

What is the NPV of Expected Future Profits of Money Managers?*

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Abstract

Although established money managers operate in an environment which seems competitive, they also seem to be very profitable. The present value of the expected future profits from managing a collection of funds is equal to the value of the assets under management times the profit margin, assuming that the managed funds will remain in business forever, zero asset flow into and out of the funds, zero excess returns net of trading costs, fixed management fee proportional to the assets under management and a fixed profit margin for the management company. A profit margin of 30% seems empirically reasonable, but money management companies seem to trade at 2-4% of assets under management. Attempts to reconcile the two figures are not compelling which is disturbing considering the centrality of the present value formula to finance and economics. Another computation suggests that holders of actively managed fund typically lose about 12% (18%) of their assets if they hold the fund for 20 (30) years, compared with a loss of less than 3% (5%) for low-cost index fund investors for similar holding periods.

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There are hundreds of mutual fund families, barriers to enter the money management business seem low and little capital is tied up in that business, all of which suggest that the industry is competitive and therefore its producers should have low if not zero profits. How does the market set the price of these expected future profits, i.e., how does the market price the equity of established money management firms?

Assuming that the annual rate of interest is fixed at R , consider a firm that manages a short term bond mutual fund and charges at the end of each year a fee equal to a fraction c of the assets under management. Assuming that it manages initially $\$A$, and that the clients neither add nor withdraw money from the fund, the stream of income that the management company will receive is: $A(1 + R)c$ at the end of the first year, $A(1 + R)^2(1 - c)c$ at the end of the second year, $A(1 + R)^3(1 - c)^2c$ at the end of the third, etc. At the discount rate R , the present value of this stream is A – the value of the assets under management. The management company uses its revenues to pay for asset gathering, retention and servicing, and portfolio management. It also pays income taxes on its profits. The rest goes to the management company's owners. Empirically reasonable estimates of the pre-tax and after-tax profit margins are 35% and 20%, respectively. Such profitability seems difficult to reconcile with the industry being highly competitive.

This back of the envelope calculation indicates that money management firms should be priced at between 20% and 35% of the assets under management. But they are priced at 1-4% of assets under management, a pricing range which applies both to private transactions, and to ten publicly traded money management firms.

It is tempting to explain away at least part of the discrepancy by invoking the risk that any given money manager may lose most or all of the assets under management for a variety of reasons such as abysmal performance or serious legal problems. But the pricing formula applies also to the incumbent money managers collectively, not only to individual money managers. Therefore the validity of this explanation must rest on new entrants siphoning

assets away from the incumbents or another process by which investors will reduce their reliance on the traditional money management industry. (Such a process can be a transition to a continental-style banking sector or an environment in which money managers will be bypassed in favor of households' holding securities directly.)

Other explanations suggest that current fees and profit margins are not sustainable in the long run, and competition will shrink them. Since prices reflect expectations of future profits, these explanations cannot be ruled out, but they entail ominous predictions for the money management industry. And they beg the question, why hasn't competition eliminated these profits by now?

Arbitrageurs who dismiss the ominous predictions will realize that the price discrepancy does not present easy profit-making opportunities: only a small fraction of the direct ownership stakes of money managers is traded regularly, and positions that attempt to exploit the price discrepancy will take years, perhaps decades to deliver profits; indeed, even very patient investors cannot be certain of the profits. Ironically, it may be that the pricing of money management firms, which is determined primarily by institutional investors – i.e., money managers – may serve as a prime example of the limits of arbitrage.

Money managers' profits are derived from the fees they charge. In the absence of evidence that active money managers typically deliver excess returns, their clients should pay close attention to the fees. Indeed, straightforward calculations show that typical fees and performance are likely to result in substantial wealth dissipation, especially for long term, buy-and-hold clients.

This paper elaborates on the present value calculation (Section 1), presents data on actual pricing of money management firms and on their fees, profits and asset growth rates (Section 2), considers future parameter values which can be consistent with the market's pricing (Section 3), sketches how standard valuation would produce prices near the observed prices (Section 4), suggests that long term fund investors lose substantial fractions of their

savings if they buy-and-hold typical under-performing funds (section 5), explains why returns data on publicly traded money managers are too noisy to reliably detect positive excess returns (Section 6), why arbitrageurs with horizons shorter than a decade will be reluctant to attempt to exploit the mispricing (Section 7), and points out that if money managers were operating in a competitive environment, they should not earn profits (Section 8).

1 Present Value Calculations

The discounted cash flow method requires the estimation of the expected future cash flows, and of the rate at which they are to be discounted. It is common to decouple these estimations and it is almost always necessary to apply a good deal of judgement in estimating the expected cash flows and their appropriate discount rates. In contrast, discounting future fees of a money management firm is more tractable. This insight, and the calculation that follows, is based on Ross (1978), Brennan (1992), Ross (2001), Boudoukh et al (2003) and Cherkes (2004).

The following example captures the logic underlying the insight: Suppose that a year hence a money manager will charge a fee equal to 1% of the assets under management, and then liquidate the fund and return the assets to their owner. Assuming no excess return, the present value of the fee is 1% of the assets under management in the present.

The example illustrates that under simplifying assumptions, the rate at which the stream of future fees should be discounted is exactly the (possibly uncertain) growth rate of these fees. Formally, consider the following set of assumptions.

1. During each time interval of length Δt the fund charges continuously a fixed fraction $c\Delta t$ of its assets.
2. No money flows into or out of the fund, with the exception of the management fees; all dividends and capital gains are reinvested in the fund.

3. The fund's excess return after trading costs and before management fees is zero.

Under these assumptions, the present value of future fees is equal to the value of the assets under management, regardless of the fee. The asset management firm retains (or passes to its owners) its profit which is a fraction of the fee. Thus, the profit margin is important to determine a reasonable price for the asset management business. Focusing on established funds, with at least a few billion dollars under management, a pre-tax profit margin of 30% is conservative. Assuming such a margin is fixed forever and ignoring tax considerations, delivers a value of the management company equal to 30% of the assets' value. Assuming that the government collects about one third of the profits in taxes reduces the value of the management company to 20% of assets under management.

A fairly general calculation follows.

Suppose that the time- t instantaneous annualized return net of trading costs is r , that the comparable market return is R , that the manager's fee is a fraction c of the assets under management, and that the manager's profit margin is m , the inflow rate into the fund is g and that the fund terminates at time T . Then for $t < T$ the time- t assets under management $A(t)$ are

$$A(t) = A(0)e^{(g+r-c)t}. \quad (1)$$

The manager's net income from these assets between time t and $t + \Delta t$ is

$$I(t) = cmA(t)\Delta t. \quad (2)$$

The present value of the stream of net income between time zero and T is

$$\begin{aligned}
PVI &= \int_0^T e^{-Rt} I(t) dt = A(0)cm \int_0^T e^{-(R-r+c-g)t} dt \\
&= \frac{A(0)cm}{R-r+c-g} [1 - e^{-(R-r+c-g)T}].
\end{aligned} \tag{3}$$

Under the apparently conservative assumption that flows into and out of the money management firm are zero (i.e., $g = 0$) and that the discount rate is equal to the return on the assets under management (i.e., $R = r$), the formula reduces to

$$PVI = A(0)m[1 - e^{-cT}]. \tag{4}$$

To interpret (3), divide the assets under management into two notional accounts, the first to be paid eventually to the clients who are the owners of the assets, and the second to cover the fees to be paid to the manager. The present value of what the clients will receive at time T is

$$PV(A(t)) = A(0)e^{-(R-r-g+c)T}, \tag{5}$$

whereas the present value of the fees is given in (3). The two present values add up to $A(0)$ if $g = 0$ (no assets are added or withdrawn) and $R = r$ (zero excess performance). If the assets are held forever, i.e., $T = \infty$, the present value of the client's assets is zero.

When the time horizon is infinity ($T = \infty$), $g = 0$ and $R = r$, PVI is insensitive to the fee c . To understand this, note that increasing the fee from c_1 to c_2 will increase the manager's income in the short run at the expense of asset growth, and thereby at the expense of income in the long runs. The two effects offset each other when the asset growth rate (gross of fees) is equal to the discount rate.

A typical pre-tax margin m is higher than 30%. If the life of the fund is open-ended,

its management company should then trade at 20-30% of the assets under management, allowing for income taxes. But this is not the case.

2 Prices, Profitability and Asset Flows

The pricing formula is forward looking, and there is no way to know either the future paths of the parameters that enter the formula, or the market's expectations of these paths. (Or the market's expectation of the future paths of these expectations, which may be relevant to current pricing, etc.) The history of these paths and of prices of money management firms can offer some indication for their future, and for beliefs about their future. Alas, the available historical records are not as comprehensive as one would like them to be.

Most money management firms are privately held, or are wholly-owned subsidiaries of publicly held firms that have multiple lines of business such as banks and insurance companies. Therefore it is impossible to obtain comprehensive data on market prices or the profitability of such enterprises. Nonetheless, some information is available. Equity of firms that concentrated in money management traded publicly at least since 1974. The equity of ten such firms traded publicly in 2002.

2.1 The Data

The following procedure was used to identify publicly traded money managers. The first step a search over all firms in SIC codes 6211 (Security Brokers and Dealers), 6282 (Investment Advice, Portfolio Managers), 6722 Management Investment Offices, Open-End; i.e., open-end funds), and 6799 (Other Investors). Then a match between firms with these SIC codes and a list of Mutual Fund Managers in CRSP Mutual Fund database. The matching was by name (approximate). Firms that did not have Mutual Funds under management were discarded. The 2001, 2002 and 2003 annual reports of the remaining companies were read

to exclude firms with substantial business outside investment management. The final step required that reliable CRSP and COMPUSTAT data were available for the remaining firms.

Price data on the publicly traded money management firms are available from the University of Chicago's Center for Research in Security Prices (CRSP). COMPUSTAT has the income statements of these firms, and they are used to study their profitability.

Additional information on prices is available from mergers and acquisitions of money managers and from Wall Street analysts who also publish profitability and growth estimates. This information is consistent with the profit margins and pricing of the publicly traded money managers reported below.

CRSP also provides asset flows for mutual funds since 1965 and for families of funds since 1993. Flows are not available for money managers in general. Data on mutual fund flows in the most recent decades should be interpreted with caution because these decades were very kind to the US mutual funds industry with the general disintermediation (which led to the emergence of money market funds and to funds holding asset-backed securities) and the early 1980s appearance and subsequent flourishing of 401(k) retirement plans.

The data are far from comprehensive, but the centrality of the present value formula to economics and the apparent discrepancy between the formula and the data call for a close scrutiny of the available data, coupled with the hope of obtaining better data in the future.

2.2 Prices of Publicly Traded Money Management Firms

Table 1 summarizes the relevant data for the ten publicly traded money managers at the end of 2002. Each managed tens of billions of dollars, and collectively they managed over \$1.2 trillion. It is reassuring to note that the ratio of revenue to all assets under management is of the same order of magnitude as the fees money managers charge, averaging .83%.

The theory predicts that the ratio MV/AUM (enterprise value to assets under management) should fall between the ratio of $(\text{net income})/Rev$ (after-tax profit margin) and that

Company	AUM(\$B)	Rev/AUM	EBIT/Rev	(N.I.)/Rev	Price/(N.I.)	MV/AUM
FRANKLIN	248	1.04%	25%	17%	19	3.49%
BLACKROCK	273	0.21%	37%	23%	19	0.94%
EATON VANCE	56	0.94%	35%	23%	16	3.81%
FEDERATED	195	0.36%	47%	29%	14	1.49%
GABELLI	21	1.02%	44%	25%	17	5.13%
NUVEEN	80	0.50%	53%	32%	19	3.33%
JANUS	138	0.83%	32%	7%	34	2.72%
NEUBERGER	56	1.16%	39%	18%	20	5.15%
T. ROWE	141	0.65%	34%	21%	17	2.42%
WADDELL	28	1.56%	35%	20%	18	6.61%
Average	124	0.83%	38%	21%	19	3.51%

Table 1: Publicly traded money management firms at the end of 2002: assets under management (AUM, in \$ billions), and the following ratios: Revenues to assets under management (Rev/AUM), operating profit margin (The ratio of EBIT – earnings before interest and taxes – to revenues), after-tax operating profit margin (The ratio of N.I. – net income, or earnings – to revenues) Price to net income ratio (P/N.I.) and the ratio of market value to assets under management (MV/AUM).

of EBIT/Rev (before-tax operating margin). But the latter two ratios are between six and eleven times larger than MV/AUM, suggesting that the market seriously under-prices money management firms.

(The after tax margin takes into account the income taxes which the fund manager pays as well as the interest payments it makes on any debt it owes. Discounting the after-tax income stream is a complex exercise which should incorporate current and future tax rates as well as the fund manager's current and future leverage. Discounting future after-tax profits with the method sketched in the previous Section therefore offers a lower bound on the present value of the future profits.)

The price/earnings ratio is a more conventional measure of the reasonableness of the equity price, and Table 1 indicates that for money managers it is on average 19, well below 32, the P/E ratio of the S&P 500 at the end of 2002. (The P/E ratio of the S&P 500 without technology was near 17 at the time, and the P/E ratio of the S&P index of the financial sector was near 14.)

Theoretically, the P/E ratio of the money managers should be much higher. Consider

a hypothetical money manager with revenues equal to .83% of assets under management and earnings (which equal to 21% of revenues) equal to $.83\% \times 21\% = .18\%$ of assets under management. If this management firm is priced at its theoretical lower (upper) bound of 21% (38%) of assets under management, then its theoretical P/E ratio is $21\% / .18\% = 121$ ($38\% / .18\% = 215$). Such outsized P/E ratio bounds suggest that the gap between the theory and practice has to do with assumptions regarding parameter values in the very distant future.

The theoretical price is based on a few assumptions regarding future conditions: that net asset flows will be zero, that fees and profitability levels will remain stable and that the funds will earn zero excess return before management fees are subtracted. History may offer some guidance regarding the reasonableness of these assumptions.

2.3 The Power of Incumbency and Flow History

Hiring and firing institutional money managers is done by individuals who are seldom the sole direct beneficiaries of the managers' performance. These individuals often have fiduciary duty to hire good managers, and probably tend to hire managers with long and good track records, because they are less likely to be blamed if the performance of such managers disappoints. Such considerations give an edge to incumbents in the institutional money management arena. Name recognition and long and presumably good track records help incumbents at the retail level as well. These observations suggest that barring a structural shift in the money management business, incumbents as a whole are unlikely to lose assets consistently.

The valuation formulas of the previous Section may be suitable for established money managers with a good track record and substantial assets under management, but not for new entrants. Therefore to assess the magnitude of the relevant asset growth rate g , the focus should be on the asset growth rates of larger and well established managers.

This study is about the value of asset gathering and retention by money managers, not about their ability to manage these assets. Comprehensive historical data on total assets managed by individual management firms are not available. The next best statistics to study are assets under management by families of mutual funds.

The proper units of analysis are probably fund families rather than individual funds, for several reasons: One, much of the branding, marketing and selling effort focuses on the fund family rather than on individual funds. Two, when a particular investment style or asset class becomes popular, the fund family is likely to respond by offering a new fund that appeals to current taste. Three, it is easier to move money from one fund to another within a family than across families of funds. (The third observation is less relevant for institutional investors.)

Jointly, these considerations lead to the construction of Figure 1 which depicts the annual average asset growth rates of mutual fund families and of mutual funds in 1993-2002 for the largest families and the largest funds that were in business and collectively managed 75% of the assets in mutual funds in 1993. (Changes in asset values through market appreciation and direct acquisition are excluded.)

A few observations emerge from Figure 1. First, the average annual asset growth rate of mutual fund families is 6%, but it also seems to decline over the 1993-2002 decade. Such a decline can be due to random fluctuations, or due to a secular trend. With so few observations it is difficult to draw firm conclusions. Second, the asset growth rate of funds was consistently lower than that of fund families, probably because the growth rate of funds is for funds that existed in 1993 whereas the growth rate for fund families also reflects assets that went to newly established funds of fund families that existed in 1993.

The decade covered in Figure 1 saw strong growth of 401(k) retirement plans, at the expense of traditional defined benefit retirement plans. An inference of similar future growth rates is inappropriate. Indeed, such growth rates are not sustainable in the long run. But

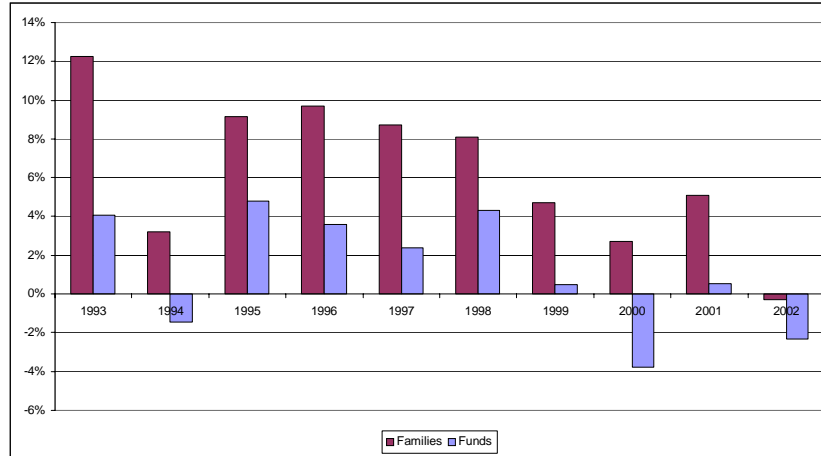


Figure 1: Annual asset flow rates to the largest families of mutual funds and to funds that existed in 1993, 1993-2002. The flow rates to fund families (funds) are to the largest fund families (funds) that existed in 1993 and collectively managed 75% of all fund assets in 1993; the experience of that decade at least does not suggest that incumbent money managers are likely to lose considerable assets in the future.

The history of asset growth need not represent the future growth, or the expected future growth. The recent proliferation of hedge funds may be a harbinger of a trend not only of asset growth in the hedge fund industry, but also of such growth at the expense of traditional money managers. Indeed, controlling for asset size, ownership of at least some hedge funds has been priced much higher than ownership of a traditional money management business. For instance, the 9/26/2004 issue of the *Wall Street Journal* reported that JP Morgan acquired a stake in the \$7 billion hedge fund Highbridge in a transaction that values the fund at \$1 billion. The pricing model in this paper does not cover hedge funds which earn performance-based fee. (Goetzmann, Ingersoll and Ross, 2003, offer a pricing theory for hedge funds.) The assets managed by hedge funds are a small fraction of the total assets under management. In fact, the very entrepreneurial nature of hedge funds, coupled with their fee structure, suggests limitations on their growth. Be that as it may, one cannot rule out the possibility that assets will migrate from traditional managers to hedge funds, thereby

shrinking the assets managed by traditional managers.

With technological and regulatory changes the financial industry has seen considerable disintermediation in the last decades. It is possible that the next phase in the disintermediation will involve more households holding more securities directly, thereby diminishing the assets managed by the traditional asset managers.

Net dissavings by the clients of the asset managers will also result in shrinkage of assets under management. For instance, rather than reinvest distributed dividends they can use them to fund consumption. Such a behavioral change cannot be ruled out, but seems unlikely as long as the population and per capita wealth grow.

It is just as easy to come up with scenarios in which assets under management grow until eventually almost all assets are managed by traditional asset managers. Therefore setting $g = 0$ in (3) seems reasonable, and perhaps even conservative.

2.4 Expense Ratio and Margin History

Mutual funds fall into a few broad categories, and Figure 2 provides the historical assets under management in each category. Most of the \$5.6 trillion in mutual funds in 2002 were in equity funds (39% of the total) and in money market funds (35%). Attempts to discern secular trends in fee size should focus on these two categories which cover the bulk of the assets under management.

CRSP gives the actual expense ratio of mutual funds. Figure 3 depicts the history of these asset-weighted ratios for the five fund categories. It suggests that fees have not shown a tendency to diminish over time.

The expenses (or fees) to the funds' investors are the revenues that appear on the income statements of the fund managers. Costs – including portfolio management, marketing and sales expenses – are paid out of these fees. Fund managers' operating income is the difference between their revenues and costs; EBIT – earnings before interest and income taxes – is a

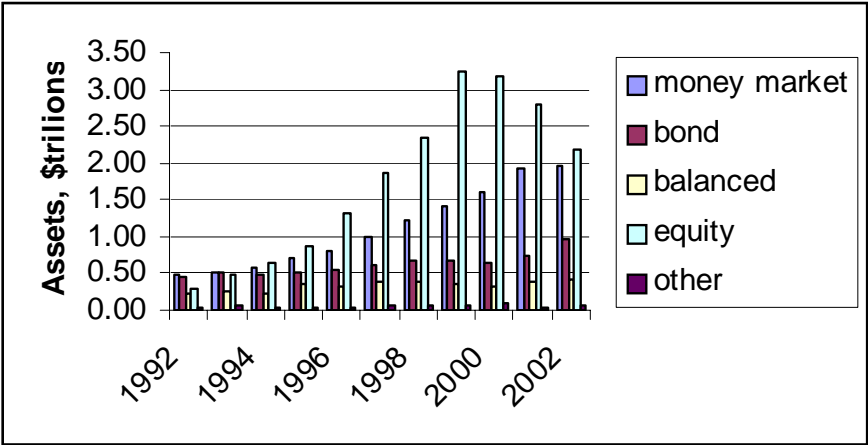


Figure 2: Total assets in mutual funds, by category

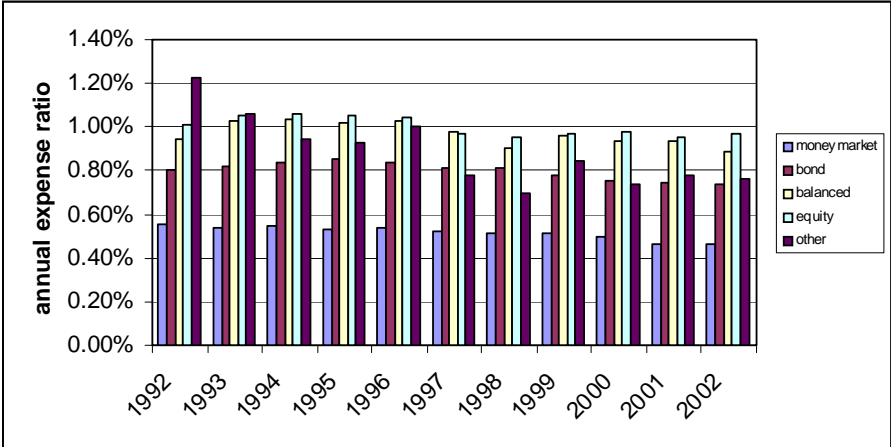


Figure 3: Average annual expense ratios for various mutual fund categories, 1992-2002.

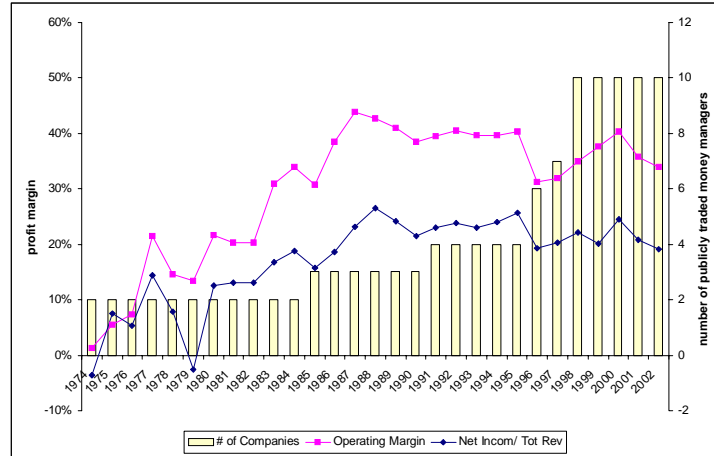


Figure 4: The number of publicly traded money managers, their average operating margin and the average ratio of their net income to revenue, 1974-2002.

common name for operating income. The ratio EBIT/Revenues is the (before tax) profit margin or profitability.

Data on money manager's revenues and profit margins are available only for stand-alone publicly traded money managers. Figure 4 depicts the number of publicly traded money managers and their average profit margins since 1974. The number of publicly traded money managers is small, but has been increasing over the years. (The small number of publicly traded money managers does not imply that most managed money is managed by privately held businesses; a substantial fraction of managed assets are managed by subsidiaries of publicly held firms such as banks.) The Figure suggests that before- and after-tax profit margins move in tandem and they seem to have increased substantially in the past three decades. This increase may have been an industry-wide trend or it may reflect the selection from the whole group of money managers into the small subset of publicly traded managers.

2.5 Summary

Assuming that past flows, fees and profit margins will persist into the indefinite future, prices of money managers seem to be about 1/5 to 1/10 of where they should be theoretically. If the market cannot be that wrong, the implication is that in sharp contrast with the history of the recent decades, the future will see some combination of assets flowing out of the incumbent managers and their profitability considerably shrinking.

3 Rationalizing the Prices of Asset Managers

Substituting historical parameter values in the present value formula yields prices which are much higher than those observed. This section engages in the reverse exercise, namely, it reconsiders equations (1) - (4) and identifies parameter configurations under which the price is right.

It is possible that the assets' return r is lower than the risk-adjusted discount rate R because turnover and the transaction costs it entails reduces the fund's returns. For an equity fund with 100% annual turnover and trading costs of .60% for a combined purchase of a security and a sale of another, the difference $R - r = .60\%$. (Note, however, that assuming positivity of $R - r$ on average for the incumbent money managers means that on average their risk-adjusted returns are negative at $r - R$.)

With the normalization $A(0) = 1$ and assuming $T = \infty$, rewrite (3) as

$$g = R - r + c - c \frac{PVI}{m}. \quad (6)$$

With annual trading costs at .6% and fund fees at .75%, the equation translates to

$$g = .6\% + .75\% \left(1 - \frac{m}{PVI}\right),$$

which implies, for instance, that the growth rate necessary to rationalize, say $m/PVI = 11$, is $g = -6.9\%$. An annual shrinkage rate of 6.9% means that that five (ten) years hence the incumbent managers will lose about 30% (50%) of the assets they currently manage, with asset size adjusted for the returns. A more modest $m/PVI = 6$ results in $g = -1.65\%$, suggesting that five (ten) years hence the incumbent managers will lose about 8% (15%) of the assets they currently manage, with asset size adjusted for the returns.

Studying mutual funds during 1985 - 1994, Gruber (1996) offers another set of numbers from which g can be calibrated. He reports: "[M]utual funds underperform an appropriately weighted average of the indices by about 65 basis points per year. Expense ratios for my sample averaged 113 basis points per year." Substitute $R - r + c = .65\%$ and $c = 1.13\%$ into (6), and assume say $m/PVI = 11$, to obtain $g = -11.78\%$. Applying Gruber's numbers to $m/PVI = 6$ results in $g = -5\%$.

Money managers may be less profitable in the future. Suppose that the margin at time t , $m(t)$, satisfies

$$m(t) = m_0 e^{-\mu t} + m_\infty (1 - e^{-\mu t}), \quad (7)$$

indicating an exponential decay of the margin from the current m_0 to the eventual margin m_∞ . Substitution of (7) into (2), reevaluation of (3) and again setting $A(0) = 1$ and $T = \infty$, results in

$$\frac{PVI}{m_0} = \frac{c \frac{m_\infty}{m_0}}{R - r + c - g} + \frac{c(1 - \frac{m_\infty}{m_0})}{R - r + c - g + \mu}. \quad (8)$$

Returning to the base case $R - r = g = 0$, the equation reduces to

$$\frac{PVI}{m_0} = \frac{m_\infty}{m_0} + \frac{c(1 - \frac{m_\infty}{m_0})}{c + \mu}, \quad (9)$$

indicating that a low valuation PVI relative to current profit margin m_0 can be ratio-

nalized by a low eventual profit margin m_∞ and a high convergence rate to it, μ . But for all convergence rates μ , $PVI/m_0 > m_\infty/m_0$, implying (within this base case) that to rationalize a price which is 1/6 of the after-tax profit margin, profit margin will have to drop to less than 1/6 of their current levels, e.g., from 21% to 3.5%.

To pursue this example further, assume that the fee rate $c = .75\%$, current after-tax profit margin $m_0 = 21\%$ and $PVI = 5\%$ (a generous assumption!). Equation (9) is satisfied, e.g., with eventual profit margin $m_\infty = 2.1\%$ and annual convergence rate slightly greater than $\mu = 9\%$. Assuming that the eventual profit margin will be zero ($m_\infty = 0$) and maintaining all the assumptions delivers $\mu = 3.75\%$.

The parameter values entertained in this section can emerge if the industry becomes very competitive. But so far competition has not eliminated money managers' profits. Moreover, recalling the economies of scale associated with money management, it is reasonable to assume that assets will increase at the rate of the underlying returns whereas costs will rise more modestly. Then profit margins will rise, not shrink.

In summary, it seems unlikely that some expectation of future parameter paths is reasonable in light of both the current prices of money managers and the history of these parameters and prices. But this is also a matter of judgement.

4 How Can It Be? Standard Present Value Analysis of a Money Manager's Expected Free Cash Flows

The standard business valuation approach entails estimation of the business' expected free cash flows and the risk of these flows, and then adding up the risk-adjusted present values of these expected cash flows. The procedure is complex and requires a good deal of judgement. Moreover, the analysis often reduces the cash flows associated with the distant horizon to a single, terminal value. (Higgins, 2004, offers a summary of the more popular valuation

techniques.)

An analysts report issued by the banking firm A. G. Edwards summarizes its valuation methodology, which is quite typical: "Our primary valuation determinants for our universe [of money managers] are individual discounted cash flow models. In our DCF models, we typically forecast annual free cash flows for a 10-year period and then assume that the businesses are mature and grow at a rate close to that of the real economy. Our estimates of free cash flow are discounted at an appropriate risk-adjusted discount rate specific to the individual companies. Often, we look at other metrics, most notably price to earnings, PEG, relative P/Es and price to revenue ratios, for a more complete picture of where a company is trading in relation to both its peers and its historical averages. Two of the primary risks to most of our universe would be a general economic slow down or a problematic merger." (Hopson *et al*, 2004, page 35).

Consider a typical valuation exercise. It takes the revenues to be .83% of the assets under management and the net income – which is the free cash flow in this simple case – to be .21% of assets under management. The important growth assumption is that assets will grow annually on average by 15% through a combination of net new flows and market returns. Taking the discount rate to be 13% per annum, the present value of the first ten years' net income is 1.4% of the initial assets under management.

With annual asset growth rate at 15%, the expected assets under management at the end of the 10th year is 3.5 times the initial level of assets under management. At this point the valuation exercise calls for a valuation not of the business currently, but of the business as it is projected ten years hence. One way to proceed is to assume that it will be priced then at, say, 3.5% of assets under management. Discounting this valuation to the present at 13% per annum delivers a present value of the 10-years-hence value equal to 3.6% of current assets under management. Together with the 1.4% (the NPV of the first ten years expected cash flows) this delivers a valuation of 5% of assets under management.

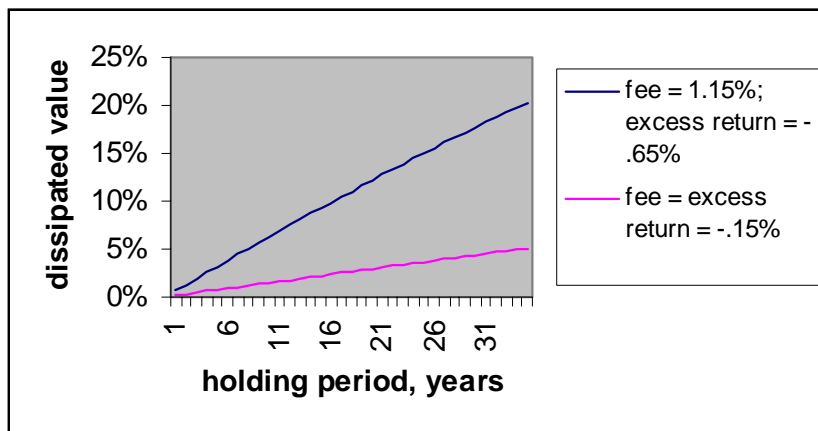


Figure 5: Fraction of wealth lost by a fund holder, relative to investing directly in an index.

Other approaches to the calculation of the terminal value are also available. For instance, if the terminal value is 19 times the tenth year's net income, then its present value is 3.2% of the current assets under management. Naturally, higher discount rates and lower growth rates will deliver lower valuations.

In summary, a routine application of a commonly used valuation technique is unlikely to uncover a conflict with the market prices of money managers.

5 The Perspective of the Mutual Fund Holder

Equation (5) with $g = 0$ allows the computation of the fraction of assets dissipated away from the retail investor for various holding periods, assuming all dividends are reinvested. Two examples are summarized in Figure 5. The first uses Gruber's (1996) estimates of annual fee and excess performance of 1.13% and -.65%, respectively, and the second is for an index fund that charges .15% annually, and its excess performance is exactly -15%, reflecting the fee.

A holding period of two to three decades is quite reasonable, especially for participants in 401(k) retirement plans. A fund to which the Gruber numbers apply will dissipate 12.2%

of an investor's wealth if he hold it for 20 years, and 17.7% of his wealth if he holds it for 30, in contrast with a .15%-a-year index fund that will dissipate 3% of the wealth of an investor who holds it for 20 years and 4.4% of the wealth if he holds it for 30.

The amount of wealth which investors in active funds dissipate seems large, especially since low-cost index funds are available to fund investors outside 401(k) plans, as well as to many participants in such plans. One wonders what investors in active funds think they get from their fund managers. Moreover, Figure 5 suggests that 401(k) plan sponsors who fail to include low-cost index funds among the offered funds are doing a disservice to the participants.

6 Mispricing as Excess Returns

Equity returns are approximately intertemporally independent and identically distributed, and therefore it is statistically convenient to study them in order to detect mispricing. This approach is fruitful when the returns series is long or the returns are sufficiently positive relative to the returns' variability. Unfortunately this is not the case here.

To contemplate such a study, consider the returns to holding the stock of a hypothetical firm which manages a single, all-equity fund. Further assume that the net asset flow into the fund is zero, that the fund's return matches the return of the market r (which implies that excess returns are exactly offset by trading costs) and that the stock of the management firm trades and will trade at a fraction p of assets under management. Suppose further that the fund's annual fee is a fraction c of the assets under management and the profit margin is m , that at the end of the year the fees are charged and all profits are distributed as dividends to the holders of the management firm's stock.

The one-year one plus capital gain to holding the manager's stock is $(1 + r)(1 - c)p/p$, and the end-of year dividend yield is $(1 + r)cm/p$. The total one-year one plus return is $(1 + r)(1 + c(m/p - 1))$, which implies an excess return of approximately $c(m/p - 1)$; with

$c = .75\%$ and $m/p = 11$, this is an annual excess return of 7.5%. With $m/p = 6$ the implied annual excess return is 3.75%

The calculated hypothetical excess returns entail considerable uncertainty. Any specific fund family is more complex than a manager of a pure, simple stock fund which pays out all its profits as dividends. Such profits are often retained, at least partially. Fund families manage varieties of funds, each with its fee and profit margin structure. Inflows and outflows of assets take place, especially within fund families, but also into and out of them. Neither profit margins nor trading costs are stable over time. Moreover, the market's perception of these parameters' future evolution changes, and changes in these perceptions affect the stock prices of money managers.

To set up a statistical model of the excess returns to holding stocks of money managers, estimate the expected excess returns and test if they are statistically positive one would need to specify benchmark returns, or at least estimate them. When the money manager's only business is a single fund with a single asset class, the task is relatively easy: The benchmark return is the return on that asset class. But most fund families manage funds consisting of assets from more than one class. And the relative weights of the different classes change. Thus, the benchmark selection is difficult, and mistakes and compromises in the estimation of the correct benchmark returns will lead to biases and errors in the estimation of the excess returns on the stocks of the money managers.

In summary, the small number of publicly traded money managers, their heterogeneity and the short period that they have been publicly held all suggest that the excess returns of holding a portfolio of these money managers is statistically indistinguishable from zero.

7 Had We But World Enough, and Time

A mispricing suggests profit opportunities. What does it take to exploit the gap between the theoretical and actual pricing of money managers? It takes time, and resources dedicated to

long-term arbitrage are limited. (See Shleifer and Summers, 1990, and Shleifer and Vishny, 1997.)

There are four categories of arbitrage opportunities. In the first and simplest, one opens a position and leaves it intact until he closes it on a certain future date which is known at the time the position is opened. Counter-party credit risk aside, a violation of the covered interest rate parity lends itself to such a trade. Violation of the put call parity is another example.

The second category requires the trader to adjust his position periodically, but its closing is still on a future date which he knows when opening it. Reliance on dynamic trading requires the traders to count on market liquidity during the execution of the trade. A violation of the Black-Scholes options pricing formula lends itself to such a trade.

In the third category a particular position is very likely to deliver positive profits by a certain date, but the profits are not assured. For instance when firms A and B agree to merge by a certain date with the shares exchanged 1 for 1 with the shares of the merged firm. A few conditions will have to be met before the merger concludes, but the date of its contingent conclusion is known. In this case the shares of firms A and B should trade at parity, and a deviation from equal price of the shares calls for buying the cheap and shorting the rich by those who believe that the merger will likely take place at the announced terms.

The fourth category of exploitation of a pricing discrepancy has no certain closing date, but relies either on an extremely long holding period or on the market's general tendency to converge eventually to some reasonable pricing. The apparent mispricing of money managers may offer an arbitrage opportunity of this fourth category. An assessment of an attempt to exploit the price discrepancy calls for analysis of the temporal dimension of the price discrepancy.

Consider a finite horizon model in which the asset manager ceases operations and returns the assets to its clients T years hence. How many years of operations will it take to render

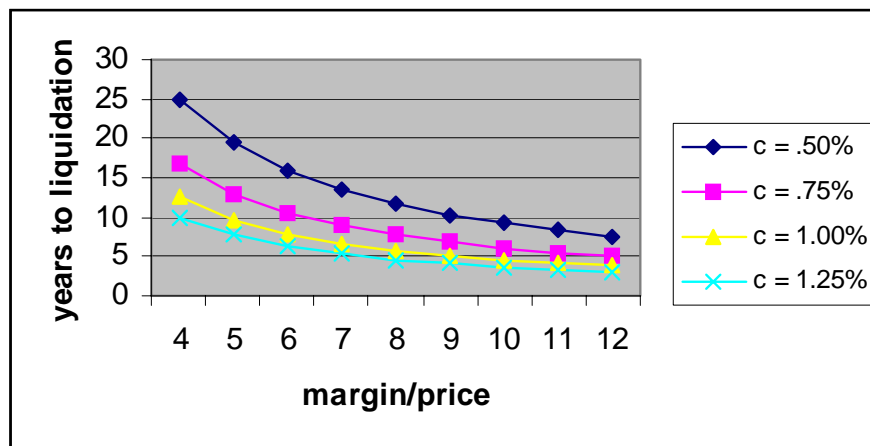


Figure 6: Given Margin/Price and fee (c), the number of years till the money management business is expected to liquidate. Price is per dollar of assets under management

the present value of the income from ownership equal to the initial investment p in the money management business under the benchmark case (i.e., asset growth rate $g = 0$ and excess return $r - R = 0$)?

Figure 6 depicts the solutions T to equation (4) under various parameter configurations. Note that under reasonable parameter configurations – e.g., the fee $c = .75\%$ and the margin/price ratio $m/p = 6$ – the liquidation period is 11 years.

An alternative way to appreciate the numbers is to think of a potential buyer of the equity of the money manager who believes that current parameters and the fund itself will survive forever. Such a buyer, if his holding period of the equity were infinity, would say that he is buying equity in the money manager at a fraction of its fundamental value equal to p/m . But what about a potential buyer who plans on a holding period of just t years? The computation of his discount requires an assumption about the resale price of these shares. Assuming that the resale price/margin ratio will be equal to the purchase price/margin ratio, the present value of his income from dividends and ultimate resale of the shares is $m(1 - e^{-ct}) + pe^{-ct}$. Purchasing this income at a price p , he receives a discount D which solves $p = (1 - D)(m(1 - e^{-ct}) + pe^{-ct})$. Figure 7 depicts the discount D for various holding

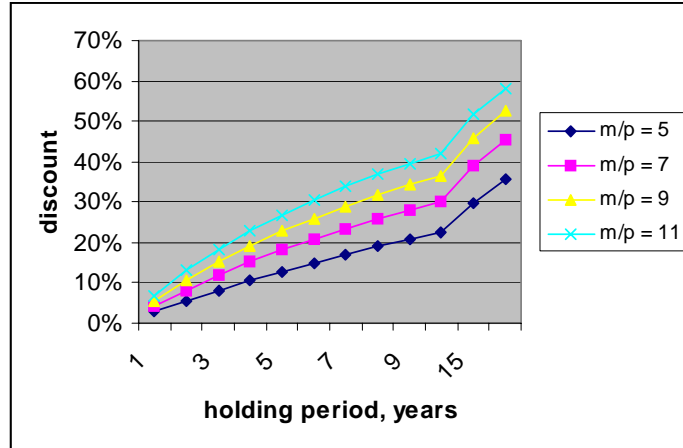


Figure 7: Implied discount on the cost of a money manager, assuming resale at the end of a given holding period at the same margin/price ratio as that prevailing at the purchase time.

periods and margin/price ratios.

The profits implied in Figures 6 and 7 require holding the position for a few years and are highly uncertain. For any given publicly held money manager, or even a set of them, the assets they manage as well as their profits can shrink. Moreover, there is no guarantee that they will pass their earnings to their shareholders. Therefore arbitrageurs may choose not to attempt exploitation of the mispricing of money managers.

It seems then that the pricing of money managers may reflect hyperbolic discounting at the market level. (Laibson, 1997, and Stortz, 1956, are standard references for hyperbolic discounting by individuals.) In his discussion of the state of long-run expectations, Keynes (1936) observes, "[L]ife is not long enough; – human nature desires quick results, there is a particular zest in making money quickly, and *remoter gains are discounted by the average man at a very high rate.*" (Italics added.)

Keynes (1936) also asserted that prices could deviate from their fundamental values due to the animal spirits in humans who trade in financial market. He did not specify the direction of the mispricing. Adam Smith (1776) had a similar view: "The value of a share in a joint stock is always the price which it will bring in the market; and this may be either

greater or less, in any proportion, than the sum which its owner stands credited for in the stock of the company." And more recently, Black asserted, "we might define an efficient market as one in which price is within a factor of 2 of value... The factor 2 is arbitrary, of course... By this definition, I think almost all markets are efficient almost all the time. 'Almost all' means at least 90%."

Miller (1977) argues that short selling constraints preclude the views of the most pessimistic market participants from being reflected in prices, and therefore asset prices can exceed their fundamental values, i.e., the present value of the dividends they expect to generate in the future. Harrison and Kreps (1978) offer a formal dynamic model of investor disagreement and short sale constraints causing mispricing. (Scheinkman and Xiong, 2003 are a recent addition to that literature.) These models share a common theme: assets may be over-priced. In contrast, the present paper offers evidence which suggests that stocks of money managers are persistently under-priced.

It is often thought that it is institutional investors (i.e., money managers) who are the price-setting marginal investors. In fact, if the proverbial marginal investors apply the dividend discount method as sketched in Section 4, they will not conclude that current prices are very wrong. Thus, ironically, a mispricing can persist in the money managers' own backyard – the pricing of their own businesses.

8 Profits and Competition

Money managers' profitability plays a central role in this paper. Profits of money managers are relatively easy to estimate because money managers' pre-tax profits are their operating profits, with no need to adjust for the cost of capital which is not tied up in the business.

To illustrate the size of the capital necessary to set up a money management business, note the following from a report by the banking firm A. G. Edwards, "LSV was established in 1994 by three college professors who had developed a value-oriented, quantitative model.

In seeking a financial partner, they found [SEI Investment], who invested \$1 million (51% ownership) in LSV asset management... The investment turned out to be a great one, with LSV's assets under management now total \$25 billion and we estimate that it will generate \$44.7 million in earnings for [SEI Investment] in 2004." (Hopson and Mason, 2004, page 3.)

With thousands of funds and hundreds of fund families, the money management industry should be highly competitive. (Khorana and Servaes, 2003, report 404 fund families in 1989, 479 in 1994 and 525 in 1998.) But it also seems highly profitable. How does one reconcile competitiveness and profitability? The issues are somewhat different for retail and institutional products.

At the retail level, customers may pay little attention to fees and to fee differences across funds because these fees seem small. It may even be that cutting the fee to bolster performance is a money-losing proposition for the money manager. But at least formally each mutual fund has trustees who are supposed to look after the interests of those whose assets are managed by the fund, not the interests of the firm that manages of the assets. Why do these trustees not cut the fees and thereby the managers' profits? Kim (1998) summarizes the relevant US law on this issue: "The great majority of cases involving challenges to management fees have been settled. Only a few such cases have been tried on their merits under section 36(b) [of the Investment Company Act of 1940]. Notably, plaintiffs have never brought a successful action against a fund's directors or adviser for excessive management fees." (Kim 1998, pp. 490-91; footnotes omitted)

In defined contribution retirement plans such as 401(k), plan sponsors contract with fund families to offer their funds to the participants. Incentives to participate are strong, thanks to the preferential income tax treatment and often also to the sponsor's matching contributions. Participants are captive clients of the offered funds. It seems that plan sponsors should negotiate the fees down to (almost) eliminate the profits of the money managers who presumably compete to offer their services. But the fees charged to fund

holders in 401(k) plans are often the same as those charged to other retail customers.

Retail customers' overlooking the seemingly small fees and paying excessive attention to fund brokers and financial advisors goes some way to explain the profitability of funds that cater to retail customers. But such arguments should be less relevant for institutional money management, often performed by the same organizations that manage money for retail customers. Presumably institutional clients are savvier than retail customers and, negotiating from a strong position, can haggle the management fees down to their competitive levels, i.e., to the point where institutional money management will earn (almost) no profit.

Moreover, the larger institutional clients can replicate a money management business in-house. This idea should appeal especially to clients who are skeptical that money managers on the whole deliver excess returns or that they can identify money managers who deliver excess returns or that they can identify consultants who can identify such money managers. Such in-house money management would further drive down the profits of money managers. (But a drawback to managing money in-house is that it also requires compensation of in-house money management staff according to the norms common in the money management industry, which may cause considerable friction.)

Institutional money management fees are probably considerably lower than their retail counterparts because the costs of asset gathering and account servicing are lower. Comprehensive data on profitability of institutional money management are not in the public domain. But the ten publicly traded money managers for which profit figures are available manage both mutual funds and institutional money. On average, the mix of assets is about even. And the correlation between revenues/(assets under management) and the fraction of institutional assets is close to zero but positive, indicating that if anything, servicing institutional clients is more profitable than servicing retail customers.

In summary, earlier sections of this paper study the pricing implications of asset managers' profitability. This section stresses the conflict between the profitability and presumed

competition in the industry.

9 Concluding Remarks

Profits of money managers are relatively easy to compute: they are the difference between revenues and expenses, with no need to account for the cost of capital, since little capital is tied up in money management. Nonetheless, with low barriers to entry (little capital!) and hundreds of money managers, the industry should be highly competitive. Due to economies of scale in asset management, profits of the larger managers are substantial fractions of their revenues, and bear no relation to the meager capital that is tied up in the business.

Buy-and-hold, long term investors in mutual funds should be especially attentive to the fees charged by funds. Indeed, one question raised in the present analysis is how can actively managed funds charge fees in the neighborhood of 1%, typically under-perform the relevant index and retain assets of the same buy-and-hold customers for decades when low-cost index funds are available. Moreover, one implication of this analysis is that plan sponsors of 401(k) plans should at least make low-cost index funds available to participants in their plans.

Prices of money managers seem not to reflect the current profitability in the industry. Possibly, they anticipate future competition and much lower fees and profits, which is ominous news to current asset managers and those contemplating entry into the business. It is also possible that prices of money managers reflect the market's expectations of asset migration away from the traditional money managers.

Neither the popular nor the more narrowly focused media suggest a bleak future for traditional money managers. Hence a second interpretation of the gap between the theoretical and actual prices of money managers: those who determine the prices – primarily money managers themselves – misapply the present value formula, and excessively discount the very distant future when most of the value should accrue.

The price of an enterprise should reflect expectations of its future cash flows. In general,

numerous judgements are made when applying the present value formula to price uncertain cash flows. Because so many free parameters are available in applying the general present value formula, it is next to impossible to confront it with data and ask to what extent market prices indeed reflect risk-adjusted present values of expected future cash flows. The task is easier here because the growth rate of the cash flows from managing money and the relevant discount rates are approximately equal.

The pricing formula discussed here applies because to a first approximation money managers' earnings grow (or shrink) with the returns on the marketable securities they hold on behalf of their clients. But it is a simple case of the more general present value formula. And if the data presented here seem contradictory to the pricing formula, the contradiction is to the general present value formula. One can hardly think of a formula more central to financial economics; indeed, to economics as a whole.

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