

At the in-efficiency frontier

This second Active Asset Allocation « Risk Letter » looks at the delicate question of the choice of hypotheses, using the example of the efficient frontier. It touches upon the influence of an incorrect choice on asset allocation decisions and their consequences.

What do pension funds and institutional investors all have in common? They all start the investment process by defining their strategic asset allocation. As the asset allocation will be responsible for 90% of the investment results, useless to say that this is the most important investment decision.

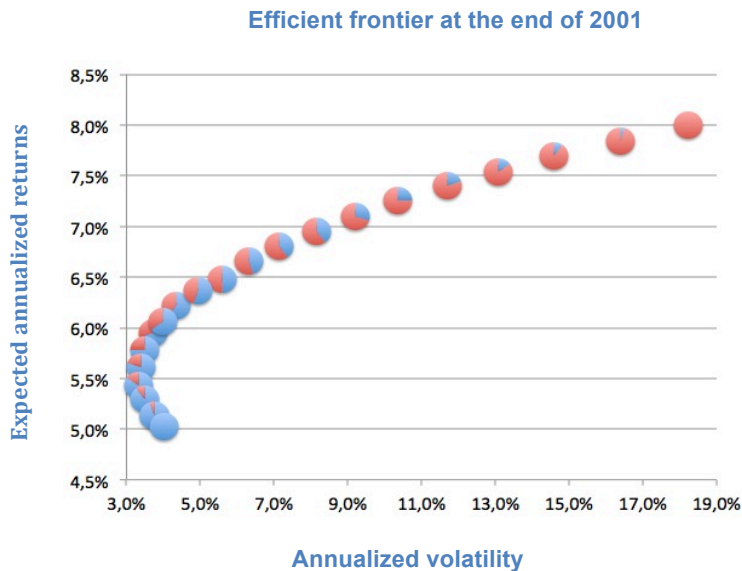
Nothing-new here. It has always worked like that. Moreover, the way strategic asset allocation is determined has not changed much since Harry Markowitz in 1952.

Still, the results achieved during these last ten years by some institutional investors, in particular pension funds suggest that something is wrong with the methodology. Actually, there are several issues with the approach used to define the strategic asset allocation. We focus here on only one of them: the fact that the allocation results rely entirely on risk, return and correlation hypotheses. This is equivalent to making a very risky bet on the future since the optimal allocation resulting from this type of approach is extremely sensitive to hypotheses.

To illustrate this, let's take the example of an investor that has decided to invest in 2 asset classes: equities and bonds. Let's use "standard" hypotheses from 10 years ago. They are summarized in the table below:

Period Dec. 2001 – Dec. 2011	Return Hypotheses	Volatility hypotheses
Equities	8%	18%
Bonds	5,5%	5%
Equity-Bond correlation	0,25	

The following graph represents the risk/return frontier of portfolios going from 100% bonds to 100% equities with a 10% step (blue for bonds' allocation, red for equities' allocation).



This graph shows that an investor who wanted to achieve an average return of 7% would have chosen 10 years ago, on the basis of the previous hypotheses, the following allocation: 60% equities and 40% bonds.

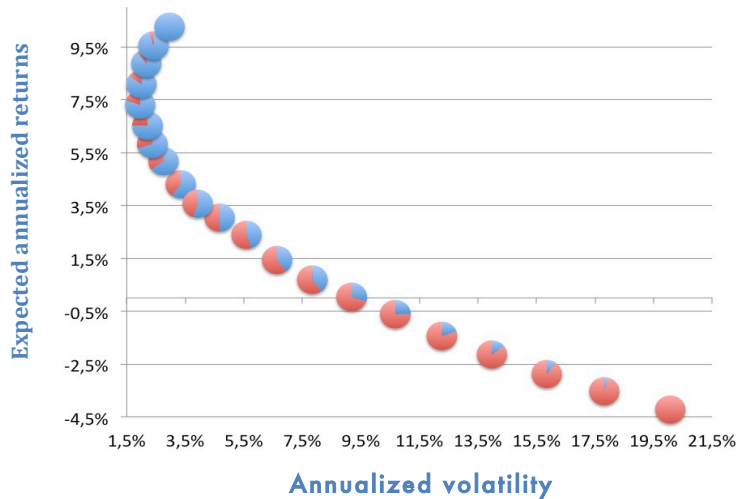
Let's now position ourselves 10 years later, at the end of 2011. The returns, volatilities and correlations among the chosen asset classes have proved to be the following:

Period Dec. 2001 – Dec. 2011	Return hypotheses	Volatility hypotheses
Equities	-4,4%	20%
Bonds	10,3%	3%
Equity-Bond correlation	-0,56	



This graph is the efficient frontier we would have drawn with hindsight:

Efficient frontier calculated with the risk and returns observed between 2001-2011



It is striking how different the results look! The hindsight efficient frontier is totally reversed with respect to the one based on forecasts. Had the investor used the “right” hypotheses, he would have chosen a 20% equities and 80% bonds allocation in order to obtain a 7% return (compared to 60% equities and 40% bonds allocation that only yield 1.5%, far away from the expected 7%).

One could argue that no one can accurately forecast the future returns of the different asset classes, not even financial theory. That is true; return forecasts are too difficult to get right on a consistent basis! And this means that for as long as we’ll keep basing our asset allocation decisions on return assumptions, future pension returns will be left in the hands of luck.

In the light of what the past 10 years taught us, what are the institutions and their consultants doing? They have revised their return hypotheses downwards. But the methodology has remained the same.

What is the alternative? It is simple and it is for everyone. Instead of trying to forecast returns, one should focus on managing risk. Once risk has been

properly defined (with regards to what it means for the institution), it is easy to define an allocation that respects the risk constraints at a certain point in time. This allocation will need to be adjusted overtime to take into account the fact that the world is changing, the risk perception varies and that the market moves constantly.

Adina Grigoriu, CEO
Member of the French Institute of Actuaries