

Chapter 19

Performance Evaluation

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1. Introduction

Trillions of dollars are invested in stocks worldwide by institutional portfolio managers. From a social perspective it is important to know whether these investors as a group add value to the portfolios they manage or whether they merely generate wasteful transaction costs through their active management. At the micro level it is important to know how to select a portfolio manager with the ability to add value to the portfolio he manages. Performance evaluation is a topic in financial economics that seeks to address both of these issues. In particular, it studies whether superior returns can be generated by active managers who are better able to collect and interpret information that helps forecast securities returns.¹

To evaluate whether a manager has generated superior returns we need to adjust his portfolio return for risk. Since the mean returns of securities are positively related to their risk, performance measures are based on techniques that adjust for priced risk. Some performance measures use the diversification of a portfolio as an additional criterion for evaluation. This requires an adjustment for both priced risk and unpriced risk, typified by the performance measure known as Sharpe's ratio [Sharpe, 1966]. Sharpe's ratio is the excess return of the portfolio (above the risk-free return) divided by the standard deviation of the return of the portfolio.

Adjusting for performance based on the total risk of a portfolio rather than the priced risk of a portfolio is no longer popular and we think inappropriate. This is

¹ Many investors assert that they make money by 'arbitraging' mispriced derivatives. For example, they may buy a European call option that is underpriced relative to the Black-Scholes model and short the underlying stock in appropriate amounts so as to achieve a riskless return that exceeds the current riskless rate available in the fixed income markets. This type of performance is based on model failure, rather than asymmetric information. Indeed, in the effectively complete markets world of derivatives pricing, no asymmetric information about the mean returns of securities is permitted. Since there is no available performance methodology that addresses the issue of performance based on model failure, we do not discuss the issue here.

because the managers whose performance is typically evaluated rarely manage the entire savings of an investor. Investors in mutual funds, for example, typically hold a number of funds and may personally manage a large portion of their wealth. They may also hold a substantial fraction of their wealth in the home they own or the human capital they possess. Even if we argue that for some individuals, most of their wealth is held in their pension fund, most pension funds farm out the management of their assets to a number of different firms. It therefore seems more important to focus on the marginal contributions of a managed portfolio to the risk and expected return of an investor. This necessarily involves adjusting for risk with a marginal risk measure, like beta.

There are two basic classes of performance measures analyzed in this chapter. An intuitive way to think about both classes of performance measures is that they compare the returns of the actively managed portfolio that is being evaluated with a passive (i.e. buy and hold) portfolio with the same level of risk. The first class requires the observation of the returns of the evaluated portfolio as well as the returns of a benchmark that consists of one or more portfolios along with a risk-free asset. The second class utilizes information about the composition of the evaluated portfolio but does not necessarily require a benchmark portfolio(s). In most cases the first class of measures assumes that stock returns are normally distributed. This assumption is not needed for the second class of measures. However, both classes of measures require that stock returns be drawn from a stationary distribution.

The stationarity requirement is considered by some to be a serious weakness of the performance evaluation literature. Given the recent literature on the nonstationarity of expected stock returns, as found, for example, in Ferson [1995, chapter 5 in this volume] and Hawawini & Keim [1995, chapter 17 in this volume], this concern seems particularly valid. However, this assumption is needed because it is generally impossible for an observer to empirically distinguish between the performance of informed investors and the 'performance' of uninformed investors who optimally respond to changes in the parameters of the return generating process. Indeed, a fair 'philosophical' distinction between an economy with informed investors and an economy with changing parameters is one of magnitude. In the former, only a few investors observe the nonstationarities, whereas in the latter, virtually all investors observe the nonstationarities (and only the evaluator is naive). A more sophisticated evaluation technique that models the nonstationarities known to uninformed market participants can in principle avoid this problem, but modelling what is known by 'the market' is speculative at best.

2. Measures based solely on returns

2.1. *Treynor's ratio, Jensen's alpha, and the Treynor-Black appraisal ratio*

A number of measures of performance are based on the capital asset pricing model, a theory relating expected return to a measure of risk known as 'beta'.