**Kendrick Winata**

**QF600 – Asset Pricing**

**Homework 1**

**Table showing mean return, standard deviation, and tangency portfolio weights for the ten industry portfolios**

A table with numbers and symbols

Description automatically generated

**Table for covariance matrix for the ten industry portfolios**

A table with numbers and lines

Description automatically generated

**Plot the minimum-variance frontier (without the riskless asset) and the efficient frontier (with the riskless asset) generated by the ten industry portfolios**

A graph with a line and a point

Description automatically generated

**Calculate the Sharpe ratio for the tangency portfolio**

Sharpe ratio = 0.4035655993495088

**Briefly explain the economic significance and relevance of the minimum-variance frontier to an investor.**

The minimum variance frontier consists of portfolios with the lowest amount of risk, for different values of Rp. Investors will not want to hold a portfolio below the minimum variance point, as they will always get higher returns along the positively sloped portion of the minimum-variance frontier.

**Briefly explain the economic significance and relevance of the efficient frontier to an investor.**

The efficient frontier consists of portfolios with the highest mean return for a given amount of risk. This tool helps investors analyze the risk and returns associated with an investment portfolio, and helps the investor adjust their asset allocation accordingly. It can also help an investor determine if he should pull his funds from an investment with a certain amount of risk and return for a similar investment with the same return but with less risk.

**Briefly explain the economic significance and relevance of the tangency portfolio to an investor.**

Tangency portfolio is unique risky portfolio where Capital allocation line (CAL) is tangent to existing top half frontier generated by n risky assets. The tangency portfolio must have the highest Sharpe ratio out of all possible risky portfolios. It indicates the optimal mix of assets that maximise an investor’s risk-adjusted returns.