Performance-Based Fees and Moral Hazard: Aligning the Interests of Investors and Managers

Jan Bertus Molenkamp

Jan Bertus Molenkamp is a Researcher at Vrije University Amsterdam and is Director of Fiduciary Management at Kempen Capital Management (Netherlands).

In an ideal world, the financial interests of asset managers would be perfectly aligned with those of their investors via optimal incentive contracts. In the real world, this is often not the case. It is worthwhile investigating how to improve the current situation. In the theory of delegated management the optimal incentive fee is often linear, under stringent assumptions. In practice we see that a lot of the incentive contracts are convex rather than linear, with option characteristics. This typically introduces moral hazard on the side of the manager. This article examines a number of fee contracts in practice. We propose several improvements on the standard convex fee contracts to better align them with the interests of investors. The key is to make actual fee arrangements more linear.

Keywords: Alignment, Delegated Management, Moral Hazard, Pension Fund, Performance Fee, Principal-Agent

Performance-Based Contracts: Theory

Fully aligning the interests of investment

managers and those of clients implies a symmetric, linear incentive fee structure.[1,2] The manager receives an incentive if performance versus a benchmark is positive, and has to pay a penalty if performance is negative. However, in most practical situations, managers do not pay negative incentive fees.[3] Instead, fee structures are positive and convex. Thus, managers are not penalized for negative performance (at least in fee terms). This structure introduces possible misalignments, as the manager could be tempted to take larger bets than the investor wishes, or to not devote sufficient resources to research and portfolio management. To see how the current situation could be improved, we start with a quick review of what academics have written on the subject.

Stracca (2006) gives a very complete overview. An investor (principal) hires a portfolio manager (agent) who has information unknown to the investor. The key issue is how to define a contract between the investor and the manager that makes optimal trade-offs between three objectives:

1. ***Effort inducement:*** the manager should work hard for the investor.
2. ***Risk-sharing:*** risk-sharing is important if both principal and agent are risk averse. It helps to limit the risks the agent takes on behalf of the principal.
3. ***Signaling:*** ideally, the contract 'separates' good managers from bad ones.

In most of the analysis and research on meeting these three objectives, a one-period optimization problem is set up. The problem is analyzed by splitting it in two.

The *first best* contract is the one that optimizes the portfolio selection for the investor under the assumption that the effort of the manager is observable. The optimum is attained when the marginal benefit for both the investor and the manager is equal to the marginal cost of the manager. The form of the optimal contract in this case is a linear sharing rule (Stoughton, 1993). The *second best* contract is done under the assumption that the effort of the agent is unobservable. A linear sharing rule is optimal here as well, and is a compromise between effort inducement and risk sharing. The typical linear optimal fee is: {Optimal Fee=Amount+%*Performance}.

Gaming

A problem is that the manager can always change the payoff by adapting responses to the signals observed, thus moving away from the optimal allocation for the investor. In Admati and Pfleiderer (1997) this effect is well demonstrated and implies a moral hazard problem. In other words, the fee structure can always be *gamed*. As linear contracts cannot cope with the three objectives in a delegated management setting, one could think of alternative contracts. For example, Bhattacharya and Pfleiderer (1985) and Stoughton (1993) use quadratic contracts,

which help induce increased effort by the manager and reveal important information. There is, however, a *connect* problem as they assume a security analysis framework in which the revelation of information is key. These types of contracts also require that investors are risk-neutral.

Starks (1987) argues symmetric contracts generally deal better with risk sharing than asymmetric contracts. Das and Sundaram (1999) find that option-like incentive contracts can lead to the adoption of more risky portfolios. Option-like contracts may even induce uninformed managers to enter into the business. Linear contracts in a situation with limited liability also behave as option-like contracts, as agents can take more risk than in a situation without limited liability. Palomino and Prat (2003) and Rajan and Srivastava (2000) address this issue and suggest bonus contracts: if the performance is above a set threshold, the manager receives a fixed sum. Under certain conditions (e.g., risk neutrality) these contracts can be optimal.

From Theory to Practice

Thus the academic literature suggests there is no good solution available for the one-period delegated management problem that holds under general conditions and addresses the three objectives. The derived optimal fee structures are also highly dependent on the specific assumptions with regard to the utility of investors and managers, which cannot be easily observed. Even worse, the approaches set out above cannot explain the fee structures we see in practice. These are often convex, option-like contracts. For example, hedge funds often have a base fee of an annual two percent fixed fraction of the assets under management plus a twenty percent performance fee. Traditional investment managers and mutual funds usually have fee structures that consist of only a fixed fraction of the assets under management each year.

The fact that the models do not explain these fee structures suggests that there are elements outside the model that impact the fee structure. For example, managers could have market power to choose a fee structure that favors them over their clients. Such fee structures could lead to less effort, risk sharing, and separating. Further, the models specify the details of the incentive structures explicitly. It could well be that there are implicit incentives that have not been captured. Examples are threats to reputation and dismissal by the client. Capturing these factors in the models could deliver different optimal fee structures that are more in agreement with practice. Finally, optimal fee structures could be altered by moving from a one-period to a multi-period framework. See Appendix I for a listing of further practical considerations and questions that lie beyond the scope if this article.

A Basis for Comparing Fee Structures

Below, we will be comparing fee structures, and hence, we need a basis for comparison. The logical standard is a base fee expressed as a fraction of the assets under management. The expected values of various performance fee structures can then be compared directly to this base fee. The Equivalent Base Fee (EBF) concept was laid out by Kritzman (1987). We calculate EBFs based on the assumptions of normally distributed returns and risk neutrality.

In practice, most of the incentive contracts are convex, option-like contracts. They usually provide managers with a base fee and a performance fee that will be paid if performance is above a benchmark. Under the assumptions set out, the Black-Scholes formula can calculate the expected fee. The pay-off patterns displayed in Figure 1 illustrate the call option features of these contracts. Grinblatt and Titman (1989) characterize these contracts as a combination of put (short) and call (long) options on the performance fee.

In practice, some fee structures attempt to deal with the drawbacks of these option characteristics. For example, some structures have a Negative Carry Forward (NCF) or a high watermark structure (see Appendix II for more). However, NCF does not solve all misalignment problems. For example, if returns are positive, then the average paid fee is equal to a linear incentive fee arrangement. If returns are negative, the average paid fees are higher than in the linear incentive fee arrangement. However, NCF will help to mitigate the effect of a pure option fee structure.

Some NCF structures limit the number of years taken into account and smooth the incentive fee payments. For example, the fee can be calculated on the basis of a rolling three years performance, where each year one-third of the cumulative performance, if positive, is paid. The rationale is that if the manager's cumulative performance in the NCF structure, with no limit on the horizon, is too negative, motivation fades, as incentive fees will not be paid for a long time (Goetzmann et al., 2003). The volatility of the NCF fee is substantially lower than of a linear fee arrangement. Managers who are risk averse with regard to the fee variability would typically prefer an NCF structure to a linear fee structure.

An Example

We now go on to calculate the Equivalent Base Fees (EBFs) for a number of compensation structures. The assumptions for the calculations are set out in Table 1. Assuming normally distributed returns, the five listed fee arrangements have a tracking error of four percent and a twenty percent performance fee. We calculate the fee payments to the manager in the five

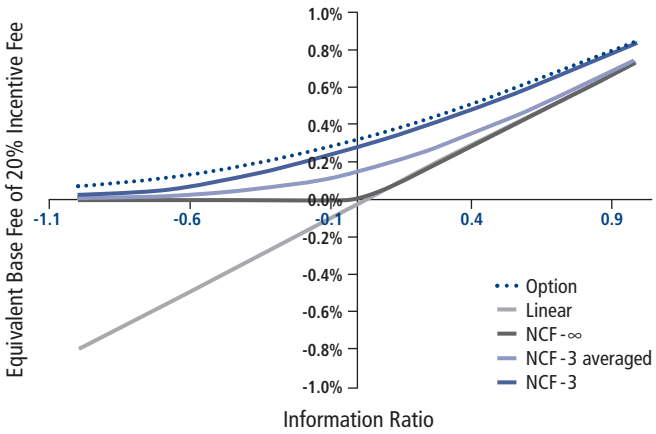
contracts for a range of skill levels as captured by the information ratios. Figure 1 displays the differences in average payout of the fee structures. It confirms that the option fee is the most attractive for managers, and the linear is the least attractive. NCF structures are in between. At an information ratio of 0.5, the EBF of the linear fee is forty basis points. For the option fee it is fifty-six basis points.

Table 1: Different Fee Structures to Be Analyzed

Fee Contract	Formula
Option	20 percent *out*performance (>0)
Linear	20 percent performance
NCF-∞	20 percent *out*performance, if cumulative performance > 0
NCF-3	20 percent *out*performance, if 3 periods cumulative performance > 0
NCF-3 averaged	1/3 of 20 percent of cumulative 3 year performance > 0 per year

Note that even if the manager has no skill (information ratio = 0), the average payout on an option fee structure is still considerable. NCF with a restriction on the horizon also gives a good average payout even if no skill is involved. Averaging the payout in the NCF structure brings down the equivalent base fee. Note that an NCF-1 structure is equal to the option structure. The option fee could almost coincide with an NCF-3 averaged fee if the participation rate of twenty percent was halved.

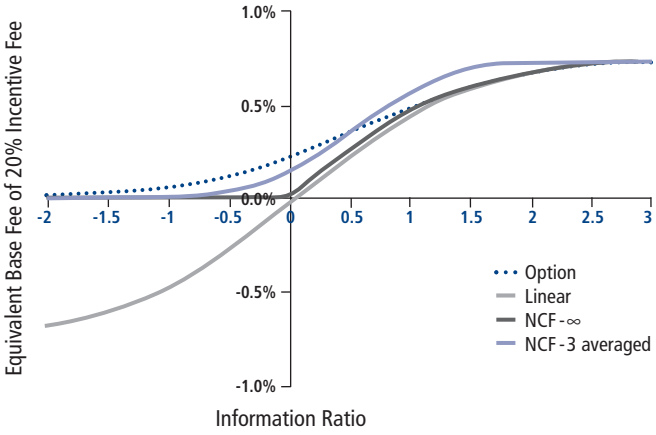
Figure 1: Equivalent Base Fee of Different Fee Structures under Risk Neutrality



Caps and Floors

In practice, a common feature of fee contracts is to cap the maximum and minimum (negative) fees in case of linear fees. Figure 2 displays the payouts, including a cap on the annual payout of performance fee. Now the levels of EBFs come down for the option, NCF and NCF-3 structures. For the linear fee, the slope of the line changes and at the extremes the slope will decrease, quadratically, towards zero. The structure that is least affected by a cap is the NCF-3 averaged structure, as it already smoothes the fees and, as a logical consequence, already decreases the probability of a fee above a cap. This structure ends up above the option structure at moderate Information Ratio (IR) levels as the average payout increases. The gap between the option fee and the other fee structures has come down.

Figure 2: Equivalent Base Fee of Four Different Fee Structures Including a Cap



Ideas for Increased Alignment in Fee Contracts

Bogle (2005) points to several principal-agent issues that, through neglect, can have serious consequences for investors. The easiest way for managers to increase revenues is to increase their assets under management. However, this increase can be detrimental to the investors. Bogle gives hard evidence for example, on the Fidelity Magellan Fund that started with extremely good performance, but after rapid asset growth, delivered underperformance, while the firm maximized fee revenues. Another way to raise revenues is by an incubator strategy which offers the market many investment products. Some of these products are likely to perform well and can then be marketed to increase the assets under management. At some point, the performance will become disappointing

for investors with a high probability. Again the manager has maximized fees.

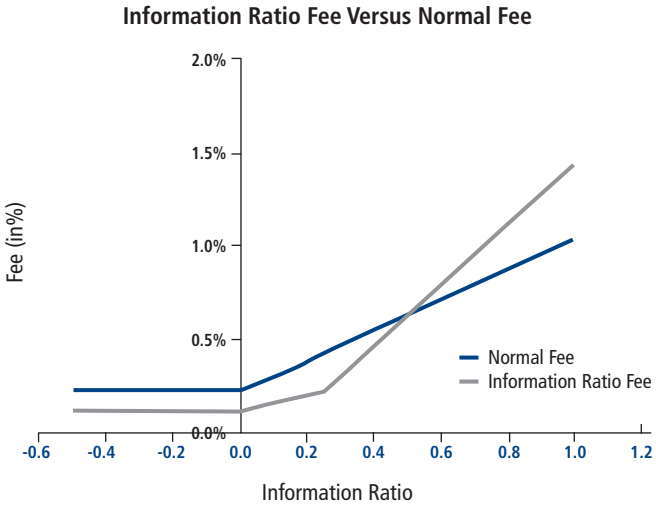
How can we incorporate knowledge of these outside options in a fee contract? Investors want managers to exert investment efforts on improving investment processes, and not on marketing strategies. We explore two approaches that address this issue. The first is to base the incentive fee on the Information Ratio[4] by paying the manager only if the expected outperformance is delivered. This is similar to hurdles in the bonus contract formulation of Palomino and Pratt (2003), and Rajan and Srivastava (2000). Van Nunen (2008) also mentions this structure as a possibility for the construction of the performance fee for fiduciary managers.

If we assume that managers are able to influence their information ratios, then the utility for both the manager and the client can be affected. It may be not so much that managers can improve on their information ratios, but instead that they do not deteriorate. For example, assume that investors want at least a minimum information ratio (IR_{MIN}). They want managers to deliver results, so they are willing to pay an extra high incentive fee (f_{HIGH}) if the information is higher and a low fee (f_{LOW}) if the information ratio is below IR_{MIN}. This would result in the following fee structure:

$$Fee = BF + f_{LOW} \cdot OP + f_{HIGH} \cdot (OP - IR_{MIN} \cdot TE) \cdot I(IR \geq IR_{MIN})$$

where I is 1 if IR is greater than the minimum requirement and 0 if not. OP denotes outperformance, and TE denotes tracking error. Note that the formulation prevents managers from profiting from outperformance that is created with a high tracking error. By choosing $f_{HIGH} >> f_{LOW}$ and a low Base Fee (BF), investors give managers an incentive to really invest in their processes rather than expend efforts on marketing.

Figure 3: Payoff of Information Ratio Hurdle



An Example

Assume a tracking error at a constant four percent. The information ratio fee is based on $IR_{MIN} = 0.25$, $f_{HIGH} = 40\%$, $f_{LOW} = 10\%$ and the base fee = 0.1%. The *normal* fee is based on a base fee of 0.2 percent and an (option) performance fee of twenty percent of the outperformance. Figure 3 shows that the fee participation rate is low at low outperformance and that the participation rate increases above the minimum target information ratio. The question now is: how would this fee structure impact the manager's trade-off with respect to efforts on marketing versus investment? Table 2 examines a $100 million fund under the assumption that the expected information ratio is 0.5, and will deteriorate to 0.25 if the fund doubles in size.

Table 2: Payoff of Normal Fee and Information Ratio Fee*

	Base $100M	Base $200M	Difference
Normal Fee	$0.6M	$0.8M	+$0.2M
IR Fee	$0.6M	$0.4M	-$0.2M
Difference	0.0	-$0.4M	

** Payoff in million $*

Under a normal fee structure the growth of $100 million in assets will result in extra revenue for the manager of $0.2 million. Under the IR fee structure on the other hand, this growth will result in a loss of revenues of $0.2 million: this is what investors should want. There are other factors to be considered. If a manager has very good performance for the first half of the year, the information ratio can be boosted by moving to full indexation for the second half of the year. To prevent this gaming, investors should set tracking error boundaries. Investors must monitor the risk their managers are taking, and have the contractual right to intervene if the manager is not within certain limits.

As more managers announce that they have capacity-constrained products, investors should confirm that there is a specified limit, that this limit does indeed conserve the expected outperformance characteristics, and how far this limit is from the present assets under management, which will indicate how much of a marketing effort is still underway. However, this checklist does not address the outside option of launching new investment products into the market. So the fee-based incentive structure set out above will still be needed.

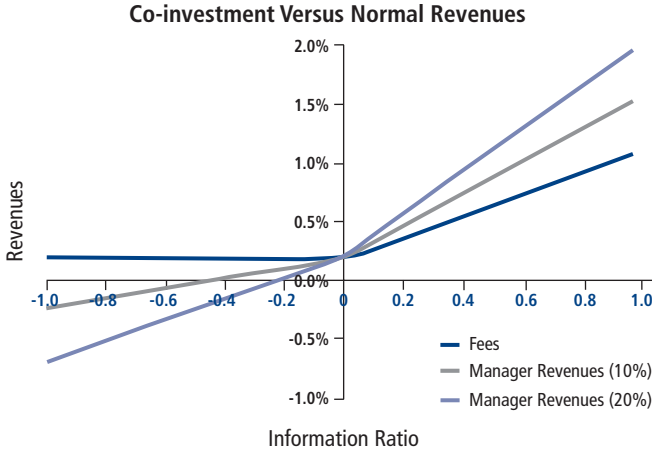
Co-investment by the Manager to Align Interests

We noted that the most broadly-used incentive structures have option-like features. Typically, there is a call option for the agent, but no downside. Other than through a more symmetric fee structure, the manager could signal alignment by also investing in the fund, as is often done in private equity. Now the manager also suffers in the case of poor performance. An obvious question becomes: how much should managers invest in their own funds to be taken seriously?

As an example, assume a fee structure of a twenty basis points base fee along with twenty percent outperformance. The manager's focus is on fee revenue and the return on the co-investment. Figure 4 shows that with a greater co-investment, the manager's total payoff moves towards a more symmetric fee structure. However, as with the information ratio tie-in, there are moral hazards with a co-investment approach. With a new investment fund, the manager is often prepared to co-invest for a substantial proportion of the total fund. However, as the fund grows, the co-investment could become relatively small. So the materiality of the manager's investment should be monitored over time, as should the exit conditions of the co-investment.

With some increased complexity, we can build fee structures which combine information ratio and co-investment elements. Such combinations are more discriminating against low-skilled or unskilled managers. The co-investment will increase the volatility in the manager's total revenues, which in turn enhances the signaling characteristic of the fee, and is more separating than an option fee. Also, such a fee structure can be more effort-inducing. Compared to the original option structure, the risk-sharing properties of these more sophisticated structures are superior.

Figure 4: Payoff of Co-investment on Fee Revenues



Impact of Risk Aversion

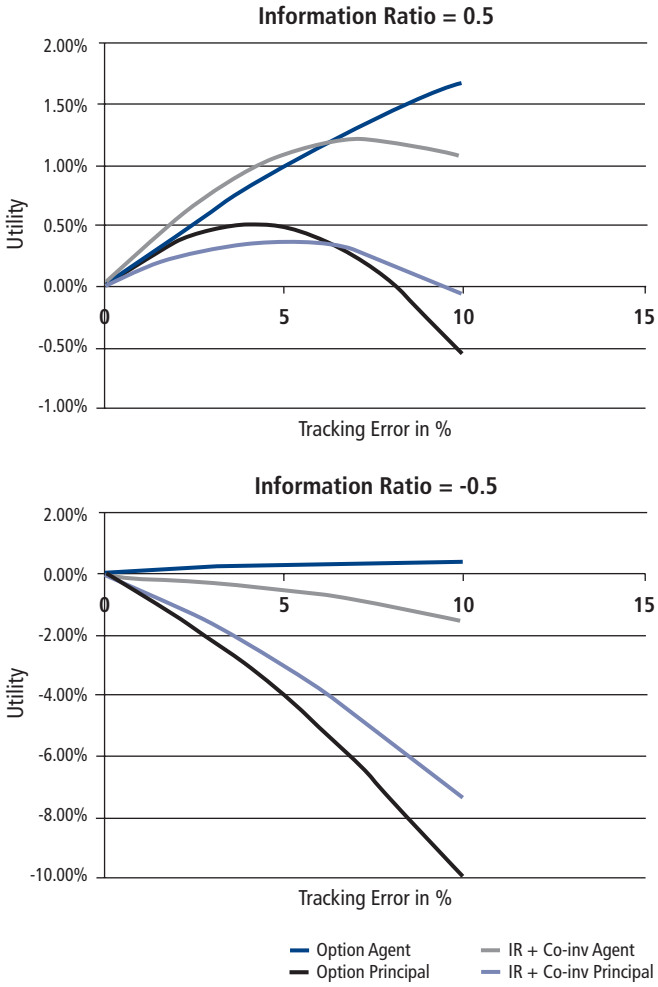
Investors and managers are generally risk averse. As an example, assume that investors are risk averse with respect to the volatility of the net returns, and that managers are risk averse with respect to volatility in their revenues. Assuming both investors and managers become increasingly risk adverse as volatility increases (i.e., they have quadratic utility functions), we can compare the attractiveness of the option-based fee structure, and the combination fee structure based on the information ratio and co-investment features as discussed above.

Note in Figure 5 that the investor's utility shape for the option fee structure is concave, and can be negative. On the other hand, the manager's utility for this structure is uniformly positive, and almost linear in the tracking error. Alignment of the investor and manager's interests requires that a change in risk impacts the utility of both in the same direction. Thus the slopes of the two utility curves must point in the same direction. Full alignment exists when this is the case over the whole spectrum of the tracking error.

Increasing alignment of interests requires that the length of the lines where the marginal utilities have the same sign is also increasing. The top panel of Figure 5 indicates, for example, that the option fee structure line slopes up until a tracking error of five is reached. Above five, the interests of the investor and the manager diverge. The utility of the agent continues to rise, while that of the investor begins to fall. In the combined fee structure case, the alignment of interests between investors and managers increases. Note that now the marginal utility for the manager can actually become negative at high levels of tracking error. The bottom panel of Figure 5 shows the utility lines when the manager's Information Ratio is a negative -0.5. Note that the combination fee now produces negative utility for the manager, while the option fee structure produces positive utility for all levels of tracking error. Managers that know they have negative skill would never opt for a combination fee.

Thus we learn that our earlier conclusions about alignment of interests in a risk neutral framework also hold in the risk averse framework set out above. The form of the utility function matters, and we know from finance literature that it cannot be easily generalized. The point is that by specifying the nature of risk aversion through a utility function, we can learn a great deal from any fee structure offered by managers. For example, these offerings can help us understand their investment beliefs and their attitude towards risk taking. See Appendix III for an example that can be of use in fee negotiations.

Figure 5: Utility of Different Fee Structures for Investors (Principals) and Managers (Agents)



Increased Alignment of Interests

Fee structures in practice often differ from theoretically optimal fee contracts. As a result, the financial interests of investors and managers are often not aligned as closely as they could be. We showed that it is useful to assess fee offerings based on an Equivalent Base Fee calculation, assuming risk neutrality and under multiple scenarios. We noted that Carry Forward structures can have a positive influence on interest alignment as they lead to increasing symmetry in fee structures. Information ratio-based incentive fees create better incentives for managers to perform, rather than focus on gathering assets. Co-investment by managers also helps to better align interests. We demonstrated that these conclusions also hold under the assumption of quadratic risk aversion. Finally, we note that these ideas can be implemented for both external and internal managers. *Eat your own cooking* should be the motto in the construction of investment fees.

Appendix I – Ideas and Questions for Further Research

In this article, we use some simple, one-period models, although analyzed over multi-periods. We have not made an effort to optimize fees. We assumed that fees influence the behavior of managers. The actual market structure in which fees are set has not been directly taken into account (e.g., the typical two percent base plus twenty percent carry for hedge funds). Many questions still deserve research attention. Here are a few:

- The simple question whether to use fixed fees or performance fees was not directly addressed. This is obviously an important question for investors. A well known paradox is that good managers should aim for a performance fee and that principals should hire good managers at a fixed fee. More subtle questions are: Can investors identify *good* managers? Will managers exercise the same effort to excel, regardless of their fee structure?
- How would a multi-period setting influence the optimal fee structure? There is literature that suggests performance fees in multi-period settings are not that optimal, and that fractional fees (fixed fees in percent) may be more optimal.
- In practice, the situation is not often a *one principal - one manager* environment. Most situations involve multiple managers, and today there can be an extra layer via a multi-manager or fiduciary manager. This transforms the principal-agent model (P-A) into a principal-agent-agents model (P-A-AN). A relevant question here is how to reward the extra layer (multi-manager or fiduciary manager).

Appendix II - Negative Carry Forward Formulae

Incentive fees can be generalized as in the following formula:

$$NCF(N,T) = \text{Participation rate} \cdot I\left(\sum_{t=Max(T-N+1,1)}^{T} OP_t \geq 0\right) \cdot (OP_t)$$

I(.) = indicator function that is 1 if the expression is true and zero otherwise.
T = period of evaluation
OP_t = outperformance over period t
N = number of periods included in the carry forward
NCF(1,T) = option fee structure evaluated at time T
NCF(∞,T) = infinite-time high watermark evaluated at time T

Working with an averaged NCF (N,T) is in fact a bonus-pool of which a part will be distributed:

$$\overline{NCF}(N,T) = \text{Participation rate} \cdot I\left(\sum_{t=Max(T-N+1,1)}^{T} OP_t \geq 0\right) \cdot \frac{1}{N} \sum_{t=Max(T-N+1,1)}^{T} OP_t$$

Appendix III - Implicit Return Expectations or Risk Aversion Parameters from Observing a Fee Offer

Given a quadratic utility function and the fee proposal of the manager, it is easy to establish implicit return expectations or degree of risk aversion. Suppose that a manager has an observed tracking error of four percent and expects to generate an information ratio of 0.5. The manager offers the investor a choice between twenty basis points base fee plus twenty percent outperformance fee (i.e., an option-like structure) or a total fixed fee of forty basis points. This implies the manager is indifferent between a twenty percent performance fee and a base fee of twenty basis points. Under a risk neutral assumption, this implies the manager has an information ratio of -0.35 as shown in Figure 1. If we see this fee proposal a skill signaling tool for a manager who is indeed risk neutral, then the investor should walk away from this offer.

However, now assume that the manager is risk averse, and that the information ratio estimate is accurate. What level risk aversion is implied? The risk aversion coefficient must be about one hundred. The information ratio estimate implies the manager expects to earn an excess return of 0.56 percent, but then subtracts 0.36 percent for the implied volatility in fees. This implies a very high level of risk aversion. Maybe the manager wants the investor to choose the fixed fee, and has therefore created an asymmetric proposal.

Endnotes

1. The author thanks Tom Steenkamp and Guus Boender for their support. Also, thanks to reviewers Don Raymond, Barbara Zvan, and Leo de Bever for their feedback. The views expressed are that of the author and do not represent those of Kempen Capital Management.

2. It seems obvious that a symmetric fee would induce fully aligned behavior. However, there is literature that implies that you are better off with less symmetric fee arrangements from a welfare standpoint (see Das and Sundaram, 1999)

3. This would require, for example, serious capitalization with consequences for the number of clients that an investment management organization could serve (Grinold et al., 1987).

4. The idea laid out here is applied to relative returns (returns versus a benchmark) but can be applied jus as easily to absolute returns (e.g. via the Sharpe ratio), depending on the role of the manager. The key notion is that risk is taken into account. For a practical example, see Bertram and Zvan (2009).

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Rotman ICPM
International Centre for Pension Management

151 Bloor Street West, Suite 702
Toronto, Ontario Canada M5S 1S4
Tel: 416.925.7525
Fax: 416.925.7377
icpm@rotman.utoronto.ca
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