

Managing Downside Risk, a.k.a. Post Modern Portfolio Theory May 31, 2006

Asset-allocation in the context of Modern Portfolio Theory (MPT) may be the most misapplied concept used by financial advisors with clients. Asset allocation is a concept based on an idea called Modern Portfolio Theory, introduced by Harry Markowitz with his paper "Portfolio Selection" in the 1952 Journal of Finance. The basic idea is that, above a certain level, an investor has to take additional risk in order to get a higher return. According to MPT it is not possible to get a relatively high return without taking higher risk (this is unfeasible) and that a lower return with higher risk just doesn't make sense (is inefficient).



Risk is measured by standard deviation, or the amount of volatility that occurs around a mean return. In this measure of risk there is no distinction between good volatility (positive returns) and bad volatility (negative returns). In order to determine your mix of stocks and bonds, you determine where you live on the efficient investment frontier by mapping your indifference curve to it. This is commonly done by completing an asset allocation questionnaire.

The basic concept makes sense, that it is not possible to get a higher return without taking more risk. It is based on history. The variables that impact its effectiveness are basically how much risk each investment has had, what the correlation of returns between them have been, and what returns they received. It is almost a guarantee that the future risk, returns, and correlations will differ. In addition, there are some investments with long track records that tend to defy the theory. A small handful of managers have historically consistently performed in the "unfeasible" area.

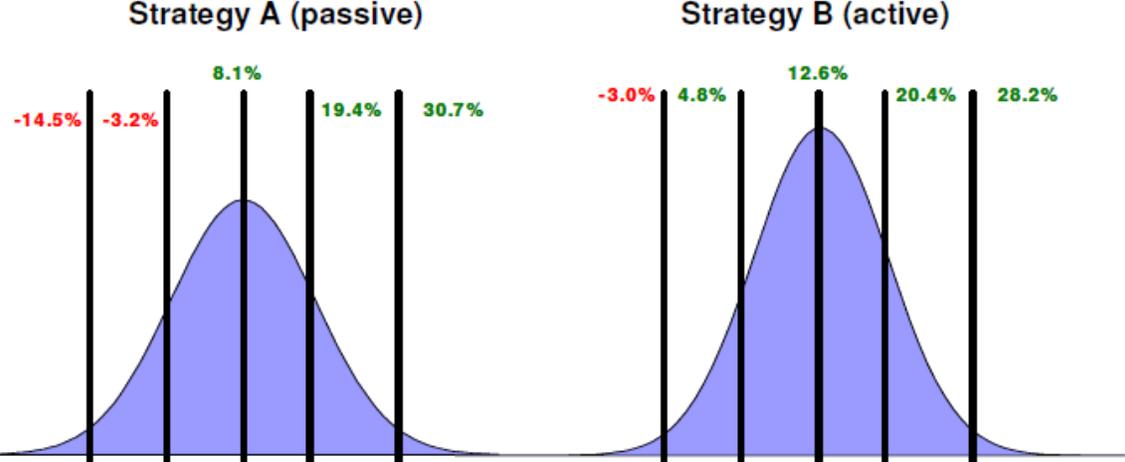
Moreover, relying on an investor's wishes, or "risk tolerance" may result in certain failure. For instance, if an investor needs a return of 7% p.a. to achieve his goals,

but the answers to his risk tolerance questionnaire lead to an expected return of 5%, then it is clear that a strategy following the risk tolerance questionnaire will result in certain failure. Finally, research in Behavioral Finance has proven the infallibility of human beings in making decisions thanks to research by Nobel Prize winning economist Daniel Kahnemann. Mr. Kahnemann illustrated through scientific observation over a 30 year period that human beings do not act in a rational fashion when making financial decisions. That instead, they suffer from a number of failures in financial decision making that make them unable to stick to their initial investment strategy.

A more up to date theory of measuring risk has been called Post-Modern Portfolio Theory (PMPT). In PMPT, risk is defined as downside volatility based on the work of Frank Sortino and Hal Forsey. More specifically, it is downside volatility compared to a stated goal. For example, if an investor needs \$60,000 to cover his first year retirement income shortfall (after taxes), and has \$1,000,000 in investment assets, then he would need to make 6% p.a. To keep this simple, we can inflate his future retirement income expenses by an expected inflation rate. Using 3%, the Real Minimum Acceptable Return target is 9%.

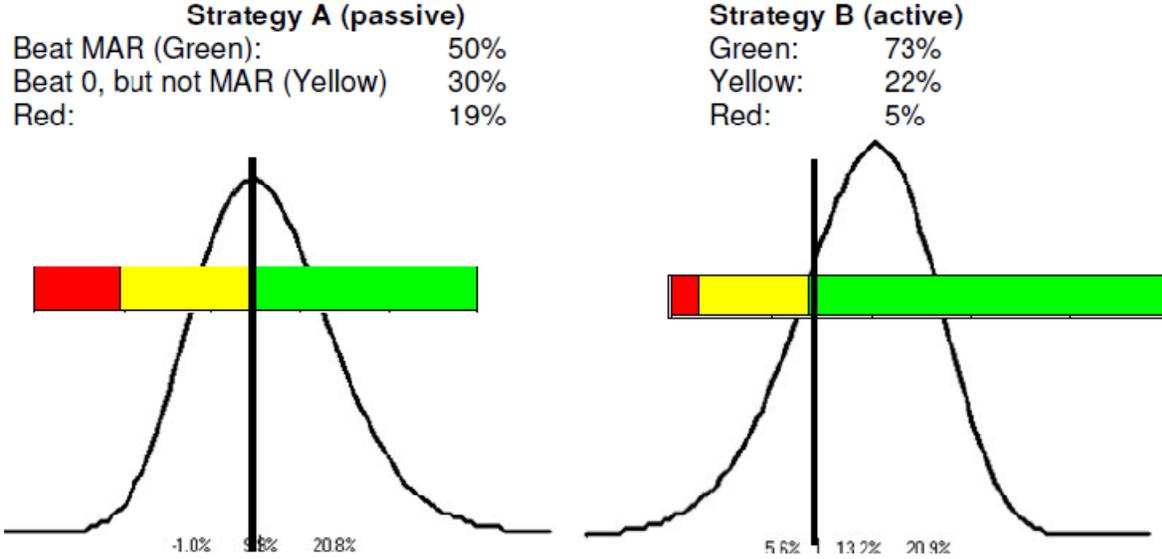
PMPT is a more meaningful way of looking at what matters to the client. While it too relies on historical information regarding risks, returns, and correlations, if we can construct a portfolio using investment managers whose first priority is to manage downside risk, and the managers work effectively toward this goal, then downside risk should be reduced. While this may cause the portfolio to fare poorly vis a vis a market index during periods of excellent market index performance, if we can quantify the probability of attaining a stated goal, then we may reduce uncertainty.

To illustrate, let's look at this in a quantitative fashion and compare two strategies. Strategy A is a blend of 60% the S&P 500 index and 40% the Lehman Brothers bond aggregate. Strategy B is a similar blend, but with 60% invested with a manager seeking to avoid downside risk while investing primarily in equities and 40% invested with a manager seeking to avoid downside risk while investing primarily in fixed income. Using Modern Portfolio Theory with its risk defined as Standard Deviation and assuming returns are distributed normally, Strategy B appears to be better, but also less risky. At 95% confidence on the downside (2 standard deviations), Strategy A loses 14.5%, while strategy B loses 3%.



It is when we illustrate this using Post Modern Portfolio Theory, with risk measured as Downside Deviation that the results become even more striking. First, instead of looking at the mean return, we set a Minimum Acceptable Return target of our goal, which is 9%. Then we test the portfolios by using actual returns experienced by both strategies over the past 15 years and measure it against the investor's MAR of 9%. We use a tool to illustrate this called the Forsey-Sortino model. It illustrates both upside potential and downside risk simulating 2500 random years of returns by "bootstrapping" the data, i.e. running simulations of what could have happened if the monthly returns had occurred in a different sequence over 2500 years.

The area in green shows the potential of exceeding the MAR. The area in yellow shows the potential the investment beats zero but does not meet the MAR and the area in red shows the potential for losing money.



It is not the intention of this illustration to show a higher return, but to show that a lower risk level is possible given the goal of minimizing downside risk. This is especially important given what we know about human behavior and the tendency for human beings to abandon their strategy when faced with a loss. Past performance is never an indication of future results. Each client needs to set his investment policy together with his financial advisor. Please contact us if you would like to learn more about how to use downside risk and Post Modern Portfolio Theory to put together a strategy for your personal retirement assets, endowment, pension, trust, or other investment assets.

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