Zero-Beta Portfolio

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What Is a Zero-Beta Portfolio?

A zero-beta portfolio is a portfolio constructed to have zero systematic risk or, in other words, a beta of zero. A zero-beta portfolio would have the same expected return as the risk-free rate. Such a portfolio would have zero correlation with market movements, given that its expected return equals the risk-free rate or a relatively low rate of return compared to higher-beta portfolios.

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Understanding Zero-Beta Portfolio

A zero-beta portfolio is quite unlikely to attract investor interest in bull markets since such a portfolio has no market exposure and would, therefore, underperform a diversified market portfolio. It may attract some interest during a bear market, but investors are likely to question whether merely investing in risk-free, short-term treasuries is a better and cheaper alternative to a zero-cost portfolio.

Beta and Formula

Beta measures a stock's (or other security's) sensitivity to a price movement of a specifically referenced market index. This statistic measures if the investment is more or less volatile compared to the market index it is being measured against. A beta of more than one indicates that the investment is more volatile than the market, while a beta less than one indicates the investment is less volatile than the market. Negative betas are possible and indicate that the investment moves in an opposite direction than the particular market measure.

emerging market debt index.

The formula for beta is:

Beta = Covariance of Market Return with Stock Return / Variance of Market Return

A Simple Zero-Beta Example

As a simple example of a zero-beta portfolio, consider the following. A portfolio manager wants to construct a zero-beta portfolio versus the S&P 500 index. The manager has $5 million to invest and is considering the following investment choices:

Stock 1: has a beta of 0.95

Stock 2: has a beta of 0.55

Bond 1: has a beta of 0.2

Bond 2: has a beta of -0.5

Commodity 1: has a beta of -0.8

If the investment manager allocated capital in the following way, he would create a portfolio with a beta of approximately zero:

Stock 1: $700,000 (14% of the portfolio; a weighted-beta of 0.133)

Stock 2: $1,400,000 (28% of the portfolio; a weighted-beta of 0.182)

Bond 1: $400,000 (8% of the portfolio; a weighted-beta of 0.016)

Bond 2: $1million (20% of the portfolio; a weighted-beta of -0.1)

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Market Portfolio

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