

April 1994

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### Recommended Citation

Kester, George W. (1994) "Mutual Fund Performance in the Eighties: Has It Improved?," *Southern Business Review*. Vol. 20: Iss. 1, Article 5.

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# MUTUAL FUND PERFORMANCE IN THE EIGHTIES: HAS IT IMPROVED?

*George W. Kester*

Shortly after the beginning of each year, mutual fund performance data and rankings are published in the financial press, including the **Wall Street Journal**, **Baron's**, **Forbes**, and **Business Week**. The highest ranking funds based upon returns are reported, usually according to fund type or objective.

By and large, most of the published data on mutual fund performance focuses singularly on returns, with little or no reference to risk. The return component of mutual fund performance is certainly the most important result that concerns most investors. However, to ignore risk and assert that one fund outperformed another based solely on returns is too simplistic and can result in misleading rankings of fund performance.

The problem of determining an appropriate rate of return for the risk involved has been a focal point of academic research since the advent of modern portfolio theory in the mid-1950s. A variety of models for measuring risk and its relation to return have been put forth and tested, the most prominent being the Capital Asset Pricing Model. These models represent attempts to relate returns to different levels of risk and can thus be useful in evaluating portfolio performance on a risk-adjusted basis.

A number of studies have been published that examine the performance of mutual funds. The seminal mutual fund studies of Sharpe (1966) and Jensen (1968), from which two widely used composite performance measures were derived, continue to be cited as evidence supporting market efficiency. These studies, which examined mutual funds performance during the late 1950s and early 1960s, indicated that few mutual funds were able to outperform a buy-and-hold policy. Approximately two-thirds of the mutual funds examined in each study failed to match the performance of the overall market.<sup>1</sup>

Despite the results of these and other studies, the growth of mutual funds over the past decade has been phenomenal. During the 1980s, total mutual fund assets increased tenfold. By the end of 1992 there were over 3,500 actively sold mutual funds in the United States with total assets exceeding \$1.4 trillion.<sup>2</sup> This leads to an obvious question: Has the extraordinary growth of mutual funds been accompanied by improvements in performance?

To answer this question, this note examines the performance of 246 mutual funds over the period 1980-89 and compares the results to the previous findings of Sharpe and Jensen.

## DATA AND METHODOLOGY

The mutual fund data used in this study consists of the annual returns of the 246 open-end equity funds for which data are available from Wiesenberger Investment Company Service (1989) each year of the period 1980-89.<sup>3</sup> The returns data reported by Wiesenberger are total returns based upon the percent changes in net asset value per share adjusted for realized capital gains and dividend distributions. The returns are computed net of operating expenses, such as management fees. However, sales charges, taxes, and redemption fees are not included. Thus, the returns data reflect the performance of the fund managers rather than results from the viewpoint of individual investors.

Three categories of funds, as classified by Wiesenberger, are examined: growth, growth & income, and balanced funds. Within the growth fund category, two types of funds are subcategorized: maximum capital gains and long-term gains. The period covered, which included the October 1987 global market crash, was one of widely fluctuating common stock prices, including periods of both rising and declining markets.

For each fund the average return over the ten-year period was calculated along with three composite measures of risk-adjusted performance based upon excess return per unit of risk:

Sharpe's reward-to-variability ratio (Sharpe, 1966), Treynor's reward-to-volatility ratio (Treynor, 1965), and a reward-to-downside variability ratio (RDV):

$$\text{Sharpe's Reward-to-Variability Ratio} = \frac{R_i - R_f}{SD_i}$$

$$\text{Treynor's Reward-to-Volatility Ratio} = \frac{R_i - R_f}{B_i}$$

$$\text{Reward-to-Downside Variability Ratio} = \frac{R_i - R_f}{SSD_i}$$

where  $R_i$  = average return on fund  $i$  in period  $t$ ,  
 $R_f$  = average risk free rate of return,  
 $SD_i$  = standard deviation of fund  $i$ ,  
 $B_i$  = beta coefficient of fund  $i$ , and  
 $SSD_i$  = semistandard deviation of fund  $i$ .

The numerator of each ratio is the fund's excess return (or risk premium), which represents the additional return above the risk free rate to compensate for risk. It is calculated as the difference between the average return on each fund and the average risk free rate of return over the sample period as measured by 30-day U.S. Treasury Bills.<sup>4</sup>

Whereas Sharpe's reward-to-variability ratio relates excess return to total variability as measured by standard deviation of returns, Treynor's reward-to-volatility ratio relates excess return to the responsiveness of the fund to changes in the market return, as measured by beta. The third measure, RDV, relates excess return to downside variability as measured by semistandard deviation. In contrast to standard deviation, which treats upside and downside variability as equally undesirable, the use of semistandard deviation (the square root of semivariance) recognizes that risk is generally thought of in the context of returns below an expected value. It is calculated by subtracting the average return of each fund from the return for each period. The differences, when negative, are squared, summed, and divided by the number of periods in the sample period. Semistandard deviation is the square root of the result.<sup>5</sup>

For perfectly diversified portfolios with symmetric returns distributions, the three measures would result in the same performance rankings. For less-than-perfectly diversified portfolios and portfolios with nonsymmetric returns distributions, it is possible for a fund to have a high ranking according to one measure, but a low ranking according to another. Therefore, the three measures provide complementary but different information about fund performance.

To these three measures was added a fourth performance measure, Jensen's alpha (Jensen, 1968):

Jensen's alpha =  $a$ , obtained from the following regression:

$$r_{it} - r_{ft} = a_i + b_i(r_{mt} - r_{ft}) + e_{it}$$

where  $b_i$  = slope coefficient for fund  $i$ ,  
 $r_{ft}$  = risk free rate of return in period  $t$ ,  
 $r_{mt}$  = market return in period  $t$ , and  
 $e_{it}$  = random variable having a mean of zero.

Like the Treynor measure, Jensen's alpha evaluates performance in terms of systematic risk. However, it is more appropriate for determining whether a fund "beat the market" than for performance comparisons or rankings, since different funds may have different levels of systematic risk.<sup>6</sup> Jensen's alpha is included among the performance measures because it makes it possible to determine whether the differences in risk-adjusted performance are statistically significant.



## OVERALL PERFORMANCE

Table 1 shows the average returns, standard deviations, betas, semistandard deviations, and four risk-adjusted performance measures for each fund category.<sup>7</sup> Included are the average returns and risk-adjusted performance measures for all 246 funds and the market index (Standard & Poor's Composite Index). As reflected in this data, growth funds had the highest average return of 16.31 percent as well as the highest risk according to standard deviation, beta, and semistandard deviation. Within the growth fund category, funds emphasizing maximum capital gains had the highest return and risk. Balanced funds had the lowest average return of 15.85 percent and lowest risk according to all three risk measures. However, none of the categories produced average returns higher than the market index return of 18.19 percent. Moreover, the standard deviation and semistandard deviation of the market index were lower than the same measures for both growth fund subcategories.

On a risk-adjusted basis the results were equally discouraging. According to the Sharp and RDV measures, each of the fund categories was outperformed by the market index. According to Treynor's measure, only balanced funds outperformed the market. Similarly, only balanced funds had a positive alpha. All other fund categories had negative alphas, with the worst performing category being growth funds emphasizing maximum capital gains.

**TABLE 1**  
**AVERAGE PERFORMANCE BY FUND CLASSIFICATION, 1980-89**  
**(IN PERCENTAGES)**

Fund Classification	n	Average Return	Excess Return	Standard Deviation	Beta	SSD	Risk-Adjusted Performance			
							Sharpe	Treynor	RDV	Jensen
Growth	169	16.31	7.39	16.14	1.02	10.72	0.46	7.25	0.69	-1.62
Max Cap Gains	54	16.59	7.67	18.72	1.16	12.25	0.41	6.61	0.63	-2.47
L.T. Growth	115	16.18	7.26	14.94	0.94	10.00	0.49	7.72	0.73	-1.21
Growth & Income	58	15.98	7.06	12.57	0.88	8.82	0.56	8.02	0.80	-1.06
Balanced	19	15.85	6.93	10.51	0.59	7.09	0.66	11.75	0.98	1.28
ALL FUNDS	246	16.20	7.28	14.87	0.95	9.99	0.49	7.66	0.73	-1.26
S&P 500 Index		18.19	9.27	12.69	1.00	9.19	0.73	9.27	1.01	0.00
Treasury Bills		8.92								

Although growth funds had the highest average return among the three categories, they had the worst performance according to the Sharpe and RDV measures. In contrast, balanced funds, which had the lowest average return, had the best risk-adjusted performance according to the Sharpe and RDV measures as well as Treynor's measure. These results demonstrate that when risk is taken into account, rankings of mutual performance can be significantly affected. Funds that rank high according to return may have low rankings on a risk-adjusted basis. Indeed, as reflected in Table 1, the ranking of fund categories according to returns is the inverse of rankings based on the Sharpe, Treynor, and RDV measures.

Table 2 shows the number and percentage of funds within each category that outperformed the market index. Comparing these results to the earlier findings of Sharpe (1966) and Jensen (1968), it appears that improvements in performance have not accompanied the growth in mutual fund assets. Based upon an examination of the annual returns data of 34 open-end funds for the period 1954-63, Sharpe found that only 32.4 percent had higher reward-to-variability ratios than the market. According to the same measure, an even lower 17.1 percent outperformed the market during the period 1980-89. Jensen found that only 33.9 percent of 115 open-end funds over the period 1955-64 had positive alphas. During the period 1980-89, 37.4 percent of the funds had positive alphas.

According to Treynor's measure, 36.6 of the funds outperformed the market. A lower 21.5 percent outperformed the market according to the RDV measure.

**TABLE 2**  
**NUMBER OF FUNDS OUTPERFORMING THE MARKET**

Fund Classification	n	Average Return	Sharpe	Risk-Adjusted Performance		Jensen
				Treynor	RDV	
Growth	169	50 (29.6%)	23 (13.6%)	53 (31.4%)	31 (18.3%)	54 (32.0%)
Max Cap Gains	54	20 (37.0%)	3 ( 5.6%)	12 (22.2%)	4 ( 7.4%)	13 (24.1%)
L.T. Growth	115	30 (26.1%)	20 (17.4%)	41 (35.7%)	27 (23.5%)	41 (35.7%)
Growth & Income	58	10 (17.2%)	14 (24.1%)	24 (41.4%)	14 (24.1%)	25 (43.1%)
Balanced	19	1 ( 5.3%)	5 (26.3%)	13 (68.4%)	8 (42.1%)	13 (68.4%)
ALL FUNDS	246	61 (24.8%)	42 (17.1%)	90 (36.6%)	53 (21.5%)	92 (37.4%)

The growth fund category had the highest percentage of funds that outperformed the market according to average return. However, it had the lowest percentage of funds according to all four risk-adjusted performance measures. Again, the balanced fund category had the opposite results. The balanced fund category had the lowest percentage funds with higher returns than the market, but the highest percentage of funds outperforming the market according to all four performance measures.

From the data presented in Tables 1 and 2, it would appear that funds with less aggressive objectives (balanced and growth & income funds) outperformed the more aggressive growth funds during the decade of the 1980s. Opposite results were obtained by McDonald (1974) in a study of the performance of 123 mutual funds over the period 1960-69.

According to the Jensen measure, 37.4 percent of the 246 funds outperformed the market on a risk-adjusted basis. As previously mentioned, a benefit of Jensen's alpha is that it makes it possible to determine whether the differences in risk-adjusted performance are statistically significant. Table 3 shows the number of statistically significant positive alphas at the 5 percent level. Whereas 37.4 percent of the 246 funds had positive alphas, only 8 funds (3.3 percent) had positive alphas that were significant at the 5 percent level. A perhaps more interesting result is that 31 funds (12.6 percent) had significantly negative alphas. Jensen (1968) had similar results. Only 3 (2.6 percent) of the 115 funds had positive alphas that were significant at the 5 percent level; 19 funds (16.5 percent) had significantly negative alphas.

**TABLE 3**  
**JENSEN'S ALPHA:**  
**NUMBER OF STATISTICALLY SIGNIFICANT ALPHA'S**  
**(5% LEVEL)**

Fund Classification	n	Significantly Positive		Significantly Negative	
		Number	Percentage	Number	Percentage
Growth	169	5	3.0%	19	11.2%
Max Cap Gains	54	2	3.7%	6	11.1%
L.T. Growth	115	3	2.6%	13	11.4%
Growth & Income	58	2	3.4%	12	20.7%
Balanced	19	1	5.3%	0	0.0%
ALL FUNDS	246	8	3.3%	31	12.6%

### SIMILARITY OF RANKINGS

These results demonstrate that rankings of mutual fund performance vary according to whether or not risk is taken into account. To further explore the differences between the rankings, Spearman rank correlation coefficients between the Sharpe, Treynor, and RDV measures with return were computed.<sup>8</sup> The results are shown in Table 4.

**TABLE 4**  
**SPEARMAN RANK CORRELATION COEFFICIENTS**  
**BETWEEN PERFORMANCE MEASURES**  
**(ALL SIGNIFICANT AT 5 PERCENT LEVEL EXCEPT AS NOTED)**

Fund Classification	n	Sharpe	Treynor	RDV
Growth	169			
Return		0.770	0.734	0.789
Sharpe			0.937	0.982
Treynor				0.954
Growth & Income	58			
Return		0.882	0.820	0.874
Sharpe			0.965	0.984
Treynor				0.964
Balanced	19			
Return		0.626	0.261*	0.595
Sharpe			0.518	0.925
Treynor				0.604
ALL FUNDS	246			
Return		0.734	0.686	0.753
Sharpe			0.920	0.981
Treynor				0.943

\*Not significant at the 5 percent level.

As reflected by these data, the rank correlations among the risk-adjusted performance measures are positive and statistically significant. These results are consistent with the findings of Cooley, Roenfeldt, and Modani (1977) in a study of the redundancy of commonly used risk surrogates. For growth and growth & income funds, the rank correlations among the performance measures are quite high (above 0.90), suggesting a high degree of substitutability for purposes of risk-adjusted performance rankings. For balanced funds, the lower rank correlations between the Treynor, Sharpe, and RDV measures indicate a lower degree of substitutability.

The lower rank correlations between return and the three risk-adjusted performance measures reflected in Table 4 further confirm that the rankings according to return differ from rankings according to the risk-adjusted performance measures.

As noted earlier, the three risk-adjusted performance measures provide complementary but different information about fund performance. For example, the Sharpe measure, which is based upon the total variability of returns, takes into account how well diversified the fund is during the period. If the fund is perfectly diversified (does not contain any diversifiable variability), the Sharpe measure results in rankings identical to the Treynor measure because the total variability of the fund would be the same as its nondiversifiable variability. If a fund is poorly diversified, it is possible to have a high ranking according to the Treynor measure, but a low ranking according to the Sharpe measure. The difference would be attributable to poor diversification of the fund. Therefore, the Sharpe measure may be more appropriate for investors with a substantial proportion of their investments in a single fund since they would be concerned with the total variability of the fund. In the case of funds with significantly skewed returns distributions, the RDV measure may be more appropriate.

### CONCLUSION

This note updated the widely cited studies of Sharpe and Jensen by examining the return and risk characteristics of 246 open-end equity mutual funds over the decade of the eighties. On average, the funds in each category underperformed the market index according to return as well as the risk-adjusted performance measures, results that are consistent with market efficiency. A comparison of these results with the earlier findings of Sharpe and Jensen suggests that the growth of mutual funds over the past decade has not been accompanied by improvements in performance.



The results of this study also demonstrate that rankings according to return can and do differ from rankings that take risk into account. This point was demonstrated using three different proxies for risk.

## FOOTNOTES

<sup>1</sup> Other studies have examined the effects of different market benchmarks (Carlson, 1970; Lehmann and Modest, 1987), the impact of different fund objectives (McDonald, 1974; Martin, Keown, and Farrell, 1982), market timing ability (Treyner and Mazuy, 1966; Veit and Cheney, 1982; Kon and Jen, 1979; Chang and Lewellen, 1984; Henriksson, 1984), and the consistency of fund performance over time (Klemkosky, 1977; Ang and Chua, 1982).

<sup>2</sup> See CDA/Wiesenberger (1993) for further discussion.

<sup>3</sup> Of the 400 growth, growth & income, and balanced funds that had returns reported by Wiesenberger for 1989, 246 funds (61.5 percent) had returns reported for each year of the period 1980-89.

<sup>4</sup> The risk free rate of return and return on the market index, as represented by 30-day U.S. Treasury Bills and Standard & Poor's Composite Index (S&P 500), respectively, were obtained from total returns data compiled by Ibbotson Associates (1989).

<sup>5</sup> The use of semivariance as a measure of risk was theoretically preferred by Markowitz (1959) and has received attention by various researchers. For example, see Hogan and Warren (1974) and Harlow and Rao (1989).

<sup>6</sup> See Smith and Tito (1969) for a discussion.

<sup>7</sup> A detailed listing of the returns and risk-adjusted performance measures for the 246 funds is available from the author upon request.

<sup>8</sup> As previously mentioned, Jensen's alpha is more appropriate for determining whether a fund "beat the market" than for performance rankings. Therefore, it is not included in the rank correlations shown in Table 4.

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