81
4.75

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2604639 Finance Theory (Section 1)

QUIZ #2_2023

40% 400
280
60% 200

1. Mr. Uthai expects that the future price of stock ABC will be either $200 with 60% probability or $400 with 40% probability. He is willing to pay up to $300 for the stock today. Draw Mr. Uthai's total utility curve. Identify important points on the graph and classify his attitude toward risk? (Ignore the time value of money) *[2 points]*

2

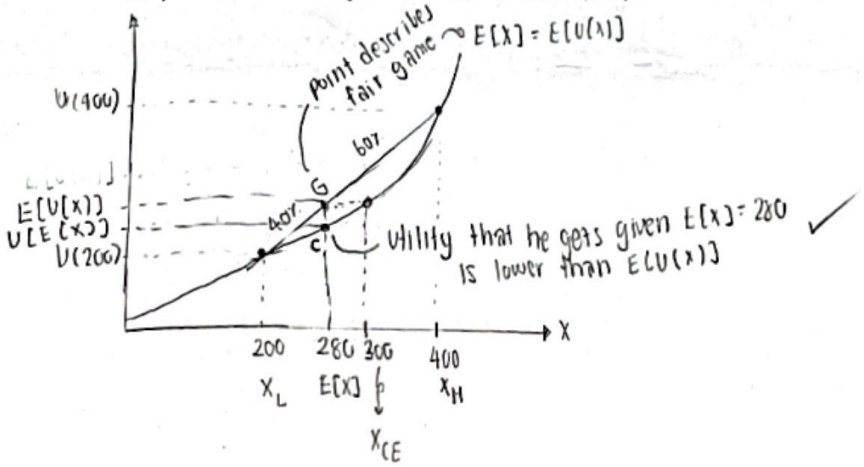
Expected price of stock ABC = $400(40\%) + 200(60\%) = \$280$ $E[X]$

▷ However, Mr. Uthai is willing to pay $300 for the investment that giving expected price of $280 ⇒ $E[r] < 0$

↳ Thus, Mr. Uthai is risk lover because he is willing to pay more that what the investment is expected to give him.

↳ Also, Mr. Uthai is risk lover because his utility of the expected price of stock ABC is lower than the expected utility from investment His utility that he gets given $E(x) = 280$ is lower than $E[U(x)]$.

U(x) Total utility curve of a risk lover



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2. The risk-free rate is 4% pa. The expected return on the market portfolio is 15% and the standard deviation of the return on the market portfolio is 24% pa. An investor has $300,000 in cash. He decides to short-sell $200,000 worth of risk-free bond. He then invests $500,000 in the market portfolio. Calculate the portfolio's expected return, standard deviation and Sharpe's ratio. *[3 points]*

2 3/4

$r_F = 4\%$
$E[r_M] = 15\%$
$\sigma_M = 24\%$

weight in risk-free asset $= \frac{-200,000}{300,000} = -66.67\%$
" " market portfolio $= \frac{500,000}{300,000} = 166.67\%$
$\Sigma = 100\%$

▶ Portfolio's expected return $E[r_p] = -66.67\%(4\%) + 166.67\%(15\%)$
$= \sum_{i=1}^{N} w_i E[r_i] = 22.33\%$ → short-sell allows him to obtain expected return > $E[r_M]$

▶ $\sigma_p = \sqrt{w_A^2\sigma_A^2 + w_B^2\sigma_B^2 + 2w_A w_B \sigma_A \sigma_B \rho_{A,B}}$ ($\rho(r_M, r_f) = 0$) $= \sqrt{(-\frac{2}{3})^2(0\%)^2 + (\frac{5}{3})^2(24\%)^2} = 40\%$ ✓

▶ Sharpe's ratio $= \frac{E[r_p] - r_f}{\sigma_p} = \frac{22.33\% - 15\%}{40\%} = 0.1832$ ✗ ?

short sell make the portfolio becomes riskier

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