



---

## risk - the most difficult topic in investing.

In reference to pornography, Supreme Court Justice Potter Stewart famously commented that he could not define it, but he knew it when he saw it. Similarly, investment risk is a particularly difficult topic because market participants have a difficult time explaining it, and they employ many different definitions; some that are quantifiable and many that are more subjective in nature. Additionally, even if you are able to settle on a workable definition, it is challenging to decide how much risk is appropriate for you or your institution, and risk tolerance tends to fluctuate over time in concert with movement in the stock market. In other words, risk is an emotional topic that is subject to all of the frailties of human decision making. Finally, relationships between securities and markets change over time which somewhat limits the value of even sophisticated mathematical risk analysis. For all of these reasons, we embark on a paper on risk with some trepidation.



BY BILL SPITZ  
*Director*

---

### ATLANTA

400 Galleria Parkway, SE, Suite 1400  
Atlanta, GA 30339

*Phone: 770.226.5333*



### GREENSBORO

300 N Greene Street, Suite 2150  
Greensboro, NC 27401

*Phone: 336.217.0151*



### MEMPHIS

6075 Poplar Avenue, Suite 900  
Memphis, TN 38119

*Phone: 901.761.7979*



### NASHVILLE

3102 West End Avenue, Suite 600  
Nashville, TN 37203

*Phone: 615.386.7302*

continued on next page >

## **investment risk defined.**

While there may well be other definitions, we want to focus on four that are most commonly used, and briefly discuss their pros and cons.

First, many people think of risk as the chance of losing money. The major benefit of this definition is that, with a little knowledge of statistics, one can estimate the probability that any given investment strategy will lose money over various time horizons. Because these estimates are based on forecasts of a number of variables, they won't turn out to be exactly correct, but they do provide an indication of the relative exposure to loss of different portfolios. The problem with this construct is that it bears no relationship to an investor's goals. For example, assume that an endowment requires a 7% return to sustain its spending rate. If that fund is entirely invested in U.S. Treasury Bills, it will never lose money, so it has never taken any risk according to this definition. But, it is also highly unlikely to achieve the target return which leads to an erosion of either the nominal or real value of the fund. That sounds like risk to me.

A second and related definition is the chance of a permanent loss of capital which is defined as an unrecoverable loss as contrasted to a temporary decline in value due to market fluctuation. A permanent loss can occur for a variety of reasons including a default or bankruptcy on the part of the issuer of a security, the use of leverage, insufficient liquidity, fraud, and so on. Or, it could occur because an investor abandons an investment strategy at the bottom of a market cycle and effectively "locks in" what was likely a temporary decline in market value. Once again, this definition is incomplete because an investor might never incur a permanent loss but still fail to achieve the fund's investment objectives.

A more complete definition of risk is therefore the probability of not achieving one's goals. Typically, this type of analysis is focused on the probability that a given portfolio will achieve a target rate of return over longer time frames. Once again, we can use some basic statistics to estimate these probabilities. The problem with this measure is that it does not really focus on interim periods. For example, a portfolio may offer good odds of achieving a long term return objective, but entail so much volatility that an investor abandons it at just the wrong time.

This leads to the most commonly used measure of risk which is the volatility of return. This quantitative measure is universally accepted by academics and researchers because it is quite measurable, lends itself to detailed statistical analysis, and in some sense, incorporates all of the other definitions of risk.

continued on next page >

But, there are several problems with it as well. First, the mathematics of volatility can be somewhat off-putting. Second, most investors are comfortable with volatility on the upside and deathly afraid of it on the downside, so they have a difficult time thinking of volatility as the universal measure of risk. Third, it is very difficult to determine how much volatility is “right” for any given investor. And, as previously stated, tolerance for volatility tends to change with the level of the stock market.

## **so how do we think about risk?**

We believe that a comprehensive way to think about risk is to blend two of the four measures in a way that takes into account both short and long time horizons. As is the case with many things in investing, this analysis involves tradeoffs because increasing the odds of success in one measure typically increases the chance of a problem with the other. We can supply the necessary math, so it is your job to think conceptually about these relationships as they apply to your financial circumstances and emotional makeup.

First, we think investing is all about accomplishing one’s goals so we are attracted to the definition of risk that is based on the probability of failing to achieve a return objective. Some investors, such as pension funds, endowments, foundations, and some individuals, have very specific return objectives that make this form of analysis particularly useful. But, it is also applicable to those that have fuzzy goals such as “I want my assets to grow.” Let’s take a simple example of an endowment fund that has a target return of 7% over a long time horizon, say twenty years. Extrapolating historical volatility and return data on stocks and bonds, an 80% domestic stock /20% bond ratio implies a 34% probability of failing to achieve the goal over the twenty year period. In contrast, a 20% stock / 80% bond ratio carries with it a lofty 64% chance of failure. According to this measure, portfolios with higher equity exposure are less risky because they increase the odds of achieving the 7% return goal.

The obvious tradeoff is that the 80/20 portfolio is much more volatile than the 20/80 alternative and offers an increased probability of short term pain. More specifically, the 80% equity portfolio is 65% more volatile as measured by the standard deviation of return, the most widely used measure. What does this mean? In any given year, the equity laden portfolio carries with it more than twice the probability of a 10% decline in value as compared to its fixed income oriented cousin.

So, the tough job in investing is evaluating this tradeoff. In order to achieve target rates of return of 6-9% which are common for pension funds, endowments, and many individuals, a significant allocation to equity-like investments is required.

continued on next page >

But, such an allocation is likely to increase short term volatility and significantly raise the probability of a moderate to significant decline in value over interim periods. Perhaps the best way to think about the tradeoff is to suggest that you should opt for the most aggressive asset allocation possible given your ability to tolerate short term volatility.

## **how much volatility can you tolerate?**

Some of the factors that determine one's tolerance for volatility are financial and structural in nature whereas others are emotional. Let's deal with the more concrete determinants first.

Portfolio volatility may create operating difficulties for certain types of entities as well as some individuals. For example, most endowments base their annual spending on a three or five year moving average of the market value of their fund. Therefore, a significant decline in value, even though temporary and somewhat muted by the use of the moving average, will reduce the transfer to the operating budget which may severely impact operations. And, this is particularly difficult for institutions that derive a large component of their budget from the endowment payout. Some institutions and individuals must abide by financial ratio covenants related to their outstanding debt which run the risk of being violated as a result of a significant decline in the market value of their investment fund. Similarly, defined benefit plan sponsors may be required to increase contributions due to a decline in market value which can materially impact the company's earnings. All of these are operating considerations that should influence the level of acceptable short term volatility. There are also intangibles that may impact this important decision. For example, charities may encounter negative publicity and fundraising problems as a result of poor performance of the investment portfolio. All of these factors need to be evaluated and they have an important implication for governance. Specifically, institutions that have separate Investment and Finance Committees need to have periodic joint meetings to discuss risk because volatility may well have implications beyond the investment portfolio. Similarly, individuals and families need to think about the investment portfolio in the context of their total financial picture. In other words, it is important to think about risk holistically rather than strictly as an investment portfolio issue.

Now for the hard part! Each individual or investment committee must assess its emotional makeup with regard to handling adversity. As we have discussed, one of the most common mistakes in investing is abandoning a sensible investment strategy at just the wrong time. To make this point, charts of flows into and out of stock mutual funds show that maximum inflows occur at market tops and outflows at bottoms; and this pattern has occurred repeatedly over many years. It is very difficult to forecast how you will feel during a market downdraft and even

continued on next page >

some very “sophisticated” investment committees panicked during the 2008-09 market melt-down. And, it is important to realize that most of us become more tolerant of volatility in rising markets and the converse. So, when thinking about your ability to tolerate volatility, it is important to try to neutralize the impact of the current market climate.

Using our quantitative models, we can show you how a given portfolio is likely to behave over time and, in particular, how it might behave in a market decline. And, we can help you think through all of the factors outlined in this section. But, in the end, you will have to assess your emotional makeup and determine if you have the fortitude to ride out the tough times without abandoning your investment program. If not, we need to dial down the short term volatility of your portfolio knowing that it will likely affect its long term return.

## **the benefit of diversification.**

Our clients are probably sick of hearing us extol the benefits of diversification, but a paper on risk provides a great opportunity to put in another plug. Let’s go back to the simple example of an 80% domestic stock/ 20% bond portfolio. It was expected to earn an annual return of 8.7% based on an extrapolation of historical data, and offered a 66% probability of achieving a 7% return target over a twenty year period. However, this portfolio is likely to be only slightly less volatile than a pure stock portfolio and carries with it about a 30% chance of a decrease in value in any given year, and a 14% probability of a 10% decline. In contrast, consider the following more diversified asset allocation which is actually somewhat similar to the mix that we currently suggest for many of our tax exempt clients:

|                 | % OF PORTFOLIO |
|-----------------|----------------|
| U.S. STOCKS     | 24             |
| NON-U.S. STOCKS | 17             |
| PRIVATE EQUITY  | 12             |
| REAL ESTATE     | 9              |
| FIXED INCOME    | 29             |
| HEDGE FUNDS     | 9              |
|                 | 100%           |

continued on next page >

---

---

## IMPORTANT NOTES AND DISCLOSURES

This White Paper is being made available for educational purposes only and should not be used for any other purpose. Certain information contained herein concerning economic trends and performance is based on or derived from information provided by independent third-party sources. Diversified Trust Company, Inc. believes that the sources from which such information has been obtained are reliable; however, it cannot guarantee the accuracy of such information and has not independently verified the accuracy or completeness of such information or the assumptions on which such information is based.

Opinions expressed in these materials are current only as of the date appearing herein and are subject to change without notice. The information herein is presented for illustration and discussion purposes only and is not intended to be, nor should it be construed as, investment advice or an offer to sell, or a solicitation of an offer to buy securities of any type of description. Nothing in these materials is intended to be tax or legal advice, and clients are urged to consult with their own legal advisors in this regard.

---

---

Interestingly, this portfolio offers the same projected return as the 80% domestic stock/ 20% bond portfolio with projected volatility almost exactly equal to that of the 20% stock/ 80% bond alternative. And there is a commensurate decrease in the probability of significant losses in any given year. So, by diversifying, we maintain the same odds of long term success with a significant decrease in the probability of an unpleasant short term decline in value that might cause panic and lead to a rash and costly decision to change investment strategy. And, the addition of still other asset classes has the potential to further improve the risk: return tradeoff.

## **conclusion.**

Wealth managers like to discuss risk using lots of math and statistics that often obfuscate the real issues. We use our share of math as well, but only as tools to help clients focus on the two real questions that must be answered. First, what is their long term return objective and what type of asset allocation is required to provide a reasonable probability of achieving that goal? Second, does this portfolio structure entail short term volatility that could cause severe distress and the possibility of a destructive, emotional decision? Answering these questions requires both an objective evaluation of one's financial circumstances and a good deal of soul searching. ■