IQIC - Risk & Performance

#6: Risk-Adjusted Performance

Is return the whole story?

- No. Two investments can have the same return but very different risk
- E.g. Portfolio A averages 8% a year and moves between 6% and 10%
- E.g. Portfolio B also averages 8% a year, but swings from -20% to +35%
  - Same average, but B is a much bumpier ride
- Big drops make people panic and sell at the worst time
- So the real question is: how much risk did you take to get that return?

Risk-adjusted performance

- **What is risk-adjusted performance?**
  - How much return you get for each unit of risk you take
- Risk is usually measured by volatility, or how much returns bounce around
  - More bouncing = more risk
- **Core Process:** Look at the return (the reward) → Look at the risk (the cost) → Compare the two
- A good investment gives you a lot of reward without too much risk

Sharpe Ratio (conceptual)

- **What is the Sharpe ratio?**
  - A number that tells you how much extra return you got for the risk you took
- It compares your return to a "risk-free" investment, like U.S. Treasury bills
  - You could earn that rate with basically zero risk, so only the return above it counts as your reward for taking risk
- Higher Sharpe ratio = better use of risk
  - Rough guide: under 0.5 is weak, around 1 is good, above 1 is strong

Sharpe Ratio (numerical)

- **Sharpe Ratio Formula:** (Portfolio Return - Risk-Free Rate) ÷ Volatility
- **Core Process:** Subtract the risk-free rate from your return → Divide by volatility → Get your Sharpe ratio
- E.g. Your portfolio returns 12%, the risk-free rate is 4%, and volatility is 16%
  - 12% - 4% = 8% extra return
  - 8% ÷ 16% = Sharpe ratio of 0.5
- This means you earned 0.5% of extra return for every 1% of risk

Sharpe Ratio in action

- **Let's compare two portfolios** (risk-free rate = 4%)
- Portfolio A: 14% return, 25% volatility
  - (14 - 4) ÷ 25 = Sharpe of 0.40
- Portfolio B: 10% return, 10% volatility
  - (10 - 4) ÷ 10 = Sharpe of 0.60
- A made more money, but B used its risk more efficiently
  - B is the better-performing portfolio once you account for risk

Sharpe Ratio limitations

- **Does the Sharpe ratio tell you everything?**
  - No, it has some blind spots
- It punishes big jumps up the same as big drops down, even though nobody complains about surprise gains
- It doesn't handle rare crashes well
- It's based on the past, so it can't promise future results
- The number can change a lot depending on which time period you pick
- That's why investors also look at other measures:
  - **Sortino ratio:** like Sharpe, but only counts downside swings
  - **Max drawdown:** the biggest drop from a high point to a low point

Additional Resources

- William Sharpe, “The Sharpe Ratio” (Stanford): the original paper from the ratios creator
- Investopedia: “Sortino Ratio” and “Maximum Drawdown” explainer pages
- Portfolio Visualizer: run real backtests and compare Sharpe, Sortino, and drawdown side by side