

**Combining Skill and Capital:
Alternate Mechanisms for Achieving an Optimal Fund Size**

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Size Matters: While a fund manager's skill is the basis of the fund's *alpha*, that *alpha* will be declining with fund size. This study examines contracts that lead to the optimal combination of human capital and financial capital. When there is an information asymmetry about a manager's skill, there is a natural role for an investment bank that does have the ability to evaluate managers and also has the capital necessary to back a performance guarantee to uninformed outside suppliers of capital. The manager and her bank-backer will enjoy the entire value-added by her skill. Institutionally-backed active managers have the correct incentive to take into account both the positive (direct) and negative (indirect) effects of growing the fund. If the competitive advantage associated with achieving the optimal fund size outweighs the contracting costs between active managers and their financial backers, such arrangements will become the dominant model for the active management industry.

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I. Introduction

Active money management is the combination of two inputs: human capital (a manager) and financial capital (the investors). Understanding how the mix affects fund performance is crucial for an understanding of the link between past performance, fund flows and performance persistence.¹ An active strategy's expected alpha will be declining in the amount of financial capital devoted to the strategy.² The mechanism through which the manager affects fund size is the choice of the fund's fee structure. As in Berk and Green (2004), the amount of capital investors will supply to a fund depends on both investors' perception of the manager's skill and the fees the fund charges. The fund manager captures all the rents associated with her skill. The manager sets the fee so as to maximize those rents. How the resultant fund size compares to the socially optimal level of investment in the fund will depend on reason why the strategy cannot be scaled without impairing its alpha.

In section II we first consider this problem when there is no asymmetry of information about the manager's skill level. Investors' knowledge of the manager's skill level is equivalent to knowledge of the relation between the strategy's expected alpha and size of the assets under management. When there is an information asymmetry, investors condition on past performance in order to estimate a manager's skill. This yields the natural link between fund flows and past performance modelled in Lynch and Musto (2003) and Berk and Green (2004) and documented in Ippolito (1992) and Sirri and Tufano (1998).

Section III considers two potential market responses to the information asymmetry that will remain despite the investors conditioning on past performance. We show first that a manager who faces an information asymmetry and has some private wealth may prefer to commit to a system of performance fee-based compensation. We then show that given an information asymmetry between managers and investors, there is

¹ Berk and Green (2004), Christoffersen and Musto (2002), Lynch and Musto (2003).

² Beckers and Vaughan (2001), Korajczyk and Sadka (2004).

a role for an intermediary with an ability to select managers as opposed to the ability to select stock. We characterize this intermediary as an investment bank, but the intermediary might also be an Investment Consultant, a Fund of Funds Managers, or a Fund Family.

Whenever a monopsonist buyer of management skill and monopolist seller of that skill face off, there is an incentive for them to merge. Section III models an investment bank as just such a merged entity. The owners of the bank are assumed to have both the ability to select managers and sufficient capital to provide performance guarantees to outside uninformed investors in the bank's products. Section IV contains our conclusions.

II. Symmetric Information, Fees and the Optimal Fund Size

We consider an active strategy whose factor exposure is that of an appropriately defined benchmark strategy. The difference between the return on the active strategy and the return on the benchmark strategy is the active strategy's alpha. Let Q^A denote the amount invested in the active strategy. The active strategy's expected alpha, $\alpha^A(Q^A)$, is assumed to be a decreasing convex function of the amount invested in the active strategy: $\alpha_1^A(Q^A) < 0$ and $\alpha_{11}^A(Q^A) > 0$.

Figure 1A shows the relation between $\alpha^A(Q^A)$ and Q^A . Note that for Q^A sufficiently large, the marginal payoff from investing an additional dollar in the active strategy rather than the passive strategy is negative; i.e., $\alpha^A(Q^A) + \alpha_1^A(Q^A)Q^A < 0$. This marginal payoff is negative for $Q^A > Q_{Max}^A$.

An otherwise active manager wanting to maximize the fund's dollar payoff over and above the payoff to an equivalent dollar investment in the benchmark strategy will never invest more than Q_{Max}^A in the active strategy. She will invest any assets in excess of Q_{Max}^A into the benchmark strategy. Let Q denote the total assets under management of the active fund. The non-negative amount $Q - Q^A$ is invested in the benchmark strategy. The active fund's expected alpha, $\alpha(Q)$, reflects both the active strategy's expected alpha and

the proportion invested in the active strategy: $\alpha(Q) = \frac{Q^A}{Q} \alpha^A(Q^A)$. Figure 1B shows that the resultant relation between alpha $\alpha(Q)$ and Q .

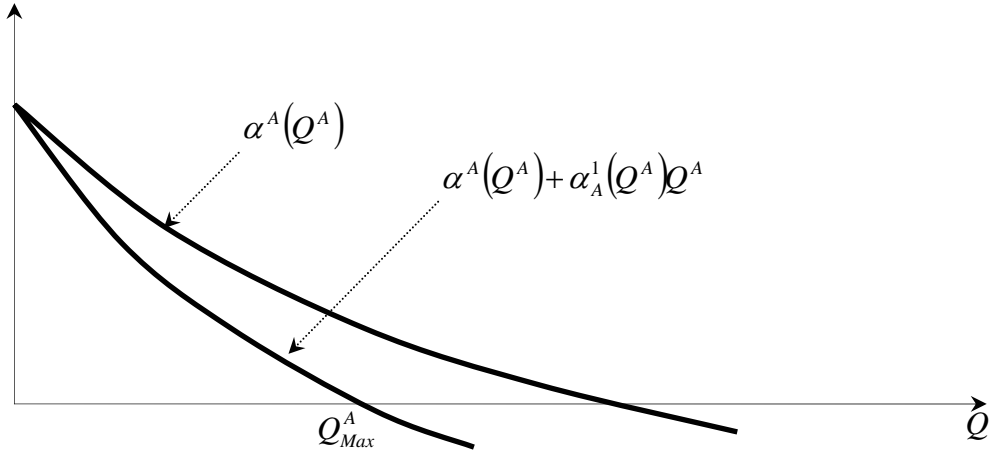


Fig 1A. The relation between the alpha of the active strategy, $\alpha^A(Q^A)$, the marginal payoff from investing in the active strategy rather than the passive strategy, $\alpha^A(Q^A) + \alpha_1^A(Q^A) Q^A$, and the amount invested in the active strategy, Q^A .

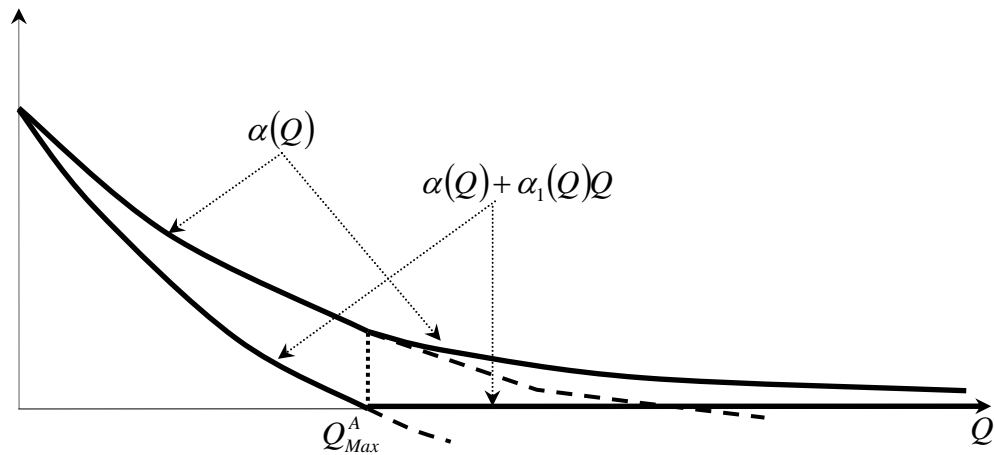


Fig 1B. The relation between the alpha of the active fund, $\alpha(Q)$, the marginal payoff from investing in the active fund rather than passive fund, $\alpha(Q) + \alpha_1(Q) Q$, and the amount invested in the fund, Q .

The dollar payoff to the active strategy over and above the payoff to an equivalent dollar investment in the benchmark strategy is simply

$$\alpha(Q)Q = \frac{Q^A}{Q} \alpha^A(Q^A)Q = Q^A \alpha^A(Q^A)$$

For $Q > Q_{Max}^A$,

$$\alpha(Q)Q = Q_{Max}^A \alpha^A(Q_{Max}^A)$$

and

$$\frac{\partial \alpha(Q)Q}{\partial Q} = \alpha(Q) + \alpha_1(Q)Q = 0. \quad (1)$$

II.1 Costs of Passive and Active Management

Let $c(Q)$ denote a fund's administrative costs associated with record-keeping and reporting as a percent of the assets under management. Both a benchmark and an active manager will incur these costs these administrative cost and the cost function is assumed to be the same for both types.

Active management involves research costs not incurred by passive managers. These research costs are assumed to be paid by the investors in the active fund. The alpha of the active strategy (denoted above by $\alpha^A(Q^A)$) is measured net of these costs. The research costs are assumed to be borne by the investors in an active fund via a system of soft dollar payments.³ The assumed use of soft dollars is without loss of generality: Active fund managers will capture the same rents whether investors bear the costs of research via soft dollar commissions or the manager initially bears the costs of research but is compensated by a higher management fee. The soft dollar assumption is purely for the notational ease of not having to distinguish gross alphas and alphas net of the research costs of active management.⁴

³ For a discussion of soft dollar payments, see Horan and Johnsen (2004).

⁴ As shown in the Appendix, there are settings in which soft dollar commissions are necessary if an active manager is to have the incentive to undertake the "optimal" level of research.

II.2 The Demand for Shares in the Active Fund

Investors in a benchmark fund will earn a return of r^B and pay a management fee f^B . Investors in an active fund expect to earn a return of $r_B + \alpha(Q)$ before the active fund's fee of f^A . Capital will flow in or out of an active fund whenever $Q \times (1 + r^B + \alpha(Q) - f^A)$ is not equal to $Q \times (1 + r^B - f^B)$; i.e., until $\alpha(Q) = f^A - f^B$. Thus in setting the active fee, the manager of an active fund effectively determines the assets under management. The demand for shares in the active fund is linked to the active fee as $Q(f^A) = \alpha^{-1}(f^A - f^B)$

Figure 1C depicts the demand for shares in an active fund. From (1) it follows that the manager's marginal revenue from increasing assets under management beyond Q_{Max}^A is simply to f^B .

$$\frac{\partial [\alpha(Q) + f^B] Q}{\partial Q} = \alpha(Q) + f^B + \alpha_1(Q) Q = f^B \text{ for } Q > Q_{Max}^A.$$

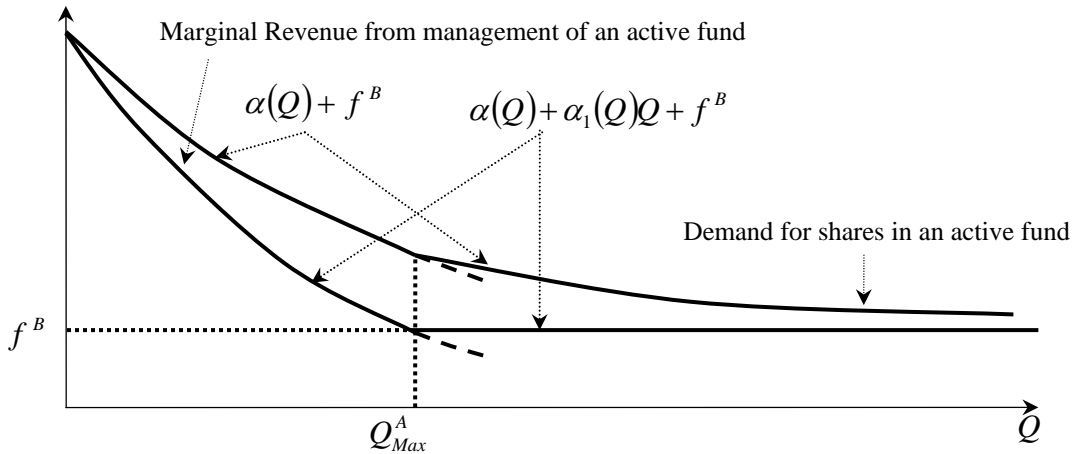


Fig 1C. The demand for shares in the active fund, $\alpha(Q) + f^B$, and the active fund manager's marginal revenue from increasing assets under management in the active fund, $\alpha(Q) + \alpha_1(Q)Q + f^B$.

II.3 The Supply of Active and Passive Management

Benchmark funds charge the market-determined management fee, f^B . They face a perfectly elastic demand for their services. Their supply of passive management services, equivalently their assets under passive management, Q^P , is chosen as the maximand of the following problem:

$$\max_{Q^P} f^B Q^P - c(Q^P) Q^P;$$

i.e., such that Q^P solves

$$f^B = c(Q^P) + c_1(Q^P) Q^P. \quad (2)$$

Figure 2 depicts the demand for and supply of passive management. The size of a passive fund is Q^{P*} . Potential passive funds with fixed costs less than the operating profit illustrated by the shaded area in Figure 2 will enter the industry.

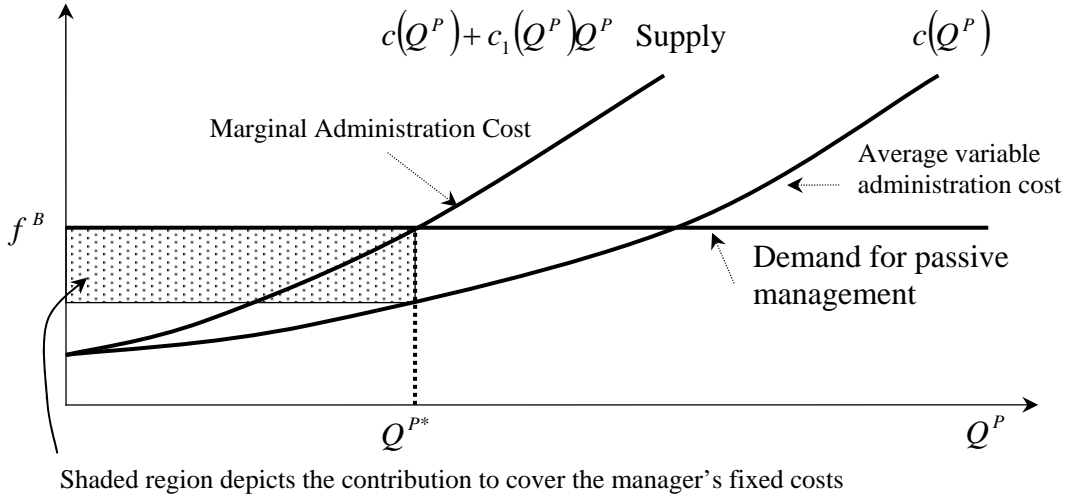


Fig 2. Demand for, and supply of, passive management

Active funds have pricing power and ration the supply of their services through their fee, f^A . An active manager will set her fee so as to

$$\max_{f^A} f^A Q(f^A) - c(Q(f^A)) Q(f^A).$$

The profit-maximizing-fee solves

$$Q(f^A) + [f^A - c(Q(f^A)) - c_1(Q(f^A)) Q(f^A)] Q_1(f^A) = 0. \quad (3)$$

Let f^{A*} denote the solution to (3). The profit-maximizing active fund size is then $Q^* \equiv Q(f^{A*})$.

Equivalently, given the relation between the dollar amount she wishes to manage and the fee she can charge, an active manager will choose the level of assets under management, Q , so as to solve:

$$\max_Q f^A(Q)Q - c(Q)Q = (\alpha(Q) + f^B)Q - c(Q)Q. \quad (4)$$

Q^* will satisfy the first-order condition:

$$\alpha(Q) + \alpha_1(Q)Q + f^B = c(Q) + c_1(Q)Q. \quad (5)$$

Our active fund has the administrative cost of the passive fund and in addition has the ability to add alpha. Not surprisingly the active fund's assets under management are at least as large as those of a passive fund. Figure 3A depicts a setting where the assets under management in the active fund are optimally invested entirely in the active strategy. Active funds that optimally invest entirely in the active strategy are optimally larger than passive funds with the same cost structure.⁵

Figure 3B depicts a setting where an active fund optimally invests Q_{Max}^A in the active strategy and also invests in the benchmark strategy. For this fund, the marginal excess of the dollar payoff to the active fund over and above the dollar payoff to an equivalent investment in the benchmark strategy is zero and expression (5) simplifies to

$$f^B = c(Q) + c_1(Q)Q. \quad (6)$$

The Q^* that solves (5) is identical to the Q^P that solves (2). Active funds that optimally split their assets between the active and passive strategies are optimally the same size as passive funds with the same cost structure. By default, such active funds invest a smaller amount in the benchmark strategy than do passive funds with the same cost structure.

⁵ This need not be true in the presence of an information asymmetry. The Conclusions section suggests that skilled managers whose true alpha exceeds the market's expectation of their alpha may optimally choose to charge higher fees and manage less money in the current period than the level that would maximize current profits.

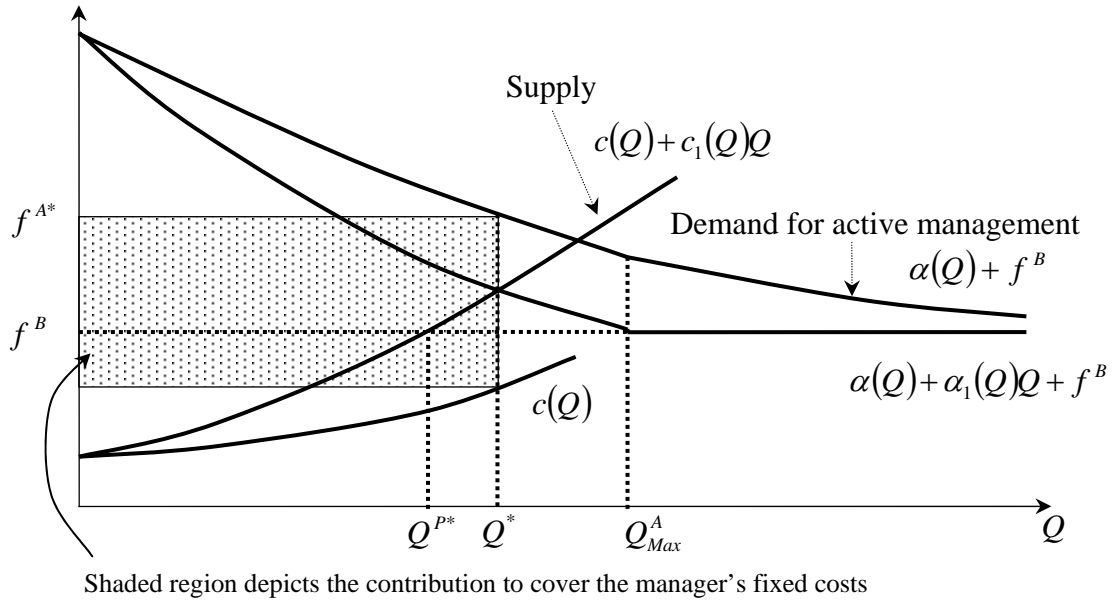


Fig 3A. Demand for, and supply of, active management. A setting where the active fund invests only in the active strategy.

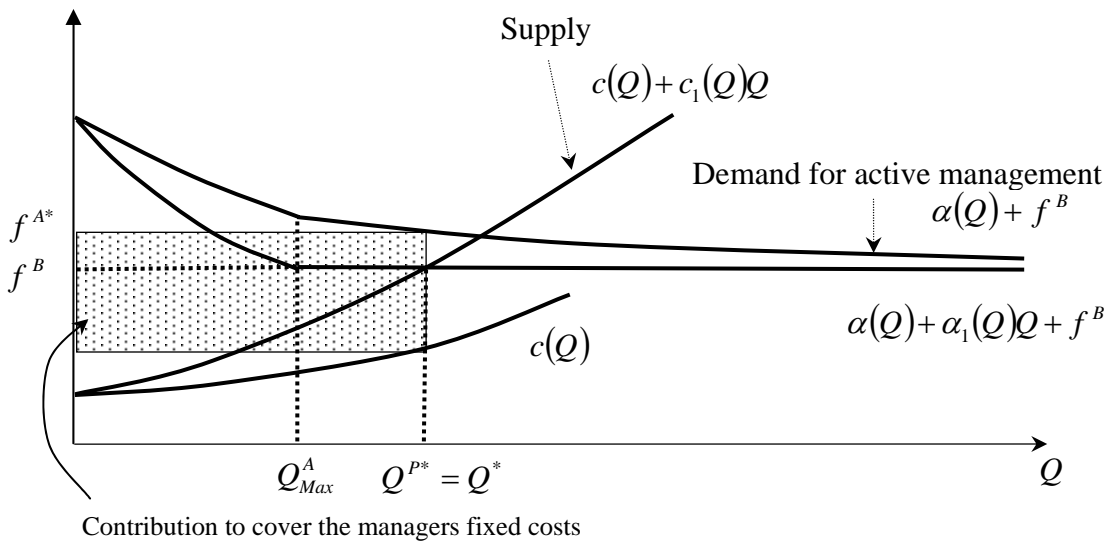


Fig 3B. Demand for, and supply of, active management. A setting where the active fund invests in both the active and passive strategies.

The optimal size of an active fund

To understand the sense in which Q^* is optimal, consider first the portfolio problem faced by a skilled individual with personal wealth of W to allocate between a self managed fund and an externally managed benchmark fund. She will invest q in the self-managed fund and chose the split of its investments between the active and passive strategies. She is assumed to bear a percentage administration cost of $c(q)$ on the q managed internally with that administrative cost function identical to a fund's administrative cost function. She must pay a fee of f^B when she invests externally in a benchmark fund. She solves

$$\begin{aligned} & \max_q (1+r^B + \alpha(q))q - c(q)q + (1+r^B - f^B)(W - q), \text{ s.t. } q \leq W ; \\ \text{i.e., } & \max_q (\alpha(q) + f^B)q - c(q)q + (1+r^B - f^B)W, \text{ s.t. } q \leq W . \end{aligned} \quad (7)$$

When her wealth constraint is not binding, the optimal amount she invests in her self-managed active fund, q^* , is given by solution of

$$\alpha(q) + \alpha_1(q)q + f^B = c(q) + c_1(q)q . \quad (8)$$

Comparing (5) and (8) we see that the optimal assets under management of an active fund whose manager charges a fee equal to her value-added is equal to the amount of her own wealth that the manager would choose to manage internally if she were sufficiently wealthy: $Q^* = q^*$.

The frequent claim that skilled managers over-invest and err in not closing their funds to new investors before their skill is dissipated should be interpreted as a claim made by those investors who (i) are already holders of the fund's shares and (ii) became investors in the fund at a time when the expectation of the manager's skill was less than it currently is. As her true skill level becomes apparent from her track record, a manager whose estimated skill level has increased will optimally attract more funds under management. The early investors will have earned a return more than commensurate with the fee paid. Greedily, they will call for the good times to continue. But in their call for the manager to cap fund size, they overlook the fact that if the skilled manager were

forced to do so, she would then choose to charge a higher fee and at that fee would expect to capture all the rents. After paying the higher active management fee, investors in a capped fund will expect to earn only a normal return; i.e., a return equal to the benchmark return less than benchmark fee. The investors will be no better off if the fund is closed, but the skilled manager will be strictly worse off. She will continue to capture all the rents, but the rents themselves will have been reduced.

In determining the active fee the skilled manager acts as a monopolist and the assets under management are optimal in the sense that her wealth is maximized. Absent an information asymmetry, the amount invested in the active strategy and the profit of the active manager is the same whether she accesses external capital or can provide the capital herself. A difference in both the amount actively managed and the skilled manager's profit can arise if either the skilled manager is not personally sufficiently wealthy and must rely on outside capital and outsiders have less information about the manager's skill level than she has. The effects of information asymmetries on fund size are examined in the following section.

One observation on socially optimality and fund size is in order. If $\alpha_1^A(Q^A) < 0$ because a skilled manager's private information is increasingly impounded into stock prices as she takes larger positions, stock prices can provide better signals to those making capital investment decisions if skilled managers continue to actively invest so long as $\alpha^A(Q^A) > 0$. While capital budgeting may be improved, more resources are consumed in fund administrative costs as the amount of actively managed capital grows (unless that is, an equal dollar administrative cost of passively managed investment is displaced). Of potentially greater importance is the reduced incentive for future managers to acquire the skill and information necessary to produce $\alpha^A(Q^A)$ should a social planner mandate a level of active management greater than the monopoly level.

III. Asymmetric Information concerning the Manager's Skill

In this section we consider one aspect of the general problem of optimal money management given an information asymmetry concerning the manager's skill. We

examine three market responses to this asymmetry. The first is that a skilled manager with limited personal wealth may choose to leverage that wealth by pledging it as collateral on a promise to guarantee the benchmark return to investors in her fund. The second is that there is a role for a third wealthy party who can evaluate the manager's skill. This third party with the ability to manage managers, but not to actively manage money, knows $\alpha^A(Q^A)$ but does not know the strategy that produces that alpha. He is a monopsonist purchaser of the skills of the monopolist manager. The combined profits of the monopsonist and monopolist are higher if they can merge and agree to split the larger pie with the monopolist employed as an in-house, rather than external, manager. The third response is a combination of the first two. An investment bank with the ability to evaluate managers may pledge its capital to back a guarantee of benchmark returns to investors in the bank's funds while using some part of the external capital raised to finance the skilled manager's strategy.

III.1 A Skilled Manager with Positive Personal Wealth

Suppose a skilled manager has personal wealth W . If she invest Q^A in the active strategy, the realized active return will be the sum of the expected active return, $\alpha^A(Q^A)$, and a random error $\varepsilon \geq \underline{\varepsilon}$. Only the expected active return is assumed to be affected by the amount being actively managed—the random error is not. The information asymmetry is such that outside investors are assumed to know only that $\alpha^A(Q^A) \geq 0$.

The skilled manager is not constrained in raising outside capital to invest in the benchmark strategy. Rather, a constraint arises when she proposes to raise outside capital to invest in the active strategy. She can loosen this constraint by pledging her personal wealth as a guarantee that investors who provide capital to be invested in the active strategy will in fact receive r^B for certain. Provided that guarantee is credible, investors will be willing to pay a fee of f^B ; i.e., the same fee they would pay for the equivalent return from passive management. The skilled manager is assumed to invest the collateral

with a benchmark manager. For simplicity, we assume henceforth that the benchmark is a risk-free bond portfolio.

The manager has no incentive to invest more than the amount she believes to be Q_{Max}^A in the active strategy. Thus it is rationale to believe that her active alpha is at least zero. Her guarantee will be considered credible even by investors who believe her active strategy has a zero alpha, provided her worst case outcome $Q^A(1+r^B+\underline{\varepsilon})+W(1+r^B-f^B)$ is never less than the amount guaranteed to the investors in the active fund net of her fee, $Q^A(1+r^B-f^B)$. For $f^B+\underline{\varepsilon}\geq 0$, the promise can be honoured for all $Q^A\geq 0$. When $f^B+\underline{\varepsilon}< 0$, the promise can be honoured provided

$$Q^A \leq \frac{W(1+r^B-f^B)}{|f^B+\underline{\varepsilon}|}.$$

If the manager succeeds in raising Q^A to be invested in the active strategy (with a guaranteed return of r^B) and an additional $Q-Q^A$ to be invested in the benchmark strategy, she will earn total fee income of f^BQ and she retain her expected addition to value of $\alpha^A(Q^A)Q^A$. She will solve:

$$\max_{Q,Q^A} \alpha(Q^A)Q^A + f^BQ - c(Q)Q + W(1+r^B-f^B) \quad (9)$$

subject to the constraint that in the event that $f^B+\underline{\varepsilon}< 0$, then Q^A is constrained to be

$$\text{such that } Q^A \leq \frac{W(1+r^B-f^B)}{|f^B+\underline{\varepsilon}|}.$$

It is instructive to compare three variants of the skilled manager's problem. The problem in (4) is the problem given symmetric information. The problem in (7) is the problem she faces given personal wealth and no access to outside capital—one can think of this as the extreme case given asymmetric information. Comparing (9) and (7), we see that any constraint in (9) must be looser than that in (7) since $\underline{\varepsilon}\geq -100\%$. For

$\underline{\varepsilon}\geq -100\%$, $\frac{(1+r^B-f^B)}{|f^B+\underline{\varepsilon}|}$ exceeds one. The problem in (9) is the problem she faces

given the ability to lever her personal wealth to achieve access to outside capital despite the information asymmetry.

When her personal wealth W is large enough, problems (7) and (9) have the same solution as the unconstrained problem (4). The difference between (7) and (9) is that the level of personal wealth necessary to achieve the unconstrained optimum of the symmetric information problem is smaller when that wealth can be pledged to guarantee outside funding than when access to outside capital is precluded.

The manager's guarantee of a payoff of r^B in return for a fee of f^B in problem (9) is equivalent to managing money under a credible 100% performance fee. A credible 100% performance fee contract is one where the manager will enjoy 100% of her out-performance of the net return over and above $r^B - f^B$ and has sufficient personal wealth pledged to guarantee that she will bear 100% of any under-performance.

When the maximum possible negative difference between the realized alpha and the manager's expectation of her alpha becomes small in absolute value, the condition that triggers the constraint in problem (9) will not be satisfied. Provided outsiders are certain that the *realized* alpha will never be more negative than the manager's fee, the manager will be able to achieve the unconstrained symmetric information optimum even if uninformed outsiders do not share her knowledge of her expected alpha.

The form of the management compensation contract will though differ between the symmetric and asymmetric information cases. Given symmetric information, the manager can be compensated with a fixed percentage fee greater than the benchmark fee. Given asymmetric information but common knowledge that the manager will never underperform the benchmark by more than her fee, the manager will instead be compensated with a (100%) performance fee. The total amount of assets under management and the manager's split of that capital between the active and passive strategies will not differ between the two cases.

We turn now to the problem when the manager has zero personal wealth and $f^B + \underline{\varepsilon} < 0$ and hence the manager has no way of accessing capital from uninformed outsiders.

III.2 A Wealthy and Informed Supplier of Capital

When the manager has nothing to back her guarantees and she might potentially underperform the benchmark by more than her fee, she will only be able to raise money to invest in active strategies from those who believe her expected alpha is positive. This creates an opportunity for an outside supplier of capital who has an informational advantage over other outsiders in the form of knowledge of the manager's expected alpha. For simplicity, we consider the case where there is no asymmetry between the skilled manager and a single wealthy outside investor concerning the manager's skill. The informed outsider can now act as a monopsonist supplier of capital to the monopoly owner of the management skill.

Note that this informed outsider is assumed to have capital to invest with the manager. He does not have to convince some other uniformed investors to supply him capital that he will in turn pass on to the skilled manager that he has identified.⁶

The classic problem of a monopsonist facing a monopolist has an interesting twist in this case.⁷ As shown in section II, the money manager facing a large number of informed suppliers of capital will invest first in the active strategy. If she optimally manages assets in excess of the level at which the marginal value added from continuing to invest in the active strategy becomes negative (denoted by Q_{Max}^A), she invest that excess in the benchmark strategy. When that same manager faces a monopsonist purchaser of her skills, she will change her investment strategy and the maximum amount invested in the active strategy will be less than Q_{Max}^A . Because her investment strategy is different, we will need to distinguish between the alpha of an active fund with many suppliers of capital, denoted by $\alpha(Q)$, and the alpha of an active fund with a single supplier of capital. The alpha of this fund will be denoted by $\alpha^M(Q)$ — the superscript M is a mnemonic for monopsonist.

⁶ One such informed outsider might be the head a government superannuation/pension organization into which state employees must make compulsory contributions.

⁷ See Chapter 24 of McCloskey (1982).

We first determine the monopsonist's demand for shares in the active fund given $\alpha^M(Q)$ and then consider how the monopolist will optimally chose the split between active and passive investment that is inherent in the functional form of $\alpha^M(Q)$.

The monopsonist's demand for shares in the active fund

The wealthy monopsonist will choose the amount Q of their wealth W to invest with the active fund manager who charges a fee of f^A and will invest the remainder with passive funds charging f^B . He will solve

$$\begin{aligned} & \max_Q (1+r^B + \alpha^M(Q) - f^A)Q + (1+r^B - f^B)(W - Q); \\ \text{i.e., } & \max_Q (\alpha^M(Q) - (f^A - f^B))Q + (1+r^B - f^B)W. \end{aligned}$$

At an optimum, Q will satisfy the first order condition

$$\alpha^M(Q) + \alpha_1^M(Q)Q - (f^A - f^B) = 0. \quad (10)$$

Relation (10) determines the monopsonist's demand for shares in the active fund, $Q^M(f^A)$, as a function of active fund's fee.

The supply of active management to a monopsonist purchaser of skill

The monopolist active fund manager sets her fee so as to maximize her profits. In doing so, she takes into account the elasticity of the monopsonist's demand for her services. For a given method of allocating funds between the active and passive strategies she solves:

$$\max_{f^A} f^A Q^M(f^A) - c(Q^M(f^A))Q^M(f^A).$$

Equivalently, she determines the quantity to manage on behalf of the monopsonist given that the functional relation between the fee she can charge the monopsonist, $f^M(Q)$, and the amount she will manage on his behalf is given by (10) as $f^M(Q) = \alpha^M(Q) + \alpha_1^M(Q)Q + f^B$; i.e. she can equivalently solve:

$$\max_Q f^M(Q)Q - c(Q)Q. \quad (11)$$

For any given Q , she will split the capital provided to her between the active and passive strategies so as to maximize the fee the monopsonist will be willing to pay for her services; i.e., she will split Q between the active and passive strategies so as to maximize

$$\alpha^M(Q) + \alpha_1^M(Q)Q.$$

This will mean investing solely in the active strategy whenever the assets under management, Q , are such that $\frac{\partial(\alpha^A(Q) + \alpha_1^A(Q)Q)}{\partial Q} \geq 0$. Let $Q_{Max}^{A,M}$ denote the investment

level that satisfies $\frac{\partial(\alpha^A(Q) + \alpha_1^A(Q)Q)}{\partial Q} = 0$. Any amount of assets under management

greater than $Q_{Max}^{A,M}$ will be invested in the benchmark strategy. Thus

$$f^M(Q) = \begin{cases} \alpha^A(Q) + \alpha_1^A(Q)Q + f_B, & \text{for } Q \leq Q_{Max}^{A,M} \\ f_B, & \text{for } Q > Q_{Max}^{A,M} \end{cases} \quad (12)$$

and

$$\alpha^M(Q) = \begin{cases} \alpha^A(Q), & \text{for } Q \leq Q_{Max}^{A,M} \\ \alpha^A(Q_{Max}^{A,M}) \frac{Q_{Max}^{A,M}}{Q}, & \text{for } Q > Q_{Max}^{A,M} \end{cases}.$$

Figure 4 depicts

- (i) the alpha of an active fund managing money on behalf of a monopsonist supplier of capital, $\alpha^M(Q)$, plus the benchmark fee f^B ;
- (ii) the fee that can be charged by an active fund managing money on behalf of a monopsonist supplier of capital, $\alpha^M(Q) + \alpha_1^M(Q)Q + f^B$; and
- (iii) the marginal revenue to an active fund from managing an additional dollar on behalf of a monopsonist supplier of capital, $\frac{\partial(\alpha^M(Q) + \alpha_1^M(Q)Q + f^B)Q}{\partial Q}$.

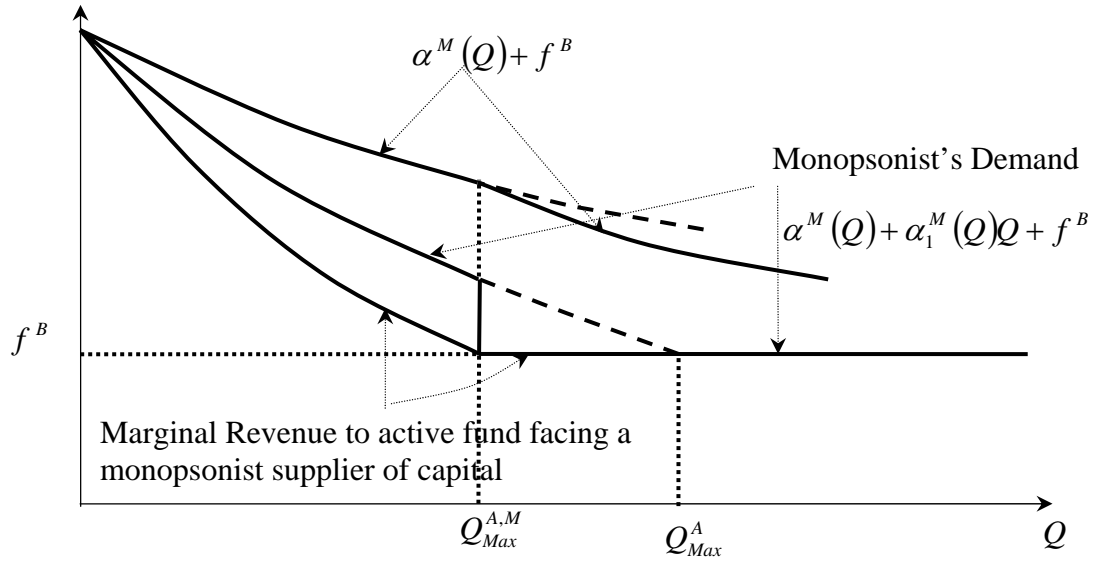


Fig 4. Active funds alpha, fee schedule and marginal revenue when facing a monopsonist supplier of capital

Figures 5A and 5B depict two settings where a monopolist active fund manager faces a monopsonist supplier of capital. The two settings differ in terms of how skilled the manager is. In Figure 5A, the manager's active alpha, $\alpha^A(Q)$, is large relative to her management costs, $c(Q)$, and she invests entirely in the active strategy. The capital optimally supplied by the monopsonist in response to the monopolist's quoted fee schedule, denoted by Q^{M*} , exceeds the amount managed by a passive manager, Q^{P*} , but is less than the amount the skilled manager would be willing to manage actively on behalf of a monopsonist supplier of capital, $Q_{Max}^{A,M}$.

Figure 5B depicts a setting where the manager is less skilled. She invests $Q_{Max}^{A,M}$ in the active strategy and invests the remaining capital in the benchmark. In total, her assets under management (being the capital supplied by the monopsonist in response to the monopolist's quoted fee schedule) is equal to the amount managed by passive managers with the same administrative cost structure, Q^{P*} .

The more-skilled manager of Figure 5A is able to charge the monopsonist a fee in excess of f^B . The active fund's alpha is split between the manager and the monopsonist capital supplier. In addition, she enjoys the excess of the benchmark fee over and above her average administration cost.⁸ The less-skilled manager of Figure 5B finds that the monopsonist extracts the entire alpha. Her profits are identical to those she would earn by managing a passive fund.

Our more-skilled manager will wish to advertise the fact that the state pension organization is not only willing to give them more than Q^{P*} to manage, but is willing to pay them more than f^B to do so.⁹ She would like others to thereby observe her alpha so that she could extract 100% of her alpha from investors competing to supply capital to her.

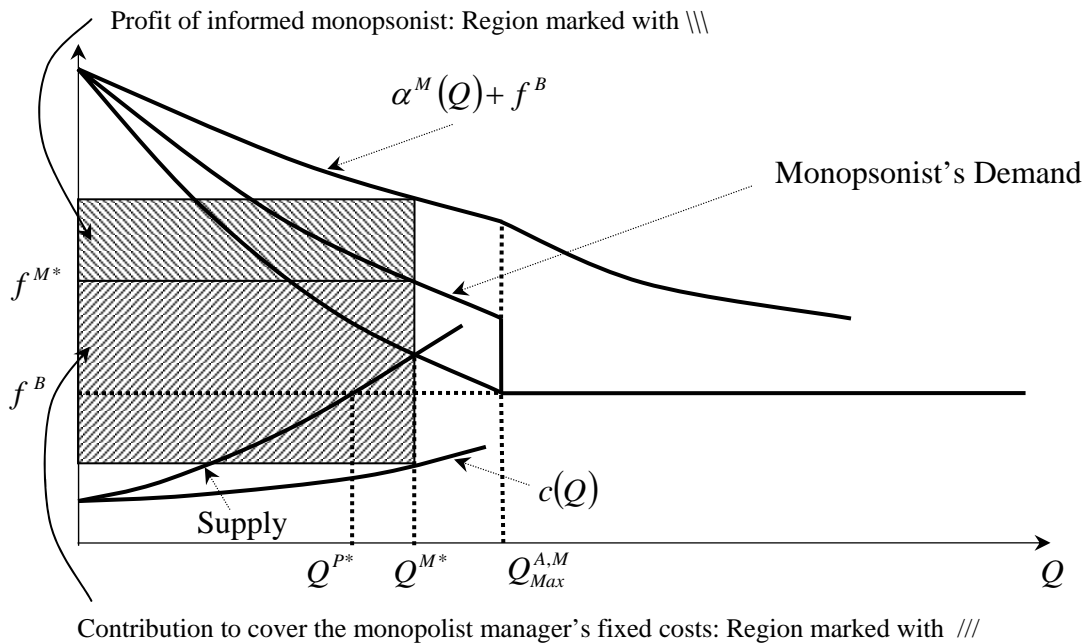


Fig 5A. Demand for, and supply of, active management given a monopsonist supplier of capital: setting where the active fund invests only in the active strategy.

⁸ When the average cost curve in Figure 5A is sufficiently steep, this excess will be a deficiency. Her share of the alpha will have more than offset this deficiency.

⁹ The less-skilled manager of Figure 5B can merely boast that she manages the same amount of capital as a benchmark manager and is paid the benchmark fee.

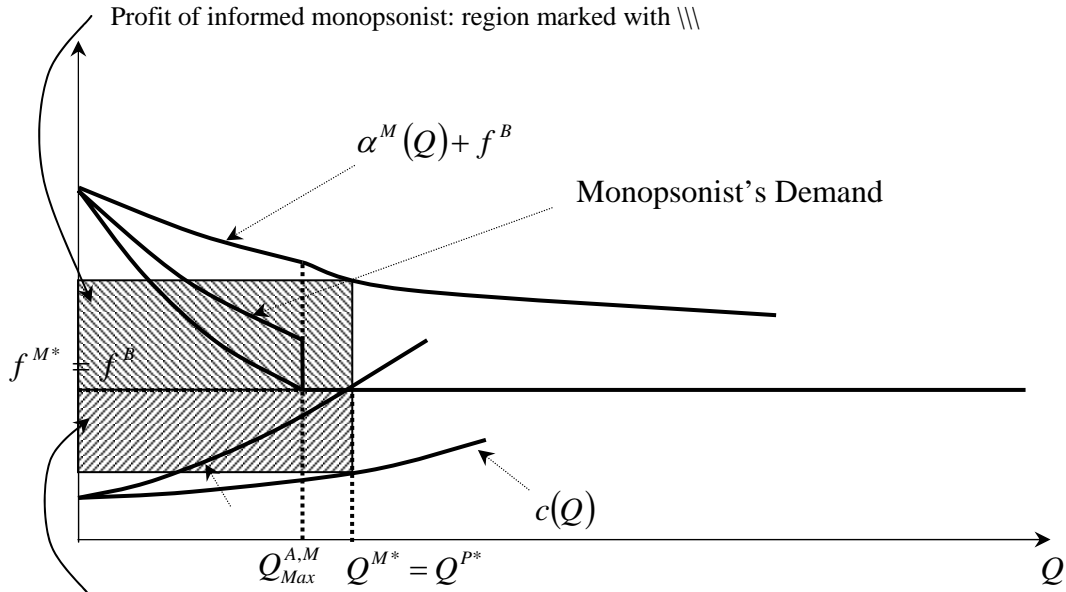


Fig 5B. Demand for, and supply of, active management given a monopsonist supplier of capital: setting where the active fund invests in both the active and passive strategies.

The conflict between human capital in the form of management skill and financial capital that recognizes that skill means that, as in the classic monopolist versus monopsonist problem, the joint profit of the two parties is not maximized. The combined profits of a more-skilled manager and the informed supplier of capital are less in Figure 5A than the profit in the setting of no information asymmetry that was depicted in Figure 3A. Similarly, the combined profits of a less-skilled manager and the informed supplier of capital in Figure 5B are less than the profit in Figure 3B. The combined profit in Figure 5A is less than the profit in Figure 3A because the more-skilled manager has less than the profit-maximising level of assets under her management in Figure 5A. All of that capital is actively managed, but she simply has too little capital relative to what investors would be willing to supply if her skilled were broadly recognized.

The combined profit in Figure 5B is less than the profit in Figure 3B because, although the assets under management by the less-skilled manager are identical in Figures 5B and 3B, only $Q_{Max}^{A,M}$ is managed actively when an informed monopsonist supplies the capital. The amount managed actively given symmetric information and

competition to supply capital is $Q_{Max}^A > Q_{Max}^{A.M}$. Irrespective of whether the manager is more- or less-skilled, she actively manages less than the optimal amount when the capital must be acquired from an informed monopsonist supplier.

We turn now to the problem when the manager has zero personal wealth and the informed outsider has only limited capital.

III.3 A Role for Investment Banks

When the manager (our monopolist) needs capital and the one man who can see her skill (our monopsonist) has less than $\min[Q^*, Q_{Max}^A]$ in capital to invest, the skilled money manager and the skilled people manager cannot achieve the optimum achieved in the symmetric information world without raising further capital. This desire for further capital provides a natural role for an investment bank characterized by

- (i) a set of partners who possess the ability to observe the manager's skill level and who contribute sufficient capital to the bank for the bank to be able to credibly promise to manage outside capital on a 100% performance fee basis;¹⁰ and
- (ii) the internalization of the monopolist-monopsonist conflict by the employment of the skilled manager within the bank under a contract that gives her a fixed share of her value-added.¹¹

Note that there will always be a conflict between a skilled manager and her bank employer concerning the share of alpha to be enjoyed by each party. A negotiation over the manager's compensation is not just about the split of her value added. Her compensation level can serve as a signal to outsiders about her skill. As her reputation outside the bank grows, her ability to leave and found a boutique firm grows. When outsiders judge quality by price (i.e., judge a manager's skill by the compensation she

¹⁰ An investment bank might advertise a guaranteed return of "benchmark plus" with the profits from stock lending contributing to the 'plus' component of returns.

¹¹ Not only will the bank undertake the optimal level of active management, the bank will be able to undertake the optimal level of research without needing to fund that research via a system of soft dollar payments.

receives from her bank employer), a skilled and well-compensated manager may be able to break away and contract with multiple suppliers of capital. In the compensation negotiation, higher compensation means not only less for the bank today but an increased chance of nothing for the bank tomorrow.

IV. Conclusions

In the absence of an information asymmetry concerning a manager's skill, the manager will capture all the rents. Capital will flow to managers with positive alphas, but not to the point where alpha is reduced to zero. The manager will charge a fee that captures the alpha and thereby caps fund size. Gross alphas will be positive, but alphas net of fees will be zero.

The presence of an information asymmetry provides a setting in which “money breeds money” provided the party with the financial capital also has the human capital necessary to recognize skill in others. A skilled money manager who lacks personal wealth may meet an informed party who does recognize their skill. But this will benefit neither party if the informed party is also broke. The informed party needs only enough financial capital to make credible a promise to uninformed suppliers of additional capital that they are guaranteed at least the benchmark return. The skilled manager of money and the skilled manager of managers can leverage their limited capital and share the value-added: Labour will enjoy some of her value-added, smart capital will enjoy the rest, and uninformed capital will receive merely the benchmark return.

The skilled manager has an incentive to try and reduce the information asymmetry. A skilled manager may seek to build a track record of her superior performance. Suppose that the market expectation of $\alpha(Q)$ is less than the true value known to the manager. Rather than charging a fee that maximizes her profit this period, a skilled manager may choose to charge an even higher fee, manage less money this period and make a smaller profit in the current period. The realized alpha on the active strategy is the sum of the true alpha and a random component of returns. Let $\sigma^A(Q^A)$ denote the standard deviation of the random component. Given the assumption that $\alpha_1^A(Q^A) < 0$, a

sufficient condition for the signal to noise ratio defined as $\frac{\alpha^A(Q^A)}{\sigma^A(Q^A)}$ to be strictly decreasing in Q^A is that $\sigma_1^A(Q^A) \geq 0$. A skilled, but underappreciated manager can more clearly demonstrate her skill by charging a higher fee and managing less money. The manager's problem of determining the fee given an information asymmetry becomes even more interesting when it is recognized that a fee higher than that which would maximize current profits may also serve as a signal to the market that the manager views her skills more favourably than the market currently does.

Appendix

The Optimality of Soft Dollar Payments

Consider a government superannuation fund or a firm pension plan where the amount of assets under management is determined by fiat. The fixed amount of assets under management is Q^A . This amount is invested in the active strategy only. In such a setting, a prohibition on soft dollar payments can lead to an underinvestment in research by the fund manager.

Suppose that the fund manager is precluded from passing her research costs back to the fund via a system of soft dollar payments. Suppose also that fund's expected return in excess of the benchmark, Ω , depends on both the amount invested in the active strategy, Q^A , and the dollar cost of the research undertaken, C^A .

$$\Omega = \Omega(Q^A, C^A) \text{ with } \Omega_1 < 0, \Omega_{11} > 0, \Omega_2 > 0 \text{ and } \Omega_{22} < 0.$$

Suppose that the manager receives a fixed percentage fee, f , of the end-of-period value of the fund. The total expected return on the fund is the benchmark return, r^B , plus the fund's alpha or excess return, $\Omega(Q^A, C^A)$. The active manager will choose to invest an amount in research that solves:

$$\max_{C^A} f \times Q^A (1 + r^B + \Omega(Q^A, C^A)) - C^A,$$

with first order condition:

$$f \times Q^A \times \Omega_2(Q^A, C^A) = 1.$$

The active manager will invest in research until her share, f , of the additional payoff to the last dollar spent on research, $Q^A \times \Omega_2(Q^A, C^A)$, is equal to the one dollar research cost that she must bear.

If instead a system of soft-dollar commissions allows the research costs to be borne by the fund, then the active manager's problem becomes:

$$\max_{C^A} f \left[Q^A (1 + r^B + \alpha^A(Q^A, C^A)) - C^A \right],$$

with first-order condition:

$$Q^A \alpha_2^A(Q^A, C^A) = 1.$$

The use of soft dollars allows the manager's incentives to invest in research to be aligned with the interests of the investors in the fund.

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