

EXAMINATION

22 April 2009 (pm)

Subject ST5 — Finance and Investment Specialist Technical A

Time allowed: Three hours

INSTRUCTIONS TO THE CANDIDATE

1. *Enter all the candidate and examination details as requested on the front of your answer booklet.*
2. *You have 15 minutes before the start of the examination in which to read the questions. You are strongly encouraged to use this time for reading only, but notes may be made. You then have three hours to complete the paper.*
3. *You must not start writing your answers in the booklet until instructed to do so by the supervisor.*
4. *Mark allocations are shown in brackets.*
5. *Attempt all six questions, beginning your answer to each question on a separate sheet.*
6. *Candidates should show calculations where this is appropriate.*

Graph paper is required for this paper.

AT THE END OF THE EXAMINATION

Hand in BOTH your answer booklet, with any additional sheets firmly attached, and this question paper.

<p><i>In addition to this paper you should have available the 2002 edition of the Formulae and Tables and your own electronic calculator from the approved list.</i></p>
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- 1**
- (i) Describe the uses of performance measurement for an investment portfolio. [6]
 - (ii) Discuss the limitations and disadvantages associated with portfolio performance measurement. [8]
 - (iii) Describe the key reasons why hedge fund index returns are likely to overstate actual returns and understate volatility for a typical hedge fund investor. [4]
 - (iv) State the formula for the Sharpe ratio, defining any terms you use. [2]
 - (v) Explain why hedge funds highlight the Sharpe ratio in their promotional material, rather than the Treynor or Jensen ratios. [2]
 - (vi) Describe the key limitations of the Sharpe ratio as a measure of the skill of a hedge fund's managers. [5]
- [Total 27]

2 You are the portfolio manager for a global equity pooled fund and have received a quarterly analysis of companies in the European telecoms sector.

- (i)
 - (a) Describe what you would expect to see in a high quality piece of fundamental research of this nature.
 - (b) List the factors that you might expect to see included in the numerical analysis. [6]
- (ii) Outline the additional commentary that you would expect to see for a company in the sector that is more highly leveraged than average, with a significant amount of debt due to be repaid in the next two years. [3]

Your company is considering launching two new global equity pooled funds, the Global Equity (Higher Leverage) Fund and the Global Equity (Lower Leverage) Fund. The intention is for a combined investment in the two new funds to broadly correspond to an investment in the existing fund. The two funds will invest in the same universe of underlying companies and can make the same buy/sell decisions as the existing global equity fund. However, companies that are highly geared can only be invested in by the Higher Leverage Fund.

- (iii) Discuss why a potential investor might find the choice of two new funds more attractive than the existing global equity fund. [7]
 - (iv) Explain why an investor should not expect investments of \$1m in each of the two new funds to perform precisely in line with a single \$2m investment in the existing global equity fund. [4]
- [Total 20]

- 3** The trustees of a pension fund decide to purchase a three year swap contract under which the pension fund will receive a fixed rate payment stream. The pension fund is required to pay a floating rate payment stream in return. The pension fund receives the following information about the swap and the likely payments:

- Term 3 years
- Notional value of swap £50m
- Payments are made in arrears semi-annually
- The swap year calculations assume there are 360 days in a year

<i>Period</i>	<i>Number of days in period</i>	<i>Annual Forward Interest Rate</i>
1	183	4.00%
2	181	4.25%
3	182	4.5%
4	182	4.75%
5	181	5.0%
6	183	5.25%

- (i) Define the term puttable swap. [1]
- (ii) Explain why a pension fund may wish to purchase a puttable swap. [2]
- (iii) State the type of swap that the trustees have purchased. [1]
- (iv) Using the information above calculate:
- (a) Present value of the floating rate payments.
- (b) The fixed rate of the swap. [4]

The pension fund trustees proceed with the proposed contract for the payments described above and the fixed rate of the swap is set at 4.75% pa.

- (v) Calculate the profit or loss to the pension fund at the end of the swap contract. [4]
- (vi) Explain what difference there would have been to the profit/loss on the swap if interest rates had risen during the duration of the swap contract. [2]
- [Total 14]

4

- (i) (a) Define the term Warrant.
(b) State two differences between a Warrant and an Option. [2]
- (ii) (a) Define the terms American call and European call.
(b) Explain which one is likely to attract a higher premium. [2]
- (iii) Draw a diagram for each of the following strategies and explain why an investor may wish to undertake such strategies.
- (a) Long one call at a strike price of $(X - a)$
Short two calls at a strike price of X
Long one call at a strike price of $(X + a)$
All three have same expiry date
- (b) Buying one call and one put with the same expiry and strike price
- (c) Buying call options of a certain strike price and selling the same number of call options at a lower strike price (in the money) with the same expiry date. [6]

As part of an investor's portfolio there are 100 call options that have been written with an exercise price of £1.50 and an expiry date of November. The option premium received was £0.50 per option.

- (iv) State the payoff for the investor. [1]
- (v) Draw the payoff chart for the entire holding. [2]
- (vi) Calculate the profit or loss to the investor if the price of the share at expiry is:
- (a) £0.75
(b) £1.50
(c) £2.15

State any assumptions made. [2]

The derivatives exchange where the call options are traded requires an initial margin of 20% of the premium received. In addition a variation margin has to be paid equal to 100% of the option price movement. The value of the premium at the end of September was £0.55.

- (vii) Calculate the total margin the investor has had to post to the exchange at the end of September. [2]

[Total 17]

- 5**
- (i) Define the par yield of a bond. [1]
 - (ii) Write down the equation of value that needs to be satisfied by the par yield, C_2 , of a two year bond (interest paid annually in arrears), in terms of the zero coupon yield, ZC_t , at time t . [2]
 - (iii) Calculate the zero coupon yields at times 1, 2 and 3 from the following par yield curve, assuming coupons are paid annually in arrears:

<i>Term</i>	<i>Par Yield</i>
1	5.50%
2	5.40%
3	5.35%
4	5.30%

[6]

- (iv) Describe three techniques that can be used to identify bond anomaly switching opportunities. [6]

[Total 15]

- 6**
- (i)
 - (a) Describe the primary purpose of an investment manager agreement.
 - (b) List typical restrictions that might be included within an investment manager agreement for a global bonds portfolio for a charity fund. [3]
 - (ii) Explain why agreements for active managers generally adopt a relatively prescriptive approach, rather than giving the manager complete discretion in how they achieve the target return. [4]

[Total 7]

END OF PAPER