	0.011**	0.019*
	(2.44)	(3.10)	(1.18)	(0.95)	(2.19)	(3.80
β^{MKTRF}		-0.049***		-0.022		-0.079*
		(-3.37)		(-1.22)		(-3.72
β^{SMB}		-0.006		0.010		-0.02
		(-0.50)		(0.63)		(-1.41
β^{HML}		-0.026		-0.027		-0.02
		(-1.45)		(-1.09)		(-1.15
β^{UMD}		-0.039**		-0.071***		-0.00
		(-2.31)		(-3.32)		(-0.16
ε^{4F}		0.009		-0.009		0.028*
		(0.80)		(-0.53)		(2.03
$Intercept$	-0.012***	-0.009***	-0.009**	-0.006*	-0.016***	-0.017*
	(-3.66)	(-3.01)	(-2.16)	(-1.69)	(-3.25)	(-3.69
$Average\ N$	2,587	2,587	2,614	2,614	2,557	2,557
$Adj.R^2$	0.068	0.211	0.078	0.214	0.056	0.094