

PART II (SECOND AND FINAL YEAR)

ACCOUNTING AND FINANCE

AcF 321 INVESTMENTS

(2.5 hours PLUS 30 minutes upload time)

Answer any **THREE** questions.

The use of standard calculators with scientific, and standard arithmetic and statistical functions, is permitted.

QUESTION 1

- a. You have two estimates of the beta of a share listed on the London stock exchange. Both estimates are calculated by regressing returns on the share against returns on the FTSE –100 index over the last five years. One is computed using daily returns, while the other is computed using weekly returns. The first estimate is 0.72, and the second is 0.95. What explanations might there be for the difference?
[6 marks]
- b. Consider two stocks A and B. Both have an expected return of 10%, and their standard deviations are 18% and 16% respectively. Also, their correlation is 0.35. If the risk-free rate of return is 3%, identify the tangency portfolio, and calculate its expected return and standard deviation.
[12 marks]
- c. A portfolio is equally split between 10 different stocks, each of which has a beta of 1.5 and the same correlation with the market portfolio. The idiosyncratic component of returns is uncorrelated across stocks. The annualized volatility of the market is 15%, and of the portfolio's volatility is 24%.

Required:

- i. What is the volatility of each stock?
[10 marks]
- ii. What is the correlation between each stock and the market?
[3 marks]
- iii. What is the correlation between one stock and another?
[2 marks]

TOTAL: 33 MARKS

QUESTION 2

- a. Compare the assumptions underlying the Capital Asset Pricing Model and arbitrage pricing models.

[10 marks]

- b. An analyst is interested in testing whether “Age” (defined as the number of years a company has been publicly listed) risk is priced in addition to the market factor (Market) that is considered in CAPM. The analyst has decided to employ the Fama-McBeth two-stage procedure.

Required:

- i. Briefly explain how you would construct a portfolio to mimic the “Age” risk.

[5 marks]

- ii. Explain the first-stage of the regression analysis you would employ.

[6 marks]

- iii. What would the dependent and independent variables in the second stage of the analysis be?

[6 marks]

- iv. What would the results be in a CAPM world?

[6 marks]

TOTAL: 33 MARKS

QUESTION 3

- a. Show that if the CAPM holds, then a randomly chosen portfolio will have a negative Fama measure. [5 marks]
- b. A manager buys four shares of stock today and then sells one of those shares each year for the next four years. His actions and price history are summarized below. The stock pays no dividends.

Time	Price	Action
0	£100	Buy 4 Shares
1	£110	Sell 1 Share
2	£112	Sell 1 Share
3	£100	Sell 1 Share
4	£100	Sell 1 Share

Required:

- i. Calculate the time-weighted geometric average return for the manager. [4 marks]
- ii. Calculate the time-weighted arithmetic average return for the manager. [4 marks]
- iii. Explain if you would expect the dollar-weighted (geometric) average would be higher or lower than the time-weighted geometric average? (Do not have to calculate the dollar-weighted average.) [3 marks]
- c. A portfolio P is invested in two assets A and B and the market portfolio M. The diversifiable components of A and B are uncorrelated with each other. Over the last year, you have the following statistics, where T denotes T-bills in which the portfolio was not invested:

	A	B	M	T
Return	10.0%	8.0%	9.0%	3.0%
Beta	0.80	1.20	1.00	
Standard Deviation	12.0%	15.0%	10.0%	
Portfolio weight	20.0%	10.0%	70.0%	

Required:

- i. Compute the Jensen measure for each asset and for the portfolio as a whole. [3 marks]
- ii. Calculate the idiosyncratic standard deviation for both A and B. [4 marks]
- iii. Calculate the portfolio's beta, total standard deviation and idiosyncratic standard deviation. [6 marks]
- iv. Calculate the Sharpe ratio of the portfolio and of the market. [4 marks]

TOTAL: 33 MARKS

QUESTION 4

- a. Discuss the difference between Pure Expectation and Liquidity Preference hypotheses of the term-structure of interest rates [5 marks]
- b. The table below lists the prices of zero-coupon bonds of various maturities, expressed as a price per \$1000 of principal.

<i>Maturity</i>	<i>Price</i>
1	950.00
2	850.00
3	750.00
4	650.00

Required:

- i. Calculate the yield to maturity of each bond [6 marks]
- ii. Calculate the corresponding sequence of implied forward rates.

[6 marks]

- iii. Assuming that the pure expectations hypothesis holds, calculate the expected price path of the four-year bond as time passes.

[12 marks]

- c. Long-term Treasury bonds currently are selling at yields to maturity of nearly 8%. You expect interest rates to fall. The rest of the market thinks that they will remain unchanged over the coming year. In each question, choose the bonds that will provide the higher holding-period return over the next year if you are correct. Briefly explain your answer.

Required:

- i. A Baa-rated bond with coupon rate 8% and time to maturity 20 years, or an Aaa-rated bond with coupon rate of 8% and time to maturity 20 years. [2 marks]
- ii. A treasury-issued perpetual bond with 5% coupon, or a treasury-issued 25-year zero coupon bond. [2 marks]

TOTAL: 33 MARKS

QUESTION 5

- a. Why is it harder to assess the performance of a hedge fund portfolio manager than that of a typical mutual fund manager?

[10 marks]

- b. Here are data on three hedge funds. Each fund charges its investors an incentive fee of 20% of total returns. Suppose initially that a fund of funds (FF) manager buys equal amounts of each of these funds, and also charges its investors a 20% incentive fee. Assume that management fees other than incentive fee are zero for all funds.

	Hedge Fund 1	Hedge Fund 2	Hedge Fund 3
Start of the Year (millions)	\$100	\$100	\$100
Gross portfolio rate of return	20%	10%	30%

Required:

- i. Compute the rate of return after incentive fees to an investor in the fund of funds.

[12 marks]

- ii. Suppose that instead of buying shares in each of the hedge funds, a stand-alone (SA) hedge fund purchases the same portfolio as the three underlying funds. The total value and composition of the SA fund is therefore identical to the one that would result from aggregating the three hedge funds. Assume that SA fund also charges an incentive fee of 20%. Show that an investor in the SA fund would be better off than one in the FF.

[3 marks]

- iii. Now, suppose that the return on the portfolio held by the hedge fund 3 were -30% rather than +30%. Would an investor in the SA fund still be better off than one in the FF? Explain.

[8 marks]

TOTAL: 33 MARKS