What is the Efficient Frontier Theory?

- SMITHA HARI

Executive Summary: The Efficient Frontier Theory was explained by Harry Markowitz and others in 1952 as a part of the Modern Portfolio Theory. According to the concept of the Efficient Frontier, there is a set of optimal portfolios which give the highest expected return for a given level of volatility and the lowest volatility for a given level of expected return. The choice of investments in the portfolio should be made in such a way that return is maximized and risk is minimized. Investors can choose a suitable portfolio along the Efficient Frontier to achieve this objective, depending on their individual preferences and capability.

Asset allocation is a critical factor in determining the performance of your portfolio. In our previous research based article on the ‘Asset Allocation Theory by Roger Ibbotson and Paul Kaplan’, we had mentioned that asset allocation helps in guiding the investment strategy of balancing risks and returns. But choosing the right asset allocation pattern is not an easy task.

This was explained by the Efficient Frontier theory which is a concept in the Modern Portfolio Theory (MPT) introduced by Harry Markowitz and few others in 1952. This blog attempts to simplify the concept of the Efficient Frontier Theory.

The essence of the MPT revolves around selection of assets in an investment portfolio. It says that it is important not to select the assets individually; but each asset’s price change should be considered relative to the price change of every other asset in the portfolio. Thus the correlation between the investments is emphasised in the MPT. The theory assumes that given two portfolios with the same returns, investors will choose the portfolio with the least risk as investors aim to minimize risk. Both the MPT and the Efficient Frontier involve mathematical arguments in favour of diversification.

The Efficient Frontier concept refers to a set of optimal portfolios which give the highest possible return for a given level of risk or the lowest possible risk for a given level of return. Markowitz explains the Efficient Frontier theory by using the terms ‘risk’ and ‘volatility’ interchangeably.

If you look at the adjoining figure, you can see that the Efficient Frontier is represented by a curved line, indicating different possible portfolios for a risk - return combination. At the top end, the line flattens because there is a limit to the returns any portfolio can deliver.
All portfolios which lie along the Efficient Frontier are optimal portfolios and demonstrate the best performance for the least risk. So what is an optimal portfolio? There are two parts to this: (1) For a given level of volatility, the portfolio which gives the highest expected return and (2) For a given expected return, the portfolio which has the lowest volatility. That is, for the same level of risk, the return of a portfolio on the Efficient Frontier is higher than the return of a portfolio which is away from the Efficient Frontier. Similarly, for the same level of expected return, the risk of a portfolio on the Efficient Frontier is lower than the risk of a portfolio which is away from the Efficient Frontier. Logically, the portfolios which lie to the right of the Efficient Frontier or below it are sub-optimal in nature, as they have a higher risk or a lower return respectively for a given level of return or risk.

The nature of the Efficient Frontier line shows that optimal portfolios have a higher degree of diversification compared to the sub optimal ones. As the line is a curved one, it starts with the lowest risk - return combination and moves higher to a greater risk - return combination. An investor can choose a suitable portfolio anywhere on the Efficient Frontier depending on his individual preferences and investment timeframe.

The concept of Efficient Frontier is explained in a simplified manner in this video by Investopedia.

Smitha writes on personal finance at www.gettingyourich.com. She can be reached at smitha@gettingyourich.com