

$$\begin{aligned}\sigma_p^2 &= \text{var}(\alpha X_A + (1-\alpha) X_B) \\ &= \alpha^2 \text{var}(X_A) + (1-\alpha)^2 \text{var}(X_B) + 2\alpha(1-\alpha)\text{cov}(X_A, X_B) \\ &= \alpha^2 \sigma_A^2 + (1-\alpha)^2 \sigma_B^2 + 2\alpha(1-\alpha)\rho \sigma_A \sigma_B + 2\alpha(1-\alpha)\sigma_A \sigma_B\end{aligned}$$

→ In a portfolio w/ imperfectly correlated asset returns

- (1) risks combine in a non-linear way
- (2) expected returns combine in a linear manner

→ The expected return on a portfolio is the weighted average of expected returns of the underlying assets

→ There are many combinations of assets w/ the same portfolio expected return, but different portfolio risk

Preview from Notesale.co.uk
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