

Greek Letter ρ Makes Clients Happier

Rho Research Note

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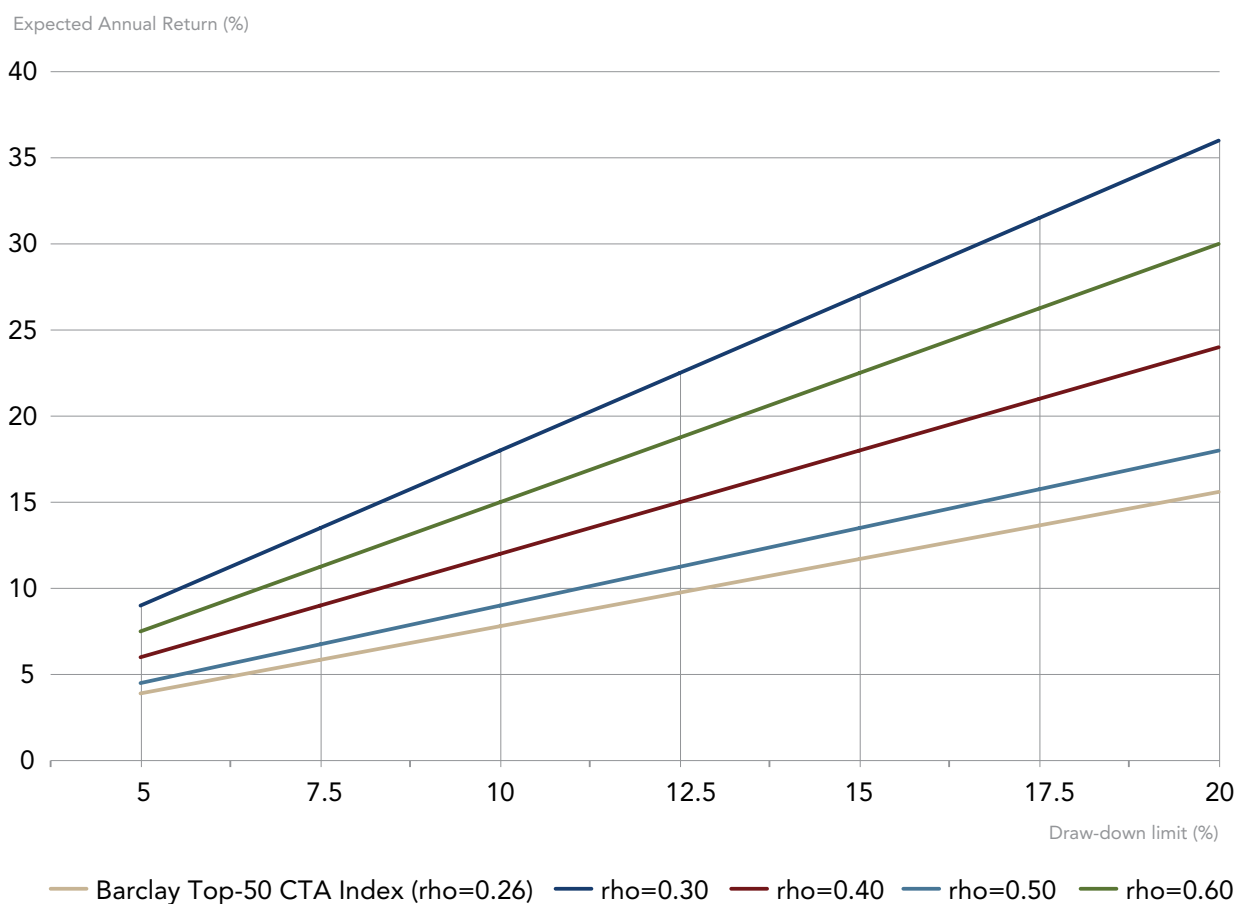
■ **EVERY CLIENT** has at least two expectations when they evaluate managers: an expected return (E_C) and a draw-down threshold (D_C). The client naturally wishes to maximize return and minimize the draw-down risk, in other words, to maximize the ratio of E_C/D_C .

Every manager's track record can be described by at least two statistical calculations: the average monthly return (μ) and the standard deviation of monthly returns (σ) measured over a known time period. The desirable manager has a mean "far" away from zero ($\mu > 0$), with consistent returns tightly packed around the mean, i.e., a small standard deviation (σ). We quantify this idea as the Return Efficiency, $\rho = \mu/\sigma$. The RETURN EFFICIENCY ρ will be greater for larger μ and/or smaller σ .

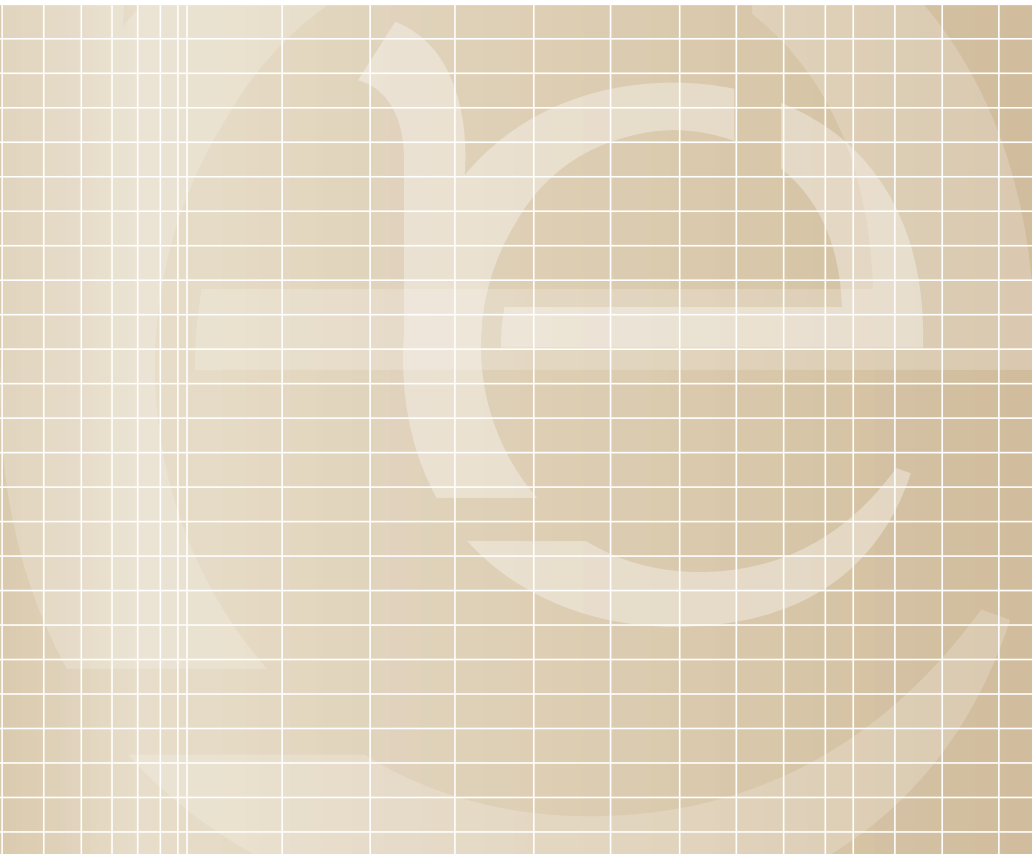
A manager's expected annual return E_m can simply be expressed as 12 times the average monthly return μ , i.e. $E_m = 12\mu$. Our research into draw down performance shows that to a good approximation, the *future* draw-down risk can be expressed as $D_m = 4\sigma$, i.e. 4 times the monthly standard deviation. We can connect client expectations (E_C) to the expected performance of the manager, i.e. $E_C = E_m$. Next, the draw-down expectations of the client, D_C are matched to the future draw-down risk of the manager, i.e., $D_C = D_m$. Following through the simple mathematics, we find that $E_C = 3\rho D_C$. Here two of the three quantities are based on client preferences, and just one on manager performance.

It shows that maximizing ρ makes for client happier as shown below for various values of ρ and D_C .

■ **THIS EQUATION HAS PROFOUND IMPLICATIONS** for managers and clients. First, it says that a manager can best serve a client by maximizing RETURN EFFICIENCY. Second, it shows quantitatively the trade-offs between risk and reward. For example, if a client can accept a draw-down limit $D=10\%$, and a manager has $\rho=0.25$, then the client can expect $E=3 \times 0.25 \times 10=7.5\%$. This allows a realistic assessment of long-term performance.



Please feel free to contact Christen Oesterbye (co@rhoam.ch) or Niels Kaastrup-Larsen (nkl@rhoam.ch) with questions about the Rho Research Paper or Rho Asset Management in general.



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Our goal is to provide the highest possible RETURN EFFICIENCY to our investors using ALTIUS, CITIUS and FORTIUS, all fully automated trading programs. Rho is research and technology driven, specializing in design and implementation of systematic trading strategies. All strategies are based on quantitative analyses of price behavior in the global financial and commodity markets.

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