Effort, Risk and Walkaway Under High Water Mark Style Contracts

Sugata Ray[1]

University of Pennsylvania

Indraneel Chakraborty

University of Pennsylvania

Abstract

We study a hedge fund style contract in which performance fees with a high water mark drive a fund manager's effort and risk choices as well as walkaway decisions by both the fund manager and the investor. Modeling such a relationship, we derive empirical predictions of the impact of the fund;s distance from the high water mark (HWM), on effort, risk and walkaway behavior. Testing empirical data, we find that as the distance from the HWM increases, effort expended falls, incidence of walkaway increases and the risk appetite of the manager increases. All of these effects are most stark for funds closer to the HWM and fade for funds further away. Additionally, we find risks taken by funds further from their HWM tend to generate lower expected returns than those closer to their HWM. In addition to being consistent with predictions from our model, these results resonate well with the economic intuition that such contracts are akin to the fund managers holding call options with varying degrees of moneyness (depending on distance from the HWM) on the return stream to the investor's funds.

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Comments Welcome

[1]Contact Author: Sugata Ray, Department of Finance, The Wharton School, University of Pennsylvania, 2300 SH-DH, 3620 Locust Walk, Philadelphia, PA, 19104. sray@wharton.upenn.edu, (646)262-6565. The authors are grateful to Chris Geczy, Itay Goldstein, João Gomes, Andrew Metrick, David Musto, Stavros Panageas, Ayako Yasuda and Wharton Seminar participants for suggestions and comments. Any remaining errors are the responsibility of the authors.

1 Introduction

The number of hedge funds has exploded from a thousand to seven thousand in the most recent half decade. Compensation for portfolio managers at top hedge funds, including compensation for some former academics-turned-money managers, has reached astronomical levels. And at the heart of hedge funds is the fabled "2/20", high water mark, fee structure, which has been the recipient of much attention in recent financial press. Indeed, the fee structure is such an integral part of hedge funds that they have recently been characterized as being "a compensation scheme masquerading as an asset class."

The central role of the high water mark in the compensation structure is readily apparent. Following the credit related market correction in August 2007, a well known hedge fund at a bulge bracket bank, which had lost a lot of money and was reportedly more than 30% below its high water mark, had a 'sale' on new fund inflows. Fees charged on new money introduced to the fund would be a waived annual management fee and a 10% incentive fee for any profits generated. That is, a '0/10' structure rather then the standard '2/20'. The implications of such a move were manifold. Original monies in the fund were far enough away from their high water mark that fund employees were sufficiently discouraged about prospects of ever hitting the high water mark (and earning substantial bonuses) to consider leaving and joining other funds. As a result of this, original investors in the fund were questioning whether the fund would be able to maintain their team through this crises and were considering withdrawing funds. Another worry of the investors would be that managers would take inordinate amounts of risk in a desperate attempt to generate returns above the high water mark. The infusion of new capital, which would come in fresh, without a high water mark, alleviated these concerns. Employees would stand to earn incentive fees (and thus bonuses) on this new money immediately, although the fees would accrue at the rate of 10% rather than the full 20%. The original investors were reassured that the fund would be able to maintain its team and did not withdraw their funds.

We focus this study on this intricate set of risk, effort and walkaway decisions driven by the high water mark (HWM) feature of the hedge fund contract. Modeling a simple two period principal-agent relationship governed by such a contract, we derive the empirical predictions in terms of risk choices, effort choices and walkaway behavior of the parties. Broadly, the model allows the investor the option to walk away at either period, and it considers the effect of the incentive pay from the contract and the continuation value of the contract on risk and effort choices made by the fund manager. The model is most similar to a two period version of the Hodder and Jackwerth (2007) model with an effort choice.

Although the model itself is fairly complex due to the optionality embedded in the hedge fund contract, the empirical implications of the model resonate with the intuition of the fund manager simply having a call option on the returns of the fund. In particular, we predict differences in both fund manger and investor behavior depending on how close the manager's option is to being in the money. We expect the following: (i) The closer a fund manager is to his HWM, the more likely he is to expend costly effort the higher the subsequent period returns will be. (ii) Once a fund reaches a certain point below the HWM, the danger of walkaway increases, as the principal is worried about the agent no longer putting in the appropriate level of effort. (iii) The manager of a fund further away from the HWM is likely to increase risk of the fund portfolio in the hopes of breaking the HWM barrier again and earning performance fee based bonuses.

We test these hypotheses against empirical data and find them to be consistent with observed return and walkaway behavior, demonstrating support for our model. In particular, we find that future expected returns for funds close to the HWM are higher than those for funds further away from the HWM. On average, for example, funds requiring a 10% return to hit their HWM will underperform funds which are *at* their HWM by up to 2.8% over a 6 month period. We interpret this as evidence of additional effort expenditure by managers in funds closer to the HWM. The incidence of walkaway increases with distance from the HWM. Funds requiring 5-10% returns to hit their HWMs are 6 times as likely to experience walkaway compared to funds requiring less than a 5% return. Finally, we also see higher variance of future returns for funds further away from the HWM. The standard deviation of monthly returns for 6 months are 1.6% higher for funds which are 10% below their HWM than for funds which are at their HWM. We also find that the variance of future returns is most sensitive to distance from the HWM when the fund is near the HWM. In addition to the increased variance, we find evidence that fund managers take poorer risks the further they are away from the HWM. Specifically, an additional 1% of return standard deviation for funds within 10% return of hitting their HWM increases expected returns by 1.6% whereas the same 1% increase in standard deviation for funds requiring more than 10% to hit the HWM only increases expected returns by 0.6%.

The implications of these empirical findings are far reaching. Portfolio allocation decisions by investors and fund-of-funds would find direct use for these findings in optimizing their portfolios. Additionally, hedge fund marketing strategies would be affected. The anecdote above, where the fund had the '0/10' sale to mitigate many of these concerns, would be a perfect example. A clearer level of disclosure about a fund's high water mark(s), too, might add value to current and potential investors alike. And, of course, academic research of hedge funds would definitely be aided by these insights into their behavior.

Extant literature related to this study includes Metrick and Yasuda (2007), which looks at the empirical differences between the "2/20" fee structures of hedge funds, venture capital firms and private equity shops. Goetzmann, Ingersoll, and Ross (2003) examine the unique, high watermark (HWM) structure of the hedge fund compensation contract and compute the alpha generation potential necessary to justify paying a fund manager according to such a contract. Panageas and Westerfield (2008), looks at how in an infinite time horizon setting, even a risk neutral agent will not increase risk indefinitely despite the optionality of the compensation contract. The Aragon and Qian (2006) study of liquidation risk finds that funds investing in illiquid assets are more likely to have HWMs to reduce risk of investor driven liquidation when the fund performs poorly. Brown, Goetzmann, and Park (2001) studies survival rates among hedge funds and commodity trading advisors (CTAs) and factors leading to fund demise. While they do identify poor returns as a factor, this study additionally pinpoints returns required to hit a fund's HWM as a separate factor in determining fund survival as a contribution. Additionally, there is a large body of literature on the survivorship bias in hedge fund returns (Fung and Hsieh (2002), Horst and Verbeek (2007), Fung and Hsieh (1999) and Rouah (2005)). Although our study does not explicitly address the magnitude of the survival bias, we do note when tests we perform are likely to exhibit bias and we specify the direction of the bias.

The remainder of this paper is divided into three sections. In section 2, we present our model and the various empirical implications resulting from the current HWM contract form. In section 3, we present results of the empirical tests of our model. In section 4, we conclude.

2 Model

We model a two period contract between an investor and a fund manager, and derive optimal effort, risk and walkaway policy dependent upon how far the fund is from the last watermark. We derive explicit solutions in section 2.4. The key results in this section are:

- Optimal effort by the agent generally decreases as required return to reach the HWM increases (equation 10).
- Optimal variance generally increases as required return to reach the HWM increases (equa-

tion 11). However, initially, it decreases to improve probability of continuation.

- Incidence of walkaway generally increases with increase in required return to reach HWM.

Some of the papers which have looked at impact of compensation form on investment strategy are Basak, Pavlova, and Shapiro (2007), Carpenter (2000), Goetzmann, Ingersoll, and Ross (2003), Panageas and Westerfield (2008) and Hodder and Jackwerth (2007). The model presented in this section is a one period model with closed form solutions for optimal effort and optimal choice of risk taken by the manager. We also solve numerically for optimal effort and optimal variance together and arrive at similar intuition as Hodder and Jackwerth (2007).

2.1 Setup

We assume both the portfolio manager and the investor to be risk neutral. The contract form we choose to study is the one prevalent in the hedge fund industry. At the end of period T_1, the portfolio manager receives the following wage for the effort expended in the period from T_0 to T_1 (there is also a lumpsum continuation payoff depending upon the value of assets in the fund at time T_1 which we will discuss later):

$$w = kv + s(v - h)^+, \tag{1}$$

where w is the wage offered by the investor to the portfolio manager and the value of the firm is represented by v. The portfolio manager receives a constant fraction k of assets and a fraction s of the performance generated above the last point of evaluation h (watermark). In the standard "2/20" contract, $k = 2\%$ and $s = 20\%$.

The agent chooses the amount of effort a he will exert and portfolio risk σ^2 he will take according to the contract specified above. The return process $\tilde{r}$ for firm is represented below:

$$1 + \tilde{r} = 1 + a + \sigma\tilde{\epsilon}, \tag{2}$$

where $\tilde{\epsilon} \sim U(-1, 1)$ is an i.i.d. shock and $\tilde{r}$ represents the return on investment.

- At time T_0:
  - The firm value is v_0, high watermark is at h_0 and required return is rr_0. rr_0 represents the return required to reach the last watermark:

$$1 + rr_0 = \max(h_0/v_0, 1), \tag{3}$$

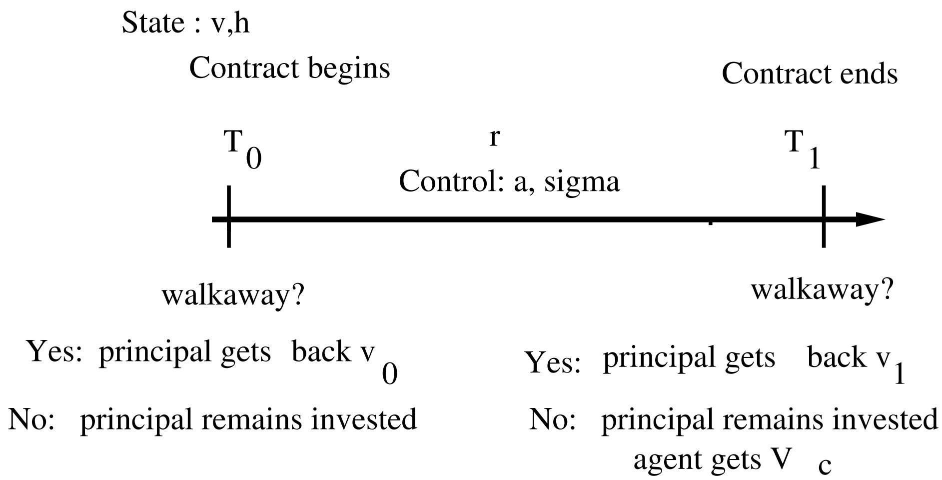

Figure 1: Timeline of Model

where v_0 is firm value and h_0 is the watermark. It may be that $rr > 0$ if the value of the firm has fallen since last watermark, and $rr = 0$ if the firm is at the watermark or above. We assume an incentive payment has just been made and the HWM has just been reset such that $v_0 \leq h_0$.

- The investor remains invested in the firm if she anticipates that the effort and variance chosen by the manager will increase her wealth (see section 2.2).
- However, if she chooses to walk away from the fund, the contract is terminated, the investor gets the fund value v_0 and the agent gets the outside option he has - which we represent by a constant $\bar{w} \equiv 0$ normalized to 0 here. The agent will never choose to walk away here since the outside option is 0.
- If the investor chooses to continue with the portfolio manager at T_0, then the manager chooses effort a and variance σ. The watermark is at h_0 at time T_0. (see section 2.3).

- At time T_1:
  - At time T_1, rate of return $\hat{r}$ is realized and thus the value of the investment is known. If $\hat{r}_{01} > r^*_{01}$, then the investor decides to remain invested again. (We will discuss the relation between absolute required return r^*_{01}, maximum return required to hit HWM by investor rr^*_1 before time T_1 walkaway, and return required to hit the HWM rr_0 in section 2.2)

- If the investor does not walk away, then the manager gets a lumpsum V_C which represents continuation value of the firm - a stylized way to future incentive and management fees.
- The contract then terminates at time T_1.

2.2 Investor's problem

We see above that in the model, the investor can walk away at both points in time T_0, T_1. At time T_0, the investor determines the expected payoff for her if she continues, given required return rr_0 that the manager has to achieve to get performance bonus fraction s at time T_1:

$$\mathbb{E}v_1 = \mathbb{E}[v_0 \tilde{r}_{01}(a^*, \sigma^*) - \text{Management Fees}], \tag{4}$$

where v_0, v_1 are fund values at time T_0, T_1 respectively and $\tilde{r}_{01}(a^*, \sigma^*)$ is the return given manager's anticipated choice of effort a^* and variance σ^{*2} as given in equation 2. Management fees in the above equation is the expected wage the manager will be paid (equation 1). If $\mathbb{E}v_1 \leq v_0$, the investor will walk away at time T_0.

At time T_1, the investor walks away if return required rr_1 is greater than rr_1^* (akin to rr_0^* walkway point discussed above). This leads to a walkaway point in terms of the realized return:

$$1 + r_{01}^* = \frac{1 + rr_0}{1 + rr_1^*}, \tag{5}$$

i.e. if $r_{01} < r_{01}^*$, there is walkaway. The investor also imposes a multiplicative penalty factor on the lumpsum continuation value that she promises to the agent is she does not walkaway from the firm at time T_1:

$$1 - \rho\sigma$$

This is invoked on the manager to dissuade him from taking excessive risk so that he can reach the HWM or increase chance of continuation. ρ is a constant and σ is standard deviation chosen by the manager which is observed by the investor.

2.3 Portfolio Manager's Problem

We assume convex cost of effort:

$$\psi_a(a) = \frac{1}{2} c_a a^2, \tag{6}$$

by the portfolio manager where a represents effort and c_a is a constant that represents the cost of alpha generating talent in the investment professional marketplace.

Let us first solve the manager's problem at time T_0. The investor has chosen to continue with the firm, the value of the firm is at v_0 and the watermark is at h_0. Now the manager has to choose a, σ. The payoff $V_m(T_0)$ the manager can expect from now till T_1 is:

$$\begin{aligned} V_m(T_0) &= \mathbb{E}\Big[kv_0 + sv_0 \max(0, \hat{r}_{01} - rr_0) - \frac{1}{2}c_a a^2 + V_c(1-\rho\sigma)p(\hat{r}_{01} > r^*_{01})\Big] \\ 1 + \hat{r}_{01} &= 1 + a + \sigma\hat{\epsilon} \end{aligned} \tag{7}$$

where $\tilde{r}_{01}$ represents the rate of return from time T_0 to T_1, and V_c is the continuation value at time T_1. We assume discount rate to be 0 for simplicity.

The expected payoff of the manager is thus the payoff from the contract net of cost of effort plus the expected payoff from continuation. The probability of the agent getting the continuation value is determined by $p(\hat{r}_{01} > r^*_{01})$, where r^*_{01} is the return where the principal chooses to walk away from the contract (from section 2.2). The probability of agent getting continuation value also depends on the penalty of variance.

The agent will choose effort a and risk σ for the next period to maximize his expected payoff :

$$\{a^*, \sigma^*\} = \arg\max_{a,\sigma} \mathbb{E}\Big[kv_0 + sv_0 \max(0, \hat{r}_{01} - rr_0) + V_c(1-\rho\sigma)p(\hat{r}_{01} > r^*_{01}) - \frac{1}{2}c_a a^2\Big], \tag{8}$$

2.4 Solution for uniform distribution

Let us assume that the shocks to the return process are drawn from a uniform distribution i.e. $\epsilon \sim U(-1, 1)$, and normalize $v_0 \equiv 1$. In such a case, the probability of the firm continuation increases with effort and decreases with choice of variance:

$$p(\hat{r}_{01} > r^*_{01}) = \frac{a + \sigma - r^*_{01}}{2\sigma}$$

Then, problem 8 becomes under regularity conditions[1]:

$$\{a^*, \sigma^*\} = \arg\max_{a,\sigma} \Big[k + s\frac{(a + \sigma - rr_0)^2}{4\sigma} + V_c(1-\rho\sigma)\frac{a + \sigma - r^*_{01}}{2\sigma} - \frac{1}{2}c_a a^2\Big], \tag{9}$$

Numerical Solution

We analytically derive optimal effort and variance below in terms of each other. We jointly solve for optimal effort and optimal variance and present the results in figures 2 and 3. Further analysis of the results is done with the derivations below. These results are similar to Hodder and Jackwerth (2007).

[1] Throughout this section, we assume regularity condition $a - \sigma < r^*, rr < a + \sigma$ holds, i.e. the required returns are within the bounds of the distribution, if this does not hold, the expressions are slightly different

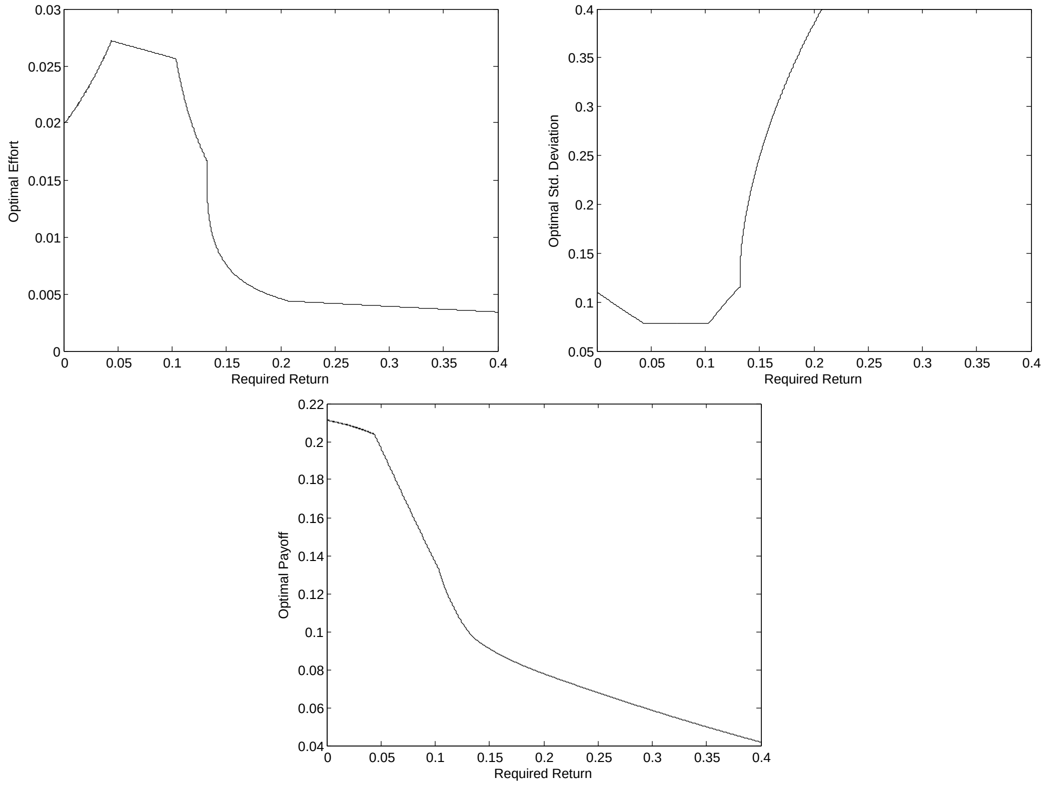

Figure 2: Optimal Effort, Variance and Payoff for Manager

Parameter values are $k = 0.02, s = 0.2, V_c = 0.2, rr_1{}^* = 10\%, c_a = 50$

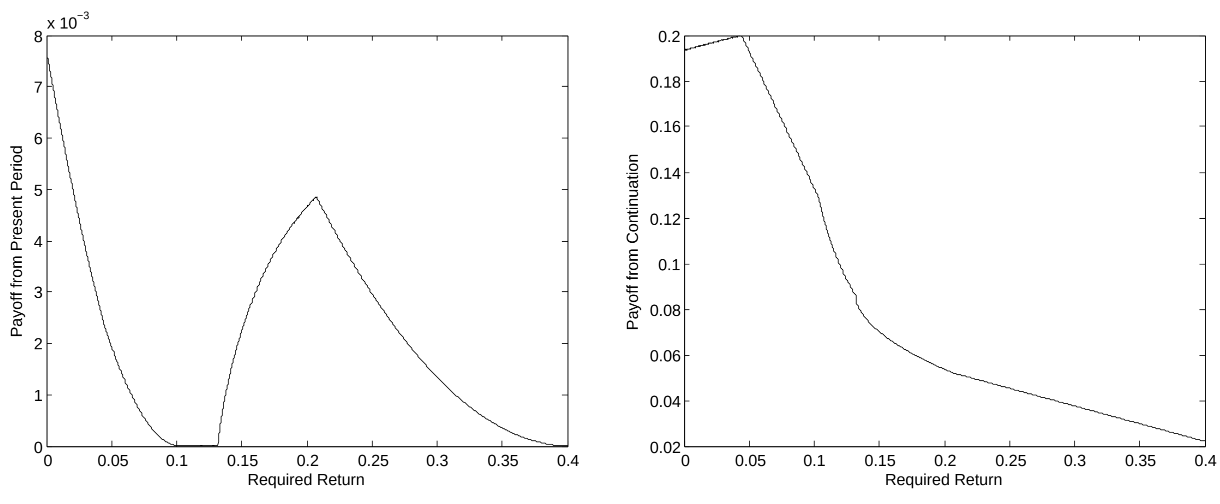

Figure 3: Payoff divided into constituents: Present and Continuation Value

Parameter values are $k = 0.02, s = 0.2, V_c = 0.2, rr_1{}^* = 10\%, c_a = 50$

Optimal Effort by Manager

The optimal value of effort a^* in this case is:

$$a^* = \frac{s(\sigma - rr_0) + V_c(1 - \rho\sigma)}{2\sigma c_a - s} \tag{10}$$

Effort generally increases with share of profits s and continuation value V_c and decreases with cost of effort c_a and required return rr. This is because as managers have higher hopes of reaching required rate of return due to larger variance, they put more effort.

Optimal Risk Taking by Manager

The optimal choice of variance σ^{*2} made by the manager is:

$$\sigma^{*2} = \frac{s(a - rr_0)^2 + 2V_c(a - r_{01}^*)}{s - 2\rho V_c} \tag{11}$$

Optimal variance is determined by two terms: the first term that appears from the option part of the contract in the present period and the second term that depends on continuation value. The dependence of variance on the squared difference between effort and required return shows that while effort drops monotonically when required return increases, variance first drops and then rises back up.

Economically, the manager first tries to put effort to reach back above required return and get continuation value as well. However, as the probability of continuing decreases, the manager reduces costly effort and increases variance in the hopes of reaching required return to hit the HWM by luck.

Optimal Walkaway point by Investor

We discussed earlier that the investor may choose to walk away at time T_0 and time T_1 if she the effort and variance chosen by the agent do not add value for the investor. At time T_0, the principal anticipates agent's effort and variance by observing required return rr_0 for the agent to reach last HWM.

Thus given a certain a^*, σ^*, the principal's expected payoff is the return due to agent's choice of effort and risk net of agent's wage (from equation 4). The investor compares it with the present value of the fund and remains invested if:

$$v_0 < v_{1,\text{after fees}} \equiv v_0 \mathbb{E}\left[1 + a^*(rr_0) + \sigma^*(rr_0)\tilde{\epsilon} - k - s\frac{(a^*(rr_0) + \sigma^*(rr_0) - rr_0)^2}{4\sigma^*(rr_0)}\right] \tag{12}$$

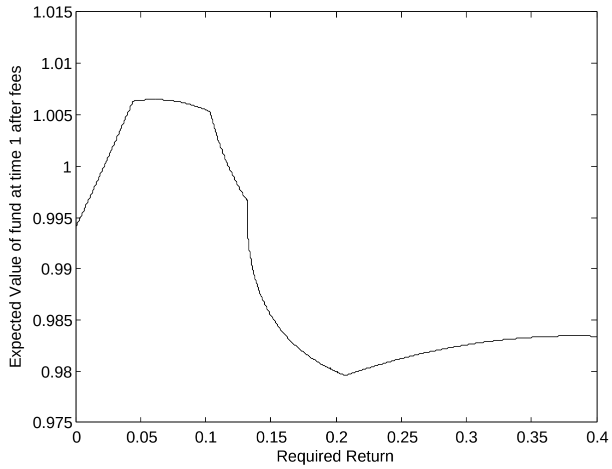

Figure 4: Expected value of fund after management fees at time T_1

Parameter values are $k = 0.02, s = 0.2, V_c = 0.2, rr_1{}^* = 10\%, c_a = 50$

Figure 4 shows the expected value of fund at time T_1 after paying management fees. As we can see above, it is optimal for the principal to walk away when required return $rr_0 < 2.5\%$ and also when required return $rr_0 > 12.5\%$. When required return to hit HWM is high, the manager puts less effort and takes more risk resulting in loss of firm value in expectation. Hence, it is optimal for the principal to walk away when rr_0 is high. On the other hand, the investor also loses value in expectation when the required return is too low, and the manager almost certainly gets bonus worth 20% of firm value above HWM.

In empirical results we can only identify walkaway when required return is high. However, if there is a backload on a fund, i.e. a fees which the investor has to pay if she wishes to walkaway (in this case if the load is higher than 0.5%), then the investor will choose to remain invested in the leftmost region of figure 4, and walkaway will only happen if required return is high (here $rr_0 > 12.5\%$).

The next section provides empirical results.

3 Empirical Results

The empirical portion of this study uses data from the CISDM database. The CISDM database provides information on fees, returns, assets under management (AUM) and active/inactive status for close to 9000 hedge funds, funds of funds, commodity pool operators (CPOs) and commodity trading advisers (CTAs). Summary statistics for the data can be found in Table 1. Panel A reports characteristics for the funds in our sample. There are a total of 8,752 funds in our sample. The variables are defined as per CISDM documentation. The funds in our sample have an average management and incentive (performance) fees of 1.51% and 17.23% respectively. Additionally, some funds also have a sales fee of 0.56% per year. The active flag is equal to 1 if the fund is currently still reporting and is 0 otherwise. Although there are a variety of reasons why funds stop reporting (see Grecu, Malkiel, and Saha (2006)), our conversations with CISDM suggest the two principle reasons are: (1) the fund ceases operating because the investors pull the money or the managers close shop, that is, either party walks away, and (2) the fund does exceedingly well and stops taking new investment. We identify a walkaway result, (1), as an inactive fund that stops reporting while the return process is below the HWM level. We classify all funds that stop reporting while the return process is at the HWM level as funds that are closed to new investment, (2), and are treated as not ending in a walkaway. The gate percent is the maximum percentage of a fund that may be withdrawn in a given period. Only 175 funds in our sample have a gate, and the average gate percentage for these funds is 12.7%. CTA, Hedge Fund, Fund of Funds (Fof) and CPO and Index flags are set to one if the funds are identified as such by the CISDM database. 872 funds responded to whether they used a HWM and 96% of responders said they used a HWM in their compensation contracts. This is in contrast to the dataset used by Aragon and Qian (2006), in which the majority of funds did not use a HWM feature. The high incidence of the HWM feature gives us some comfort in running the empirical study for the entire sample of returns.

Panel B reports summary statistics for these walkaway results and for the returns. Excess returns are computed by subtracting the average of all fund returns for a given month from the monthly return of each fund. Monthly returns are simply raw monthly returns for each fund, net of fees. The return process is defined as beginning at one for each fund at inception (or at the beginning of the sample period) and reflects the compound impact of all monthly returns until that period. It can also be thought of as the value of a dollar invested in the fund at inception in the current period. The HWM is defined as the maximum of the return process until the current point in time for each fund and the return to HWM is defined as the the return required to hit the HWM (or the HWM divided by the current return process minus one). If the return process is at its maximum, the return required to hit the HWM is 0. We assume that the incentive fees are paid out monthly and that the HWM is reset monthly. In practice, funds generally pay incentive fees quarterly, half yearly or yearly, but CISDM does not report when the fees are paid and when the reset takes place. Walkaway, as defined in the previous paragraph, appears in 0.70% of the fund-periods.

We note that the HWM level as constructed does not factor in new money. For example, a fund that receives new money during a dip in their return process will have some money that is indexed to a lower HWM than what our empirical analysis suggests. CISDM does not report inflow and outflow numbers separately and even with AUM /net flow numbers for each period, it is impossible to correct for this effect. However, despite this limitation, we take comfort in knowing that the return to the HWM that we use in our analysis is the theoretical maximum. The actual return required to hit the HWM can only be lower than this number as no money could possibly have entered the fund while it was higher than the maximum in the return process. Thus, if we find a statistical and economically significant impact on our dependent variable assuming the maximum return required, actual return required would produce only a magnified impact. For example, we calculate that a fund requires 20% to hit the HWM, but in actuality, it requires only 10% to hit the HWM as some money entered the fund after the maximum in the return process was hit and is benchmarked to a lower HWM. Comparing this fund to other funds which are at their HWM, we find it is more likely to experience walkaway and the fund manager is likely to exert less effort. We conclude that a 20% return required to hit a HWM produces these effects; in actuality, only a 10% return required is needed to produce these effects. Thus, in some sense, if our results do err due to this construction of the HWM, they err conservatively. To further address concerns regarding this issue, we conduct some robustness tests by eliminating the portion of the sample we believe to suffer most from this issue. We discuss this further in the robustness section below.

3.1 Univariate Analysis

Table 2 shows the univariate analysis of the impact of the return required to hit the HWM on subsequent period excess returns. The sample is divided into deciles by return required to hit the HWM. Note that for the lowest four deciles, the fund is at the HWM, and hence they are condensed into a single group and the return required to hit the HWM for these funds is 0.

Panel A shows the mean return required, average 1 month realized return and average 6 month realized return. We note that the average future return for funds at the HWM (next month return = 0.26%) is higher than funds below the HWM (next month return -0.17% to -0.23%). Since effort in our model directly leads to improved returns in expectations, this is consistent with empirical predictions from our model. Panel B shows the standard deviation of return required, 1 month realized return and 6 month realized return. We note that the standard deviation of returns when a fund is further from a HWM (10.21% for next month returns, 30.87% for next 6month returns for funds in the 10th decile of return required to hit the HWM) is much higher than that for the overall sample of funds (next month return standard deviation for all funds is 5.79%, next 6 month standard deviation is 17.19%). For both next month and next 6 month returns, there is a U-shaped relationship, with the standard deviation falling and then rising again with the return required. The increase in the higher deciles is consistent with economic intuition that fund managers become desperate when they are far from their HWM and increase risk in the hopes of somehow returning the HWM. However, the initial drop is a bit more interesting and resonates well with the intuition that fund managers voluntarily reduce risk to increase the probability of continuation of the fund and of earning the continuation value. In fact, this U-shaped pattern is exactly in what is predicted by our model (Figure 2).

In general, the univariate results reveal definite patterns to the returns. Persistence of returns and the need to control for the risk/return tradeoff requires multivariate analysis. Controlling for historical returns and realized variance or average returns allows us clarify the choice decisions of the manager.

Table 3 shows the univariate analysis of the impact of the return required to hit the high watermark on walkaway rates for both the next month and for the following 6 month period. These results are unequivocal. We see clear evidence of increasing walkaway incidence as the return required to hit the HWM increases. Looking at 6-month walkaway rates, we see funds at the HWM (Decile 1) have a 1.1% chance of walking away whereas fund in the highest decile of return to HWM (average return to HWM is 300%) have a 12.3% chance of either the principal or agent walking away. Additionally, the incidence of walkaway increases monotonically with return required to hit the HWM. However, the distance to the HWM is closely tied to historical returns. In particular, if historical returns are low, the fund's distance to the HWM will be high. We use a multivariate logistic regression specification to control for this effect in Section 3.3.

Univariate analysis of the impact on returns required to hit the HWM on effort (as proxied by expected returns), risk and walkaway provides some preliminary support for our hypotheses from the model. We further test these hypotheses using multivariate regressions.

3.2 Impact of HWM on Effort Decisions

As in our model, effort in real life is unobservable. However, we use realized returns as a proxy for the amount of effort expended by the agent, while controlling for other factors that could affect returns, such as variance. Table 4 and 5 shows the regression of returns on a fund's distance from it's HWM. Table 4 shows the impact for returns required to hit the HWM on next month returns and Table 5 shows the same impact on next 6 month returns.

In table 4 we see that although the coefficient on the return required to hit the HWM is negative, it is not significant at the 5% level for any of our specifications. It is significant at the 10% level for the funds where the return required is less than 10% and the point estimate is -5.81. We can interpret this as implying a fund that is 10% away from the HWM at the end of the last period will underperform a fund at the HWM by 58 basis points the following month. This point estimate is statistically more significant and economically greater than that for funds which are further away from the HWM. The point estimate for funds where return required is greater than 10% is -0.011 and not statistically significant. Returning to our intuition that the contract is essentially a call option the manager has on the returns, these results are in consistent with the increased incentives for the fund manager to exert effort while this call option is close to the money as compared to when it is far out of the money.

We also note that there is a positive coefficient on the variance of the fund for the next 6 months with returns in the current month. For the entire sample of funds, there is a positive and significant coefficient (0.183) and when split between funds within a 10% return of the HWM and funds which need more than 10% return, we see that while both coefficients are positive and significant (0.269, 10% significance and 0.093, 5% significance, respectively) the point estimate for the funds within 10% return of their HWM is much higher. This is evidence of the general risk/return tradeoff faced by the funds (i.e. the higher the risk, the higher the expected return), but also of the poorer risks taken by funds further away from the HWM, as evidenced by the lower return generated by additional variance.

In table 5 we see, that for all specifications including controls, the impact of the returns required to hit the HWM at the end of the last period are negative and significant on the returns for the following 6 months. The reason the coefficient for the base regression is not significant is the countervailing effect of the increased variance for funds further away from the HWM, and thus increased returns due to the risk/return tradeoff. Looking at the regressions with control variables, we find once again that the effect is most significant when the funds are near the HWM, or the option is close to the money. The coefficient for the return to the HWM for funds that are within 10% of the HWM is an economically and statistically significant -28.03. This means that a fund 10% from the HWM is likely to underperform a fund at the HWM by 2.8% in the next 6 months. Given that the average returns for funds is about 1% a month, this is a significant fraction of expected returns. The corresponding coefficient for funds which are further than 10% away from the HWM is -0.077. Although statistically significant, this would mean a fund requiring a 100% return to hit the HWM would only underperform a fund requiring 10% to hit the HWM by 6.9 (7.7 bp * 90% increase in return required) basis points over the next 6 months. Once again, we see that this effect is much more stark while the compound call option is near the money.

The impact of variance highlighted for 1 month returns is seen more clearly for 6 month returns. For the entire sample, we see that increased variance during these 6 months does lead to increased returns: the coefficient on variance is statistically significant at 1.137. When splitting the sample into those funds within a 10% return of the HWM and those not, the coefficients are 1.576 and 0.612 respectively, both still statistically significant and positive, but the former significantly greater than the latter. Again, we see evidence of that managers take less efficient risks further away from the HWM.

While we interpret the increased expected returns closer to the HWM to be a sign of increased effort , a more cynical interpretation would involve a fund manager's ability to time returns. If a fund manager has any discretion over when returns would actually be realized (as is often the case for investors in illiquidly traded assets) he would certainly try to realize as much return as possible on winning positions and minimize realizations of losses while the fund is at the high watermark. Such an interpretation also comports well with findings from Aragon and Qian (2006) which suggest that funds with illiquid assets are more likely to use a HWM structure in their compensation scheme.

3.3 Impact of HWM on Walkaway Decisions

Brown, Goetzmann, and Park (2001) study the survival rates among hedge funds and CTAs, which show that poor returns in the previous periods increases the mortality rates of hedge funds. While historical returns are an integral part of generating the the distance from the HWM, we show that this distance has an independent effect on the walkaway rates. Table 6 shows a logistics regression of walkaway outcomes on a fund's distance from the HWM. The dependent variable is 1 if there is a walkaway at the end of the current period and 0 if there the fund continues. The coefficients presented are the odds ratios for walkaway for a unit change in each independent variable. Controls for the regressions include the overall return process and the fund's recent performance, time, the amount of time the fund has been in operation and what type of fund it is (these results are not displayed). We note that funds are more likely to experience walkaway when recent returns are lower and the longer the fund has been in existence (similar to Brown, Goetzmann, and Park (2001). We also note that funds are more likely to experience walkaway when they are further away from the HWM. We see positive and significant odds ratios for returns required on the 1 month walkaway rates (first two columns) and a positive, but insignificant odds ratio for the 6 month walkaway (third column). To better interpret these ratios, we truncate our returns required sample at 200%. We see the odds ratio for returns required on 1 month walkaway is 1.55. The interpretation of this odds ratio is

$$\frac{P(W|100\%rr)/P(NW|100\%rr)}{P(W|0\%rr)/P(NW|0\%rr)} = 1.55, \tag{13}$$

ignoring the second order terms, an approximation of this relationship would mean that

$$P(W|200\%rr) \approx 1.55 \times P(W|100\%rr) \approx 1.55 \times P(W|0\%rr) \tag{14}$$

where W and NW defines a walkaway and no walkaway outcome,respectively and rr is the return required to hit the HWM. In particular, the probability of walkaway for a fund that requires 100% returns to hit the HWM is 1.55 times higher than a fund at the HWM. We see a similar pattern for the 6 month walkaway odds ratios, where the odds ratio is a significant and positive 1.80. This is exactly what our model predicts: the further the fund is from the HWM, the higher the incidence of walkaway

One of the concerns with our definition of walkaway is that a fund at the HWM cannot have an incidence of walkaway. If a fund stops reporting while it is at the highest point in its return process we assume it is for reasons other than a walkaway. To correct for this definitional bias we run this same regression excluding all observations where funds are at their HWM. The results are presented in Table 7. Column 1 shows the results presented in the column 5 of Table 6 but only for observations where the fund is not at the HWM. We see the results are robust to this specification and the odds ratio is still positive and significant, albeit slightly lower at 1.58 (compared to 1.80 in Table 6). This table also shows the impact of the HWM is higher when funds are closer to the HWM than when funds are further away (odds ratio of 123.901 vs. 1.354). This suggests that initial decrease in walkaway as return required increases when return required is very low is not evident in the data (Figure 4). However, the subsequent increase in walkaway incidence as return required continues to increase is definitely clear in the data. For funds requiring 0-10% returns to hit their HWM, the odds ration (123.901) suggests that funds that require between 5 and 10% returns about 6 times more likely to experience walkaway than funds which require between 0 and 5%. [2]

3.4 Impact of HWM on Variance

Economic intuition and empirical predictions from our model suggests that managers further away from the HWM would increase risk. We noted in our univariate analysis a U-shaped pattern in which variance initially fell and then rose as distance from the HWM increased. Table 8 shows the regression of fund return standard deviation on a fund's distance from the HWM. The dependent variable is the standard deviation of a fund's returns for the next 6 months (including the current month). We see that, across the board, the further funds are from the HWM, the higher the standard deviation is for the next 6 months once we control for historical returns and the returns during this time period. For the entire sample with controls, the coefficient is significant and positive at 0.054. Splitting the sample into funds that are close to the HWM (return required less than 10%) and those that are far from the HWM, the coefficients are positive and significant at 16.31 and 0.033 respectively. We see that variance is much more sensitive to the returns required when the fund is close to the HWM.

We further analyze why there is a U-shaped pattern in the univariate analysis, but there is a monotonic relationship between return required and variance in Table 8. We run the regression in Table 8 with progressively fewer covariates until we observe the U-shaped pattern seen in the univariate analysis. As it turns out, simply removing all historical returns as covariates produces the U-shaped pattern seen before. The results are shown in Table 9. Panel A shows the regression with historical returns and Panel B shows the regression without any historical returns as controls. Only the coefficient on the return required to hit the HWM is shown. We see that in Panel B, variance of returns initially falls with with distance from the HWM and then increases again; however, controlling for historical returns, variance simply increases with distance from the HWM

[2] The odds ratio, 123.9, presents the change in the odds of walkaway for a unit change in the return required, thus for computing the difference between funds requiring 0-5% and 5-10% returns, we use the difference in the required return between these two categories, 5%, and multiply it by the odds ratio, 123, to obtain the increase in probability of walkaway

(Panel A). This suggests that when funds at their HWM experience a period of poor performance, managers decrease variance choices (this effect has been documented in Brown, Goetzmann, and Park (2001)). The univariate analysis reveals this clearly. However, this effect is not due to an increase in the distance from the HWM, but rather, due to the poor past returns. We also see evidence of this in Table 8. We note that for funds within a 10% return of their HWM, variance going forward increases with historical returns. For example, if returns in the preceding month were lower by 1% (controlling for distance to HWM and all the other variables), we expected standard deviation of returns for the next 6 months to be lower by 8.9 basis points. This is consistent with managers of funds close to their HWM decreasing variance as a result of losing money.

The intricate relationship between historical returns and distance to the HWM and the different effect of the two factors on future variance is evident in a hypothetical, extreme, example. Consider two funds currently at their HWM. The first fund loses 3% in the first year and has 0% returns for the next 9 years. The second fund has 0% returns for all ten years. The regression results suggest that at the 10 year mark, the first fund is expected to have a higher return variance than the second, since historical returns for the two funds are similar and zero and the first fund is further from the HWM. However, at the second year, the first fund will have lower variance because although the fund is further from the HWM, the variance is lower because historical returns have been lower.

3.5 Robustness and Discussion

Our results are robust to a wide variety of changes among various dimensions of our tests. We detail the robustness checks conducted below. Broadly, these tests can be classified into 4 distinct types. (1) We vary the historical return series lengths used as controls for the tests (2) We try to identify and eliminate portions of our sample in which the HWM as constructed is less likely to accurately reflect the actual HWM (3) We adjust our calculation of return required to hit the HWM to moderate the impact of outliers and (4) We adopt fixed effects 'within' regressions structure to control for innate differences in our funds. Out results are, by and large, robust to these various specifications.

The results presented control for historical excess returns of the funds going back two years before our period of interest. We do tests to control for returns going back even further. Tables 11, 12 and 13 present these results for the effort, walkaway and variance regressions respectively. Our results are robust to addition of all five years of returns for walkaway and variance regressions. For the effort regressions, our results are robust to adding in historical returns going back 4 years.

Given the half lives of these funds, the sample shrinks significantly for each additional year of historical returns added to the controls. When adding the 5th year (i.e. controlling for the return series from t-60 to t-1), the results are no longer significant, although they are still directionally consistent. We also note that that sample size drops to about a quarter of the total number of observations. However, rather than interpreting this as a failure of our hypotheses, we believe that these results are due to other effects. For example, a fund that has existed for 5 years will have built up a significant reputation, and effort and walkaway decisions will no longer solely be based on maximizing the value of payoffs from returns above the HWM. Additionally, a fund that has existed for 5 years will likely also have monies that have been deposited after that HWM was reached so the return required to hit the HWM calculation we use will not produce as crisp a barometer to measure the incentives of the fund managers.

The construction of the HWM, as mentioned in section 3 above, suffers from the drawback that it doesn't adequately reflect monies that might have been invested after a fund reached a HWM which are benchmarked to a lower HWM than what we use. Partly to mitigate this and partly to control for what we call a 'seasoning' effect, we perform a robustness test looking at observations where the following condition is met: the current return required to hit the HWM is the maximum return required to hit the HWM in the fund's history. In other words, observations for this test include funds that have never been this far away from their HWM before and are unseasoned as to their actions under this condition. Additionally, it is less likely (although still possible) that the HWM as defined above will not be representative for such a sample. The results for this test are presented in Table 14. The results are robust, and in fact, stronger than the original test.

One of the problems with the current construction of the "returns required to hit the HWM" is that when the return process gets really low, the return required rises astronomically. For example, a fund that started at 100, reached 200 and the fell to 10 has a return required of 2000%. We perform the overall sample regressions with controls for the impact of returns required on next period return and variance (second column of Tables 4, 5 and 8), capping the return required at 200%. The results are presented in Table 10. Our results are robust to this specification. In fact, the coefficients are more economically meaningful under this specification, as we can easily interpret them as the impact on returns and variance as the fund moves from a 200% return required to a 100% return required to being at the HWM.

Tables 15, 16 and 17 present regressions under a fixed effects 'within' regression structure. This entails adding in a dummy variable for each fund in the sample to control for innate differences in the funds. However, under this structure, we can no longer add in our rich historical series as this produces collinearity issues. From Panel A of Tables 15 and 16, we see that although across the entire sample, expected excess returns now do not have a clear relationship with distance from the HWM; when funds are within 10% return of their HWM, however, the results remain the robust, at least directionally. Thus a fund at the HWM is expected to outperform a fund 10% below the HWM by 35 and 21 basis points for a 1 month and 6 month period respectively. We do note that once funds have fallen past the 10% return required mark, this effect does not exist any longer. Similarly we see that variance does increase with distance from the HWM for funds which are within a 10% return of their HWM, although not statistically significantly. Panel B of these tables shows the same regressions, but only for unseasoned observations as defined previously in the robustness section. Again, since looking at funds which are encountering this magnitude of return required to hit the HWM for the first time, we expect the results to be crisper. Indeed, the results for all three regressions are much crisper. Focusing on the sample of funds which are within a 10% return of the HWM, we see that expected returns are much lower the further a fund is from the HWM. In fact, a fund 10% away from the HWM is likely to underperform a fund at the HWM by 69 basis points in the next month and 78 basis points over the next 6 months. Similarly, the standard deviation of returns for the next 6 months will also be 10 basis points higher point higher. We also note that the efficiency of risk taking decreases with distance from the HWM regardless of whether we consider the entire sample of funds or just the unseasoned observations. For example, looking at Panel A of Table 16, we see that funds within a 10% return of their HWM get 1.48% of expected return for the next 6 months return for each 1% additional standard deviation in the returns. Funds requiring more than 10% to hit their HWM only get 0.31% additional returns over the next 6 months for each additional 1% in standard deviation of the returns. This pattern is repeated throughout all the results presented in these six tables.

In general, our results are robust to a number of specifications. Even when results across the overall sample are weaker (such as under the fixed effects specification), results for funds that are close to the HWM, and thus more likely to experience an impact from the effect of the HWM, are robust. Additionally, corrections for our construction of the HWM, such as using only 'unseasoned' funds produce crisper results.

4 Conclusion

The HWM structure of money manager contracts has definite implications on investor and manager behavior. Using a principal-agent model to describe the relationship found in hedge fund contracts, we derive empirical implications in terms of the investor and fund manager's walkaway behavior as well as the manager's effort expenditure and portfolio risk decisions. Consistent with intuition, our model predicts that walkaway incidence will generally be greater when the fund is further away from the HWM. Effort expenditure is likely to be greater while the fund is closer to the HWM. Fund managers are also likely to take more risks the further their funds are from their HWMs.

We test these hypotheses on fund return and walkaway data obtained from CISDM. Empirical results precisely track predictions from our model. Walkaway is more likely when a fund is further from its HWM. We also find that funds closer to the HWM are more likely to generate superior returns going forward, which we interpret as evidence of increased effort expenditure.

In addition to walkaway and effort, we test the impact of the HWM on how much risk fund managers decide to take. Our findings are consistent with economic intuition: the further a fund is away from the HWM, the higher the variance of the returns going forward. However, we find that a period of poor returns tends to reduce risk taking. We interpret this is as a manager decreasing portfolio risk to maintain the continuation value of the contract. This intuition resonates well with Panageas and Westerfield (2008), who suggest that a fund manager will not choose an infinite amount of risk even when far from the HWM because of the continuation value of the contract. However, beyond a certain point, risk increases with distance from the HWM regardless of poor historical returns. Finally, we also see that the risks taken by fund managers when the fund is further away from the HWM are less efficient than funds close to the HWM: the increase in expected returns due to the increase in risk is lower when the fund is further away from the HWM.

The HWM structure of hedge fund and other money manager contracts have definite impact on the manager's effort and risk choices and the walkaway behavior of the investors and managers. Our empirical results are consistent with the model's predictions and economic intuition. The implications of such relationships are manifold: from portfolio allocation decisions of real-money managers, to marketing decisions on the part of hedge funds, and even to academic modeling decisions in terms of how to accurately characterize behavior of investors and fund managers. These, and many other, applications would benefit from a closer look at the impact of the HWM structure on fund manager and investor behavior.

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Table 1: Summary Statistics

The table reports the summary statistics of the database of hedge fund returns used. Panel A reports the characteristics of the funds and Panel B reports the return and walkaway characteristics of the funds.

Panel A: Fund Types and Fee Structures

Variable	Mean	Std. Dev	N
Incentive Fee (%)	17.23	6.45	8143
Management Fee (%)	1.51	0.91	8304
Sales Fee (%)	0.56	2.11	6326
Active	0.51	0.5	8752
Gate Percent (%)	12.7	15.92	175
HWM Used?	0.96	0.19	872
CPO Flag	0.13	0.33	8752
CTA Flag	0.13	0.33	8752
Hedge Fund Flag	0.5	0.5	8752
Fund of Fund Flag	0.24	0.43	8752
Index Flag	0.01	0.08	8752

Panel B: Return and Walkaway Characteristics

Variable	Mean	Std. Dev	N
Excess Returns (%)	0	5.786	493719
Monthly Returns (%)	0.947	5.997	493719
Return Process	1.991	2.397	493719
Return to HWM	0.324	40.443	493719
Walkaway	0.007	0.083	493719

Table 2: Impact of the HWM on Returns

The table shows the monthly and 6-monthly returns for a fund given the return required to hit the HWM. The sample is divided into deciles according the return required to hit the HWM at the end of the last period. Note that a large portion (approx. 40%) of the sample is at the HWM, hence the first decile with a positive return required to hit the HWM is the fifth decile. The first column shows the return required to hit the HWM. The second column shows the return for the next month. The third column shows the returns for the next 6 months (including the current month). Panel A displays to means for these variables and Panel B displays the standard deviations.

Panel A: Means

Return Req'd Decile	Return Req'd	1m Excess Return	6m Excess Return
1	0.00	0.26	0.69
5	0.01	-0.23	-1.24
6	0.02	-0.22	-1.04
7	0.04	-0.21	-0.83
8	0.09	-0.19	-0.51
9	0.18	-0.11	-0.44
10	1.37	-0.17	-1.03
Total	0.17	-0.01	-0.22

Panel B: Standard Deviation

Return Req'd Decile	Return Req'd	1m Excess Return	6m Excess Return
1	0.00	5.36	15.80
5	0.00	3.06	9.04
6	0.01	3.66	11.16
7	0.01	4.39	12.88
8	0.02	5.42	15.96
9	0.04	6.67	19.24
10	7.76	10.21	30.87
Total	2.48	5.79	17.19

Table 3: Impact of the HWM on Walkaway

The table shows the walkaway rates for a fun given the return required to hit the HWM. The sample is divided into deciles according the return required to hit the HWM at the end of the last period. Note that a large portion (approx. 40%) of the sample is at the HWM, hence the first decile with a positive return required to hit the HWM is the fifth decile. The first column shows the return required to hit the HWM. The second column shows the walkaway rate for the next month. The third column shows the walkaway rates for the next 6 months (including the current month). Each set of two rows has the mean and standard error for the variable being presented.

Return Req'd Decile	Return Req'd	Walkaway (%)	6-month Walkaway (%)
1	0.00	0.00	1.10
5	0.01	0.62	2.71
6	0.02	0.75	3.59
7	0.04	0.86	4.76
8	0.09	1.01	5.80
9	0.18	1.34	7.79
10	2.90	2.37	12.28
Total	0.32	0.69	4.13

Table 4: Fund 1-month Returns and Returns Required to hit the HWM

The table reports the results of a regression of fund returns on returns required to hit a HWM and various controls. The sample of returns is obtained from the CISDM database and spans from 1/1/1990 to 12/31/2005. The dependent variable is excess return for the current period. The first column presents a basic regression showing the impact of the return required to hit the HWM at the end of the previous period. The second column presents the same results but adds in control variables, including dummy variables for the type of fund, returns from previous periods and variance of returns for the next 6 months. The third and fourth column present the results with control variables, but split the sample into funds requiring less than a 10% return to hit the HWM and those requiring more than a 10% return to hit the HWM, respectively. The standard errors adjust for heteroskedasticity. +, * and ** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Variable	Basic	Controls	Return Req'd < 10%	Return Req'd > 10%
L. Return to HWM	-0.014	-0.019	-5.810	-0.011
	(0.010)	(0.014)	(3.249)+	(0.010)
t to t+5 Return Variance (%)		0.183	0.269	0.093
		(0.085)*	(0.155)+	(0.021)**
L. Return Process	0.066	0.118	-0.044	-0.027
	(0.029)*	(0.079)	(0.148)	(0.049)
L. High Watermark	-0.030	-0.114	0.044	0.002
	(0.027)	(0.075)	(0.142)	(0.035)
Months in Operation	-0.004	-0.001	-0.001	-0.001
	(0.000)**	(0.000)	(0.000)	(0.001)
Time	0.001	0.003	0.003	0.004
	(0.000)**	(0.001)**	(0.001)*	(0.001)**
L. Excess Returns (%)		0.058	0.016	0.079
		(0.008)**	(0.021)	(0.008)**
L2. Excess Returns (%)		-0.007	-0.004	-0.024
		(0.005)	(0.015)	(0.008)**
L3. Excess Returns (%)		0.011	-0.001	0.012
		(0.005)*	(0.012)	(0.007)+
L4. Excess Returns (%)		-0.013	-0.031	-0.002
		(0.004)**	(0.012)**	(0.007)
L5. Excess Returns (%)		-0.020	-0.023	-0.024
		(0.005)**	(0.010)*	(0.007)**
L6. Excess Returns (%)		0.026	0.003	0.044
		(0.005)**	(0.008)	(0.007)**
t-12 to t-7 Return (%)		0.005	0.001	0.007
		(0.002)*	(0.005)	(0.002)**
t-24 to t-13 Return (%)		-0.003	-0.001	-0.004
		(0.001)*	(0.002)	(0.001)*
Constant	0.013	-0.831	-0.841	-0.872
	(0.027)	(0.249)**	(0.338)*	(0.179)**
Observations	485063	305299	219962	85337
Adjusted R-squared	0.001	0.024	0.048	0.013

Table 5: Fund 6-month Returns and Returns Required to hit the HWM

The table reports the results of a regression of fund returns on returns required to hit a HWM and various controls. The sample of returns is obtained from the CISDM database and spans from 1/1/1990 to 12/31/2005. The dependent variable is excess return for next 6 month period, including the current period. The first column presents a basic regression showing the impact of the return required to hit the HWM at the end of the previous period. The second column presents the same results but adds in control variables, including dummy variables for the type of fund, returns from previous periods and variance of returns for the next 6 months. The third and fourth column present the results with control variables, but split the sample into funds requiring less than a 10% return to hit the HWM and those requiring more than a 10% return to hit the HWM, respectively. The standard errors adjust for heteroskedasticity. +, * and ** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Variable	Basic	Controls	Return Req'd < 10%	Return Req'd > 10%
L. Return to HWM	0.009	-0.116	-28.034	-0.077
	(0.021)	(0.027)**	(3.433)**	(0.022)**
t to t+5 Return Variance (%)		1.137	1.576	0.612
		(0.124)**	(0.141)**	(0.062)**
L. Return Process	-0.022	0.679	0.421	-0.073
	(0.081)	(0.130)**	(0.432)	(0.119)
L. High Watermark	0.155	-0.650	-0.414	-0.034
	(0.074)*	(0.123)**	(0.414)	(0.089)
Months in Operation	-0.022	-0.004	-0.003	-0.008
	(0.001)**	(0.001)**	(0.001)**	(0.002)**
Time	0.006	0.016	0.017	0.021
	(0.001)**	(0.001)**	(0.001)**	(0.002)**
L. Excess Returns (%)		0.052	-0.108	0.105
		(0.013)**	(0.034)**	(0.018)**
L2. Excess Returns (%)		0.004	-0.098	0.030
		(0.010)	(0.028)**	(0.018)+
L3. Excess Returns (%)		0.016	-0.071	0.049
		(0.011)	(0.021)**	(0.018)**
L4. Excess Returns (%)		0.025	-0.047	0.063
		(0.011)*	(0.016)**	(0.018)**
L5. Excess Returns (%)		0.056	0.006	0.079
		(0.013)**	(0.011)	(0.018)**
L6. Excess Returns (%)		0.088	0.033	0.126
		(0.016)**	(0.015)*	(0.018)**
t-12 to t-7 Return (%)		-0.035	-0.036	-0.040
		(0.004)**	(0.006)**	(0.006)**
t-24 to t-13 Return (%)		-0.009	0.002	-0.010
		(0.002)**	(0.002)	(0.003)**
Constant	0.225	-4.594	-5.113	-3.879
	(0.078)**	(0.369)**	(0.323)**	(0.486)**
Observations	442877	281404	203532	77872
Adjusted R-squared	0.002	0.101	0.219	0.030

Table 6: Walkaway and Returns Required to hit the HWM

The table reports the results of a logistic regression of fund walkaway outcomes on returns required to hit a HWM and various controls. The sample is obtained from the CISDM database and spans from 1/1/1990 to 12/31/2005. The dependent variable is a walkaway outcome in the next month or in the next 6 months. The odds ratios are presented in the table along with standard errors for these ration, The first column presents a basic regression showing the impact of the return required to hit the HWM at the end of the period on next month walkaway. The second column presents the same results but adds in control variables, including dummy variables for the type of fund, and returns from previous periods. The third column presents the impact of the variables detailed in column 2 on walkaway outcomes in the next 6 months. The fourth and fifth columns truncate the returns required to hit the HWM at 200% so the odds ratios can be more meaningfully interpreted. The standard errors adjust for heteroskedasticity. +, * and ** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Variable	Base	1m Walkaway	6m Walkaway	1m Walkaway	6m Walkaway
Return to HWM	1.0106	1.0005	1.0005		
	(0.0013)**	(0.0001)**	(0.0003)		
Return to HWM (200% Cap)				1.5498	1.8045
				(0.0946)**	(0.0452)**
Return Process	0.7664	0.9533	0.9770	0.9635	0.9852
	(0.0409)**	(0.0293)	(0.0096)*	(0.0257)	(0.0078)+
Months in Operation	1.0099	1.0000	0.9993	0.9992	0.9984
	(0.0009)**	(0.0010)	(0.0004)*	(0.0009)	(0.0003)**
Time	1.0046	1.0073	1.0063	1.0077	1.0066
	(0.0003)**	(0.0005)**	(0.0002)**	(0.0005)**	(0.0002)**
Excess Returns (%)		0.9542	0.9601	0.9604	0.9702
		(0.0029)**	(0.0018)**	(0.0026)**	(0.0016)**
L. Excess Returns (%)		0.9708	0.9662	0.9777	0.9759
		(0.0034)**	(0.0019)**	(0.0031)**	(0.0017)**
L2. Excess Returns (%)		0.9688	0.9689	0.9751	0.9777
		(0.0035)**	(0.0019)**	(0.0031)**	(0.0017)**
L5. Excess Returns (%)		0.9833	0.9734	0.9879	0.9814
		(0.0038)**	(0.0019)**	(0.0033)**	(0.0016)**
L6. Excess Returns (%)		0.9743	0.9752	0.9805	0.9832
		(0.0035)**	(0.0019)**	(0.0031)**	(0.0016)**
t-12 to t-7 Return (%)		0.9854	0.9879	0.9898	0.9929
		(0.0023)**	(0.0009)**	(0.0021)**	(0.0008)**
t-24 to t-13 Return (%)		0.9931	0.9924	0.9948	0.9945
		(0.0010)**	(0.0005)**	(0.0008)**	(0.0004)**
Observations	493719	311490	311490	311490	311490

Table 7: Walkaway and Returns Required to hit the HWM

The table reports the results of a logistic regression of fund walkaway outcomes on returns required to hit a HWM and various controls. The sample is obtained from the CISDM database and spans from 1/1/1990 to 12/31/2005. The dependent variable is a walkaway outcome in the next 6 months. The odds ratios are presented in the table along with standard errors for these ration, The first column presents a regression showing the impact of the return required to hit the HWM at the end of the period on next month walkaway for all observations where the fund is not at the HWM. The second column presents the same results but only for funds where return required otto hit the HWM are less than 10%. The third column presents the same results as column 1 but only for funds which require more then 10% to hit the HWM. The standard errors adjust for heteroskedasticity. $^+$, * and ** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Variable	Return Req'd > 0	0 < Return Req'd < 10%	Return Req'd > 10%
Return to HWM (200% Cap)	1.581	123.901	1.354
	(0.044)**	(78.059)**	(0.039)**
Return Process	0.993	1.060	0.976
	(0.015)	(0.109)	(0.013)+
High Watermark	0.989	0.945	0.994
	(0.008)	(0.091)	(0.007)
Months in Operation	0.998	0.999	0.996
	(0.000)**	(0.001)*	(0.000)**
Time	1.007	1.006	1.008
	(0.000)**	(0.000)**	(0.000)**
Excess Returns (%)	0.972	0.971	0.978
	(0.002)**	(0.006)**	(0.002)**
L. Excess Returns (%)	0.981	0.955	0.986
	(0.002)**	(0.005)**	(0.002)**
L2. Excess Returns (%)	0.981	0.965	0.987
	(0.002)**	(0.005)**	(0.002)**
L5. Excess Returns (%)	0.983	0.963	0.988
	(0.002)**	(0.004)**	(0.002)**
L6. Excess Returns (%)	0.985	0.962	0.990
	(0.002)**	(0.005)**	(0.002)**
t-12 to t-7 Return (%)	0.994	0.978	0.997
	(0.001)**	(0.002)**	(0.001)**
t-24 to t-13 Return (%)	0.995	0.988	0.996
	(0.000)**	(0.001)**	(0.000)**
Observations	202914	115621	87293

Table 8: Return Variance and Returns Required to hit the HWM

The table reports the results of a regression of fund return variance on returns required to hit a HWM and various controls. The sample of returns is obtained from the CISDM database and spans from 1/1/1990 to 12/31/2005. The dependent variable ia the variance of excess returns for next 6 month period, including the current period. The first column presents a basic regression showing the impact of the return required to hit the HWM at the end of the previous period. The second column presents the same results but adds in control variables, including dummy variables for the type of fund, returns from previous periods and returns for the next 6 months. The third and fourth column present the results with control variables, but split the sample into funds requiring less than a 10% return to hit the HWM and those requiring more than a 10% return to hit the HWM, respectively. The standard errors adjust for heteroskedasticity. $^{+}$, * and ** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Variable	Basic	Controls	Return Req'd $<$ 10%	Return Req'd $>$ 10%
L. Return to HWM	0.100	0.054	16.313	0.033
	(0.011)**	(0.008)**	(1.170)**	(0.006)**
L. Return Process	-0.828	-0.311	0.001	-0.222
	(0.038)**	(0.027)**	(0.141)	(0.028)**
L. High Watermark	0.906	0.316	0.024	0.168
	(0.036)**	(0.027)**	(0.137)	(0.021)**
Months in Operation	-0.003	-0.001	-0.001	-0.001
	(0.000)**	(0.000)*	(0.000)*	(0.000)*
Time	-0.018	-0.007	-0.010	-0.004
	(0.000)**	(0.000)**	(0.000)**	(0.000)**
t-6 to t-1 Return Variance (%)		0.406	0.080	0.536
		(0.029)**	(0.035)*	(0.007)**
Excess Returns t to t + 5 (%)		0.079	0.131	0.022
		(0.014)**	(0.024)**	(0.003)**
L. Excess Returns (%)		-0.036	0.089	-0.038
		(0.015)*	(0.029)**	(0.004)**
L6. Excess Returns (%)		-0.035	0.014	-0.017
		(0.015)*	(0.012)	(0.004)**
t-12 to t-7 Return (%)		0.014	0.025	0.008
		(0.001)**	(0.002)**	(0.001)**
t-24 to t-13 Return (%)		0.005	0.006	0.003
		(0.001)**	(0.001)**	(0.001)**
Observations	476500	281404	203532	77872
Adjusted R-squared	0.082	0.335	0.335	0.377

Table 9: Return Variance Regressions - Impact of Historical Returns

The table reports the results of a regression of fund return variance on returns required to hit a HWM and various controls. The sample of returns is obtained from the CISDM database and spans from 1/1/1990 to 12/31/2005. The dependent variable ia the variance of excess returns for next 6 month period, including the current period. Panel A presents the regression with all controls shown in Table 8 Column 2 but split more finely by return required to hit the HWM. The first column shows only observations where the return required at the end of the previous period was less than 3%, the second column shows observations where the return required was between 3% and 7%. The third column show observations where return required was between 7% and 15% and the fourth column shows observations with greater than 15% return required. Panel B shows this same regression but removes all historical returns from the controls.The standard errors adjust for heteroskedasticity. $^{+}$, * and ** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Panel A: Historical Returns in Controls				
Variable	RR $<$ 3%	3% $\leq$ RR $<$ 7%	7% $\leq$ RR $<$ 15%	RR $\geq$ 15%
L. Return to HWM	23.909	8.697	4.508	0.031
	(2.937)**	(1.351)**	(0.862)**	(0.006)**
Observations	153024	34265	34607	59508
Adjusted R-squared	0.381	0.368	0.331	0.371

Panel B: Historical Returns not in Controls				
Variable	RR $<$ 3%	3% $\leq$ RR $<$ 7%	7% $\leq$ RR $<$ 15%	RR $\geq$ 15%
L. Return to HWM	-2.969	6.598	5.036	0.048
	(0.660)**	(0.940)**	(0.615)**	(0.006)**
Observations	251660	53449	50407	79286
Adjusted R-squared	0.157	0.330	0.292	0.335

Table 10: Robustness: Returns Required to hit the HWM Capped at 200%

The table reports the results of a regression of fund returns and fund return variance on returns required to hit a HWM and various controls. The sample of returns is obtained from the CISDM database and spans from 1/1/1990 to 12/31/2005. The dependent variable in the first column is 1 month returns. The dependent variable in the second column is 6 month returns and the dependent variable in the third column is the variance of excess returns for next 6 month period, including the current period. All columns show the impact of return required to hit the HWM at the end of the last period and add in control variables, including dummy variables for the type of fund, returns from previous periods and returns for the next 6 months. The standard errors adjust for heteroskedasticity. $^{+}$, * and ** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Variable	1 month Return	6 month Return	6 month Return Std. Dev.
L. Return to HWM (200% Cap)	-0.690	-4.367	2.816
	(0.504)	(0.730)**	(0.145)**
L. Return Process	0.027	0.106	0.010
	(0.038)	(0.092)	(0.021)
L. High Watermark	-0.033	-0.141	0.031
	(0.035)	(0.085)+	(0.019)
Months in Operation	-0.000	-0.001	-0.002
	(0.001)	(0.001)	(0.000)**
Time	0.003	0.016	-0.007
	(0.001)**	(0.001)**	(0.000)**
L. Excess Returns (%)	0.055	0.032	-0.013
	(0.009)**	(0.013)*	(0.014)
L5. Excess Returns (%)	-0.023	0.042	-0.014
	(0.006)**	(0.012)**	(0.014)
L6. Excess Returns (%)	0.023	0.074	-0.017
	(0.006)**	(0.015)**	(0.013)
t-12 to t-7 Return (%)	0.003	-0.045	0.021
	(0.003)	(0.005)**	(0.001)**
t-24 to t-13 Return (%)	-0.004	-0.013	0.008
	(0.002)*	(0.002)**	(0.001)**
t to t+5 Return Std. Dev. (%)	0.195	1.210	
	(0.093)*	(0.128)**	
t-6 to t-1 Return Std. Dev (%)			0.326
			(0.030)**
Excess Returns t to t + 5 (%)			0.078
			(0.014)**
Observations	305299	281404	281404
Adjusted R-squared	0.024	0.104	0.352

Table 11: Additional Historical Return Data - Effort

The table reports the results of a regression of fund 6 month returns on returns required to hit a HWM and various controls. The sample of returns is obtained from the CISDM database and spans from 1/1/1990 to 12/31/2005. The dependent variable is 6 month returns. All the regressions are based on the regression shown in column two of Table 5 and include (but may not present) all the same controls. The returns required to hit the HWM are capped at 200%. The first column adds returns from 3 years ago. The second column adds returns from 4 years ago and the third column adds returns from 5 years ago. The standard errors adjust for heteroskedasticity. $^{+}$, * and ** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Variable	t-36 to t-25 Returns	t-48 to t-37 Returns to	t-60 to t-49 Returns
L. Return to HWM (200% Cap)	-3.898	-3.956	-0.514
	(0.865)**	(0.900)**	(0.316)
L. Return Process	0.009	0.139	0.064
	(0.094)	(0.096)	(0.101)
L. High Watermark	0.004	-0.188	-0.133
	(0.088)	(0.089)*	(0.094)
L. Excess Returns (%)	0.038	0.030	0.068
	(0.014)**	(0.016)+	(0.016)**
L6. Excess Returns (%)	0.067	0.067	0.086
	(0.016)**	(0.018)**	(0.022)**
t-12 to t-7 Return (%)	-0.044	-0.043	-0.026
	(0.006)**	(0.007)**	(0.005)**
t-24 to t-13 Return (%)	-0.012	-0.006	0.009
	(0.003)**	(0.004)+	(0.003)**
t-36 to t-25 Return (%)	-0.016	-0.024	-0.023
	(0.002)**	(0.003)**	(0.002)**
t to t+5 Return Std. Dev. (%)	1.045	1.143	0.449
	(0.166)**	(0.189)**	(0.046)**
t-48 to t-37 Return (%)		0.029	0.039
		(0.003)**	(0.003)**
t-60 to t-49 Return (%)			0.009
			(0.002)**
Observations	218842	168972	129256
Adjusted R-squared	0.077	0.096	0.031

Table 12: Additional Historical Return Data - Walkaway

The table reports the results of a regression of fund 6 month walkaway incidence on returns required to hit a HWM and various controls. The sample of returns is obtained from the CISDM database and spans from 1/1/1990 to 12/31/2005. The dependent variable is 1 if there is a walkaway in the next 6 months and 0 otherwise. All the regressions are based on the regression shown in column five of Table 6 and include (but may not present) all the same controls. The first column adds returns from 3 years ago. The second column adds returns from 4 years ago and the third column adds returns from 5 years ago. The standard errors adjust for heteroskedasticity. $^{+}$, * and ** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Variable	t-36 to t-25 Returns	t-48 to t-37 Returns to	t-60 to t-49 Returns
Return to HWM (200% Cap)	1.704	1.564	1.578
	(0.049)**	(0.050)**	(0.057)**
Return Process	0.991	0.988	0.991
	(0.010)	(0.009)	(0.010)
High Watermark	1.006	1.014	1.008
	(0.007)	(0.007)*	(0.008)
Excess Returns (%)	0.971	0.971	0.972
	(0.002)**	(0.002)**	(0.002)**
L. Excess Returns (%)	0.977	0.977	0.978
	(0.002)**	(0.002)**	(0.002)**
L6. Excess Returns (%)	0.982	0.981	0.983
	(0.002)**	(0.002)**	(0.002)**
t-12 to t-7 Return (%)	0.992	0.991	0.992
	(0.001)**	(0.001)**	(0.001)**
t-24 to t-13 Return (%)	0.994	0.993	0.993
	(0.000)**	(0.001)**	(0.001)**
t-36 to t-25 Return (%)	0.995	0.994	0.993
	(0.000)**	(0.000)**	(0.001)**
t-48 to t-37 Return (%)		0.998	0.999
		(0.001)*	(0.001)
t-60 to t-49 Return (%)			1.001
			(0.000)**
Observations	243226	188221	144633

Table 13: Additional Historical Return Data - Variance

The table reports the results of a regression of fund 6 month return standard deviation on returns required to hit a HWM and various controls. The sample of returns is obtained from the CISDM database and spans from 1/1/1990 to 12/31/2005. The dependent variable is next 6 month return standard deviations. All the regressions are based on the regression shown in column two of Table 8 and include (but may not present) all the same controls. The returns required to hit the HWM are capped at 200%. The first column adds returns from 3 years ago. The second column adds returns from 4 years ago and the third column adds returns from 5 years ago. The standard errors adjust for heteroskedasticity. +, * and ** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Variable	t-36 to t-25 Returns	t-48 to t-37 Returns to	t-60 to t-49 Returns
L. Return to HWM (200% Cap)	2.762	2.339	2.025
	(0.144)**	(0.168)**	(0.159)**
L. Return Process	-0.000	-0.044	-0.071
	(0.022)	(0.022)*	(0.024)**
L. High Watermark	0.032	0.068	0.074
	(0.020)	(0.020)**	(0.023)**
L6. t to t+5 Return Std. Dev.	0.303	0.345	0.421
	(0.031)**	(0.041)**	(0.041)**
Excess Returns t to t + 5 (%)	0.065	0.072	0.020
	(0.015)**	(0.018)**	(0.002)**
L. Excess Returns (%)	-0.017	-0.013	0.010
	(0.016)	(0.019)	(0.004)*
L6. Excess Returns (%)	-0.019	-0.018	-0.030
	(0.015)	(0.018)	(0.025)
t-12 to t-7 Return (%)	0.021	0.020	0.015
	(0.002)**	(0.002)**	(0.002)**
t-24 to t-13 Return (%)	0.009	0.008	0.009
	(0.001)**	(0.001)**	(0.001)**
t-36 to t-25 Return (%)	0.004	0.005	0.004
	(0.001)**	(0.001)**	(0.001)**
t-48 to t-37 Return (%)		-0.001	0.002
		(0.001)	(0.001)**
t-60 to t-49 Return (%)			0.003
			(0.001)**
Observations	218842	168972	129256
Adjusted R-squared	0.348	0.361	0.449

Table 14: Robustness: Unseasoned Observations Only

The table reports the results of a regression of fund returns and fund return variance on returns required to hit a HWM and various controls. Only unseasoned funds, as defined in section 3.5 are included in the sample. A fund is unseaosned when the current period return required to hit a HMW is the maximum return required to hit a HWM historically. The sample of returns is obtained from the CISDM database and spans from 1/1/1990 to 12/31/2005. The dependent variable in the first column is 1 month returns. The dependent variable in the second column is 6 month returns and the dependent variable in the third column is the variance of excess returns for next 6 month period, including the current period. All columns show the impact of return required to hit the HWM at the end of the last period and add in control variables, including dummy variables for the type of fund, returns from previous periods and returns for the next 6 months. The standard errors adjust for heteroskedasticity. $^{+}$, * and ** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Variable	1 month Return	6 month Return	6 month Return Std. Dev.
L. Return to HWM	-0.066	-0.192	0.059
	(0.020)**	(0.039)**	(0.012)**
L. Return Process	0.891	1.935	-0.428
	(0.132)**	(0.193)**	(0.042)**
L. High Watermark	-0.823	-1.824	0.444
	(0.128)**	(0.187)**	(0.041)**
Months in Operation	-0.002	-0.005	-0.001
	(0.000)**	(0.001)**	(0.000)*
Time	0.003	0.020	-0.008
	(0.001)*	(0.002)**	(0.000)**
L. Excess Returns (%)	0.119	0.089	-0.048
	(0.022)**	(0.021)**	(0.021)*
L6. Excess Returns (%)	0.024	0.094	-0.045
	(0.007)**	(0.023)**	(0.022)*
t-12 to t-7 Return (%)	0.007	-0.034	0.015
	(0.003)*	(0.005)**	(0.002)**
t-24 to t-13 Return (%)	-0.006	-0.011	0.006
	(0.002)**	(0.003)**	(0.001)**
t to t+5 Return Std. Dev. (%)	-0.095	1.146	
	(0.131)	(0.167)**	
t-6 to t-1 Return Std. Dev.			0.389
			(0.036)**
Excess Returns t to t + 5 (%)			0.114
			(0.022)**
Observations	188407	174209	174209
Adjusted R-squared	0.094	0.140	0.317

Table 15: Fixed Effects Regression of 1 Month Returns on Distance from HWM

The table reports the results of a regression controlling for fixed effects of fund returns and fund return variance on returns required to hit a HWM and various controls. The sample of returns is obtained from the CISDM database and spans from 1/1/1990 to 12/31/2005. Panel A presents the results for all observations and Panel B presents only unseasoned observations, as defined in section 3.5. The dependent variable is 1 month excess returns. The first column presents results for all observations. The second column presents results for funds within 10% return of their HWM and the third column present results for funds further than 10% form their HWM. The standard errors adjust for heteroskedasticity. $^{+}$, * and ** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Panel A: All Observations

Variable	All	RR < 10%	RR ≥ 10%
L. Return to HWM	0.046	-3.410	0.037
	(0.016)**	(0.601)**	(0.016)*
L. Return Process	-0.033	-0.423	-0.528
	(0.048)	(0.208)*	(0.088)**
L. High Watermark	-0.224	0.221	-0.153
	(0.047)**	(0.208)	(0.065)*
t to t+5 Return Std. Dev. (%)	0.216	0.292	0.070
	(0.086)*	(0.137)*	(0.023)**
Observations	476500	369246	107254
Number of Fund ID	8477	8477	4490
Adjusted R-squared	0.021	0.037	0.012

Panel B: Unseasoned Observations

Variable	All	RR < 10%	RR ≥ 10%
L. Return to HWM	0.053	-6.880	0.047
	(0.018)**	(0.797)**	(0.017)**
L. Return Process	0.127	-0.353	-0.462
	(0.064)*	(0.273)	(0.106)**
L. High Watermark	-0.336	0.178	-0.159
	(0.063)**	(0.275)	(0.085)+
t to t+5 Return Std. Dev. (%)	0.240	0.328	0.020
	(0.115)*	(0.167)*	(0.032)
Observations	313337	251014	62323
Number of Fund ID	8477	8477	4490
Adjusted R-squared	0.027	0.051	0.011

Table 16: Fixed Effects Regression of 6 Month Returns on Distance from HWM

The table reports the results of a regression controlling for fixed effects of fund returns and fund return variance on returns required to hit a HWM and various controls. The sample of returns is obtained from the CISDM database and spans from 1/1/1990 to 12/31/2005. Panel A presents the results for all observations and Panel B presents only unseasoned observations, as defined in section 3.5. The dependent variable is 6 month excess returns. The first column presents results for all observations. The second column presents results for funds within 10% return of their HWM and the third column present results for funds further than 10% form their HWM. The standard errors adjust for heteroskedasticity. $^{+}$, * and ** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Panel A: All Observations

Variable	All	RR < 10%	RR ≥ 10%
L. Return to HWM	0.199	-2.103	0.139
	(0.047)**	(1.868)	(0.042)**
L. Return Process	-0.230	-3.051	-2.945
	(0.168)	(0.790)**	(0.213)**
L. High Watermark	-1.539	1.667	-0.992
	(0.175)**	(0.759)*	(0.169)**
t to t+5 Return Std. Dev. (%)	1.097	1.487	0.308
	(0.117)**	(0.129)**	(0.057)**
Observations	476216	369061	107155
Number of Fund ID	8477	8477	4487
Adjusted R-squared	0.091	0.146	0.060

Panel B: Unseasoned Observations

Variable	All	RR < 10%	RR ≥ 10%
L. Return to HWM	0.165	-7.770	0.131
	(0.050)**	(2.153)**	(0.046)**
L. Return Process	0.258	-3.285	-2.458
	(0.235)	(0.890)**	(0.285)**
L. High Watermark	-1.871	1.998	-1.230
	(0.241)**	(0.861)*	(0.236)**
t to t+5 Return Std. Dev. (%)	1.299	1.717	0.244
	(0.133)**	(0.120)**	(0.076)**
Observations	313173	250909	62264
Number of Fund ID	8477	8477	4487
Adjusted R-squared	0.119	0.205	0.059

Table 17: Fixed Effects Regression of Std. Dev. of 6 Month Returns on Distance from HWM

The table reports the results of a regression controlling for fixed effects of fund returns and fund return variance on returns required to hit a HWM and various controls. The sample of returns is obtained from the CISDM database and spans from 1/1/1990 to 12/31/2005. Panel A presents the results for all observations and Panel B presents only unseasoned observations, as defined in section 3.5. The dependent variable is 6 month excess returns. The first column presents results for all observations. The second column presents results for funds within 10% return of their HWM and the third column present results for funds further than 10% form their HWM. The standard errors adjust for heteroskedasticity. +, * and ** denote statistical significance at the 10%, 5% and 1% levels, respectively.

Panel A: All Observations

Variable	All	RR $<$ 10%	RR $\geq$ 10%
L. Return to HWM	-0.004	0.337	0.003
	(0.009)	(0.321)	(0.009)
L. Return Process	-0.105	-0.041	-0.160
	(0.027)**	(0.112)	(0.043)**
L. High Watermark	-0.021	-0.030	-0.015
	(0.028)	(0.113)	(0.032)
Ex. Ret. t to t+5 (S.A.)	0.048	0.079	0.010
	(0.008)**	(0.014)**	(0.002)**
Observations	476216	369061	107155
Number of Fund ID	8477	8477	4487
Adjusted R-squared	0.069	0.131	0.024

Panel B: Unseasoned Observations

Variable	All	RR $<$ 10%	RR $\geq$ 10%
L. Return to HWM	0.003	1.032	0.013
	(0.010)	(0.398)**	(0.009)
L. Return Process	-0.173	0.031	-0.190
	(0.037)**	(0.158)	(0.053)**
L. High Watermark	0.055	-0.068	-0.025
	(0.040)	(0.159)	(0.040)
Ex. Ret. t to t+5 (S.A.)	0.064	0.105	0.008
	(0.011)**	(0.019)**	(0.002)**
Observations	313173	250909	62264
Number of Fund ID	8477	8477	4487
Adjusted R-squared	0.098	0.193	0.022