

PERFORMANCE EVALUATION

Fall 2002

Basic Idea. Compare performance of active manager with passive manager with same risk and subject to same constraints.

Example 1:

Assume manager is larger stock picker. Then relevant comparison might be her performance relative to S&P index.

Example 2:

Assume manager is a market timer holds bonds and moves between long and short term bonds according to his beliefs about interest rate changes. Then relevant comparison might be a portfolio of short and long index in weights equal to average weights of managers choices (e.g. if half the time long and half short weights equal to 1/2).

Note: If we believe we have appropriate equilibrium model and if we believe we have efficient markets can compare versus equilibrium model.

Two groups need to evaluate and they have different information sets:

- (1) Plan sponsor**
- (2) Individual investors**

Plan sponsors can:

- (1) Specify with managers the appropriate benchmark**
- (2) Require any and all information**

Individual investors data set:

- (1) Usually limited to returns**
- (2) Or ratings like morningstar**

What are characteristics sensible passive portfolios?

- (1) Replicable indexes**
- (2) Total return indexes**
 - a. Dividends or interest included**
 - b. Splits or stock dividends included**
- (3) Expenses included (?)**

Candidates For Indexes

(A) Stock

- (1) S & P**
- (2) Wilshire**
- (3) Value or growth indexes**

(B) Bond

- (4) Shearson Lehman**
- (5) Solomon**
- (6) Merrill**

(C) International

- (7) Morgan Stanley (International)**
- (8) London Times - Actuary
(International)**

Considerations

- (1) Weighting**
- (2) Frequency**
- (3) Accuracy**

Some Comments

- (1) A plan sponsor can generally agree with managers on relevant indexes. They need to since they need to do aggregate asset allocation.**
- (2) Normal measure is difference in return between active manager and benchmark.**
- (3) Benchmark can and often will be multiple indexes.**
- (4) Normal excess return is small**

Standard analysis compares against "similar managers."

Some comments:

- (1) Hardly similar (risk objectives)**
- (2) Doesn't answer question should we be active at all**

Adjust for risk

Issue: assume we agree that relevant population is S&P securities but manager chooses the highest beta stocks from securities in S&P index. Then if market goes up he or she looks good. If this is timing good. If this is selectivity incorrect evaluation

$$\text{Performance} = R_p - \underset{\uparrow}{\beta} R_I$$

Where this is empirical Beta.

For plan sponsor Betas can be built up from securities, for individual investors must be estimated from return series.

**Some serious considerations for individual investors
and plan sponsors making comparisons:**

(A) Survivorship Bias

(B) Selection Bias

Traditional One Parameter Measures

Sharpe

Equation of Line

$$\bar{R}_i = R_F + \frac{\bar{R}_A - R_F}{\sigma_A} \sigma_i$$

Sharpe measure is slope

$$\frac{\bar{R}_A - R_F}{\sigma_A}$$

Sharpe differential return height above line.

$$\bar{R}_A = R_F + \frac{\bar{R}_m - R_F}{\sigma_m} \sigma_A$$

$$\Delta = \bar{R}_i - \bar{R}_A$$

Treynor-Jenson

Equation of Line

$$\bar{R}_i = R_F + \frac{\bar{R}_A - R_F}{\beta_A} \beta_i$$

Treynor measure is slope

$$\frac{\bar{R}_A - R_F}{\beta_A}$$

Jenson is differentiated return

$$\bar{R}_{A'} = R_F + \frac{\bar{R}_m - R_F}{\beta_A} \beta_A$$

$$\Delta = \bar{R}_A - \bar{R}_{A'}$$

$$= \bar{R}_A - \left(R_F + \beta_A \left(\bar{R}_m - R_F \right) \right)$$

Easy to generalize to multi-index model.

We use four indexes:

- (1). S&P
- (2). Small - Large
- (3). Value - Growth
- (4). Bond Index

$$\Delta = R_A - \bar{R}_A$$

where

$$\begin{aligned} \bar{R}_A = & R_F + \beta_{S\&P} (R_{S\&P} - R_F) + \beta_{SL} R_{SL} \\ & + \beta_{vg} R_{vg} + \beta_B (R_B - R_F) \end{aligned}$$

