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MUTUAL FUND EFFICIENCY AND PERFORMANCE

The primary purpose for which mutual funds are acquired and held is for their expected good performance. Mutual funds are said to have "professional" managements which, presumably, provide the potential for investment results better than those that the layman might achieve by selecting his own individual securities and subsequently managing his portfolio himself.

Mutual funds, however, are saddled with two burdens which offset some, all, or more than, the performance benefits derived from the "professionalism" of their managements. The lesser of these two burdens is routinely measured in a mutual fund's "expense ratio" which includes its management fees, administration and operational expenses, and 12b-1 marketing fees.

MARKET IMPACT COSTS

Still greater burdens imposed upon mutual funds are what are known as "market impact costs." These are concessions in price to which all institutional investors are subject when they buy or sell securities by virtue of the large sizes of the positions they must trade. In addition to being functions of the sizes of their positions, the magnitudes of such concessions also vary with the "liquidity" of the securities traded which, in turn, is related to the "market capitalizations" of such securities. The market impact cost of a mutual fund transaction may vary anywhere from 1/2 of 1% to 20% of the value of the security traded.

The relative burden of market impact costs on a mutual fund's entire portfolio can be estimated, given the total size of its portfolio, the number of issues in its portfolio, the median market capitalization of the securities in which the fund specializes, and the rate of the fund's portfolio turnover (buying and selling).

PORTFOLIO TURNOVER

If one examines the portfolio practices of mutual funds, one is apt to be astounded by the high rates of turnover characteristic of most.

In 1998, the mutual funds categorized by *Morningstar* as large-capitalization growth funds had an average annual rate of portfolio turnover of 93%, which is equivalent to an average holding period for the stocks in these portfolios of just 12.9 months. Of particular fascination is the extraordinary rates of turnover of the more active mutual funds. The twenty-five most active growth funds covered by *Morningstar* in 1998 had portfolio turnover rates that ranged from 215% to 972% and averaged 320%, which rates translate into average holding periods of 24 weeks, 5 weeks, and 16 weeks, respectively

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Clearly, the detrimental effects of market impact costs on portfolio performance are exacerbated by such high rates of turnover. In fact, if a mutual fund never made any purchases or sales in its portfolio, it would not have any market impact costs at all. It is partially the recognition of this fact that has spawned the interest in index funds. An index funds sells stocks only to rebalance its portfolio to match the index it is tracking or to meet net redemptions. It purchases stocks only to rebalance or to accommodate cash inflows. As a result, index funds have turnover rates of the order of only 5% or so.

Why, then, do mutual funds indulge in so much self-abuse?

One cynical, but plausible, explanation is that active trading is the mutual fund manager's "raison d'être." If an inactively traded mutual fund does well, it may be concluded that the manager's services were superfluous; if it does poorly, the manager will be blamed for inaction. On the other hand, if an actively traded fund does well, the manager is a hero; but, if it does poorly, it can be said that the manager at least tried.

There is, however, an even more compelling reason for these high mutual fund portfolio turnover rates. This issue is tax-related and, again, is a burden associated with the nature of the beast. If an investor purchases a mutual fund in a taxable account, he takes on the capital gains tax liabilities for the unrealized gains in the mutual fund portfolio.

For example, assume that an investor purchases $10,000 in the shares of a mutual fund for his taxable account and that these shares have a cost basis to the fund of $6,000. Assume that the market sector in which the fund is invested performs poorly, and a year later the investor's shares are worth only $8,000. Assume, further, that, because of its poor performance, the fund experiences heavy redemptions and/or management decides drastically to alter its investment strategy; it sells securities and realizes $2,000 in capital gains. In this case, the mutual fund investor has a $2,000 loss but must pay a tax on $2,000 in gains. In short, he must pay taxes on somebody else's gains. He can reverse the injustice only if he sells his shares and realizes his own loss.

Nor is the foregoing example purely academic. It conservatively describes what happened in 1998 to great numbers of investors who had previously purchased shares in emerging market mutual funds. During the course of 1998, the average emerging market fund declined in value by from 40% to 50%. These funds were, indeed, forced to sell large amounts of stock to meet mass redemptions; and, no doubt, they also did some significant portfolio restructuring to adapt to the newly perceived realities of the marketplace.

Large unrealized capital gains, then, are clearly a liability for any mutual fund wanting its shares to be purchased by taxable investors. It is in the marketing interests of funds to keep these

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unrealized gains reasonably low, and they can do this only by selling securities in which they have gains.

Interestingly, the motivation for realizing gains in a mutual fund portfolio is diametrically opposite to the motivation for realizing gains in a personal portfolio. While the mutual fund manager is motivated to minimize the unrealized gains in his portfolio in order to attract new investors, the individual investor is motivated to minimize realized gains so as to defer or avoid the capital gains tax.

From a tax perspective for a taxable investor, a mutual fund may be said to function as a "Reverse IRA." Whereas a traditional IRA serves to defer the taxes on one's income, a mutual fund serves to accelerate the payment of taxes.

It is, of course, after the stock market has had a large rise that the magnitude of unrealized capital gains in mutual fund portfolios becomes an important consideration. It is presumably because the stock market has performed so well over the past seventeen years that mutual funds have had to employ such high turnover rates to keep their unrealized gain problems under control. The continuing severity of this problem, in spite of these high turnover rates, however, is illustrated by the following survey of the 84 large-capitalization growth funds for which the information is provided by *Morningstar* in the summer of 1999. Unrealized gains in this group of funds averaged 54% and ranged from a low of 19% to a high of 194%.

EFFICIENCY

The "efficiency" or "inefficiency" of a mutual fund portfolio, or the extent to which market impact costs and other expenses detract from its overall performance, may be estimated by comparing the fund's performance with some appropriate market index over some long period of time. For mutual funds invested in common stocks, the most commonly used index is the Standard & Poor's 500.[1] For mutual funds invested in bonds, appropriate bond indices are used.

The performance of an index is generally accepted as equivalent to the performance a layman could achieve by selecting securities of the type in the index at random and never managing his portfolio thereafter.

The extent to which the burdens of market impact costs and other expenses offset the benefits of professional management in a mutual fund portfolio, then, can be effectively estimated, over

[1] During "bull" markets, securities portfolios of lower quality (high risk) might be expected to outperform securities portfolios of higher quality (lower risk); during "bear" markets, the opposite might be expected.

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time, by the degree to which the mutual fund underperforms the market index for the class of securities in which it invests.

THE MUTUAL FUND PERFORMANCE JINX

There are purported to be over 10,000 mutual funds available to the public for purchase. There are also many hundreds of sponsors, each with a stable of these funds. Each of a sponsor's funds pursues a different investment strategy. At any point in time, and over varying periods of time, merely by the laws of random chance, it is inevitable that some funds will have delivered higher returns than others. Those funds which have delivered the highest returns are given the greatest visibility by the many mutual fund rating services; and they are also the specific funds that their sponsors most heavily merchandise. As a result, massive amounts of money pour into them.

The laws of random chance, however, also indicate that, after a period of above-average performance, a fund will probably return to normalcy at best (referred to by mathematicians as a "reversion to the mean").[2] Furthermore, after an influx of new money, the fund's outlook may be even less promising than normal. The formerly successful fund may be more likely than other funds to underperform. The source of the underperformance is the exacerbation of "market impact costs" associated with the larger amount of money now under management.[3]

A mutual fund that has been showing a decreasing rate of performance, relative to the market in which it invests, is very likely the victim of this commonplace "performance jinx." In short, the very fact that a mutual fund has done well before one acquires it, may be the primary cause of its doing poorly after he acquires it.

The validity of the mutual fund performance jinx is supported by some fascinating statistics. It appears that the average mutual fund investor experiences a rate of return that is not much over half the rate returned by the mutual fund he owns. The following is an excerpt from an article by Robert Markman in the December 1998 issue of the *Journal of Financial Planning*:

> The Boston market research firm Dalbar found that between 1984 and 1995 the average stock fund posted a yearly return of 12.3 percent, while the average investor in those funds made just 6.3 percent. Similarly, another study showed that during the period January 1, 1991, through October 31, 1995, the 20th Century Ultra fund posted an official return of 26.5 percent. The average shareholder over that period, however, earned only 16.0 percent.

[2] Numerous studies have demonstrated the absence of any positive correlation between the past performance of a mutual fund and its future performance.

[3] In recognition of the magnitude the market impact cost burden, many mutual funds have closed their doors to new investors after having reached a certain size. The Fidelity Magellan Fund is a case in point.

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> Numerous other examples abound that illustrate the same phenomenon: due to errors in the timing of purchases and sales, most investors do not reap the reward one would expect from their allocations. We call this phenomenon "wastage."

Given that it is hard to believe mutual fund investors experience little over half the returns delivered by their funds, let us illustrate the above phenomenon with a hypothetical example: In Year 1, mutual fund "Red Hot" is small, has 10,000 shareholders, and returns 35%. As a result of its good performance, Red Hot attracts new money and, in Year 2, has 50,000 shareholders. As a consequence of its larger size, however, the fund delivers only 5% in Year 2. The fund has averaged a return of 20% per year[4] over the two-year period, but the average shareholder in the fund has experienced a return of only 10% per year.[5]

In addition to the shortcomings of the vehicles in which they invest, then, it appears that mutual fund shareholders tend to be burdened with a form of mutual fund "whiplash" related to a misguided timing of their purchases and sales.

THE IRONY OF 12B-1 FEES AND ECONOMIES OF SCALE

The following are some observations, excerpts, and conclusions extracted from a study conducted by Sean Collins and Phillip Mack, published in the September/October 1997 issue of the *Financial Analysts Journal* and titled, "The Optimal Amount of Assets under Management in the Mutual Fund Industry."

The study covered mutual fund expense ratios (not including market impact costs) and the behavior of these ratios with respect to mutual fund complexes and individual product lines with various amounts of assets under management.

In particular, the study covered all 533 mutual fund complexes that existed in the United States during the years 1990 to 1994, encompassing assets totaling about $2 trillion at the end of the period. A mutual fund complex is a "sponsor" which may offer anywhere from one to scores of different funds (i.e., the Fidelity or Vanguard funds). The study utilized data provided by Lipper Analytical Services. For all mutual funds in the study, expense ratios averaged 1.2% of assets under management.

With respect to 12b-1 fees, the authors noted the following:

> Some funds also charge 12b-1 fees - named after the SEC rule authorizing them - to pay for distribution costs, such as advertising and commissions paid to brokers. Investment

[4] (35% + 5%)/2 = 20%
[5] [(1 x 35%) + (5 x 5%)]/6 = 10%

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> companies assess such fees against their funds' assets. Although typically amounting to only a few basis points a year, 12b-1 fees have been contentious since their inception. Investment companies have argued that these fees help reduce fund expenses over the long run because they can be used to pay for promotions that help fund assets grow more rapidly than they otherwise would. Ferris and Change (1987) and Trzcinka and Zweig (1990), however, found that funds charging 12b-1 fees tend to have higher over-all expenses than other funds. They concluded that funds charging 12b-1 fees are imposing an undue burden on their shareholders.

Of their own study, the authors state:

> The coefficient on 12b-1 fees is significant and of the anticipated sign. The positive sign on this variable confirms earlier findings: 12b-1 fees appear to drive up fund costs instead of reducing them.

With respect to equity mutual funds, the study further notes that funds are experiencing diseconomies of scale in their expense ratios when their size exceeds $600 million to $800 million.

Interestingly, the foregoing study does not even address the problem of "market impact costs" which are clearly an even greater expense to mutual funds than are the more visible costs used in the calculation of their expense ratios.

Nevertheless, on the basis of expense ratios alone, mutual funds invested in common stocks, appear to begin to experience diseconomies of scale as they reach $600 million to $800 million in size.

Furthermore, 12b-1 marketing fees, which help a mutual fund grow in size more quickly, are clearly counterproductive in that they exacerbate the problem of diseconomies of scale, even when considering expense ratios alone. When market impact costs are taken into consideration, of course, 12b-1 fees are even more abusive.

In short, a 12b-1 fee is an added expense imposed upon a mutual fund shareholder to attract more investors to his fund which, in turn, produces for him a lower net return.

MEASUREMENTS OF VALUE ADDED AND EFFICIENCY SHORTFALLS

It goes without saying that, by employing the services of a mutual fund, an investor hopes to achieve a level of performance superior to what he would achieve by selecting securities at random and then never managing his list. To the extent that a mutual fund provides an "above-

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the-market" level of performance, its professional management is said to "add value."[6] To the extent that a mutual fund fails to provide such performance, it may be said to suffer an "efficiency shortfall."

Unlike its other expenses, a mutual fund's market impact costs cannot be measured with precision, and so they are not reported in the institution's prospectus or sales literature. Their magnitude can, however, be inferred collectively for mutual funds in general from tabulations such as the following: [7]

	AVERAGE TOTAL RETURN FOR PERIODS ENDING DECEMBER 31, 1998					
Series	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years
Standard & Poor's 500 Index	28.57%/yr.	28.23%/yr.	24.06%/yr.	19.21%/yr.	17.90%/yr.	17.75%/yr.
All Equity Mutual Funds	9.74%/yr.	14.69%/yr.	13.03%/yr.	13.79%/yr.	13.34%/yr.	15.28%/yr.
Average Annual Shortfall	-18.83%/yr.	-13.54%/yr.	-11.03%/yr.	-5.42%/yr.	-4.56%/yr.	-2.47%/yr.

Although the Standard & Poor's 500 is the most commonly used measure of the performance of the U. S. stock market, it is sometimes argued that, because this index is so heavily populated with high quality, large capitalization stocks, it may not be an appropriate benchmark with which to compare a mutual fund which may be invested in lower quality, smaller capitalization stocks. The obvious refutation: If one can obtain a higher return by investing in the higher quality companies in the S&P 500, why even consider investing in a lower quality mutual fund?

A similar argument pertains to comparing a mutual fund which may include foreign stocks with the S&P 500 which is made up entirely of U. S. stocks. The refutation here, too, is similar: Why take on the added risks (currency exchange and political) associated with the ownership of foreign securities if one can achieve a higher rate of return by owning only the U. S. stocks in the S&P 500?

If one, nevertheless, wants to compare the performance of equity mutual funds with broader market indices which include lower quality, smaller capitalization companies, the Russell 3000 and the Wilshire 5000 are benchmarks available for that purpose. And, if one wants to compare the performance of mutual funds that invest exclusively in U. S. equities with any of the three above-mentioned benchmarks, that, too, is possible. The data in the following tables provide such additional comparisons.

[6] The amount of "above-the-market" value added to a portfolio's total return is referred to by the term "alpha."
[7] The performance data herein is taken from the CDA/Wiesenberger and Morningstar mutual fund services.

	Average Total Return for Periods Ending December 31, 1998					
Stock Market Index	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years
Russell 3000	24.14%/yr.	25.84%/yr.	22.26%/yr.	18.48%/yr.	16.93%/yr.	17.30%/yr.
Wilshire 5000	23.45%/yr.	25.24%/yr.	21.78%/yr.	18.11%/yr.	16.67%/yr.	17.20%/yr.
All U. S. Equity Mutual Funds	12.24%/yr.	18.02%/yr.	16.05%/yr.	15.44%/yr.	14.19%/yr.	15.98%/yr.
			Average Annual Shortfall			
All Equity Mutual Funds vs.	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years
Russell 3000	-14.40%/yr.	-11.15%/yr.	-9.23%/yr.	-4.69%/yr.	-3.59%/yr.	-2.02%/yr.
Wilshire 5000	-13.71%/yr.	-10.55%/yr.	-8.75%/yr.	-4.32%/yr.	-3.33%/yr.	-1.92%/yr.
			Average Annual Shortfall			
All U. S. Equity Mutual Fund vs.	1 Year	3 Years	5 Years	10 Years	15 Years	20 Years
Standard & Poor's 500	-16.33%/yr.	-10.21%/yr.	-8.01%/yr.	-3.77%/yr.	-3.71%/yr.	-1.77%/yr.
Russell 3000	-11.90%/yr.	-7.82%/yr.	-6.21%/yr.	-3.04%/yr.	-2.74%/yr.	-1.32%/yr.
Wilshire 5000	-11.21%/yr.	-7.22%/yr.	-5.73%/yr.	-2.67%/yr.	-2.48%/yr.	-1.22%/yr.

SURVIVORSHIP BIAS

Even the foregoing comparisons appear to understate the collective underperformance of mutual funds because of an analytical handicap called "survivorship bias." This tendency for the data to be skewed in favor of the funds is explained in the following excerpts from an article in the *Wall Street Journal* of May 10, 1999:

Out of Sight: Lagging Funds Mimic Houdini

> Now you see the poor-performance record; now you don't.
>
> In a magic trick increasingly popular among mutual fund firms, lagging funds are disappearing. Last year, 387 stock and bond mutual funds were merged out of existence, up 43% from the year before, while fund liquidations claimed another 250, a 37% increase, and the number of vanishing stock funds jumped a steep 74% in this year's first quarter, according to newly compiled figures from the fund-tracker Lipper, Inc.
>
> "There's an increasing tendency to bury the record of an underperforming fund and to merge it" into a better-performing one, says Burton Greenwald, a mutual fund consultant in Philadelphia. Some call it "survivorship bias - it makes the industry look better," adds Louis Stanasolovich, president of Legend Financial Advisors of Pittsburgh.

INFERENCES RELATING TO THE EFFICIENCY OF THE SECURITIES MARKETS

Either of two conclusions may be drawn from the foregoing performance data:

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1. If, as many scholars contend, the securities markets are "efficient"[8] and professionals cannot add value by actively managing a mutual fund portfolio, then, the figures in the above tables labeled "Average Annual Shortfall" represent the sum of the mutual fund industry's reported expenses and market impact costs.[9]

2. If, however, as most mutual fund managers contend, the markets are not efficient, and so professionals can make enlightened purchase and sale decisions by identifying and exploiting underpriced and overpriced securities, then, the shortfall figures in the above table understate the magnitude of the mutual fund industry's reported expenses and market impact costs by whatever value these professional managers add.

The fact that the shortfall figures have been rising over the past twenty years indicates that the mutual fund industry's market impact problems are becoming increasingly severe. This is not surprising, given the rapid growth in the size of mutual funds and an increase in the rates of their portfolio turnover.

In any event, it appears that the combination of reported expenses and market impact costs, on average, now consumes the mutual fund investor's capital at a rate of no less than 11% per year (and perhaps by as much as 19% per year). Given that the stock market has averaged an annual return of over 20% per year in recent years, even after a substantial "haircut," mutual fund investors have netted over 10% per year. The return sacrificed, then, may not have seemed all that burdensome to most mutual fund shareholders. If, and when, the stock market again generates only the 10% returns it has averaged over the past two-hundred years (or generates negative returns, as it has in many years in the past), an 11% (or 19%) built-in performance shortfall may prove more discomforting.[10]

SUMMARY

Given that the mutual fund industry's performance figures, as published, are extremely poor; given that, because of "survivorship bias," the industry's actual results are even worse than those published; given that, because of misguided timing, most mutual fund investors themselves do

[8] Supporters of the "efficient market hypothesis" assert that the price of every security in the marketplace already incorporates, discounts, or reflects all the information known (and that can be legally acted upon) with respect to that security, and so no investor, neither layman nor professional, can outperform the market in which he invests with a probability greater than that of random chance.

[9] Reported operating expenses accounted for only 1.41% of 1998's 16.33% U. S. stock fund shortfall, implying that "market impact costs" accounted for the 14.92% balance. In other words, the costs that were not reported were over ten times as great as the costs that were reported.

[10] As an example, during the decade of the 1970s (1/1/70 to 12/31/79) the average total return on the Standard & Poor's 500 was 5.9% per year. An 11% haircut, then, would have left the mutual fund shareholder with a negative rate of return of about 5% per year for that entire ten-year period.

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little better than half as well as the mutual funds in which they invest; and given that the tax motivations and practices of mutual fund managers are inimical to the tax interests of their shareholders, it appears that such investors are playing with a deck that is stacked heavily against them.

AN ANALOGY BY AMOS 'N' ANDY

Amos: A mutual fund portfolio manager
Andy: A layman investor

Amos: I feel pretty good today. I earned 10% last year on the mutual fund stock portfolio I manage;[11] and I also went canoeing last weekend and covered an average of 10 miles per hour paddling my canoe.

Andy: I do not know much about investing, but I am an avid canoeist. 10 miles per hour is a pretty good paddle. Where did you canoe?

Amos: On the river.

Andy: Upstream or downstream?

Amos: Downstream.

Andy: How fast is the current in the river?

Amos: 29 miles per hour.

Andy: If the current was 29 miles per hour and you were traveling only 10 miles per hour, it sounds to me as though you were paddling backwards at 19 miles per hour.

Amos: Maybe so, but I was paddling very fast.[12]

Andy: Do you realize that, if you were to canoe upstream and paddle backwards at 19 miles per hour, you would be going in the wrong direction at the rate of 48 miles per hour?

Amos: I do not plan to canoe upstream.

Andy: We shall have to talk about investing sometime. I understand that the stock market returned 29% last year.[13]

[11] In 1998, the average stock fund returned 9.74%
[12] In 1998, the average domestic stock fund had a rate of portfolio turnover of 85% which implies an average holding period of 14 months.
[13] In 1998, the stocks in the S&P 500 Stock Index returned 28.57%.

CONCLUSION

At least one alternative obviously superior to the purchase of common stocks indirectly via mutual funds is the random selection, outright purchase, and unmanaged retention of common stocks directly, without the mutual fund as an intermediary.

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Chief Investment Officer
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