University of California, Irvine
Graduate School of Management

Using RiskGrades

 04/21/2004

"RiskGrades" is a risk measurement system developed by RiskMetrics for individual investors and released on May 23, 2000. The web site is at www.riskgrades.com;. Access to the site requires registration, which is free. The methodology is an extension of the RiskMetrics model, which estimates conditional volatility using exponential weights with decay λ=0.97. For more information, see the technical manual at www.riskmetrics.com/research/techdoc/

Measuring Risk: Concepts

Users need to specify a portfolio from a choice of US or foreign stocks or mutual funds.
The portfolio description reports positions (by symbol), market values, and the following risk statistics.

The *RiskGrade* of an asset or portfolio measures the scaled daily volatility, defined in percent of the risk on a portfolio of global stocks during normal market conditions, which is taken as 20% per annum. The actual formula is $RG_i = 100 \times [\sqrt{252}\ \sigma_i / 0.2]$.

The *RiskImpact* of an asset within a portfolio is defined as the incremental VAR in percent. This is measured as the effect of removing the asset and investing the proceeds in cash: RI = [VAR(initial)-VAR(final]/VAR(initial).

The *XLoss* of an asset is the conditional tail loss (in dollars), obtained by averaging the worst 5% observations in the tail (historical simulation). As with volatility, the portfolio XLoss is less than the sum of individual Xlosses.

The *RiskChart* (RC) describes the time-series of the risk grades. Note that the patterns are typical of exponential decay.

The *Return Analysis* (RA) plots return against risk.

The *Graphical Analysis* (GA) describes the portfolio risk, broken down by asset class and by instrument.

The *Sector Analysis* (SA) describes the portfolio exposure to industry sectors, as well as a breakdown of risk components into sector and idiosyncratic effects, all relative to the S&P500. The exposures are derived from a multivariate regression of portfolio returns on sector returns:

$$R_{pt} = \alpha + \Sigma_i\ \beta_i R_{it} + \varepsilon_{pt}\ .$$

The "concentration weights" are derived from

$$CW_j = 100 \times (|\beta_j|\sigma_j / \Sigma_i\ |\beta_i|\sigma_i\ ).$$

The "risk weights" are derived from a variance decomposition:

$$Risk_j = 100 \times (\beta_j^2\ \sigma_j^2 + \Sigma_{i><j}\ \beta_j\beta_i\ \sigma_{ji}\ )/\ \sigma_p^2$$