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One way and two way analysis of variance pdf free windows 7

Mathematical framework for investment risk "Portfolio analysis" redirects here. For the text book, see Portfolio Analysis. For theorems about the mean-variance efficient frontier, see Mutual fund separation theorem. For non-mean-variance portfolio analysis, see Marginal conditional stochastic dominance. Modern portfolio theory (MPT), or mean-variance analysis, is a mathematical framework for assembling a portfolio of assets such that the expected return is maximized for a given level of risk. It is a formalization and extension of diversification in investing, the idea that owning different kinds of financial assets is less risky than owning only one type. Its key insight is that an asset's risk and return should not be assessed by itself, but by how it contributes to a portfolio's overall risk and return. It uses the variance of asset prices as a proxy for risk.[1] Economist Harry Markowitz introduced MPT in a 1952 essay,[2] for which he was later awarded a Nobel Memorial Prize in Economic Sciences; see Markowitz model. Mathematical model Risk and expected return This section does not cite any sources. Please help improve this section by adding citations to reliable sources. Unsourced material may be challenged and removed. (April 2021) (Learn how and when to remove this template message) MPT assumes that investors are risk averse, meaning that given two portfolios that offer the same expected return, investors will prefer the less risky one. Thus, an investor will take on increased risk only if compensated by higher expected returns. Conversely, an investor who wants higher expected returns must accept more risk. The exact trade-off will not be the same for all investors. Different investors will evaluate the trade-off differently based on individual risk aversion characteristics. The implication is that a rational investor will not invest in a portfolio if a second portfolio exists with a more favorable risk-expected return profile – i.e., if for that level of risk an alternative portfolio exists that has better expected returns. Under the model: Portfolio return is the proportion-weighted combination of the constituent assets' returns. Portfolio volatility is a function of the correlations ρ_{ij} of the component assets, for all asset pairs (i, j) . In general: Expected return: $E(R_p) = \sum_i w_i E(R_i)$ where R_p is the return on the portfolio, R_i is the return on asset i and w_i is the weighting of component asset i (that is, the proportion of asset "i" in the portfolio). Portfolio return variance: $\sigma_p^2 = \sum_i w_i^2 \sigma_i^2 + \sum_{i \neq j} 2 w_i w_j \sigma_i \sigma_j \rho_{ij}$ where $\sigma_i^2 = \sum_{i=1}^n w_i^2 \sigma_i^2 + \sum_{i \neq j} 2 w_i w_j \sigma_i \sigma_j \rho_{ij}$ is the (sample) standard deviation of the periodic returns on an asset i , and ρ_{ij} is the correlation coefficient between the returns on assets i and j . Alternatively the expression can be written as: $\sigma_p^2 = \sum_i \sum_j w_i w_j \sigma_i \sigma_j \rho_{ij}$ where $\rho_{ij} = 1$ for $i = j$, or $\sigma_p^2 = \sum_i \sum_j w_i w_j \sigma_i \sigma_j \rho_{ij}$ where $\rho_{ij} = \sigma_i \sigma_j \rho_{ij} / (\sigma_i \sigma_j)$ is the (sample) covariance of the periodic returns on the two assets, or alternatively denoted as $\sigma(i, j)$ or $\text{cov}(i, j)$. Portfolio return volatility (standard deviation): $\sigma_p = \sqrt{\sigma_p^2}$ For a two-asset portfolio: Portfolio return: $E(R_p) = w_A E(R_A) + w_B E(R_B) = w_A E(R_A) + (1 - w_A) E(R_B)$. Portfolio variance: $\sigma_p^2 = w_A^2 \sigma_A^2 + w_B^2 \sigma_B^2 + 2 w_A w_B \sigma_A \sigma_B \rho_{AB}$ For a three-asset portfolio: Portfolio return: $E(R_p) = w_A E(R_A) + w_B E(R_B) + w_C E(R_C)$. Portfolio variance: $\sigma_p^2 = w_A^2 \sigma_A^2 + w_B^2 \sigma_B^2 + w_C^2 \sigma_C^2 + 2 w_A w_B \sigma_A \sigma_B \rho_{AB} + 2 w_A w_C \sigma_A \sigma_C \rho_{AC} + 2 w_B w_C \sigma_B \sigma_C \rho_{BC}$ Diversification This section does not cite any sources. Please help improve this section by adding citations to reliable sources. Unsourced material may be challenged and removed. (April 2021) (Learn how and when to remove this template message) An investor can reduce portfolio risk simply by holding combinations of instruments that are not perfectly positively correlated (correlation coefficient $-1 \leq \rho_{ij} < 1$)

