The Difficulty of Selecting Superior Mutual Fund Performance

by Thomas P. McGuigan, CFP®

Executive Summary

- Much has been written about the management of mutual funds and active versus passive management. This study attempts to quantify the relative performance of actively managed large- and mid-cap domestic stock mutual funds with a passive strategy during a 20-year period, including 11 10-year rolling periods.
- During the study period, most actively managed large- and mid-cap mutual funds underperformed their respective passive strategies. While every period under review had mutual funds that outperformed the passive strategy, few funds did so consistently.
- Furthermore, predicting in advance which mutual funds would outperform was difficult, if not impossible, and the cost of selecting the "wrong" manager was high. These factors combined demonstrate the difficulty for financial planners to select superior performance.
- The study also reviewed the impact of taxes on large-cap investments.
- Finally, the author provides recommendations for financial planners in discussing action steps regarding clients' portfolios.

Thomas P. McGuigan, CFP®, is the president of Beyond Tomorrow Strategic Advisors LLC in Guilford, Connecticut, a firm that provides strategic planning for individuals and businesses. He is also the owner of a financial planning company.

Much has been written about the management of mutual funds and active versus passive management.[1,2] This study attempts to quantify the relative performance of actively managed large- and mid-cap domestic stock mutual funds with a passive strategy during a 20-year period beginning December 1, 1983, and ending November 30, 2003. A 20-year period is used since this approximates the time frame associated with many client goals such as saving for a child's education, saving for retirement from mid-career to retirement age (when many clients save with greater discipline), and providing income during post-retirement. The 20-year period also provides a time frame long enough to observe changes during a series of 10-year rolling periods. This particular 20-year period is used because it provided the most up-to-date data available at the time the study was conducted. Additionally, this study seeks to add to the current body of knowledge with three additional considerations:

1. Defining the consistency in the relative performance between the two strategies during ten-year time periods
2. Quantifying the number of actively managed individual funds that have outperformed the passive strategy consistently
3. Testing the financial planner's ability to predict, in advance, which actively managed funds will outperform the passive strategy based on currently available data

The study shows that there is remarkable consistency in the relative performance of active versus passive strategies during ten-year periods, that the number and percentage of individual actively managed funds that have outperformed the passive approach is low, and that based on data available to planners, it is difficult to predict in *advance* which actively managed funds will outperform during the next ten-year period.

A Note on Growth and Value

Investors and advisors are faced with numerous decisions regarding portfolio construction including asset type, fixed income versus equity, liquid versus illiquid, domestic versus foreign,

credit quality, and market capitalization. Another consideration is growth versus value for domestic and international equities. This study purposely selected passive strategies that can best be described as a blend of growth and value. The reason was to test whether this approach would have been successful during the study period while providing the following benefits:

- Eliminate the guesswork of determining the next cycle of growth or value
- Reduce investment costs associated with growth or value portfolio changes
- Reduce the tax consequences associated with growth or value portfolio changes
- Eliminate the problem of inertia—that is, the tendency of investors and advisors to not take action when investments are performing well
- Eliminate the tendency of investors and advisors to "fire" investment managers or change investment style after a few quarters of underperformance

Large-Cap Domestic Stock Funds

The first part of the study reviewed large-cap domestic stock funds. The number of funds in this category is significant. The November 2003 version of Morningstar Principia lists 3,460 funds with the following criteria:

- Equity style box equals large
- Percent of holdings in North America greater than 85 percent
- Morningstar category equals large growth, large blend, or large value

To obtain a clear understanding of long-term performance, this study reviewed performance of those funds that had been in existence for 20 years or more. Therefore, two additional criteria were applied to the Morningstar Principia database:

- Fund inception date earlier than October 1983
- Share class type not equal to B (this eliminated five funds)

The resulting list had 171 funds, which served as the basis of this portion of the study. It is important to note that the investment style of the funds reviewed can be categorized as growth, value, or blend (of growth and value).

The question to be answered was, How did actively managed funds perform during this period compared with an index fund based on the S&P 500 Index?

One index fund, the Vanguard 500 Index Fund, met the criteria for this study since it had been in existence before 1983. Therefore, this fund was used for comparison purposes.

The first analysis was to compare the returns of the set of funds with the index fund over the past 5, 10, 15, and 20 years beginning on December 1 of each period and ending November 2003. A determination was made regarding the number and percentage of funds performing above and below the index fund. The results are tabulated in Table 1. Note: all returns are calculated without sales charge, surrender charge, or advisory fee. All returns exclude the impact of taxes, unless otherwise noted.

Table 1: Large-Cap Fund Performance Versus Index Fund

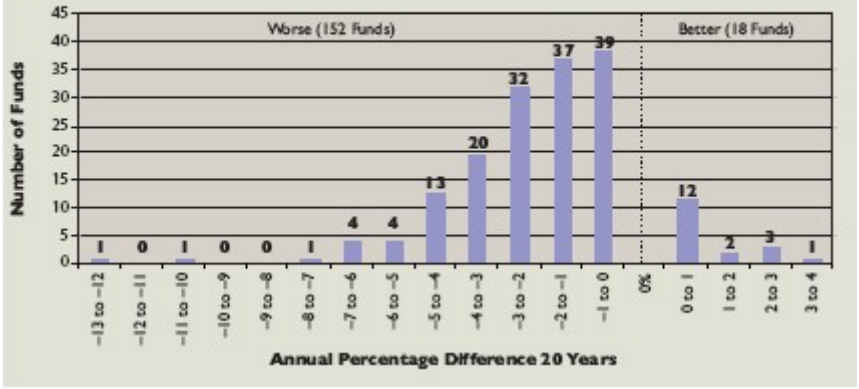
Time Frame	# Funds Above	# Funds Below	% Above	% Below
5 Years	94	76	55.29%	44.71%
10 Years	42	128	24.71%	75.29%
15 Years	37	133	21.76%	78.24%
20 Years	18	152	10.59%	89.41%

The data in the table reflect four main findings:

1. The longer the investment time frame, the more difficult it was for active managers to outperform the index fund.
2. The percentage of funds that outperformed the index fund over a 20-year period was 10.59 percent.
3. The distinction between returns based on growth, value, and blend styles faded as the investment time frame lengthened.
4. A long-term investor (10-20 years) had a 10.59 percent to 24.71 percent chance of selecting an actively managed fund that outperformed the index fund.

A particularly striking fact about the last finding is that the cost of selecting the "wrong" manager was high. Figure 1 illustrates the percentage of over- or under-performance of the mutual fund set versus the index fund during the 20-year period. Each bar represents a 1 percent difference in annual returns. The vertical dashed line represents the index fund. To the right of that line, note the funds that outperformed. Twelve funds outperformed from 0 to 1 percent, two outperformed from 1 to 2 percent, and only one outperformed by 3 to 4 percent. Note the number of funds that underperformed: 39 underperformed from 0 to -1 percent, 37 from -1 to -2 percent, 32 from -2 to -3 percent, and one even underperformed by -12 to -13 percent. The number of funds that underperformed by a certain range was significantly higher than the number of funds that outperformed by the same range.

Figure 1: Large-Cap Funds Versus Index Fund Over 20 Years



Given the variations in relative performance based on the length of time (see Table 1), the study then reviewed relative performance based on rolling ten-year periods. The data for all 171 funds were run over the 11 ten-year rolling periods beginning in December 1983 to December 1993, and ending in November 1993 to November 2003. Table 2 summarizes the findings.

Table 2: Large-Cap Fund Performance Versus the Index Fund, Ten-Year Periods

Time Frame	# Funds Above	# Funds Below	% Above	% Below
1983–1993	27	143	15.88%	84.12%
1984–1994	36	134	21.18%	78.82%
1985–1995	36	134	21.18%	78.82%
1986–1996	34	135 *	20.12%	79.88%
1987–1997	27	143	15.88%	84.12%
1988–1998	26	144	15.29%	84.71%
1989–1999	30	139 *	17.75%	82.25%
1990–2000	46	123 *	27.22%	72.78%
1991–2001	42	128	24.71%	75.29%
1992–2002	47	122 *	27.81%	72.19%
1993–2003	42	128	24.71%	75.29%

* One fund matched the index fund's performance during this time frame.

Table 2 demonstrates that an investor had a chance of 15.29 percent to 27.81 percent to select a managed fund that outperformed the index fund in any ten-year period.

The question that follows, then, is Could advisors predict in advance which funds would outperform the index fund? To answer this question, three tests were performed on the data. These were not random tests. Rather, they are reasonable ways of looking at the available information and, in fact, the ways that many mutual fund companies, advisors, and investors review performance information.

Method #1. Review how many of the funds that outperformed the index fund did so consistently in the 11 rolling periods.

Discussion. There were 171 funds compared with the index fund. These were measured over 11 ten-year rolling periods, providing 1,870 "opportunities" for a fund to outperform the index fund. During the time covered by this study, there were 395 occurrences of outperformance, provided by 96 funds. Of these, 30 funds outperformed the index fund more than half the time (6 or more of the 11 ten-year rolling periods). And of these, only one fund outperformed the index fund in every ten-year rolling period.

Therefore, the percentage of occurrences of outperformance was only 21.12 percent, even though 56.47 percent of the funds actually outperformed the index fund during at least one ten-year rolling period. Furthermore, and perhaps most significant, is that only 30 funds (17.65 percent of the total) demonstrated consistent outperformance by providing higher returns than the index fund in 6 or more of the 11 rolling periods.

Method #2. Compare quartile rankings of the funds that were in the first quartile of performance in the 1983–1993 study period with their rankings in the 1993–2003 study period (that is, the first ten years compared with the next ten years).

Discussion. A common method of reviewing funds is to note their rankings compared with their peers and segregate them into "quartiles." For this study, funds ranked in performance from 1 to 42 represent the top quartile of performance.

The 42 first-quartile funds from the 1983–1993 study period were then examined to see if their success in that period could be used to predict their success in the next ten-year period from 1993 to 2003.

Only 28.57 percent of the funds remained in the first quartile of performance during the second

ten-year study period, while 33.33 percent dropped to the second quartile. In addition, 38.98 percent of the funds fell to the third or fourth quartiles. Quartile performance from the first ten-year period was not a reliable predictor of relative performance in the second ten-year period.

Method #3. Compare the returns of those funds that outperformed the index fund in the first ten-year period with their performance in the second ten-year period.

Discussion. While past performance is no guarantee of future returns, mutual funds are sold by fund companies, recommended by professional advisors, and bought by investors based largely on past performance.

During the 1983–1993 study period, 27 mutual funds outperformed the index fund. These funds were then used to build a hypothetical portfolio in Morningstar Principia as follows:

- Time period: December 1993 to November 2003
- Equal amount invested in each fund
- No re-balancing of portfolio assets
- No sales charges, redemption charges, or advisor fees; taxes not considered

This portfolio was then compared with the index fund during the same period. The results are summarized in Table 3.

Table 3: 1993–2003 Return and Risk for Those Large-Cap Funds That Had Outperformed the Index Fund in the Prior Period (1983–1993)

Portfolio	Ten-Year Pre-Tax Return	Ten-Year After-Tax Return	Ten-Year Risk (Standard Deviation)
Mutual Fund Portfolio (27 funds)	9.85%	8.34%	17.16
Index Fund	10.56%	9.94%	17.53

Those funds that outperformed the index fund during the first ten years were unable, as a portfolio, to outperform during the second ten-year period. Therefore, the returns of the first period did not provide an adequate predictor of the second period. Note that the risk assumed by the two portfolios was similar.

Taxes

In an attempt to quantify the cost of taxation on large-cap funds, the ten-year study noted above was replicated applying tax rates of 25 percent for income and 15 percent for capital gains. Note that actual tax rates during the study period (1993–2003) were higher. The results are included in Table 3.

The reduction in return of the managed fund portfolio was 1.51 percent, or 15.33 percent of the return actually earned, for taxes. The reduction in return of the index fund was 0.62 percent, or 5.87 percent of the return actually earned, for taxes.

Survivor Bias

As noted earlier, this study provides data on the performance of mutual funds from December 1983 to November 2003. Those data are then compared with an investment in a passive index-based product. A significant flaw in this approach is survivor bias. During the period, it is likely that mutual funds, presumably those with poor performance, ceased operations. Therefore, the "survivors" may have biased the study since poorer-performing funds simply ceased to exist and

were not accounted for in the data.

John C. Bogle, the founder of Vanguard and inventor of the first index fund, addresses this issue of survivor bias.[3] He reported on academic studies by Professor Burton Malkiel and Professor Mark Carhart that demonstrated a significant percentage of funds studied (from one-fifth to one-third) did not survive the periods under review (10 years and 30 years, respectively). Referencing the ten-year period, Bogle further stated, "During that period, the survivors enjoyed annual returns of 17.1 percent a year, but all funds together provided returns of only 15.7 percent per year. This survivor bias had therefore enhanced the annual returns reported by the funds by fully 1.4 percentage points over the *actual* returns earned by the funds during that ten-year period."

The study by Malkiel showed that 18 percent of funds reviewed did not survive the ten-year period from 1982 to 1991, according to Bogle. If this same percentage is assumed for the 1993–2003 period in this paper,[4] then it could be estimated that 208 funds existed at the beginning of the period and 37 of them did not survive. If we further assume that those 37 were underperforming funds, then the data from Table 1 would be revised to show that 42 funds out of 208 (20.19 percent) outperformed the index fund. This is a reduction from 24.71 percent noted in the table. This is an area for further study.

Mid-Cap Domestic Stock Funds

To obtain an understanding of long-term performance in domestic mid-cap stocks similar to that of large-cap stocks, a review was conducted of the returns for those mid-cap funds that have been in existence for 20 years or more. The following criteria were applied to the Morningstar Principia database:

- Equity style box equals mid
- Percent of holdings in North America greater than 85 percent
- Morningstar category equals mid-growth, mid-blend, or mid-value
- Fund inception date earlier than October 1983
- Share class type not equal to B

The resulting list had 38 funds, which served as the basis of the study. It is important to note that the investment style of the funds reviewed can be categorized as growth, value, or blend (of growth and value).

The question to be answered was, How did actively managed mid-cap domestic stock funds perform compared with an index fund based on the S&P 400 Mid Cap Index?

Unlike the study with the large-cap stocks, there is no index fund (to my knowledge) that has mirrored the S&P 400 Mid Cap Index for the 20-year period. Therefore, a proxy for the index was constructed for comparison purposes. The methodology was to use Thompson Financial InvestmentView data on indexes and construct hypothetical illustrations for the time periods in the study. A 0.20 percent wrap fee was added to the illustration to approximate the expense ratio of a hypothetical index fund. This proxy will be referred to as the "index fund" for the remainder of this discussion on mid-cap funds.

The first analysis was to compare the returns of the set of funds with the index fund over the past 5, 10, 15, and 20 years ending November 2003. A determination was made regarding the number and percentage of funds performing above and below the index fund. The results are tabulated in Table 4. Note: all returns are calculated without sales charge, surrender charge, or advisory fee. All returns exclude the impact of taxes.

Table 4: Mid-Cap Fund Performance Versus Index Fund

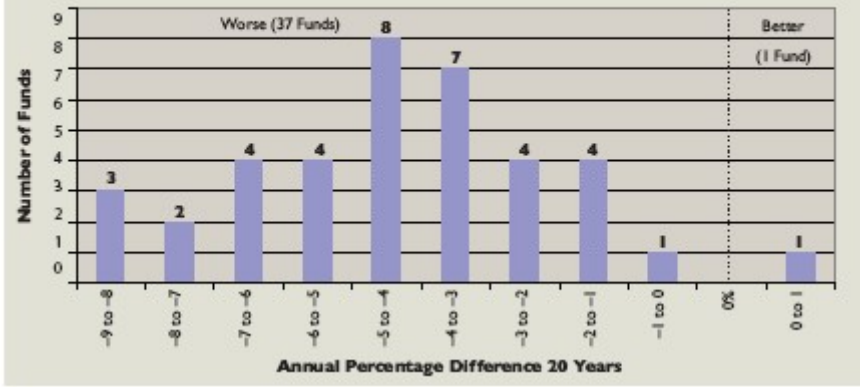
Time Frame	# Funds Above	# Funds Below	% Above	% Below
5 Years	9	29	23.68%	76.32%
10 Years	5	33	13.16%	86.84%
15 Years	1	37	2.63%	97.37%
20 Years	1	37	2.63%	97.37%

Table 4 reveals four main findings from this data:

1. The longer the investment time frame, the more difficult it was for active managers to compete with the index fund
2. The percentage of funds that outperformed the index fund over both 15- and 20-year periods was 2.63 percent
3. The distinction between returns based on growth, value, and blend styles faded as the investment time frame lengthened
4. A long-term investor (10–20 years) had a 2.63 percent to 13.16 percent chance of selecting an actively managed fund that outperformed the index fund

As was the case in the study of large-cap funds, the last finding demonstrates the high cost of selecting the "wrong" manager. Figure 2 illustrates the percentage of over- or underperformance of the mutual fund set versus the index fund during the 20-year period. Each bar represents a 1 percent difference in annual returns. The dashed line represents the index fund. To the right of that line, note the funds that outperformed. One fund outperformed from 0 to 1 percent. Note the number of funds that underperformed: one underperformed from 0 to -1 percent, four from -1 to -2 percent, four from -2 to -3 percent, and so on. The number of funds that underperformed by a certain range was significantly higher than the number of funds that outperformed by the same range.

Figure 2: Mid-Cap Funds Versus Index Fund Over 20 Years



The findings on mid-cap funds versus the index are a surprise. Mid-cap funds performed worse against the index than did large-cap funds. I thought the mid-cap sector of the market would provide greater opportunity for stock selection since many of the companies in this sector are not as familiar to investors. This is an area for further study.

The study then reviewed relative performance based on rolling ten-year periods from 1983 to 2003.

The data for all 38 funds were run over the 11 ten-year rolling periods beginning in December

1983 to December 1993, and ending in November 1993 to November 2003. Table 5 summarizes the findings.

Table 5: Mid-Cap Fund Performance Versus the Index Fund, 10-Year Periods

Time Frame	# Funds Above	# Funds Below	% Above	% Below
1983–1993	2	36	5.26%	94.74%
1984–1994	2	36	5.26%	94.74%
1985–1995	8	30	21.05%	78.95%
1986–1996	5	33	13.16%	86.84%
1987–1997	6	32	15.79%	84.21%
1988–1998	6	32	15.79%	84.21%
1989–1999	12	26	31.58%	68.42%
1990–2000	10	28	26.32%	73.68%
1991–2001	9	29	23.68%	76.32%
1992–2002	6	32	15.79%	84.21%
1993–2003	5	33	13.16%	86.84%

The table demonstrates that an investor had a 5.26 percent to 31.58 percent chance to select an actively managed fund that outperformed the index fund in any ten-year period. As with large caps, the logical question that follows is, Can we predict in advance which funds will outperform the index fund? To answer this question, the following test was conducted on the data.

Method. Review how many of the funds that outperformed the index fund did so consistently in the 11 rolling periods.

Discussion. There were 38 funds compared with the index fund. These were measured over 11 ten-year rolling periods, providing 418 "opportunities" for a fund to outperform the index fund. During the time covered by this study, there were 71 occurrences of outperformance, provided by 21 funds. Of these, five funds outperformed the index fund more than half the time (6 or more of the 11 ten-year rolling periods). Of these, none outperformed the index fund in every ten-year rolling period.

Therefore, the percentage of occurrences of outperformance was 16.99 percent, even though 55.26 percent of the funds actually outperformed the index fund during at least one ten-year rolling period. Furthermore, and perhaps most significant, is that only five funds (13.16 percent of the total) demonstrated consistent outperformance by providing higher returns than the index fund in 6 or more of the 11 rolling periods.

Further Test on Mid-Cap Funds

Because of the small number of funds that met the 20-year history criterion in this study, the two other methods used to test large-cap funds did not appear to be relevant. Instead, mid-cap funds were selected using the same criteria noted earlier, except that the fund inception date was set to October 1993. The resulting list had 150 mid-cap funds. There was no attempt made to eliminate multiple share classes other than the B shares, one of the criteria of the original search.

The 150 funds were then sorted based on ten-year performance, ending November 2003. The range of annual returns was 21.19 percent to 1.73 percent. The average was 10.09 percent.

The hypothetical mid-cap index fund constructed earlier had a ten-year annual return of 13.63 percent. This return was exceeded by 22 funds, or 14.67 percent. The remaining 128 funds, or 85.33 percent, underperformed the index.

The same procedure as noted above was repeated for funds whose inception date was earlier than October 1988. The resulting list had 88 mid-cap funds. The 88 funds were then sorted based on 15-year performance, ending November 2003. The range of annual returns was 6.83 percent to 17.82 percent. The average was 11.93 percent.

The hypothetical mid-cap index fund had a 15-year annual return of 15.57 percent. This return was exceeded by four funds, or 4.54 percent. The remaining 84 funds, or 95.46 percent, underperformed the index.

Another area for additional research is to see if the tax implications noted under the discussion of large-cap funds apply to mid-cap funds.

Small-Cap Domestic Stock Funds

The study methodology used for large- and mid-cap funds could not be used for small-cap funds because of the very small study sample. Only 21 funds had a 20-year history. Furthermore, Thompson Financial InvestmentView data on the S&P 600 index, the proxy to be used for comparison, has less than a ten-year history. This is an area for further research.

Implications for Clients

This study suggests the following:

- The percentage of actively managed large- and mid-cap domestic stock funds that consistently outperform a passive broad-based index is low
- A small number of actively managed large- and mid-cap funds have consistently outperformed an index fund in the same asset class
- Anticipating in advance those funds that might outperform the index is difficult
- In the large-cap fund universe, active management during the last ten years of the study period resulted in significantly lower after-tax returns than the index fund

The following are considerations for the management of the domestic large and mid-cap portion of client portfolios:

- Since a passive large-cap index fund outperformed active funds 72.19–84.71 percent of the time during ten-year periods, a majority of a client's domestic large-cap portfolio should be allocated to a passive index investment rather than actively managed mutual funds
- Since a hypothetical passive mid-cap index fund outperformed active funds 68.42 percent to 94.74 percent of the time during ten-year periods, then a majority of a client's domestic mid-cap portfolio should be allocated to a passive index investment rather than actively managed mutual funds
- Clients should be provided with the results of this study
- Clients should select an allocation (from 0 percent to 20 percent) to actively managed funds if they hope to choose a fund that might outperform the index, but only after they understand the results of this study
- Clients will need encouragement to remain true to the passive strategy during the inevitable periods when active management is superior, and during the onslaught they will see and hear from advertising and media reports promoting the "best performing funds" for each new year

Advisors who already deploy passive strategies can use this study with clients to confirm their approach. Advisors who do not use passive strategies can use the study methodology to test

their investment selection process. In either case, additional research is needed, as noted in this paper. Ultimately, our clients are the beneficiaries of our collective efforts to improve the understanding of investment selection and performance.

Endnotes

1. John C. Bogle, *Common Sense on Mutual Funds* (John Wiley & Sons Inc., 1999): 128–129.
2. *The Case for Indexing*. (The Vanguard Group, September 2003).
3. Bogle, op. cit.
4. The author could find no reference for survivor bias for the entire 20-year period of this paper's study.

Web Sites

- https://institutional2.vanguard.com
- www.vanguard.com/bogle