Chapter 24 - Portfolio Performance Evaluation

Richard Herron

D'Amore-McKim School of Business, Northeastern University

Summary from BKM (2023)

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1. The simplest performance measure compares average return to that on a benchmark such as an appropriate market index or even the median return of funds in a comparison universe. Alternative measures of the average return include the arithmetic and geometric average and time-weighted versus dollar-weighted returns.
2. The appropriate performance measure depends on the role of the portfolio to be evaluated. Appropriate performance measures are as follows:
   a. Sharpe: When the portfolio represents the entire investment fund.
   b. Information ratio: When the portfolio is an active portfolio to be optimally mixed with the passive portfolio.
   c. Treynor: When the portfolio is one subportfolio of many.
   d. Jensen (alpha): All of these measures require a positive alpha for the portfolio to be considered attractive.
3. Many observations and long sample periods are required to eliminate the effect of the "luck of the draw" from the evaluation process because portfolio returns commonly are very noisy.
4. Style analysis uses a multiple regression model where the factors are category (style) portfolios such as bills, bonds, and stocks. The coefficients on the style portfolios indicate a passive strategy that would match the risk exposures of the managed portfolio. The return difference between the managed portfolio and the matching portfolio measures performance relative to similar-style funds.
5. Shifting mean and risk of actively managed portfolios makes it difficult to assess performance. An important example of this problem arises when portfolio managers attempt to time the market, resulting in ever-changing portfolio betas.
6. One way to measure timing and selection success simultaneously is to estimate an expanded security characteristic line, for which the slope (beta) coefficient is allowed to increase as the market return increases. Another way to evaluate timers is based on the implicit call option embedded in their performance.
7. Common attribution procedures decompose portfolio performance to asset allocation, sector selection, and security selection decisions. Performance is assessed by calculating departures of portfolio composition from a benchmark or neutral portfolio.

Key equations from BKM (2023)

Geometric time-weighted return: $1 + r_G = [(1 + r_1)(1 + r_2) \cdots (1 + r_n)]^{1/n}$

Sharpe ratio: $S_P = \dfrac{r_P - r_f}{\sigma_P}$

M^2 of portfolio P given its Sharpe ratio: $M^2 = \sigma_M(S_P - S_M)$

Treynor measure: $T_P = \dfrac{r_P - r_f}{\beta_P}$

Jensen's alpha: $\alpha_P = \bar{r}_P - \left[\bar{r}_f + \beta_P \left(\bar{r}_M - \bar{r}_f\right)\right]$

Information ratio: $\dfrac{\alpha_P}{\sigma\left(e_P\right)}$

Morningstar risk-adjusted return: $\text{MRAR}(\gamma) = \left[\dfrac{1}{T}\sum_{t=1}^{T}\left(\dfrac{1 + r_t}{1 + r_{ft}}\right)^{-\gamma}\right]^{\frac{12}{\gamma}} - 1$

References I

 Bodie, Zvi, Alex Kane, and Allan J. Marcus (2023). *Investments*. 13th ed. New York: McGraw Hill.