

# Sharpe thinking in asset ranking with one-sided measures

Simone Farinelli <sup>a</sup>, Luisa Tibiletti <sup>b,\*</sup>

<sup>a</sup> *Quantitative and Bond Research, Cantonal Bank of Zurich, P.O. Box, CH-8010 Zurich, Switzerland*

<sup>b</sup> *Department of Statistics and Mathematics “Diego de Castro”, University of Torino, Piazza Arbarello, 8, I-10122 Torino, Italy*

Available online 10 October 2006

---

## Abstract

If we exclude the assumption of normality in return distributions, the classical risk–reward Sharpe Ratio becomes a questionable tool for ranking risky projects. In line with Sharpe thinking, a general risk–reward ratio suitable to compare skewed returns with respect to a benchmark is introduced. The index includes asymmetrical information on: (1) “good” volatility (above the benchmark) and “bad” volatility (below the benchmark), and (2) asymmetrical preference to bet on potential high stakes and the aversion against possible huge losses. The former goal is achieved by using one-sided volatility measures and the latter by choosing the appropriate order for the one-sided moments involved. The Omega Index (see [Cascon A., Keating, C., Shadwick, W., 2002. Introduction to Omega, The Finance Development Centre]) and the Upside Potential Ratio (see [Sortino, F., Van Der Meer, R., Plantinga, A., 1999. The Dutch triangle. *Journal of Portfolio Management*, 26 (I, Fall), 50–58]) follow as special cases.

© 2006 Elsevier B.V. All rights reserved.

*Keywords:* Risk management; Sharpe index; One-sided risk measures

---

## 1. Introduction<sup>1</sup>

How should we rank investments differing in expected return and risk if a return benchmark is fixed? Although risk managers are very interested in this vital issue, it seems that no unanimous answer has yet been found. The aim of this paper is to dwell on to discuss this topic with a practice-oriented perspective. A general rule based on a risk–reward ratio with benchmark is proposed.

Let us take a quick glance at the existing literature. More than 50 years ago, Roy (1952) introduced a risk–reward ratio for scaling risky investments, originally termed as *reward-to-variability*. Subsequently, Sharpe (1966) first applied this ratio to evaluate mutual funds and, under the name of *Sharpe Ratio*, it has become one of the most popular indices used in both the academics’ and practitioners’ world. A growing need to express the performance of risky projects with respect to a benchmark  $b$ , a wider interpretation of the ratio has been given (see Roy, 1952 and Sharpe, 1994): the *Sharpe Ratio* of any investment  $X$  is simply defined

---

*E-mail addresses:* [simone.farinelli@zkb.ch](mailto:simone.farinelli@zkb.ch) (S. Farinelli), [luisa.tibiletti@unito.it](mailto:luisa.tibiletti@unito.it) (L. Tibiletti).

<sup>1</sup> We are grateful to Con Keating for a stimulating discussion on the topic. The views expressed herein are those of the authors and do not necessarily reflect opinions shared by Cantonal Bank of Zurich.