



**LEADING TREASURY
PROFESSIONALS**

Examination Paper, Solutions and Examiner's Report

**Paper:
Certificate in Risk Management**

April 2014

SECTION A – Answer TWO COMPULSORY questions

QUESTION 1

RRR, a company based in New Zealand, manufactures a specialised home security product. Most of the shares are held by large global institutions. The majority of sales (by value) are to customers in New Zealand (priced in New Zealand Dollars, NZD) but there are also significant export sales to customers in the USA, priced in USD. All costs are in NZD. RRR has two main competitors, both based in the USA.

Financial data for RRR for the year ended 31 December 2013

	NZD million	Notes
Statement of Profit or Loss		
Revenue	150	This includes NZD 60 million relating to USD sales, converted at an average rate of USD/NZD 1.2800
EBITDA	25	

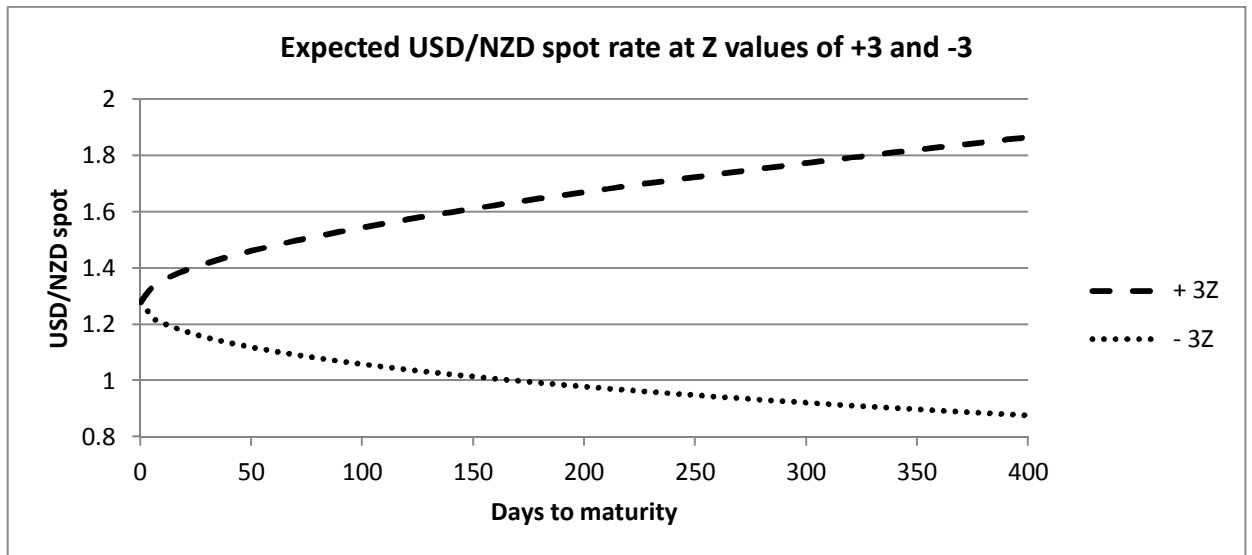
Statement of Financial Position at start of year

Cash and cash equivalents	10	No interest earned
5% bonds	(40)	
Bank borrowings	(20)	Interest charge of 5% on opening balance

Bank borrowings are subject to debt covenants where net debt/EBITDA should not exceed 3.5 times and interest cover should be at least 4 times (based on EBITDA).

VaR analysis of USD/NZD spot movements

RRR's Treasury Analyst has been asked to investigate the worst and best case scenarios for USD/NZD spot over the next year assuming a lognormal distribution for market rates, annual volatility of 12% and today's spot rate of USD/NZD 1.2800. The results are shown below:



Required:

- (a) (i) Define the term 'risk appetite'. (1 mark)
- (ii) Identify **THREE** key factors that are likely to influence a company's risk appetite and discuss each in the context of RRR. (5 marks)
- (iii) Explain the nature of RRR's foreign exchange exposure and assess the extent of such exposure. Your answer should include a sensitivity table for net debt/EBITDA and EBITDA/interest based on USD/NZD rates of 1.2800, 1.2000, 1.1000, 1.0000 and 0.9000. (10 marks)
- (b) (i) Calculate the best and worst exchange rate outcomes in 100 days' time using lognormal VaR and Z values of +3 and -3. No adjustment is required for forward points. (4 marks)
- (ii) State the probability of USD/NZD spot being between the rates calculated in (b)(i) above in 100 days' time. (1 mark)

Hedging policy

RRR does not have a formal hedging policy, although, in the past, occasional hedging deals have been entered into if it was considered that the spot rate was at a favourable level historically. RRR's Board has delegated responsibility for hedging policy to its Risk Management Committee (RMC). Two Directors sitting on the RMC have expressed reservations about carrying out any hedging for foreign exchange risk.

Director A considers that the USD/NZD spot rate is equally likely to move up or down and that, over the longer term, such movements are likely to cancel out and therefore there is unlikely to be any long term financial benefit from hedging foreign exchange exposures.

Director B is of the opinion that shareholders should have been aware of the foreign currency profile of the company when they invested in it and would expect to benefit from favourable exchange rate movements. Therefore the company should not carry out any foreign exchange hedging so that it can still benefit from favourable rate movements.

Required:

- (c) Respond to the views expressed by Directors A and B, concluding with a recommendation of an appropriate risk response for RRR.**

(9 marks)

(Total 30 marks)

QUESTION 2

Assume today is 30 June 2014.

A Japanese company, QQQ, has significant exports to customers in Hong Kong, priced in HKD. The foreign exchange exposure arising from export sales is not hedged at present but the Board of QQQ has taken the decision to introduce a new hedging strategy with effect from 30 June 2014.

Under this new hedging strategy, forecast future HKD sales receipts are to be hedged using forward contracts up to 12 months out on a rolling month-on-month basis. Only 80% of forecast receipts are to be hedged in order to help meet hedge accounting effectiveness tests.

The first transaction under the new hedging strategy is to be carried out today, 30 June 2014, entering into a 12 month forward contract to hedge 80% of forecast HKD 10 million sales receipts due on 30 June 2015. IAS 39 hedge accounting regulations will be applied, treating hedged positions as cash flow hedges.

Required:

- (a) Explain why this hedge will be accounted for as a cash flow hedge rather than a fair value hedge.**

(2 marks)

On 30 June 2014, market rates are:

HKD/JPY 12 months forward: 12.7600

On 30 September 2014, market rates are:

HKD/JPY 9 months forward: 12.5400

JPY 9 month interest rate: 2.0% (act/365)

Required:

- (b) (i) Calculate the fair value, as at 30 September 2014, of the 12 month forward contract taken out on 30 June 2014. Ignore credit spread and transaction costs.**

(4 marks)

- (ii) Explain how this 12 month forward contract would be accounted for when:**

- **Initially entered into on 30 June 2014**
- **Re-valued on 30 September 2014**
- **The hedged sales are invoiced and hence the sale recognised in profit or loss**

No calculations are required in part (b) (ii)

(4 marks)

(Total 10 marks)

SECTION B – Answer **THREE** questions from **FOUR**

QUESTION 3

Assume money market rates are as follows:

Maturity	Overnight	3 day	7 day	30 days	90 days
USD (act/360)	2.4%	2.5%	2.8%	3.3%	3.9%
AUD (act/365)	4.4%	4.5%	4.7%	5.7%	6.5%

Assume USD/AUD spot is 1.0923.

Company A is based in the USA. The Treasurer of Company A is considering how best to invest USD 50 million cash that is forecast to be surplus for 90 days.

Three alternative short term investments are being considered, each with the same counterparty, as follows:

- Investment 1 3 day USD money market deposit to be rolled over every 3 days over the 90 day period and interest reinvested
- Investment 2 90 day USD money market deposit
- Investment 3 90 day AUD money market deposit

Required:

- (a) (i) **Calculate the 90 day USD/AUD forward rate implied by the money market rates provided.**

(2 marks)
- (ii) **Discuss the extent to which the forward rate is a good indicator of the spot rate in 90 days' time.**

(2 marks)
- (b) (i) **Describe the key principles of short term investment.**

(4 marks)
- (ii) **Calculate the effective annual return for each of the investments 1 to 3 listed above assuming that interest rates and exchange rates remain unchanged over the 90 day term.**

(3 marks)
- (iii) **Compare and contrast the risks and benefits to Company A of investments 1 to 3 with reference to the key principles of short term investment.**

(9 marks)

(Total 20 marks)

QUESTION 4

PENSK is a defined benefit pension scheme located in the UK. Company PK is the sponsor company for PENSK.

PENSK's investments have a total value of GBP 900 million, of which 60% is invested in equities and 40% in bonds. Pension payment liabilities are estimated to be approximately GBP 88 million a year for the next 15 years.

The bonds have an AA credit rating and range in maturity from 2 to 20 years, with a modified duration of 9.3 years and modified convexity of 123.0. The yield to maturity on the bonds is currently 4%.

PENSK's Trustees are currently reviewing the risk profile of both the scheme assets and liabilities.

The Trustees are aware that Quantitative Easing (QE) programmes can negatively affect pension schemes. Advisers to PENSK expect a QE programme to be announced shortly and that this would lead to a fall in interest rates, coupled with an increase in the value of equities. Equity values are expected to rise by approximately 2% for each 1% fall in interest rates. Bond yields can be assumed to move in line with interest rates.

Required:

- (a) **Explain the following risk factors and their potential impact on a defined pension scheme value (no calculations are required):**
- **Changing interest rates**
 - **A credit rating downgrade of a corporate bond held as an investment**
- (4 marks)**
- (b) (i) **Calculate the PENSK scheme surplus or deficit.**
- (3 marks)**
- (ii) **Calculate the expected impact on the PENSK scheme surplus or deficit of a QE programme that causes interest rates to fall from 4% to 3%.**
- (6 marks)**
- (iii) **Explain the implications for sponsor PK of a large PENSK scheme deficit.**
- (3 marks)**
- (iv) **Describe methods that can be used by pension schemes to reduce their interest rate exposure.**
- (4 marks)**
- (Total 20 marks)**

QUESTION 5

Assume that you are the newly appointed Treasurer of INT, a transport infrastructure company based in Malaysia. INT is financed by equity plus floating rate bank borrowings. Interest is charged on the borrowings at 12 month KLIBOR plus 150 bp (where KLIBOR is the interbank rate in Malaysia).

The Managing Director has become aware that other companies tend to have a mix of fixed and floating rate debt finance and has asked you to consider the implications of changing the interest profile of INT's debt.

Three derivatives have been identified that could be used to adjust the interest profile of MYR 100 million of INT's floating rate bank borrowings. Each derivative has a 4 year term. Current market prices are as follows:

- 4.0% cap at an upfront premium of 0.8% of the notional principal
- Interest rate swap at 3.5% fixed against 12 month KLIBOR
- Zero cost collar with a cap of 4.0% and a floor of 3.0%

Required:

(a) Explain the potential benefits and challenges for INT of changing the interest profile of debt.

(5 marks)

(b) (i) For each of the three derivatives identified above:

- **Calculate the annual interest rate achieved on the hedged borrowings for each of the following 12 month KLIBOR rates: 2%, 3%, 4%, 5% and 6%. In each case, assume the KLIBOR rate applies throughout the 4 year term. Ignore the time value of money.**
- **Using the graph paper provided, draw a graph to illustrate your results.**

(9 marks)

(ii) Discuss the advantages and disadvantages to INT of using each of the three derivatives listed to alter the interest rate profile of its debt. Your answer should include reference to your results in (b) (i) above.

(6 marks)

(Total 20 marks)

QUESTION 6

USC is a listed company based in the USA. It is in the process of acquiring a French company, FRC. FRC will retain a separate treasury operation but funding will be arranged at group level. The Treasurer of USC is concerned about the implications of this acquisition in respect of:

- Ensuring that FRC's treasury department complies with Sarbanes-Oxley regulations
- The management of foreign exchange exposure created by the acquisition of FRC

Sarbanes-Oxley

The Treasurer of USC has concerns about the extent and quality of the internal control procedures at FRC such as segregation of duties controls and therefore whether FRC's internal controls comply with Sarbanes-Oxley regulations.

Management of foreign exchange exposure

The Board of Directors of USC has decided to protect group gearing (D/D+E) from changes in USD/EUR.

Extract forecast financial results for the financial year ending 31 December 2014:

	USC	FRC
Revenue	USD 1,250 million	EUR 310 million
EBITDA	USD 43 million	EUR 15 million
Interest on borrowings (%)	3.5%	6.0%
Net assets (before deducting borrowings)	USD 300 million	EUR 120 million
Borrowings	USD 80 million	EUR 45 million

Required:

- (a) (i) **Define the term 'segregation of duties'. Describe three treasury processes which should be separated under segregation of duties controls.**

(5 marks)

- (ii) **Describe other provisions of Sarbanes-Oxley that should be considered when reviewing compliance by FRC's treasury department.**

(3 marks)

- (b) (i) **Discuss the benefits and drawbacks to the USC group of hedging group gearing.**

(5 marks)

- (ii) Construct a hedge to protect group gearing from the effect of exchange rate movements on the USD value of FRC's assets and liabilities. Demonstrate that your proposed hedge would ensure that gearing ($D/D+E$) remains unchanged if USD/EUR were to move from the current level of USD/EUR 0.9000 to USD/EUR 1.3000.

(7 marks)

(Total 20 marks)

FORMULAE

1. Population variance

$$\text{Variance Var}[X] = \sigma^2 = \frac{\text{Sum of squared differences of observations from the mean}}{\text{Number in population}}$$

2. Estimated population variance based on a sample

$$\text{Variance Var}[X] = \sigma^2 = \frac{\text{Sum of squared differences of observations from the mean}}{(\text{Number in sample} - 1)}$$

3. Present value of an annuity

$$PV = \frac{CF}{r} \times \left(1 - \frac{1}{(1+r)^n} \right)$$

or

$$AF = (1 - DF) \div r$$

4. Estimated internal rate of return

$$\text{Estimated IRR}\% = a\% + \frac{A}{(A - B)} (b\% - a\%)$$

5. Lognormal Value at Risk calculation for use with market interest rates or foreign exchange rates

$$\text{EQUATION Ia: Expected Maximum Rate} = e^{Z\sigma\sqrt{T}} \times S_0$$

$$\text{EQUATION Ib: Expected Minimum Rate} = e^{-Z\sigma\sqrt{T}} \times S_0$$

$$\text{EQUATION IIa: } Z = \frac{+\text{Ln}\left(\frac{\text{Expected Maximum Rate}}{S_0}\right)}{\sigma\sqrt{T}}$$

$$\text{EQUATION IIb: } Z = \frac{-\text{Ln}\left(\frac{\text{Expected Minimum Rate}}{S_0}\right)}{\sigma\sqrt{T}}$$

6. Duration

$$\text{Duration (also known as Macaulay Duration)} = \frac{\text{Sum}(t \times \text{PV})}{\text{Sum}(\text{PV})}$$

7. Modified duration

$$\text{Modified duration} = \frac{\text{Duration}}{(1+r)}$$

8. Convexity

$$\text{Convexity} = \frac{\text{Sum}(t \times (t + 1) \times \text{PV})}{\text{Sum}(\text{PV})}$$

9. Modified convexity

$$\text{Modified convexity} = \frac{\text{Convexity}}{(1+r)^2}$$

10. Price sensitivity

% change in Value \approx - modified duration \times (change in r) + $\frac{1}{2}$ modified convexity \times (change in r)²

The Normal Table – One Tailed Distribution

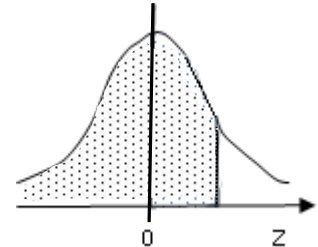
This table is based on the cumulative distribution function Z for the Standard Normal Random Variable for a one-tailed distribution with $Z = 0$ as the mean.

The table shows the respective probabilities of any outcome up to a given Z value.

The table can be used with interpolation.

Note:

- $Z = 2.00$ represents a confidence level of 97.7%
- At 95% confidence level, $Z = 1.65$
- At 99% confidence level, $Z = 2.33$



z	.00	.01	.02	.03	.04	.05	.06	.07	.08	.09
0.0	0.500	0.504	0.508	0.512	0.516	0.520	0.524	0.528	0.532	0.536
0.1	0.540	0.544	0.548	0.552	0.556	0.560	0.564	0.567	0.571	0.575
0.2	0.579	0.583	0.587	0.591	0.595	0.599	0.603	0.606	0.610	0.614
0.3	0.618	0.622	0.626	0.629	0.633	0.637	0.641	0.644	0.648	0.652
0.4	0.655	0.659	0.663	0.666	0.670	0.674	0.677	0.681	0.684	0.688
0.5	0.691	0.695	0.698	0.702	0.705	0.709	0.712	0.716	0.719	0.722
0.6	0.726	0.729	0.732	0.736	0.739	0.742	0.745	0.749	0.752	0.755
0.7	0.758	0.761	0.764	0.767	0.770	0.773	0.776	0.779	0.782	0.785
0.8	0.788	0.791	0.794	0.797	0.800	0.802	0.805	0.808	0.811	0.813
0.9	0.816	0.819	0.821	0.824	0.826	0.829	0.831	0.834	0.836	0.839
1.0	0.841	0.844	0.846	0.848	0.851	0.853	0.855	0.858	0.860	0.862
1.1	0.864	0.867	0.869	0.871	0.873	0.875	0.877	0.879	0.881	0.883
1.2	0.885	0.887	0.889	0.891	0.893	0.894	0.896	0.898	0.900	0.901
1.3	0.903	0.905	0.907	0.908	0.910	0.911	0.913	0.915	0.916	0.918
1.4	0.919	0.921	0.922	0.924	0.925	0.926	0.928	0.929	0.931	0.932
1.5	0.933	0.934	0.936	0.937	0.938	0.939	0.941	0.942	0.943	0.944
1.6	0.945	0.946	0.947	0.948	0.949	0.951	0.952	0.953	0.954	0.954
1.7	0.955	0.956	0.957	0.958	0.959	0.960	0.961	0.962	0.962	0.963
1.8	0.964	0.965	0.966	0.966	0.967	0.968	0.969	0.969	0.970	0.971
1.9	0.971	0.972	0.973	0.973	0.974	0.974	0.975	0.976	0.976	0.977
2.0	0.977	0.978	0.978	0.979	0.979	0.980	0.980	0.981	0.981	0.982
2.1	0.982	0.983	0.983	0.983	0.984	0.984	0.985	0.985	0.985	0.986
2.2	0.986	0.986	0.987	0.987	0.987	0.988	0.988	0.988	0.989	0.989
2.3	0.989	0.990	0.990	0.990	0.990	0.991	0.991	0.991	0.991	0.992
2.4	0.992	0.992	0.992	0.992	0.993	0.993	0.993	0.993	0.993	0.994
2.5	0.994	0.994	0.994	0.994	0.994	0.995	0.995	0.995	0.995	0.995
2.6	0.995	0.995	0.996	0.996	0.996	0.996	0.996	0.996	0.996	0.996
2.7	0.997	0.997	0.997	0.997	0.997	0.997	0.997	0.997	0.997	0.997
2.8	0.997	0.998	0.998	0.998	0.998	0.998	0.998	0.998	0.998	0.998
2.9	0.998	0.998	0.998	0.998	0.998	0.998	0.998	0.999	0.999	0.999
3.0	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999
3.1	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999
3.2	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999	0.999
3.3	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000
3.4	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000	1.000

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Question 1

(a) (i)

'Risk appetite' describes the extent to which an organisation is willing to accept some types of risk at a point in time, in expectation of improved financial performance or of other benefits.

(a) (ii)

Business

The commercial activities and associated core competencies of a company will affect the risk appetite of that company. RRR manufactures a specialised home security product and may need to take risk by investing in research and development activities with uncertain outcomes with the aim of keeping at the fore-front of product developments in this area. Competitive position and risk appetite of competitors will influence risk appetite. It is important to benchmark risk appetite against that of competitors to gain reassurance that it is appropriate for the industry sector in which the company operates. However, RRR may be best advised to adopt a more aggressive, risky strategy in the USA in order to protect or grow market share since it faces competition from two other companies in the USA.

Greater risk appetite should only be entertained if taking on additional risk is considered likely to be rewarded.

Investor risk appetite

Directors should have an understanding of shareholder preferences. Prospective investors in RRR should be aware that USD exposure is an inevitable result of selling the products into the US market and that selling to the USA is a profitable part of the business and a key component of the overall business strategy. Investors would therefore expect some improvement in results in years where the USD/NZD rate is favourable. However, they would also expect the directors to take appropriate steps to reduce volatility of exchange rates that could severely damage results. The typical shareholder is a large institution such as a pension fund or insurance company and is likely to have a low risk appetite and to put pressure on RRR to adopt a low risk policy.

Capital structure

Debt finance is generally considered to be riskier than equity for the company since interest obligations on debt finance have to be honoured in full, regardless of performance, whereas dividends payable to equity holders can be reduced or even waived if necessary. A highly geared company may therefore be a result of a large risk appetite. Conversely, however, a company that is so highly geared that it is in danger of breaching debt covenants must adopt a more risk averse strategy to avoid the severe consequences of breaching such a covenant.

We can see from the net debt/EBITDA ratio of 2X (where net debt/EBITDA = 2 = (40+20-10)/25) that RRR is not highly geared. The lack of risk in the capital structure would suggest that RRR has a low risk appetite and does not operate under such constraints but is free to adopt a greater risk appetite if this is in line with the overall business strategy.

(a)(iii)

RRR's foreign exchange exposure

Exports to the USA and priced in the US dollar account for 40% of all sales. This is a highly significant exposure for the company.

RRR faces both transaction risk and economic risk.

Transaction risk arises when exporting home security products to the USA. The exposure is to a fall in the value of the expected sales receipt between order and settlement due to exchange rate movements.

Pre-transaction risk would arise if RRR tenders for export business or issues a USD price list to help publicise its products. Pre-transaction risk is lower the greater the number of issues of the price list in a year.

Economic risk generally exceeds both transaction and pre-transaction risk in both size and significance. It encompasses exposure to all future exchange rate movements that affect the volume or price of future sales. We are told that RRR has two main competitors in the USA. If these companies are sufficiently large to be market leaders and therefore, influence the market price, RRR may have no opportunity to increase its sales price to reflect any future devaluation of the USD against the NZD.

Economic risk may also arise in respect of NZD sales if the USD price is lower and NZD customers are able to purchase products in the USA.

Translation risk can largely be ignored in this instance since it only relates to the retranslation of receivables and this risk is simply a sub-set of transaction risk and is more easily assessed and managed under the transaction risk label. Any policy designed to hedge transaction risk would automatically hedge this type of translation risk.

RRR faces the risk of breaching debt covenants as a result of unfavourable exchange rate movements. The sensitivity table below shows that both RRR's debt covenants are breached at exchange rates of USD/NZD 1.0000 and USD/NZD 0.9000.

Sensitivity table in NZD millions:

USD/NZD rate	1.2800	1.2000	1.1000	1.0000	0.9000
NZD revenue	90.00	90.00	90.00	90.00	90.00
USD revenue	60.00	56.25	51.56	46.88	42.19
Total revenue	150.00	146.25	141.56	136.88	132.19
Costs	(125.00)	(125.00)	(125.00)	(125.00)	(125.00)
EBITDA	25.00	21.25	16.56	11.88	7.19
Interest	3.00	3.00	3.00	3.00	3.00
EBITDA/Interest	8.33	7.08	5.52	3.96	2.40
Net debt/EBITDA	2.00	2.35	3.02	4.21	6.95

Note that these figures are based solely on the information provided in the question and ignore both the potential impact of a fall in EBITDA on debt and interest in future periods. Full credit was given to candidates who made such adjustments.

The sensitivity table shows that both debt covenants are likely to be exceeded at an exchange rate of USD/NZD 1.0000.

(b) (i)

Maximum expected rate after 100 days

$$= S_0 \times e^{(Z \times \sigma \times \sqrt{T})} = 1.2800 \times e^{(3 \times 0.12 \times \sqrt{(100/365)})} = 1.5454$$

Minimum expected rate after 100 days

$$= -S_0 \times e^{(-Z \times \sigma \times \sqrt{T})} = 1.2800 \times e^{(-3 \times 0.12 \times \sqrt{(100/365)})} = 1.0602$$

(b)(ii)

A Z value of 3 and -3 carry a probability of 99.9% and 0.1% respectively (rate for Z = 3 obtained by looking up a Z of 3 in Normal Distribution tables, rate for Z = -3 obtained by deducting the first result from 100%). So the probability of the spot rate falling between USD/NZD 1.0602 and 1.5454 in 100 days' time is 99.8%.

(c)

Response to comments made by directors A and B

Director A

It is true that the forward rate is an unbiased indicator of the future rate and, therefore, that there is an equal chance of the future spot rate being below the forward rate as above it. However, this only holds for the forward rate, it is not correct to say that it is equally likely that the future spot rate is higher or lower than the current spot rate.

It is, however, correct to say that hedging is a zero sum game for this very reason. The forward rate that can be obtained from a forward contract is equally likely to be higher or lower than the future spot rate.

However, hedging does carry a number of important advantages over leaving the position unhedged. Namely, lower volatility and less uncertainty of future earnings. These benefits should also be taken into account when deciding whether or not to hedge foreign exchange exposures.

Director B

Yes, we can expect investors to be aware of the significant exposure of RRR to the value of the USD against NZD. That is an inevitable consequence of holding an investment in RRR.

Whether the current shareholders were aware of this exposure when making the initial investment is not so clear cut as some of the shares may have been held prior to the export drive in the USA. However, this is not particularly relevant here since such shareholders could always sell their shares if they are not happy with this development.

The management have a duty to the shareholders to manage the foreign exchange risk in a responsible manner. We can expect shareholders to react favourably to a risk strategy that involves carefully monitoring the exposure and putting a hedging strategy in place to reduce short term volatility of results and protect reported results. This would protect RRR from market shocks that might impact unfavourably on USD/NZD spot.

The majority of shareholders are large financial institutions and their views should be taken into account when deciding on an appropriate approach to hedging the USD exposure. For example, how far out to hedge and what hedging instruments to use.

Recommended risk response

RRR has significant exposure to the value of the US dollar since 40% of sales are priced in US dollars. This exposure should be managed in order to protect company reported results in the short term. A rolling (layered) programme of forward contracts might be appropriate, based on forecast USD sales.

Based on our current performance, the USD/NZD rate would need to fall to USD/NZD 1.0000 in order to cause a breach of debt covenants. This has a likelihood of less than 0.01% within the next 100 days and hence is not a large threat.

RRR should also consider longer term solutions to the company's structural exposure to the US dollar. It may be beneficial to build production facilities in the USA or source components in the USA in order to reduce the structural exposure to the US dollar.

Question 2

(a)

This is a cash flow hedge because it is a hedge of the exposure to variability in future CASH FLOWS arising from a HIGHLY PROBABLE FORECAST TRANSACTION.

It would not qualify as a fair value hedge for either of the following two reasons:

- The hedge is of cash flow rather than fair value.
- The underlying transaction is highly probable rather than recognised/committed.

(b)(i)

Forward rates for settlement 30 June 2015:

Current contract: HKD/JPY 12.7600
giving JPY 102.08 million (= 8 million x 12.7600)

On 30 September: HKD/JPY 12.5400
giving JPY 100.32 million (= 8 million x 12.5400)

Discount the difference by 273 days at a discount rate of 2%:

JPY 1.734 million (= (102.08 million – 100.32 million) / (1 + 0.02 x 273/365)).

Answer: JPY 1.734 million profit/ asset.

(b)(ii)

At inception, the forward contract would have a value of zero, being its exit price (ignoring any cost of closing out the contract).

On 30 September, the forward contract would be revalued and shown as an asset of JPY 1.734 million. The other side of the accounting entry is profit on revaluation to date of JPY 1.743 million profit which would be 'parked' in equity until the underlying cash flows affect profit or loss (normally when the invoice is raised for the sale). If the hedge is of the spot element only, any change in value due to a change in interest rates (as reflected in the forward points), would be posted directly to profit or loss.

When the hedged sales are invoiced, the forward contract would be re-valued again in the same manner as on 30 September and disclosed on the accounts as an asset/liability at the latest fair value. The change in value is again posted to 'equity' initially but then the total cumulative change in fair value up to this point would be transferred from equity and disclosed in profit or loss for the period.

The forward contract would continue to be shown as an asset/liability in the statement of financial position until maturity. Any subsequent profit or loss on revaluation of the forward contract up to maturity would, however, now be disclosed directly within profit or loss for the current period.

Question 3

(a)(i)

Under interest rate parity theory, the forward rate is related to the current spot rate after adjusting for interest rates so as to eliminate arbitrage profits.

That is, the 90 day forward rate for USD/AUD is 1.0991

where $1.0991 = 1.0923 \times (1 + 0.065 \times 90/365) / (1 + 0.039 \times 90/360)$.

(a)(ii)

The forward rate is an unbiased indicator of the future spot rate. This means that the spot rate in 90 days' time is equally likely to be above or below the forward rate.

However, it is not correct to say that the forward rate is a 'good' predictor of future spot rates. It is highly likely that the future spot rate will be significantly different from the forward rate and extremely unlikely that it would be within 1 or 2 basis points of the current forward rate.

In practice, there are so many other influences on exchange rates, that it is very difficult to forecast future rates.

(b)(i)

The principles of short term investment are:

- Security. The risk of not receiving full payment at the end of the investment. This comprises counterparty risk (the risk of failure of the counterparty) and market risk (the risk of a fall in the value of the investment)
- Liquidity. The ease of converting an instrument or portfolio into cash at any time prior to its maturity without unduly affecting its value.
- Yield. The return obtained. Note that yield carries a lower priority to both security and liquidity and should only be taken into account when selecting investments once security and liquidity constraints have been satisfied.
- Diversification of type of investment, counterparty and maturity to reduce portfolio risk
- Flexibility to meet changing business needs.

(b)(ii)

Investment 1

USD 50 million invested at 3 day rates of 2.5% would give an effective annual return of 2.567% ($= (1 + 0.025 \times 3/360)^{(365/3)} - 1$).

Investment 2

USD 50 million invested at 90 day rates of 3.9% would give an effective annual return of 4.013% ($= (1 + 0.039 \times 90/360)^{(365/90)} - 1$).

Investment 3

Equivalent AUD invested at 90 day rates of 6.5% would give an effective annual return of 6.661% ($= (1 + 0.065 \times 90/365)^{(365/90)} - 1$).

(b)(iii)

The risks and benefits of investing for 90 days rather than 3 days (Investments 2 and 3 versus Investment 1) are:

- Yield. Investments 2 and 3 have a higher return than Investment 1 if rates remain unchanged over the 90 day period. However, this is highly unlikely. There is much greater uncertainty as to the return obtained under Investment 1 than Investment 2 and 3 and it is not possible to predict which instrument would provide the higher return at this point in time.
- Liquidity risk. Investments 2 and 3 carry higher liquidity risk since funds are tied up for the whole 90 day period and cannot be repaid until day 90 without penalty. The situation is quite different under Investment 1 where funds are returned for reinvestment or use in the business every 3 days.
- Even though the investments are all made with the same counterparty, counterparty risk would be higher for Investments 2 and 3 than Investment 1 due to their longer time to maturity. Counterparty risk increases with longer time to maturity. The funds can be invested elsewhere within 3 days in the event of deterioration in credit worthiness of the counterparty under Investment 1 but are locked away until the end of the 90 day period for investments 2 and 3.
- Market risk. See comments under 'yield' above.

The risks and benefits of depositing funds in a foreign currency (Investment 3 versus Investment 2):

- Yield. Investment 3 has a higher return than Investment 2 but the USD equivalent return is exposed to exchange rate risk from changes in USD/AUD spot. These could be significant and a loss on exchange may actually exceed the interest income earned. Hedging the foreign exchange exposure is unlikely to help since fixing the return of the principal plus interest at the forward rate is likely to eliminate the differential in returns between Investments 2 and 3.
- Liquidity risk is largely the same whether funds are deposited in either AUD or USD. In both cases the funds cannot be obtained before the end of the 90 day period without penalty.
- Counterparty risk is likely to be greater for the AUD investment due to the additional counterparty risk associated with the spot contracts required to convert USD to AUD at the start and back to USD at the end of the 90 day period (Herstatt risk).
- Market risk is also greater, as already discussed under 'yield' above. The value of the principal invested could vary considerably due to exchange rate movements if the investment is unhedged.

Question 4

(a)

A rise in interest rates is likely to have the following effects:

- The value of assets is likely to fall. However, new bond investments and replacement investment on maturity would be at higher, more favourable coupon rates.
- Pension scheme liabilities would fall in value due to the larger discount rate based on current interest rates.

A fall in interest rates is likely to have the opposite effect on the value of pension scheme assets and liabilities.

The net effect on pension scheme value will largely depend on the extent to which the interest profile of investments matches that of the pension liabilities.

A corporate bond credit rating downgrade would lead to:

- Increased yield in recognition of the higher risk. Increased yield would cause a fall in value/price due to the inverse relationship between price and yield.
- The risk of breaching internal investment regulations and limits, possibly requiring disposal of the bond.

(b)(i) and (ii)

	At 4% interest rate	At 3% interest rate
PV of pension liabilities	978.4 (=88 / 0.04 x (1 - 1.04 ⁻¹⁵))	1,050.5 (=88 / 0.03 x (1 - 1.03 ⁻¹⁵))
Value of equities	540.0 (= 60% x 900)	550.8 (= 540 x 102%)
Value of bonds	360.0 (= 40% x 900)	395.7 (= 360 x (1 + 9.3 x 0.01 + 0.5 x 123 x 0.01 ²)) = 360 x 1.09915)
Total value of investments	900.0	946.5
Surplus/(deficit)	(78.4)	(104.0)

(b)(iii)

As the sponsor company, PK is responsible for funding the pension scheme deficit by making one-off or regular contributions into the scheme.

Increased demands for funds by the pension scheme restricts the availability of liquidity within the business which could lead to problems for PK in servicing debt or paying dividends, or lead to a credit rating downgrade.

If the sponsor covenant is breached, PK could suffer a loss of control over the running of the business.

(b) (iv)

1. Matching the interest profile of assets and liabilities

Pension payment streams are generally fixed and have a long average duration. Long-dated assets provide the best interest rate match to the pension liabilities. Typically this means holding a high proportion of assets in long dated fixed rate investments such as government bonds such as gilts (in the UK).

2. Use of interest rate swaps

Interest rate swaps can be used to extend the duration of the assets, structured as pay floating/receive fixed swaps. However, swaps create liquidity risk, especially where they contain a credit support annex. Such risks need to be considered very carefully before deciding whether or not to enter into swaps.

3. As an extreme measure, the pension scheme could be sold off to a 3rd party, largely eliminating any future interest rate risk.

Question 5

(a)

Benefits:

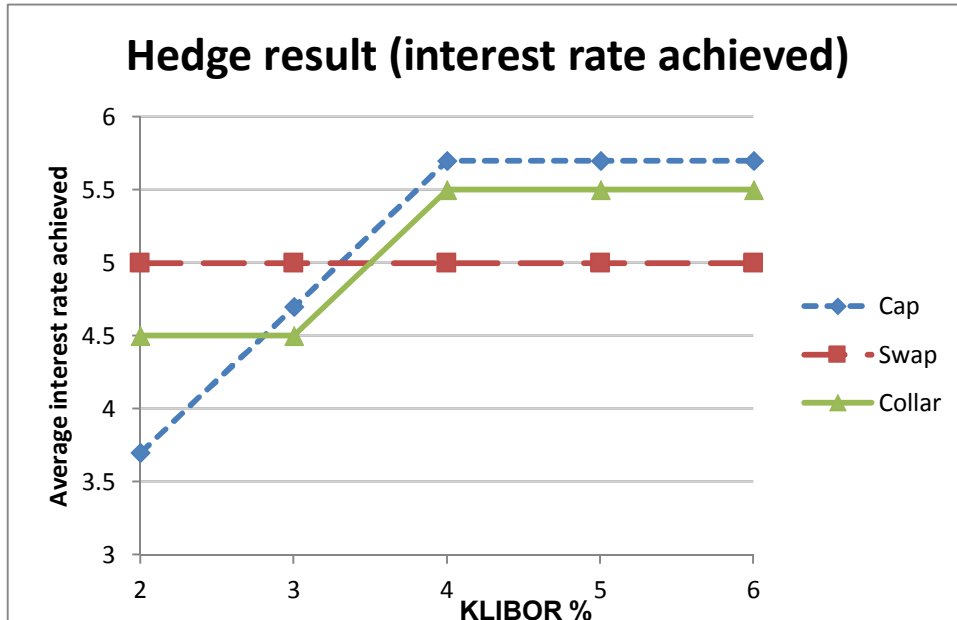
- Increased predictability of financing costs and hence earnings and cash flows.
- Greater stability of key lender ratios such as interest cover and EBITDA/net debt.
- Lower risk of breaching loan covenants based on such ratios.
- Closer alignment to the risk profile of competitor companies

Challenges:

- Absorbing higher cost if locked into unfavourable rates and there is a fall in 12 month KLIBOR.
- Avoiding higher overall margin costs.
- New counterparty exposures arising from the use of a hedging instrument such as a swap.
- New liquidity risk arising from any swaps (eg from credit support annex).
- More complex accounting and risk of volatility in reported results unless hedge accounting can be used.

(b)(i)

Future interest rate	2%	3%	4%	5%	6%
“All in” borrowing rate:					
Cap	3.70%	4.70%	5.70%	5.70%	5.70%
Swap	5.00%	5.00%	5.00%	5.00%	5.00%
Collar	4.50%	4.50%	5.50%	5.50%	5.50%



(b) (ii)

INT’s main concern is to ensure that it is not disadvantaged by having a significantly different interest profile to that of other companies operating in the same industry sector. The question says that other companies have a mix of fixed and floating rate debt finance and makes no mention of the use of option based derivatives such as a cap or collar. Only the swap contract enables INT to achieve a mix of fixed and floating rate debt finance and hence would appear to be the most appropriate approach in this case.

A swap contract can be used to effectively alter the interest profile of debt to achieve the desired balance of fixed and floating rate finance. A swap provides flexibility in that the interest profile can be altered without affecting the underlying borrowing and then readjusted at a future date, again using a swap contract. However, INT would then be unable to benefit from lower finance cost if interest rates were to fall during the hedge period.

Although a cap or collar both have the benefit of being able to profit from favourable rates, this comes at a cost as they both prove to be more expensive than a swap if rates are unfavourable. They also require more complex accounting procedures and INT may not have the necessary expertise in this area.

The results in (b)(i) show that the cap is the most expensive hedging method for KLIBOR above 3.3% and the collar is only slightly less expensive at those rates but significantly more expensive than the cap for KLIBOR below around 2.9%. The swap is the most financially beneficial hedging instrument for KLIBOR above 3.5%. It therefore provides the best protection if interest rates rise significantly.

However, this observation is not directly relevant to the decision on which instrument to use in the context of the comments made in the first paragraph above. If the priority for INT is to achieve a target balance of fixed and floating rate finance, the swap is clearly the best instrument to use as it is the only one that can alter the interest profile of debt between fixed and floating as required.

Question 6

(a)(i)

Segregation of duties is the separation of a process into component parts whereby no single employee is responsible for 2 key processes that could result in error or fraud.

Separate functions into at least 3 stages, no one person to act in more than one of the following stages in the process of a deal:

1. Front office: deal authorisation, transact with bank, enter deal on TMS
2. Back office; make settlement
3. Accounting: account for the transaction

(a)(ii)

SOX provisions that should be considered when reviewing compliance by FRC's treasury department are:

- Identifying the areas where there are risk or control issues inherent in treasury functions. These include dealing activities such as foreign exchange, cash transactions, technology, risk management and use of specialised cash management vehicles and techniques.
- Ensuring that there are policies, procedures and preventative measures in place to adequately control the treasury processes. These might include segregation of duties, transaction limits, security of transaction origination systems, technology security, mandatory job rotation etc.
- Assisting 'global governance' by providing effective information, reporting and transparency for the financial reporting process and ensuring compliance with regulatory requirements, even in a decentralised environment.

(b)(i)

Foreign exchange losses arising from changes in the value of a subsidiary can have a significant effect on group gearing levels. A significant loss could increase the risk of a breach of a debt covenant or a ratings downgrade.

Volatility of gearing due to exchange rate movements can largely be eliminated by the use of hedging focussed on protecting gearing.

It is not possible to hedge both gearing and net worth. However, hedging activities designed to protect gearing also provide partial protection of net worth from exchange rate movements.

However, there are also some important arguments against the use of hedging to protect translation exposure of this nature. Key issues include:

- Foreign exchange loss due to a fall in the value of a subsidiary is reported in comprehensive income rather than in profit for the year. It is therefore of less significance when measuring performance in terms of EBITDA than other types of foreign exchange loss and therefore hedging gearing may be considered to be unnecessary.
- Translation risk is an accounting exposure but hedging activity can create actual cash exposures.
- Hedge accounting is required in order to avoid increased volatility of reported profit. However this also creates risks, especially if the hedge were to fail effectiveness tests (e.g. due to a fall in the value of the investment to below that of the hedging instrument).
- In some cases, additional borrowings may need to be arranged, leading to the 'grossing up' of the balance sheet. This is not advisable as liabilities become inflated and creditworthiness may fall.

(b)(ii)

Preliminary calculation of current gearing level:

	Assets in USD million	Liabilities in USD million
USC	300.00	80.00
FRC	133.33 = 120 / 0.9000	50.00 = 45 / 0.9000
Total	433.33	130.00

Hence D/E is 30.0% (= 130/433.33) and D/D+E is 23.1% (= 130/(130+433.33)).

To protect gearing, construct EUR borrowings such that this ratio is maintained. That is, EUR borrowings should be EUR 36 million (being 30% of EUR 120 million), equivalent to USD 40 million (= 36 million/0.9000), with the remaining USD 90 million held as USD borrowings (where USD 90 million = USD 130 million – USD 40 million).

Constant gearing	Value in currency	USDm at	USDm at
		USD/EUR 0.9000	USD/EUR 1.3000
		£	£
Assets	EUR 120	133	92
Assets	USD 300	300	300
Total assets		433	392
Debt	EUR 36	40	28
Debt	USD 90	90	90
Total debt		130	118
Gearing (D/D+E)		23.1%	23.1%

CertRM April 2014

EXAMINER'S REPORT

The paper was 3 hours long and the basic format was unchanged from October 2013. The pass rate was 65% (57% in October 2013). 14 candidates were awarded a distinction (8 candidates in October 2013). This is a larger percentage than normal, reflecting the larger than normal number of exceptionally strong candidates.

General observations

The three main reasons for failure in this sitting are summarised below:

- a) Lack of understanding of key concepts of risk management and the ability to apply these to a given scenario
- b) Gaps in knowledge. Sections of the syllabus clearly not studied in any depth
- c) Lack of competence in handling the numerical sections of the syllabus

Some extreme examples of point a) above included the misconception that the forward FX rate is an accurate predictor of the future spot rate (see Question 3).

Common gaps in knowledge (point b) above) were hedge accounting (Question 2), managing pension scheme risk (Question 4) and hedging translation exposure (Question 6).

Numerical errors arose most frequently in the calculation of the fair value of a forward contract (Question 2), effective yield (Question 3), changes in bond value and pension liabilities as a result of changing interest rates (Question 4) and constructing a hedge of gearing (Question 6).

Detailed comments by question

Question 1

This question required the definition and evaluation of risk in a given scenario. Calculations of VaR and a response to comments on the usefulness of hedging were also required.

Note that risk appetite should be defined in relation to potential future returns (or rewards) from taking on that risk. There was a tendency for candidates' answers to wander around the subject of risk appetite or move straight into a discussion of FX exposures rather than focus on risk appetite in relation to shareholder expectations, business needs and competitive environment, underpinned by references to risk and reward.

The evaluation of FX risk was generally answered well, as was the VaR calculation. However, fewer candidates were able to state the probability of occurrence of a given range of results.

In the final part of this question candidates were required to respond to certain director comments regarding to hedging strategies. In many cases, candidates lost marks by talking about the arguments for and against hedging in general terms rather than directly addressing the specific issues raised by the two directors.

Question 2

Question 2 focussed on hedge accounting regulations (IAS 39). A number of candidates struggled to define a cash flow hedge clearly, talking about hedging an exposed future cash flow rather than making the link to a highly probable future transaction. Many omitted to discount the change in forward value when asked to calculate the fair value of a forward contract. However, the fundamental accounting approach for cash flow hedges was generally well understood.

Question 3

This question focussed on the choice of investment for short term surplus cash. It had the highest average mark of all the optional questions but there were still a number of common errors made and key issues missed.

Common omissions:

- Highlighting the significant foreign exchange risk involved in investing in a foreign currency and the fact that the return would be the same as that for a deposit in the home currency if exchange rates were to move in line with market interest rates.
- Noting that a rolling 3 day deposit has a much more volatile return than a 90 day deposit due to the constant reinvestment of the principal plus interest at later market rates.
- Noting that counterparty risk increases in line with term, hence the greater counterparty risk arising for a 90 day deposit than for a 3 day deposit.

Question 4

Question 4 concerned sponsor company risks arising from changing interest rates that affect the value of a defined contribution pension scheme.

This question had the 2nd lowest pass rate due to the difficulty that a number of students had in calculating the change in value of the pension assets as a result of an interest rate change. In addition, few candidates were able to describe appropriate possible approaches that can be adopted by pension schemes in order to reduce interest rate exposure.

Question 5

In Question 5 candidates were asked to evaluate hedge results in respect of three possible alternative hedging instruments and draw a graph to illustrate their results. The calculation and graph were generally attempted well. Marks were often lost in the final part where a number of candidates lost sight of the underlying objective of the hedge, that is, to fix a proportion of floating rate debt to match competitor profile.

Question 6

Question 6 was the least popular of the optional questions. It focused on translation risk and the construction of a balance sheet hedge to fix gearing. Only a few candidates attempted this question and the vast majority failed to construct an appropriate hedge. This is possibly a technique that is quickly forgotten if not used for a while and was not examined in the previous two diets.