

# INSTITUTE OF CHARTERED SHIPBROKERS

## 2009 EXAMINATIONS

THURSDAY 30 APRIL – AFTERNOON

### FUNDAMENTALS OF FINANCE

Time Allowed – Three Hours

**Answer Question 1 (compulsory) and four other questions. (Total Five)**  
**ALL questions carry equal marks**

Non Programmable calculators may be used.

1a) You wish to invest \$1000 at 10% nominal rate for one year. If the inflation rate is 4%, what is the real value of the investment at the end of one year?

- A) \$1100
- B) \$1000
- C) \$1058
- D) \$1040

1b) An investment at 10% nominal rate compounded continuously is equal to an equivalent annual rate of:

- A) 10.250%
- B) 10.517%
- C) 10.381%
- D) 10.750%

1c) The variance or standard deviation is a measure of:

- A) Unique risk
- B) Total risk
- C) Market risk
- D) None of the above

- 1d) You are given information about the following two mutually exclusive projects. The opportunity cost of capital is 10%. Which project would you select?

Project	C <sub>0</sub>	C <sub>1</sub>	C <sub>2</sub>	IRR
A	-4,000	2,500	3,500	30%
B	-8,000	5,000	6,000	23%

- A) Project A
- B) Project B
- C) Projects A and B
- D) Neither of the above

- 1e) Two machines, A and B, which perform the same functions, have the following costs and lives.

Type	PV Costs	Life
Machine A	\$6,000	5
Machine B	\$8,000	7

Which machine would you choose? The two machines are mutually exclusive and the cost of capital is 15%.

- A) Machine A
- B) Machine B
- C) Don't buy either machine
- D) Select both machines

- 1f) Describe in Detail

- A) Payback
- B) Annual Rate of Return
- C) Profitability Index
- D) Net Present Value
- E) Internal Rate of Return

- 2) You are a Director of a large shipping business. You have identified three investment projects that you have called the projects simply project A, B and C all costing 3,000 euros to initiate, having a life of three years with income arising at the end of the year, and the residual value of the assets being zero.

Depreciation is on a straight line basis and amounts to 1,000 euros per year. Tax where applicable is at the rate of 50% and is charged and collected simultaneously at the end of each year. The details of earnings, depreciation, tax and profitability are given below:

Project years	2009 Euros	2010 Euros	2011 Euros
<b>Project A</b>			
Earnings	2,500	2,500	2,500
Depreciation	1,000	1,000	1,000
Profit before tax	1,500	1,500	1,500
Tax at 50%	750	750	750
Profit after tax	750	750	750
<b>Project B</b>			
Earnings	1,500	2,500	3,500
Depreciation	1,000	1,000	1,000
Profit before tax	500	1,500	2,500
Tax at 50%	250	750	1,250
Profit after tax	250	750	1,250
<b>Project C</b>			
Earnings	3,500	2,500	1,500
Depreciation	1,000	1,000	1,000
Profit before tax	2,500	1,500	500
Tax at 50%	1,250	750	250
Profit after tax	1,250	750	250

You are to produce a report to the board of directors showing for each project the payback period; the rate of return and the net present value of each project. Assume the cost of capital is 10%. Conclude in your report that on the assumption that each project is exclusive to your company which project, if any, you would recommend the company invest in.

- 3a) Virginia Logistics expects to earn \$100 million per year in perpetuity if it does not undertake any new projects, The firm has an opportunity that requires an investment of \$15 million today and \$5 million in one year. The new investment will begin to generate additional annual earnings of \$10 million two years from today in perpetuity. The firm has 20 million shares of common stock outstanding, and the required rate of return on the stock is 15 percent:
- i. What is the share price of the stock if the firm does not undertake the new project?
  - ii. What is the value of growth opportunities if the company undertakes the project?
  - iii. What will the share price of the stock be if the firm undertakes the new project? 50%
- 3b) The Citation Encore of the Chief Executive is not fully utilised. You judge that its use by other officers would increase direct operating costs by \$20,000 a year and would save \$100,000 a year on airline bills. On the other hand, you

believe that with the increased use the company will need to replace the jet at the end of three years rather than four. A new jet costs \$1.1 million and (at its current low rate of use) has a life of six years. Does it make economic sense to allow other officers to use the plane? Assume that the real opportunity cost of capital is 10% and all figures presented above are also in real terms.

50%

- 4a) ICS Manufacturing Plc (ICSM) is a company that operates in the UK. It has traditionally raised capital in the UK market and therefore has substantial quantities of long-term Pound sterling denominated debt. More recently, ICSM was involved in a series of projects in Japan and as a result, the company will have substantial cash inflows in Japanese Yen over the next seven years. The following rates are quoted in the swap market as of March 15, 2008:

Years	Japanese Yen - ¥		Pound Sterling - £	
	Bid	Ask	Bid	Ask
1	0.07	0.10	4.52	4.54
2	0.16	0.18	4.63	4.67
3	0.28	0.30	4.74	4.78
4	0.42	0.44	4.80	4.86
5	0.57	0.60	4.84	4.89
6	0.73	0.76	4.88	4.92
7	0.89	0.92	4.90	4.95

- i. ICSM wants to use its long Japanese Yen position to pay-off some of its Sterling Pound denominated debt over a seven year period. Calculate the relevant annual swap payments on a 500 million Japanese Yen notional principal. Assume that the spot exchange rate as of 15 March 2008 is Yen 198.76 per Pound Sterling (¥ 198.76 /£)
  - ii. A year has now passed since the initialisation of the swap above. Assume that on 16 March 2009, one year and one day following the commencement of the swap agreement, ICSM wishes to unwind its currency swap position. The current swap rates for Japanese Yen are now 0.88% - 0.9%, the current swap rates for Pound Sterling are 4.9% - 4.93% and the current spot exchange rate is ¥ 112.00 /£. What is the cost or profit to ICSM Plc from unwinding the swap?
- 5) XYZ Shipping, owners of dry bulk tonnage, are negotiating the renewal of a chartering contract for M/V Ariadne. Her current charterer (Grain Expo) is offering them a four year deal under the following terms.

Starting in one month, XYZ will be receiving \$400,000 per month growing at a rate of 0.5% per month for the next 11 months (i.e. till month 12). Freight payments in the second year (months 13-24) will be \$500,000 at period 13, growing at a rate of 0.4% per month until period 24, followed by payments of \$600,000 at period 25 growing at a rate of 0.3% thereafter, until the end of the fourth year (period 48).

Grain Impex, a rival charterer, is offering a flat fee of \$20,000,000 for a four year contract. If the shipowner requires a return of 10% per annum on their investments, which charterer is offering them a better deal?

- 6) During the period 2005 to mid 2008 there have been a number of Shipping Companies IPO's on various stock markets. Discuss why this is a recent phenomena for the shipping industry. Give examples if possible.
  
- 7) Describe Risk and detail the main areas of financial risk for a Maritime company, (e.g. a shipowner, shipbroker, shipyard, agency). Provide suggested solutions currently available for this type of company wishing to minimise these risks.
  
- 8) Betabrokers Plc has been formed to undertake two investment opportunities. The risk and return characteristics of the two projects are as follows:

	A	B
Expected return	12%	20%
Risk	3%	7%

Betabrokers is planning to invest 80% of its available funds into project A and 20% into project B. The directors feel that the correlation co-efficient between the returns of the projects is + 0.1.

- a) Calculate the returns from the proposed portfolio of Projects A and B.
- b) Calculate the risk of the portfolio.
- c) Make comments on your calculations for part (b) in the context of the risk reducing effects (if any) of diversification.
- d) Now assume the correlation coefficient between project A and project B is -1.0. How should Betabrokers invest their funds in order to obtain a zero risk portfolio.

# **THE INSTITUTE OF CHARTERED SHIPBROKERS**

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## **FUNDAMENTALS OF FINANCE (FOF)**

**2009**

### **EXAMINER'S REPORT**

#### **OVERALL COMMENTS**

The paper was set with the shipping manager in mind as well as someone who knew about finance. The paper had the required 8 subjects with question 1 compulsory.

#### **QUESTION 1 - DEFINITIONS - COMPULSORY.**

This question comprised of sub-questions which was to see the candidate's knowledge of basic definitions and understanding..

#### **QUESTION 2 – EVALUATION OF PROJECTS, NPV**

This was a straightforward Investment Appraisal question with payback, ARR, PI and NPV the minimum expected. No discount table was given but the rate of 10% given and so it should not have been difficult to work out the discount factor over three years. Terminology was expected to be known. A report to the managers was required and therefore marks were lost if this was not in a suitable report format.

#### **QUESTION 3 - OPPORTUNITY INVESTMENTS**

This question had two sections which were of a practical nature and were set to find an understanding and knowledge of the subjects.

#### **QUESTION 4 – CURRENCY SWAPS**

A subject which is practical and involves the example of a foreign currency against the pound over a period of a year. This type of question has been asked before so should not have caused any surprise..

## **QUESTION 5 - RETURN ON INVESTMENT**

This question gave an example of two scenarios for a shipowner and the candidate had to work out which gave a better return..

## **QUESTION 6 - INITIAL PUBLIC OFFERINGS.**

This was a current affairs question which was to test the candidate's knowledge of the current financial markets relevant to the shipping industry. Some knowledge of actual companies was expected..

## **QUESTION 7- RISK ANALYSIS**

A very topical question and the idea was to test if the students knew the various methods of mitigating against risk.

## **QUESTION 8 - RISK AND RETURNS**

This question was a company that had two investment opportunities and the expected return was stated and the risk factor given. Therefore knowledge of the risks, returns, correlation and risk reducing elements was to be evidenced. A popular question and all satisfactorily gave sufficient information to pass.

## **CONCLUSION**

This was a wide ranging subject area trying to cover the better known elements of the subject. The knowledge of the candidates proved to be good generally.