Prospect Theory and Mutual Fund Flows*

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Abstract

This paper studies the flows of equity mutual funds. We find that investors base their mutual fund purchase decisions in a way described by prospect theory. The prospect theory value predicts fund flows for horizons up ten months and contains incremental information compared to historical performance measures already discovered in the fund flow literature. Especially the concavity and convexity feature of the prospect theory value is responsible for the superior fund flow predictions. The results are robust to various specifications.

Keywords: Mutual Fund Flows, Prospect Theory

JEL: G11, G23, G41

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1 Introduction

Mutual funds are largely traded by retail investors. In 2019, individual investors owned 89% of mutual fund assets ($21.3 trillion) and therefore made up the largest group of investors in mutual funds.[1] As a direct consequence retail investors directly determine the flows for mutual funds. Understanding the individuals' preferences and how they influence fund flows is important since mutual fund flows do significantly affect asset prices and fund managers' incentives.

The literature on prospect theory suggests that investors mentally represent an investment by its distribution of the investment's past returns. As outlined by Barberis, Mukherjee, and Wang (2016), investors see the past return distribution of a stock as a good and easily accessible proxy for the distribution of the stock's future return. In this paper, we transfer the concept from stocks to mutual funds and exploit this framework and its information content to better understand flows into and out of mutual funds. When it comes to the potential acquisition of mutual fund shares, we conjecture that retail investors are similar (or even less) sophisticated than stock investors. Hence, mutual fund retail investors are prone to evaluate their investment decisions under consideration of prospect theory as well.[2] We test the hypothesis that investors evaluate a potential investment in a mutual fund based on its past return distribution under cumulative prospect theory. The primary predictor variable we are connecting to future fund flows, and which we contrast from existing traditional fund flow predictors, is the prospect theory value of mutual funds.

Our main results can be summarized as follows: i) We show that the cumulative prospect theory value of mutual funds predicts future mutual fund flows for horizons up to ten months. ii) The information content inherited in the prospect theory value is fundamentally different from known fund flow predictors associated with the historical fund performance or lottery-like payoff measures. iii) When analyzing the individual components of the prospect theory value concerning its predictive power, it turns out that the concavity and convexity feature,

[1]See Figure A1 - Investment Company Institute - Fact Book (2020): https://www.ici.org/pdf/2020_factbook.pdf

[2]It might be the case that the historical return chart or the monthly realized returns of the mutual funds are sufficient for them to start investing in the fund. On most online platforms and fund information brochures, these performance measures are reported at monthly, quarterly, and on a yearly level, as well as the cumulative return chart of the funds (over a more extended history) is depicted.

which is a crucial part of the prospect theory values' definition, is responsible for the superior predictive performance. iv) As opposed to single stocks, the prospect theory value fails to explain mutual fund flow returns in the cross-section.

To obtain the aforementioned results, we proceed as follows. To access the prospect value of a mutual fund, we adapt the literature on prospect theory for individual firms and stock returns following Barberis, Mukherjee, and Wang (2016) and apply it to the universe of mutual funds. To investigate the predictive relationship between the mutual funds prospect value and fund flows, we estimate a Fama and MacBeth (1973) specification that simultaneously controls for multiple fund characteristics. We find that the funds prospect theory value predicts that future funds flow positively for horizons from one month up to ten months.

In the next step, we also include various traditional predictors of mutual fund flows, such as the funds' average return, volatility, skewness, and lottery-like measures such as the highest and lowest return over the past. We then show that the prospect value of the mutual funds contains fundamentally different and incremental information compared to these traditional predictors. The results remain valid when we orthogonalize the prospect values concerning traditional performance measures (such as return, volatility, and skewness). In addition, we show that the prospect value also subsumes the information content of funds performance measures related to the convex flow-performance puzzle.

When we analyze the individual building blocks of the mutual funds prospect value, loss aversion, concavity and convexity, and probability weighting, we find that the concavity and convexity feature, which means that the value function is concave over gains and convex over losses, plays an essential role in mutual fund flow prediction.

Since fund flows can be seen as a function of the fund's total net asset value and its realized return, we also analyze the predictive relationship between prospect values and mutual fund returns. While Barberis, Mukherjee, and Wang (2016) show that the prospect values on the individual stock level can be treated as a systematic factor, the equivalent funds prospect value does not reliably forecast future mutual fund returns.

Overall, the empirical results are robust to various specifications, including sample splits, alternative definitions of the prospect theory value, the clustering of standard errors, and the incorporation of idiosyncratic volatility and idiosyncratic skewness.

1.1 Literature Review

The paper contributes to two strands of literature. First, our paper advances the understanding of investors' behavior in mutual funds. Prior research (e.g. Chevalier and Ellison (1997); Sirri and Tufano (1998)) shows that fund investors chase past performance. Zheng (1999) finds that mutual fund flows can predict future fund performance in the cross-section, suggesting information-based investment decisions. Berk and Green (2004) built a rational Bayesian equilibrium model to show that fund flows rationally respond to past performance in the model even though performance is not persistent and investments with active managers do not outperform passive benchmarks on average. Berk and Van Binsbergen (2016) and Barber, Huang, and Odean (2016) examine the sensitivity of mutual fund flows to alternative performance metrics such as the CAPM alpha and multi-factor alphas. Akbas and Genc (2020) and Chen and Dai (2020) shows that extreme positive payoffs and tail risks in the distribution of monthly fund returns have a positive relationship with future mutual fund flows. While these performance metrics use various risk adjustments in explaining fund flows, our paper focuses on risks that are departed significantly from the predictions of expected utility functions (Prospect Theory, Tversky and Kahneman (1992)).

Our paper is also related to prior work that uses prospect theory to analyze the cross-section of average returns in stock markets. Barberis and Huang (2008) study asset prices in a one-period economy in which investors derive prospect theory utility from the change in their wealth throughout the period. This framework generates a new prediction, one that does not emerge from the traditional analysis based on expected utility, namely, that a security's expected future skewness – even including idiosyncratic skewness – will be priced: a stock whose future returns are expected to be positively skewed will be "overpriced" and earn a lower average return. Over the past few years, several papers, using various measures of expected skewness, have presented evidence in support of this prediction (Kumar (2009); Boyer, Mitton, and Vorkink (2010); Bali, Cakici, and Whitelaw (2011); Conrad, Dittmar, and Ghysels (2013)). Moreover, the idea that expected skewness is priced has been analyzed to make sense of a variety of empirical facts, including the low average returns of IPO stocks, distressed stocks, high volatility stocks, stocks sold in over-the-counter markets, and out-of-the-money options (all of these assets have positively skewed returns); the diversification discount; and the lack of diversification in many household portfolios. Barberis, Mukherjee, and Wang (2016) finds that, when thinking about allocating money to stock, investors mentally represent the stock by the distribution of its past returns and then evaluate this distribution in the way described by prospect theory and find that a stock whose past return distribution has a high (low) prospect theory value earns a low (high) subsequent return, on average. In more recent research, Barberis, Jin, and Wang (2020) present a new model of asset prices in which investors evaluate risk according to prospect theory and examine its ability to explain 22 prominent stock market anomalies. However, few papers show whether prospect theory can be used to analyze mutual fund return and flow. Our paper finds that prospect theory can predict future fund flows but not future mutual fund returns.

2 Conceptual Framework

In this Section, we discuss the application and the embedding of Prospect Theory in the mutual fund framework in more detail. Readers already familiar with this material may prefer to jump to Section 3.

We start with a revision of Tversky and Kahneman (1992) in Section 2.1, and the concrete application of it in Section 3.1 following Barberis, Mukherjee, and Wang (2016). Assuming that the future return distribution can be represented as a function inferred from the historical return distribution, an investor's investment decision will be based on its prospect theory value (as a kind of mental accounting). Hence investors are biased within their investment decision, which affects the mutual fund flows in a second step.

2.1 Prospect theory

In this section, we will review the cumulative prospect theory based on Kahneman and Tversky (1979), and Tversky and Kahneman (1992). To see how cumulative prospect theory works, consider the gamble

$$\{x_{-m}, p_{-m}; \ldots\ldots; x_{-1}, p_{-1}; x_0, p_0; x_1, p_1; \ldots\ldots; x_n, p_n\}, \tag{1}$$

where x_i is the value of gain and loss and p_i is the probability of x_i for all $i \in [-m, n]$ where $x_i < x_j$ for $i < j$, $x_0 = 0$. Hence x_{-m} through x_{-1} are losses and x_1 through x_n are gains, and $\sum_{i=-m}^{n} p_i = 1$. For example, tossing coins could be written as $\{-1, 50\%; 1, 50\%\}$. In the expected utility framework, an individual with utility function U evaluates the gamble in 1 by computing

$$EU = \sum_{i=-m}^{n} p_i U(W + x_i), \tag{2}$$

where W is his current wealth. A cumulative prospect theory individual, by contrast, assigns the gamble the value

$$TK = \sum_{i=-m}^{n} \pi_i v(x_i), \tag{3}$$

with

$$\pi_i = \begin{cases} w^+(p_i + ... + p_n) - w^+(p_{i+1} + ... + p_n) & 0 \leq i \leq n \\ w^-(p_{-m} + ... + p_i) - w^-(p_{-m} + ... + p_{i-1}) & -m \leq i < 0, \end{cases} \tag{4}$$

$$v(x) = \begin{cases} x^\alpha & x \geq 0 \\ -\lambda(-x)^\alpha & x < 0 \end{cases} \tag{5}$$

where w^+ and w^- are known as the probability weighting functions and v as the value function. Tversky and Kahneman (1992) propose the following functional form for the probability weighting functions w^+ and w^-

$$w^+(p) = \frac{p^\gamma}{(p^\gamma + (1-p)^\gamma)^{1/\gamma}}, \tag{6}$$

$$w^-(p) = \frac{p^\delta}{(p^\delta + (1-p)^\delta)^{1/\delta}}, \tag{7}$$

where $\alpha, \gamma, \delta \in (0, 1)$ and $\lambda > 1$. In equation (4) the weighted total probability of all outcomes equal to or better than x_i, namely $p_i + ... + p_n$ is getting deducted by the total probability of all outcomes strictly better than x_i, namely $p_{i+1} + ... + p_n$. Similarly, for an outcome $x_i < 0$, the total weighted probability of all outcomes equal to or worse than x_i are getting deducted by the total weighted probability of all outcomes strictly worse than x_i. Overall, in the setting of cumulative prospect theory, agents do not consider objective probabilities to evaluate their utility function. They rather use a weighting function w^+ and

w^- to transform probabilities, and hence the extreme gain and loss which is the tail of the gamble distribution is overweight. A popular example of the probability overweighting are lotteries where individuals prefer the improbable gain of 500$ over a save gain of 5$. For an insurance, individuals are willing to lose 5$ for sure rather than to lose 500$ with a low probability. The degree to which the agent overweights the tails decreases in the parameters γ and δ.

There are several differences for the two utility functions as defined in (2) and (3), which are worth to discuss: First, in (3) the cumulative prospect theory utility function, the inputs (x_i) are the potential gains and losses and therefore do not relate to their final wealth (in contrast to (2)). Second, while U is differentiable everywhere, v is kinked in $x = 0$. Intuitively, this can be interpreted as loss-aversion since it means that the agent is more sensitive to a potential loss than a gain. The severity of the kink and therefore of the loss-aversion is increasing in λ. Third, while U is concave, v is only concave when x is positive and convex when x is negative. Therefore risk-aversion is changing in the potential gains, and therefore agents who follow cumulative prospect theory are risk-averse in gain and risk-seeking in the loss. The parameter which determines the shape of the utility curve in both domains is denoted by α.

3 Data and Methodology

In this section, we define the fundamental quantities that we adopt to conduct our empirical analysis. We start by describing the measure of the prospect theory value following Barberis, Mukherjee, and Wang (2016), which presents empirical evidence that investors commonly use a backward-looking representation of stocks. Next, we present the details on calculating the fund flow data and other variables that we are exploiting in our empirical analysis.

3.1 Prospect Theory Value

In order to calculate the prospect theory value (TK) of a given mutual fund i we first calculate the funds monthly style adjusted return, following Teo and Woo (2001), deducting from the raw monthly fund return the cross-sectional average return of all mutual funds belonging to the same style.[3] For the calculation of TK we consider style adjusted returns over the past five years on a monthly frequency.[4] In a next step we sort the total of 60 monthly style adjusted returns ascending. Suppose that m of these returns are negative (where the most negative return is labeled as r_{-m}), while the remaining $n = 60 - m$ are positive (the most positive return is labeled r_n). The historical return distribution of the mutual fund which implicitly assigns an equal probability to each of the sixty excess returns is then given by

$$(r_{-m}, \frac{1}{60}; r_{-m+1}, \frac{1}{60}; ...; r_{-1}, \frac{1}{60}; r_1, \frac{1}{60}; ...; r_n, \frac{1}{60}). \tag{8}$$

Following Barberis, Mukherjee, and Wang (2016) the prospect theory value of a given distribution can be calculated as

$$\begin{aligned} TK_{i,t} \equiv & \sum_{\tau=-m}^{-1} v(r_\tau)[w^-(\frac{\tau + m + 1}{60}) - w^-(\frac{\tau + m}{60})] \\ & + \sum_{\tau=1}^{n} v(r_\tau)[w^+(\frac{n - \tau + 1}{60}) - w^+(\frac{n - \tau}{60})], \end{aligned} \tag{9}$$

where v, w^+ and w^- are defined as in (5), (6) and (7). As inferred from experimental data by Tversky and Kahneman (1992), we set $\alpha = 0.88, \lambda = 2.25, \gamma = 0.61$, and $\delta = 0.69$.

3.2 Data Description and Variable Definitions

Fund returns and other fund characteristics are obtained from the Center for Research in Security Prices (CRSP) Survivor-Bias-Free U.S. Mutual Fund Database. The sample covers actively managed domestic equity funds from January 1980 (when CRSP initiated the reporting of monthly net asset values) to December 2019. We select equity funds that fall into one of the six CRSP objective codes (EDCI, EDCM, EDCS, EDYB, EDYG, or EDCL), thus excluding bond, balanced, international, sector funds, and index funds from the sample. Since the analysis is on the fund-level, we aggregate all share classes of each fund.

[3] Mutual funds are often confined to trade stocks within their styles which causes high cross-sectional return correlations. Style-adjusted returns control for this time-varying style effect and mitigate concerns related to the categorization of funds. There is considerable empirical evidence that investor decisions are based on fund and style returns, see for example Barberis and Shleifer (2003), Pomorski (2004) and Mullainathan (2002).

[4] As presented in Section 5, we obtain the same qualitatively results when ii) we use raw returns instead of style adjusted returns ii) we shorten the length of the backward-looking window to 4 years or 3 years.

Barber, Odean, and Zheng (2005) show that observations with zero (or negative) expense most likely indicate missing information, and therefore these observations are removed. For small size and short maturity mutual funds, Evans (2010) shows an incubation bias in the CRSP mutual fund database. This is why we exclude funds with less than US $1 million total assets from our sample and since the calculation method of TK requires at least five years of historical returns, short maturity funds are eliminated via this method as well.[5]

The main dependent variable is the mutual fund net flow, reflecting the growth rate of a fund i due to new investments at time t, defined as

$$FLOW_{i,t} = \frac{(TNA_{i,t} - TNA_{i,t-1})(1 + RET_{i,t})}{TNA_{i,t-1}}, \tag{10}$$

where $RET_{i,t}$ denotes the return of fund i over month t, and $TNA_{i,t}$ the total net asset value of the fund i at the end of month t. Following Elton, Gruber, and Blake (2011) we filter out the top and bottom 1% tails of the fund flow data (for each point in time).[6]

Additional control variables in the main analysis are labeled and defined as follows: Motivated by Chevalier and Ellison (1997) and Barber, Odean, and Zheng (2005) we include the logarithm of the total net assets of a fund ($\log(TNA)$), the logarithm of total net assets of the funds that belong to the same family ($\log(FTNA)$), and the logarithm of the number of months since a fund's date of inception ($\log(AGE)$). Sirri and Tufano (1998) and Barber, Odean, and Zheng (2005) show that the total operating expenses expressed as a percentage of a fund's average net assets (EXP), and the monthly turnover ration of a fund ($TURN$), are related to mutual fund flows. We also include performance measures of the funds such as the mean ($MEAN$), the standard deviation (VOL), and the skewness ($SKEW$) of monthly style-adjusted returns over the previous five years. We also add the highest (MAX) and lowest (MIN) return over the last 12 months to capture lottery-like payoffs. As shown by Kosowski, Timmermann, Wermers, and White (2006), the momentum effect for stock returns also translates into the returns of mutual funds. Besides, as outlined by Akbas and Genc (2020), MAX displays a strong positive correlation with the future flow and is consistent with investors' preference for extreme positive payoffs in the distribution of asset returns

[5] We consider a funds' TK for a given point in time if we have at least 50 style adjusted returns over the last 60 months available.

[6] Elton, Gruber, and Blake (2011) report that the top and bottom percentiles of fund flows are often affected by the merge of mutual funds, and therefore these extreme flows should not be considered.

(lottery-like investments). Chen and Dai (2020) shows that investor flows are significantly sensitive to tail risk (MAX and MIN) in the cross-section, even after controlling for fund performance and characteristics.

	mean	std	min	max
TK	-0.015	0.016	-0.161	4.569
FLOW	0.049	12.836	-2.845	43.662
log(TNA)	4.862	2.061	-2.303	12.634
log(FTNA)	9.166	2.201	-2.303	14.352
log(AGE)	5.046	0.517	3.932	6.545
EXP	0.077	0.122	0.025	0.752
TURN	0.022	0.549	-8.25	2.877
MEAN	0.000	0.005	-0.029	1.830
VOL	0.017	0.031	0.000	14.162
SKEW	-0.067	1.010	-7.746	7.746
MAX	0.026	0.088	-.0128	13.693
MIN	-0.026	0.0249	-1.017	0.0157
N	740070			

Table 1: Summary Statistics. This table reports summary statistics for several mutual fund characteristics. Thereby variables are defined as in section 3: $FLOW$ (as calculated in (10)), TK (as calculated in (9)), log(TNA) (the logarithm of the total net assets of a fund), log($FTNA$) (the logarithm of total net assets of the funds that belong to the same family), log(AGE) (the logarithm of the number of months since a fund's date of inception), EXP (the total operating expenses expressed as a percentage of a fund's average net assets), $TURN$ (the monthly turnover ration of a fund), and $MEAN$, VOL, $SKEW$, (the mean, standard deviation, and skewness of monthly style-adjusted returns over the previous five years), MAX and MIN denote the highest and lowest return over the last 12 months. The sample ranges from 1985 to 2019.

As visible from Table 2 most variables display a rather low average absolute correlation with the exception of TK and $MEAN$. Therefore, in the empirical analysis, we test for multicollinearity[7], and to alleviate further concerns, we also consider an orthogonal TK measure. Hence, we run, for each mutual fund, the following specification over the full sample,

$$TK_i = \alpha_i + \beta_{MEAN} \times MEAN_i + \beta_{VOL} \times VOL_i + \beta_{SKEW} \times SKEW_i + \varepsilon_i, \qquad (11)$$

where we consider ε_i as the Residual TK.

[7]From Table A1 one can infer that the maximum variance inflation factor reaches 4.91 for the $MEAN$.

Variables	TK	FLOW	log(TNA)	log(FTNA)	log(AGE)	EXP	TURN	MEAN	VOL	SKEW	MAX	MIN
TK	1.000											
FLOW	0.005	1.000										
log(TNA)	0.249	0.019	1.000									
log(FTNA)	0.267	0.008	0.345	1.000								
log(AGE)	0.051	-0.000	0.215	0.127	1.000							
EXP	-0.001	0.000	-0.007	-0.016	0.021	1.000						
TURN	-0.007	-0.000	-0.029	0.006	-0.025	-0.002	1.000					
MEAN	0.727	-0.000	0.278	0.187	0.024	0.000	0.005	1.000				
VOL	-0.641	-0.006	-0.120	-0.230	-0.038	0.002	0.008	-0.146	1.000			
SKEW	0.130	-0.041	-0.056	-0.047	-0.048	-0.000	-0.011	0.031	0.115	1.000		
MAX	0.007	-0.000	0.002	0.011	-0.009	0.004	-0.002	-0.000	-0.014	0.004	1.000	
MIN	-0.006	-0.001	0.001	-0.012	0.006	-0.002	0.002	0.004	0.013	-0.006	-0.458	1.000

Table 2: Correlation - Fund Characteristics. This table reports the time-series averages of cross-sectional correlations for several mutual fund characteristics. Thereby variables are defined as in Section 3: $FLOW$ (as calculated in (10)), TK (as calculated in (9)), $\log(TNA)$ (the logarithm of the total net assets of a fund), $\log(FTNA)$ (the logarithm of total net assets of the funds that belong to the same family), $\log(AGE)$ (the logarithm of the number of months since a fund's date of inception), EXP (the total operating expenses expressed as a percentage of a fund's average net assets), $TURN$ (the monthly turnover ration of a fund), and $MEAN$, VOL, $SKEW$, (the mean, standard deviation, and skewness of monthly style-adjusted returns over the previous five years), MAX and MIN denote the highest and lowest return over the last 12 months. The sample ranges from 1985 to 2019.

4 Empirical Analysis

In this section, we conduct and report the main results of our empirical analysis. We start with the estimation of the Fama and MacBeth (1973) regression model where we show that TK predicts future fund flows with a positive sign. In the next step, we analyze the components of prospect theory and their predictive content over time. We conclude this section by showing that TK for mutual funds does not reliably predict future mutual fund returns.

4.1 TK and Fund Flows

To investigate the relationship between TK and fund flows, we estimate the following Fama and MacBeth (1973) specification that controls for multiple fund characteristics simultaneously, that is,

$$FLOW_{i,t} = \alpha + \beta_{i,t-1} \times TK_{i,t-1} + \lambda_{i,t-1} \times X_{i,t-1} + \epsilon_{i,t-1}, \tag{12}$$

where $FLOW_{i,t}$ denotes the fund flow for fund i at month t, $TK_{i,t-1}$ denotes the prospect theory value for mutual fund i at month $t-1$, and $X_{i,t-1}$ denote the control variables as described and motivated in Section 3.2. For the calculation of the standard errors, we rely on Newey and West (1987) and correct for autocorrelation and heteroscedasticity with five lags.

Table 3 reports the parameter estimates from the outlined regressions in (12) for different specifications: i) considering unstandardized variables (see columns 1, 2, and 3), and ii) to compare and assess each independent variable's relative importance, we also explore the same specifications using standardized variables (see columns 4, 5, and 6). In conformity with the intuition, the parameter estimates associated with TK are all positive and strongly significant at the 1% level, and therefore TK and future fund flows are positively related. The relationships between future fund flows ($FLOW$) and fund size ($\log(TNA)$), family size ($\log(FNA)$), age ($\log(AGE)$), fund expenses (EXP), turnover ($TURN$), are consistent with the findings of previous studies such as Chevalier and Ellison (1997) and Huang, Wei, and Yan (2007). Also, the mean ($MEAN$), volatility (VOL), skewness ($SKEW$), and the maximal return over the last year (MAX) does not subsume the effect of TK in any specification.[8]

[8] We present the results without the consideration of TK in Table A2. In this setting, the coefficients for $MEAN$, VOL are positive, while the coefficient for $SKEW$ is negative.

	Unstandardized Variables			Standardized Variables		
	(1) FLOW	(2) FLOW	(3) FLOW	(4) FLOW	(5) FLOW	(6) FLOW
TK	2.640***	13.081***	13.402***	0.003**	0.015***	0.016***
	(2.79)	(2.65)	(2.67)	(2.53)	(2.61)	(2.66)
FLOW	-0.128	-0.192	-0.206	-0.189	-0.227*	-0.227*
	(-0.86)	(-1.52)	(-1.64)	(-1.46)	(-1.82)	(-1.82)
log(TNA)	-0.027	-0.033	-0.034*	-0.007*	-0.006*	-0.006*
	(-1.35)	(-1.60)	(-1.65)	(-1.73)	(-1.83)	(-1.86)
log(FTNA)	0.006	0.007	0.008	0.001	0.002**	0.002**
	(1.06)	(1.38)	(1.52)	(1.47)	(1.97)	(1.98)
log(AGE)	0.024	0.018	0.018	0.001	0.001	0.001
	(0.93)	(0.68)	(0.71)	(1.09)	(0.73)	(0.73)
EXP	-81.181	-80.632	-80.780	-0.741	-0.763	-0.765
	(-1.44)	(-1.40)	(-1.39)	(-1.39)	(-1.40)	(-1.39)
TURN	0.001	0.004	0.002	-0.003	-0.000	-0.000
	(0.09)	(0.66)	(0.27)	(-0.63)	(-0.69)	(-1.45)
MEAN		-21.681**	-22.442**		-0.007*	-0.007**
		(-2.06)	(-2.12)		(-1.92)	(-2.07)
VOL		8.810***	8.989***		0.018***	0.018***
		((2.70)	(2.72)		(2.70)	(2.72)
SKEW		-0.080**	-0.079**		-0.006**	-0.006**
		(-2.08)	(-2.05)		(-2.03)	(-2.10)
MAX			0.309			0.002
			(0.83)			(0.84)
MIN			0.270			0.001
			(1.34)			(1.15)
CONS	0.0887***	0.155***	0.160***	0.009	0.009	0.010
	(3.13)	(3.26)	(3.24)	(1.16)	(1.19)	(1.23)
N	733028	733028	733028	733028	733028	733028
R^2	0.295	0.312	0.312	0.295	0.312	0.312

t statistics in parentheses

$^{*}p < 0.1$, $^{**}p < 0.05$, $^{***}p < 0.01$

Table 3: Fund Flow and TK. This table reports the relationship between future fund flows and TK as outlined in (12). Thereby variables are defined as in section 3: $FLOW$ (as calculated in (10)), TK (as calculated in (9)), log(TNA) (the logarithm of the total net assets of a fund), log($FTNA$) (the logarithm of total net assets of the funds that belong to the same family), log(AGE) (the logarithm of the number of months since a fund's date of inception), EXP (the total operating expenses expressed as a percentage of a fund's average net assets), $TURN$ (the monthly turnover ration of a fund), $MEAN$, VOL, $SKEW$, (the mean, standard deviation, and skewness of monthly style-adjusted returns over the previous five years), and MAX and MIN which denote the highest and lowest return over the last 12 months. The sample ranges from 1985 to 2019.

In Table 4 we repeat the specifications with the usage of the orthogonal Residual TK measure as calculated in (11). Residual TK is positively and significantly related to future fund flows and therefore the results remain qualitatively unchanged.

	Unstandardized Variables			Standardized Variables		
	(1) FLOW	(2) FLOW	(3) FLOW	(4) FLOW	(5) FLOW	(6) FLOW
Residual TK	7.284*	13.091***	13.404***	0.005*	0.008***	0.009***
	(1.93)	(2.65)	(2.67)	(1.79)	(2.60)	(2.64)
FLOW	-0.193	-0.192	-0.206	-0.230*	-0.227*	-0.227*
	(-1.50)	(-1.52)	(-1.64)	(-1.83)	(-1.82)	(-1.82)
log(TNA)	-0.028	-0.033	-0.034	-0.005	-0.006*	-0.006*
	(-1.41)	(-1.59)	(-1.65)	(-1.63)	(-1.82)	(-1.84)
log(FTNA)	0.005	0.007	0.008	0.002*	0.002**	0.001**
	(1.15)	(1.36)	(1.50)	(1.67)	(1.98)	(1.97)
log(AGE)	0.020	0.018	0.018	0.001	0.001	0.001
	(0.77)	(0.68)	(0.70)	(0.93)	(0.72)	(0.63)
EXP	-81.212	-80.633	-80.778	-0.762	-0.763	-0.765
	(-1.37)	(-1.40)	(-1.39)	(-1.36)	(-1.40)	(-1.39)
TURN	-0.008	0.001	-0.002	0.012	-0.000	-0.000
	(-0.33)	(0.09)	(-0.28)	(1.38)	(-0.69)	(-1.45)
MEAN		13.078***	13.153***		0.005***	0.005***
		(3.17)	(3.13)		(3.41)	(3.30)
VOL		8.557***	8.721***		0.017***	0.018***
		(2.70)	(2.72)		(2.70)	(2.72)
SKEW		-0.051*	-0.049*		-0.004*	-0.004*
		(-1.79)	(-1.73)		(-1.69)	(-1.81)
MAX			0.309			0.002
			(0.83)			(0.84)
MIN			0.270			0.000
			(1.34)			(1.14)
CONS	0.0668**	-0.0337	-0.0343	0.00760	0.00924	0.00968
	(2.32)	(-0.89)	(-0.92)	(0.93)	(1.19)	(1.23)
N	733028	733028	733028	733028	733028	733028
R^2	0.297	0.312	0.312	0.297	0.312	0.313

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 4: Fund Flow and Residual TK. This table reports the relationship between future fund flows and Residual TK as outlined in (12). Thereby variables are defined as in section 3: $FLOW$ (as calculated in (10)), Residual TK (as calculated in (11)), log(TNA) (the logarithm of the total net assets of a fund), log($FTNA$) (the logarithm of total net assets of the funds that belong to the same family), log(AGE) (the logarithm of the number of months since a fund's date of inception), EXP (the total operating expenses expressed as a percentage of a fund's average net assets), $TURN$ (the monthly turnover ration of a fund), and $MEAN$, VOL, $SKEW$, (the mean, standard deviation, and skewness of monthly style-adjusted returns over the previous five years), MAX and MIN denote the highest and lowest return over the last 12 months. The sample ranges from 1985 to 2019.

4.2 Components of Prospect Theory

In this subsection, we investigate the composition and functioning of TK to its connection to future fund flows.

In a first step, we examine which component of the TK is most important and responsible for the future fund flow prediction. In order to assess the relative importance of the individual

TK components, that is i) loss aversion (LA), driven by λ and as introduced in (5), ii) concavity and convexity (CC), as a function of α, as introduced in (5), and iii) probability weighting (PW) as introduced in (6) and (7), we run the specifications as outlined in (12), but considering the TK factor only based on some of it components (LA, CC, and PW). In Table 5 we present the results where column 7 replicates the specification of Table 3 and serves as the benchmark. In the first column, specification LA, the prospect value is only calculated considering loss aversion, hence $\lambda = 2.25, \alpha = \gamma = \delta = 1$. In column CC we set $\alpha = 0.88, \lambda = \gamma = \delta = 1$. In column labeled as PW we set $\gamma = 0.61, \delta = 0.69, \alpha = \lambda = 1$. Transitioning to two components, column LA, CC retains loss aversion and concavity and convexity but does not consider probability weighting and therefore corresponds to $\alpha = 0.88, \lambda = \gamma = 1, \delta = 2.25$. LA, PW and CC, PW are calculated in a similar way. As immediately visible, it is not sufficient to obtain significantly meaningful results when predicting future fund flows considering only one ingredient of TK (columns 1, 2, and 3). Even though CC does not load significantly on future fund flows in a university setting, it seems to be the most important part when combining it with other building blocks of TK: For the construction of TK with two components, such as LA and CC (column 4), and CC and PW (column 6), the results display significance at the 10% level. The commonality of these specifications is the incorporation of the concavity and convexity (CC). Overall the evidence suggests that the synergy effects from all three components, but especially from CC, are important and responsible for the positive predictive relationship of TK and $FLOW$.

	(1) LA	(2) CC	(3) PW	(4) LACC	(5) LAPW	(6) CCPW	(7) TK
TK Component	35.861*	-13.964	20.891*	20.341**	9.104*	27.771*	13.401***
	(1.68)	(-0.49)	(1.68)	(2.27)	(1.68)	(1.91)	(2.67)
FLOW	-0.207	-0.210*	-0.206	-0.207	-0.206	-0.206	-0.206
	(-1.64)	(-1.65)	(-1.64)	(-1.64)	(-1.64)	(-1.63)	(-1.64)
log(TNA)	-0.034	-0.034	-0.034	-0.034	-0.034	-0.035*	-0.034*
	(-1.62)	(-1.62)	(-1.65)	(-1.64)	(-1.63)	(-1.67)	(-1.65)
log(FTNA)	0.008	0.008	0.008	0.007	0.008	0.008	0.008
	(1.62)	(1.57)	(1.56)	(1.46)	(1.55)	(1.56)	(1.52)
log(AGE)	0.021	0.021	0.020	0.020	0.020	0.019	0.018
	(0.79)	(0.83)	(0.74)	(0.74)	(0.75)	(0.71)	(0.71)
EXP	-81.251	-79.072	-81.333	-79.737	-81.662	-81.442	-80.776
	(-1.40)	(-1.37)	(-1.40)	(-1.39)	(-1.40)	(-1.40)	(-1.39)
TURN	-0.003	-0.002	-0.002	-0.004	-0.002	-0.001	0.002
	(-0.44)	(-0.31)	(-0.25)	(-0.51)	(-0.28)	(-0.21)	(0.27)
MEAN	-51.745	30.646	-11.227	-45.243**	-6.6184	-29.203	-22.441**
	(-1.53)	(0.69)	(-0.96)	(-2.05)	(-0.73)	(-1.53)	(-2.12)
VOL	16.201	-0.452	-2.355**	12.352**	3.677	-2.617**	8.989***
	(1.58)	(-1.05)	(-2.01)	(2.14)	(1.36)	(-2.08)	(2.72)
SKEW	-0.058*	-0.060*	-0.073*	-0.053	-0.070*	-0.082*	-0.079**
	(-1.73)	(-1.65)	(-1.75)	(-1.64)	(-1.78)	(-1.84)	(-2.05)
MAX	0.294	0.308	0.326	0.303	0.314	0.331	0.309
	(0.81)	(0.83)	(0.87)	(0.83)	(0.85)	(0.88)	(0.83)
MIN	0.275	0.293	0.270	0.284	0.269	0.269	0.270
	(1.33)	(1.39)	(1.34)	(1.35)	(1.33)	(1.35)	(1.34)
CONS	0.106***	0.090***	0.125***	0.158***	0.122***	0.131***	0.160***
	(3.23)	(3.20)	(3.26)	(3.06)	(3.26)	(3.26)	(3.24)
N	733028	733028	733028	733028	733028	733028	733028
R^2	0.312	0.313	0.312	0.313	0.312	0.311	0.313

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 5: Fund Flow and TK components This table reports the relationship between future fund flows and TK components as outlined in (12). Thereby variables are defined as in Section 3: $FLOW$ (as calculated in (10)), loss aversion (LA) as introduced in (5), ii) concavity and convexity (CC) as introduced in (5), and iii) probability weighting (PW) as introduced in (6) and (7), log(TNA) (the logarithm of the total net assets of a fund), log($FTNA$) (the logarithm of total net assets of the funds that belong to the same family), log(AGE) (the logarithm of the number of months since a fund's date of inception), EXP (the total operating expenses expressed as a percentage of a fund's average net assets), $TURN$ (the monthly turnover ration of a fund), and $MEAN$, VOL, $SKEW$, (the mean, standard deviation, and skewness of monthly style-adjusted returns over the previous five years), MAX and MIN denote the highest and lowest return over the last 12 months. The sample ranges from 1985 to 2019.

4.3 The Convex Performance-Flow Puzzle

The just outlined analysis motivates us to investigate whether the prospect theory value (TK) can explain the convex performance-flow puzzle. Empirical evidence shows that the inflow of funds with a good performance exceeds the outflow of mutual funds with a bad investment performance. Sirri and Tufano (1998) and Barber, Odean, and Zheng (2005) used performance square as a dependent variable in their fund flow regressions and found a positive and significant relationship. However, some other papers, such as Guercio and Tkac (2008), fail to confirm the relationship empirically. In order to check whether TK could explain the convex performance-flow puzzle, we add the funds' squared mean ($MEAN^2$) to capture the convex flow–performance relationship in a more continuous manner. From column 3 and 6 of Table 6, we find that $MEAN^2$ also has a positive and significant coefficient. However, from columns 2 and 5, if we add TK into the regression, the coefficient of $MEAN^2$ turns negative (but stays significant). Therefore, TK subsumes the information content of $MEAN^2$ and captures relevant information regarding the convex flow-performance puzzle. To account for multicollinearity between TK and the performance related measures we consider the residual TK.[9] Comparing columns 2 and 5 with columns 3 and 6 of Table 7, the coefficients of $MEAN^2$ are insignificant when we add new residual TK into the model, which show that mutual fund investors' behavioral preference from prospect theory might be a good explanation for the convex flow-performance puzzle.

[9] We add $MEAN^2$ in the orthogonalization of TK, hence $TK_i = \alpha_i + \beta_{MEAN} \times MEAN_i + \beta_{MEAN^2} \times MEAN_i^2 + \beta_{VOL} \times VOL_i + \beta_{SKEW} \times SKEW_i + \varepsilon_i$.

	Unstandardized Variables			Standardized Variables		
	(1) FLOW	(2) FLOW	(3) FLOW	(4) FLOW	(5) FLOW	(6) FLOW
TK	13.401***	13.432**		0.016***	0.016**	
	(2.67)	(2.57)		(2.66)	(2.55)	
FLOW	-0.206	-0.208*	-0.210*	-0.227*	-0.228*	-0.231*
	(-1.64)	(-1.65)	(-1.65)	(-1.82)	(-1.83)	(-1.83)
log(TNA)	-0.034*	-0.034*	-0.034	-0.006*	-0.006*	-0.006*
	(-1.65)	(-1.65)	(-1.65)	(-1.86)	(-1.86)	(-1.86)
log(FTNA)	0.008	0.008	0.009	0.002**	0.002**	0.002**
	(1.52)	(1.52)	(1.59)	(1.98)	(1.98)	(2.02)
log(AGE)	0.018	0.019	0.021	0.001	0.001	0.001
	(0.71)	(0.71)	(0.83)	(0.73)	(0.73)	(0.84)
EXP	-80.781	-80.162	-80.681	-0.765	-0.759	-0.764
	(-1.39)	(-1.39)	(-1.39)	(-1.39)	(-1.39)	(-1.39)
TURN	0.002	0.002	-0.003	-0.000	-0.000	-0.000
	(0.27)	(0.31)	(-0.44)	(-1.45)	(-1.41)	(-1.60)
MEAN	-22.441**	-22.692**	8.533***	-0.007**	-0.007*	0.003***
	(-2.12)	(-2.01)	(2.81)	(-2.07)	(-1.96)	(2.97)
$MEAN^2$		-135.212	770.832***		-0.006	0.032***
		(-0.36)	(2.94)		(-0.36)	(2.94)
VOL	8.989***	9.099**	-0.614	0.018***	0.018**	-0.001
	(2.72)	(2.44)	(-1.22)	(2.72)	(2.44)	(-1.11)
SKEW	-0.079**	-0.079**	-0.060*	-0.006**	-0.006**	-0.005*
	(-2.05)	(-2.03)	(-1.84)	(-2.10)	(-2.08)	(-1.92)
MAX	0.309	0.309	0.280	0.002	0.002	0.002
	(0.83)	(0.83)	(0.77)	(0.84)	(0.85)	(0.79)
MIN	0.270	0.275	0.286	0.000	0.000	0.001
	(1.34)	(1.36)	(1.39)	(1.15)	(1.17)	(1.35)
CONS	0.160***	0.158***	0.0926***	0.00969	0.00951	0.0101
	(3.24)	(3.34)	(3.22)	(1.23)	(1.19)	(1.27)
N	733028	733028	733028	733028	733028	733028
R^2	0.311	0.312	0.322	0.310	0.314	0.320

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 6: Fund Flow, Performance Convexity, and TK. This table reports the relationship between future fund flows and TK as outlined in (12). Thereby variables are defined as in section 3: $FLOW$ (as calculated in (10)), TK (as calculated in (9)), log(TNA) (the logarithm of the total net assets of a fund), log($FTNA$) (the logarithm of total net assets of the funds that belong to the same family), log(AGE) (the logarithm of the number of months since a fund's date of inception), EXP (the total operating expenses expressed as a percentage of a fund's average net assets), $TURN$ (the monthly turnover ration of a fund), $MEAN$, $MEAN^2$, VOL, $SKEW$, (the mean, the mean squared, standard deviation, and skewness of monthly style-adjusted returns over the previous five years), and MAX and MIN which denote the highest and lowest return over the last 12 months. The sample ranges from 1985 to 2019.

	Unstandardized Variables			Standardized Variables		
	(1) FLOW	(2) FLOW	(3) FLOW	(4) FLOW	(5) FLOW	(6) FLOW
Residual TK'	13.221***	13.432**		0.007**	0.007**	
	(2.60)	(2.57)		(2.57)	(2.55)	
FLOW	-0.206	-0.208*	-0.210*	-0.227*	-0.228*	-0.231*
	(-1.64)	(-1.65)	(-1.65)	(-1.82)	(-1.83)	(-1.83)
log(TNA)	-0.034	-0.034	-0.034	-0.006*	-0.006*	-0.006*
	(-1.64)	(-1.64)	(-1.65)	(-1.84)	(-1.84)	(-1.86)
log(FTNA)	0.008	0.008	0.009	0.001*	0.001*	0.002**
	(1.51)	(1.51)	(1.59)	(1.95)	(1.95)	(2.02)
log(AGE)	0.018	0.018	0.021	0.001	0.001	0.001
	(0.70)	(0.71)	(0.83)	(0.66)	(0.66)	(0.84)
EXP	-80.881	-80.162	-80.684	-0.766	-0.759	-0.764
	(-1.40)	(-1.39)	(-1.39)	(-1.40)	(-1.39)	(-1.39)
TURN	-0.002	-0.002	-0.003	-0.000	-0.000	-0.000
	(-0.26)	(-0.25)	(-0.44)	(-1.43)	(-1.41)	(-1.60)
MEAN	10.041***	10.212***	8.533***	0.004***	0.004***	0.003***
	(2.91)	(2.97)	(2.81)	(3.10)	(3.17)	(2.97)
MEAN^2		53.461	770.789***		0.002	0.032***
		(0.16)	(2.94)		(0.16)	(2.94)
VOL	5.406***	5.470**	-0.614	0.011***	0.011**	-0.001
	(2.60)	(2.34)	(-1.22)	(2.60)	(2.34)	(-1.11)
SKEW	-0.043	-0.043	-0.060*	-0.003*	-0.003*	-0.005*
	(-1.63)	(-1.63)	(-1.84)	(-1.71)	(-1.72)	(-1.92)
MAX	0.310	0.309	0.280	0.002	0.002	0.002
	(0.83)	(0.83)	(0.77)	(0.84)	(0.84)	(0.79)
MIN	0.271	0.275	0.286	0.000	0.000	0.001
	(1.34)	(1.36)	(1.39)	(1.05)	(1.07)	(1.35)
CONS	0.0223	0.0198	0.0926***	0.00952	0.00947	0.0101
	(0.89)	(0.76)	(3.22)	(1.21)	(1.19)	(1.27)
N	733028	733028	733028	733028	733028	733028
R^2	0.312	0.313	0.312	0.320	0.324	0.310

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 7: Fund Flow, Performance Convexity, and Residual TK. This table reports the relationship between future fund flows and Residual TK as outlined in (12). Thereby variables are defined as in section 3: $FLOW$ (as calculated in (10)), Residual TK (as calculated in (11)), log(TNA) (the logarithm of the total net assets of a fund), log($FTNA$) (the logarithm of total net assets of the funds that belong to the same family), log(AGE) (the logarithm of the number of months since a fund's date of inception), EXP (the total operating expenses expressed as a percentage of a fund's average net assets), $TURN$ (the monthly turnover ration of a fund), $MEAN$, $MEAN^2$, VOL, $SKEW$, (the mean, the mean squared, standard deviation, and skewness of monthly style-adjusted returns over the previous five years), MAX and MIN denote the highest and lowest return over the last 12 months. The sample ranges from 1985 to 2019.

4.4 Horizon Effects

In this Section, we want to extend our analysis in two dimensions. First, how strong remains the prediction of fund flows if investors have a delayed excess to the past return distribution (TK), and, in the next step, we also investigate the prediction of fund flows for a longer predictive horizon, that is, up to one year.

In the first part, we investigate whether TK built by lagging past return distribution preserves its predictive power. The main intuition is that some retail investors may not rely on the newest mutual funds data to make an investment decision. Therefore, we construct 12 different TKs based on different past return distribution (lagging the distribution by 1 to 12 months). For example, the lag 2 TK for month t is calculated by the past return distribution from month $t-62$ to month $t-2$. Using the lagged TK and new distribution characteristics, we rerun the regressions as outlined in (12). Figure 1 displays the coefficients and t-statistics of the lagged TK when predicting future fund flows. The results show that the TKs based on the past return distribution considering lags from one to seven months maintains it strong predictive power for predicting quarterly future fund flows.

(a) Coefficient of lagged TK (b) t-statistic of the lagged TK coefficient

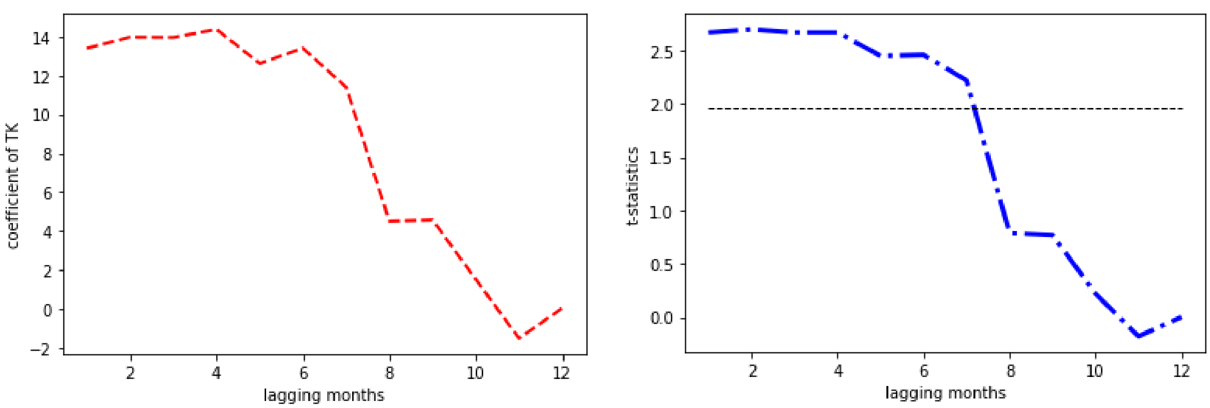

Figure 1: Fund Flow and lagged TK – Horizon Effects. This Figure reports the coefficients and t-statistics of TK as outlined in (12) considering lagged return distributions for the calculation of TK. Thereby variables are defined as in Section 3: $FLOW$ (as calculated in (10)), TK (as calculated in (9)), $\log(TNA)$ (the logarithm of the total net assets of a fund), $\log(FTNA)$ (the logarithm of total net assets of the funds that belong to the same family), $\log(AGE)$ (the logarithm of the number of months since a fund's date of inception), EXP (the total operating expenses expressed as a percentage of a fund's average net assets), $TURN$ (the monthly turnover ration of a fund), $MEAN$, VOL, $SKEW$, (the mean, standard deviation, and skewness of monthly style-adjusted returns over the previous five years), and MAX and MIN which denote the highest and lowest return over the last 12 months. The sample ranges from 1985 to 2019.

In the second part, we investigate the predictive power of TK and fund flows for longer predictive horizons, where we apply the usual regression given in (12). The coefficient of TK and its t-statistic are displayed for the different predictive horizons of $FLOW$ in Figure 2.

It turns out that TK predicts fund flows for horizons up to 10 months.[10]

(a) Coefficient of TK (b) t-statistic of the TK coefficient

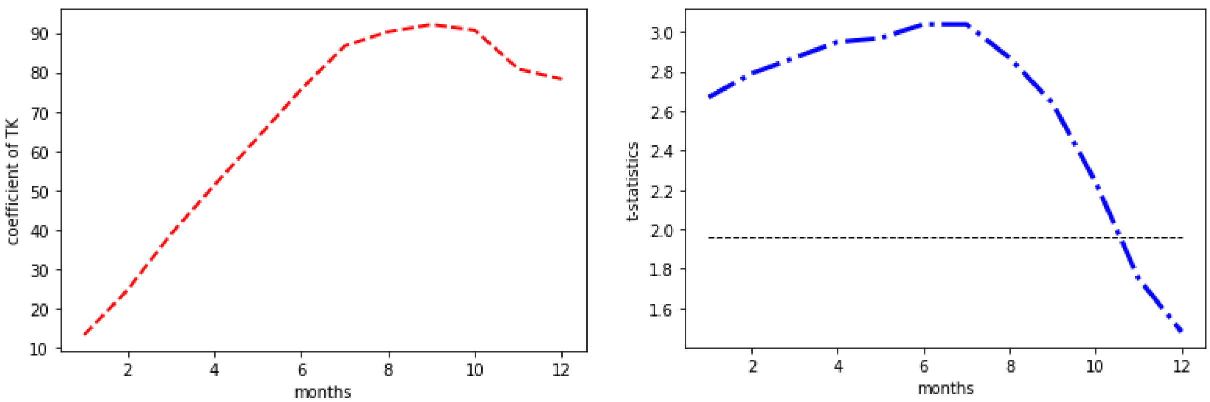

Figure 2: Fund Flow and TK - Horizon Effects. This Figure reports the coefficients and t-statistics of TK as outlined in (12) for 12 different predictive horizons of future fund flows. Thereby variables are defined as in Section 3: $FLOW$ (as calculated in (10)) over the respective predictive horizon, TK (as calculated in (9)), $\log(TNA)$ (the logarithm of the total net assets of a fund), $\log(FTNA)$ (the logarithm of total net assets of the funds that belong to the same family), $\log(AGE)$ (the logarithm of the number of months since a fund's date of inception), EXP (the total operating expenses expressed as a percentage of a fund's average net assets), $TURN$ (the monthly turnover ration of a fund), $MEAN$, VOL, $SKEW$, (the mean, standard deviation, and skewness of monthly style-adjusted returns over the previous five years), and MAX and MIN which denote the highest and lowest return over the last 12 months. The sample ranges from 1985 to 2019.

4.5 Alternative Explanations – Return Predictability

In this Section, we investigate potential alternative mechanisms explaining the positive relationship between $FLOW$ and TK. First, the performance of funds is increasing in its TK realization. Therefore one might argue that TK is a rather useful metric for investors to select funds that are more likely to provide better returns. Second, TK contains investors' biases, which can not explain mutual fund manager performance well. In such a case, high TK mutual funds will not perform better in the future.

A natural way to test this hypotheses is to examine whether a high fund TK also predicts superior future funds performance. To answer this question, we exploit the following

[10] See the Tables A3, A4, A5 and A6 for the results of our analysis when predicting quarterly, half-yearly, nine-monthly, and yearly fund flows.

regression model:

$$RET_{i,t} = \alpha + \beta_{i,t-1} \times TK_{i,t-1} + \lambda_{i,t-1} \times X_{i,t-1} + \epsilon_{i,t-1}, \tag{13}$$

where $RET_{i,t}$ denotes the cumulative style-adjusted or risk-adjusted monthly return of fund i at month t .[11] Table 8 reports the TK coefficients of regression (13) where we include the usual control variables as defined in Section 3. We find that, there is a positive but often not significant relationship between TK and the future funds performance.

[11] Risk-adjusted returns ("alphas") are obtained as the intercept of the regression of a funds excess returns (raw fund return minus the risk free rate) on various factors (CAPM Sharpe (1964), Carhart's (1997) 4-factor model Carhart (1997), and Fama and French (2015) 5-factor model over a 12 months rolling window. Monthly style-adjusted and risk-adjusted returns are then cumulated over the time horizon of the performance measurement.

	(1) SRET	(2) CAPM Alpha	(3) 4-factor Alpha	(4) 5-factor Alpha
TK	0.120	0.068	0.058	0.031
	(1.14)	(1.39)	(1.33)	(0.78)
FLOW	0.005	0.014***	0.008***	0.007***
	(0.57)	(5.00)	(4.00)	(2.77)
log(TNA)	-0.004	-0.001	-0.000	-0.001
	(-1.36)	(-1.46)	(-0.37)	(-0.94)
log(FTNA)	0.002	0.001**	0.001	-0.012***
	(1.34)	(2.13)	(0.90)	(-3.83)
log(AGE)	0.003	-0.000	-0.001	-0.000
	(1.19)	(-0.60)	(-0.59)	(-0.24)
EXP	-0.715***	-0.521***	-0.506***	-0.366***
	(-2.71)	(-4.54)	(-6.37)	(-4.21)
TURN	0.000996	-0.000134	0.000281	0.000539
	(0.82)	(-0.29)	(0.39)	(0.72)
MEAN	0.462**	0.398***	0.289***	0.377***
	(2.52)	(3.21)	(2.69)	(3.85)
VOL	-0.104**	0.0527	0.0386	0.0401
	(-2.08)	(1.56)	(0.92)	(1.15)
SKEW	-0.000	-0.001	-0.000	0.001
	(-0.05)	(-1.39)	(-0.40)	(0.51)
MAX	-0.007	0.001	-0.000	-0.000
	(-1.25)	(0.79)	(-0.08)	(-0.16)
MIN	0.00575	0.000371	0.0000934	-0.00140
	(1.03)	(0.35)	(0.12)	(-0.92)
CONS	-0.002	-0.002	0.000	-0.167***
	(-0.44)	(-1.54)	(0.27)	(-8.02)
N	733028	733028	733028	733028
R^2	0.350	0.493	0.418	0.409

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table 8: Fund Performance and TK. This table reports the relationship between future fund performance and TK as outlined in (13). Thereby variables are defined as in Section 3 and 4.5: $SRET$ (style-adjusted return), CAPM Alpha (risk-adjusted return of CAPM), 4-factor Alpha (risk-adjusted return of Carhart 4-factor model), 5-factor Alpha (risk-adjusted return of Fama French 5-factor model), $FLOW$ (as calculated in equation (10)), TK (as calculated in equation (9)), $\log(TNA)$ (the logarithm of the total net assets of a fund), $\log(FTNA)$ (the logarithm of total net assets of the funds that belong to the same family), $\log(AGE)$ (the logarithm of the number of months since a fund's date of inception), EXP (the total operating expenses expressed as a percentage of a fund's average net assets), $TURN$ (the monthly turnover ration of a fund), $MEAN$, VOL, $SKEW$, (the mean, standard deviation, and skewness of monthly style-adjusted returns over the previous five years), and MAX and MIN denote the highest and lowest return over the last 12 months. The sample ranges from 1985 to 2019.

In addition to the multivariate regression outlined in (13), we also perform a portfolio sorting exercise. Therefore, at the beginning of each month, we rank funds into deciles based on their TK and calculate equally and value-weighted portfolio returns for each decile over the subsequent month. Thereby decile 1 (10) comprises funds with the lowest (highest) TK. In the next step, we regress the excess returns of each portfolio decile on a set of risk factors. Table 9 exhibits the performance and the alphas of the just outlined regressions for the different deciles, as well as the difference between the two extreme portfolios (high TK - low TK). The fact that funds with a high TK seem not to exhibit superior future performance in the cross-section suggests that directing incremental flows into funds with a high TK is not necessarily beneficial for fund investors. Moreover, buying high TK funds and selling low TK funds is not a profitable strategy; From the TK-Performance relationship analysis, we find no substantial evidence to support the explanation of TK as a mutual fund return predictor.

		P1 low TK	P2	P3	P4	P5	P6	P7	P8	P9	P10 high TK	TK high-low
SRET	EW	-0.099	0.063	-0.066	-0.001	-0.020	0.101	-0.061	-0.010	0.033	-0.0187	0.081
		(-1.32)	(1.21)	(-1.60)	(-0.01)	(-0.51)	(0.92)	(-1.71)	(-0.34)	(0.98)	(-0.45)	(1.00)
SRET	VW	-0.093	0.065	-0.056	0.026	0.052	0.107	0.014	0.034	0.063	0.014	0.107
		(-1.07)	(1.10)	(-1.05)	(0.47)	(0.75)	(3.34)	(0.36)	(1.00)	(1.82)	(0.35)	(1.22)
CAPM Alpha	EW	-0.064	0.073	-0.050	0.019	-0.024	0.112	-0.061	-0.012	0.022	-0.041	0.073
		(-0.85)	(1.38)	(-1.19)	(0.39)	(-0.60)	(1.01)	(-1.67)	(-0.38)	(0.66)	(-0.98)	(0.71)
CAPM Alpha	VW	-0.038	0.079	-0.046	0.048	0.069	0.114	0.026	0.048	0.057	0.000	0.101
		(-0.44)	(1.31)	(-0.86)	(0.86)	(0.99)	(3.54)	(0.64)	(1.42)	(1.62)	(-0.02)	(0.96)
4-factor Alpha	EW	-0.030	0.087	-0.036	0.027	-0.009	0.0892	-0.068	-0.015	0.007	-0.040	0.026
		(-0.47)	(1.78)	(-0.88)	(0.53)	(-0.23)	(0.79)	(-1.88)	(-0.53)	(0.23)	(-1.01)	(0.31)
4-factor Alpha	VW	0.036	0.112	-0.007	0.067	0.081	0.114	0.029	0.039	0.039	0.004	0.017
		(0.52)	(2.03)	(-0.13)	(1.22)	(1.15)	(3.67)	(0.71)	(1.16)	(1.24)	(0.09)	(0.22)
5-factor Alpha	EW	-0.203	-0.009	-0.051	0.012	-0.038	0.144	-0.035	0.038	0.84	0.019	0.272
		(-1.04)	(-0.18)	(-1.19)	(0.22)	(-0.91)	(1.12)	(-0.92)	(1.30)	(2.83)	(0.47)	(1.13)
5-factor Alpha	VW	-0.136	0.012	-0.020	0.052	-0.028	0.104	0.023	0.088	0.113	0.046	0.245
		(-1.68)	(1.21)	(-0.36)	(0.91)	(-0.39)	(3.22)	(0.57)	(2.56)	(1.47)	(1.12)	(1.60)

Table 9: Decile Portfolio Analysis. This table reports average monthly excess returns and alphas, for both, equal-weighted (EW) and value-weighted (VW) portfolios sorted on the mutual funds TK value. Portfolios are rebalanced monthly. Thereby variables are defined as in Section 3: $FLOW$ (as calculated in (10)), TK (as calculated in (9)). Numbers are represented in percentages. The sample ranges from 1985 to 2019.

Barberis, Mukherjee, and Wang (2016) show that when thinking about allocating money to a stock, investors mentally represent the stock distribution in the way described by prospect theory. Therefore, investors tilt their portfolios toward stocks whose past return distributions are appealing under prospect theory, causing them to become overvalued and earn subsequent low returns. However, for mutual funds, our analysis shows that this mechanism does not work. A high (low) TK mutual fund does not necessarily earn a low (high) subsequent return. The main reason is the difference in trading mechanisms between stocks and mutual funds. In general, stock investors trade in secondary markets via the bid-ask system, and therefore, high demand for one stock (high TK) will cause a high current price and a subsequent low return. However, mutual funds can be traded in primary and secondary markets since investors can trade their mutual fund shares with other investors (in secondary markets) and purchase and redeem them for the market price via the purchase and redemption mechanism. Therefore, trading mutual funds for their market price will not necessarily affect these mutual funds' subsequent return.

5 Robustness

To verify the robustness results of the analysis to various specifications, a series of tests are carried out and reported in the Appendix B. Overall, the results in the central part of the paper are robust.

5.1 Sub-Periods Analysis

To analyze a possible change in the relationship between TK and $FLOW$ over time, we will repeat the regressions outlined in (12) over the two sub-periods, that is, i) from 1985-01 to 2008-12 and from ii) 2009-01 to 2019-12. From Table A7 and Table A8 we find that TK remains significant in both periods, but with a different economic magnitude. One potential explanation is that after the financial crisis makes mutual investors focus more on three components of behavioral biases in prospect theory, which increases the magnitude of the coefficient.

5.2 Alternative Definitions of TK

As described in Section 3.1, TK is calculated using monthly style-adjusted returns over a period of 60 months. In this section, we experiment with various alternative TK measures to assess the sensitivity of the relationship between TK and $FLOW$. While the style adjustment is intuitive in the mutual fund universe, we repeat the main analysis with an alternative TK measure called RTK where we consider raw returns in the calculation of TK (see Table A9). In a second step we also calculate TK considering shorter rolling windows, that is, over 48 months (see Table A10) and 36 months (see Table A11).[12] Overall, we find

[12] We consider a funds TK for a given point in time if we have at least 40 observations (out of 48 months) or 30 observations (out of 36 months) available.

that neither the usage of raw returns nor a shorten of the backward-looking window for the calculation of TK affects the major results outlined in the main section of the paper, that is, the relationship between TK and future fund flows.

5.3 Clustered Standard Errors

Although we present results with standard errors corrected for autocorrelation and heteroscedasticity using Newey and West (1987), Petersen (2009) outlines that these might be still underestimated. In Table A12, we test the TK-flow relationship using a panel regressions with standard errors clustered on two dimensions, that is, mutual fund and time, following Barber, Odean, and Zheng (2005) and Elton, Gruber, and Blake (2011). The results show that the effect and the magnitude of the coefficient of TK are similar to what we present in Table 3.

5.4 Idiosyncratic Volatility, Idiosyncratic Skewness

TK applies the concept of probability weighting, which is also driven by the idiosyncratic components of the return distribution. To accommodate concerns that TK purely serves as a good proxy for idiosyncratic risk, we control two additional idiosyncratic risk measures: idiosyncratic volatility and idiosyncratic skewness.

Idiosyncratic volatility is calculated as the standard deviation of the residuals from the regression of the individuals funds style adjust excess returns on the Carhart (1997) four factor model:

$$R_{i,t}-r_{f,t} = \alpha_i+\beta_{m,i}\times(R_{m,t}-r_{f,t})+\beta_{HML,i}\times HML_t+\beta_{SMB,i}\times SMB_t+\beta_{UMD,i}\times UMD_t+\epsilon_{i,t}. \quad (14)$$

We run the just outlined regression using a backward looking window of 60 months. The idiosyncratic return of fund i is then simply inferred by the standard deviation of the residuals $\epsilon_{i,t}$.

To decompose skewness into an idiosyncratic and systematic components, we follow Harvey and Siddique (2000) and estimate the following regression for each fund, again over the previous 60 months:

$$R_{i,t} - r_{f,t} = \alpha + \beta_i \times (R_{m,t} - r_{f,t}) + \theta_i \times (R_{m,t} - r_{f,t})^2 + \epsilon_{i,t}, \quad (15)$$

where idiosyncratic skewness (Iskewness) is defined as the skewness of monthly residuals $\epsilon_{i,t}$. The systematic skewness (Sskewness) is the estimated slope coefficient θ_i in (15).

Table A13 reports the time-series average of the cross-sectional regressions for the mutual fund flows. In some settings, $IVOL$ loads negatively on future fund flows even though the overall significance is rarely given (in contrast to the total volatility VOL, as reported in Table 3). This indicates that investors respond to the total risk of funds rather than the idiosyncratic risk. It turns out that the negative and significant relationship between skewness and TK (Table 3) is driven solely by systematic skewness. The coefficients for TK remain highly significant in all specifications. In conclusion, the additional tests confirm that the impact of TK on future fund flows is robust to the inclusion of idiosyncratic volatility and idiosyncratic skewness.

6 Conclusion

This paper relates future fund flows to the prospect theory value, which suggests that investors mentally represent an investment by the distribution of the investment's past returns. In this paper, we transferred the concept from stocks to mutual funds, where we conjecture that mutual fund retail investors evaluate their investment decisions under consideration of cumulative prospect theory.

We test this hypothesis and find that the funds prospect value predicts future fund flows for horizons up to nine months controlling for multiple fund characteristics. Thereby we show that the prospect value of the mutual funds contains fundamentally different and incremental information compared to traditional predictors, and that the prospect value also subsumes the information content of funds performance measures related to the convex flow-performance puzzle.

The analysis of the individual building blocks of the mutual funds prospect value reveals that the concavity and convexity feature, which means that the value function is concave over gains and convex over losses, plays an essential role in mutual fund flow prediction. We also analyze the predictive relationship between prospect values and mutual fund returns and we show that the funds prospect value does not reliably forecast future mutual fund returns.

Overall, the empirical results are robust to various specifications, including sample splits, alternative definitions of the prospect theory value, the clustering of standard errors, and the incorporation of idiosyncratic volatility skewness measures.

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Appendix

A Additional Figures

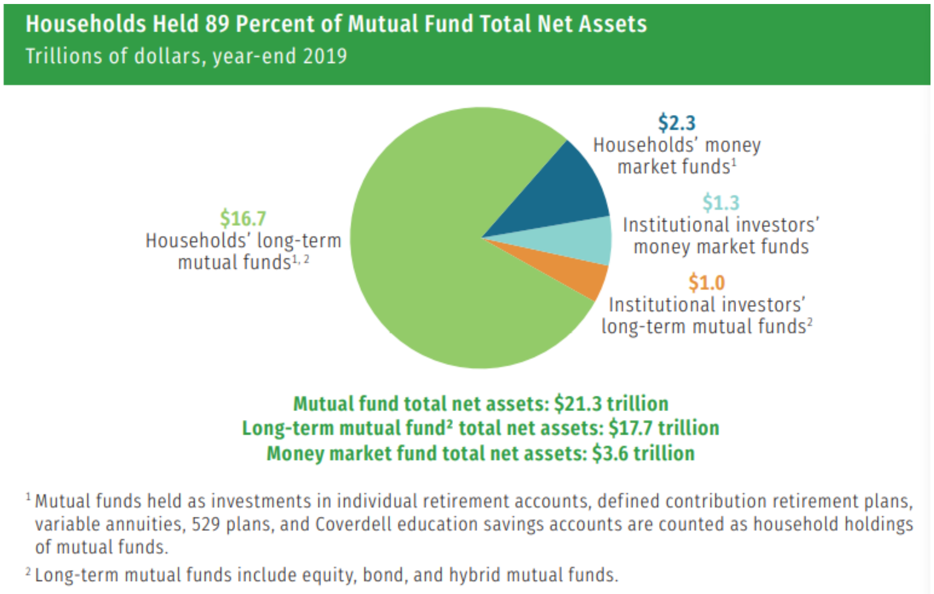

Figure A1: Households Held 89 Percent of Mutual Fund Total Net Assets.
Trillions of dollars, year-end 2019

B Additional Tables

	(1)	(2)	(3)	(4)
	VIF	SQRT VIF	TORELANCE	R-SQURE
TK	3.512	1.871	0.285	0.715
FLOW	1.000	1.000	1.000	0.000
log(TNA)	1.261	1.122	0.796	0.204
log(FTNA)	1.191	1.090	0.837	0.163
log(AGE)	1.083	1.041	0.922	0.078
EXP	1.000	1.000	1.000	0.000
TURN	1.000	1.000	0.998	0.002
MEAN	4.911	2.211	0.204	0.796
VOL	2.042	1.431	0.490	0.510
SKEW	1.182	1.091	0.845	0.155
MAX	1.000	1.000	1.000	0.000
MEAN VIF	1.74			

Table A1: VIF of TK and Other Control Variables. This table reports the variance inflation factors (VIF) of TK and other control variables. Thereby variables are defined as in Section 3: $FLOW$ (as calculated in (10)), TK (as calculated in (9)), $\log(TNA)$ (the logarithm of the total net assets of a fund), $\log(FTNA)$ (the logarithm of total net assets of the funds that belong to the same family), $\log(AGE)$ (the logarithm of the number of months since a fund's date of inception), EXP (the total operating expenses expressed as a percentage of a fund's average net assets), $TURN$ (the monthly turnover ration of a fund), and $MEAN$, VOL, $SKEW$, (the mean, standard deviation, and skewness of monthly style-adjusted returns over the previous five years), MAX and MIN denote the highest and lowest return over the last twelve months. The sample ranges from 1985 to 2019.

	Unstandardized Variables			Standardized Variables		
	(1) FLOW	(2) FLOW	(3) FLOW	(4) FLOW	(5) FLOW	(6) FLOW
FLOW	-0.095	-0.193	-0.207	-0.178	-0.228*	-0.228*
	(-0.61)	(-1.51)	(-1.63)	(-1.37)	(-1.81)	(-1.81)
log(TNA)	-0.024	-0.033	-0.034	-0.004	-0.006*	-0.006*
	(-1.18)	(-1.58)	(-1.63)	(-1.21)	(-1.81)	(-1.85)
log(FTNA)	0.006	0.008	0.009	0.002*	0.002**	0.002**
	(1.05)	(1.47)	(1.61)	(1.78)	(2.06)	(2.04)
log(AGE)	0.024	0.021	0.022	0.001	0.001	0.001
	(0.89)	(0.81)	(0.84)	(0.81)	(0.86)	(0.85)
EXP	-84.171	-80.512	-80.764	-0.779	-0.762	-0.764
	(-1.41)	(-1.39)	(-1.38)	(-1.38)	(-1.39)	(-1.38)
TURN	0.143	-0.000	-0.003	0.000	-0.000	-0.000
	(0.78)	(-0.05)	(-0.41)	(0.02)	(-0.88)	(-1.56)
MEAN		7.725***	7.652***		0.003***	0.003***
		(2.62)	(2.62)		(2.86)	(2.79)
VOL		0.107	0.052		0.001	0.000
		(0.28)	(0.13)		(0.63)	(0.25)
SKEW		-0.062*	-0.060*		-0.005*	-0.005*
		(-1.89)	(-1.83)		(-1.81)	(-1.91)
lmax			0.283			0.002
			(0.78)			(0.80)
lmin			0.291			0.001
			(1.40)			(1.36)
CONS	0.0308	0.0810***	0.0845***	0.00769	0.00924	0.00965
	(0.88)	(2.99)	(3.07)	(0.95)	(1.18)	(1.22)
N	733028	733028	733028	733028	733028	733028
R^2	0.288	0.306	0.306	0.288	0.306	0.306

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A2: Fund Flow without TK. This table reports the relationship between future fund flows and TK as outlined in (12). Thereby variables are defined as in Section 3: $FLOW$ (as calculated in equation (10)), log(TNA) (the logarithm of the total net assets of a fund), log($FTNA$) (the logarithm of total net assets of the funds that belong to the same family), log(AGE) (the logarithm of the number of months since a fund's date of inception), EXP (the total operating expenses expressed as a percentage of a fund's average net assets), $TURN$ (the monthly turnover ration of a fund), and $MEAN$, VOL, $SKEW$, (the mean, standard deviation, and skewness of monthly style-adjusted returns over the previous five years), MAX and MIN denote the highest and lowest return over the last twelve months. The sample ranges from 1985 to 2019.

	Unstandardized Variables			Standardized Variables		
	(1) FLOW	(2) FLOW	(3) FLOW	(4) FLOW	(5) FLOW	(6) FLOW
TK	5.654***	38.681***	38.962***	0.004***	0.025***	0.026***
	(2.81)	(2.85)	(2.87)	(2.64)	(2.81)	(2.86)
FLOW	-0.198	-0.389	-0.402	-0.206	-0.261	-0.261
	(-0.53)	(-1.20)	(-1.25)	(-1.10)	(-1.45)	(-1.45)
log(TNA)	-0.012	-0.026	-0.028	-0.003	-0.002	-0.003
	(-0.49)	(-1.18)	(-1.29)	(-1.35)	(-1.44)	(-1.57)
log(FTNA)	0.009	0.013*	0.014*	0.000	0.001*	0.001**
	(0.89)	(1.67)	(1.88)	(0.28)	(1.95)	(2.07)
log(AGE)	0.001	-0.018	-0.016	0.000	-0.000	-0.000
	(0.03)	(-0.46)	(-0.41)	(0.33)	(-0.44)	(-0.38)
EXP	-136.912**	-132.321**	-132.434**	-0.696*	-0.705*	-0.705*
	(-1.80)	(-1.75)	(-1.74)	(-1.71)	(-1.75)	(-1.74)
TURN	-0.042	0.015	0.000	-0.003	0.000	0.000
	(-0.50)	(1.09)	(0.00)	(-0.38)	(0.47)	(0.02)
MEAN		-77.831***	-78.072***		-0.014**	-0.014**
		(-2.44)	(-2.46)		(-2.34)	(-2.41)
VOL		25.271***	25.402***		0.029***	0.029***
		(2.79)	(2.81)		(2.79)	(2.81)
SKEW		-0.232**	-0.227**		-0.010**	-0.010**
		(-2.32)	(-2.27)		(-2.21)	(-2.28)
MAX			-1.110			-0.004
			(-1.19)			(-1.20)
MIN			-0.316			-0.000
			(-0.39)			(-0.36)
CONS	0.256***	0.479***	0.499***	0.00803	0.00808	0.00813
	(3.38)	(3.41)	(3.35)	(1.30)	(1.35)	(1.39)
N	714321	714321	714321	714321	714321	714321
R^2	0.311	0.328	0.328	0.313	0.323	0.329

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A3: Quarterly Fund Flow and TK. This table reports the relationship between future fund flows and TK as outlined in (12). Thereby variables are defined as in Section 3: $FLOW$ (as calculated in (10)), TK (as calculated in (9)), log(TNA) (the logarithm of the total net assets of a fund), log($FTNA$) (the logarithm of total net assets of the funds that belong to the same family), log(AGE) (the logarithm of the number of months since a fund's date of inception), EXP (the total operating expenses expressed as a percentage of a fund's average net assets), $TURN$ (the monthly turnover ration of a fund), and $MEAN$, VOL, $SKEW$, (the mean, standard deviation, and skewness of monthly style-adjusted returns over the previous five years), MAX and MIN denote the highest and lowest return over the last 12 months. The sample ranges from 1985 to 2019.

	Unstandardized Variables			Standardized Variables		
	(1) FLOW	(2) FLOW	(3) FLOW	(4) FLOW	(5) FLOW	(6) FLOW
TK	9.762***	75.812***	75.691***	0.004***	0.034***	0.034***
	(3.09)	(3.03)	(3.04)	(3.03)	(2.99)	(3.03)
FLOW	-0.041	-0.351	-0.377	-0.125	-0.167	-0.166
	(-0.08)	(-0.92)	(-1.00)	(-0.84)	(-1.17)	(-1.16)
log(TNA)	0.050	0.021	0.013	0.002	-0.000	-0.001
	(1.09)	(0.62)	(0.39)	(0.70)	(-0.24)	(-0.35)
log(FTNA)	-0.001	0.007	0.010	0.000	0.001*	0.001*
	(-0.06)	(0.68)	(0.97)	(0.27)	(1.74)	(1.90)
log(AGE)	-0.055	-0.094	-0.088	-0.001	-0.001	-0.001
	(-1.20)	(-1.60)	(-1.50)	(-1.08)	(-1.22)	(-1.20)
EXP	-208.721**	-195.832**	-196.310**	-0.712**	-0.709**	-0.711**
	(-2.23)	(-2.14)	(-2.14)	(-2.08)	(-2.14)	(-2.14)
TURN	-0.053	0.029	0.013	-0.002	0.000	0.000
	(-0.51)	(1.35)	(1.15)	(-0.19)	(0.75)	(0.54)
MEAN		-160.823***	-159.543***		-0.020**	-0.020***
		(-2.66)	(-2.67)		(-2.55)	(-2.62)
VOL		49.238***	49.166***		0.038***	0.038***
		(2.89)	(2.90)		2.89	2.90
SKEW		-0.431**	-0.413**		-0.013**	-0.013**
		(-2.40)	(-2.32)		(-2.33)	(-2.41)
MAX			-1.218			-0.003
			(-1.29)			(-1.30)
MIN			-0.401			-0.000
			(-0.32)			(-0.40)
CONS	0.479***	0.958***	0.976***	0.005	0.008	0.009*
	(3.86)	(3.71)	(3.83)	(0.89)	(1.58)	(1.66)
N	695614	695614	695614	695614	695614	695614
R^2	0.301	0.321	0.321	0.310	0.323	0.324

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A4: Half Yearly Fund Flow and TK. This table reports the relationship between future fund flows and TK as outlined in (12). Thereby variables are defined as in Section 3: $FLOW$ (as calculated in (10)), TK (as calculated in (9)), log(TNA) (the logarithm of the total net assets of a fund), log($FTNA$) (the logarithm of total net assets of the funds that belong to the same family), log(AGE) (the logarithm of the number of months since a fund's date of inception), EXP (the total operating expenses expressed as a percentage of a fund's average net assets), $TURN$ (the monthly turnover ration of a fund), and $MEAN$, VOL, $SKEW$, (the mean, standard deviation, and skewness of monthly style-adjusted returns over the previous five years), MAX and MIN denote the highest and lowest return over the last 12 months. The sample ranges from 1985 to 2019.

	Unstandardized Variables			Standardized Variables		
	(1)	(2)	(3)	(4)	(5)	(6)
	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW
TK	14.121***	92.442***	92.103***	0.005***	0.032**	0.032***
	(3.52)	(2.62)	(2.64)	(3.59)	(2.58)	(2.62)
FLOW	0.265	-0.245	-0.313	-0.039	-0.117	-0.118
	(0.43)	(-0.56)	(-0.73)	(-0.28)	(-0.92)	(-0.93)
log(TNA)	0.078	0.051	0.052	0.004	0.001	0.001
	(1.34)	(0.98)	(0.99)	(1.51)	(0.47)	(0.34)
log(FTNA)	-0.002	0.006	0.007	0.000	0.001	0.001*
	(-0.08)	(0.39)	(0.45)	(0.08)	(1.48)	(1.76)
log(AGE)	-0.097	-0.156*	-0.159*	-0.001*	-0.002	-0.002
	(-1.60)	(-1.78)	(-1.82)	(-1.88)	(-1.59)	(-1.57)
EXP	-287.302***	-244.832**	-245.337**	-0.775***	-0.695**	-0.696**
	(-2.76)	(-2.48)	(-2.47)	(-2.60)	(-2.48)	(-2.47)
TURN	-0.075	0.046*	0.022	-0.005	0.000	0.000
	(-0.39)	(1.66)	(1.56)	(-0.47)	(1.51)	(1.20)
MEAN		-202.734**	-200.939**		-0.019**	-0.020**
		(-2.36)	(-2.37)		(-2.24)	(-2.31)
VOL		55.813**	55.644**		0.034**	0.034**
		(2.35)	(2.36)		(2.36)	(2.36)
SKEW		-0.494*	-0.487*		-0.012**	-0.012**
		(-1.91)	(-1.90)		(-1.98)	(-2.05)
MAX			-2.520**			-0.005**
			(-2.03)			(-2.04)
MIN			-0.814			-0.001
			(-0.40)			(-0.47)
CONS	0.793***	1.417***	1.466***	0.00461	0.00780*	0.00825*
	(4.77)	(3.55)	(3.77)	(0.83)	(1.67)	(1.79)
N	676907	676907	676907	676907	676907	676907
R^2	0.331	0.332	0.332	0.330	0.332	0.333

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A5: Nine-Monthly Fund Flow and TK. This table reports the relationship between future fund flows and TK as outlined in (12). Thereby variables are defined as in Section 3: $FLOW$ (as calculated in (10)), TK (as calculated in (9)), log(TNA) (the logarithm of the total net assets of a fund), log($FTNA$) (the logarithm of total net assets of the funds that belong to the same family), log(AGE) (the logarithm of the number of months since a fund's date of inception), EXP (the total operating expenses expressed as a percentage of a fund's average net assets), $TURN$ (the monthly turnover ration of a fund), and $MEAN$, VOL, $SKEW$, (the mean, standard deviation, and skewness of monthly style-adjusted returns over the previous five years), MAX and MIN denote the highest and lowest return over the last 12 months. The sample ranges from 1985 to 2019.

	Unstandardized Variables			Standardized Variables		
	(1) FLOW	(2) FLOW	(3) FLOW	(4) FLOW	(5) FLOW	(6) FLOW
TK	18.861***	79.072	78.263	0.006***	0.022	0.023
	(3.80)	(1.48)	(1.48)	(3.83)	(1.45)	(1.47)
FLOW	0.165	-0.344	-0.374	-0.056	-0.106	-0.105
	(0.21)	(-0.64)	(-0.71)	(-0.41)	(-0.82)	(-0.82)
log(TNA)	0.125	0.078	0.080	0.005	0.002	0.001
	(1.57)	(1.05)	(1.08)	(1.62)	(0.68)	(0.58)
log(FTNA)	-0.00676	0.0155	0.0153	0.000	0.001*	0.001*
	(-0.22)	(0.80)	(0.79)	(0.21)	(1.69)	(1.83)
log(AGE)	-0.150*	-0.212*	-0.214*	-0.002**	-0.002	-0.002
	(-1.90)	(-1.82)	(-1.84)	(-2.06)	(-1.61)	(-1.59)
EXP	-343.623***	-299.947***	-301.032***	-0.767***	-0.705***	-0.707***
	(-2.97)	(-2.74)	(-2.74)	(-2.78)	(-2.74)	(-2.74)
TURN	-0.220	0.0415	0.0286	-0.006	0.000	0.000
	(-0.81)	(1.55)	(1.44)	(-0.57)	(1.07)	(0.93)
MEAN		-184.643	-181.423		-0.014	-0.015
		(-1.55)	(-1.54)		(-1.43)	(-1.49)
VOL		39.15	38.80		0.020	0.019
		(0.99)	(0.98)		(0.99)	(0.98)
SKEW		-0.416	-0.410		-0.009	-0.009
		(-1.16)	(-1.15)		(-1.23)	(-1.28)
MAX			-1.706			-0.003
			(-1.10)			(-1.10)
MIN			-1.180			-0.001
			(-0.47)			(-0.58)
CONS	1.051***	1.702***	1.715***	0.004	0.007	0.008*
	(5.49)	(3.31)	(3.57)	(0.70)	(1.58)	(1.73)
N	658200	658200	658200	658200	658200	658200
R^2	0.311	0.323	0.324	0.310	0.323	0.323

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A6: Yearly Fund Flow and TK. This table reports the relationship between future fund flows and TK as outlined in (12). Thereby variables are defined as in Section 3: $FLOW$ (as calculated in (10)), TK (as calculated in (9)), log(TNA) (the logarithm of the total net assets of a fund), log($FTNA$) (the logarithm of total net assets of the funds that belong to the same family), log(AGE) (the logarithm of the number of months since a fund's date of inception), EXP (the total operating expenses expressed as a percentage of a fund's average net assets), $TURN$ (the monthly turnover ration of a fund), and $MEAN$, VOL, $SKEW$, (the mean, standard deviation, and skewness of monthly style-adjusted returns over the previous five years), MAX and MIN denote the highest and lowest return over the last 12 months. The sample ranges from 1985 to 2019.

	Unstandardized Variables			Standardized Variables		
	(1) FLOW	(2) FLOW	(3) FLOW	(4) FLOW	(5) FLOW	(6) FLOW
TK	0.179***	2.662***	2.591***	0.009*	0.005***	0.005***
	(2.65)	(2.61)	(2.76)	(1.81)	(2.73)	(2.76)
FLOW	0.112***	-2.432	-2.850*	0.469	0.548*	0.547*
	(2.67)	(-1.51)	(-1.81)	(1.21)	(1.76)	(1.75)
log(TNA)	-0.002	-0.050	-0.063	-0.008	-0.002	-0.002
	(-0.27)	(-1.21)	(-1.48)	(-0.35)	(-0.48)	(-0.48)
log(FTNA)	0.0000	0.014	0.019*	0.013	0.003*	0.003*
	(0.01)	(1.30)	(1.71)	(0.76)	(1.70)	(1.71)
log(AGE)	-0.002	0.010	0.013	0.002	0.001	0.001
	(-0.46)	(0.64)	(0.89)	(0.28)	(0.95)	(0.95)
EXP	-5.069***	-9.508	-9.540	-0.321	-0.707***	-0.708***
	(-2.81)	(-1.38)	(-1.38)	(-0.23)	(-4.12)	(-3.13)
TURN	-0.009	-0.064	0.032	0.212	0.001	0.001
	(-0.57)	(-0.96)	(0.97)	(1.41)	(1.07)	(1.08)
MEAN		-2.231***	-2.231***		-0.013***	-0.013***
		(-3.29)	(-3.31)		(-4.21)	(-3.19)
VOL		-0.650	-0.762		-0.002	-0.002
		(-0.67)	(-0.79)		(-0.67)	(-0.70)
SKEW		-0.001	0.002		0.003	0.003
		(-0.08)	(0.20)		(1.42)	(1.42)
MAX			0.072			0.002
			(0.19)			(0.15)
MIN			0.063			0.031
			(1.29)			(1.04)
CONS	0.039***	0.170	0.185*	0.027	0.021**	0.021**
	(5.18)	(1.58)	(1.67)	(0.98)	(2.26)	(2.25)
N	314427	314427	314427	314427	314427	314427
R^2	0.410	0.431	0.431	0.413	0.431	0.431

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A7: Robustness: Fund Flow and TK - before the financial crisis. This table reports the relationship between future fund flows and TK as outlined in (12). Thereby variables are defined as in Section 3: $FLOW$ (as calculated in (10)), TK (as calculated in (9)), log(TNA) (the logarithm of the total net assets of a fund), log($FTNA$) (the logarithm of total net assets of the funds that belong to the same family), log(AGE) (the logarithm of the number of months since a fund's date of inception), EXP (the total operating expenses expressed as a percentage of a fund's average net assets), $TURN$ (the monthly turnover ration of a fund), and $MEAN$, VOL, $SKEW$, (the mean, standard deviation, and skewness of monthly style-adjusted returns over the previous five years), MAX and MIN denote the highest and lowest return over the last twelve months. The sample ranges from 1985 to 2008.

	Unstandardized Variables			Standardized Variables		
	(1) FLOW	(2) FLOW	(3) FLOW	(4) FLOW	(5) FLOW	(6) FLOW
TK	8.517***	46.278***	47.379***	0.010***	0.054***	0.055***
	(2.96)	(3.12)	(3.16)	(2.96)	(3.12)	(3.16)
FLOW	-0.905**	-0.898**	-0.898**	-0.906**	-0.899**	-0.898**
	(-2.25)	(-2.28)	(-2.28)	(-2.25)	(-2.28)	(-2.28)
log(TNA)	-0.105	-0.113*	-0.113*	-0.017	-0.018*	-0.018*
	(-1.62)	(-1.69)	(-1.69)	(-1.62)	(-1.69)	(-1.69)
log(FTNA)	0.029*	0.026*	0.026*	0.005*	0.004*	0.005*
	(1.89)	(1.75)	(1.78)	(1.89)	(1.75)	(1.78)
log(AGE)	0.091	0.060	0.060	0.004	0.002	0.002
	(1.06)	(0.67)	(0.64)	(1.06)	(0.67)	(0.64)
EXP	-262.621	-267.434	-267.932	-2.486	-2.531	-2.536
	(-1.38)	(-1.37)	(-1.36)	(-1.38)	(-1.37)	(-1.36)
TURN	-0.007	-0.012	-0.014	-0.000	-0.001	-0.001
	(-1.21)	(-1.42)	(-1.52)	(-1.21)	(-1.42)	(-1.52)
MEAN		-81.338**	-84.023**		-0.027**	-0.028**
		(-2.46)	(-2.54)		(-2.46)	(-2.54)
VOL		30.959***	31.598***		0.063***	0.064***
		(3.17)	(3.21)		(3.17)	(3.21)
SKEW		-0.277**	-0.280**		-0.022**	-0.022**
		(-2.28)	(-2.29)		(-2.28)	(-2.29)
MAX			1.090			0.008
			(0.85)			(0.85)
MIN			0.956			0.002
			(1.40)			(1.40)
CONS	0.220**	0.504***	0.528***	0.032	0.035	0.036
	(2.46)	(3.67)	(3.77)	(1.25)	(1.34)	(1.35)
N	415406	415406	415406	415406	415406	415406
R^2	0.290	0.312	0.312	0.291	0.312	0.312

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A8: Robustness: Fund Flow and TK - after the financial crisis. This table reports the relationship between future fund flows and TK as outlined in (12). Thereby variables are defined as in Section 3: $FLOW$ (as calculated in (10)), TK (as calculated in (9)), log(TNA) (the logarithm of the total net assets of a fund), log($FTNA$) (the logarithm of total net assets of the funds that belong to the same family), log(AGE) (the logarithm of the number of months since a fund's date of inception), EXP (the total operating expenses expressed as a percentage of a fund's average net assets), $TURN$ (the monthly turnover ration of a fund), and $MEAN$, VOL, $SKEW$, (the mean, standard deviation, and skewness of monthly style-adjusted returns over the previous five years), MAX and MIN denote the highest and lowest return over the last twelve months. The sample ranges from 2009 to 2019.

	Unstandardized Variables			Standardized Variables		
	(1) FLOW	(2) FLOW	(3) FLOW	(4) FLOW	(5) FLOW	(6) FLOW
RAW TK	2.768***	8.962**	9.087**	0.003***	0.010**	0.010**
	(2.77)	(2.36)	(2.37)	(2.59)	(2.33)	(2.33)
FLOW	-0.181	-0.219*	-0.235*	-0.222*	-0.239*	-0.239*
	(-1.34)	(-1.70)	(-1.83)	(-1.70)	(-1.87)	(-1.87)
log(TNA)	-0.030	-0.033	-0.032	-0.006	-0.006*	-0.006*
	(-1.47)	(-1.57)	(-1.50)	(-1.59)	(-1.82)	(-1.84)
log(FTNA)	0.007	0.008	0.007	0.002**	0.002**	0.002**
	(1.43)	(1.50)	(1.40)	(1.99)	(2.02)	(2.05)
log(AGE)	0.024	0.017	0.015	0.001	0.001	0.001
	(0.95)	(0.64)	(0.58)	(0.96)	(0.84)	(0.77)
EXP	-80.791	-82.942	-83.149	-0.759	-0.785	-0.787
	(-1.40)	(-1.40)	(-1.39)	(-1.39)	(-1.40)	(-1.39)
TURN	-0.011	-0.004	-0.008*	0.003	-0.000	-0.000
	(-0.82)	(-0.68)	(-1.80)	(0.63)	(-1.32)	(-1.41)
RAW MEAN		-10.491*	-10.762*		-0.004*	-0.004*
		(-1.68)	(-1.70)		(-1.65)	(-1.70)
RAW VOL		5.655**	5.696**		0.012**	0.012**
		(2.38)	(2.39)		(2.38)	(2.39)
RAW SKEW		-0.074*	-0.075*		-0.005*	-0.005*
		(-1.96)	(-1.96)		(-1.78)	(-1.86)
MAX			0.271			0.002
			(0.73)			(0.73)
MIN			0.302			0.001
			(1.45)			(1.45)
CONS	0.0916***	0.145***	0.153***	0.00829	0.00902	0.00943
	(3.01)	(3.46)	(3.46)	(1.05)	(1.12)	(1.15)
N	733028	733028	733028	733028	733028	733028
R^2	0.296	0.314	0.315	0.296	0.314	0.315

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A9: Robustness: Fund Flow and Raw TK. This table reports the relationship between future fund flows and TK as outlined in (12). Thereby variables are defined as in Section 3: $FLOW$ (as calculated in (10)), RTK (as calculated in (9) considering raw monthly returns), log(TNA) (the logarithm of the total net assets of a fund), log($FTNA$) (the logarithm of total net assets of the funds that belong to the same family), log(AGE) (the logarithm of the number of months since a fund's date of inception), EXP (the total operating expenses expressed as a percentage of a fund's average net assets), $TURN$ (the monthly turnover ration of a fund), and $MEAN$, VOL, $SKEW$, (the mean, standard deviation, and skewness of monthly style-adjusted returns over the previous five years), MAX and MIN denote the highest and lowest return over the last twelve months. The sample ranges from 1985 to 2019.

	Unstandardized Variables			Standardized Varibles		
	(1)	(2)	(3)	(4)	(5)	(6)
	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW
TK48	2.006***	12.023***	12.411***	0.003***	0.014**	0.015***
	(3.12)	(2.61)	(2.66)	(3.28)	(2.58)	(2.65)
FLOW	-0.155	-0.201	-0.219*	-0.195	-0.230*	-0.230*
	(-1.13)	(-1.59)	(-1.75)	(-1.51)	(-1.85)	(-1.85)
log(TNA)	-0.027	-0.032	-0.030	-0.005	-0.006*	-0.006*
	(-1.36)	(-1.54)	(-1.48)	(-1.49)	(-1.82)	(-1.83)
log(FTNA)	0.007	0.007	0.007	0.001	0.002**	0.001**
	(1.23)	(1.36)	(1.29)	(1.33)	(2.04)	(1.97)
log(AGE)	0.023	0.018	0.016	0.001	0.001	0.001
	(0.87)	(0.66)	(0.60)	(0.85)	(0.81)	(0.77)
EXP	-83.068	-81.922	-82.002	-0.776	-0.775	-0.776
	(-1.43)	(-1.38)	(-1.38)	(-1.41)	(-1.38)	(-1.38)
TURN	-0.018	0.011	-0.002	-0.011	-0.000	-0.000
	(-0.55)	(1.17)	(-0.46)	(-1.43)	(-0.80)	(-1.48)
MEAN48		-21.982**	-22.913**		-0.008**	-0.008**
		(-2.19)	(-2.26)		(-2.12)	(-2.23)
VOL48		7.906***	8.142***		0.016***	0.017***
		(2.68)	(2.73)		(2.67)	(2.73)
SKEW48		-0.082**	-0.083**		-0.005*	-0.006**
		(-2.10)	(-2.12)		(-1.89) (-1.99)	
MAX			0.281			0.002
			(0.76)			(0.78)
MIN			0.267			0.001
			(1.32)			(1.41)
CONS	0.079***	0.146***	0.154***	0.008	0.009	0.010
	(2.79)	(3.17)	(3.28)	(1.02)	(1.17)	(1.20)
N	733028	733028	733028	733028	733028	733028
R^2	0.295	0.313	0.314	0.296	0.313	0.314

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A10: Robustness: Fund Flow and TK - 48 months window. This table reports the relationship between future fund flows and TK as outlined in (12). Thereby variables are defined as in Section 3: $FLOW$ (as calculated in (10)), $TK48$ (as calculated in (9) over a 48 months window), log(TNA) (the logarithm of the total net assets of a fund), log($FTNA$) (the logarithm of total net assets of the funds that belong to the same family), log(AGE) (the logarithm of the number of months since a fund's date of inception), EXP (the total operating expenses expressed as a percentage of a fund's average net assets), $TURN$ (the monthly turnover ration of a fund), and $MEAN$, VOL, $SKEW$, (the mean, standard deviation, and skewness of monthly style-adjusted returns over the previous four years), MAX and MIN denote the highest and lowest return over the last twelve months. The sample ranges from 1985 to 2019.

	Unstandardized Variables			Standardized Variables		
	(1)	(2)	(3)	(4)	(5)	(6)
	FLOW	FLOW	FLOW	FLOW	FLOW	FLOW
TK	0.864	11.971**	12.492***	0.001*	0.015**	0.016**
	(1.35)	(2.52)	(2.61)			
FLOW	-0.252*	-0.215*	-0.221*	-0.206	-0.232*	-0.232*
	(-1.74)	(-1.71)	(-1.77)	(-1.61)	(-1.86)	(-1.86)
log(TNA)	-0.035*	-0.036*	-0.036*	-0.005	-0.006*	-0.006*
	(-1.68)	(-1.80)	(-1.82)	(-1.47)	(-1.84)	(-1.83)
log(FTNA)	0.0111*	0.0108**	0.0109**	0.002**	0.002**	0.002**
	(1.78)	(1.97)	(2.03)	(2.15)	(2.03)	(2.02)
log(AGE)	0.027	0.021	0.021	0.001	0.001	0.001
	(1.00)	(0.80)	(0.79)	(0.93)	(0.89)	(0.80)
EXP	-85.491	-82.158	-82.234	-0.799	-0.778	-0.778
	(-1.40)	(-1.39)	(-1.39)	(-1.39)	(-1.39)	(-1.39)
TURN	-0.014	0.006	0.002	0.002	-0.000	-0.000
	(-0.59)	(0.79)	(0.34)	(0.33)	(-0.76)	(-1.09)
MEAN36		-24.818**	-25.973**		-0.010**	-0.011**
		(-2.37)	(-2.44)		(-2.33)	(-2.42)
VOL36		7.514**	7.849**		0.016**	0.017**
		(2.43)	(2.52)		(2.43)	(2.53)
SKEW36		-0.088**	-0.089**		-0.006**	-0.006**
		(-2.23)	(-2.23)		(-2.18)	(-2.27)
MAX			0.293			0.002
			(0.78)			(0.79)
MIN			0.297			0.001
			(1.40)			(1.37)
CONS	0.064**	0.141***	0.148***	0.009	0.009	0.010
	(1.98)	(3.15)	(3.27)	(1.05)	(1.17)	(1.20)
N	733028	733028	733028	733028	733028	733028
R^2	0.296	0.315	0.316	0.296	0.315	0.316

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A11: Robustness: Fund Flow and TK - 36 months window. This table reports the relationship between future fund flows and TK as outlined in (12). Thereby variables are defined as in Section 3: $FLOW$ (as calculated in equation (10)), $TK36$ (as calculated in equation (9) over a 36 months window), $\log(TNA)$ (the logarithm of the total net assets of a fund), $\log(FTNA)$ (the logarithm of total net assets of the funds that belong to the same family), $\log(AGE)$ (the logarithm of the number of months since a fund's date of inception), EXP (the total operating expenses expressed as a percentage of a fund's average net assets), $TURN$ (the monthly turnover ration of a fund), and $MEAN$, VOL, $SKEW$, (the mean, standard deviation, and skewness of monthly style-adjusted returns over the previous three years), MAX and MIN denote the highest and lowest return over the last twelve months. The sample ranges from 1985 to 2019.

	Unstandardized Variables			Standardized Variables		
	(1) FLOW	(2) FLOW	(3) FLOW	(4) FLOW	(5) FLOW	(6) FLOW
TK	16.660**	33.830*	33.870*	0.082**	0.167*	0.173*
	(2.01)	(1.91)	(1.93)	(2.01)	(1.91)	(1.93)
FLOW	-0.014***	-0.015***	-0.016***	-0.183***	-0.196***	-0.198***
	(-3.85)	(-3.69)	(-3.69)	(-3.62)	(-3.33)	(-3.33)
log(TNA)	-0.586*	-0.644*	-0.654*	-1.204*	-1.323*	-1.343*
	(-1.89)	(-1.88)	(-1.86)	(-1.89)	(-1.84)	(-1.88)
log(FTNA)	0.134	0.144	0.154	0.295	0.316	0.346
	(1.24)	(1.23)	(1.13)	(1.24)	(1.33)	(1.23)
log(AGE)	0.160	0.152	0.162	0.083	0.079	0.085
	(1.36)	(1.15)	(1.55)	(1.35)	(1.45)	(1.15)
EXP	0.008	-0.005	-0.005	0.001	-0.001	-0.001
	(0.61)	(-0.36)	(-0.36)	(0.61)	(-0.36)	(-0.36)
TURN	-0.013	-0.010	-0.010	-0.007	-0.006	-0.006
	(-1.33)	(-1.19)	(-1.19)	(-1.33)	(-1.19)	(-1.19)
MEAN		-0.277	-0.276		-0.022	-0.023
		(-1.54)	(-1.57)		(-1.55)	(-1.62)
VOL		-1.160	-1.159		-0.030	-0.030
		(-0.95)	(-0.95)		(-0.95)	(-0.95)
SKEW		-0.238	-0.234		-0.240	-0.247
		(-1.21)	(-1.24)		(-1.21)	(-1.25)
MAX			-0.023			-0.002
			(-1.01)			(-1.01)
MIN			0.012			-0.003
			(1.23)			(1.23)
Cons	0.865	1.108	1.108	0.0497*	0.0587**	0.0587**
	(1.52)	(1.53)	(1.53)	(1.89)	(2.04)	(2.04)
Mutual Fund FE	YES	YES	YES	YES	YES	YES
TIME FE	YES	YES	YES	YES	YES	YES
N	733015	697888	697888	733015	697888	697888
R^2	0.313	0.324	0.323	0.313	0.315	0.326

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A12: Robustness: Fund Flow and TK - Clustered Standard Errors. This table reports the relationship between future fund flows and TK as outlined in (12). Thereby variables are defined as in Section 3: $FLOW$ (as calculated in equation (10)), TK (as calculated in equation (9)), log(TNA) (the logarithm of the total net assets of a fund), log($FTNA$) (the logarithm of total net assets of the funds that belong to the same family), log(AGE) (the logarithm of the number of months since a fund's date of inception), EXP (the total operating expenses expressed as a percentage of a fund's average net assets), $TURN$ (the monthly turnover ration of a fund), and $MEAN$, VOL, $SKEW$, (the mean, standard deviation, and skewness of monthly style-adjusted returns over the previous five years), MAX and MIN denote the highest and lowest return over the last twelve months. The sample ranges from 1985 to 2019.

	Unstandardized Variables				Standardized Variables			
	(1) FLOW	(2) FLOW	(3) FLOW	(4) FLOW	(5) FLOW	(6) FLOW	(7) FLOW	(8) FLOW
TK	13.401***	4.293***	4.827***		0.016***	0.005***	0.006***	
	(2.67)	(2.82)	(2.80)		(2.66)	(2.75)	(2.83)	
FLOW	-0.206	-0.187	-0.227*	-0.226*	-0.227*	-0.234*	-0.234*	-0.233*
	(-1.64)	(-1.44)	(-1.78)	(-1.77)	(-1.82)	(-1.84)	(-1.84)	(-1.83)
log(TNA)	-0.034*	-0.034*	-0.036*	-0.037*	-0.006*	-0.006*	-0.006*	-0.006*
	(-1.65)	(-1.68)	(-1.81)	(-1.83)	(-1.86)	(-1.76)	(-1.75)	(-1.74)
log(FTNA)	0.008	0.010**	0.011**	0.011**	0.002**	0.002**	0.002**	0.002**
	(1.52)	(1.97)	(2.17)	(2.26)	(1.98)	(2.03)	(2.01)	(1.97)
log(AGE)	0.018	0.025	0.028	0.029	0.001	0.001	0.001	0.001
	(0.71)	(1.00)	(1.14)	(1.16)	(0.73)	(1.06)	(1.04)	(1.06)
EXP	-80.781	-81.942	-81.713	-81.150	-0.765	-0.776	-0.773	-0.768
	(-1.39)	(-1.40)	(-1.40)	(-1.38)	(-1.39)	(-1.40)	(-1.40)	(-1.38)
TURN	0.002	0.004	0.002	0.002	-0.000	-0.000	-0.000	-0.000
	(0.27)	(0.67)	(0.46)	(0.41)	(-1.45)	(-1.21)	(-1.28)	(-1.32)
MEAN	-22.441**	-2.888	-4.325	6.488**	-0.007**	-0.001	-0.001	0.002**
	(-2.12)	(-1.09)	(-1.40)	(2.40)	(-2.07)	(-0.90)	(-1.40)	(2.52)
VOL	8.989***				0.018***			
	(2.72)				(2.72)			
SKEW	-0.079**				-0.006**			
	(-2.05)				(2.10)			
IVOL		1.320	1.535	-1.988**		0.003	0.003	-0.004**
		(1.20)	(1.22)	(-2.12)		(1.20)	(1.22)	(-2.10)
SSKEW			-0.007**	-0.006**			-0.001**	-0.001*
			(-2.45)	(-2.33)			(-2.38)	(-1.78)
ISKEW		-0.290	-0.293	-0.287		-0.001	-0.001	-0.001
		(-0.89)	(-0.90)	(-0.92)		(-0.86)	(-0.89)	(-0.91)
MAX	0.309	0.320	0.338	0.315	0.002	0.002	0.002	0.002
	(0.83)	(0.86)	(0.91)	(0.85)	(0.84)	(0.91)	(0.90)	(0.91)
MIN	0.270	0.400*	0.385*	0.392*	0.000	0.001*	0.001*	0.001
	(1.34)	(1.72)	(1.66)	(1.69)	(1.15)	(1.68)	(1.83)	(1.64)
CONS	0.160***	0.103***	0.0996***	0.0804***	0.00969	0.00896	0.00888	0.00870
	(3.24)	(3.67)	(3.32)	(3.08)	(1.23)	(1.12)	(1.11)	(1.09)
N	733028	733028	733028	733028	733028	733028	733028	733028
R^2	0.296	0.310	0.304	0.313	0.296	0.310	0.304	0.313

t statistics in parentheses

* $p < 0.1$, ** $p < 0.05$, *** $p < 0.01$

Table A13: Robustness: Fund Flow and TK - Idiosyncratic Volatility, Idiosyncratic Skewness. This table reports the relationship between future fund flows and Residual TK as outlined in (12). Thereby variables are defined as in Section 3 and 5.4: $FLOW$ (as calculated in equation (10)), TK (as calculated in equation (9)), log(TNA) (the logarithm of the total net assets of a fund), log($FTNA$) (the logarithm of total net assets of the funds that belong to the same family), log(AGE) (the logarithm of the number of months since a fund's date of inception), EXP (the total operating expenses expressed as a percentage of a fund's average net assets), $TURN$ (the monthly turnover ration of a fund), and $MEAN$, VOL, $SKEW$, $IVOL$, $SSKEW$ and $ISKEW$ (the mean, standard deviation, skewness, idiosyncratic volatility, systematic skewness and idiosyncratic skewness of monthly style-adjusted returns over the previous five years), MAX and MIN denote the highest and lowest return over the last twelve months. The sample ranges from 1985 to 2019.