CFR Working Paper NO. 11-09

Determinants and Implications of Fee Changes in the Hedge Fund Industry

V. Agarwal • S. Ray

centre for financial research
Look deeper

Determinants and Implications of Fee Changes in the Hedge Fund Industry

Vikas Agarwal[*]
Georgia State University

Sugata Ray[+]
University of Florida

Abstract

We examine the determinants and consequences of changes in hedge fund fee structures. We show that fee changes are asymmetric with much greater incidence of fee increases compared to fee decreases. We find that managers of younger and smaller funds are more likely to increase fees after good performance. Investors view the fee increases following good performance as a signal of managerial ability only to be disappointed by their worse future performance. Taken together, these findings are consistent with opportunistic behavior of emerging fund managers in expropriating surplus from their investors.

First draft: Feb 15, 2011
This draft: Mar 12, 2011

[*]Vikas Agarwal is from Georgia State University, J. Mack Robinson College of Business, 35, Broad Street, Suite 1221, Atlanta GA 30303, USA. Email: vagarwal@gsu.edu.Tel: +1-404-413-7326. Fax: +1-404-413-7312. Vikas Agarwal is also a Research Fellow at the Centre for Financial Research (CFR), University of Cologne.
[+] Sugata Ray is from University of Florida, Warrington College of Business, Box 117168, WCBA, UFL, Gainesville FL 32611, USA. Email: sugata.ray@ufl.edu. Tel: +1-352-392-8022.
We are grateful to seminar participants at the University of Florida for their comments. We are responsible for all errors.

Introduction

A significant body of literature has examined the implications of the incentive-based compensation structure of hedge funds for their future performance and risk-taking behavior (see for example, Ackermann, McEnally, and Ravenscraft (1999), Brown, Goetzmann, and Ibbotson (1999), Liang (1999), Edwards and Caglayan (2001), Hodder and Jackwerth (2007), Chakraborty and Ray (2008)). However, all studies on hedge funds with the sole exception of Schwarz (2007) treats hedge fund compensation as fixed once an investment is made. In this paper, we obtain unique historical data on changes in the hedge fund fee structure including changes in the management fee, incentive fee, and high-water mark provision, between April 2008 and November 2010 to examine the following research questions:

- What are the determinants of fee changes? Are there specific determinants for changes in the various components of the hedge fund fee structure, namely management fees, incentive fees, and the high-water mark provision? How do these changes relate to each other and to a fund's past performance, flows, and other characteristics?
- What are the effects of the changes in hedge fund fee structure on (a) future performance, (b) risk-taking behavior, and (c) capital flows from investors?

The first part of our paper relates to the determinants of changes in the fee structure of hedge funds. We identify four different motivations for the fee changes:

First, fee changes can be used as a mechanism to adjust the incentives of hedge fund managers. In case of mutual funds, Christoffersen (2001) shows that funds tend to increase (decrease) their fees after good (poor) performance in order to make their net-of-

fee returns look better and to better align manager payouts and fund performance. If such incentive-adjustment mechanism is prevalent in hedge funds, fee changes should be positively related to past performance.

A second motivation for fee changes is the response of the fund managers to inflows or outflows from funds' investors. Christoffersen and Musto (2002) show that following poor performance and some investors withdrawing money, mutual funds increase their fees for the remaining price-insensitive investors. In contrast, Bris et al. (2009) show that well-performing funds that close for new investment to constrain more inflows, tend to increase their fees at the time of closing the fund.

In case of hedge funds, there are restrictions to withdraw capital in the form of lockups and extended redemption periods. Hence, a priori, there is less incentive to use fee changes as a way to restrict outflows. Depending on which, if any, of these two effects are present in hedge funds, we would expect fee changes to be negatively or positively related to past fund flows.

A third motivation for fee changes can be in the form of managers expropriating the surplus from the investors by increasing the fees after good performance but not decreasing fees after poor performance.

Finally, a fourth and last motivation for fee change can be related to managers learning about their abilities over time where younger and smaller funds start with lower fees and then increase them following good performance.

Our major findings related to the determinants of fee changes are as follows. First, we find that fee decreases are less likely to occur in hedge funds compared to fee increases. In other words, fee changes in hedge funds tend to be asymmetric. Second, we

observe that younger and smaller funds typically starting with lower initial management fees and incentive fees tend to increase their fees after superior performance, consistent with managerial learning.[1] Finally, we find fee increases to be associated with superior past performance and little evidence of fee decreases after poor performance. Taken together, these findings suggest that the fee-change phenomenon is mainly driven by younger and smaller funds that tend to increase their fees following superior performance but do not decrease their fees after worse performance.

The second part of our paper examines how future fund performance, risk-taking behavior, and flows relate to the fee changes and to the different types of fee changes. Extant hedge fund literature (Chakraborty and Ray (2008), Agarwal, Daniel, and Naik (2009), Panageas and Westerfield (2009), and Ray (2010)) shows that hedge fund compensation contract provides incentives for both exerting effort to improve future performance as well as incentives to engage in risk-shifting behavior. Therefore, any changes in the fee structure should have implications both for the future performance and risk-taking behavior. The investors should also take these effects into account while making their investment decisions and therefore fee changes should also be associated with changes in fund flows.

There are different hypotheses linking changes in performance, risk, and flows into funds with the fee changes. For future performance, on one hand, increasing the fees should lower the net-of-fee returns while on the other hand; it should incentivize the

[1] We measure performance both in terms of raw returns as well as risk-adjusted returns (in excess of the average returns of all funds following the same investment style). It is interesting to compare and contrast these findings with those in Warner and Wu (2010) study of changes in mutual fund advisory contracts. Unlike them, we find fee decreases to be much less prevalent and not associated with economies of scale. However, similar to their findings, we do observe fee increases in hedge funds to be driven by superior past performance.

manager to exert effort which should be associated with higher net-of-fee returns. Hence, the direction of the impact of changes in the fee structure on fund performance would depend on which of these two effects dominates.

For future risk, we posit that an increase in incentive fees should lead to an increase in the risk taken by the fund due to the option feature of the contract. In contrast, an increase in management fee should be associated with a decrease in the risk borne by the fund as management fees can be viewed as perpetuity if the fund continues to be in business. Finally, for the relation between fee changes and changes in fund flows, we have two competing hypotheses. If fee changes are being used to control fund flows to mitigate problems of decreasing returns to scale and capacity constraints in the hedge fund industry, fee changes should be negatively related to changes in fund flows. In contrast, if fee changes are being used to signal managerial ability, it would predict a positive relation between fee changes and changes in fund flows.

We have three major findings related to the effects of fee changes. First, we observe that fee changes are negatively related to changes in future fund performance. We had earlier found that fee increases are more likely than fee decreases, and that fee increases are more likely to be associated with younger and smaller funds following good performance. Taken together, these two results indicate that emerging hedge fund managers may be opportunistically increasing their fees after superior performance only to deliver worse performance in the future.

Second, we find that changes in fee are associated with reduction in risk in the future. Our data on the changes in the different components of fee structure shows that this finding is driven by an increase in the management fee, which should be related to

dampening of risk-taking behavior as the cash flows from management fee are akin to perpetuity if the fund continues to survive.

Finally, we show that flows into funds increase in the year following the fee changes. This finding is consistent with fee changes being more consistent with signaling by fund managers about their abilities rather than fee changes being used to control flows into the funds. Since the future performance of funds that increase fees does not improve, this result at first sight may convey that investors may not be rational. However, there is a caveat here. Given that most fee changes occur during 2009 and 2010, the last two years of our sample period, it is possible that investors may withdraw their capital in a longer period, after meeting the redemption period and notice period requirements. This would be interesting to examine with the availability of longer time-series data in the future.

Our findings have practical implications for both academics and practitioners alike. They suggest that fund managers opportunistically increase fund fees following good performance but do not decrease their fees subsequent to poor performance. This raises the question why investors do not participate in downward negotiation of fees. One possibility is that decrease in fees may not help the managers raise more capital if investors view it is a bad signal about future performance.

Our paper extends the work of Schwarz (2007) in four important ways. First, as opposed to his largely cross-sectional study, we focus on time-series analysis of fee changes, and its consequences for future performance, risk-taking behavior, and investor reaction in terms of capital flows. Second, instead of inferring the changes in fees from annual snapshots of Lipper TASS database, our data allows us to precisely identify not only the date of changes in management and incentive fees but also addition and removal

of high-water mark provision, which has been shown to be important for performance and risk-taking behavior of hedge funds (e.g., Goetzmann, Ingersoll, and Ross (2003), Agarwal, Daniel, and Naik (2009), Panageas and Westerfield (2009), and Ray (2010)). Third, our data allows us to look at the prevalence, causes, and effects of multiple changes in fees occurring simultaneously (i.e. changes to one or more of the components of the fee structure: incentive fee, management fee and HWM feature). Finally, more refined data enables us to capture situations where a fund changes fees during the earlier part of its appearance in hedge fund database.

Among empirical work pertaining to mutual fund fees, the closest study to ours is Warner and Wu (2010), who study changes in mutual fund advisory compensation. They find fee increases to be associated with good past performance and fee decreases to be associated with economies of scale. Our study differs in that we examine fee changes in hedge funds, which in contrast to mutual funds, have different components in their fee structure that can change simultaneously and can have different implications for performance and risk-taking behavior. Finally, we examine the impact of fee changes on operational characteristics of funds after the fee change.

The remainder of the paper is organized as follows. Section II discusses the related literature to develop testable hypotheses. Section III describes the data. Section IV presents our findings on the factors driving the changes in the fee structure of hedge funds. Section V provides evidence on how fee changes influence the changes in the fund's future performance and risk-taking behavior, and how investors respond to the fee changes in terms of altering the flows into the funds. Section VI offers concluding remarks.

II. Literature Review and Hypotheses Development

We now discuss prior theoretical and empirical literature that helps us develop competing hypotheses related to determinants of fee changes.

II.A Hypotheses for determinants of fee changes

II.A.1 Are fee changes largely to adjust incentives?

Christoffersen (2001) studies the phenomenon of mutual fund managers voluntarily waiving their fees. She argues that the selective waiving of the fees creates a performance-based payout for the manager. Specifically, fund managers waive fees following poor performance to increase net-of-fee returns, and take fees when returns are good. This finding for mutual funds, if applicable in case of hedge funds, motivates our first hypothesis that hedge funds should decrease (increase) their fees after poor (good) performance. We test this hypothesis by relating the fee changes to past fund performance.

II.A.2 Are changes in fees used to control investor flows to maximize investor returns?

Christoffersen and Musto (2002) show empirically that mutual fund pricing depends on demand sensitivity. They find that following poor returns and outflows, funds with retail investors actually increase fees for the remainder of their investors assuming that these remaining investors are price insensitive.[2] They document that for funds with institutional investors, this effect is not there indicating that institutional investors are largely price sensitive. Overall, their results suggest a negative relation between fee increases and past fund flows.

[2] Gil-Bazo et al. (2009) also suggests a level of price insensitivity among mutual fund investors.

In contrast, Bris et al. (2009) document a positive relation between fee increases and past fund flows. In their study of open-ended mutual funds that close for new investments between 1993 and 2004, they show that funds close after good performance and large inflows, while simultaneously raising their fees. Unlike mutual funds, hedge funds have mechanisms other than closing the fund for new investments to control flows. These include features such as lockup period and redemption period that restrict the flows out of the funds. Hence, compared to mutual funds, hedge funds are perhaps less likely to use fee increases to reduce inflows to mitigate the problem of decreasing returns to scale and/or capacity constraints that can hurt future performance of hedge funds (Naik, Ramadorai, and Stromqvist (2007), Fung, Hsieh, Naik, and Ramadorai (2008)).

Both the possibilities discussed in Christoffersen and Musto (2002) and Bris et al. (2009) can coexist in hedge funds and the eventual relation between fee changes and past fund flows will depend on which of these two effects dominates.

II.A.3 Are changes in fees used to expropriate surplus from the investment relationship?

An alternative to our second hypothesis would be that hedge funds increase their fees following good performance but do not decrease their fees following poor performance to expropriate surplus from their investors. This hypothesis would predict a positive relation between good past performance and fee changes.

II.A.4 Do fee changes correspond to a "feeling out period" before funds settle on a final fee structure for learning purposes or other reasons?

Given the highly competitive nature of the hedge fund business and the uncertainty associated with whether a fund that starts will be able to survive and do well, it is conceivable that hedge funds may start with low management fees and/or incentive

fees. As the managers learn more about their abilities over time, they change their fees in line with their performance. This hypothesis would be supported by prevalence of fee changes earlier in a fund's life when the fund is small.

II.B Hypotheses related to how fee changes affect future performance, risk, and flows into hedge funds

Having discussed the different hypotheses related to determinants of fee changes, we next develop hypotheses on how the fee changes relate to fund's future performance, to future risk, and to fund flows in the future. In the case of mutual funds, Golec and Starks (2004) find support for changes in fee structure driving risk-taking incentives when mutual funds were exogenously forced to remove asymmetric performance-based fees due to regulatory reasons. Prior literature related to hedge funds (Chakraborty and Ray (2008), Agarwal, Daniel, and Naik (2009), Panageas and Westerfield (2009), and Ray (2010)) suggests that hedge fund compensation contract affects fund manager incentives to exert effort and take risk, which in turn naturally affect the investor's decision to invest. Therefore, any changes in the fee structure should have implications both for the future performance, risk-taking behavior, and net inflows.

II.B.1 Fee changes and future performance

For future performance, on one hand, increasing the fees should lower the net-of-fee returns while on the other hand; it should increase incentives for the manager to exert effort, which should be associated with higher net-of-fee returns. Hence, the direction of the impact of changes in the fee structure would depend on which of these two effects dominates.

II.B.2 Fee changes and future risk

For future risk, we posit that an increase in incentive fees should lead to an increase in the risk taken by the fund due to the option feature of the contract. In contrast, an increase in management fee should be associated with a decrease in the risk borne by the fund as management fees can be viewed as perpetuity if the fund continues to be in business.

II.B.2 Fee changes and future fund flows

As we discuss earlier, one of the motivations for fee changes can be to control the fund flows to mitigate problems of decreasing returns to scale and capacity constraints in the hedge fund industry. If this argument is supported in the data, we posit that fee changes should be negatively related to changes in fund flows. In contrast, fee increases after good performance can be viewed by the investors as a signal of managerial ability, which should be associated with increase in fund flows as investors rationally respond to good performance. Hence, fee changes as a signaling mechanism would predict a positive relation between fee changes and changes in fund flows.

In the table below, we summarize each of the factors above and our hypotheses on how they will influence the determinants of fee changes and the consequences of fee changes for future performance, risk, and flows from investors. Determinants are denoted with a "D" and a specific operational characteristic. For example, if fee changes adjusted incentives, we would expect past performance increases (decreases) to be associated with an overall increase (decrease) in fees, and specific increases (decreases) in incentive fees and management fees. Effects are denoted with an "E" and the characteristic. Positive (negative) sign in the fee or high-water mark (HWM) section would indicate how we would expect the characteristic to change given an increase or decrease in the fee (or in

some cases, any change in the fees) or the addition or removal of the HWM. For example, if fee changes adjusted incentives, we would expect an increase (a decrease) in incentives fees to an increase (a decrease) in risk, an increase (a decrease) in management fees to a decrease (an increase) in risk and an addition (removal) of the HWM feature to a decrease (an increase) in risk. Blanks cells do not have an explicit empirical prediction associated with them.

Summary of hypothesized determinants and effects of fee changes

Factors and hypotheses	**Fees**	**IF**	**MF**	**HWM**
Hypothesis 1: Fee changes to adjust incentives				
D: Past performance	+	+	+	
E: Risk shifting		+	–	–
Hypothesis 2: Fees changes to control investor flows to maximize investor returns				
D: Past inflows high	+	+	+	
E: Inflows	–	–	–	
E: Performance		+		
Hypothesis 2A: Fees changes to expropriate surplus				
D: Good past performance	+	+	+	
E: Performance	–	–	–	
E: Inflows	–	–	–	
Hypothesis 3: Fee changes correspond to a "feeling out period"				
D: Fund Age		–	–	
D: Fund Size at Inception		–	–	

III. Data

This study uses data from the Lipper TASS database that includes monthly net-of-fee returns and assets under management of hedge funds, along with their characteristics such as inception date, lockup period, notice and redemption periods, management fee, incentive fee, and high-water mark provision at a point in time. Although Lipper TASS data has been widely used in a large number of hedge fund studies (e.g., Fung and Hsieh (2000, 2004), Getmansky, Lo, and Makarov (2004), Hasanhodzic and Lo (2007), Avramov, Kosowski, Naik, and Teo (2011)), we are the first to use the fee-change data, which is proprietary and tracks fee changes by funds reporting to TASS at a daily level. Fee-change data includes changes in incentive fees and management fees, and addition and removal of the high-water mark feature. Data on the fee changes is only available since 04/17/2008 when Lipper took over the TASS database. As a result, the sample period of our study starts in April 2008 and ends in November 2010, the last month for which fee-change data is available.

We aggregate fee changes at a monthly level and merge the fee changes with the monthly return and assets under management data. For our analysis, we restrict the sample to hedge funds denominated in US dollars. We exclude the return history of the funds before their entry into the Lipper TASS database to control for backfilling bias.

We start by reporting the summary statistics on the fee changes in Table I. Panel A shows that out of the 3,770 funds in our sample, 292 funds had one change in the fee structure (either in incentive of management fees or the high-water mark feature), 11 funds had 2 changes, and 1 fund had 3 fee changes, all adding up to a total of 315 changes during our sample period between April 2008 and November 2010. Panels B and

C tabulate the number of different types of changes in the fee structure including increase or decrease in management and/or incentive fees, and addition or removal of the high-water mark provision. From Panel B, we observe that fee increases (either in incentive fee or management fee or both) are more prevalent than fee decreases (203 versus 25 cases out of the total 315 changes in the fee structure). Additionally, we also notice that most fee changes involve changes in more than one component of the fee structure (management fee, incentive fee and high-water mark feature) at the same time. We examine the simultaneous changes in these different components in our empirical analysis to follow.

Panel C provides the frequency of increases and decreases in management fee and incentive fee, and addition or removal of high-water mark feature. Panel D shows the number of fee changes month by month during our sample period. Panels E and F show the exact magnitudes of fee changes for incentive and management fees, respectively. A number of the fee changes involve raising either the incentive or management fee from zero to a positive number. For example, out of the 191 (129) cases of changes in incentive (management) fees, we find 177 (75) correspond to an increase in incentive (management) fees from zero to a positive number. To confirm that these are real fee changes and not some artifact of new funds entering their fees into Lipper TASS database with a delay, we replicate these tables after grouping funds by their age at the time of fee change. A similar pattern can be seen for all fee changes across different age groups, indicating that fee changes are not due to the delay in reporting by hedge funds (results not reported in the table). We interpret the preponderance of fee increases as evidence

consistent with our hypothesis that there is a "feeling out" period where fund managers learn about their abilities before settling on a final fee structure.

Next, we compare the characteristics of the funds that exhibit fee changes with the funds with no changes in the fee structure. Table II provides the summary statistics on fund fees (incentive fee and management fee) and high-water mark for the original contract of the fund manager at the beginning of the sample period. Table II also reports the summary statistics of the operational characteristics of funds including their raw returns, logarithm of the assets under management (AUM) (in $ millions), percentage net inflows, and months in operation (or age) for the fund-month observations for which the data is available. Results in Table II show that funds with fee changes tend to have lower initial fees, lower incidence of use of high-water mark feature, better returns, lower AUM, and higher net inflows than their counterparts that do not have fee changes. These differences are both economically and statistically significant and provide preliminary support for some of our hypotheses. In particular, these univariate results are consistent with our hypotheses that fee changes are related to adjustment in incentives, controlling the fund flows, expropriation of surplus, and feeling out period following fund's launch.

In the following section, we examine the determinants of fee changes using multivariate regression analysis to test our hypotheses after controlling for other variables.

IV. Determinants of fee changes

Univariate results in the previous section indicate that funds that show changes in the fee structure are inherently different from those that do not exhibit such changes. In this section, we conduct a multivariate analysis by estimating the following cross-sectional logistic regression at the fund level after controlling for different fund

characteristics such as management and incentive fees at fund's inception, inception year, redemption notice period, lockup period, payout period, and assets under management at fund's inception.

$$\begin{aligned}\text{Fee Change}_i = {} & \lambda_0 + \lambda_1 \text{Initial Incentive Fee}_i + \lambda_2 \text{Initial Management Fee}_i \\ & + \lambda_3 \text{Inception Year}_i + \lambda_4 \text{Size}_i + \lambda_5 \text{Redemption Notice Period}_i \\ & + \lambda_6 \text{Lockup Period}_i + \lambda_7 \text{Payout Period}_i + \xi_i\end{aligned} \quad \textbf{(1)}$$

where Fee Change_i is an indicator variable that takes a value of 1 if the fund *i* changes any component of its fee structure (incentive fee, management fee, or high-water mark feature) at any time during our sample period and 0 otherwise, Initial Incentive Fee_i and Initial Management Fee_i are the incentive fee and management fee of fund *i* at inception, Inception Year_i is the year in which fund *i* was started, Redemption Notice Period_i, Lockup Period_i and Payout Period_i are the redemption notice period, lockup period, and payout period for fund *i*,[3] Size_i is the size of the fund measured as the natural logarithm of the assets under management (AUM) for fund *i*, and ξ_i is the error term.

We report the results in Panel A of Table III. We find negative and highly significant slope coefficients on both initial incentive fee and initial management fee (coeff. = –0.153 and –0.768; t-stats = –11.162 and –4.937 respectively).[4] In addition, we observe the slope coefficient on inception year is positive and significant (coeff. = 0.102; t-stat=6.463) while the coefficient on fund size is negative and significant at a 10% level (coeff. = –0.069; t-stat = –1.955). Taken together, these findings are consistent with our

[3] Redemption notice period refers to the notice investors need to provide to the managers for withdrawing their money, payout period is the time period before an investor will receive cash back, and lockup period refers to the period for which the investments are locked before first withdrawal. These definitions are provided in the Lipper TASS questionnaire: http://tass.lipperweb.com/LipperTASSQuestionnaire.xls.

[4] Throughout the paper, unless noted otherwise, we cluster the standard errors both at the fund and time levels to estimate the t-statistics (see Petersen (2009)).

hypothesis that fee changes are related to a feeling out period where smaller funds that initially start with lower incentive fee and management fee tend to increase their fees as their managers learn about their abilities. We also notice that restrictions on capital withdrawal (redemption notice period and lockup period) are positively related to fee changes. This is consistent with these restrictions being positively correlated with fee changes, another mechanism for controlling fund flows.

Our cross-sectional analysis so far focuses on fund characteristics at the time of inception that are associated with fee changes. This does not allow us to test alternative hypotheses for which we need to introduce the time-varying operational characteristics of funds such as past performance, fund flows, and total or idiosyncratic risks. For this purpose, we estimate the following panel regression where include time-varying independent variables such as past inflows, returns, and risk-taking behavior of funds:

$$\begin{aligned}\text{Fee Change}_{i,m} = {} & \beta_0 + \beta_1 \text{Size}_{i,m} + \beta_2 \text{Time}_m + \beta_3 \text{Annual Inflows}_{i,m-1} \\ & + \beta_4 \text{Aggregate HF Inflows}_m + \beta_5 \text{Annual Returns}_{i,m-1} \\ & + \beta_6 \text{Total Risk}_{i,m-1} + \varepsilon_{i,m}\end{aligned} \qquad \textbf{(2)}$$

where $\text{Fee Change}_{i,m}$ is an indicator variable that takes a value of 1 if the fund *i* changes any component of its fee structure (incentive fee, management fee, or high-water mark feature) during month *m* and 0 otherwise, $\text{Size}_{i,m}$ is the size of the fund measured as the natural logarithm of the assets under management (AUM) for fund *i* during month *m*, Time_m is a trend variable that takes a value of 1 for the first month in our sample period and increases by 1 thereafter for every subsequent month, $\text{Annual Inflows}_{i,m-1}$ are the net inflows for fund *i* over the last 12 months ending in month *m* expressed as a percentage of AUM at the beginning of the 12-month period, $\text{Aggregate HF Inflows}_m$ are the

aggregate monthly net inflows over month *m* expressed as a percentage of total AUM for all hedge funds in the sample, $\text{Annual Returns}_{i,m-1}$ and $\text{Total Risk}_{i,m-1}$ are the net returns and standard deviation of monthly returns over the last 12 months for fund *i* as of previous month *m-1*, and $\varepsilon_{i,m}$ is the error term.

We report the results in Table III, Panel B column 1, labeled "Fund Period (1)", of Table III. Trailing annual fund returns are positively related to fee changes (coeff. = 0.929; t-stat = 3.113), which is consistent with both our hypotheses of fee changes being motivated by adjustment of incentives and expropriation of surplus by the fund manager. Slope coefficient on time is positive and significant (coeff. = 0.067; t-stat = 3.084) suggesting that there is an upward trend in the fee changes during our sample period. We do not find support for the hypothesis that fee changes are used to control flows as the relation between fee changes and trailing inflows is not significant.

We repeat our analysis with risk-adjusted performance and report the results in column 2, labeled "Fund Period (2)", of Table III. For this purpose, we replace raw performance with risk-adjusted fund performance, and replace total risk with the idiosyncratic risk in the regression in equation (2). For computing risk-adjustment performance and idiosyncratic risk, we regress the fund's monthly raw returns over a 12-month period on the monthly returns of all funds following the same investment style as that of the fund. Risk-adjusted performance and the idiosyncratic risk are the intercept and standard deviation of the residuals from this regression. Corroborating our prior finding using raw returns, we continue to observe a positive relation between fee changes and past performance when we use risk-adjusted performance (coeff. = 1.958; t-stat = 4.515). Additionally, the coefficient on trailing idiosyncratic risk is now significant at the

10% level (coeff. = –0.096; t-stat = –1.805), while results for other independent variables remain qualitatively similar.

IV.A Determinants of specific fee changes

Until now, we did not differentiate between the different types of fee changes in our analysis. As we mentioned before, the three components of the fee structure — management fees, incentive fees, and high-water mark provision, tend to be altered simultaneously. Furthermore, we did not examine fee increases and fee decreases separately to see if there is any asymmetric relation between the fee changes and fund's operational characteristics such as past performance, inflows, risk, and size. We examine these issues by estimating the following panel regressions:

$$\begin{aligned}\text{Fee Increase}_{i,m} = {} & \gamma_0 + \gamma_1 \text{Annual Inflows}_{i,m-1} + \gamma_2 \text{Annual Excess Returns}_{i,m-1} \\ & + \gamma_3 \text{Aggregate HF Inflows}_m + \gamma_4 \text{Idiosyncratic Risk}_{i,m-1} \\ & + \gamma_5 \text{Size}_{i,m} + \gamma_6 \text{Time}_m + \upsilon_{i,m}\end{aligned} \quad \textbf{(3)}$$

$$\begin{aligned}\text{Fee Decrease}_{i,m} = {} & \omega_0 + \omega_1 \text{Annual Inflows}_{i,m-1} + \omega_2 \text{Annual Excess Returns}_{i,m-1} \\ & + \omega_3 \text{Aggregate HF Inflows}_m + \omega_4 \text{Idiosyncratic Risk}_{i,m-1} \\ & + \omega_5 \text{Size}_{i,m} + \omega_6 \text{Time}_m + \eta_{i,m}\end{aligned} \quad \textbf{(4)}$$

where $\text{Fee Increase}_{i,m}$, $\text{Fee Decrease}_{i,m}$, and $\text{Add HWM}_{i,m}$ are indicator variables that takes a value of 1 if the fund *i* increases, decreases, and adds a high-water mark feature respectively in its fee structure during month *m* and 0 otherwise, and $\upsilon_{i,m}, \eta_{i,m}$, and $\vartheta_{i,m}$ are the error terms. The specific combinations of fee changes constituting fee increases and decreases can be found in Table I, Panel B. Other variables are as defined previously in equation (2).

We report our estimates from regressions (3) and (4) in Panel A of Table IV. Results in column (1) show that fee increases are more likely when the excess returns

over other funds following the same investment style are higher (coefficient on trailing excess returns = 2.139; t-stat = 5.243) and when the idiosyncratic risk associated with these returns is low (coefficient on trailing idiosyncratic risk= –0.123; t-stat = –2.004). In contrast, results in column (2) do not show any relation between trailing excess returns and risk and fee decreases. However, there is a negative relation between aggregate hedge fund inflows and fee decreases that indicates that funds tend to be less likely to decrease their fees when there is lot of money pouring into the hedge fund industry. It is important to note here that we observe much fewer cases of fee decreases compared to fee increases in our sample (25 versus 203; see Panel B of Table II). Hence, lack of relation between past performance and fee decreases could also be simply due to lack of power due to fewer observations. Fee increases following superior past risk-adjusted performance support our hypotheses of fee changes being used to adjust the incentives of the fund managers and allowing the managers to expropriate the surplus.

We also examine the determinants of the most common types of specific fee changes, as described in Table I, Panel B. These include (a) adding the HWM feature, (b) adding HWM and increasing incentive fees, (c) adding HWM, increasing incentive fees and management fees, (d) increasing only incentive fees, (e) increasing both incentive fees and management fees, and (f) increasing only management fees. The results from the logistic regressions for each of these types of fee increases are presented in columns (1) to (5) of Table IV Panel B.

The most notable finding is that positive relation between trailing excess returns and three out of the five types of fee increases. Comparing these results with those in column (1) of Table IV Panel A, we observe that positive relation between fee increases

and past excess returns is driven by the three cases: adding HWM accompanied by increases in incentive fees or increases in both management and incentive fees, and increasing only management fees. It is interesting to note that investors do not accept increases in management and incentive fees without the addition of HWM to curb the possibility of fund managers increasing their risk-taking behavior following the fee increases.

Another result in this table is the negative relationship between future risk-taking behavior and fee changes. In particular, in cases where funds want to increase incentive fees without increasing management fees, they must have a demonstrated history of lower risk taking to assuage investors' fears regarding increased risk-taking as a result of higher incentive fees. Management fee, by their perpetuity nature, serve as a natural counterweight to the increased risk taking incentives arising from increased incentive fees (see Panageas and Westerfield (2008) and Chakraborty and Ray (2008)), thus such fee changes do not require a similar track record of low risk.

Overall, the findings in this section provide support to three out of the four hypotheses. First, the evidence suggests that funds increase (decrease) their fees following superior (inferior) performance, lending support to both our hypotheses: fee changes are associated with adjustment of incentives and expropriation of surplus by the fund managers. Second, we also observe that fee changes are more likely to be made during the early part of a fund's life. Further, incentive fee increases (decreases) when the initial incentive fee is low (high). This finding resonates well with our hypothesis that there may be a feeling out period when the funds adjust their fees as the managers learn about their abilities.

V. Relation between fee changes, future performance, risk-taking behavior, and fund flows

Having examined the determinants of fee changes, the next natural step is to examine how the fee changes influence future performance and risk-taking behavior of fund managers, and how the investors respond to the fee changes in terms of capital inflows into the funds. We analyze these issues in this section, starting with analyzing the effect of fee changes on fund performance.

V.A Fee changes and future performance

We have two competing hypotheses regarding how fee changes may be related to future performance. If fee changes are motivated by the desire of the fund managers to control fund flows then one would expect to observe fee changes being associated with better future performance. In contrast, if fee changes are a mechanism for fund managers to expropriate surplus then future performance would be worse. To disentangle between these two competing hypotheses, we regress the difference between the annual returns of the fund before and after the fee changes on an indicator variable, fee change dummy, controlling for changes in the total risk and year fixed effects.

Our findings in column 1 of Table V show a statistically significant negative coefficient (coeff. = –0.130; t-stat = –3.364) on the fee change dummy indicating support for the expropriation hypothesis. We also report the results for the specific types of fee increases as we did previously in Table IV. For three out of the six types of fee increases, we continue to observe fee change dummy to be significantly negative, again confirming the support for the expropriation hypothesis.

We repeat the tests using the difference in excess returns (in excess of the average returns of all funds following the same investment style) around the fee change instead of raw returns. In line with this change in the dependent variable, instead of change in the total risk, we include change in idiosyncratic risk as the control variable. We report our findings in Table VI. Again, we observe a negative relation between change in fund's risk-adjusted performance and fee changes, regardless of whether we use any fee change (column 1), or specific types of fee increases (columns 2-7). These findings continue to provide support to our hypothesis that fee changes, mostly in form of fee increases, are associated with worse future performance, suggesting fund managers strategically increasing their fees after good performance only to expropriate the surplus and deliver worse performance in the future.

V.B Fee changes and future fund flows

We have two hypotheses regarding how future fund flows will change with the changes in the funds' fee structure. If fee changes are used to control fund flows then one would expect to observe changes in fund flows to be negatively related to fee changes. In other words, fee increases (decreases) should be associated with lower (higher) fund flows in the future. In contrast, if fee changes are used to expropriate surplus and investors respond rationally to this behavior of the fund managers, then we should expect to see a negative relation between changes in fund flows and any fee change. To disentangle between these two competing hypotheses, we regress the difference between the annual percentage fund flows before and after the fee changes on an indicator variable, fee change dummy, controlling for changes in performance and total risk, and year fixed effects.

Our findings in column 1 of Table VII show a statistically significant positive coefficient (coeff. = 0.320; t-stat = 2.263) on the fee change dummy indicating support for our hypothesis that fee changes are used to control the fund flows. As before, we also report the results for the specific types of fee increases. For two out of the six types of fee increases, we continue to observe fee change dummy to be significantly positive. This does not comport with either of our hypotheses. One possible explanation for these increases in inflows following fee increases could relate to the marketing efforts that may accompany fee changes. It may be possible that funds publicize impending fee increases that may already be reflecting in the Lipper TASS database and give investors "one last chance" to get in under the old fee regime, leading to this consistent increase in inflows.

V.C Fee changes and future risk-taking behavior of funds

For changes in the future risk-taking behavior of hedge funds, we have different predictions depending on the type of fee change. Given the asymmetric option-like feature of incentive fee contract, an increase (decrease) in incentive fees should be associated with an increase (decrease) in the risk-taking behavior (Goetzmann, Ingersoll, and Ross (2003), Hodder and Jackwerth (2007)). In contrast to incentive fee, management fee is like perpetuity if the hedge fund continues to be in business. Therefore, an increase in management fee should attenuate the risk-taking behavior of fund managers as they would not favor increasing the risk to raise the probability of fund's liquidation and lose the steady stream of cash flows from the management fees. Finally, adding high-water mark (HWM) can also reduce the risk-taking incentives for the fund managers as HWM can be considered as a sequence of options with changing strike price. Panageas and Westerfield (2009) show that in presence of HWM, even a

risk-neutral manager will not place an unboundedly large weight on the risky asset despite the option-like feature of the incentive contract. We test for these different hypotheses by regressing the difference between return standard deviation over twelve months before and after the fee changes on an indicator variable, fee change dummy, while controlling for changes in performance and year fixed effects.

Our findings in column 1 of Table VIII show a statistically significant negative coefficient (coeff. = –0.410; t-stat = –2.260) on the fee change dummy. Since we expect a positive relation between changes in incentive fee and changes in risk, and a negative relation between either changes in management fees or adding HWM and change in risk, the net effect being negative suggests that change in management fees and/or adding HWM dominate change in incentive fee as the specific type of fee change. We verify that this indeed is the case by examining six types of fee changes for which we report the results in columns (2) to (7) in Table VIII. The first thing to note is that except one category of increasing the incentive fees alone, remaining five categories of fee changes either include adding HWM and/or increasing the management fees. This suggests that investors perhaps do not usually accept increases in incentive fees unless it is accompanied by changes in the other two components of the fee structure to mitigate the risk-taking behavior. Consistent with our hypothesis, we observe that all the three types of fee changes with increase in management fees show a significant negative relation with the change in the risk, i.e., increase in management fees is associated with decrease in risk (coeff. = –0.863; t-stat = –3.209 in column 4, coeff. = –0.740; t-stat = –1.985 in column 6, and coeff. = –1.423; t-stat = –1.709 in column 7).

Conclusions

In this paper, we provide evidence of hedge fund managers increasing their fees more often than decreasing their fees. We observe that these fee increases tend to be more prevalent in younger and smaller funds, whose managers seem to be opportunistic in their behavior as they tend to increase fees following good performance but then fail to deliver superior performance in the future. Investors respond rationally to superior past performance, viewing the fee increases as a signal of managerial ability, and reward these funds with greater flows. These findings raise a puzzling question about the lack of downward revisions in fee structure as one would expect in a competitive industry, especially for those funds that perform poorly. We believe that a partial explanation for this puzzle may be that decrease in fees may not necessarily benefit the managers. Investors can view this as a negative signal and restrain from flocking to such funds even if they charge less. These issues are being investigated as a part of our ongoing research agenda.

*** *** ***

References

Ackermann, Carl, Richard McEnally, and David Ravenscraft, 1999, The Performance of Hedge Funds: Risk, Return, and Incentives. *Journal of Finance* 54, 833–874.

Agarwal, Vikas, Naveen D. Daniel, and Narayan Y. Naik, 2009, Role of Managerial Incentives and Discretion in Hedge Fund Performance, *Journal of Finance* 64, 2221–2256.

Avramov, Doron, Robert Kosowski, Narayan Y. Naik, and Melvyn Teo, 2011, Hedge Funds, Managerial Skill, and Macroeconomic Variables, *Journal of Financial Economics* 99, 672–692.

Bollen, Nicolas P.B., and Veronika K. Pool, 2009, Do Hedge Fund Managers Misreport Returns? Evidence from the Pooled Distribution, *Journal of Finance* 64, 2257–2288.

Bris, Arturo, Huseyin Gulen, Padma Kadiyala, and P. Raghavendra Rau, 2007, Good Stewards, Cheap Talkers, or Family Men? The Impact of Mutual Fund Closures on Fund Managers, Flows, Fees, and Performance, *Review of Financial Studies* 20, 953–982.

Brown , Stephen J., William N. Goetzmann, Roger G. Ibbotson, 1999, Offshore Hedge Funds: Survival and Performance, *Journal of Business* 72, 91–117.

Chakraborty, Indraneel, and Sugata Ray, 2008, Effort, Risk and Walkaway Under High Water Mark Contracts, Working Paper, University of Florida.

Chordia, Tarun, 1996, The Structure of Mutual Fund Charges, *Journal of Financial Economics* 41, 3–39.

Christoffersen , Susan E. K., 2001, Why Do Money Fund Managers Voluntarily Waive Their Fees?, *Journal of Finance* 56, 1117–1140.

Christoffersen, Susan E. K., and David K. Musto, 2002. Demand Curves and the Pricing of Money Management, *Review of Financial Studies* 15, 1499–1524.

Edwards, Franklin R., and Mustafa O. Caglayan, 2001, Hedge Fund Performance and Manager Skill, *Journal of Futures Markets* 21, 1003–1028.

Fung, William, and David A. Hsieh, 2000, Performance Characteristics of Hedge Funds and CTA Funds: Natural Versus Spurious Biases, *Journal of Financial and Quantitative Analysis* 35, 291–307.

Fung, William, and David A. Hsieh, 2004, Hedge Fund Benchmarks: A Risk-Based Approach, *Financial Analysts Journal* 60, 65–80.

Fung, William, David A. Hsieh, Narayan Y. Naik, and Tarun Ramadorai, 2008, Hedge Funds: Performance, Risk and Capital Formation, *Journal of Finance* 63, 1777–1803.

Getmansky, Mila, Andrew W. Lo, and Igor Makarov, 2004, An Econometric Model of Serial Correlation and Illiquidity in Hedge Fund Returns, *Journal of Financial Economics* 74, 529–609.

Gil-Bazo, J. and Ruiz-Verdu, P., 2009, The Relation between Price and Performance in the Mutual Fund Industry, *Journal of Finance* 64, 2153–2183.

Goetzmann, William N., Jonathan E. Ingersoll, and Stephen A. Ross, 2003, High-Water Marks and Hedge Fund Management Contracts, *Journal of Finance* 58, 1685–1718.

Golec, Joseph and Laura T. Starks, 2004, Performance fee contract change and mutual fund risk, *Journal of Financial Economics*, 73, 93–118.

Hasanhodzic, Jasmina, and Andrew W. Lo, 2007, Can Hedge Fund Returns be Replicated? The Linear Case, *Journal of Investment Management* 5, 5–45.

Hodder, James E., and Jens C. Jackwerth, 2007, Incentive Contracts and Hedge Fund Management, *Journal of Financial and Quantitative Analysis* 42, 811–826.

Kazemi, Hossein, and Ying Li, 2007, Conditional Performance of Hedge Funds: Evidence From Daily Returns, *European Financial Management*, 13, 211–238.

Liang, Bing, Hedge Fund Performance: 1990-1999, *Financial Analysts Journal*, 57, 11–18.

Luo, Guo Ying, 2002, Mutual Fund Fee-Setting, Market Structure and Mark-Ups, *Economica*, 69, 245–71.

Naik, Narayan Y., Tarun Ramadorai, and Maria Stromqvist, 2007, Capacity Constraints and Hedge Fund Strategy Returns, *European Financial Management,* 13, 239–256.

Panageas, Stavros, and Mark M. Westerfield, 2009, High-Water Marks: High Risk Appetites? Convex Compensation, Long Horizons, and Portfolio Choice, *Journal of Finance*, 64, 1–36.

Ray, Sugata, 2010, The Downside of High water Marks: An Empirical Study, Working Paper, University of Florida.

Schwarz, Christopher, 2007, Hedge Fund Fees, Working Paper, University of California Irvine.

Warner, Jerold B. and Joanna S. Wu, 2011, Why Do Mutual Fund Advisory Contracts Change? Performance, Growth, and Spillover Effects, *Journal of Finance* 66, 271–306.

Table I: Fee change summary statistics

Panel A reports the number of funds with different number of fee changes. Panel B reports the exact nature of these changes, sorted by how prevalent the change is. Different types of fee changes include removal of high-water mark (HWM) provision (HWM down), addition of HWM provision (HWM up), decrease and increase in management fees (Mfee down and Mfee up), and decrease and increase in incentive fees (Ifee down and Ifee up). For example, of the 315 changes in the fee structure, 75 involved adding a HWM feature only (and no changes to the other features). The last two columns of Panel B show if the changes in the fee structure correspond to increase or decrease in fee. Fee increases (decreases) are marked as "Y" (yes) if either management fee or incentive fee or both types of fee increase (decrease), exlcuding conflicting cases such as management fee increases (decreases) and incentive fee decreases (increases). Panel C reports a summation of all fee increases and decreases as well as incidence of addition/removal of the HWM feature. Panel D reports the distribution of these changes over calendar time in our sample. Panel E reports incentive fees before and after fee changes, in cases where incentive fees were changed and Panel F reports management fees before and after changes, in cases where management fees were changes.

Panel A

	Funds	Percentage
No changes	3,466	91.94
One change	290	7.75
Two changes	11	0.29
Three changes	1	0.03

Panel B

HWM down	HWM up	Mfee down	Mfee up	Ifee down	Ifee up	Change count	%	Fee Increase	Fee decrease
0	1	0	0	0	0	75	23.81		
0	1	0	0	0	1	60	19.05	Y	
0	1	0	1	0	1	49	15.56	Y	
0	0	0	0	0	1	41	13.02	Y	
0	0	0	1	0	1	25	7.94	Y	
0	0	0	1	0	0	23	7.3	Y	
0	0	1	0	0	0	9	2.86		Y
0	1	1	0	0	0	6	1.9		Y
1	0	0	0	0	0	6	1.9		
0	1	0	1	0	0	5	1.59	Y	
0	0	1	0	1	0	4	1.27		Y
0	0	0	0	1	0	3	0.95		Y
0	1	1	0	0	1	3	0.95		
0	0	1	0	0	1	2	0.63		
0	0	0	1	1	0	1	0.32		
0	1	1	0	1	0	1	0.32		Y
1	0	0	0	1	0	1	0.32		Y
1	0	1	0	1	0	1	0.32		Y
					Total	315		203	25

Panel C

	Increase/Add	Decrease/Remove
Incentive Fee	180	11
Management Fee	103	26
HWM	199	8

Panel D

Year \ Month	1	2	3	4	5	6	7	8	9	10	11	12	Total
2008				5	6	15	14	3	5	7	5	4	64
2009	6	17	7	1	5	12	6	11	11	7	7	14	104
2010	5	7	23	19	16	18	16	8	22	13			147
Total	11	24	30	25	27	45	36	22	38	27	12	18	315

Panel E – Incentive fees before and after change

After Before	IF = 0%	0 < IF < 10%	IF = 10%	10 < IF < 15%	IF = 15%	15 < IF < 20%	IF = 20%	IF > 20%	Total
IF = 0%	0	4	8	0	11	4	136	14	177
IF = 10%	0	0	0	0	1	0	1	0	2
IF = 15%	0	0	1	0	0	0	0	0	1
15 < IF < 20%	0	0	0	1	0	0	0	0	1
IF = 20%	2	0	1	0	5	0	0	1	9
IF > 20%	0	0	0	0	0	0	1	0	1
Total	2	4	10	1	17	4	138	15	191

Panel F –Management fees before and after change

After Before	MF = 0%	0 < MF < 1%	MF = 1%	1 < MF < 1.5%	MF = 1.5%	1.5 < MF < 2.0%	MF = 2%	MF > 2%	Total
MF = 0%	0	7	9	1	23	4	27	4	75
0 < MF < 1%	0	1	2	0	5	1	2	1	12
MF = 1%	0	0	0	0	1	0	5	0	6
1 < MF < 1.5%	0	2	1	0	0	1	0	0	4
MF = 1.5%	2	2	2	0	0	0	2	2	10
MF = 2%	0	4	5	0	4	0	0	5	18
MF > 2%	0	0	0	0	0	0	3	1	4
Total	2	16	19	1	33	6	39	13	129

Table II: Summary Statistics

Panel A reports the means, standard deviations, and number of fund-month observations for funds that do not exhibit changes in their fee structures and operational characteristics while Panel B reports the same statistics for funds that have changes in their fee structures. Panel C reports the t-statistics from t-tests comparing the means of the different components of the fee structure (incentive fee, management fee, and high-water mark) and means of the operational characteristics (raw returns of the funds (Returns), logarithm of the assets under management in $ millions (log AUM), net inflow computed as the percentage net inflow based on the AUM in the previous period, and months in operation (or age of the fund in months)). Statistical significance of 1%, 5%, and 10% is indicated by **,*, and + respectively. Our sample period is from April 2008 to November 2010.

	Panel A – Funds without fee changes			Panel B – Fund with fee changes			Panel C – t-test
	Mean	Std. Dev	Obs.	Mean	Std. Dev	Obs.	Mean (fee change) –Mean (no fee change)
Initial Incentive Fee	17.856	6.057	3,480	7.212	9.75	302	-10.357** (-154.05)
Initial Management Fee	1.53	0.716	3,494	1.191	1.612	302	-0.394** (-43.03)
Initial High-water Mark	0.758	0.429	3,504	0.116	0.32	302	-0.642** (-32.446)
Returns	0.224	7.535	75,958	0.637	6.093	7,457	0.412** (4.588)
Log AUM ($ millions)	3.634	1.94	55,359	3.321	1.796	4,485	-0.313** (-10.454)
Net Inflow (%)	-0.006	0.107	53,192	0.005	0.121	4,219	0.011** (6.102)
Months in Operation	70.196	57.524	75,958	47.203	45.452	7,457	-22.993** (-33.506)

Table III: The determinants of a fee change

This table provides the results of logistic regressions modelling the likelihood of a fund changing its fees. In Panel A, the dependent variable is an indicator variable that equals to one if a fund changes its fees at any time over the sample period and zero if fund does not change its fees. The independent variables are incentive fee and management fee for the fund at the time of inception (Initial IFee and Initial MFee), year in which the fund was started (Inception Year), notice that investors need to provide for withdrawing their money (Redemption Notice Period), the period for which investments are locked up before first withdrawal (LockUp Period), time period before an investor will receive cash back (Pay Out Period), logarithm of assets under management (AUM) at inception (Log AUM at inception In Panel B, Column (1) and (2), the dependent variable is an indicator variable that equals to one if a fund changes its fees in month *t* and zero otherwise.). The independent variables are logarithm of assets under management (AUM), Time, which is the calendar time starting from 1 and increasing by 1 for each subsequent month, Trailing inflows are the net inflows into the fund over the last 12 months expressed as a percentage of AUM at the beginning of the year, Aggregate HF inflow are the aggregate monthly hedge fund inflows as a percentage of total AUM for all hedge funds in the sample, Trailing returns are fund's raw returns over last 12 months, Trailing total risk is the standard deviation of fund's raw returns over the last 12 months, Trailing excess returns are the fund's raw returns over the average raw returns of all the funds following the same investment style over the last 12 months, Trailing idiosyncratic risk is the standard deviation of the residuals from regressing fund's raw returns on the average raw returns of all funds following the same investment style over a period of 12 months. The standard errors are clustered at fund level and time level. The t-statistics are reported in the parentheses. Statistical significance of 1%, 5%, and 10% is indicated by **,*, and + respectively.

Panel A

	Fund
Initial IFee	-0.153**
	(-11.162)
Initial MFee	-0.768**
	(-4.937)
Inception Year	0.102**
	(6.463)
RedemptionNoticePeriod	0.005**
	(2.868)
LockUpPeriod	0.025*
	(2.083)
PayOutPeriod	-0.002
	(-0.411)
Log AUM at inception	-0.069+
	(-1.955)
Pseudo R-squared	0.330
N	2511

Panel B

	Fund period (1)	Fund period (2)
Log AUM	-0.012	-0.025
	(-0.188)	(-0.405)
Time	0.067**	0.073**
	(3.084)	(3.462)
Trailing Inflows	-0.179	-0.217
	(-0.809)	(-0.997)
Aggregate HF inflow	-3.259	-0.707
	(-0.519)	(-0.112)
Trailing Returns	0.929**	
	(3.113)	
Trailing total risk	-0.045	
	(-1.128)	
Trailing excess return		1.958**
		(4.515)
Trailing idiosyncratic risk		-0.096+
		(-1.805)
Pseudo R-squared	0.032	0.037
N	43855	43855

Table IV: The determinants of specific fee changes

This table provides the results of logistic regressions modelling the likelihood of specifc fee changes. Panel A presents the determinants of fee increases, fee decreases, and addition of the high-water mark (HWM) feature where fee increase (decrease) relates to an increase (decrease) in management fee or incentive fee or both. Panel B shows details of determinants of common specific fee changes. The dependent variable is a 1 if a fee change of the appropriate nature takes place in a given month and 0 otherwise. The key independent variables of interest are trailing inflows, trailing excess returns, aggregate HF inflows and trailing fund idiosyncratic risk, as defined in Table III. The standard errors are clustered at fund level and time level. The t-statistics are reported in the parentheses. Statistical significance of 1%, 5%, and 10% is indicated by **,*, and + respectively.

Panel A

	(1) Fee Increase	(2) Fee Decrease	(3) Add HWM
Log AUM	-0.009	-0.015	-0.123
	(-0.152)	(-0.059)	(-1.160)
Time	0.087**	0.104*	0.035
	(3.657)	(2.091)	(1.195)
Trailing Inflows	-0.208	-0.486	0.045
	(-1.235)	(-1.127)	(0.161)
Aggregate HF inflow	13.179	-25.347+	-7.498
	(1.052)	(-1.865)	(-0.661)
Trailing excess return	2.139**	0.193	1.887*
	(5.243)	(0.162)	(2.085)
Trailing idiosyncratic risk	-0.123*	0.021	-0.145
	(-2.004)	(0.851)	(-0.904)
Pseudo R-squared	0.051	0.032	0.019
N	43827	43789	43797

Panel B

	(1) Add HWM	(2) Add HWM IFee up	(3) Add HWM IFee up MFee up	(4) IFee up	(5) IFee up MFee up	(6) MFee up
Log AUM	-0.123	-0.225*	-0.027	-0.053	0.393*	0.202
	(-1.160)	(-2.532)	(-0.311)	(-0.539)	(2.409)	(1.155)
Time	0.035	0.226+	0.094*	0.064+	0.009	0.105+
	(1.195)	(1.647)	(2.489)	(1.902)	(0.187)	(1.819)
Trailing Inflows	0.045	-0.181	-0.228	-0.279	-0.052	-0.431
	(0.161)	(-0.512)	(-0.501)	(-0.443)	(-0.084)	(-0.984)
Aggregate HF inflow	-7.498	28.608	-7.692	117.471*	31.914	-10.372
	(-0.661)	(0.435)	(-0.669)	(2.032)	(1.189)	(-0.382)
Trailing excess return	1.887*	3.094**	2.639**	1.934	-1.798	2.601**
	(2.085)	(3.316)	(5.631)	(1.018)	(-1.470)	(3.684)
Trailing idiosyncratic risk	-0.145	-0.365+	0.065	-0.455**	0.024	0.005
	(-0.904)	(-1.866)	(0.686)	(-3.370)	(0.152)	(0.050)
Pseudo R-squared	0.019	0.132	0.054	0.068	0.037	0.057
N	43797	43794	43792	43790	43787	43788

Table V: The effects of fee changes on returns

This table provides the results of OLS regressions modelling the effects of fee changes on returns. The dependent variable is the difference between returns for the twelve months following the fee change and the returns during the twelve months preceeding the fee change. The key independent variable of interest is the fee change dummy which equals 1 if any fee change occurs during our sample period for column (1) and a specific type of fee change occurs during our sample period for columns (2) to (7). Other independent variables are change in total risk which is the difference in the return standard deviation before and after the fee change over a twelve-month period, and time dummies. The standard errors are clustered at fund level. The t-statistics are reported in the parenthesis. Statistical significance of 1%, 5%, and 10% is indicated by **,*, and + respectively.

	(1) Any change	(2) Add HWM	(3) Add HWM Ifee Up	(4) Add HWM Ifee Up Mfee Up	(5) Ifee Up	(6) Ifee Up Mfee Up	(7) Mfee Up
Fee change dummy	-0.130**	-0.221**	-0.071	0.058	-0.098*	-0.134	-0.533**
	(-3.364)	(-3.179)	(-0.747)	(0.940)	(-2.006)	(-1.262)	(-2.900)
Change in total risk	-0.043**	-0.043**	-0.043**	-0.043**	-0.043**	-0.043**	-0.043**
	(-16.520)	(-16.478)	(-16.484)	(-16.480)	(-16.481)	(-16.479)	(-16.483)
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.247	0.247	0.247	0.247	0.247	0.247	0.247
N	32919	32864	32855	32853	32857	32853	32849

Table VI: The effects of fee changes on excess returns

This table provides the results of OLS regressions modelling the effects of fee changes on changes in funds' excess returns. Excess returns are defined as fund's raw returns minus the average returns of all funds following the same investment style. The dependent variable is the difference between fund's excess returns over twelve months following the fee change and excess returns over twelve months preceeding the fee change. The key independent variable of interest is the fee change dummy which equals 1 if any fee change occurs during our sample period for column (1) and a specific type of fee change occurs during our sample period for columns (2) to (7). Other independent variables are change in idiosyncratic risk which is the difference in the standard deviation of residuals (from regressing fund's returns on average returns of all funds following the same investment style) before and after the fee change over a twelve-month period, and time dummies. The standard errors are clustered at fund level. The t-statistics are reported in the parenthesis. Statistical significance of 1%, 5%, and 10% is indicated by **,*, and + respectively.

	(1) Any change	(2) Add HWM	(3) Add HWM Ifee Up	(4) Add HWM Ifee Up Mfee Up	(5) Ifee Up	(6) Ifee Up Mfee Up	(7) Mfee Up
Fee change dummy	-0.085**	-0.140**	-0.146*	-0.024	-0.109*	0.038	-0.178+
	(-3.050)	(-3.080)	(-2.140)	(-0.391)	(-2.293)	(0.335)	(-1.671)
Change in idiosyncratic risk	-0.026**	-0.026**	-0.026**	-0.026**	-0.026**	-0.026**	-0.026**
	(-8.456)	(-8.425)	(-8.432)	(-8.428)	(-8.422)	(-8.432)	(-8.427)
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.022	0.022	0.022	0.022	0.022	0.022	0.022
N	32919	32864	32855	32853	32857	32853	32849

Table VII: The effects of fee changes on risk

This table provides the results of OLS regressions modelling the effects of fee changes on return risk. The dependent variable is the difference between return standard deviation during the twelve months following the fee change and the return standard deviation during the twelve months preceeding the fee change. The key independent variable of interest is the fee change dummy which equals 1 if any fee change occurs during our sample period for column (1) and a specific type of fee change occurs during our sample period for columns (2) to (7). Other independent variables are change in returns defined as the difference between returns for the twelve months following fee change and the annual fund returns during the 12 months preceeding the fee change, and time dummies. The standard errors are clustered at fund level (Petersen (2009)). The t-statistics are reported in the parenthesis. Statistical significance of 1%, 5%, and 10% is indicated by **,*, and + respectively.

	(1) Any change	(2) Add HWM	(3) Add HWM Ifee Up	(4) Add HWM Ifee Up Mfee Up	(5) Ifee Up	(6) Ifee Up Mfee Up	(7) Mfee Up
Fee change dummy	-0.410*	0.232	-0.484	-0.863**	0.148	-0.740*	-1.423+
	(-2.260)	(0.615)	(-1.320)	(-3.209)	(0.326)	(-1.985)	(-1.709)
Change in returns	-1.185**	-1.183**	-1.183**	-1.183**	-1.183**	-1.183**	-1.183**
	(-16.251)	(-16.210)	(-16.217)	(-16.214)	(-16.214)	(-16.214)	(-16.216)
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.307	0.307	0.307	0.307	0.307	0.307	0.307
N	32919	32864	32855	32853	32857	32853	32849

Table VIII: The effects of fee changes on inflows

This table provides the results of OLS regressions modelling the effects of fee changes on returns. The dependent variable is the difference between net inflow percentages for the twelve months following the fee change and the twelve months preceeding the fee change. The key independent variable of interest is the fee change dummy which equals 1 if any fee change occurs during our sample period for column (1) and a specific type of fee change occurs during our sample period for columns (2) to (7). Other independent variables are change in returns defined as the difference between returns for the twelve months following fee change and the annual fund returns during the 12 months preceeding the fee change, change in total risk defined as the difference between return standard deviation during the twelve months following the fee change and the return standard deviation during the twelve months preceeding the fee change, and time dummies. The standard errors are clustered at fund level. The t-statistics are reported in the parenthesis. Statistical significance of 1%, 5%, and 10% is indicated by **,*, and + respectively.

	(1) Any change	(2) Add HWM	(3) Add HWM Ifee Up	(4) Add HWM Ifee Up Mfee Up	(5) Ifee Up	(6) Ifee Up Mfee Up	(7) Mfee Up
Fee change dummy	0.320*	0.235	0.039	0.602+	0.207**	-0.077	0.434
	(2.263)	(0.890)	(1.434)	(1.895)	(2.918)	(-0.241)	(1.407)
Change in returns	0.023	0.023	0.023	0.023	0.023	0.023	0.023
	(0.665)	(0.668)	(0.667)	(0.668)	(0.667)	(0.664)	(0.670)
Change in total risk	-0.010+	-0.010+	-0.010+	-0.010+	-0.010+	-0.010+	-0.010+
	(-1.799)	(-1.800)	(-1.796)	(-1.796)	(-1.797)	(-1.797)	(-1.795)
Time dummies	Yes	Yes	Yes	Yes	Yes	Yes	Yes
R-squared	0.085	0.084	0.084	0.084	0.084	0.084	0.084
N	20554	20536	20531	20533	20534	20533	20533

CFR Working Paper Series

centre for financial research cologne

CFR working papers are available for download from **www.cfr-cologne.de**.

Hardcopies can be ordered from: centre for financial research (CFR), Albertus Magnus Platz, 50923 Koeln, Germany.

2011

No.	Author(s)	Title
11-09	V. Agarwal, S. Ray	Determinants and Implications of Fee Changes in the Hedge Fund Industry
11-08	G. Cici, L.-F. Palacios	On the Use of Options by Mutual Funds: Do They Know What They Are Doing?
11-07	V. Agarwal, G. D. Gay, L. Ling	Window Dressing in Mutual Funds
11-06	N. Hautsch, D. Hess, D. Veredas	The Impact of Macroeconomic News on Quote Adjustments, Noise, and Informational Volatility
11-05	G. Cici	The Prevalence of the Disposition Effect in Mutual Funds' Trades
11-04	S. Jank	Mutual Fund Flows, Expected Returns and the Real Economy
11-03	G.Fellner, E.Theissen	Short Sale Constraints, Divergence of Opinion and Asset Value: Evidence from the Laboratory
11-02	S.Jank	Are There Disadvantaged Clienteles in Mutual Funds?
11-01	V. Agarwal, C. Meneghetti	The role of Hedge Funds as Primary Lenders

2010

No.	Author(s)	Title
10-20	G. Cici, S. Gibson, J.J. Merrick Jr.	Missing the Marks? Dispersion in Corporate Bond Valuations Across Mutual Funds
10-19	J. Hengelbrock, E. Theissen, Ch. Westheide	Market Response to Investor Sentiment
10-18	G. Cici, S. Gibson	The Performance of Corporate-Bond Mutual Funds: Evidence Based on Security-Level Holdings
10-17	D. Hess, D. Kreutzmann, O. Pucker	Projected Earnings Accuracy and the Profitability of Stock Recommendations
10-16	S. Jank, M. Wedow	Sturm und Drang in Money Market Funds: When Money Market Funds Cease to Be Narrow

10-15	G. Cici, A. Kempf, A. Puetz	Caught in the Act: How Hedge Funds Manipulate their Equity Positions
10-14	J. Grammig, S. Jank	Creative Destruction and Asset Prices
10-13	S. Jank, M. Wedow	Purchase and Redemption Decisions of Mutual Fund Investors and the Role of Fund Families
10-12	S. Artmann, P. Finter, A. Kempf, S. Koch, E. Theissen	The Cross-Section of German Stock Returns: New Data and New Evidence
10-11	M. Chesney, A. Kempf	The Value of Tradeability
10-10	S. Frey, P. Herbst	The Influence of Buy-side Analysts on Mutual Fund Trading
10-09	V. Agarwal, W. Jiang, Y. Tang, B. Yang	Uncovering Hedge Fund Skill from the Portfolio Holdings They Hide
10-08	V. Agarwal, V. Fos, W. Jiang	Inferring Reporting Biases in Hedge Fund Databases from Hedge Fund Equity Holdings
10-07	V. Agarwal, G. Bakshi, J. Huij	Do Higher-Moment Equity Risks Explain Hedge Fund Returns?
10-06	J. Grammig, F. J. Peter	Tell-Tale Tails
10-05	K. Drachter, A. Kempf	Höhe, Struktur und Determinanten der Managervergütung-Eine Analyse der Fondsbranche in Deutschland
10-04	J. Fang, A. Kempf, M. Trapp	Fund Manager Allocation
10-03	P. Finter, A. Niessen-Ruenzi, S. Ruenzi	The Impact of Investor Sentiment on the German Stock Market
10-02	D. Hunter, E. Kandel, S. Kandel, R. Wermers	Endogenous Benchmarks
10-01	S. Artmann, P. Finter, A. Kempf	Determinants of Expected Stock Returns: Large Sample Evidence from the German Market

2009

No.	Author(s)	Title
09-17	E. Theissen	Price Discovery in Spot and Futures Markets: A Reconsideration
09-16	M. Trapp	Trading the Bond-CDS Basis – The Role of Credit Risk and Liquidity
09-14	A. Kempf, O. Korn, M. Uhrig-Homburg	The Term Structure of Illiquidity Premia
09-13	W. Bühler, M. Trapp	Time-Varying Credit Risk and Liquidity Premia in Bond and CDS Markets
09-12	W. Bühler, M. Trapp	Explaining the Bond-CDS Basis – The Role of Credit Risk and Liquidity
09-11	S. J. Taylor, P. K. Yadav, Y. Zhang	Cross-sectional analysis of risk-neutral skewness
09-10	A. Kempf, C. Merkle, A. Niessen	Low Risk and High Return - How Emotions Shape Expectations on the Stock Market
09-09	V. Fotak, V. Raman, P. K. Yadav	Naked Short Selling: The Emperor`s New Clothes?

09-08	F. Bardong, S.M. Bartram, P.K. Yadav	Informed Trading, Information Asymmetry and Pricing of Information Risk: Empirical Evidence from the NYSE
09-07	S. J. Taylor , P. K. Yadav, Y. Zhang	The information content of implied volatilities and model-free volatility expectations: Evidence from options written on individual stocks
09-06	S. Frey, P. Sandas	The Impact of Iceberg Orders in Limit Order Books
09-05	H. Beltran-Lopez, P. Giot, J. Grammig	Commonalities in the Order Book
09-04	J. Fang, S. Ruenzi	Rapid Trading bei deutschen Aktienfonds: Evidenz aus einer großen deutschen Fondsgesellschaft
09-03	A. Banegas, B. Gillen, A. Timmermann, R. Wermers	The Performance of European Equity Mutual Funds
09-02	J. Grammig, A. Schrimpf, M. Schuppli	Long-Horizon Consumption Risk and the Cross-Section of Returns: New Tests and International Evidence
09-01	O. Korn, P. Koziol	The Term Structure of Currency Hedge Ratios

2008

No.	Author(s)	Title
08-12	U. Bonenkamp, C. Homburg, A. Kempf	Fundamental Information in Technical Trading Strategies
08-11	O. Korn	Risk Management with Default-risky Forwards
08-10	J. Grammig, F.J. Peter	International Price Discovery in the Presence of Market Microstructure Effects
08-09	C. M. Kuhnen, A. Niessen	Public Opinion and Executive Compensation
08-08	A. Pütz, S. Ruenzi	Overconfidence among Professional Investors: Evidence from Mutual Fund Managers
08-07	P. Osthoff	What matters to SRI investors?
08-06	A. Betzer, E. Theissen	Sooner Or Later: Delays in Trade Reporting by Corporate Insiders
08-05	P. Linge, E. Theissen	Determinanten der Aktionärspräsenz auf Hauptversammlungen deutscher Aktiengesellschaften
08-04	N. Hautsch, D. Hess, C. Müller	Price Adjustment to News with Uncertain Precision
08-03	D. Hess, H. Huang, A. Niessen	How Do Commodity Futures Respond to Macroeconomic News?
08-02	R. Chakrabarti, W. Megginson, P. Yadav	Corporate Governance in India
08-01	C. Andres, E. Theissen	Setting a Fox to Keep the Geese - Does the Comply-or-Explain Principle Work?

2007

No.	Author(s)	Title

07-16	M. Bär, A. Niessen, S. Ruenzi	The Impact of Work Group Diversity on Performance: Large Sample Evidence from the Mutual Fund Industry
07-15	A. Niessen, S. Ruenzi	Political Connectedness and Firm Performance: Evidence From Germany
07-14	O. Korn	Hedging Price Risk when Payment Dates are Uncertain
07-13	A. Kempf, P. Osthoff	SRI Funds: Nomen est Omen
07-12	J. Grammig, E. Theissen, O. Wuensche	Time and Price Impact of a Trade: A Structural Approach
07-11	V. Agarwal, J. R. Kale	On the Relative Performance of Multi-Strategy and Funds of Hedge Funds
07-10	M. Kasch-Haroutounian, E. Theissen	Competition Between Exchanges: Euronext versus Xetra
07-09	V. Agarwal, N. D. Daniel, N. Y. Naik	Do hedge funds manage their reported returns?
07-08	N. C. Brown, K. D. Wei, R. Wermers	Analyst Recommendations, Mutual Fund Herding, and Overreaction in Stock Prices
07-07	A. Betzer, E. Theissen	Insider Trading and Corporate Governance: The Case of Germany
07-06	V. Agarwal, L. Wang	Transaction Costs and Value Premium
07-05	J. Grammig, A. Schrimpf	Asset Pricing with a Reference Level of Consumption: New Evidence from the Cross-Section of Stock Returns
07-04	V. Agarwal, N.M. Boyson, N.Y. Naik	Hedge Funds for retail investors? An examination of hedged mutual funds
07-03	D. Hess, A. Niessen	The Early News Catches the Attention: On the Relative Price Impact of Similar Economic Indicators
07-02	A. Kempf, S. Ruenzi, T. Thiele	Employment Risk, Compensation Incentives and Managerial Risk Taking - Evidence from the Mutual Fund Industry -
07-01	M. Hagemeister, A. Kempf	CAPM und erwartete Renditen: Eine Untersuchung auf Basis der Erwartung von Marktteilnehmern

2006

No.	Author(s)	Title
06-13	S. Čeljo-Hörhager, A. Niessen	How do Self-fulfilling Prophecies affect Financial Ratings? - An experimental study
06-12	R. Wermers, Y. Wu, J. Zechner	Portfolio Performance, Discount Dynamics, and the Turnover of Closed-End Fund Managers
06-11	U. v. Lilienfeld-Toal, S. Ruenzi	Why Managers Hold Shares of Their Firm: An Empirical Analysis
06-10	A. Kempf, P. Osthoff	The Effect of Socially Responsible Investing on Portfolio Performance
06-09	R. Wermers, T. Yao, J. Zhao	The Investment Value of Mutual Fund Portfolio Disclosure
06-08	M. Hoffmann, B. Kempa	The Poole Analysis in the New Open Economy Macroeconomic Framework
06-07	K. Drachter, A. Kempf, M. Wagner	Decision Processes in German Mutual Fund Companies: Evidence from a Telephone Survey

06-06	J.P. Krahnen, F.A. Schmid, E. Theissen	Investment Performance and Market Share: A Study of the German Mutual Fund Industry
06-05	S. Ber, S. Ruenzi	On the Usability of Synthetic Measures of Mutual Fund Net-Flows
06-04	A. Kempf, D. Mayston	Liquidity Commonality Beyond Best Prices
06-03	O. Korn, C. Koziol	Bond Portfolio Optimization: A Risk-Return Approach
06-02	O. Scaillet, L. Barras, R. Wermers	False Discoveries in Mutual Fund Performance: Measuring Luck in Estimated Alphas
06-01	A. Niessen, S. Ruenzi	Sex Matters: Gender Differences in a Professional Setting

2005

No.	Author(s)	Title
05-16	E. Theissen	An Analysis of Private Investors´ Stock Market Return Forecasts
05-15	T. Foucault, S. Moinas, E. Theissen	Does Anonymity Matter in Electronic Limit Order Markets
05-14	R. Kosowski, A. Timmermann, R. Wermers, H. White	Can Mutual Fund „Stars“ Really Pick Stocks? New Evidence from a Bootstrap Analysis
05-13	D. Avramov, R. Wermers	Investing in Mutual Funds when Returns are Predictable
05-12	K. Griese, A. Kempf	Liquiditätsdynamik am deutschen Aktienmarkt
05-11	S. Ber, A. Kempf, S. Ruenzi	Determinanten der Mittelzuflüsse bei deutschen Aktienfonds
05-10	M. Bär, A. Kempf, S. Ruenzi	Is a Team Different From the Sum of Its Parts? Evidence from Mutual Fund Managers
05-09	M. Hoffmann	Saving, Investment and the Net Foreign Asset Position
05-08	S. Ruenzi	Mutual Fund Growth in Standard and Specialist Market Segments
05-07	A. Kempf, S. Ruenzi	Status Quo Bias and the Number of Alternatives - An Empirical Illustration from the Mutual Fund Industry –
05-06	J. Grammig, E. Theissen	Is Best Really Better? Internalization of Orders in an Open Limit Order Book
05-05	H. Beltran, J. Grammig, A.J. Menkveld	Understanding the Limit Order Book: Conditioning on Trade Informativeness
05-04	M. Hoffmann	Compensating Wages under different Exchange rate Regimes
05-03	M. Hoffmann	Fixed versus Flexible Exchange Rates: Evidence from Developing Countries
05-02	A. Kempf, C. Memmel	On the Estimation of the Global Minimum Variance Portfolio
05-01	S. Frey, J. Grammig	Liquidity supply and adverse selection in a pure limit order book market

2004

No.	Author(s)	Title
04-10	N. Hautsch, D. Hess	Bayesian Learning in Financial Markets – Testing for the Relevance of Information Precision in Price Discovery
04-09	A. Kempf, K. Kreuzberg	Portfolio Disclosure, Portfolio Selection and Mutual Fund Performance Evaluation
04-08	N.F. Carline, S.C. Linn, P.K. Yadav	Operating performance changes associated with corporate mergers and the role of corporate governance
04-07	J.J. Merrick, Jr., N.Y. Naik, P.K. Yadav	Strategic Trading Behavior and Price Distortion in a Manipulated Market: Anatomy of a Squeeze
04-06	N.Y. Naik, P.K. Yadav	Trading Costs of Public Investors with Obligatory and Voluntary Market-Making: Evidence from Market Reforms
04-05	A. Kempf, S. Ruenzi	Family Matters: Rankings Within Fund Families and Fund Inflows
04-04	V. Agarwal, N.D. Daniel, N.Y. Naik	Role of Managerial Incentives and Discretion in Hedge Fund Performance
04-03	V. Agarwal, W.H. Fung, J.C. Loon, N.Y. Naik	Risk and Return in Convertible Arbitrage: Evidence from the Convertible Bond Market
04-02	A. Kempf, S. Ruenzi	Tournaments in Mutual Fund Families
04-01	I. Chowdhury, M. Hoffmann, A. Schabert	Inflation Dynamics and the Cost Channel of Monetary Transmission

centre for financial research
cfr/university of cologne
Albertus-Magnus-Platz
D-50923 cologne
Fon +49(0)221-470-6995
Fax +49(0)221-470-3992
kempf@cfr-cologne.de
www.cfr-cologne.de