

IMPROVING MUTUAL FUND RISK DISCLOSURE

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(excerpted from a comment letter submitted by the Investment Company Institute to the Securities and Exchange Commission on its risk disclosure concept release¹)

Summary

Mutual fund investors are largely middle class Americans², many of whom are investing for essential long-term objectives like retirement and college education. For these individuals to make appropriate investment decisions, they must understand all dimensions of risk, including, perhaps most importantly, that risk and reward are closely related and that it may be necessary to assume certain “risks” to achieve long-term investment “rewards.”

The Institute and its members have long engaged in efforts to educate investors about mutual fund risk. From the industry’s perspective, such a broad understanding is essential to preserve the industry’s most important asset—investor confidence.

At the same time, the SEC and the industry have long sought to meet the investor need for concise and understandable risk information. Recent efforts include simplified pro-

¹ SEC Release Nos. 33-7153; 34-35546; IC-20974 (March 29, 1995).

² Institute data shows that the median household income of mutual fund investors is \$50,000. *Profiles of Mutual Fund Shareholders*, Investment Company Institute, Fall 1992.

spectus disclosure such as the general “profile prospectus” project and the proposal to simplify and shorten money market fund prospectuses. The Institute and its members have engaged in similar efforts to educate investors, for example, about the effects of interest rate changes on bond funds. While these are all important initiatives, a broad consensus supports the need for additional measures to improve the investor’s understanding of risk.

Based on year-long consideration of the risk disclosure issue by a cross-section of the industry, we advocate the following actions, which, taken together, would do much to improve investor understanding of mutual fund risk characteristics.

- ***Improve narrative risk disclosure*** by shifting the focus from the risks of *individual* portfolio securities to the *overall* risks of a fund. Refocusing disclosure from the “trees” (i.e., the particular investments that a fund intends to make) to the “forest” (i.e., a fund’s portfolio as a whole) would improve understanding of risk significantly.
- ***Require that prospectuses include a bar graph reflecting the fund’s total return*** over each of the past ten years (accompanied by the fund’s one-, five-, and ten-year average annual total returns). While this information is available in the fund’s financial highlights table, investors may have difficulty extracting it in tabular form. Graphically depicting total return fluctuations over time would greatly assist the many investors for whom a single picture is indeed worth a thousand words.
- ***Require funds that hold themselves out as having a stated maturity policy to maintain a commensurate portfolio duration policy.*** For example, a fund with “short-term” in its name could be required to have an average portfolio duration of no more than three or four years. Imposing such requirements would help ensure that funds are managed in a manner consistent with investor expectations.

The Institute ***adamantly opposes*** any requirement that funds report a single, standardized, numerical risk measurement. Fundamentally flawed, this approach erroneously assumes that a single, optimal yardstick of investment risk exists; ignores that risk is multifaceted, necessarily having different meanings for different investors; and poses the significant danger that investors—neither understanding the limitations of some government-sanctioned, all-purpose risk measure nor accurately assessing its relevance and appropriateness to their particular circumstances and investment objectives—nonetheless will rely on it to their detriment.

The search for a single, universal risk measure is but another example of the truth once observed by H.L. Mencken: “For every complex problem, there’s an answer that’s clear, simple, and wrong.”

Narrative Risk Disclosure. Mutual funds must currently include in their prospectuses narrative disclosure describing the principal risk factors associated with a fund. In fulfilling this obligation, mutual funds often include detailed disclosures concerning the risks of the individual securities in which they may invest.³ Funds go to such detail for a number of reasons, including the desire to respond to comments on prospectuses by SEC staff and state examiners and efforts by fund counsel to minimize disclosure liability. It appears, however, that such detailed disclosure may actually obscure a fund’s overall risks. A lengthy technical description of inverse floaters, for example, would likely distract an investor from understanding the effects of interest rate risk on the overall investment portfolio.

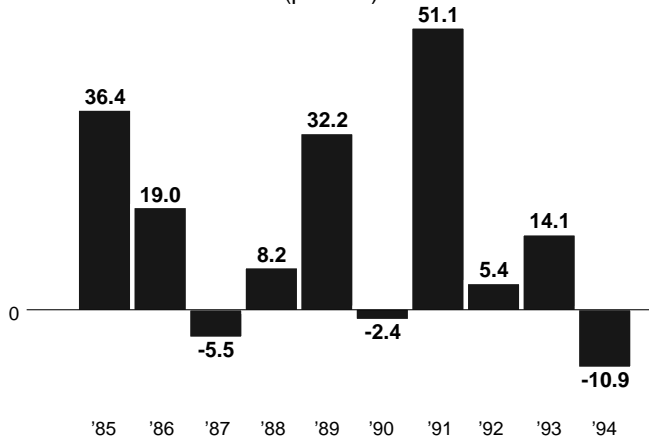
More important than centering on the risks of individual portfolio securities, disclosure should focus primarily on a fund’s broad investment objectives, its strategies to reach those objectives, and the portfolio risks accompanying those strategies. Focusing on overall risk disclosure would greatly enhance investor understanding, particularly when reinforced by annual report discussions of the relevant market conditions and general investment strategies and techniques pursued by the fund that materially affected performance. Accordingly, the SEC should permit funds to focus risk disclosure in this manner.⁴

The Total Return Bar Graph. The Institute generally agrees with the proposition asserted by the SEC (and others) that “graphs, tables, and other pictorial representations may assist investors in understanding and comparing funds.” Hence, we forward a second recommendation: prospectuses should include a bar graph reflecting a fund’s total return for each of the past ten years (accompanied by one-, five-, and ten-year average annual total returns).

³ Barry Barbash, Director, Division of Investment Management, SEC, reportedly stated, “The average person doesn’t understand jargon like collateralized mortgage obligations or inverse floaters...We need to explain fund risks in ways that investors can quickly grasp.” Wang, “What You Need to Know About Fund Risk,” *Money*, June 1995.

⁴ Based on concerns about potential prospectus disclosure liability under the Securities Act of 1933, funds may be reluctant to modify their current disclosure. To alleviate funds’ liability concerns, we specifically suggest that the SEC issue a formal statement (such as an interpretive release) of its belief that investors would be better served by general fund disclosure about overall portfolio risks, and that such disclosure satisfies the requirement of the Securities Act of 1933.

FUND Q
ANNUAL TOTAL RETURN 1985-1994*
 (percent)

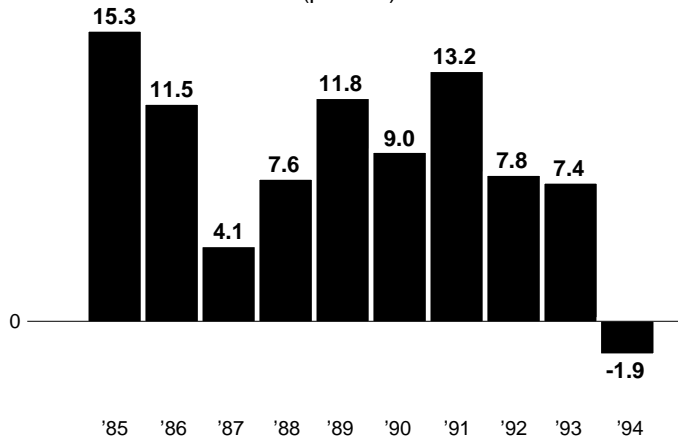


FUND Q
AVERAGE ANNUAL
TOTAL RETURN

Past 1 year **-10.9%**
Past 5 years **11.5%**
Past 10 years **14.8%**

*For fiscal periods ended
 December 31, 1994.*

FUND R
ANNUAL TOTAL RETURN 1985-1994*
 (percent)



FUND R
AVERAGE ANNUAL
TOTAL RETURN

Past 1 year **-1.9%**
Past 5 years **7.1%**
Past 10 years **8.6%**

*For fiscal periods ended
 December 31, 1994.*

In general, the "bar graph" approach would pro-

**Total returns are based on past results and are not an indication of future performance.*

vide investors with a straightforward presentation of a fund's performance variability. A bar graph, specifically, would enhance investor understanding of the total return data already provided in tabular form in the financial highlights table of fund prospectuses. Such a format would make total return information clear to *all* investors, particularly those who are disinclined to focus on the financial highlights table and who, therefore, may not be aware that total return is included.

Graphically depicting a fund's best and worst annual performance over the last ten years

would be particularly helpful. In addition, the bar graph and accompanying total return data, taken together, would show investors the benefits of long-term investing and help them appreciate that short-term fluctuations are not necessarily relevant to a long-term strategy. Moreover, such a graph would facilitate comparisons between the variability of different funds' performance.

There are other benefits of a total return bar graph as well. Funds could implement this approach easily, without concerns about new disclosure liabilities under the federal securities laws. Funds of all types could present such a graph. Finally, a total return bar graph already is being used by several funds and will be an important feature of the experimental "profile prospectus."⁵

The Institute opposes the suggestion that funds be required to provide, along with the total return bar graph, a bar graph of the returns of a market index. For many funds, no comparative index exists. Funds also are required to report their performance net of all expenses, while index "performance" is computed on a cost-free basis. And, unlike an index, mutual funds must maintain a portion of their portfolio in liquid assets to meet redemptions. Thus, comparing a fund's total return information to an index, besides being inappropriate, could be potentially misleading.

Duration Limitations. Investors would be well served if additional measures were adopted to ensure that bond funds are managed in a manner consistent with reasonable investor expectations. In particular, investors generally (and appropriately) expect short-term bond funds to be less "risky" than long-term bond funds. While many funds have adopted duration policies to meet shareholder expectations (created by a fund's name or otherwise), they are not currently required to do so. Accordingly, we recommend that the SEC require all funds with a stated maturity policy (for example, one suggested in a fund name or through marketing materials) to have a commensurate portfolio duration policy, at least under normal market conditions. For instance, a "short-term" fund would be required to have an average portfolio duration of less than three or four years.

If this recommendation is pursued, however, several matters would still need to be resolved: most notably, the development of a standardized methodology for calculating duration and definitions for the various maturity categories.

⁵ Consistent with the instructions for the bar graph in the profile prospectus, we recommend that only returns for full years be included and that front-end or deferred sales charges not be reflected.

Adopting a duration policy is preferable to requiring funds to disclose actual duration. Such a “snapshot” of a fund’s portfolio—tied to specific market conditions at the time of a disclosure document’s publication—would prove far less useful than disclosing general duration expectations. A duration policy would help ensure that short-term bond fund purchasers understand that their expectations of low interest rate sensitivity are likely to be met even if they don’t understand the complexities underlying this measure.

“If somebody can come up with a single way of [defining risk], I think that is wonderful. Of course, they would need to be able to predict the future in detail.”

*—A. Michael Lipper,
president of Lipper
Analytical Services Inc. (as
reported in the October 9
issue of Newsday)*

Drawbacks to Suggested Numerical Risk Measures

For the past year, the Institute and its members have closely studied the feasibility of developing standardized, quantitative measures of mutual fund risk. The result is clear: there is and can be no single, all-encompassing measure of fund risk. The effort to apply a single yardstick of a fund’s risk would be not only fruitless, but also highly counterproductive, creating far more problems than it solves.⁶

The Different Concepts of Risk Cannot Be Captured in a Single Measure

Risk encompasses many different concepts and, consequently, evades reduction to a single quantitative measure.

Duration is one of many good examples of the limitations of the available quantitative risk measures. It estimates only interest rate risk,⁷ and provides no information regarding credit, currency, or other risks. In fact, using duration to measure fixed-income fund risk

⁶ This does not mean, however, that in certain instances there may not be some utility in providing investors with appropriate measures. Indeed, many funds may wish to, and in fact do, disclose measures such as duration and standard deviation of fund performance in prospectuses and other shareholder communications. These measures, however, are not appropriate across the board for *all* funds.

⁷ In fact, duration is only an *approximate* measure of interest rate risk in that it is only accurate for relatively small parallel shifts in the yield curve. Thus, it is unclear whether mandatory disclosure of duration would have indicated the likelihood of the losses realized by certain short-term government bond funds in 1994.

could be more harmful than beneficial, exaggerating the importance of one risk element over others.

Even so-called “total risk” measures fail to encompass risk. Different investors have quite different and legitimate perceptions and concerns about risk, depending on, among other things, their time horizons, goals, financial situations, other investments in their portfolios, and basic attitudes. In the case of an investor concerned about potential short-term loss, money market funds may rightly be characterized as low risk and aggressive growth funds as just the opposite. Conversely, for an investor defining risk as the potential long-term loss of purchasing power (inflation), aggressive growth funds could be considered low risk and money market funds as high risk.

Standard deviation, which measures performance *volatility*, is another instructive example. To obtain a meaningful sample for computation, standard deviation would likely have to be based on monthly or quarterly returns (thus, the SEC proposed *monthly* returns over three years as a possible timeframe over which to measure standard deviation). It is far from clear, however, how meaningful the volatility of monthly returns would be for a fund shareholder investing for the long term. Such an investor would probably view risk as the likelihood of a decline in investment value, or the failure to meet a benchmark, *over a long-term time horizon*. In fact, it appears that most investors *do* view risk in this manner.⁸ There is no reason to think that a measure of *short-term volatility* will correspond to the risk of *longer-term underperformance*. Indeed, our research suggests that the two have a slightly *negative* correlation.⁹

Thus, if standard deviation is used as *the* measurement of fund risk, many investors might be misled and inappropriately favor funds with lower short-term volatilities, thereby imperiling their long-term investment goals. Unfortunately, evidence exists that many inves-

“I worry that, by focusing exclusively on the riskiness of each individual fund, the SEC may scare investors into sticking with more conservative investments.”

—Jonathan Clements,
The Wall Street Journal

⁸ See *Profiles of First-time Mutual Fund Buyers*, pp. 3, 50, Investment Company Institute, Fall 1994; *Piecing Together Shareholder Perceptions of Investment Risk*, p. 18 (Figure 17), Investment Company Institute, Spring 1993.

⁹ See Appendix, pp. 13.

tors *already* may be making investment decisions ill advisedly on this basis.¹⁰ It would be deeply disturbing to further aggravate this alarming trend.

Similarly, the risk of any particular investment needs to be considered in light of the *other* elements of an investor's portfolio. Many mutual fund sponsors, investment advisers, personal finance columnists, and others have long stressed the importance of evaluating investments within the context of one's overall portfolio.¹¹ Even assuming the appropriateness of short-term volatility (as measured by standard deviation) as a risk measure, one cannot be sure of any one investment's effect on the overall volatility of an investor's portfolio (which from an *investor's* perspective would be the more relevant consideration).

For example, if Fund X has a relatively high standard deviation but its performance negatively correlated with that of Fund Y, an investor in Fund Y might very well *reduce* risk by investing in Fund X. As such, investors are highly unlikely to be able to use the standard deviation of a particular fund to evaluate the effect of an investment in a particular fund on their overall portfolio.

Investors Will Place Undue Reliance on a Single, Numerical Measure

Concerns that existing risk disclosure may be lengthy and complex (and therefore difficult to understand) provided the impetus for the SEC's current search for a standardized risk measure. It seems ironic, then, that most of the risk measures under discussion are so complex, and only a small portion of investors will likely understand their benefits and limitations. It is also ironic that, because any mandated risk measure presumably would be accompanied by substantial explanatory disclosure, it would further burden fund prospectuses, making them less likely to be read, understood, and used by investors.

"Besides encouraging a false sense of security, spending too much time on a risk-measure debate can . . . imply that a single measure is in fact desirable. It is not."

*—Eileen Makoff,
Morningstar Mutual Funds*

Also, reliance on a single, numerical measure of risk may cause investors to make the wrong investment decisions. Standard deviation, for example, measures the past variability

¹⁰ See, e.g., Teitelbaum, "How Your 401(k) Can Make You Rich," *Fortune*, July 24, 1995.

¹¹ See, e.g., Rogers, "T. Rowe Price's Morris Issues Timely Advice," *Investor's Business Daily*, July 26, 1995; Quinn, "A Contrarian View of Foreign-Stock Funds," *The Washington Post*, May 21, 1995.

of a fund's return. Under certain conditions, it can be used to compute a range or confidence interval that would, on average, contain future returns about two thirds of the time.¹² Many investors, however, are not likely to understand standard deviation or its limitations.¹³ Investors—especially the many viewing risk as the likelihood that a fund will underperform—may be confused that a fund gaining five percent one month, ten percent the next month and one percent the month after will have the same standard deviation as a fund *losing* five percent one month, ten percent the next month and one percent the month after. They also may not appreciate that a fund losing a constant two percent per month will have a standard deviation of zero.

Even with accompanying disclosure, investors are likely to place undue reliance on a numerical measure at the expense of other important fund risk information. In recent years, investors have been deluged with financial information, and are seeking shortcuts for digesting it all. Providing investors with a numerical measure may tempt them to rely on that number as the sole source of information about a fund's risks.¹⁴ As a result, investors may understand less about fund risks than if the number had not been provided.

In addition, several measures (including standard deviation) are historically based. Despite this, however, investors may unduly rely on them as predictive of future risk or performance, or even promissory in nature—despite disclosure to the contrary. As a result, investors may not understand that a fund could behave very differently because of changes in market conditions (e.g., changes in interest or foreign exchange rates) or portfolio holdings.

¹² For example, if the average annual return of a mutual fund is 15 percent and the standard deviation is 12 percent, there would be about a two-thirds chance that the annual return would be between 3 percent and 27 percent. In addition, there would be a one-third chance that the return would be outside the range.

¹³ Indeed, the validity of standard deviation rests upon various conditions being satisfied. These conditions include constancy of the standard deviation, which history has shown to be highly variable, and a normal distribution of the fund's returns, which is generally not the case. Even assuming that these conditions are satisfied, there would be a one-third chance that the return would be outside the range.

¹⁴ Providing investors with a measure that focuses only on certain risks such as interest rate and market risk, but does not account for inflation risk, is dangerously misleading. For investors to be able to meet their long-term objectives, such as a comfortable retirement or funding a child's college education, investors need to understand that there is a risk that the "buying power" of their investment may be diminished due to inflation. For example, an annual inflation rate of 5 percent over 15 years will cut the value of \$1,000 by more than half, to \$481.

Other Specific Risk Measures

In addition to standard deviation and duration, other suggested numerical measures have serious shortcomings that eliminate their effectiveness as a universal risk measure.

Beta. Presumably, beta would correlate the fund's historical returns with those of a benchmark index. As with standard deviation, the returns would have to be short-term (e.g., quarterly or monthly) for most funds to have a meaningful sample of observations. Thus, beta, like standard deviation, suffers from a fundamental shortcoming: it is, at best, a gauge of short-term volatility, providing a relative, rather than an absolute, measure.

That beta is a relative measure illustrates another limitation: it is only useful to the extent the fund's performance is correlated with that of a benchmark index. For many funds, an appropriate index may not exist. Many equity funds (e.g., gold funds) have very little correlation with indices such as the Standard &

Poor's 500 Index. (Of course, different funds might utilize different indices. Thus, a gold fund might compute its beta with respect to a gold index, making comparison to other types of funds all but impossible for investors.) Beta is also likely to provide useful information to investors only if they understand the volatility of the index. It is doubtful, however, that many investors—even those familiar with, for example, the S&P index—will demonstrate familiarity with how volatile an index has been.

Risk-adjusted Measures of Performance. Risk-adjusted performance measures (e.g., Sharpe's ratio, Treynor's ratio, Jensen's alpha) suffer from three fundamental weaknesses. First, by adding an additional layer of complexity, they are even less likely to be understood by investors than the other various measures, even with extensive accompanying disclosure. Second, each uses a single "risk" measure to adjust return (standard deviation in the case of Sharpe's ratio, and beta in the case of Treynor's ratio and Jensen's alpha). If, as previously noted, beta and standard deviation are not appropriate, neither are the risk-adjusted measures based on them. Third, these standards are designed to measure performance independent of the requisite risk measure. Treynor's ratio, for example, attempts to remove from the fund's return that portion due to market risk, leaving only the portion of the return attributable to other factors, such as portfolio manager skill. Thus, these approaches do not really satisfy the stated objective of a

"Several measures are being used to describe mutual funds' riskiness. Most are complex, none is perfect, and all have the potential to mislead"

—Russ Wiles,
Los Angeles Times

numerical risk measure: providing investors with a means for ascertaining the overall riskiness of a particular fund.

Portfolio-based Measures. This measure relies on calculating risk according to the particular securities in a portfolio as of a specified measurement date. Such a historical approach comes with inherent difficulties. For example, the lack of a relevant history for financial instruments recently included in a fund's portfolio.

Risk Objectives or Targets. This approach would require funds to use any of the risk and risk-adjusted performance measures as an objective or target, and could force funds to "pigeonhole" themselves. Consequently, they could be driven to base portfolio management decisions on an announced target, clearly a detriment to investors. If a relatively narrow range is required, management flexibility could be severely limited.¹⁵ Conversely, a broad range (e.g., a duration range of 0 to 30 years) would be meaningless to investors. Moreover, if a fund missed its stated target, it could be exposed to significant liability (unless the SEC adopts adequate protections). Finally, to the extent investors do not understand the objectives or targets, disclosure will provide scant practical value—or prove potentially detrimental.

Non-Quantitative Approaches

Self-assessment of Risk. Many fund sponsors include in sales literature a ranking of the relative risks of the funds within their complex. In general, such measures assist comparison of different *types* of funds. For instance, a fund complex may provide a "risk spectrum," with a money market fund at the low end and an aggressive growth fund at the high end. Such rankings, however, appear inappropriate as mandated prospectus disclosure.

Requiring such self-assessment would raise serious liability concerns. For example, a fund categorized as "low risk" could incur liability if an unforeseen market event, such as a significant devaluation of a foreign currency, caused a precipitous decline of net asset value. (As a result, few funds would feel comfortable labeling themselves as "low risk.") Instead, funds would likely feel compelled, out of liability concerns, to include considerable narrative describing the risk scale and the basis for assessment. Such disclosure runs counter to the general SEC objective of prospectus simplification.

¹⁵ For instance, integral to the success of a balanced fund is the flexibility to allocate its assets among equity, fixed-income, and money market instruments in a manner determined to be appropriate, depending upon, among other things, market conditions. If such a fund were required to stay within a specified, narrow duration range, its ability to achieve its investment objective could be greatly hampered.

“Some observers told us that if you’re smart enough to answer our [risk measurement] questionnaire, you’re smart enough to understand that risk is too difficult a concept to boil down to a single number.”

*—Barry Barbash,
Director, Division of
Investment Management,
Securities and Exchange
Commission (as reported in
The New York Times)*

Also, subjective self-assessments, many of which are fairly broad risk categories such as low, medium, and high, would prove useless to investors comparing funds from different sponsors (e.g., comparing one money market fund with another).

Risk Management Procedures. To the extent risk management procedures are deemed material to an investment decision, they should be, and generally are, fully disclosed. Otherwise, we question their relevance to investors. And a detailed discussion of technical aspects of portfolio investing will merely lengthen fund prospectuses, with no corresponding investor benefit. Most investors are not likely to understand procedures such as “stress testing,” or their relevance. In addition, funds could be forced to disclose proprietary information. Finally, and perhaps most important, it

could be implied that such disclosure seeks to eliminate all risks, clearly not the case and emphatically *not* consistent with the concept of investing in securities.

Conclusion

The Institute and its members are committed to improving mutual fund risk disclosure. To this end, we recommend that the SEC take the three specific actions discussed in this paper:

- improve narrative risk disclosure by shifting the focus from the risks of individual portfolio securities to the overall risks of a fund;
- require that prospectuses include a bar graph reflecting the fund’s total return; and
- oblige funds that hold themselves out as having a stated maturity policy to enact a commensurate portfolio duration policy.

In addition, we strongly urge no pursuit of a quantitative risk measure, which, as discussed, would hinder rather than help investor understanding of risk.

APPENDIX

Comparison of Standard Deviation to Five-Year Underperformance Measure

Summary

The Institute analyzed two methods for measuring mutual fund risk—standard deviation of monthly returns and a measure of underperformance for five-year periods. The Institute found the two to have a slight negative correlation.

Description of Study

The Institute computed two sets of data for 18 categories of mutual funds, grouped by investment objective.¹⁶ The first was the standard deviation of the monthly returns for each category over the period January 1986 through December 1994. This was calculated by first determining the average monthly returns for all the funds in the category, and then computing the standard deviation of those average monthly returns.

The second represented an attempt to measure the extent to which a category underperformed a neutral target return over a longer period, specifically five years. To obtain this measure, the Institute first computed average five-year returns for all the funds in the category over rolling periods beginning in January 1986 and each month thereafter through January 1990. (Thus, the first period measured the performance of funds in the category from January 1986 through December 1990; the second measured the performance from February 1986 through January 1991, etc. This produced a total of 49 observations for each category.) Each average return was then compared to the five-year Treasury note rate for the corresponding period. For each category, the sum of all observations in which the funds' return was less than the T-note rate was computed to produce a measurement of five-year underperformance.

¹⁶ Four investment objective categories (European stock funds, Pacific stock funds, world bond funds, and ARM funds) were excluded because they had fewer than seven funds in the category. Had they been included, the correlation coefficient would have been significantly more negative.

Data was supplied by Morningstar, Inc. Only funds included in Morningstar's database for the entire period were included. (This amounted to 749 funds, or approximately 70 percent of all funds in existence that met the specified criteria.) Money market funds and tax-exempt funds were not included. The funds were grouped according to Morningstar's investment objective categories.

A technical annex describing the methodologies used in greater detail is set forth at the end of this appendix.

Rationale for Underperformance Measure

The underperformance measure was intended to represent the risk that an investor with a five-year time horizon would fail to achieve a target rate of return. (A five year period was chosen because it allowed for a relatively long-term time horizon, while still permitting utilization of fairly recent performance information.) The five-year Treasury note rate was chosen as the best proxy for a "risk-free" five-year investment. Utilizing rolling five-year periods allowed a relatively large sample of observations within the specified time period.

Of the 49 rolling five-year periods, only those in which the fund group's return was less than the T-note rate were taken into account. (Thus, performance in excess of the target rate was ignored.) The difference between the two rates was computed and then the absolute values of all the differences were added together. Thus, the resulting measure takes into account both the frequency and magnitude of any underperformance.

Unlike standard deviation, the underperformance measure is not a measure of short-term fluctuations in return. Instead, it represents an answer to the questions, "How likely is it that this fund [or, in the case of this study, group of funds] will perform worse than a risk free investment? And by how much?"¹⁷

¹⁷ The underperformance measure is similar to the risk measure utilized by Morningstar. It differs primarily in that it measures underperformance over five-year periods, rather than monthly periods.

Findings

The standard deviations and five-year under performance measures for each of the 18 fund categories are set forth below.

Investment Objective	Number of Funds	Standard Deviation	Under-performance Measure*
Aggressive Growth	28	5.948	93.13
Growth	185	4.491	56.15
Growth & Income	115	3.878	110.02
Equity-income	19	3.393	132.45
Small-Company Funds	47	5.329	99.14
International—World	15	4.314	420.47
International—Foreign	21	4.559	470.40
Specialty Funds	69	4.194	237.01
Asset Allocation	12	2.368	508.80
Balanced Funds	32	2.922	108.05
Income Funds	16	2.030	88.07
Convertible Bond Funds	7	3.128	305.37
Corporate—High-yield	34	1.891	313.72
Corporate—General	39	1.314	167.07
Corporate—High-quality	25	1.201	201.50
Government Bonds—General	42	1.230	277.96
Government—Mortgage	31	1.202	122.85
Government—Treasury	12	2.406	333.70

Correlation Coefficient = -0.11

**when compared to a total return on a five-year Treasury note*

Source: Morningstar, Inc.

The two measures have a slight negative correlation. It can be readily seen from the table that several fund groups that appear to be relatively risky using standard deviation are less risky if one uses the underperformance measure and vice versa. For example, corporate high-yield bond funds have a relatively low standard deviation (14th out of 18). Under the five-year underperformance measure, they are the fifth riskiest category. Conversely, growth funds have a high standard deviation (4th out of 18), but the lowest underperformance risk.

While the underperformance measure utilized here is not the only, or even necessarily the best, means of quantifying longer-term risk,¹⁸ the fact that it is has either no or negative correlation with monthly standard deviation, measured over the same period, casts doubt on the usefulness of the latter as a universal measure of risk. Investors with longer-term horizons will receive little in the way of useful information. Furthermore, if they do not understand the limitations of standard deviation, they may very well be encouraged to make inappropriate investment decisions in reliance on it. In conclusion, a measure that focuses on short-term fluctuations will be at best irrelevant, and at worst misleading, to the millions of investors who do (or should) invest for the longer term.

¹⁸ Among other things, a five-year period is somewhat arbitrary (and is not particularly long term). We did not study the correlation between monthly standard deviation and measures of underperformance over longer periods (e.g., ten years), due primarily to a relative lack of data. There is little reason, however, to think there would be any greater correlation in that case.

Annex to Appendix

Five-year Rolling Returns

The rolling total returns for 22 different investment objective categories were computed by Morningstar, Inc. for 49 different 60-month periods. The first 60-month rolling period was from January 1986 through December 1990, the second period was from February 1986 through January 1991 and so on, and the last rolling period was from January 1990 through December 1994.

The total return is expressed in percentage terms and is calculated by taking the change in net asset value, reinvesting all income and capital gains distributions during the period (and any other miscellaneous distributions), and dividing by the starting net asset value. All distributions are reinvested at either the NAV or the load-adjusted NAV as of the distribution date depending upon the fund's policy for treating reinvested dividends. Total returns for periods of longer than one year are expressed in terms of compounded average annual returns. The above can be expressed as follows:

$$\text{Total Return (TR)} = \frac{[(NAV_t * D) - NAV_{t-1}]}{NAV_t}$$

where,

NAV_t is the net asset value at the end of the time period;

NAV_{t-1} is the net asset value at the beginning of the time period;

D is the product of the distributions weighted by the NAV as of the respective distribution dates and is calculated as follows:

$$D = \frac{(1 + \frac{D_1}{NAV_{d1}}) * (1 + \frac{D_2}{NAV_{d2}}) * \dots * (1 + \frac{D_n}{NAV_{dn}})}{NAV_t}$$

NAV_{d1} is the net asset value on the day of the first distribution during the period for which total return is being calculated, NAV_{d2} is the net asset value on the day of the second distribution and so on, and $D_1, D_2 \dots D_n$ are the distributions made during the period.

Annualized returns are calculated using the following formula:

$$\text{Annualized Total Return (TR)} = \frac{[(1+\text{TR})^{1/n} - 1] \times 100}{100}$$

where n is the number of years in the period for which total returns are computed. In this case, the TR is computed over a five-year period and hence, n is equal to five years.

Total Return on a Five-year Treasury Note

$$\text{Total Return} = \frac{(1+R_t)^n}{2}$$

The returns on the five-year Treasury note were computed using the following formula:

where n is equal to the number of semi-annual payments on the Treasury note and R_t is the interest rate on the note.

For example, the interest rate on a five-year Treasury note purchased in January 1986 was 8.68 percent. When the note became due in January of 1991, the compounded total return on the note was equal to 52.94 percent; $\text{TR} = (1 + 0.0868/2)^{10}$. Similar total returns were computed for five-year Treasury notes for all the months from December 1985 through December 1989. These returns were then subtracted from the corresponding rolling returns of different categories of funds for the periods ended December 1990 through December 1994. Finally, the differences between the two returns were computed and the sum of all the differences is equal to the Underperformance Measure.



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