

# Portfolio optimization

Finance



Affiliation: Portfolio Optimization Asset Allocation A variation of different assets will provide the investor with a variability of return in the investor's portfolio and reduce the risk. In order to achieve portfolio optimization the investor has to allocate the portfolio in different asset classes. The most beneficial way to allocate the assets is to let a global touch permeate the portfolio. Look at different national markets in order to find independency, hence reduce the risk (Litterman, 2003).

In order to attain optimization at a national level it is of great importance to look at different type of sectors and industries, this is supported by Litterman (2003). ). The investor treats the national market as a global market with all its different industrial sectors where each sector symbolizes a national market. The diverse industrial sectors are to some extent uncorrelated and will provide a positive excess return and consequently should be added to the portfolio.

Independency and diversification is of significance to attain optimization, and allocating assets in different type of industries is what the investor practically does to achieve optimization.

Search for the window of opportunity with mathematical tools, the statistical result gives the investor an indication of the suitability of the opportunity in the perspective of the investor's aversion to risk. When allocating the portfolio from a global point of view, it is important to be aware of that the transaction costs probably will rise to a great extent (Litterman, 2003).

Efficient frontier

The efficient frontier solves the question of how to identify the best level of diversification. The concept of an efficient frontier can be applied in a number of ways. In essence, an efficient frontier is a curve on a graph  
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representing the relationship between return and risk for a set of portfolios.

For a portfolio to be on the efficient frontier, the portfolio must maximize return for a given level of risk (Litterman, 2003).

It is simple concepts that risk and return are linked together and that there is a relationship between them, and thus there could be a way to determine the degree of risk that would be required for various levels of return.

According to Litterman (2003). it is hard to generate high returns without exposing yourself to some kind of risk.

Litterman (2003). devised what he called the efficient frontier, a trade-off graph with the expected return on one axis and risk on the other axis. It is a curve representing all portfolios that maximize the expected return for a given level of risk. The efficient frontier is simply a line drawn from the bottom left to the top right where each point on that line represents an intersection between potential reward and its corresponding level of risk. The most efficient portfolio is the one that gives the highest return for a given level of portfolio risk.

Minimum Variance Portfolios/ Minimum Risk

Mean-variance dominance allows us to partially rank portfolios. The minimum mean variance in a portfolio helps us greatly reduce the number of portfolios that we need to consider in an investment decision by identifying those portfolios in the opportunity set of portfolios that no risk-averse mean-variance utility maximizer will choose to hold.

Optimal risky portfolio/ Maximum Return

The more risk averse an investor is, the lower will the optimal portfolio be on the efficient frontier. According to Litterman (2003). all investors will choose a portfolio that is the optimal risky portfolio.

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Which portfolio that is chosen as the optimal, depends on the investors decision rule<sup>4</sup> However, Litterman (2003). disregards the need to have all results evaluated by the individual investor with these indifference curves. The only portfolio that is optimal according to Litterman (2003). is the one that is tangent between the CAL and the Efficient Frontier.

#### Resources

Litterman, B. (2003). The Quantitative Resource Group, Modern investment management. John Wiley & Sons, Hoboken, New Jersey.