KEEL POINT

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A Discussion of Risk

Talking to clients about risk is often one of the more challenging parts of our job. The investment advisory community is prone to take what is a very emotional concept and treat it with the rigid tools of a mathematician. We recognize that can leave clients wondering about the relevance of their portfolio's risk statistics. So how should you think about risk? We'll divide the discussion into two categories: standard deviation, the mathematical approach, and maximum drawdown, the emotional approach.

Standard Deviation in Context

For those of you experiencing unpleasant flashbacks to long-ago math classes, we will keep the explanation of the concept of standard deviation brief. Think of the long-term annual return for stocks, for simplicity let's say it's 10%. The standard deviation figure tells you the average difference between any one year's return and the long-run 10% average.

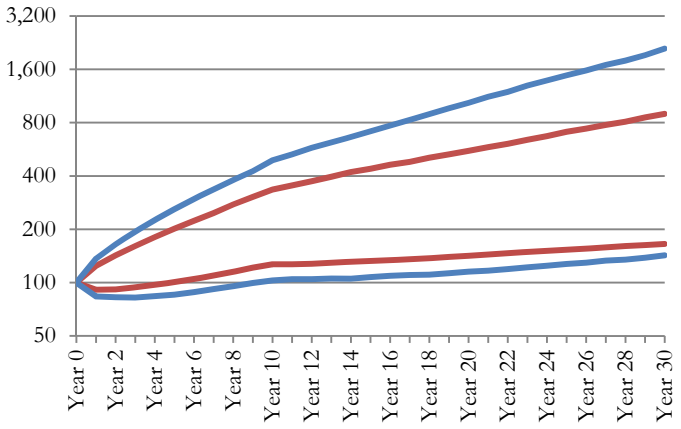
If you assume the stock market's annual returns are distributed within a bell curve (which, as we will address later, is not a perfect assumption), then you can use the return and standard deviation to figure the likelihood of any one year's return falling in certain ranges. Within a range starting one standard deviation less than the average and extending to one deviation greater you should observe two-thirds of one year results. So if in our example the standard deviation of annual stock returns is 16%, two-thirds of years should fall between (6%) and +26%. Further, 95% of years should fall within a band spanning two standard deviations in each direction. So 19 of 20 years should fit within the (22%) to +42% range.

With the appropriate context for standard deviation, we can move on to applications. A (22%) year would be a major disappointment for all portfolios, but the level of disappointment would be specific to a client's risk preferences, goals, and time horizon. Is the chance of a (22%) or worse return next year an appropriate risk to take given your goals? We will work through a way to think about this in the following paragraphs, but must first point out that every client's mission, vision, values, and goals are different and the following is intended only as an example.

Let's say you are presented a choice between two portfolios: A is expected to generate 10% per year with a standard deviation of 16% while B will likely return a bit less, 8%, with a standard deviation of just 10%. You are 55 years old and will start drawing 4% of the portfolio's value to fund your living expenses at retirement in 10 years. This analysis takes that 4% draw out 20 years to age 85. Can you choose the 10% portfolio without jeopardizing your financial plan?

Figure 1 is derived from 10,000 simulations of portfolio A and B's experience over the 30 year study period. The blue lines correspond to portfolio A; red corresponds to portfolio B. The top line for each portfolio represents the 95% path. This is the outcome that is better than 95% of the simulations at the end of each year. The bottom line for each is the 5% path, or the outcome that is superior to only one out of every twenty simulations.

Figure 1: Simulating Asset Growth
Blue = Portfolio A (10% return/16% std dev)
Red = Portfolio B (8% return/10% std dev)
4% spending rule after year 10
Lines represent 95th & 5th percentile paths
Source: KP calculations (10,000 simulations)



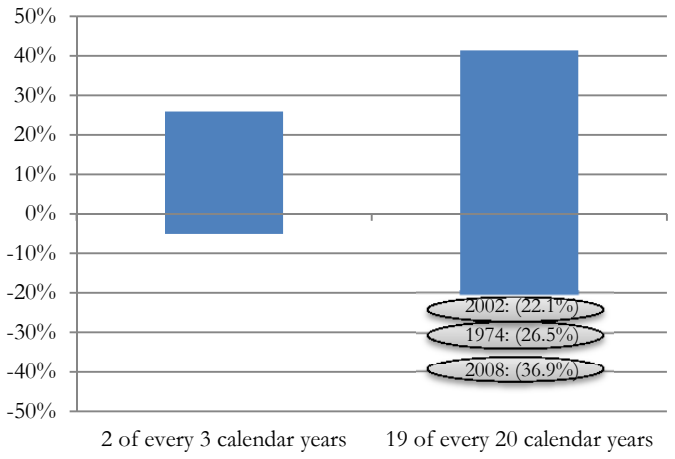
As expected, the higher return opportunity presented by A can drive your portfolio significantly higher over the 30 year period. B also shows promise on the upside and potentially better protection in the 5% path scenario. Hopefully a visualization such as this helps put the risk/return tradeoff in context. Also, note that this analysis is plotting nominal dollars; the purchasing power of each $100 would only be $55 in 2044 if inflation ran at 2% per year. Both 5% path portfolios actually lose purchasing power.

Hypothetical A and hypothetical B are comparable not only to each other, but also relative to your personal goals. We can extend the analysis further if we bring in the concept of shortfall risk. Arthur Roy proposed a simple rule of thumb for determining the most appropriate portfolio. He thought investors should attempt to maximize the safety first ratio (SFR), or the difference between the expected return and their minimum acceptable return divided by the expected standard deviation.

Let's say your minimum acceptable return is 4%. Any inferior result would put your financial plan in jeopardy. SFR(A) would equal 0.375 [(10-4)/16] while SFR(B) would equal 0.4. The probability of a return falling below 4% is lower for portfolio B (because B's SFR is greater) so an investor might choose it over A if "safety-first" was the primary consideration. For any return that must be higher than 4.67% portfolio A maximizes the chances of clearing the hurdle.

We want to stress that these applications of standard deviation are just a component of making a risk decision. They should not be relied on by themselves because of the flawed assumption that returns are normally distributed. To see the difficulty posed by that assumption see Figure 2 below, borrowed from our new Investment Process presentation.

Figure 2: Not so Normal Distributions
Range of Returns Implied by S&P 500 Historical Results
Data from January 1970 - December 2013
Source: PerTrac



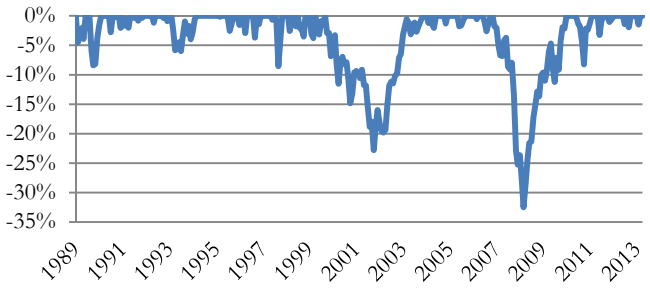
There is a substantial difference between the theory and the reality of return distribution. The band on the left gives the expected range of two thirds of S&P 500 calendar year returns based on the observed return and standard deviation over the period from 1970 to 2013. The band on the right gives the same for the 95% confidence interval. Solo, the range of returns looks comfortable, but when you consider the three annotated disastrous years below the 95% band, that comfort morphs to high anxiety.

The Emotional Side – Drawdown Analysis

This shortcoming of standard deviation applications leads us to consider drawdown when analyzing risk. A drawdown is defined as the percentage loss from a market or portfolio peak to the subsequent trough. Drawdowns can range in length from one month to multiple years to TBD in the case of a dollar invested in the Nasdaq in 2000 or the Nikkei 225 (Japan) in 1989. It is helpful to have a sense of how often and to what depths a portfolio has drawn down in the past.

Figure 3 shows the drawdowns of a portfolio made up of 60% stocks, as measured by the S&P 500, and 40% bonds, as measured by the Barclays Aggregate Bond Index. Downward sloping lines represent the portfolio loss measured from its preceding peak. Upward sloping lines measure the retracement of the loss until the prior peak is recaptured. Consider each of these troughs as a test of your fortitude. If you had invested in such a portfolio, would the 30%+ loss from the market peak in 2007 have forced you to question your investment strategy? Drawdown analysis is the emotionally-charged side of risk analysis. We want to make sure the portfolio you are invested in is unlikely to create the emotional distress that would tempt you to make a change near a market bottom.

Figure 3: Picturing Drawdowns
Portfolio comprised of S&P 500 (60%) & Barclays Agg Bond (40%), rebalanced monthly
Source: Bloomberg



Abandoning discipline near the bottom of a drawdown is how bad results are crystallized. After a capitulation risk takes on its most tangible definition – lost money. The fancy investment world term for this is the permanent impairment of capital. The conditions that lead to the permanent impairment of capital are described by James Montier of GMO: "(i) valuation risk (buying an overvalued asset); (ii) fundamental risk (real business risk); and (iii) financing risk (including leverage, overcrowding, etc.)". These are conditions we constantly monitor across asset classes. We believe that, together with a clear understanding of your risk preferences, our permanent impairment of capital radar can add tremendous value to your investing experience. □