

ECON 313 HW 3

Due: Wednesday, OCT 27

Starred questions are optional

1. Last year, Rocket Inc. earned a 20% return. Farmer's Corp. earned 11%. The overall market return last year was 15%, and the risk-free rate was 4%. If Rocket stock has a beta of 1.8 and Farmer's has a beta of 0.6, which stock performed better once you take risk into account?
2. *A security has a beta of 1.20. Is this security more or less risky than the market? Explain. Assess the impact on the required return of this security in each of the following cases.
 - a. The market return increases by 15%.
 - b. The market return decreases by 8%.
3. *Assume the risk-free rate is 7.4% and the expected return on the market portfolio is 8.6%. Use the capital asset pricing model (CAPM) to find the required return for a security whose Beta is 1.36.
4. Jason Jackson is attempting to evaluate two possible portfolios consisting of the same five assets but held in different proportions. He is particularly interested in using beta to compare the risk of the portfolios and, in this regard, has gathered the following data:

		Portfolio Weights	
Asset	Asset Beta	Portfolio A	Portfolio B
1	1.34	25%	35%
2	0.74	28%	6%
3	1.21	14%	18%
4	1.09	13%	16%
5	0.86	20%	25%
Total		100%	100%

- a. Calculate the betas for portfolios A and B.
 - b. If the risk-free rate is 2.2% and the market return is 5.7%, calculate the required return for each portfolio using the CAPM.
5. Ron's Rodents Co. has total assets of \$3.3 million, total short- and long-term debt of \$2.4 million, and \$370,000 worth of 9% preferred stock outstanding.
 - a. What is the firm's total book value?
 - b. What would its book value per share be if the firm had 150,000 shares of common stock outstanding?
 - c. If the price of the stock is \$225, calculate the market capitalization.

Help:

Book value = Total Assets – Total Debt – Preferred stock

Book Value per share = Book value/ Number of outstanding shares

Market cap = Number of outstanding shares * price

6. Consider the following information about Truly Good Coffee, Inc. Use the information in the table to find the following:
- *The company's book value.
 - *Its book value per share.
 - The stock's earnings per share (EPS).
 - The dividend payout ratio.
 - *The dividend yield on the common stock.
 - *The dividend yield on the preferred stock.

Total assets (\$millions)	200
Total debt (\$millions)	92
Preferred stock (\$millions)	24
Common stockholders' equity (\$millions)	84
Net profit after taxes (\$millions)	22.8
Number of preferred stock outstanding (millions)	1
Number of common stock outstanding (millions)	10
Preferred dividends paid (per share)	2.25
Common dividends paid (per share)	0.81
Market price of the preferred stock (\$/per share)	33.05
Market price of the common stock (\$/per share)	26.62

7. *When adding a risky asset to a portfolio of many risky assets, which property of the asset is more important, its standard deviation or its correlation with the other assets? Explain.
8. An investor ponders various allocations to the optimal risky portfolio and risk-free T-bills to construct his complete portfolio. How would the Sharpe ratio of the complete portfolio be affected by this choice?
9. **(Bonus question)** A pension fund manager is considering three assets. The first is a stock, the second is a long-term government and corporate bond fund, and the third is a T-bill money market fund that yields a sure rate of 5.5%. The table below shows the SDs and rates of return for the bond and stock.

	Expected Return	Standard Deviation
Stock fund (S)	15%	32%
Bond fund (B)	9	23

The correlation between the fund returns is .15. Using optimization tools, we have calculated the following.

	E(r)	σ
Minimum variance portfolio	10.89%	19.94%
Tangency portfolio	12.88%	23.3382%

Also, the weight of bonds in the tangency portfolio is 0.3534.

- Explain the difference between min-variance portfolio and tangency portfolio.
- What is the Sharpe ratio of the best feasible CAL?
- Suppose now that your portfolio must yield an expected return of 12% and be efficient, that is, on the best feasible CAL. What is the standard deviation of your portfolio? What is the proportion invested in the T-bill fund and each of the two risky funds?

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The equation for the CAL is:

$$E(r_C) = r_f + \frac{E(r_P) - r_f}{\sigma_P} \sigma_C$$

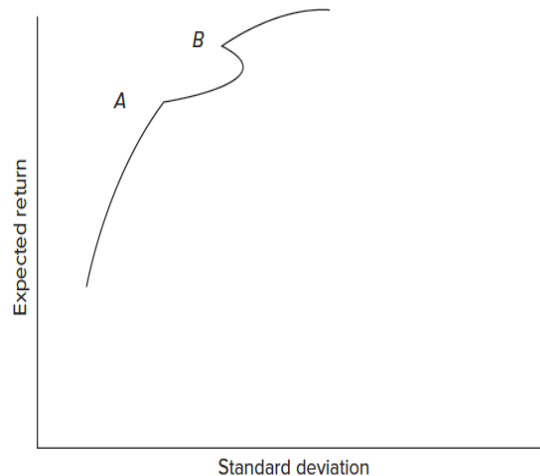
You can find SD using this equation.

The mean of the complete portfolio as a function of the proportion invested in the risky portfolio (y) is:

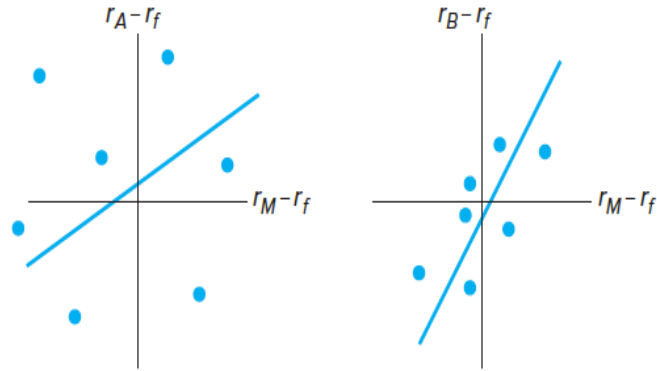
$$E(r_C) = (1-y)r_f + y E(r_P)$$

You can find y using this equation.

- *Your assistant gives you the following diagram as the efficient frontier of the group of stocks you asked him to analyze. The diagram looks a bit odd, but your assistant insists he doublechecked his analysis. Would you trust him? Is it possible to get such a diagram?



- The following figure shows plots of monthly rates of return and the stock market for two Stocks.
 - Which stock is riskier to an investor currently holding a diversified portfolio of common stock?
 - Which stock is riskier to an undiversified investor who puts all of his funds in only one of these stocks?



12. Which of the following portfolios would be off the efficient frontier? Briefly explain your answer. (CFA Question)

Portfolio	Expected return	Portfolio risk
A	13	17
B	12	18
C	18	30