CAPM (Capital Asset Pricing Model)

- CAPM is a model that describes the relationship between the expected return and risk of securities.
- CAPM indicates that the expected return on a security is equal to the risk-free return plus a risk premium.

$$r_i = r_f + B_i\ (r_m - r_f)$$

r_i = Expected return on a security

r_f = Risk free rate of return

B_i = Beta between the stock and the market

r_m = Expected return of the market

Risk Free Asset Return

- A risk free asset could be a US Government 10 year Treasury bill.
- Investors who are extremely risk averse would prefer to buy the risk free asset to protect their money and earn a low return.
- If investors are interested in gaining more return, they have to bear more risk compared to the risk free asset

Market Portfolio Return

- Market portfolio includes all securities in the market. A good representation of th emarket portfolio is the S&P 500.
- Market portfolio return is the average return of the overall return of the SP500.

Beta

- It is a measure of a stock's risk (volatility of returns) reflected by measuring the fluctuation of its price changes relative to the overall market.

$\beta = 0$: No Market Sensitivity

$\beta < 1$: Low Market Sensitivity

$\beta = 1$: Same as Market (Neutral)

$\beta > 1$: High Market Sensitivity

$\beta < 0$: Negative Market Sensitivity