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Differential Information and Performance Measurement Using a Security Market Line

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ABSTRACT

An uninformed observer using the tools of mean variance and security market line analysis to measure the performance of a portfolio manager who has superior information is unlikely to be able to make any reliable inferences. While some positive results of a very limited nature are possible, e.g., when there is a riskless asset or when information is restricted to be "security specific," in general anything is possible. In particular, a manager with superior information can appear to the observer to be below or above the security market line and inside or outside of the mean-variance efficient frontier, and any combination of these is possible.

MEAN-VARIANCE THEORY PREDICTS that if we plot expected returns against beta coefficients, all securities plot on a single line, known as the security market line (SML). Since β_i, the beta coefficient for security i, is interpreted as a measure of the riskiness of security i, the market line is a graphical representation of the linear relationship between risk and return. What are we to make of deviations from the SML, i.e., of securities or managed portfolios that do not plot on such a line? If we can retain our intuitive interpretation of β_i as the riskiness of asset i and the market line as the appropriate expected return needed to "reward" agents taking on various degrees of risk, then vertical deviations from the market line represent abnormal returns that differ from what is merited. This paper and the companion piece, Dybvig and Ross [10], explore in detail the validity of this intuition and the question of what SML deviations really measure. The companion piece analyzes SML deviations caused by the choice of an inefficient market or reference portfolio. In this paper, we analyze SML deviations caused by superior performance based on superior information.

The intuitive explanation of deviations from the SML has motivated many calls for using this analysis to measure the performance of portfolio managers.[1] The most important recent critique of these arguments was mounted by Roll [20, 22, and especially 21] in his series of papers criticizing existing applications and tests of the CAPM. Roll pointed out that the intuitive argument is not theoretically correct: the interpretation of β_i as a measure of riskiness is based on the validity of mean-variance theory. However, if mean-variance theory were valid,

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[1] See, e.g., Jensen [16, 17], Friend and Blume [13], or Sharpe [26].