

# MRAR Illustrated

The Morningstar Risk-Adjusted Return ('MRAR') measure with  $\gamma \neq 0$ , is defined as:

$$\text{MRAR} (\gamma) = \left[ \frac{1}{T} \sum_{t=1}^T (1 + r_{Gt})^{-\gamma} \right]^{-\frac{12}{\gamma}} - 1$$

Where:

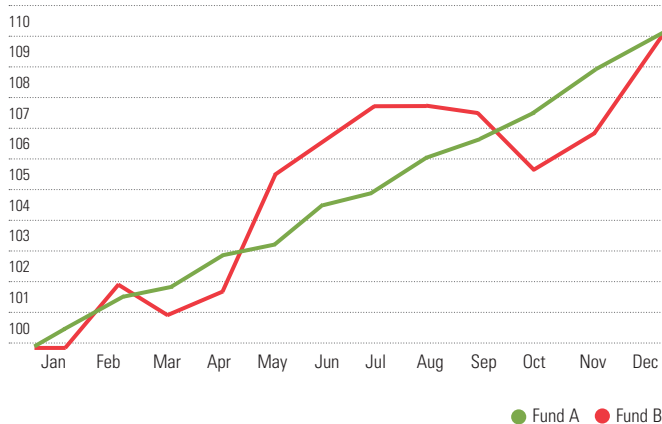
- $\gamma$  = represents the investor's level of risk aversion
- $T$  = number of months in a period
- $r_{Gt}$  = geometric excess return in month  $t$  and defined as:  $\frac{1 + TR_t}{1 + R_{bt}} - 1$
- $TR_t$  = the return of the fund in month  $t$
- $R_{bt}$  = the return on risk free asset in month  $t$

We will illustrate this calculation on two funds using just 12 months of returns.

Morningstar uses  $\gamma = 2$ , therefore we need to calculate the following:

$$\text{MRAR} (2) = \left[ \frac{1}{12} \sum_{t=1}^T (1 + r_{Gt})^{-2} \right]^{-6} - 1$$

Fund A and Fund B have the following excess returns. Their compounded return is the same, but Fund B has provided less regular returns than Fund A



The MRAR calculations

|  | $r_{Gt}$    |             | $(1 + r_{Gt})^{-2}$ |              |
|--|-------------|-------------|---------------------|--------------|
|  | Fund A (%)  | Fund B (%)  | Fund A              | Fund B       |
| Jan                                      | 0.50        | 0.10        | 0.9901              | 0.9980       |
| Feb                                      | 1.00        | 2.00        | 0.9803              | 0.9612       |
| Mar                                      | 0.50        | -0.90       | 0.9901              | 1.0182       |
| Apr                                      | 1.00        | 0.50        | 0.9803              | 0.9901       |
| May                                      | 0.50        | 3.82        | 0.9901              | 0.9277       |
| Jun                                      | 1.00        | 0.60        | 0.9803              | 0.9881       |
| Jul                                      | 0.50        | 0.70        | 0.9901              | 0.9861       |
| Aug                                      | 1.00        | 0.00        | 0.9803              | 1.0000       |
| Sep                                      | 0.50        | -0.20       | 0.9901              | 1.0040       |
| Oct                                      | 1.00        | -1.50       | 0.9803              | 1.0307       |
| Nov                                      | 0.50        | 1.00        | 0.9901              | 0.9803       |
| Dec                                      | 1.00        | 3.00        | 0.9803              | 0.9426       |
| <b>Compounded</b>                        | <b>9.38</b> | <b>9.38</b> |                     |              |
| <b>SUM</b>                               |             |             | 11.8222             | 11.8270      |
| <b>SUM /12</b>                           |             |             | 0.9852              | 0.9856       |
| <b>((SUM/12)<sup>-6</sup>)-1 is MRAR</b> |             |             | <b>9.37%</b>        | <b>9.10%</b> |

Fund B delivers less consistent returns and as a result receives the lower MRAR. Conversely, Fund A has delivered its returns with near-perfect regularity and its MRAR (9.37%) is very close to its return (9.38%). Fund A will receive a higher rating than Fund B.