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Asset Allocation in a Downside-Risk Framework

W.V. Harlow

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by W. V. Harlow

Asset Allocation in a Downside-Risk Framework

A downside-risk approach to investment decisions uses intuitive measures of risk that focus on return dispersions below a specified target or benchmark return. Downside-risk measures are attractive not only because they are consistent with investors' perception of risk, but also because the theoretical assumptions required to justify their use are very simple. Equally important, a number of well known risk measures, including the traditional variance (standard deviation) measure, are special cases of the downside-risk approach. Asset allocation in a downside-risk framework therefore determines an investment opportunity set for downside-averse investors that is at least as efficient as that derived using conventional techniques.

A set of international asset allocation examples demonstrates the benefits of the downside-risk framework. Specifically, optimizations based on downside measures produce portfolio strategies with realized returns that have less downside risk exposure than those determined using variance. Thus investors averse to below-target return dispersions achieve a more attractive risk-return tradeoff within this framework. Moreover, in the asset allocation examples considered, the downside-risk approach produces a significantly higher average bond allocation relative to stocks. This difference in asset composition increases downside protection while offering the same or a greater level of expected return.

CENTRAL TO MODERN portfolio theory is the premise that investment decisions are made to achieve an optimal risk/return tradeoff from the available opportunities. In order to meet this objective, the portfolio manager must first evaluate capital market information and quantify *ex ante* measures of both risk and expected return for the appropriate set of assets. The next task is to isolate those combinations of assets that are the most "efficient," in the sense of providing the lowest level of risk for a desired level of expected return, and then to select one combination that is consistent with the risk tolerance of the investor.

While the principle of identifying portfolios with the required risk and return characteristics is certainly clear, the appropriate definition of risk is more ambiguous. One manager might view risk as the probability of shortfall below some benchmark level of return, for example, while another may be more sensitive to the overall magnitude of a loss, should one occur. These seemingly disparate notions of risk, as well as other possible definitions, serve as a reminder that simple return variance (or standard deviation)—the traditional measure of risk—is sometimes deficient for dealing with the rich set of portfolio objectives and constraints that investment managers often formulate.

This article discusses and demonstrates a general approach to asset allocation based on definitions of risk that are attractive alternatives to variance.[1] These alternatives all capture the appealing notion of "downside risk" and provide a more robust approach to portfolio optimization. Using an **asymmetric measure of risk** that focuses on the returns below a specified target or benchmark return level, this framework includes as special cases such well known measures as the probability of loss, expected loss

1. Footnotes appear at end of article.

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