

## **A RE-EXAMINATION OF THE IMPACT OF EXPENSES ON THE PERFORMANCE OF ACTIVELY MANAGED EQUITY MUTUAL FUNDS**

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### **ABSTRACT**

According to the Investment Company Institute, average mutual fund expense ratios declined sixty percent in recent years. We evaluate the performance of domestic equity mutual funds to determine whether this decline in expense ratios had a measurable impact on fund performance. We find that most mutual funds in our sample track the S&P 500 index, and at least thirteen percent outperform the index, providing evidence that the market is not quite efficient. Only a small percentage of the funds underperformed the market; a result that is remarkably different from previously documented findings. Our results show that both expense ratio and portfolio turnover are negatively associated with investment performance. The decline in fund expenses does not appear to be significantly beneficial to fund investors.

**Key words:** Mutual funds; Expense ratios; Portfolio turnover; Market efficiency, Asset pricing model.

**JEL Codes:** G23, G10, G11, G14.

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## **I. INTRODUCTION**

The performance of open-end investment companies has been extensively documented over the past five decades. Generally, studies find that, on average, equity mutual funds, bond funds, and international equity funds underperform relevant market indexes on a risk adjusted basis. Martin, Keown, and Farrell (1982) find that portfolio risk and return are positively correlated, and that the aggressiveness of a fund's stated investment objective and portfolio risk are also positively related.

Moreover, the effect of mutual fund fees and expenses has also been examined by several studies. Generally, the findings are that mutual funds outperform their relevant indexes on a gross return basis, that is, before fund's fees and expenses. When fees and expenses are considered, however, mutual funds underperform the market averages. These findings hold for domestic equity funds, bond funds, and international mutual funds (Lehmann and Modest, 1987; Cumby and Glenn, 1990; Bailey and Lim, 1992; Blake, Elton, and Gruber, 1993; Daniel, Grinblatt, Titman, and Wermers, 1999; Wermers, 2000; and Shukla, 2004).

Past studies also find that equity and bond funds with lower expense ratios have higher returns, and funds with lower portfolio turnover also have higher returns. (Carpenter, 1991; Hooks, 1996; Carhart, 1997; Bogle, 1998; Reichenstein, 1999; and Shukla, 2004). These findings suggest that active portfolio management is deleterious to portfolio performance and therefore commend index funds to investors interested primarily in risk-adjusted-investment performance. Carpenter (1991) reports that, after adjusting for expenses, investment performance does not make up for higher costs. With few exceptions, according to Carpenter (1991), high expenses hurt performance. He observes also that the aggressive growth and balanced funds suffer less from the effect of expenses than growth funds and growth and income funds. With growth funds and growth and income funds, "a doubling effect on a 2% expense ratio could reduce shareholder returns by almost half in an average year. Moreover, every time a portfolio is completely turned over, investors gave up about 0.4% in net return. Carpenter (1991) asserts that it is generally wise to avoid funds with high portfolio turnover.

Wermers (2000), on the other hand, supports the value of active management because he finds that mutual funds generally pick stocks well enough to cover costs, and that high turnover funds beat the passive Vanguard Index. On a net return basis, however, Wermers's (2000) results indicate that mutual funds underperform broad market indexes by 1% per year because of lower returns of their non-stock holdings and because of

expense ratio and transaction costs of portfolio turnover. Wermers (2000) attributed this poor performance entirely to mutual fund holdings of cash and bonds. Considering only their stock holdings, mutual fund managers hold stocks that beat their benchmark indexes. Moreover, Wermers (2000) finds that mutual funds, although incurring substantial transaction costs and charging higher expenses, also hold stocks with much higher average returns than lower turnover funds. These results ignore the higher tax burden of actively managed, high turnover, mutual funds. Further, Hooks (1996) finds that load funds with low expenses outperform high expense no-load mutual funds. For funds with similar expenses however, the load funds do not produce returns sufficient to offset the load. Haslem, Baker and Smith (2008) find that superior investment performance, on average, occurs among large funds with low expense ratios, low trading activity, and no load or low load.

According to the Investment Company Institute (ICI) 2009 Mutual Fund Fact Book, the number of mutual fund shareholder accounts rose from just 12 million in 1980 to about 265 million in 2008, and most of these shareholders are invested in lower cost funds with above average long-term performance. These investors demand a competitive level of fees and expenses.<sup>3</sup> The ICI states that mutual funds manage about 20% of household financial assets in competition with other financial intermediaries including commercial banks, insurance companies, and hedge funds.

In view of the fact that mutual fund performance is severely diminished by high expenses and because fund shareholders are keenly aware of this, the ICI findings of a declining trend in expense ratios should be well received by investors.<sup>4</sup> Further, the Fact Book states that from 1999 to 2008, more than 103% of the net cash flowing to stock funds went to those funds whose expense ratios were below average. Funds with above average expense ratios experienced outflows. The decline in the average fund expense ratios from 2.32% in 1980 to 0.99% in 2008 is likely predictive of better mutual fund investment performance. According to the ICI (2007 Mutual Fund Fact book, page 4), the lower average expense ratios on stock funds implies considerable cost savings for fund investors, and estimates that investors' savings is in the order of several billions of dollars per year.

The purpose of the present study is to evaluate the performance of domestic equity mutual funds from February 1990 to January 2010, to determine if the 60% decline in equity-mutual fund expense ratios in recent years has a measurable impact on fund performance.

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<sup>3</sup> See also [WWW.ici.org](http://WWW.ici.org) for further trends in the mutual fund industry.

<sup>4</sup> The 2009 Mutual Fund Fact Book states that mutual fund expenses fell to their lowest levels in more than a quarter century in 2008, continuing a trend observed since early 1980s.

## II. DATA

Of the 26,347 funds in the Morningstar Principia database as of January 31, 2010, we select only domestic equity mutual funds with less than 15% of their portfolio invested in fixed income securities, and less than 15% invested in foreign securities. The final sample consists of actively managed domestic equity mutual funds drawn from five investment objective categories including Growth (G), Aggressive Growth (AG), Growth and Income (GI), Equity Income (EI), and Small Company (SC) categories. Excluded from the final sample are Funds of Funds, Master Feeder Funds, Index Funds, Specialty Funds, and Money Market Funds. I also exclude funds with less than \$500 million in total assets, and funds with inception dates after December 2004. The final sample consists of 1898 actively managed equity mutual funds: 50 Aggressive Growth, 1119 Growth, 388 Growth and Income, 96 Equity Income, and 245 Small Company funds.

As shown in Table 1, the average fund in the sample has approximately 91% of its portfolio invested in domestic stocks, 6% in foreign stocks, and less than 1% invested in bonds. The average fund has net assets of \$793 million, holds 159 stocks, and invests approximately 26% of its portfolio in the top-ten companies it holds. Moreover, the average fund has an expense ratio of 1.3% and replaces its portfolio holdings approximately every 14 months, as implied by the turnover ratio of 85.8%.

**Table 1**  
**Sample Profile of Actively Managed Domestic Equity Mutual Funds for the Period February 1990 – January 2010.**

Variable	N	Mean	Std. Dev.
Net Assets (m)	1639	792.687	2393.040
U.S. Stocks %	1898	91.145	6.434
Non-US Stocks	1898	5.446	3.958
Bonds %	1898	0.310	1.448
Cash %	1898	2.666	3.864
Holdings	1898	159.340	201.310
Top-Ten %	1898	26.431	9.744
Expense Ratio	1898	1.302	0.471
Turnover %	1898	85.816	68.504

*Note: N is the number of mutual funds with non-missing data; "Std. Dev." is short for "standard deviation;" and Top-Ten is the percentage of the mutual fund portfolio invested in the top ten companies held by the average mutual fund in the sample. Net Assets are in millions of dollars. Other investments are less than 1% of the fund's portfolio and are not shown in the Table.*

Additionally, we sort the sample by investment objective and then repeated the calculations as shown in Table 2. On average, the GI and EI investment objective categories manage the largest portfolios as indicated by the net assets of \$1095.7 million and \$1040.5 million, respectively. The Growth category on average manages \$700.4 million of net assets and the Small Company Category manages the least net assets of \$641.6 million. The Average fund in all five categories has 87% to 92% of its portfolio invested in domestic common stocks (DOM), and has less than 1% of its portfolio invested in bonds. The average expense ratio ranges from 1.20% to 1.4% and the average portfolio turnover ranges from 65% to 120.

**Table 2**  
**Sample Profile Sorted by Investment Objective for the Period February 1990 - January 2010.**

Objective	Net Assets	DOM	Bonds	Exp. Ratio %	Turnover %	N
AG	808.096	92.274	0.002	1.279	120.120	50
G	700.392	91.739	0.172	1.325	96.548	1119
GI	1095.660	90.296	0.843	1.178	66.928	388
EI	1040.470	86.916	0.567	1.241	72.292	96
SC	641.586	91.202	0.058	1.421	65.012	245
Sample	792.687	91.145	0.310	1.302	85.816	1898

Note: N is the number of mutual funds in the sample; Bonds is the percentage of the portfolio invested in bonds; DOM is the percentage of the portfolio invested in domestic common stocks; and net assets are in millions of dollars. The relevant investment objective categories are: Aggressive Growth (AG), Growth (G), Growth and Income (GI), Equity Income (EI), and Small Company (SC).

We obtain monthly mutual fund returns from the Morningstar Principia database. Monthly returns on the market, represented by the S&P 500 Index, and monthly returns on the three-month-Treasury bills were also obtained from the same database.

### III. METHODOLOGY

We use the following model to measure the risk-adjusted performance of mutual funds:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}, \quad [1]$$

where,  $R_{it}$  is the excess return on fund  $i$ , in month  $t$ , i.e. the fund's return in excess of the 30-day Treasury bill rate;  $R_{mt}$  is the excess return on the S&P 500 index in month  $t$ ; and  $\varepsilon_{it}$  is the residual return on fund  $i$ , in month  $t$ . Fund  $i$ 's risk-adjusted performance is measured by Jensen's alpha,  $\alpha_i$ .

We measure the risk-adjusted performance again using Sharpe Information Ratio as suggested by Reilly and Norton (2006) and Goodwin (1998). According to Reilly and Norton (2006), the Sharpe Information Ratio,  $S_p$ , is a more general measure of portfolio performance than the traditional Sharpe measure. If " $D_t$ " is the difference in return between the portfolio and the benchmark ( $R_{pt} - R_{mt}$ ) in period  $t$ , then:

$$S_p = \frac{\bar{D}}{\sigma_D} \quad [2]$$

Where,  $\bar{D}$  is the average value of the monthly differences in return between the portfolio and the benchmark,  $\frac{1}{n} \sum_{t=1}^n D_t$ ;  $\sigma_D$  is the standard deviation of the differential return, and  $n$  is the number of monthly returns. As with Jensen's alpha, this performance measure indicates portfolio performance relative to the benchmark portfolio and lends itself to statistical tests of significance. However, unlike the Jensen's alpha, the Sharpe Information Ratio adjusts for total risk, rather than just systematic risk, and this is relevant to performance measurement because previous studies have shown that mutual fund portfolios, on average, contain significant idiosyncratic risks.

### IV. EMPIRICAL RESULTS

We estimate the risk-adjusted performance of each mutual fund over the 20 year sample period from February 1990 to January 2010, using Jensen's alpha as a measure of performance – as defined in the regression equation [1] above. Altogether, 262 mutual funds outperform the market, and only 26 funds underperformed the market. Therefore 1610 of the 1898 mutual funds in the sample had an alpha which was not significantly different from zero and had thus tracked the market over the 20 year period. Similar results are

reported by Fama and French (2009), who find that “the aggregate portfolio of actively managed U.S. equity mutual funds is close to the market portfolio. After adjusting portfolio performance for the effect of expense ratios, Fama and French find “inferior and superior performance” (i.e., non-zero alphas) “in the extreme tails of fund alpha estimates.” These results are also similar to ours. When we re-estimate the performance of each fund again using the Sharpe’s Information Ratio (IR), 249 mutual funds outperform the market, and only 23 mutual funds underperform the market. Therefore, 1626 of the 1898 mutual funds tracked the market over the 20 period. In summary, the present study finds that few mutual funds had negative alpha from February 1990 to January 2010. Most funds had positive or zero alpha.

When we sort the sample by investment objective and re-estimate the Jensen’s alpha again via cross-sectional regression, the results contained in Table 3 show that all of the mutual fund categories had a positive and statistically significant alpha. The Small Company category appears to have the best performance with a Jensen’s alpha of 0.296 followed by the Growth and then the Aggressive Growth categories with alpha of 0.125 and 0.109, respectively.

These results are radically different from prior evidence regarding mutual fund performance. Existing studies had generally found that most mutual funds underperformed the market as suggested by a preponderance of negative alphas. Very few funds were found to have significantly positive Jensen’s alpha and very few funds tracked the market. According to Reilly and Norton (2006), “The basic result of these [previous] studies supports the concept of efficient markets: It is difficult for mutual funds to consistently outperform their benchmark indexes after taking risk differences into account.” The present study finds that, from February 1990 to January 2010, most mutual funds actually tracked the S&P 500 index, and that at least 13% of the funds in this sample actually outperform the S&P 500 index. Moreover, no more than 1.4% of the funds underperformed the S&P 500 index. For at least 13% of the funds in the sample, the market is evidently not quite efficient. Things must be looking up for mutual funds in recent years! Is this much improved performance influenced by the decline in mutual fund expense ratios from 1980 to 2008, as shown in the ICI’s Mutual Fund Fact Book (2009)? To address this question, we performed a cross-sectional regression of each fund’s alpha on both the fund’s expense ratio and portfolio turnover, as follows:

$$\text{Alpha}_i = \text{Intercept}_i + \beta_{1i}(\text{Expense Ratio})_i + \beta_{2i}(\text{Turnover})_i + \varepsilon_i.$$

The results (t-statistics in parentheses) are:

$$\text{Alpha}_i = 0.184 - 0.006(\text{Expense Ratio})_i - 0.0002(\text{Turnover})_i + \varepsilon_i$$

(10.47)\* (-0.51) (-2.86)\*

\*Statistically significant at the 5% level.

**Table 3**  
**Cross-Sectional Regressions of Monthly Excess Fund Returns on the Market Portfolio for the Period February 1990 - January 2010.**

Object	N	Jensen's Alpha	T-Statistics	Portfolio Beta	O-Perform	U-Perform
AG	50	0.109	2.77*	1.193	0	0
G	1119	0.125	20.28*	1.010	155	20
GI	388	0.054	8.63*	0.895	32	3
EI	96	0.070	5.11*	0.809	15	0
SC	245	0.296	16.95*	0.942	47	0
Sample	1898	0.124	27.10*	0.970	249	23

\*Jensen's alpha is significantly different from zero at the 5% significance level.

Note: N is the number of funds in the sample; O-Perform is the number of funds with significantly positive Sharpe's Information Ratio (IR) as defined by Equation (2); and U-Perform is the number of funds with significantly negative IR. The market portfolio is represented by the S&P 500 Index and monthly returns on 91-day Treasury bills are used in the calculation of excess returns. The regression equation is represented by Equation [1], as follows:

$$R_{it} = \alpha_i + \beta_i R_{mt} + \varepsilon_{it}$$

where  $R_{it}$  is fund  $i$ 's return in excess of 91-day Treasury bill yield;  $\alpha_i$  is Jensen's alpha; and  $\varepsilon_{it}$  is fund  $i$ 's residual return in month  $t$ . Overall, from February 1990 to January 2010, 262 mutual funds had significantly positive alphas and 26 had significantly negative alphas. The rest of the 1610 mutual funds had insignificant alphas and had thus tracked the market during our sample period.

The results indicate that although mutual fund expense ratio is negatively related to mutual fund performance, the relationship is not statistically significant. These results are a departure from previous evidence that suggested that mutual funds with lower expense ratios had higher returns. According to ICI (2007 Mutual Fund Fact Book), the lower average expense ratios on stock funds implies considerable cost savings for fund investors and should impact investment performance significantly. The present study supports this point of view with the finding that the risk



performance. We find that most mutual funds actually track the S&P 500 index as indicated by the preponderance of zero alphas over the sample period. Moreover, at least 13% of the funds in our sample actually outperformed the S&P 500 index. Therefore, for these funds, the market is evidently not quite efficient. No more than 1.4% of the funds underperformed the market--a result that is remarkably different from previously documented findings.

To determine if this much improved performance is influenced by the decline in mutual fund expense ratios from 1980 to 2008, as shown in the ICI's Mutual Fund Fact Book (2007 and 2009), we perform a cross-sectional regression of each fund's risk adjusted performance on both the fund's expense ratio and portfolio turnover using Sharpe's Information Ratio as the measure of performance. The results show that both expense ratio and portfolio turnover are negatively associated to investment performance. Thus high expenses and high turnover tend to hurt performance, a finding which is in line with previous studies. The decline in fund expenses from 1980 to 2008, does not appear to be significantly beneficial to fund investors.

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