Loughborough University

INTRODUCTION TO FINANCIAL ECONOMICS
(21ECB004)

Semester 1 2021/22 (1b) Exam paper

Answer **SECTION A, TWO** questions from **SECTION B and ONE question from SECTION C.**
This exam is marked out of 100.

Additional Instructions

This is a (1b) online examination, meaning you have a total of **2 hours plus an additional 30 minutes** to complete and submit this paper. The additional 30 minutes are for downloading the paper and uploading your answers when you have finished. If you have extra time or rest breaks as part of a Reasonable Adjustment, you will have further additional time as indicated on your exam timetable.

It is your responsibility to submit your work by the deadline for this examination. You must make sure you leave yourself enough time to do so.

It is also your responsibility to check that you have submitted the correct file.

Exam Help
If you are experiencing difficulties in accessing or uploading files during the exam period you should contact the exam helpdesk. For urgent queries please call **01509 222900**.
For other queries email examhelp@lboro.ac.uk

For questions requiring quantitative or narrative answers, you are **free** to **hand-write** or **type** them, the latter being preferred. A mix of hand-written and typed answers is also acceptable.

For questions requiring graphical answers, you are **free** to use a **drawing tool** (e.g. the Shapes tool in MS Word) or **hand-draw** them, the latter being preferred.

You may use any calculator (not just those on the University's approved list).

This is an **open book exam** and you may refer to module materials, notes or textbooks when answering. **You may not however copy or reproduce content wholesale from module materials**. Students who do this will be marked down for poor scholarship.

You must clearly identify the question and part as required in your answer. If you wish you may include the relevant exam question and/or part as a heading.

You may include headings, bullet points etc to help with clarity as required. Graphs and images may also be included and should be appropriately referenced.

In text citations should use the Harvard style in accordance with the School of Business and Economics guidelines. You do not need to include a reference list.

SECTION A

(30 marks; Suggested time: 36 minutes)

Answer Question 1

1. Answer any **THREE** of the following:

(i) Critically discuss the statement: “The theory and data support the negative relationship between risk and return.” (10 marks)

(ii) Critically discuss the statement: “The weak form of efficiency makes technical analysis ineffective.” (10 marks)

(iii) Discuss the different types of trading at the London Stock Exchange. (10 marks)

(iv) Explain how financial intermediaries impact investment in physical capital in the economy. (10 marks)

(v) Critically discuss the impact of diversification on systematic and unsystematic risk. (10 marks)

(vi) Compare and contrast annuity and perpetuity. (10 marks)

SECTION B

(40 marks; Suggested time: 48 minutes)

Answer TWO of questions 2-4

2. Suppose, that you have been given the following information on the yield to maturity of the zero-coupon bonds:

Term (Years)	1	2	3	4	5
YTM (%)	0.7%	1.0%	1.2%		

Moreover, you have been informed that the $F_{3,4} = 1.2\%$ and $F_{4,5} = 0.2\%$, where $F_{t1,t2}$ denotes annual forward rate between year $t1$ and year $t2$.

(i) Calculate the missing yields to maturity and forward rates $F_{1.2}$ and $F_{2,3}$. (6 marks)

(ii) Explain the difference between the yield to maturity on the zero-coupon bond and forward rate. In light of the information provided in this question and your calculations in (i) explain what you expect to happen to one-year spot rates in the next 4 years and exactly why? (8 marks)

(iii) In many countries across the world, we observe historically low interest rates. Explain briefly what this implies for the bond prices. Support your answer with a relevant example. (6 marks)

3. Consider 2.5% Treasury (2022) that are UK government bonds maturing on May 21st, 2022, when the final coupon will also be paid. Assume, that coupons on these bonds are paid annually on May 21st. On May 22nd, 2021, 2.5% Treasury (2022) were priced at £103, per £100 nominal. Meanwhile, inflation was officially forecast to be 3% over the following 12 months. For May 22nd, 2021, calculate the following. Give answers in % correct to 4 decimal places.

(i) The nominal interest yield on 2.5% Treasury (2022). (2 marks)

(ii) The nominal redemption yield on 2.5% Treasury (2022). Explain in your own words the way of calculating the nominal interest yield and why your answer differs from the nominal interest yield calculated in (i). (6 marks)

(iii) The real *ex-ante* redemption yield on 2.5% Treasury (2022). Comment on your result. (3 marks)

(iv) Suppose that because of an oil price shock, inflation expectations increase to 6%. According to Fisher, exactly what would you expect to happen to the nominal redemption yield of 2.5% Treasury (2022)? Explain briefly. (3 marks)

Question 3 continues/…

(v) Now consider 2.5% Treasury (2023) that are UK government bonds maturing on May 21st, 2023, when the final coupon will also be paid. Assume, that coupons on these bonds are paid annually on May 21st. On May 22nd, 2021, 2.5% Treasury (2022) were priced at £103, per £100 nominal. For May 22nd, 2021, calculate the nominal redemption rate and show your workings. (6 marks)

4. Gold plc is a public company whose shares currently trade at £7.00. The company has had 5,000,000 shares outstanding for the past ten years. The company has recently reported earnings of £3,000,000 and has a policy of paying out 60% of earnings in dividends each year. The earnings history of the firm is as follows:

Last reported	£3,000,000
One year ago	£2,700,000
Two years ago	£2,500,000

The rate of growth in dividends and earnings shown in the past two years is expected to continue into the future.

(i) What is the rate of growth in dividends and the rate of return on Gold? (6 marks)

(ii) Calculate and discuss the historical and more complete (prospective) price to earnings ratio. (6 marks)

(iii) Assume that the next dividend is due in January 2023. Then, suppose that following the poor investments, management considers two options:

a) the January 2023 and January 2024 dividend will be skipped completely. The January 2025 dividend will be retained at the last reported level and will remain at this level thereafter.
b) the January 2023 will be held at the “last reported” level and will grow thereafter at 0.075% per annum.

Which option would you prefer as a holder of Gold’s shares and why? Show your workings. In both cases assume the rate of return calculated in (i). (8 marks)

SECTION C

(30 marks; Suggested time: 36 minutes)

Answer ONE of questions 5-6

5. You have been bequeathed a legacy of £257,542.23 and you are considering placing the entire funds either in the shares of Alpha plc or in the shares of Beta plc. Your stockbroker told you that at least some degree of diversification could be achieved by investing some of the money in the Alpha plc and some in the Beta plc.

You are given the following information:

State of the economy	Probability of occurrence	Returns on Alpha plc	Returns on Beta plc
Recession	0.25	16%	4%
Normal growth	0.5	14%	7%
Boom	0.25	11%	7%

(i) Calculate the expected return and standard deviation for each security separately. Explain your results. (8 marks)

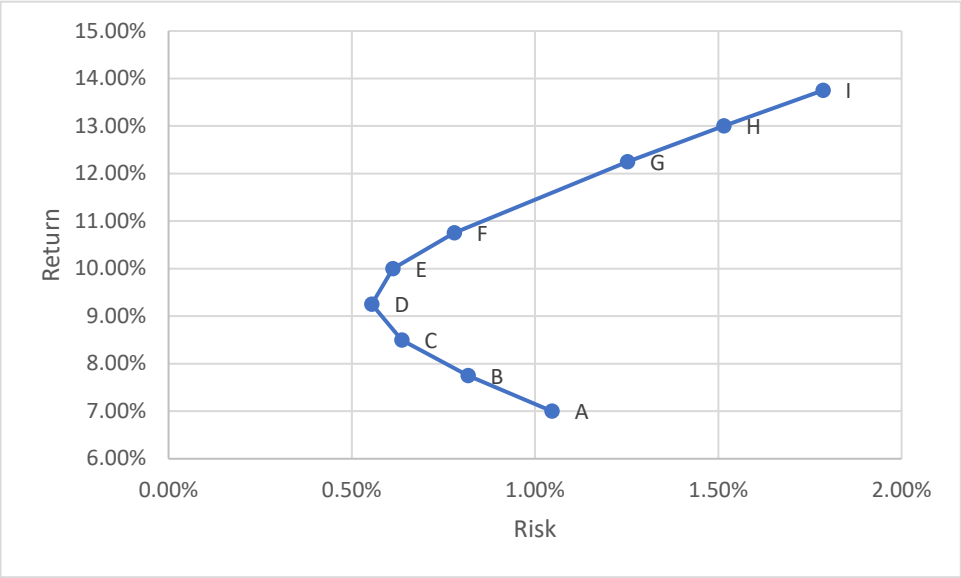
(ii) Calculate the correlation coefficient between the two shares. Comment on your result. (6 marks)

(iii) Calculate the expected return and risk of the portfolio consisting of 50% of Alpha and 50% of Beta (i). Compare the results with (i) and comment briefly. (6 marks)

(iv) Now assume that the correlation coefficient between the two shares is 1. Calculate the risk of the portfolio consisting of 50% of Alpha and 50% of Beta. Compare the results with (iii) and comment briefly. (5 marks)

(v) To provide you with a greater choice your stockbroker calculated risks and returns of portfolios with different proportions of Alpha and Beta and drew an estimated portfolio risk-return line based on the plot points for the two-share portfolio. Explain which portfolio (i.e. A, B, C, D, E, F, G, H, I) and why would you choose if you were a high risk-averse investor. (5 marks)

Question 5 continues/…



6. During 2010-20 the expected return on the London Stock Exchange (LSE) index was 11% per annum with a variance of 400; the risk-free rate over the period was 2% per annum.

(i) What was the market price of risk in London? Plot the Capital Market Line for the LSE and comment on your graph and the market price of risk. (8 marks)

(ii) James Smith is reviewing his investments. He holds shares in Gamma plc which have a beta coefficient of 1.5 and in Delta plc which have a beta coefficient of 0.5. Gamma plc currently trades with an expected return of 15% per annum and Delta plc currently trades with an expected return of 7%. James Smith considers whether he should buy the shares of the two companies or sell them short. Explain in detail to Mr Smith what he should do and support your answer with a relevant graph. (12 marks)

(iii) Compare and contrast options and futures. (10 marks)

D. G. TRZECIAKIEWICZ