



**Carl Bacon**  
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## How sharp is the Shape-ratio? - Risk-adjusted Performance Measures

“Alpha to omega, downside to drawdown, appraisal to pain”

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### About the author:

Carl Bacon CIPM, joined [StatPro Group plc](#) as Chairman in April 2000. StatPro provides sophisticated [data](#) and [software solutions](#) to the asset management industry. Carl also runs his own consultancy business providing advice to asset managers on various risk and performance measurement issues.

Prior to joining StatPro Carl was Director of Risk Control and Performance at Foreign & Colonial Management Ltd, Vice President Head of Performance (Europe) for J P Morgan Investment Management Inc., and Head of Performance for Royal Insurance Asset Management.

Carl holds a B.Sc. Hons. in Mathematics from Manchester University and is an executive committee member of Investment-Performance.com, and an associate tutor for 7city Learning. A founder member of both the Investment Performance Council and GIPS<sup>®</sup>, Carl is a member of the GIPS Executive Committee, chair of the Verification Sub-Committee, a member of the UK Investment Performance Committee and a member of the Advisory Board of the Journal of Performance Measurement.

Carl is also the author of “[Practical Portfolio Performance Measurement & Attribution](#)” part of the Wiley Finance Series, numerous articles and papers and editor of “[Advanced Portfolio Attribution Analysis](#)”

Any discussion on risk-adjusted performance measures must start with the grandfather of all risk measures the Sharpe Ratio<sup>1</sup> or *Reward to Variability* which divides the excess return of a portfolio above the risk free rate by its standard deviation or variability:

$$\text{Sharpe Ratio } SR = \frac{r_P - r_F}{\sigma_P}$$

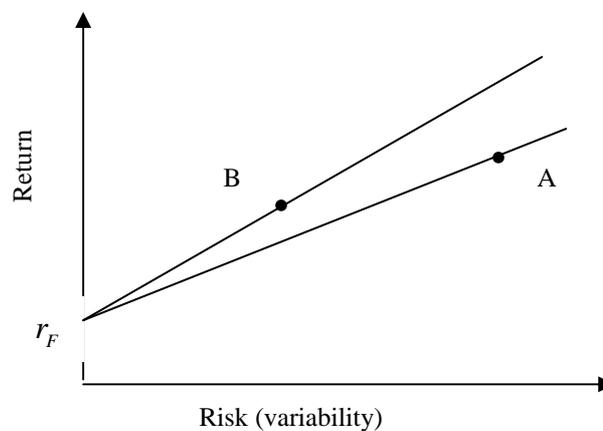
Where:

$r_P$  = portfolio return normally annualised

$r_F$  = risk free rate (annualised if portfolio return is annualised)

$\sigma_P$  = portfolio risk (variability, standard deviation of return) again annualised if portfolio return is annualised

Most risk measures are best described graphically, a measure of return in the vertical axis and a measure of risk in the horizontal axis as shown below:



Ideally if investors are risk averse they should be looking for high return and low variability of return, in other words in the top left-hand quadrant of the graph. The Sharpe ratio simply measures the gradient of the line from the risk free rate (the natural starting point for any investor) to the combined return and risk of each portfolio, the steeper the gradient, the higher the Sharpe ratio the better the combined performance of risk and return.

The Sharpe ratio is sometimes erroneously described as a risk-adjusted return; actually it's a ratio. We can rank portfolios in order of preference with the Sharpe ratio but it is difficult to judge the size of relative performance. We need a risk adjusted return measure to gain a better feel of risk-adjusted outperformance such as  $M^2$  shown below.