On the Valuation of Performance Fees and Their Impact on Asset Managers' Incentives

Wei Dai, Robert C. Merton, and Savina Rizova

Wei Dai
is a senior researcher and vice president at Dimensional Fund Advisors in Singapore.
wei.dai@dimensional.com

Robert C. Merton
is distinguished professor of Finance at MIT Sloan School of Management in Cambridge, MA.
rmerton@mit.edu

Savina Rizova
is the head of research at Dimensional Fund Advisors in Santa Monica, CA.
savina.rizova@dimensional.com

KEY FINDINGS

- This article provides a practical framework for assessing performance fees based on standard option pricing models. The fee valuation does not require any expected return or alpha estimate, making this framework transparent, robust, and widely applicable.

- Using the framework, the authors show the incentive impact of performance fees and caution against the unintended consequences for manager behaviors.

- The article discusses the implications of performance fees in the context of systematic investing. This discussion is especially relevant today as asset owners are increasingly interested in the broader adoption of performance fee structures beyond traditional alternative investments.

ABSTRACT

This article provides a robust and practical framework for assessing performance fees. The fee valuation uses standard option pricing models and therefore does not require any expected return or alpha estimate. These features make the framework easy to use, robust, and widely applicable to a variety of fee structures in practice. The authors discuss the incentive impact of performance fees and caution against the unintended consequences for manager behaviors. These implications are especially relevant today, as systematic investing is on the rise and asset owners are increasingly interested in the adoption of performance fees across a broader range of investment styles.

TOPICS

*Derivatives, options, manager selection, performance measurement**

Performance fees, which give managers a percentage of the profits above a hurdle rate of return, have traditionally been associated with alternative investments. For example, hedge funds have opted for a "two and twenty" fee structure, which consists of a 2% base management fee charged on total assets under management (AUM) and a 20% performance fee charged on outperformance above a certain benchmark. Similarly, carried interest serves as a primary source of compensation for general partners of private equity funds upon a successful exit from an investment, typically amounting to 20% or more of the profit in excess of a hurdle rate. In more recent years, however, there has been a movement toward increasing adoption of

performance fees in the setup of long-only separately managed investments for large asset owners. Traditionally, such investments have not charged performance fees.[1]

As asset owners contemplate implementing performance-based fee structures across a broader group of managers, it is critical that the resulting implications and trade-offs are well understood. A fee structure that may be sensible for one type of manager may be less appropriate for another. Indeed, a fee structure that might work well for managers trying to outguess the market might not work well for managers that seek to outperform by using a systematic (factor-based) approach.[2] In view of the rise of systematic investing in recent years, one of the most important trends in the money management industry, it is time to revisit the framework for evaluating performance fees.[3]

This article aims to remind investors that they can use option theory to compare the cost of different fee structures and to analyze the incentives they provide. We first lay out the option-based framework for evaluating the cost of performance fees, which allows investors to easily compare different fee structures in the same unit as standard AUM percentage. This framework uses standard option pricing models and does not rely on a manager's alpha estimate or expected return assumptions. This makes the valuation framework highly robust, practical, and easy to use.

Not only does this framework facilitate a direct cost comparison of different fee structures, but it also offers useful insights into how fees impact managers' incentives and investment decisions. As a result, investors can readily analyze how the value of performance fees changes with different inputs and how the change in the value of performance fees, in turn, may induce certain manager behaviors. We discuss these consequences with respect to different types of investment approaches and point out why performance fees might not be suitable for certain investment styles, such as systematic investing. Ultimately, a deeper understanding of the incentive implications will help investors pursue an appropriate fee contract depending on their goals and intended outcomes.

Our work is related to a number of articles that apply an option pricing framework to study manager incentives.[4] For example, Kritzman (1987), Grinblatt and Titman (1989), and Anson (2001) use standard option pricing models to characterize performance fees. More recent articles model complex incentive environments with additional features, such as high-water mark[5] (Goetzmann, Ingersoll, and Ross 2003), positivity constraint[6] (Drago, Lazzari, and Navone 2005), managerial ownership in the fund (Kouwenberg and Ziemba 2007), investor redemption and prime

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[1] See, for example, https://www.gpif.go.jp/en/performance/annual_report_fiscal_year_2018.pdf.

[2] For the purpose of the discussions in this article, we use the terms "systematic" and "factor-based" broadly to refer to investment approaches that offer diversified exposures to return premiums (factors). However, systematic managers can differ substantially in their investment philosophy, research, portfolio design, portfolio management, and trading, all of which are important determinants of investment outcomes.

[3] For example, according to Morningstar, assets in smart beta exchange-traded products have grown from nil in 2000 to $705.1 billion as of the end of 2018 (https://www.morningstar.com/content/dam/marketing/shared/pdfs/Research/A_Global_Guide_To_Strategic_Beta_Exhange-Traded_Products.pdf). The 2019 FTSE Russell annual smart beta survey finds 58% of institutional investors surveyed have implemented smart beta strategies, up 10% from 2018 (https://www.ftserussell.com/press/global-smart-beta-adoption-reaches-record-high-58-percent).

[4] Other frameworks have also been proposed. For example, Hodder and Jackwerth (2007) use a discrete-time framework to model the incentives of hedge fund managers and numerically solve for their optimal behavior.

[5] High-water mark provisions are often built into performance fee contracts to ensure that if the strategy is underperforming, the manager must recoup its previous losses before receiving a performance bonus.

[6] Under the positivity constraint, managers can receive a performance fee only in periods for which the strategy return is positive.

broker forced deleverage (Buraschi, Kosowski, and Sritrakul 2014), and shared loss (Djerroud et al. 2016).[7] While the option theory application to performance fees is well documented, most articles present analysis from the perspective of hedge funds and the like. Similarly, many empirical studies on performance fees focus on alternative investments (see, for example, Ackermann, McEnally, and Ravenscraft 1999; Agarwal, Daniel, and Naik 2009; Ben-David, Birru, and Rossi 2020; Brown, Goetzmann, and Liang 2005; Brown, Goetzmann, and Park 2001). Although some articles have examined long-only managers using mutual fund data (see, for example, Elton, Gruber, and Blake 2003; Golec and Starks 2004; Drago, Lazzari, and Navone 2005; Díaz-Mendoza, López-Espinosa, and Martínez 2014; Servaes and Sigurdsson 2018), we are not aware of any that have specifically looked at systematic managers.[8]

As the use of performance fees becomes increasingly popular and spreads beyond alternative investments, our article serves as a timely reminder that option theory can be used to evaluate different investment management fee structures and to design appropriate incentive contracts. More importantly, to the best of our knowledge, our work is the first to discuss the implications of performance fees for systematic investing, an important trend in recent years. This makes our article immediately relevant for the growing number of systematic asset managers, as well as for the growing number of asset owners considering the use of performance fees for their systematic investments.

VALUATION OF PERFORMANCE FEES

Performance fees entitle the manager to a percentage of the profits above a hurdle over a stated period of investment. If the strategy's return is below the hurdle at the end of the measurement period, the manager receives no performance fee but does not usually share the downside by paying the client.[9] Effectively, this asymmetric fee structure gives the manager a call option on some percentage of the strategy's profits. Thus, we can value such performance fees using option pricing models. We will start with standard performance fee contracts, then extend the framework to include other features, such as fee caps and convexity.

Standard Performance Fees

Suppose a fee contract consists of two parts: (1) base management fee, m, which is a fixed percentage of AUM directly deducted from the asset balance, and (2) performance fee, p, which is a percentage of profits above a hurdle rate of return, h, paid at the end of the measurement period T. Let V_0 be the beginning value of the strategy and V_T its value at T, net of the fixed base fee paid throughout the period $[0, T]$.

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[7] Under a shared-loss fee structure, the fund manager will absorb the first loss up to a certain percentage of the initial investment.

[8] While the mutual fund industry provides a natural setting to study long-only managers, the data are limited by the fact that the use of asymmetric performance fees in mutual funds have been banned in the United States since 1971 (Golec and Starks 2004). Mutual fund studies therefore focus on asymmetric fees in US funds in the earlier years (Golec and Starks 2004), or on symmetric performance fees in US funds in the later years (Elton, Gruber, and Blake 2003), or on performance fees for European funds (Drago, Lazzari, and Navone 2005; Díaz-Mendoza, López-Espinosa, and Martínez 2014; Servaes and Sigurdsson 2018).

[9] There are performance-based fee contracts that provide some downside protection against losses to the investors, such as shared-loss and fulcrum fees. We do not discuss these cases in this article given their limited popularity.

EXHIBIT 1
Option-Like Payoff of Performance Fees
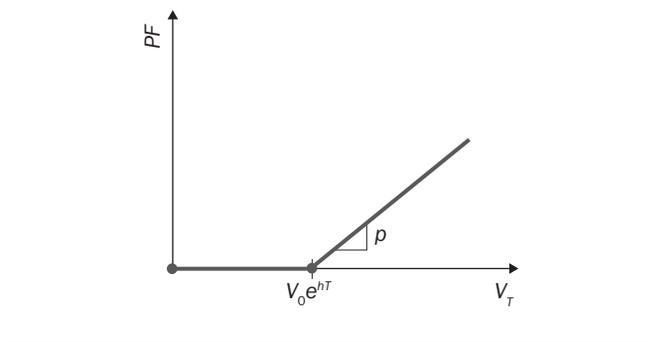
Under this contract, the performance fee portion paid to the manager, *PF*, is:

$$PF = p \cdot \max\{0, V_T - V_0 e^{hT}\} \tag{1}$$

The option-like payoff of PF at the end of the measurement period is illustrated in Exhibit 1, which is analogous to the payoff of a European call option. Using the Black–Scholes–Merton formula (Black and Scholes 1973; Merton 1973), the value of this equivalent call option depends on the current price of the underlying asset $S = V_0$, time to expiration T, strike price $K = V_0 e^{hT}$, volatility of the strategy returns σ, risk-free rate r, and dividend rate δ, which equals the fixed-rate base management fee, m.[10]

$$V(PF) = p \cdot (N(d_1)e^{-mT} - N(d_2)e^{hT}e^{-rT}) \cdot V_0 \text{ }^{[11]} \tag{2}$$

$$\text{where } d_1 = \frac{1}{\sigma\sqrt{T}}\left(\ln(e^{-hT}) + \left(r - m + \frac{\sigma^2}{2}\right)T\right) \text{ and } d_2 = d_1 - \sigma\sqrt{T}$$

We can express the value of total fees as a percentage of V_0 per year and define the fixed-fee equivalence of total fees as follows:

$$FFE^{Total} = m + \frac{V(PF)}{V_0 T} \tag{3}$$

Performance Fees Related to a Benchmark Portfolio

Another common type of performance fee contract is based on returns in excess of a benchmark portfolio, such as the S&P 500 Index. Suppose at the end of the measurement period, in addition to a base management fee, m, a contract grants the manager a percentage of the incremental return, p, above a benchmark return plus a hurdle rate, h. Let V_t^{Strat} and V_t^{BM} be the value at time t of a strategy and its benchmark, respectively, and $V_0^{Strat} = V_0^{BM} = V_0$. Then, the performance fee payoff to the manager, PF' is

$$PF' = p \cdot max\{0, V_T^{Strat} - V_T^{BM} e^{hT}\} \tag{4}$$

The payoff is analogous to that of an exchange option, which gives the holder the right to exchange one asset for another and can be valued using the Margrabe formula.[12,13] The option value depends on the volatility of the return differences between two assets. In our case, we need to replace σ in Equation 2 with

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[10] m, r, and δ are continuously compounded rates; σ is based on continuously compounded returns.

[11] $N(\cdot)$ denotes the cumulative distribution function of the standard normal distribution.

[12] See Margrabe (1978) for derivation of the value of exchange options. See also Fischer (1978) and Merton (1973) for option pricing with the stochastic exercise price.

[13] Kritzman (1987) was the first to recognize and apply the Margrabe model to the evaluation of performance fees relative to a benchmark. He showed that the value of performance fees is influenced by the tracking error of the portfolio against the benchmark, and as a result, the manager may be tempted to manipulate the portfolio's idiosyncratic risk in order to increase his chance of getting a higher fee. See also Wilmott (2007).

EXHIBIT 2
Illustration of Complex Performance Fee Structures

Panel A: Standard with Fee Cap | Panel B: Convex Fee Structure | Panel C: Concave Fee Structure
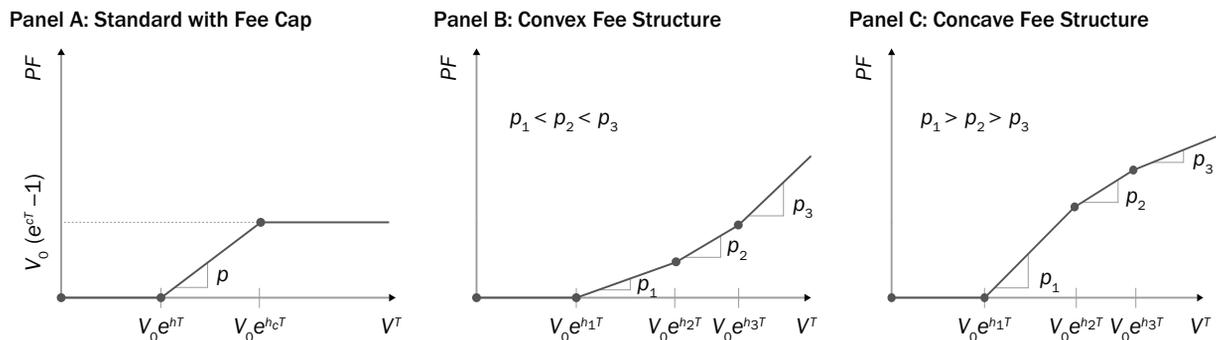
$\sigma' = \sqrt{\sigma_{Strat}^2 + \sigma_{BM}^2 - 2\rho\sigma_{Strat}\sigma_{BM}}$, where σ_{Strat} is the strategy's volatility, σ_{BM} is the benchmark's volatility, and ρ is the correlation between the strategy and the benchmark.[14] Effectively, σ' is the tracking error of the strategy versus the benchmark.

$$V(PF') = p \cdot (N(d_1')V_0^{Strat} - N(d_2')V_0^{BM}e^{hT})$$
$$= p \cdot (N(d_1') - N(d_2')e^{hT}) \cdot V_0 \qquad (5)$$

$$\text{where } d_1' = \frac{1}{\sigma'\sqrt{T}}\left(\ln(e^{-hT}) + \frac{\sigma'^2 T}{2}\right) \text{ and } d_2' = d_1' - \sigma'\sqrt{T}$$

Performance Fees with Complex Structures

To value more complex fee structures, such as those illustrated in Exhibit 2, the key is to recognize that they can be decomposed into a linear combination of standard European call options with different strike prices.

Consider the performance fee contract shown in Panel A, which caps the maximum performance fee at c. That is, the manager keeps the fraction p of the returns in excess of the hurdle rate up to the cap and does not receive additional performance compensation beyond that. We can decompose the payoff into two components, each of which can be valued using Equation 2.

$$PF^{Capped} = p \cdot \max\{0, V_T - V_0 e^{hT}\} - p \cdot \max\{0, V_T - V_0 e^{h_c T}\} \qquad (6)$$

where h_c and c are one-to-one determined by the implicit function $p \cdot (e^{h_c T} - e^{hT}) = e^{cT} - 1$.[15]

Panel B shows a convex fee structure, whereby the fraction of profits rewarded to the manager increases from p_1 to p_3 as the strategy exceeds a series of hurdles $h_1 < h_2 < h_3$, while Panel C illustrates a concave fee structure, whose participation

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[14] For simplicity, we assume identical fixed fees for managing the strategy and the benchmark (so the dividend in the option pricing model is 0). We can also subtract the present value of the differences in fixed fees (or just the fixed fee on the strategy if the benchmark is an index assumed to have a zero fee) from the strategy's value at time 0 as an approximation. We follow this approach as a robustness check and confirm that the impact of this fee assumption is of secondary order.

[15] Sometimes the fee cap may be expressed on the total fee instead of on the performance fee only. In that case, solve h_c using $p \cdot (e^{h_c T} - e^{hT}) = e^{cT} - e^{mT}$.

rate decreases as the strategy earns higher returns. Both fee structures can be decomposed into a linear combination of three call options:

$$PF^{Convex/Concave} = p_1 \cdot \max\{0, V_T - V_0 e^{h_1 T}\} + (p_2 - p_1)$$
$$\cdot \max\{0, V_T - V_0 e^{h_2 T}\} + (p_3 - p_2) \cdot \max\{0, V_T - V_0 e^{h_3 T}\} \qquad (7)$$

These examples highlight the wide applicability of our framework. It should also be straightforward to see that the same decompositions apply if the performance is measured against a benchmark portfolio, in which case the underlying options can be valued using Equation 5.

Robustness of the Valuation Framework

The option-based framework for evaluating the cost of different fee structures is highly robust, practical, and easy to use. As shown in Equations 2 and 5, the calculation relies on standard option pricing models, which are transparent and require minimal assumptions.

The Black–Scholes–Merton option pricing model (and its subsequent improvements) have the feature that the valuation does not depend on the expected return of the underlying asset, which is, and has been, a powerful element in support of its robust adoption in mainstream finance practice for more than four decades. In the context of performance fees, it means that asset owners can assess fee costs without knowing the manager's expected return or alpha. Thus, those who agree on the fund's volatility but disagree on its alpha will nevertheless agree on its performance fee valuation. Expected returns and premiums are notoriously difficult to estimate due to their sizable standard errors.[16] As a result, models of performance fee valuation that use expected return estimates or alpha estimates as an input will be sensitive to the estimation method and estimation period and will provide investors with unreliable or misleading conclusions. In contrast, the option-based framework does not depend on any expected return assumptions. The lack of dependency on expected returns or expected outperformance derives from the fact that with continuous trading and perfect hedging, the probabilities of different outcomes (and as a result, the expected outcome) do not matter for the pricing of an option.[17] This makes the option-based framework for performance fee evaluation considerably more robust and practical.

It is important to note that option pricing does require a volatility estimate; hence the volatility of a strategy's total returns or excess returns is an important determinant of the value of performance fees. Using volatility as an input is practically feasible

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[16] For example, Fama and French (2018) discuss the impact of high return volatility on the distribution of equity premiums over various investment horizons.

[17] Although some investments are not traded (for example, one cannot buy or sell shares of separate accounts), one can often find instruments such as ETFs and futures that can be traded and that can be used, for example, by a financial intermediary, to create a hedging portfolio for the performance fee option. Merton (1998) shows that under reasonable conditions, in equilibrium, the price of a derivative security linked to an underlying asset that is not traded (and in some cases cannot be perfectly replicated using traded instruments) would be the same as if the underlying asset was traded continuously. In other words, the Black–Scholes–Merton option pricing formula can apply even in cases when the underlying asset is not traded. Hence, the assumptions related to the perfect replication of the strategy and its benchmark have limited impact on the validity of the option-based valuation framework for performance fees.

because we can estimate much more precisely a strategy's expected absolute or relative volatility than its expected returns.[18]

The classic version of Black–Scholes–Merton option pricing used in this article assumes that the absolute or relative volatility of the underlying portfolio strategies is constant over the life of the option. The assumption that the volatility or tracking error of an investment strategy stays relatively constant is more realistic for performance fees than for standard equity options, because asset managers are typically required to state targeted volatility or tracking error ranges for an investment solution in advance and to monitor, control, and report the strategy's ex ante and ex post volatility or tracking error on an ongoing basis. In contrast, managers of traded companies rarely set explicit goals for their stock's volatility as a stated goal of their management process. Therefore, the assumption of constant volatility for the underlying strategy in using Equation 2 for performance fee valuation is consistent with the common practices in the asset management industry to manage fund volatility toward a target and is thus more applicable to performance fee valuation.

As shown in the previous section, the option-based framework can be applied to value a wide variety of fee structures, including performance fees with a fee cap, convex/concave performance fees, and so on. It can also be extended to capture other features not shown in this article. For example, Goetzmann, Ingersoll, and Ross (2003) show how high-water mark provisions limit the value of the performance fees due to the extra time required before the asset value reaches the high-water mark;[19] Drago, Lazzari, and Navone (2005) discuss several variations on the standard performance fees, including those under the positivity constraint and under the constraint of a minimum benchmark return equal to zero.[20] As we will illustrate in a case study later, often, the fee structures under consideration differ in multiple aspects, and the net effects cannot be evaluated intuitively. The option-based framework provides a useful tool to tackle such situations and facilitate a direct comparison.

UNDERSTANDING THE IMPACT OF PERFORMANCE FEES ON MANAGER BEHAVIOR

Volatility and Tracking Error

As discussed earlier, managers' alpha, or ability to produce excess returns, does not play a role in the valuation of performance fees. Rather, the volatility of a strategy's total returns, or excess returns, is an important determinant. We now investigate how this feature may, in turn, induce certain manager behaviors.

For the sensitivity analysis here and below, we use a base fee of 25 bps per year, participation rates ranging from 10% to 30%, hurdle rates ranging from 0% to 2%, a fee cap of 2% (when it exists), a one-year measurement period, and a zero risk-free rate as input parameters. To be practically relevant, these values reflect typical performance fee contracts for systematic managers. For example, the base fee is set to

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[18] Indeed, it can be shown statistically that, when estimating volatility and average return from historical returns, increasing observation frequency can help improve the precision of the estimates of volatility over a given total time period but does not improve the precision of average return estimates.

[19] We consider the impact of high-water marks to be secondary because they are not effective as clawbacks beyond the measure period. If a strategy falls well below its high-water mark, the manager may not have sufficient funding to cover the ongoing operational costs. As a result, instead of forgoing compensation while trying to get back to the high-water mark, the manager may voluntarily close the strategy and start a similar one. Effectively, the high-water mark is reset.

[20] These constraints make it impossible to find a closed-form solution, so the authors use numerical procedures to calculate the value of the performance fees.

EXHIBIT 3
Impact of Return Volatility on the Value of Total Fees
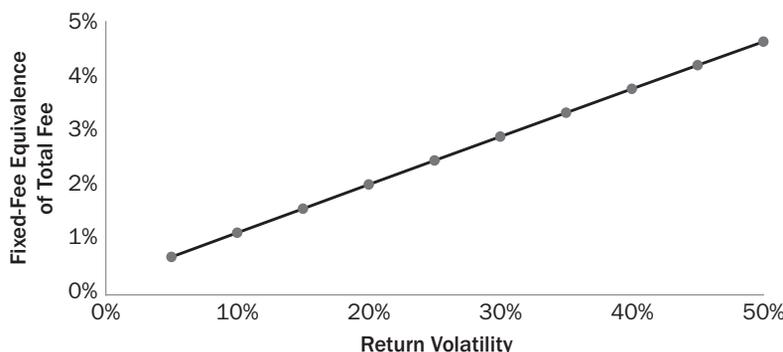
NOTE: The varying parameter is return volatility σ, and the base parameters are $m = 0.25\%$, $r = 0\%$, $h = 0\%$, $p = 20\%$, and $T = 1$.

be lower than the 2% in the traditional "two and twenty" hedge fund fee structure, as systematic strategies usually charge far less than typical alternative investments.[21]

Exhibit 3 shows the impact of return volatility on the value of total fees, whereby the performance fee is paid on outperformance relative to a fixed hurdle and valued using Equation 2. Holding other parameters fixed ($m = 0.25\%$, $r = 0\%$, $h = 0\%$, $p = 20\%$, $T = 1$), the fixed-fee equivalence of total fees increases from 62 bps to 417 bps as the annualized return volatility increases from 5% to 50%.[22] The more volatile the underlying strategy, the more valuable the fee option—to the manager. Therefore, to increase their compensation, managers can scale up the volatility of the investment strategy.[23] To do that, managers who are permitted to use leverage can borrow or use derivatives. Managers who cannot use leverage can increase volatility by tilting the portfolio toward more-volatile stocks with greater correlation among them.[24] Indeed, a number of articles find empirical evidence that incentive fees can lead to increased risk-taking (see, for example, Elton, Gruber, and Blake 2003; Golec and Starks 2004).

When outperformance is relative to a benchmark portfolio, the primary investment parameter that matters is the strategy's tracking error against the benchmark portfolio, as shown in Equation 5. Exhibit 4 quantifies the impact of tracking error on the value of total fees, holding other parameters fixed ($m = 0.25\%$, $h = 0\%$, $p = 20\%$, $T = 1$). As the annualized tracking error scales from 1% to 10%, the fixed-fee equivalence of the total fee increases from 33 bps to 105 bps. This relation points to a strong incentive for managers to deviate more from the benchmark to increase the value of their fee option.

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[21] As an example, GPIF introduced a full-scale performance-based fee structure for their external active managers in April 2018. The fee structure has a base fee on par with the fees paid to passive managers and a performance fee on excess returns with no fee cap. See https://www.gpif.go.jp/en/performance/annual_report_fiscal_year_2018.pdf.

[22] As shown in Exhibits 3, 4, 6, and 7, the relation between performance fee value and standard deviation (or tracking error) of strategy returns is close to linear. This is consistent with the approximate formula derived in Brenner and Subrahmanyam (1988, 1994) illustrating that for options that are at the money on a forward basis (i.e., the spot price equals the present value of the strike price), the option price is approximately linear in volatility.

[23] This observation is consistent with Carpenter (2000), who proves theoretically that when the options are deep out of the money, increasing asset volatility is optimal for utility-maximizing managers, and Starks (1987), who shows that performance fees lead to a lower than optimal resource expenditure level and a higher than optimal risk level. On the other hand, Panageas and Westerfield (2009) argue that excessive risk-taking might be mitigated by career and reputation concerns.

[24] Unlike with using leverage, this action will generally reduce the Sharpe ratio of the strategy.

EXHIBIT 4
Impact of Tracking Error on the Value of Total Fees
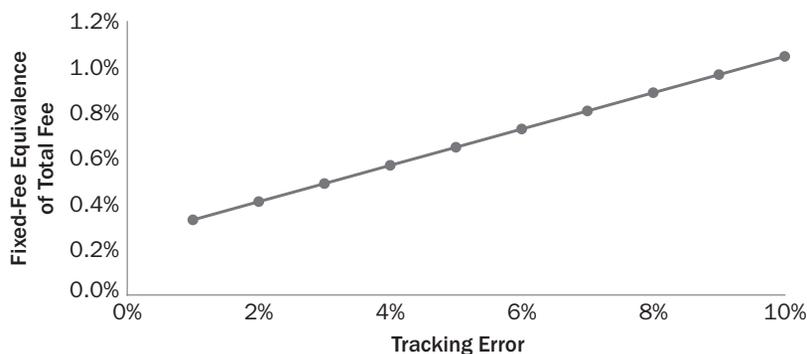
NOTES: Performance fee is based on returns relative to a benchmark portfolio. The varying parameter is tracking error σ′, and the base parameters are $m = 0.25\%$, $h = 0\%$, $p = 20\%$, and $T = 1$.

Although many asset owners might perceive higher tracking error as evidence of strong manager conviction in the investment strategy and, as a result, might welcome large deviations from the benchmark, it is unclear whether the incentives to increase volatility or tracking error, imposed by performance fees, will lead to better investment outcomes. If the intent is to screen out closet indexers and avoid paying higher fees for index-like strategies, then choosing transparent, systematic investment approaches may allow for more-effective monitoring of portfolio behavior than adopting performance fees. This is because the valuation of performance fees is agnostic about where the volatility or tracking error comes from. For example, randomly sampling stocks can inflate tracking errors without leading to higher expected returns. Rather, it may increase the concentration in individual names or industries, reduce the consistency of investment outcomes, reduce flexibility in portfolio management and trading, and increase implementation costs. Similarly, for systematic managers, using more variables to define and target a premium can lead to more deviation from the market or factor benchmark. However, it is often not the case that more is better. If there is no sensible financial theory or robust empirical evidence supporting the use of the additional variables, adding those variables can introduce more noise into the investment process, impose unnecessary constraints on the portfolio, and increase turnover and costs. In summary, the use of performance fees may have a negative impact on the performance experienced by the investor paying the fees.

Moreover, the use of performance fees may create a mismatch between effort and reward—particularly for systematic managers—and undermine the alignment of interests between investors and managers. Generally, the goal of systematic investing is to provide a broadly diversified, consistent, and transparent focus on reliable premiums in equity and bond markets. Return premiums, however, are volatile. They can go through pronounced periods of underperformance. For example, the value premium has been, on average, negative in the United States over the past 10 years. Systematic strategies providing value focus would have underperformed broad market benchmarks, especially if the managers had a consistent emphasis on the deepest value stocks. A performance fee structure in that situation would have left the systematic deep-value managers with very low revenue despite their ongoing efforts and costs, failing to account for the fact that their underperformance was not driven by bad investment decisions but by the underperformance of the premium they were systematically pursuing. To avoid such outcomes, some managers might opt for weakening their focus on the targeted premium or abandoning the pursuit of the

EXHIBIT 5
Impact of Return Volatility on the Value of Total Fees: with Fee Cap
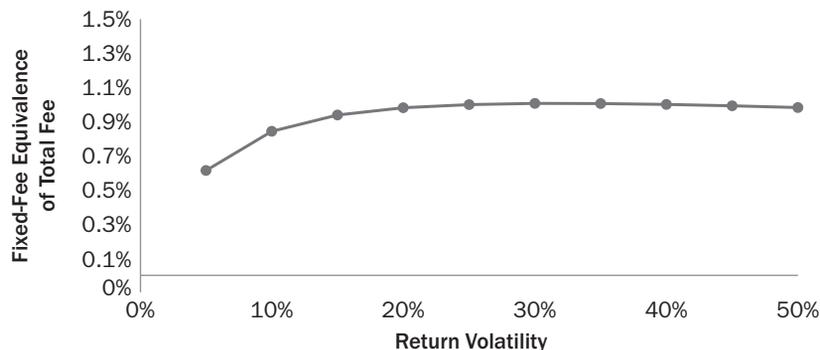
NOTE: The varying parameter is return volatility σ, and the base parameters are $c = 2\%$, $m = 0.25\%$, $r = 0\%$, $h = 0\%$, $p = 20\%$, and $T = 1$.

premium altogether. Hence performance fees could incentivize systematic managers to derail from their stated mandate—to provide systematic exposure to one or more premiums, exposing investors to unintended deviations from their targeted asset allocation and investment goals. Asset owners should take this analysis into account when considering a performance fee structure for their systematic investments.

Fee Cap

While the valuation of capped performance fees can be reduced into simple building blocks, the existence of a fee cap may significantly change the manager's incentives and investment decisions.[25] For example, compared to Exhibit 3, Exhibit 5 shows a very different pattern of the fixed-fee equivalence of total fees against return volatility, although the only difference is the capping of performance fees at 2%. Since the upside is now capped, the effect of increasing return volatility on the option value is moderated. Moreover, the relation is no longer monotonic—the value of performance fees plateaus and then goes down as return volatility increases. This is because increasing volatility magnifies both the upside and downside, and at some point, the downside starts to dominate the capped upside.

This asymmetry between potential upside and downside also sheds light on how manager incentives may evolve as conditions change over the measurement period. For example, if the strategy performs very well and the manager is already at the cap before the measurement period ends, how should the manager behave? At that point, the manager does not get paid anything more for additional outperformance, so the value on the upside is effectively zero. However, if the relative performance deteriorates over the remainder of the measurement period, the manager does participate in the downside through a reduction from the maximum payoff possible. Therefore, the manager's incentive is to minimize the risk of the portfolio as much as possible. At the extreme, the manager would lock in the profits by investing in risk-free assets (or track precisely the benchmark that his performance is measured against). For systematic investing, this implies that a cap could motivate some systematic managers to simply track their benchmark index and stop pursuing other value-adds once

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[25] For example, Grinblatt and Titman (1989) argue contracts designed to have caps and penalties for underperformance mitigate the adverse risk incentives associated with performance-based fees.

EXHIBIT 6
Impact of Tracking Error on the Value of Total Fees: Convexity and Concavity
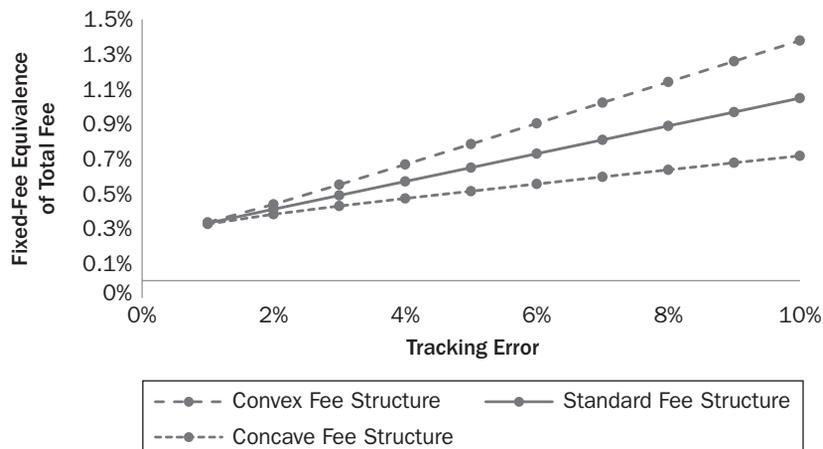
NOTES: Performance fee is based on returns relative to a benchmark portfolio. The varying parameter is tracking error σ', and the base parameters are $p = 20\%$, $h = 0\%$, $m = 0.25\%$, and $T = 1$ for the standard fee structure, $p_1 = 20\%$, $h_1 = 0\%$, $p_2 = 25\%$, $h_2 = 1\%$, $p_3 = 30\%$, $h_3 = 2\%$, $m = 0.25\%$ and $T = 1$ for the convex fee structure, and $p_1 = 20\%$, $h_1 = 0\%$; $p_2 = 15\%$, $h_2 = 1\%$, $p_3 = 10\%$, $h_3 = 2\%$, $m = 0.25\%$, and $T = 1$ for the concave fee structure.

they hit the fee cap. In other words, the existence of a fee cap effectively limits the upside for the asset owner.[26]

Convexity and Concavity

Convex and concave fee structures alter the participation rates corresponding to different levels of outperformance. To study how they impact manager incentives, we extend the analysis in Exhibit 4 by including two more fee structures, one convex and one concave. Exhibit 6 illustrates the impact of tracking error on the value of total fees under these fee structures, whereby the other base parameters are kept the same as in Exhibit 4 ($m = 0.25\%$, $T = 1$). The convex fee structure offers the manager 20% of the profits if the strategy outperforms the benchmark and increases the participation rate to 25% and 30% if the outperformance exceeds 1% and 2%, respectively. The embedded convexity leads to a much faster increase in the cost of total fees with increasing tracking error, as shown in Exhibit 6. That means, compared to the standard fee case, there is an even greater incentive for managers to take on more deviation from the benchmark to boost the payoff. For systematic strategies, securities' target weight may deviate from their market weight in pursuit of higher expected returns, but the level of over- or underweight should be measured and controlled while balancing the trade-offs between premiums, diversification, and costs. This implies a reasonable range of tracking errors for a given strategy and investment goal. If the incentive for higher tracking error is too great, as can be the case with convex performance fees, the increase in tracking error will have to come at the cost of sound investment principles. In such cases, investors may be left with a strategy that provides an inconsistent focus on the intended asset class or premiums, sacrifices broad diversification, or applies extreme over- and underweight across securities. It is important to understand these consequences before adopting a convex performance fee structure.

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[26] Similar moral hazards are discussed in Kritzman (1987).

In contrast, the value of the concave fee structure—which pays the manager a decreasing participation rate of 20%, 15%, and 10% for outperformance exceeding 0%, 1%, and 2%, respectively—still increases but has a less pronounced sensitivity to tracking error. For investors who would like to encourage risk-averse manager behaviors above a certain performance level but do not want to completely take away the incentive like in the capped case, a concave fee structure may better achieve this goal than using a fee cap. That said, asset owners may not need to rely on performance fees to ensure robust risk control, especially when it comes to their systematic investments. A systematic investment approach can allow managers to offer greater transparency into their investment process and a clearer demonstration of whether they have delivered what they promised to deliver. Rather than resorting to performance fees, asset owners should consider investing with transparent, systematic managers if they want to lower their monitoring costs and increase the reliability of investment outcomes.

A Case Study

When fee structures differ in multiple aspects, the differences can have offsetting effects on the fee valuation and induced manager behaviors. Our framework provides a useful tool to assess the net effect in those situations, which we will illustrate using a case study.

Suppose, instead of paying a fixed fee only, an asset owner would like to incorporate performance-based fees. Two new fee structures are proposed: (1) a 20 bps base fee plus 2.5% performance fee on positive excess return over the policy benchmark, with the performance fee capped at 20 bps; (2) a 5 bps base fee plus 10% performance fee on positive excess return, without fee cap. Compared to the first fee structure, the second lifts the fee cap and offers a higher participation rate, but in return also lowers the base fee.

Exhibit 7 shows the fixed-fee equivalence of total fees (Panel A) and the performance fee portion (Panel B) for both fee structures under different tracking error assumptions. For strategies with low tracking error, the value of the total fee is lower under the second fee structure due to a lower base fee. As tracking error increases, the second fee structure becomes more valuable to managers, and its value eventually exceeds that of the first fee structure when tracking error goes above about 5% per year. This should not be surprising because the second fee structure has a higher participation rate and no fee cap, which means its performance fee portion (shown in Panel B) has greater sensitivity to tracking error and starts to dominate the total payoff quickly.

From the perspective of the investor, it is debatable which fee structure is better and whether either should be preferable to a fixed-fee arrangement. Compared to the first fee structure, the second option retains more upside potential for the investor. However, its heavy reliance on the performance fee might incentivize managers to deviate more from the benchmark, which may help discourage benchmark-hugging behavior but may not lead to better investment outcomes. These concerns apply not only to traditional active managers who seek to outperform the market by trying to out-guess market prices but also to systematic asset managers who seek to outperform by pursuing reliable sources of higher expected returns. In the context of systematic investing, it is in the best interest of asset owners to incentivize managers to pursue reliable premiums in a consistent, controlled, and cost-effective manner. As discussed earlier, however, performance fees—regardless of the participation rate and the existence of a fee cap—are not particularly effective at providing these incentives. Consequently, it is important for investors to think through these implications before opting for performance fees.
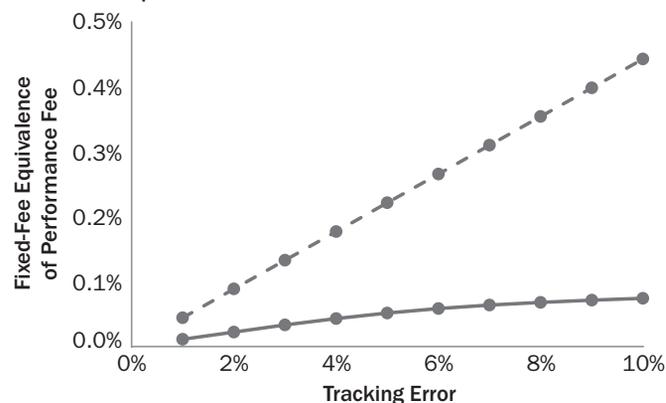
EXHIBIT 7
A Case Study

Panel A: Comparison of the Value of Total Fees
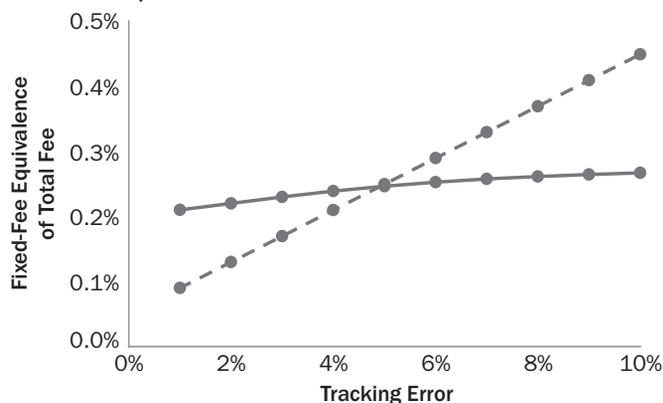
Panel B: Comparison of the Value of Performance Fees

NOTES: Performance fee is based on returns relative to a benchmark portfolio. The varying parameter is tracking error σ', and the base parameters are $m = 0.20\%$, $p = 2.5\%$, $h = 0\%$, $c = 0.20\%$ and $T = 1$ for fee structure 1, and $m = 0.05\%$, $p = 10\%$, $h = 0\%$ and $T = 1$ for fee structure 2.

WHICH FEE STRUCTURE?

When negotiating an appropriate fee structure, investors should evaluate the costs and potential induced manager behaviors in the context of the organizational form of the manager and the investment style of the underlying strategy because differences in these aspects may lead to different considerations for fee structures.

From the perspective of investors' overall influence and control over managers, one can argue that performance fees and exit rights (investors' right to withdraw their money) are substitutes for one another (see, for example, Morley 2013). Not surprisingly, performance incentives tend to be strongest for the types of investments with the weakest exit rights. For example, some managers offer strong exit rights in the form of daily redemptions, so the marginal benefit of performance incentives may be small. Exit rights offered by other types of managers may be more limited, ranging from periodic redemptions for hedge funds to no redemption and only infrequent liquidations for private equity funds. In those cases, investors might desire powerful performance incentives to make up for the lack of withdrawal rights.

Managers with different investment styles may be naturally attracted to and incentivized by different fee structures. For example, traditional stock pickers tend to run concentrated portfolios with higher volatility and tracking error and, as a result, may find performance-based fee structures with a higher participation rate and convexity most valuable. Furthermore, stock-picking strategies typically have limited capacity and diminishing returns to scale, so those managers may be more willing to opt for performance fees because they cannot expect to increase compensation meaningfully through AUM growth (see, for example, Goetzmann, Ingersoll, and Ross 2003). In those cases, since the value added comes from making bets on individual stocks or market movements, it might make sense to reward correct decisions and make a minimal payment if the manager fails to deliver. In addition, investors may customize the parameters of performance fee contracts as one way (albeit not the most efficient) to discourage closet indexing and alter managers' risk tolerance.

In contrast, some systematic managers seek to outperform through broadly diversified strategies providing a consistent and controlled focus on reliable return premiums. As discussed earlier, the incentives for higher tracking error that performance fees create may be detrimental to the robustness of such strategies. When compensating systematic managers, asset owners might be willing to pay only index-like fees when the managers underperform and higher fees when they outperform. Although it is reasonable to avoid paying high fees for strategies that do not add value over index products, effective manager evaluation should recognize the noise in short-term returns and the importance of understanding whether the manager has delivered what they committed to deliver. As already mentioned, the manager might have been quite successful at pursuing the desired premiums and still underperformed the market because of the performance of the premiums, which the manager has limited control over. Therefore, rather than varying the fee payment based on performance relative to the market, using fixed fees may be more appropriate. A fixed-fee compensation structure recognizes systematic managers for their efforts throughout the entire investment process and better aligns the interest of those managers with asset owners over the long term.

SUMMARY AND CONCLUSIONS

For investors, understanding how much is paid to managers is an important first step toward a better-informed and improved investment experience. This article revisits a robust and practical framework for the valuation of management and performance fees. The framework builds on standard option pricing models, which have been widely used for more than four decades. An enormous advantage of using the option pricing approach is that it does not depend on an alpha estimate or any expected return assumption, thus making the fee assessment highly robust. The constant volatility or tracking error assumption made in the framework, on the other hand, is strongly supported in practice because managers typically state it in advance and manage toward a volatility or tracking error target. Hence, this framework realistically and elegantly captures the key elements of fee valuation and can be easily adapted to a wide variety of fee structures with different features.

Using this methodology, we analyze the impact of different fee structures on manager incentives and focus on systematic managers, as more and more asset managers shift toward systematic investing. Our analysis sheds light on why performance fees might have negative implications for the incentives of systematic managers. Thinking through these implications can help investors select an appropriate fee structure consistent with their investment goals.

ACKNOWLEDGMENTS

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Disclosures

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