# Answers

**Section B**

**1** **(a)** Market value of equity = 15,000,000 x 3·75 = $56,250,000

Market value of each irredeemable loan note = 6/0·07 = $85·71
Market value of irredeemable loan notes = 10,000,000 x 85·71/100 = $8,571,000

Market value of each 7% loan note = (7 x 5·582) + (105 x 0·665) = $39·074 + 69·825 = $108·90
Market value of 7% loan notes = 12,000,000 x 108·90/100 = $13,068,000

Total market value of debt = 8,571,000 + 13,068,000 = $21,639,000

Debt/equity ratio based on market values = 100 x 21,639,000/56,250,000 = 38·5%

This is slightly less than the average debt/equity ratio of companies similar to Gemlo Co and so the company appears to have a similar financial risk to these companies.

**(b)** If the stock market on which Gemlo Co is listed is semi-strong form efficient, share prices on the stock market will quickly and accurately react to the release of new information. The stock market will have already factored the information about the proposed business expansion into the share price of the company. The announcement that the business expansion will be financed by a $10 million issue of 8% loan stock is new information, as is the announcement of the expected increase in profit before interest and tax (PBIT) of 20% in the first year. The effect of the announcements on the share price of Gemlo Co will depend on how the stock market interprets this new information.

*Interest cover*
The information about the financing choice indicates that annual interest will increase by $0·8 million (8% x $10m) from $1·44 million (6% x $10m + 7% x $12m) to $2·24 million. The stock market knows that Gemlo Co currently has interest cover of 6 times and hence PBIT of $8·64 million (6 x $1·44m). After the business expansion, PBIT is expected to increase by 20% to $10·368 million ($8·64m x 1·2) in the first year. The interest cover of Gemlo Co is therefore expected to fall to 4·6 times ($10·368m/$2·24m).

The stock market will note that the interest cover of Gemlo Co, which at 6 times is already below the average interest cover of 9 times of companies in the same business sector, will fall further below the average interest cover to 4·6 times.

*Debt/equity ratio*
The total market value of debt would increase from $21·639 million to $31·639 million. If the market value of equity remains unchanged, the market value debt/equity ratio increases from 38·5% to 56·3% (100 x 31,639,000/56,250,000). From being slightly less than the average debt/equity ratio of 40% of companies in the same business sector, therefore, the debt/equity ratio of Gemlo Co would be 41% above it in relative terms.

*Share price of Gemlo Co*
Of course, the debt/equity ratio on a market value basis of Gemlo Co depends on the ordinary share price of the company. The above analysis of interest cover and debt/equity ratio indicates that the shareholders of Gemlo Co will experience a substantial increase in financial risk. The cost of equity of the company is therefore likely to increase. This will exert a downward pressure on the share price of Gemlo Co, leading to a further increase in the market value basis debt/equity ratio. The announcements of the financing decision and the expected increase in PBIT could therefore lead to a fall in the share price of Gemlo Co.

On the positive side, the increase in PBIT may lead to more cash being available to pay dividends. If the company were to make an announcement about increased future dividends, this would exert an upward pressure on the share price of Gemlo Co, and this could counteract the downward pressure due to the increase in financial risk.

**2** **(a)** The borrowing interest rate in the forward rate agreement (FRA) is 4·5%. Borrowing €12 million for six months at 4·5% per year gives an interest payment at the end of nine months of €270,000 (12m x 0·045/2).

The finance director is concerned that the interest rate on the six-month loan could be as high as 5·5% per year. At this rate, the interest payment on the loan at the end of nine months would be €330,000 (12m x 0·055/2). Under the FRA, GXJ Co would receive a compensating payment of €60,000, leaving the company with €270,000 of interest to pay.

The finance director also thought the interest rate on the six-month loan could be as low as 3·5% per year. At this rate, the interest payment on the loan at the end of nine months would be €210,000 (12m x 0·035/2). Under the FRA, GXJ Co would make a compensating payment of €60,000 to the bank, again effectively leaving the company with €270,000 of interest to pay. GXJ Co would not benefit from the lower interest rate, having entered into an FRA.

The FRA effectively locks GXJ Co into borrowing at 4·5% on its planned loan. The company would be protected against interest rates rising above 4·5%, but would not benefit from lower interest rates.

**(b)** The future interest payment of GXJ Co is €270,000 in nine months' time. GXJ Co will be concerned about the dollar depreciating against the euro, increasing the dollar cost of the euro interest payment. The forward rate indicates this is

expected to happen, as the nine-month forward exchange rate shows a 4·3% depreciation (100 x (1·7964 – 1·7191)/1·7964) of the dollar against the euro. The current dollar cost of the interest payment is $150,301 (€270,000/1·7964) and the dollar cost of the interest payment after nine months is $157,059 (€270,000/1·7191), an increase of $6,758.

The future spot exchange rate may not be the same as the current forward exchange rate. One way to hedge the uncertainty regarding the future spot rate is to lock into the current forward rate, and accept the depreciation it implies. One of the ways to do this is by agreeing a forward exchange contract (FEC) with the bank, whereby the company agrees now to buy €270,000 at the forward rate in nine months' time. This would fix the future dollar cost at $157,059.

Another hedging method, if GXJ Co regularly has euro income and euro expenditure, is to open a euro-denominated bank account, so that transaction risk is reduced significantly because of transactions netting off against each other.

GXJ Co could consider hedging the future euro interest payment using a money market hedge, although an FEC is usually cheaper. This requires a euro asset to be created to hedge the euro liability, so GXJ Co would put euros on deposit to hedge the future payment.

**(c)** Interest rate parity theory expresses the relationship between the current spot exchange rate between two currencies and the forward exchange rate. It says that the forward exchange rate, which is available now in the foreign exchange market, depends on the relative short-term interest rates in the two countries whose currencies are being compared.

Purchasing power parity theory expresses the relationship between the current spot exchange rate between two currencies and the future (expected) spot rate. It says that the future spot rate which is expected to occur depends on the relative inflation rates in the two countries.

The four-way equivalence model suggests that the difference between interest rates, the difference between inflation rates, the difference between the spot exchange rate and the forward exchange rate, and the difference between the spot exchange rate and the future (expected) spot rate should be equal and in equilibrium.


**3** **(a)** Current credit sales income = $30,000,000 x 0·8 = $24,000,000
Credit sales income after introducing discount = $24,000,000 x 1·2 = $28,800,000
Increase in income by introducing discount = $24,000,000 x 0·2 = $4,800,000
Increase in net profit (profit before interest and tax) = $4,800,000 x 0·1 = $480,000

Current level of bad debts = $24,000,000 x 0·005 = $120,000 per year
Revised level of bad debts = $28,800,000 x 0·00375 = $108,000 per year
This would be a benefit of $120,000 – $108,000 = $12,000 per year

|  | $000 |
|---|---|
| Trade receivables taking discount = $28,800,000 x 0·75 x 30/360 = | 1,800 |
| Trade receivables not taking discount = $28,800,000 x 0·25 x 51/360 = | 1,020 |
| Revised level of trade receivables | 2,820 |
| Current trade receivables = $24,000,000 x 51/360 = | 3,400 |
| Reduction in trade receivables | 580 |

|  | $ | $ |
|---|---|---|
| **Benefits** | | |
| Reduction in financing costs = 580,000 x 0·04 = | 23,200 | |
| Increase in net profit = | 480,000 | |
| Reduction in bad debts = | 12,000 | |
| | | 515,200 |
| **Costs** | | |
| Increase in administration costs | 35,000 | |
| Cost of discount = $28,800,000 x 0·005 x 0·75 = | 108,000 | |
| | | 143,000 |
| Net benefit of proposed early settlement discount = | | 372,200 |

**(b)** A company could reduce the risk associated with foreign accounts receivable, such as export credit risk, by reducing the level of investment in them, for example, by using bills of exchange.

If payment by the foreign customer is linked to bills of exchange, these can either be discounted or negotiated by a company with its bank. Discounting means that the trade bills (term bills) are sold to the bank at a discount to their face value. The company gets cash when the bills are discounted, thereby decreasing the outstanding level of trade receivables. Negotiation means that the bank makes an advance of cash to the company, with the debt being settled when the bills of exchange (sight bills) are paid.

Advances against collection means that the bank handling the collection of payment on behalf of the selling company could be prepared to make a cash advance of up to 90% of the face value of the payment instrument, for example, bills of exchange. Again, this would reduce the level of investment in foreign accounts receivable.

The risk of non-payment by foreign accounts receivable can be reduced by raising an international letter of credit (documentary credit) linked to the contract for the sale of goods. This could be confirmed (guaranteed) by a bank in the foreign customer's country.

The exporting company could also arrange for export credit insurance (export credit cover) against the risk of non-payment, which could occur for reasons outside the control of the foreign customer.

The risk of foreign accounts receivable becoming bad debts can be reduced by performing the same creditworthiness assessment processes on foreign credit customers as those used with domestic credit customers, such as seeking credit references and bank references.

**Examiner's note:** *Only TWO methods were required to be discussed.*

**4  (a)**  The financial statement information of KQK Co can be projected forwards by one year.

|  | | Current position $m | | Projected position $m |
|---|---|---|---|---|
| Income | | 140·0 | | 147·0 |
| Cost of sales and other expenses | | 112·0 | | 115·4 |
| Profit before interest and tax | | 28·0 | | 31·6 |
| Finance charges (interest) | | 2·8 | | 4·4 |
| Profit before tax | | 25·2 | | 27·2 |
| Taxation | | 7·6 | | 8·2 |
| Profit after tax | | 17·6 | | 19·0 |

|  | $m | $m | $m | $m |
|---|---|---|---|---|
| Equity finance | | | | |
|     Ordinary shares | 25·0 | | 25·0 | |
|     Reserves | 118·5 | 143·5 | 129·9 | 154·9 |
| Non-current liabilities | | 36·0 | | 56·0 |
| Current liabilities | | 38·3 | | 39·5 |
| Total equity and liabilities | | 217·8 | | 250·4 |

The changes in key financial ratios can be compared with the average values of other companies similar to KQK Co.

|  | Current | Forecast | Average |
|---|---|---|---|
| Debt/equity ratio: | 25·1% | 36·2% | 30% |
| Interest cover: | 10 times | 7·2 times | 10 times |
| Operational gearing: | 2·6 times | 2·4 times | 2 times |
| Return on equity: | 12·3% | 12·3% | 15% |
| Dividend per share | $0·28 | $0·30 | |
| Return on capital employed | 15·6% | 15·0% | |

**Impact on financial position and financial risk**
The business expansion would lead to a slight fall in operational gearing, from 2·6 times to 2·4 times, indicating a slight fall in business risk. This would occur because the fixed costs would be unchanged, even though income has increased by 5%. Irrespective of the method of finance, the business expansion would therefore exert downward pressure on the total risk of KQK Co.

As might be expected, financing the business expansion through an issue of loan notes would increase gearing as measured by the debt/equity ratio, from 25·1% at the start of the year to 36·2% at the end of the year, indicating an increase in the financial risk of KQK Co. From being currently below the average gearing level of similar companies, KQK Co would have a gearing higher than the average debt/equity ratio. The increase in financial risk is confirmed by looking at interest cover, which would fall from 10 times to 7·2 times, below the 10 times average interest cover of similar companies.

**Impact on shareholder wealth**
The return on equity is lower than that of similar companies and the expansion of business, financed by the loan note issue, would leave it unchanged at 12·3%. Return on capital employed, the primary accounting ratio, would fall slightly from 15·6% to 15%. Shareholder wealth would be positively influenced, however, by the 7·1% increase in dividend per share from $0·28 per share to $0·30 per share. The overall impact on shareholder wealth of the debt-financed business expansion will depend largely on how the share price reacts to the increase in financial risk.

**Workings**

Forecast income = 140·0m x 1·05 = $147·0 million
Current variable costs = 112·0m x 0·6 = $67·2 million
Current fixed costs = 112·0m x 0·4 = $44·8 million
Forecast variable costs = 67·2 x 1·05 = $70·56 million
Forecast cost of sales and other expenses = 44·8m + 70·56m = $115·4 million

Increase in finance charges = 20m x 0·08 = $1·6 million
Forecast finance charges = 2·8m + 1·6m = $4·4 million

Forecast reserves = 118·5m + (19·0m x 0·6) = $129·9 million
Forecast current liabilities = 38·3m x 1·03 = $39·5 million

Current operational gearing = (140m – 67·2m)/28m = 2·6 times
Forecast operational gearing = (147m – 70·56m)/31·6m = 2·4 times

**(b)** The current weighted average cost of capital (WACC) of a company reflects the required returns of existing providers of finance, such as the cost of equity of shareholders and the cost of debt of providers of debt finance, for example, banks and loan note holders. The cost of equity and the cost of debt depend on particular elements of the existing risk profile of the company, such as business risk and financial risk. Providing the business risk and financial risk of a company remain unchanged, the cost of equity and the cost of debt, and hence the WACC, should remain unchanged.

Turning to investment appraisal, the WACC could be used as the discount rate in calculating the present values of investment project cash flows. Since the discount rate used should reflect the risk of investment project cash flows, using the WACC as the discount rate will only be appropriate if the investment project does not result in a change in the business risk and financial risk of the investing company.

One of the circumstances which is likely to leave business risk unchanged is if the investment project were an expansion of existing business activities. WACC could therefore be used as the discount rate in appraising an investment project which looked to expand existing business operations.

However, business risk depends on the size and scope of business operations as well as on their nature, and so an investment project which expands existing business operations should be small in relation to the size of the existing business.

Financial risk will remain unchanged if the investment project is financed in such a way that the relative weighting of existing sources of finance is unchanged, leaving the existing capital structure of the investing company unchanged. While this is unlikely in practice, a company may finance investment projects with a target capital structure in mind, about which small fluctuations are permitted.

If business risk changes as a result of an investment project, so that using the WACC of a company in investment appraisal is not appropriate, a project-specific discount rate should be calculated. The capital asset pricing model (CAPM) can be used to calculate a project-specific cost of equity and this can be used in calculating a project-specific WACC.

**5 (a)** Evaluation of purchase of new machine using net present value method

| Year | 1 | 2 | 3 | 4 | 5 |
|---|---|---|---|---|---|
| | $000 | $000 | $000 | $000 | $000 |
| Sales income | 2,072 | 2,352 | 2,596 | 2,716 | |
| Variable cost | (1,099) | (1,250) | (1,376) | (1,444) | |
| Contribution | 973 | 1,102 | 1,220 | 1,272 | |
| Maintenance cost | (152) | (159) | (166) | (174) | |
| Cash flow before tax | 821 | 943 | 1,054 | 1,098 | |
| Tax | | (222) | (255) | (285) | (297) |
| Depreciation benefits | | 101 | 76 | 57 | 117 |
| Cash flow after tax | 821 | 822 | 875 | 870 | (180) |
| Working capital | (7) | (7) | (8) | (8) | |
| Resale value | | | | 200 | |
| Net cash flow | 814 | 815 | 867 | 1,062 | (180) |
| Discount at 11% | 0·901 | 0·812 | 0·731 | 0·659 | 0·593 |
| Present values | 733 | 662 | 634 | 700 | (107) |

| | $000 |
|---|---|
| PV of future cash flows | 2,622 |
| Initial investment | (1,500) |
| Net present value | 1,122 |

The investment in the new machine has a positive net present value and is therefore financially acceptable.

Workings

| Year | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Selling price ($ per unit) | 5·92 | 6·19 | 6·49 | 6·79 |
| Sales volume (units/year) | 350,000 | 380,000 | 400,000 | 400,000 |
| Sales income ($000/year) | 2,072 | 2,352 | 2,596 | 2,716 |

| Year | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Variable cost ($ per unit) | 3·14 | 3·29 | 3·44 | 3·61 |
| Sales volume (units/year) | 350,000 | 380,000 | 400,000 | 400,000 |
| Variable cost ($000/year) | 1,099 | 1,250 | 1,376 | 1,444 |

| Year | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| | $000 | $000 | $000 | $000 |
| Tax-allowable depreciation | 375 | 281 | 211 | 433* |
| Tax benefits at 27% | 101 | 76 | 57 | 117 |

*(1,500,000 – 200,000) – 375,000 – 281,000 – 211,000

| Year | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Working capital ($000) | 157 | 164 | 172 | 180 |
| Incremental working capital ($000) | 7 | 7 | 8 | 8 |

**(b)** Theoretically, a company should invest in all projects with a positive net present value in order to maximise shareholder wealth. If a company has attractive investment opportunities available to it, with positive net present values, it will not be able to maximise shareholder wealth if it does not invest in them, for example, because investment finance is limited or rationed.

If investment finance is limited for reasons outside a company, it is called 'hard capital rationing'. This may arise because a company is seen as too risky by potential investors, for example, because its level of gearing is so high that it is believed it may struggle to deliver adequate returns on invested funds. Hard capital rationing could also arise if a company wants to raise debt finance for investment purposes, but lacks sufficient assets to offer as security, leading again to a risk-related problem.

During a time of financial crisis, investors may seek to reduce risk by limiting the amount of funds they are prepared to invest and by choosing to invest only in low-risk projects. It is also true to say that companies could struggle to secure investment when the capital markets are depressed, or when economic prospects are poor, for example, during a recession.

If investment funds are limited for reasons within a company, the term 'soft capital rationing' is used. Investing in all projects with a positive net present value could mean that a company increases in size quite dramatically, which incumbent managers and directors may wish to avoid in favour of a strategy of controlled growth, limiting the investment finance available as a consequence. Managers and directors may limit investment finance in order to avoid some consequences of external financing, such as an increased commitment to fixed interest payments if new debt finance were raised, or potential dilution of earnings per share if new equity finance were raised, whether from existing or new shareholders.

Investment finance may also be limited internally in order to require investment projects to compete with each other for funds. Only robust investment projects will gain access to funds, it is argued, while marginal projects with low net present values will be rejected. In this way, companies can increase the likelihood of taking on investment projects which will actually produce positive net present values when they are undertaken, reducing the uncertainty associated with making investment decisions based on financial forecasts.

**Fundamentals Level – Skills Module, Paper F9**
**Financial Management**                                                                    **September/December 2015 Marking Scheme**

|  |  |  | *Marks* | *Marks* |
|---|---|---|---|---|

Section B

| | | | | |
|---|---|---|---|---|
| **1** | **(a)** | Market value of equity | 0·5 | |
| | | Market value of irredeemable loan notes | 0·5 | |
| | | Market value of redeemable loan notes | 1 | |
| | | Debt/equity ratio based on market values | 1 | |
| | | Comment on debt/equity ratio | 1 | |
| | | | | 4 |
| | | | | |
| | **(b)** | Semi-strong form market and new information | 1 | |
| | | Interest cover calculations | 1 | |
| | | Interest cover discussion | 1 | |
| | | Debt/equity ratio calculations | 1 | |
| | | Debt/equity ratio discussion | 1 | |
| | | Discussion of effect on share price | 1 | |
| | | | | 6 |
| | | | | **10** |
| | | | | |
| | | | | |
| **2** | **(a)** | Interest payment on loan | 1 | |
| | | Compensating payment by bank | 0·5 | |
| | | Compensating payment by company | 0·5 | |
| | | Evaluation and discussion | 1 | |
| | | | | 3 |
| | | | | |
| | **(b)** | Identification of foreign currency risk | 1 | |
| | | Forward exchange contract | 1 | |
| | | Discussion of other hedges | 2 | |
| | | | | 4 |
| | | | | |
| | **(c)** | Interest rate parity and the forward exchange rate | 1 | |
| | | Purchasing power parity and the future spot exchange rate | 1 | |
| | | Four-way equivalence | 1 | |
| | | | | 3 |
| | | | | **10** |
| | | | | |
| | | | | |
| **3** | **(a)** | Increase in net profit | 1 | |
| | | Benefit of reduction in bad debts | 1 | |
| | | Reduction in trade receivables | 1 | |
| | | Reduction in financing costs | 1 | |
| | | Cost of discount | 1 | |
| | | Evaluation of early settlement discount | 1 | |
| | | | | 6 |
| | | | | |
| | **(b)** | First method of reducing risk | 2 | |
| | | Second method of reducing risk | 2 | |
| | | | | 4 |
| | | | | **10** |

|  |  |  | *Marks* | *Marks* |
|---|---|---|---|---|
| **4** | **(a)** | Forecast profit before interest and tax | 1 | |
| | | Forecast profit after tax | 1 | |
| | | Forecast total liabilities | 1 | |
| | | Current and forecast debt/equity ratio | 1 | |
| | | Current and forecast interest cover | 1 | |
| | | Current and forecast operational gearing | 1 | |
| | | Current and forecast return on equity | 1 | |
| | | Other relevant financial analysis | 1 | |
| | | Assessment of impact on financial position and financial risk | 1 | |
| | | Assessment of impact on shareholder wealth | 1 | |
| | | | | 10 |
| | **(b)** | WACC and business risk | 2 | |
| | | WACC and financial risk | 2 | |
| | | CAPM and project-specific WACC | 1 | |
| | | | | 5 |
| | | | | **15** |

|  |  |  | *Marks* | *Marks* |
|---|---|---|---|---|
| **5** | **(a)** | Inflated sales income | 1 | |
| | | Inflated variable cost | 1 | |
| | | Inflated maintenance cost | 0·5 | |
| | | Tax liabilities | 1 | |
| | | Timing of tax liabilities | 1 | |
| | | Tax-allowable depreciation | 1 | |
| | | Tax benefits of tax-allowable depreciation | 1 | |
| | | Incremental working capital | 1 | |
| | | Resale value | 0·5 | |
| | | Present value calculations | 1 | |
| | | Evaluation of financial acceptability | 1 | |
| | | | | 10 |
| | **(b)** | Reasons for hard capital rationing | 1–4 | |
| | | Reasons for soft capital rationing | 1–4 | |
| | | Maximum | | 5 |
| | | | | **15** |