

# Manager's Report

## May 2017



### Risk for People Who Don't Like Statistics



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The genesis for this month's topic is a telephone call with a Financial Advisor in the area. Not long ago I connected with this advisor to discuss a few clients and catch up on the markets in general. The conversation started with something along the lines of: "Hey you know when I look at my clients' Baystate Wealth portfolios, there is a little more risk than one might think by looking at the surface." He was right – our portfolios do incur more risk than some might think by briefly looking at the allocation. On average, our portfolios are 10% to 15% *underweight* stocks relative to their average and to our strategic benchmarks. I find it perfectly understandable that some investors, if not most, would assume that our lower levels in equities would translate to less risk. The fact is that correctly evaluating and managing investment risk is not that simple.

This advisor picked up on this dynamic for two reasons. First, he has software that analyzes the embedded risk in a portfolio. Second, and probably more important, he has experience that allows him to correctly interpret the real risk in a portfolio. However, a Financial Advisor's situation is obviously different than the average investor. We find that most investors simply do not have the time or desire to become experts on this topic.

Because of this conversation, this month's report will focus on risk and how to assess the true risk in portfolios. I'll review three of the most common risk metrics in portfolio management and one proprietary measure used at Baystate Wealth.

## **Concentration Risk**

The first type of risk is simple and has little to do with statistics. Yet, controlling it is often easier said than done for many investors. Concentration risk refers to the inherent risk in owning a relatively large position in a single equity, one asset class, or even one industry. This risk, which may be better referred to as a “problem,” can often be frustrating for Financial Advisors. Why? Emotions, taxes and comfort. Experienced Financial Advisors have no doubt encountered clients with concentrated positions that they are hesitant to reduce because of an emotional attachment, a large embedded unrealized gain, or a sense of comfort. For example:

- An inherited stock from a family member who spent most of their working life with the company.
- Owning shares of a company in which you are currently employed.
- Shares of a company or mutual fund purchased decades ago with a very low cost basis.
- An overweight to an industry in which you are employed and have more insight.

I find it generally accepted that a concentrated position poses excess risk. Most investors understand that diversification helps reduce risk and that it is better to have more eggs in more baskets. However, it is very common for an investor to rationalize why this excessive risk taking is acceptable in their specific circumstance. The most common of these rationalizations is that their concentration is a “good company” or a “safe industry.” From a Financial Advisor’s or Portfolio Manager’s point of view – it doesn’t matter. Bad things happen to good companies and good industries. “Bad things” can range from oil spills to charges of corruption to changes in regulations.

It is important for investors to understand that when investing they are incurring two types of risk, *systematic* and *unsystematic* risk. Systematic risk is basically market risk, which is common to all traded securities. As we all know, markets can and do move higher or lower based on a variety of factors ranging from geopolitical uncertainty to a normal correction in economic growth. This risk has nothing to do with company-specific issues. For example, if a company that sells widgets disappoints the market by selling widgets that can randomly explode, the shares of that company can, and likely will, fall even though the stock market or industry, on average, might be moving higher. In this instance the unsystematic risk is owning the individual shares of a company that produces randomly exploding widgets, rather than owning the “market” or sector in its totality.

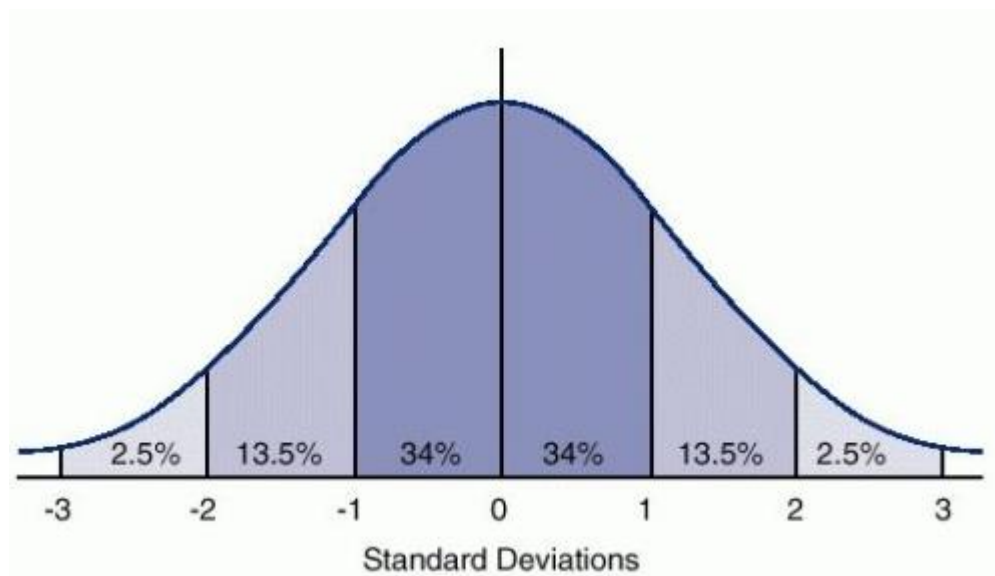
Fortunately, the cure for this risk is straightforward. Listen to your Financial Advisor and avoid maintaining overly-concentrated positions. If you currently do have a concentrated position, develop a strategy for hedging the position, reducing it over time, or both. Doing nothing and hoping for the best is not a good idea.

## **Standard Deviation**

Standard Deviation (“SD”) is a very commonly used metric for measuring the risk with either an individual investment or a portfolio of different investments. It’s a remarkably important concept in portfolio construction and, at Baystate Wealth, it is something we monitor very closely. At the same time, SD is something we find to be widely misunderstood.

SD is a statistical measure of variation, or dispersion, of a set of values. The way I explain it to investors with little interest in statistics is that standard deviation is just a measure of how much something bounces around its average over a specific timeframe (usually a year). The higher the SD, the greater the volatility and the more that investment or portfolio can oscillate in any given year.

The graph below shows the relationship between standard deviation and the distribution of data in a normal distribution. I’ll explain. In the normally distributed graph below, 68% of the time the data falls within (+/-) one SDs of the mean. Taking it a step further, the data would fall within +/- two SDs 95% of the time and +/- three SDs all the time.



Now let’s transform this into something more tangible using the S&P 500 as an example. Since the first quarter of 2011 (about 6 years ago) the S&P 500 has averaged a little over 12% and +/- one SD is about 10% on either side. This would imply that a lot of the time (68%) the S&P 500 will fall somewhere between 2% and 22% and most of the time (95%) the returns will fall between -8% and 32%.

Another way of viewing this, and setting return expectations, is that if the SD is 10%, you should just expect that, most of the time, the S&P 500 could be up or down 20% in any given 12-month period.

As I said, SD is an important measure of risk. I’ve always referred to it as a good but imperfect metric. There are a few reasons why:

1. Security returns are not normally distributed as in the perfect looking bell curve in the graph above. In fact, most asset classes, particularly equities, have a “skew” to the left side of the curve. This is often referred to as a “fat tail” which is why those of us in the industry referred to the Great Recession, almost a decade ago, as a “fat tail event.”
2. SD is only one measure of risk. It is by no means total risk. As an extreme, but accurate, example: imagine a stock with a relatively low valuation that plummets by 50% in price because of something like an exploding widget.
3. Most of the time is not all the time. Although it is statistically sound to have the expectation that most of the time a portfolio will be +/- two SDs, it must be emphasized that although theoretically rare, negative returns can fall well outside of two SDs (e.g. a “fat tail event”). For those readers who have been investing for 20 years we have all experienced two market declines of about 50% - the internet bubble as well as the credit bubble.
4. Standard deviation has standard deviation. In other words, the SD of a stock, bond, index or any other type of investment is not a constant. There are periods of time where it can be higher or lower than in other time frames. Budgeting for risk by assuming recent SDs will be like the recent past is a dangerous strategy. For example, one SD on the S&P 500 from January 1, 2010 to December 31, 2016 was 9.59. Yet, one SD on the same index from January 2003 to December 31, 2009 was 20.28. Two six-year time frames – two very different levels of volatility.

At Baystate Wealth Management we developed a way of looking at volatility that has helped us to better manage risk while also helping our clients better understand the risk in their portfolios. Although the level of SD can change of time, the relationship between the SDs of different types of investments remains relatively stable. For example, emerging market stocks are typically more volatile than stocks in developed countries, like the U.S. If overall volatility rises or falls, it is likely the case that emerging market equities will remain more volatile than their developed market counterparts by roughly the same degree.

The reason this matters is because it allows us to either target a relative volatility or create a maximum relative volatility limit; something we refer to as a “speed limit” or “risk budget.” It may sound complex at first but it’s quite intuitive at a higher level. By way of example, our portfolios that incur a moderate amount of risk have a “speed limit” of 75% of the SD of the MSCI ACWI. The ACWI is a stock index like the S&P 500 or Dow Jones Industrial Average (DJIA) but it is globally diversified. The ACWI has a SD close to the S&P 500 or DJIA which are more well-known. Nonetheless, we find most investors are aware of the volatility of an all equity index and assigning a maximum limit as to how volatile their portfolio can be relative to that basket of stocks is easy to understand.

Using the relative maximum SD, or speed limit, to express risk tolerance creates an environment where inexperienced investors, Financial Advisors, and Portfolio Managers can speak the same language without diving into the complexities of skewed

distributions, fat tails or the standard deviation of standard deviation. At Baystate Wealth, we can learn a lot about someone's risk tolerance by asking the basic question: "How volatile do you want to be compared to a stock index like the ACWI, S&P 500 or Dow Jones?"

## **Beta**

Beta is another commonly used metric to assess risk with investments. This is true for both individual securities as well as at the portfolio level. It's a good metric, but like almost anything else, it is imperfect.

Beta is basically a measure of the systematic risk relative to the market. The number comes from a mathematical technique called regression analysis. I'll explain regression using a hypothetical stock (which we will call "ABC") and the MSCI ACWI (All Country World Index) as an example. The inputs for the regression are the daily returns of ABC and MSCI ACWI, respectively. This type of analysis provides us with an alpha, a beta and an epsilon which are all important, but for this discussion we'll focus on beta.

If the beta is 1, it would imply that ABC behaves in a very similar fashion to the ACWI in terms of risk and returns. In fact, if you regress something against itself the number will be exactly 1. Numbers below 1 indicate less sensitivity while numbers above 1 indicate more sensitivity of the price of ABC relative to MSCI ACWI. Utility stocks, as an example, typically have betas of less than 1 while more volatile stocks, like tech, can reasonably be expected to have betas of greater than 1. This type of analysis can be done at the portfolio level as well by regressing the daily returns with that of whatever index or benchmark you are interested in comparing.

At face value this appears to be a simple way to measure risk for investors. It may be even more clear than standard deviation because it inherently corrects for the "relative issue" that led us to create the portfolio speed limits. That said, there are two imperfections worth considering. The first is the fact that as with standard deviation, beta is only one measure of risk – volatility. A portfolio of many stocks with a hypothetical beta of .7 is less risky than a portfolio of one stock with a beta of .7 because of the diversification benefits. Same beta but very different levels of risk. The second imperfection with beta is that it's based off regression analysis which works best when two data series are reasonably correlated. Regressing a large cap U.S. mutual fund with the S&P 500 will most likely have a strong correlation and the relevance of the beta will be strong. In other words, you can "trust" it. On the other hand, if you regress two uncorrelated data series, like ice cream sales in Wakefield, MA with light bulb sales in Poland, the beta will be much less reliable; if not worthless and downright silly.

## **Drawdown**

Drawdown, which is often referred to as downside capture, is a measure of how much an investment, or more appropriately, a portfolio will fall when the equity market falls. If an equity index like MSCI ACWI falls 20% while a portfolio falls 10%, the drawdown is 50%. I purposely saved this risk measure for last because I find it to be a high priority for many investors. In my experience, not many investors are too concerned

with their beta or standard deviation during a relatively “normal” market cycle. Many investors don’t ever care about those statistical measures. Investors care about how much their portfolio will lose if the market corrects, pulls-back, crashes, etc.

This type of risk is indeed important to Baystate Wealth Management and is at the heart of how we engineer and manage portfolios. When Baystate Wealth was within its first year we developed a ratio, the RAD™ Ratio, to help us manage this risk and bring more clarity and transparency to our investors about the true risk in their portfolios.

During a normal market environment, there are many investments that are relatively non-correlated. The classic example we use are high yield bonds and U.S. stocks. Under most circumstances, stocks and high yield bonds have some connection but are by no means moving in lock step. In times when stock markets are under stress and equities are falling, high yield bonds have historically risen and fallen in a somewhat similar manner to stocks. For this reason, we group high yield bonds in the same risk category with stocks when budgeting for risk – and specifically drawdown risk.

In short, anything that we believe could behave like a stock during a market pull-back, or “fat tail event,” is a “risk asset.” Any investment that we believe will fall substantially less, or better yet increase in value, would be a “diversification asset.” Investments like cash are referred to as “protection assets.”

The benefit of our RAD™ Ratio is that it allows investors to mathematically assign a value to their drawdown risk tolerance without getting involved in the complexities and issues associated with the most commonly referenced risk metrics discussed earlier (SD and Beta).

The fact of the matter is that all measures of risk are worth considering. There is no one perfect all-encompassing measure of risk. The list of risk metrics in this report are just a fraction of what is available to assess different risk characteristics. The purpose of this month’s report was to review some of the most commonly cited measures by the financial media, Financial Advisors and investors. The goal was not to get too far into the weeds, but to help provide enough insight so that those reading this will be able to have better discussions about their portfolios as well as a clearer understanding of the true risk in a portfolio. Risk is much more complex than the ratio of stocks to bonds in a portfolio.

As always, let us know if we can be of service.

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