THE UNIVERSITY OF MELBOURNE

FNCE10002 Principles of Finance
Semester 1, 2019

Modern Portfolio Theory and Asset Pricing II
Tutorial Questions for Week 7

*This tutorial is divided into two parts. The answers to the questions in Part I need to be submitted at the **beginning** of your tutorial. All answers must be **handwritten** and in **original** (photocopies/emails will not be accepted). Please follow the instructions on the Tutorial Hand-in Sheet available on the LMS via the Tutorials link. The answers to questions in Part II do not need to be submitted and will be discussed in your tutorial. Please make sure that you have worked through these questions and are prepared to discuss them if called upon by your tutor.*

Note that questions flagged as "EXM" are past exam questions that I've used in this subject or subjects similar in scope to this subject, while those flagged as "TXT" are sourced from the textbook. Detailed answers to the questions in Part II will only be provided in tutorials. Brief answers may be provided via the LMS after a time lag. This policy is in place to ensure that you attend your tutorials regularly and receive timely feedback from your tutor. If you are unsure of any answer you should check with your tutor, a pit stop tutor, online tutor or me.

Part I: Answers to be Submitted to Your Tutor

A. Questions and Problems

A1.[TXT] Answer each part separately.

a) The table below shows the beta and standard deviation for two stocks. Is the information shown in the table possible? *Explain*.

systematic risk

Stock	Beta	Standard Deviation of Return
A	1.5	22.0%
B	0.9	35.0%

→ systematic risk + unsystematic risk

b) According to the capital asset pricing model, is the following information possible? *Explain*.

Security	Expected Return	Standard Deviation of Return
X	4%	0.0%
Y	2%	20.0%

→ Risk-free security. $r_f = 4\%$

→ If its β is negative, it can have a required return less than r_f

c) If a security has a beta of 1.0 will its standard deviation be equal to the standard deviation of the market portfolio? *Explain*.

A2.[TXT] Answer each part separately and show your calculations.

a) The riskfree rate is 3% and the expected market risk premium is 6%. What is the expected return on a security with a beta of 1.1?

b) The expected return on the market portfolio is 12% and the riskfree rate is 6%. What is the expected return on a security with a beta of 0.7?

c) The expected return on a security is 14% and its beta is 1.5. What is the riskfree rate if the expected return on the market portfolio is 10%?

d) If the riskfree rate equals 4% and a security with a beta of 0.75 has an expected return of 10%, what is the expected return on the market portfolio?

A3.[EXM] The beta of OzCo Ltd is 1.1, the expected return on the market portfolio is 12% and the riskfree rate is 5%. Based *only* on the current price and future expected cash flows from OzCo Ltd an analyst estimates that the stock's expected return is 14%.

a) Using the CAPM, calculate the required rate of return on OzCo.

b) Are OzCo shares currently under- or over-priced? What would you expect to happen to OzCo's expected return and price? *Explain*. (*No calculations required*.)

Part II: Submission of Answers Not Required

B. Short Answer Questions

Provide brief responses to the following questions.

B1. Classify each of the following events as a source of systematic or unsystematic risk and explain your classification.

a) The governor of the Reserve Bank of Australia resigns unexpectedly, and no announcement of a replacement is forthcoming.

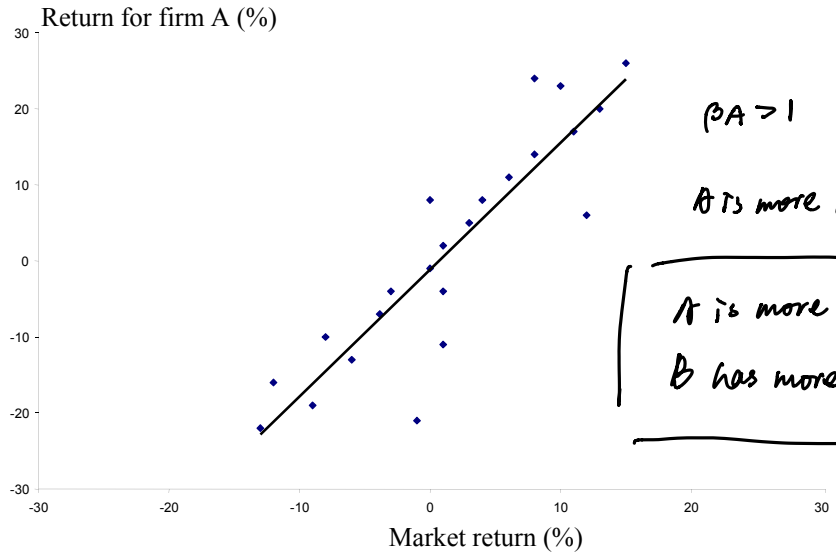
b) The entire senior management team of V. R. Dodgy, Ltd. is convicted of insider trading and sentenced to varying prison terms. Market commentators suggest that the trial and conviction is a direct result of the incoming government's "get tough on white collar crime" approach.

c) Following the US Federal Reserve's decision to raise interest rates, the Reserve Bank of Australia decides to raise the cash rate as well. The move catches markets by surprise.

d) A major consumer products firm loses a multibillion dollar product liability case.

e) The Australian High Court rules that no employer can lay off an employee without first giving 90 days' notice.

B2. TXT The graphs below show scatter plots for the returns on the ordinary shares of firms A and B relative to the market portfolio. What, if anything, can you say about the systematic and unsystematic risks of firms A and B?

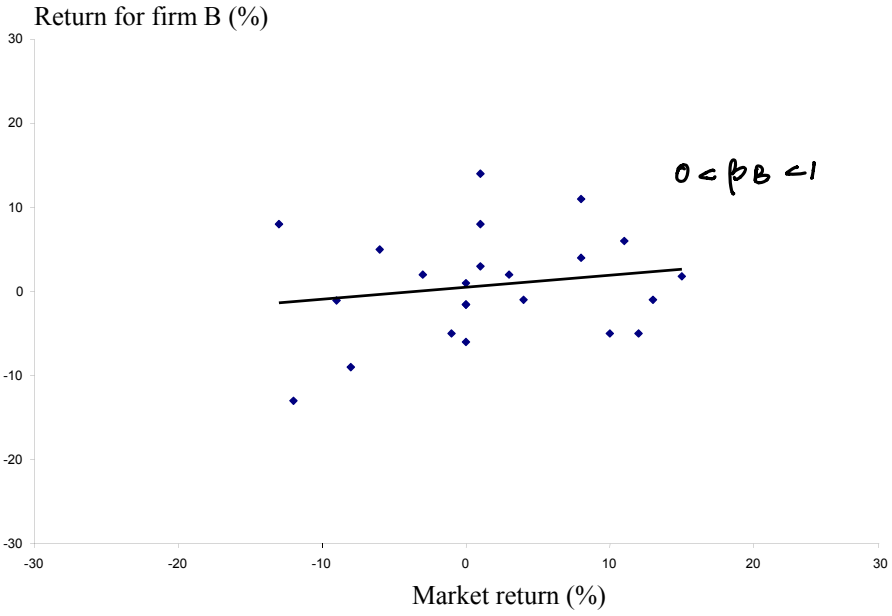


$\beta_A > 1$

A is more correlated than B

A is more sensitive than B

B has more unsystematic risk/R



$0 < \beta_B < 1$

C. Multiple Choice Questions

For each question pick the *most reasonable* response based *only* on the information provided.

C1. EXM Assume that the CAPM is correct and a security's beta has been estimated as 1.2. The riskfree rate of return is 6% and the security's expected rate of return is 18%. This implies that the market risk premium is **closest** to:

b

a) 6.0%.
b) 10.0%.
c) 12.0%.
d) 16.0%.

$\beta = 1.2$
$R_f = 6\%$
$E(r_j) = 18\%$

$18\% = 6\% + x \cdot 1.2$
$12\% = x \cdot 1.2$

b C2. [EXM] Assume that the riskfree rate is 5% and that you can invest in the market portfolio which has an expected return of 15% and a standard deviation of return of 20%. You have $5,000 available for investment and you want to form a portfolio with an expected return of 20%. In this case, you:

a) Need to lend $2,500 at the riskfree rate and invest $2,500 in the market portfolio.
b) Need to borrow $2,500 at the riskfree rate and invest $7,500 in the market portfolio.
c) Need to borrow $7,500 at the riskfree rate and invest $12,500 in the market portfolio.
d) Cannot achieve an expected return of 20% because the expected return of the market portfolio is only 15%.

Questions C3 – C5 are based on the following information.

The earnings per share of Ouno Ltd are expected to be $1.25 next year and the company is expected to maintain a constant payout ratio of 40% forever. The company's earnings are expected to grow at a constant rate of 8% p.a. forever. The standard deviation of the stock's returns is 40% and its covariance with the market portfolio is 0.05. The expected market risk premium is 10%, the standard deviation of the market portfolio is 25% and the government bill rate is 5%.

b C3. [EXM] Ouno Ltd's beta is **closest** to:

a) 0.6.
b) 0.8.
c) 1.0.
d) 1.2.

a C4. [EXM] In equilibrium, Ouno Ltd's stock price should be **closest** to:

a) $10.00.
b) $15.00.
c) $25.00.
d) $50.00.

a C5. [EXM] Assume that there is an unexpected rise in the market risk premium to 12%. All else being the same, Ouno Ltd's stock price would:

a) Fall by around 24%.
b) Fall by around 14%.
c) Rise by around 32%.
d) Remain unchanged.

D. Problems

D1. [TXT] Shares of Firm A currently sell for $30.00, their beta is 1.25, the riskfree rate is 4% and the expected return on the market portfolio is 10%. You forecast that the share price will be $33.00 next year and that no dividend will be paid at that time.

a) Should you buy stock A? *Show all calculations*.

b) What price today would lead you to conclude that the shares are fairly priced? *Show all calculations*.

(a) $E(r_j) = r_f + [E(r_m) - r_f] \cdot \beta$

$= 4\% + 6\% \cdot 1.25$

$= 11.5\% = r_E$

$P_{1\,real} = P_0(1+r_E) = 33.45 > P_1$ forecast

~~you should buy~~

obs return

$E(r_A) = \frac{P_1 - P_0}{P_0} = 10\%$

obs return < req return

overpriced

Don't buy

(b) $P = \frac{33}{1+11.5\%} = 29.59$

To profit short sell

$30

↓

in future price ↓ eg $29.6

$0.4 ↓