

Return and portfolio measurement

Q: Explain (a) why a normal distribution is relevant for the mean-variance framework, and (b) which characteristics of a return distribution indicate non-normality. Give 2 examples.

A:

- a) A normal distribution is one way to arrive at the MV-criterion (the other is quadratic utility); since risk has to express itself in the return distribution, and a normal distribution can be reconstructed solely from its mean and variance, a normal distribution directly justifies the MV-framework.
- b) All moments of the distribution above the second should have specific values under a normal distribution, any deviation from them indicates non-normality. Examples: skewness (normal value = 0); kurtosis (normal value = 3).

Q: Explain the rationale behind Jensen's alpha.

A: Jensen's alpha gives you the intercept of a regression of the form $r_i = \alpha + \beta R_M$, possibly expanded with other risk factors. Alpha (or the alpha in excess of the risk free rate if one isn't using excess returns) indicates return without corresponding risk, and hence is a measure of (superior) performance.

Q: Explain why the CAPM beta of a hedgefund with a market-neutral strategy is likely to be a poor indication of its (total) risk.

A: market-neutral strategy indicates that the correlation of the hedge fund's portfolio with the market is very low. This means that the CAPM beta is close to zero as well. However, given the highly levered nature of hedgefunds, the risks are substantial (as measured by variance or any other measure). The CAPM assumes this risk is diversifiable and hence not priced, but it is certainly there.