Risk is a complex, multidimensional concept that can't be captured in a single number, but there are helpful summary yardsticks that mutual fund investors can use.

Wrestling With Risk: A Multiheaded Concept With No Single Measure

By Albert J. Fredman

The concept of investment risk is getting plenty of attention. The losses from plunging bond prices and derivative debacles in 1994 and Mexico's peso crisis, which began late that year, heightened investor interest. In addition, the roaring bull market in U.S. stocks in 1995 has some investors concerned that a fallback may be overdue.

In March 1995, the Securities and Exchange Commission sought to determine how a mutual fund's riskiness could be summed up in a simple, comprehensive measure. However, risk is a complex, multidimensional concept that manifests itself in various ways. It can't be fully captured in just one standardized number, although there are some useful summary gauges. Risk is omnipresent and includes stock market crashes, corporate bankruptcies, currency devaluations, sea changes in sentiment, unanticipated surges in inflation and interest rates, and even major changes in the tax code.

Defining Risk

Risk is generally defined by academics and mutual fund analysts as return volatility, or the degree of "ups" and "downs" of returns. But there's more to risk than volatility, as we'll see. Risk and long-term reward are generally related. Risk is the chance that your actual return will be less than you expected. People sometimes think that a good return can be achieved with little or no risk. Unfortunately, that's impossible. To achieve your objectives, you need to assume certain risks and avoid others.

Your ability to handle risk is related closely to your individual circumstances, including your age, time horizon, liquidity needs, portfolio size, income, investment knowledge, and attitude toward price fluctuations. What's highly risky to one individual may be no problem to another. For example, for an 85-year-old fearful of near-term losses, money market and short-term bond funds are low risk and aggressive growth funds are highly risky. Conversely, for a 30-year-old mainly concerned about loss of purchasing power, the opposite is true. Short-term fluctuations are not that relevant for long-term investors who have the discipline, patience, and understanding to deal with them. Stock funds are actually less risky than money market funds for those with long time horizons.

Risk and Reward in Perspective

Table 1 shows compound annual returns and standard deviations (total risk or volatility) of the major security groups for the 1926-1994 period. These data, provided by Ibbotson Associates in Chicago, indicate that common stocks—both large-company and small-company—are by far the best long-term performers. The words "long-term" must be emphasized, though. There have been occasional extended periods where stocks did badly. For example, from 1968 through 1978, the S&P 500 index produced a paltry 3.85% annual total return, according to Ibbotson.

The fact that stocks are riskier than bonds and money market securities is evident from their higher standard deviations, a measure of volatility that indicates the amount actual returns varied around the long-term average. Higher short-term volatility is the price we pay for greater long-run rewards. The standard deviation in T-bill returns reflects fluctuations in income only—not principal. Because short-term rates are notoriously volatile, the income from T-bills and the like can drop abruptly when rates fall rapidly. This is known as "rollover risk," as the cash from maturing obligations must be rolled over into successively lower-yielding instruments. Rollover risk is a major uncertainty facing holders of money market funds.

Well-informed investors are far less likely to let risk get the best of them. Those who understand the various elements of risk are better equipped to enjoy a profitable long-term investment journey.

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Table 1.
Return and Risk of Major Asset Classes: 1926 Through 1994

Asset Class	Average Annual Return (%)	Standard Deviation (%)
Large-company stocks (S&P 500)	10.19	20.35
Small-company stocks	12.22	34.56
Long-term (20-year) corporate bonds	5.41	8.41
Long-term (20-year) government bonds	4.83	8.75
Intermediate-term (5-year) government bonds	5.09	5.68
Treasury bills (30-day)	3.69	3.29
U.S. inflation	3.12	4.61

Source: Ibbotson Associates, Chicago

Let's examine the major dangers confronting mutual fund investors.

Inflation Risk

Do you have too much of your nest egg allocated to cash equivalents? About 27% of the mutual fund industry's total $2.8 trillion of assets was parked in money market funds as of November 1995, according to data collected by the Investment Company Institute.

Inflation nibbles away at the interest and principal of fixed-income investments. With longer life expectancies, inflation risk is an even greater danger. T-bills, CDs, and money market funds are highly vulnerable. These securities have high principal stability, but offer only minuscule growth. For example, T-bills returned 3.69% yearly for the 1926-1994 period when inflation averaged 3.12% (Table 1). Intermediate- and long-term bond funds fare noticeably better, but don't come close to stocks. For example, intermediate-term government bonds returned 5.09% over the 1926-1994 period versus 10.19% for the S&P 500 (Table 1).

Market Risk

Corrections and bear markets inflict harm on countless individuals who throw in the towel and lock in their losses. In a classic correction, the broad market averages such as the S&P 500 lose 10% to 15% of their value, whereas they plunge 20% to 30%, or more, in a real bear market. Some equity funds get hit worse than others in a bear rout. Table 2 shows the worst 12-month periods for the 25 years through 1994 for each of Lipper Analytical Service's general equity fund categories. Even though general equity fund returns averaged 10.2% yearly during this 25-year span, they still took some big plunges.

In addition to short-term risk, there's always a small chance that stocks can do poorly for about a decade—introducing a long-term danger. For instance, Lipper's general equity funds eked out a meager 2.52% a year over the decade ended December 1978. The fact that this broad Lipper group returned a stellar 13.38% from 1982 through 1994 raises the possibility of significantly lower performance during the next decade or so.

Interest-Rate Risk

This peril confronts bond fund investors directly, especially those in longer-term portfolios. Simply put, bond prices fall when interest rates rise. Bond funds were hit hard by rising rates in 1994, taking many unsuspecting shareholders by surprise. Interest-rate risk is greater for bond issues with more distant maturities and lower coupons. Thus, long-term bond funds have greater interest-rate risk than intermediate-term funds, which in turn, are more volatile than short-term portfolios. Long-term target maturity funds, which invest in zero-coupon bonds, exhibit the most volatility. The flip side of interest-rate risk is that a decrease in rates will lead to a corresponding rise in bond prices, enhancing total returns of bond investors.

Stock funds are also affected by interest-rate risk because stocks and bonds compete for investor money. If interest rates rise significantly, fixed-income securities become relatively more attractive, so money is shuttled from the stock market into higher-yielding bond and money market funds.

Currency Risk

If the greenback grows stronger, U.S. investors experience a currency loss on their foreign securities. Conversely, if the dollar weakens, these investors enjoy a bonus. Fluctuating exchange rates are of particular concern to single-country investors. It can be devastating for individuals who hold funds for short periods, as those who invested in Mexico prior to the peso crisis in late 1994 and subsequently sold at gaping losses.

Some fund managers may try to hedge their portfolios against adverse currency moves with currency futures or forward contracts. However, hedgers are fallible and lose money when the currency goes opposite their predictions. In addition, a hedge costs money. I prefer funds that do little or no hedging. Currency risk is generally not too much of a problem for long-term investors in well-diversified international funds.

Asset-Class Risk

Stocks, bonds, and cash are the three major asset classes. If you allocate a disproportionate amount to any of the three main categories—or totally ignore one or two of them—you are subject to asset-class risk. It's prudent to diversify across all three major asset classes even though you want to give primary emphasis to, say, stocks.

Younger investors who don't own bonds should realize that their primary function is to add stability while producing higher returns than money market funds. As we saw in Table 2, stock funds could lose more than 40% of their value in a severe bear market. However, bond funds are unlikely to generate a total return worse than –10%, even in severe bond bear markets. Most bond funds had single-digit losses in 1994, the worst year for bonds since 1974. But it may take you longer to recoup a loss with bond funds than with stock funds because they have less upside potential.

Older investors should at least have a small stake in stocks, because they provide long-term growth, thereby reducing the likelihood the investor will outlive his nest egg. Of course, these investors should emphasize the more stable equity-income and growth and income categories.

Other Pitfalls

We've covered the most common risk factors affecting mutual fund investors. But there are still more dangers. Here's a brief overview of some of them:

- ***Management risk.*** The majority of actively managed funds underperform the broad market benchmarks. Even though a fund has beaten the market in the past, there are no guarantees it will continue to do so. A star manager may leave or lose his touch. Individuals who stick with poorly run funds risk substantial under performance, which can compound over time. Investors in index mutual funds avoid management risk.
- ***Sector risk.*** Industry or sector risk faces those who invest in narrowly focused sector portfolios, such as those focusing on health care or even utility stocks. It also affects individuals holding more diversified funds that make big sector bets.
- ***Country risk.*** This danger, which includes economic and political instability, is associated with single-country funds, especially those targeting developing markets.
- ***Credit risk.*** The risk of default can be a concern for high-yield bond fund investors. Junk bonds (those rated below triple-B) can experience staggering losses when setbacks occur in this sector as they did in 1989-1990.
- ***Tax-rate risk.*** Municipal bond investors have been skittish about changes in tax laws that could make munis less valuable. For example, if a flat tax were introduced and all investment income became tax-exempt, muni bond holders could suffer a substantial decline in the value of their positions.

Volatility Yardsticks

The effect on returns of many of the risks that we've examined is evident from eyeing the ups and downs of a fund's past returns. Funds that have a history of wide swings in net asset value are more likely to exhibit erratic behavior in the future than more placid portfolios.

Let's examine three common yardsticks of volatility.

Bond Duration

The best indicator of interest-rate risk for a bond portfolio is its effective duration. Duration is a sophisticated measure of a bond's "average" life, considering its time to maturity, stream of interest payments, and price. It's essentially a weighted average time to recovery of all payments to the bondholder. For instance, the duration of a 20-year zero-coupon bond is its time to maturity—20 years—since all payments are received at that time; the duration of a 20-year, 10% coupon bond would be less than 20 years, since income payments are received prior to maturity. The shorter the duration, the less risky the bond. The duration of a bond mutual fund is found by averaging the durations of its bonds.

The telephone reps at major mutual fund companies can provide up-to-date duration information; it can also be obtained from Morningstar. Typical maturity-group duration ranges are one to three years for short-term funds, four to six years for intermediate-term and seven to 10 years for long-term portfolios. Conversely, money funds have readings near zero. The higher the number, the more net asset value fluctuates in response to interest rate changes. For example, if interest rates increase by one percentage point, a long-term fund with a duration of 12 could be expected to fall about 12% in value. The longest durations are found among the long-term target maturity bond funds such as Benham Target Maturity Trust 2020, which recently had an effective duration of 24.6 years.

Be aware that duration gauges only the interest-rate risk of a bond fund, not its credit risk, currency risk, or any other potential perils.

Table 2. Worst Rolling 12-Month Returns by Stock Fund Category: 1970 Through 1994

Category	Total Return (%)
Capital Appreciation	–45.27
Growth	–43.62
Mid Cap	–48.89
Small-Company Growth	–46.05
Growth & Income	–35.67
Equity Income	–30.61
General Equity	**–40.56**

Source: Lipper Analytical Services

Table 3.
Standard Deviations and Total Risk Rankings of Fund Categories

Category	Standard Deviation (%)	Total Risk
Aggressive Growth	13.4	high
Growth	9.4	above avg
Growth & Income	8.3	avg
Balanced	6.2	below avg
Corporate Bond	4.3	low
Corporate High-Yield Bond	4.7	low
Government Bond	4.5	low
Mortgage-Backed Bond	3.5	low
General Bond	3.4	low
Tax-Exempt Bond	6.1	below avg
International Stock	12.7	high
International Bond	5.8	below avg
Gold	27.9	high
Domestic Equity	9.7	above avg
Small-Capitalization Stock	10.6	above avg
Domestic Taxable Bond	3.6	low

Source: Extracted from data used in the Quarterly Low-Load Mutual Fund Update, January 1996, American Association of Individual Investors

The Beta Coefficient

This modern portfolio theory statistic measures a fund's volatility relative to a broad benchmark, commonly the S&P 500 index. Although betas are normally associated with stocks, they are also used for bonds. Morningstar provides a beta for bond funds using a bond index benchmark, normally Lehman Brothers aggregate index.

Beta is typically calculated on the basis of monthly returns over the past three years. A fund that seesaws in perfect sync with the market has a beta of 1.0. Portfolios that are more volatile relative to the S&P 500, such as aggressive-growth funds, have betas greater than 1.0; more conservative investments such as utility funds have coefficients of less than 1.0. Beta readings for gold, international, and other funds that move independently of the S&P 500 are not meaningful, so it's wise to check the standard deviation along with beta when you're examining volatility. Both are found in AAII's "Individual Investor's Guide to Low-Load Mutual Funds" and Morningstar Mutual Funds.

Incidentally, Morningstar also provides an "R-squared" for funds, which tells you how well diversified a portfolio is. Values can range from 0% to 100%, with higher numbers indicating better diversification, using the S&P 500 as the standard for fully diversified. In addition, the closer the R-squared is to 100%, the more dependable the fund's beta. The Vanguard Index Trust 500, which tracks the S&P 500, has an R-squared of 100%. Conversely, a gold fund might have an R-squared close to 0%.

Standard Deviation

The most insightful and dependable barometer for all funds, standard deviation, reflects the degree to which returns fluctuate around their average. It is usually based on monthly returns over the past 36 months. The higher the number, the greater the volatility; for a stock fund that has an average annual return of 12% and a standard deviation of 20%, you can expect to earn between 32% and –8% in about two out of every three years.

A useful summary statistic, standard deviation allows you to make comparisons across as well as within fund categories. The standard deviation generally tends to work better than beta because it is a purer, more universal number; it is not based on the relationship of return to fluctuations in an index. For bond funds, standard deviation is a more comprehensive yardstick than duration because it reflects all sources of volatility, not just interest-rate risk.

High beta funds usually have high standard deviations, but certain funds with very low betas may have huge standard deviations. For example, a fund investing in Japanese stocks or gold shares could have a beta near zero, but a standard deviation greater than 20%. If the duration of a bond fund is high, its standard deviation is usually high. However, if the standard deviation is high, its duration is not necessarily high because the variability could be from some other factor such as currency or credit risk rather than interest-rate risk, which duration measures.

Table 3 displays the standard deviations and category risk ranking for the fund groups covered in the AAII's *Quarterly Low-Load Mutual Fund Update.* Notice that the bond funds have lower total risk than the stock funds, but risk varies by fund type within both categories. AAII also provides a useful 'risk index' based on the standard deviation of a fund relative to the average standard deviation for its category. A fund with a risk index of, say, 1.4 is 40% more volatile than its group average.

A caveat: Risk statistics are based exclusively on historical numbers and are not necessarily predictive. The period used to calculate the measure may not be representative of the future investment climate. While a fund's risk is generally more predictable than its return, major changes in the way it is managed can cause its future volatility to differ strikingly from past ups and downs.

Gauging the Downside

Duration, beta, and standard deviation reflect potential "ups" as well as

Volatility Measures

Measure	Definition	Where Found
Beta Coefficient	A measure of a fund's volatility relative to a broad benchmark such as the S&P 500. Funds with betas higher than 1.0 are more volatile than the benchmark; funds with betas less than 1.0 are less volatile than the benchmark. A beta of 1.0 designates a fund that moves to the same degree as the benchmark.	• Individual Investor's Guide to Low-Load Mutual Funds, AAII, 625 N. Michigan Ave., Chicago, Ill. 60611, (312) 280-0170. Updated annually; $19 for AAII members. • Morningstar Mutual Funds, Morningstar Inc., 225 W. Wacker Dr., Chicago, Ill. 60606, (800) 876-5005. Updated biweekly; available in libraries.
Bond Duration	A weighted average time to recovery of all payments to the bondholder. The duration of a bond fund is the average duration of its bonds. The shorter the duration, the less risky the bond fund.	• Available by phone from major mutual fund companies. • Morningstar Mutual Funds, Morningstar Inc., 225 W. Wacker Dr., Chicago, Ill. 60606, (800) 876-5005. Updated biweekly; available in libraries.
Standard Deviation	A measure of the degree to which returns fluctuate around their average. The higher the number, the greater the volatility.	• Individual Investor's Guide to Low-Load Mutual Funds, AAII, 625 N. Michigan Ave., Chicago, Ill. 60611, (312) 280-0170. Updated annually; $19 for AAII members. • Morningstar Mutual Funds, Morningstar Inc., 225 W. Wacker Dr., Chicago, Ill. 60606, (800) 876-5005. Updated biweekly; available in libraries.

"downs" in net asset value. But individuals fear only the downs—they love the ups. Most people equate investment risk with losing money—downside risk.

There are several ways to gauge the downside:

Large annual or quarterly losses. If a fund's net asset value is down 30% or 40% in some years (or even in some quarters for the most volatile portfolios), it could take you on a wild roller coaster ride. Limit your positions in such funds to, say, 5% of your portfolio, if you invest at all. Annual returns can be found in mutual fund guides as well as in the prospectus. Looking at quarterly returns (found through AAII or Morningstar) can be useful because annual numbers sometimes mask intra-year volatility.

Morningstar risk. The more frequently a fund's monthly returns fall short of the three-month T-bill return, and the greater the shortfall relative to others in its category, the higher its Morningstar risk. Consistent underperformers are riskier than those that outperform for long stretches, but also incur big losses occasionally. Sector, aggressive growth, and single-country funds tend to have the highest Morningstar risk in the equity arena.

The portfolio's price-earnings ratio. Morningstar provides weighted average price-earnings ratios for stock funds. Price-earnings ratios that are substantially above average point to greater downside potential if the market heads south.

Maintaining Control

While you can't prevent bear markets and other investment perils, there are several things you can do to handle risk better. They include:

• **Allocating your assets among diverse fund categories:** Don't view the riskiness of a single fund in isolation. Rather, determine how each investment meshes with others you own. A mix of dissimilar funds can calm your overall portfolio. Volatile funds may not be that risky when used as a modest part of a well-diversified portfolio. International diversification can help trim market risk a bit, even though international stock funds tend to have high standard deviations (Table 3). That's because some markets can be charging ahead when others are flat or down. With stock funds it's particularly important to diversify your holdings across small-cap, large-cap, and international types. That's because the international or small-cap group could outperform or underperform the S&P 500 for periods up to five years or more.

• **Setting your sights on the long term, patiently riding with the ups and downs:** If you have the time to be patient, you can benefit from "time diversification." The more numerous good years for stocks outweigh the bad, pulling your return up. Thus, if you hold equities for many years, you can expect to realize significant positive growth in your wealth.

• **Weeding out your laggards:** Don't be too patient with laggards. This is the management risk referred to earlier. Underperforming the market benchmarks is a big risk to which many people are oblivious. The more years you remain with a subpar performer, the greater the damage to your nest egg. Weed out funds that have lagged their peers over the past 18 to 24 months. Finally, consider holding a low-cost index fund core in your portfolio to reduce your management risk.

• **Avoiding hard-core market timing:** It's not uncommon for hard-core market timers to move between the extremes of 100% stocks during an up

market to 100% cash when their indicators signal a major turning point in prices. Market timing is especially easy to do with mutual funds. Resist the temptation. Participation in the best up months is far more important than avoiding the worst down months, and the really dramatic upward surges in stocks are unpredictable, of short duration, and few and far between. Market timers risk being in cash when the bull stampedes, as in 1995 when the S&P 500 total returns topped 35% (despite beginning-year predictions from many "experts" of a flat or modest year). Missing out can make a big difference in your long-run returns.

• **Being disciplined and using dollar cost averaging:** Dollar cost averaging—investing, say, $100 monthly in a specific stock fund—is a great way to build wealth and cope with market ups and downs. Your fixed-dollar investments buy more shares when prices are down and fewer at higher levels. Dollar cost averaging can help people become more disciplined because it encourages investing during market nadirs when individuals otherwise might be too fearful. A particularly good strategy is to double up on your investments when prices are depressed, if you're able to. This will help enhance your long-term performance, by further reducing your average cost per share. Retirees who are tapping their nest eggs can use dollar cost averaging in reverse. A systematic withdrawal plan established with your mutual fund company can provide regular monthly or quarterly checks to help meet your current living expenses. By taking your money out of stock funds in small increments, you don't expose yourself to the risk of withdrawing a big chunk of cash when the market happens to be depressed.

Concluding Thoughts

Keep the following points in mind when evaluating the risk/reward characteristics of your funds.

- Risk is too complex to be reduced to a single quantitative yardstick such as standard deviation, beta, duration, or Morningstar risk. Nevertheless, these measures provide important historical insight and can be useful in fine-tuning a portfolio of funds when used in combination with other information.
- Investments that are volatile by themselves such as small-company and international stock funds can make a meaningful addition to a well-diversified portfolio. By investing prudently in funds holding different groups of securities, you may enjoy a calmer portfolio overall.
- Highly stable T-bills, CDs, and money market funds carry the greatest risk of all for individuals with long-time horizons. Their low returns are not sufficient to grow your nest egg in an inflationary environment.
- Just because stocks have delivered a long-term return of about 10% does not assure you of that return even if you hold on to them for several decades. This is doubly true for the next decade or so because equities have returned far more than the 10% norm since 1981.
- Many managed stock funds will underperform the market because they're burdened by management fees and transaction costs. Avoid getting saddled with duds by weeding out your laggards.
- Jumping in and out of stocks to try to sidestep down markets may do more harm than good. You'll probably succeed in lowering your volatility, but you could also substantially reduce your long-run average return by being out of stocks at times when they unexpectedly spike upward.
- Learn all you can about mutual funds and their risks. Knowledgeable, disciplined individuals have far better odds for investment success than fickle individuals with a superficial understanding.