Evaluation Measures

Firms may wish to judge if a particular manager has done 'well'. If we knew the true distribution from which returns were drawn we could test to see if a particular strategy made sense. That is, we could determine if it was mean variance efficient or if a manager made sensible decisions given his information. As we don't know the true distributions from which security returns are drawn we have to compare the realised returns with other realised returns. There are two things to consider when using performance measures:

1. Is the measure appropriate ?

2. Is the measure statistically significant?

(Some of these issues are explored in *Can Managed Portfolio Performance be Predicted*.)

It is extremely important that the performance measure takes the risk of a position into account. High risk strategies typically have a high payoff. So, in order to evaluate a manager one has to consider his risk adjusted returns and see if they are abnormal. (This is the heart of the argument in *The Dow Theory: William Peter Hamilton's Track Record Reconsidered*

There are numerous measures that are used to judge active performance. One of the most popular is the Sharpe Ratio or index:

$$S_p = \frac{Er_p - r_f}{\sigma_p}, \tag{1}$$

where Er_p is the return on the managed portfolio and σ_p is the standard deviation of the portfolio. The idea with the Sharpe ratio is that if a manager is doing a good job then his Sharpe ratio should be as high as possible. This is equivalent to asking if the portfolio is the optimal risky one. (This is discussed in *The Sharpe Ratio*. You might also want to visit his web site: www-sharpe.stanford.edu/ — he discusses ranking systems and has a preliminary analysis of Morningstar's ratings.

The Treynor Index also adjusts for risk, but the risk it considers is market exposure, so the measure of risk that it uses is the CAPM beta:

$$T_p = \frac{Er_p - r_f}{\beta_p}, \tag{2}$$

where β_p is the CAPM beta of the portfolio. This index asks if the implied security market line (SML) is the highest one possible. Clearly if you are comparing the performances of two candidates and one has managed a portfolio that appears to lie on a higher SML, then the higher line has a better return for the same exposure to the market. Notice that this measure is based on the CAPM.

Jensen's Alpha Index,

$$J_p = Er_p - [r_f + \beta_p(Er_m - r_f)] \tag{3}$$

is widely used. It is *usually* based on the CAPM, that is, it asks how far above the security market line a particular portfolio lies. Sometimes, any excess over the predicted value of a pricing model (such as a factor model) is referred to as the portfolio alpha. In general it refers to return in excess of the return generated by being exposed to a specific amount of risk.

The *Appraisal Ratio* asks the question, suppose there is a positive alpha — how much idiosyncratic risk do I have to bear to get it? Essentially this measure takes into account the fact that some portfolios have more or less diversifyable risk. In this case, the σ is the diversifyable risk (the residuals).

$$A_p = \frac{\alpha_p}{\sigma} \tag{4}$$

The final measure takes a somewhat different tack. It has only recently been introduced. It is not a risk adjusted measure and so it does not require a benchmark. (The method is presented in *Performance Measurement without Benchmarks: An examination of Mutual Fund returns.* Suppose that a manager is successfully managing his portfolio. Then, it must be the case that if he increased the weight of a particular asset in his portfolio, the returns to that asset were high. You do not want a manager who increases his holdings of assets who have low realised returns. This is equivalent to saying that there should be a positive covariance between holdings of an asset and the subsequent returns. To estimate this covariance, this measure sums across all the assets finds if the changes were positive or negative and considers if the weight change was positive or negative. This is the *Portfolio Change Measure*

$$PCM = \sum_j r_{j,t}(w_{jt} - w_{jt-1}). \tag{5}$$

r_{jt} is the return of security j at time t and $w_{jt} - w_{jt-1}$ is the change in weight of asset j in the portfolio.

Performance measures that are based on pricing models are prey to all the problems of pricing models.

1. Model misspecification e.g. leaving out a factor

2. Using the wrong proxy for the market

Suppose that you have decided on a measure and have calculated it. The next step is to decide if the number is statistically significantly different from zero. The null hypothesis is that the manager has not added any value. So, for example, in the case of the Jensen's alpha, after having determined an estimate of α, $\hat{\alpha}$ and calculated the standard error $se(\hat{\alpha})$, the appropriate test is:

$$H_0 : \frac{\hat{\alpha} - 0}{se(\hat{\alpha})} \tag{6}$$

As a rough rule of thumb if the number of observations is large enough the critical value for significance at the 95 percent level is 1.96. If the number you obtain under H_0 is greater than 1.96 then you cannot reject the hypothesis that the manager has added value. However, if the number is less than 1.96 then you can reject the hypothesis that the manager has added value. Typically enough data is never available to perform a rigorous test.

If there are problems measuring active management, can we be certain that it is important? In *The Determinants of Portfolio Performance*, Brinson, Hood and Beebower decompose portfolio returns and attribute them to policy decisions and to active management (security selection and market timing). They find that 93.6% of returns can be attributed to policy decisions. This suggests that the vital decision is asset allocation — what mix of assets there should be in a portfolio.