# Answers

**Fundamentals Level – Skills Module, Paper F9**
**Financial Management**                                                                  **June 2012 Answers**

**1   (a)   Calculation of net present value (NPV)**

As nominal after-tax cash flows are to be discounted, the nominal after-tax weighted average cost of capital of 7% must be used.

| Year | 1 | 2 | 3 | 4 | 5 |
|------|---|---|---|---|---|
|  | $000 | $000 | $000 | $000 | $000 |
| Sales revenue | 1,300 | 2,466 | 3,622 | 2,018 |  |
| Variable costs | (513) | (1,098) | (1,809) | (1,035) |  |
| Contribution | 787 | 1,368 | 1,813 | 983 |  |
| Fixed costs | (105) | (115) | (125) | (125) |  |
| Taxable cash flow | 682 | 1,253 | 1,688 | 858 |  |
| Tax liabilities |  | (205) | (376) | (506) | (257) |
| CA tax benefits |  | 113 | 84 | 63 | 160 |
| After-tax cash flow | 682 | 1,161 | 1,396 | 415 | (97) |
| Scrap value |  |  |  | 100 |  |
| Net cash flow | 682 | 1,161 | 1,396 | 515 | (97) |
| Discount at 7% | 0·935 | 0·873 | 0·816 | 0·763 | 0·713 |
| Present values | 638 | 1,014 | 1,139 | 393 | (69) |

|  | $000 |
|---|---|
| Present value of cash inflows | 3,115 |
| Cost of machine | (1,500) |
| NPV | 1,615 |

Project 1 has a positive NPV of $1,615,000 and so it is financially acceptable to Ridag Co. However, the discount rate used here is the current weighted average after-tax cost of capital. As this is a recently-developed product, it may be appropriate to use a project-specific discount rate that reflects the risk of the new product launch.

**Workings**

**Sales revenue**

| Year | 1 | 2 | 3 | 4 |
|------|---|---|---|---|
| Selling price ($/unit) | 25·00 | 24·00 | 23·00 | 23·00 |
| Inflated selling price ($/unit) | 26·00 | 25·96 | 25·87 | 26·91 |
| Sales volume (units/year) | 50,000 | 95,000 | 140,000 | 75,000 |
| Sales revenue ($/year) | 1,300,000 | 2,466,200 | 3,621,800 | 2,018,250 |

**Variable cost**

| Year | 1 | 2 | 3 | 4 |
|------|---|---|---|---|
| Variable cost ($/unit) | 10·00 | 11·00 | 12·00 | 12·50 |
| Inflated variable cost ($/unit) | 10·25 | 11·56 | 12·92 | 13·80 |
| Sales volume (units/year) | 50,000 | 95,000 | 140,000 | 75,000 |
| Variable costs ($/year) | 512,500 | 1,098,200 | 1,808,800 | 1,035,000 |

**Capital allowance tax benefits**

| Year | Capital allowance | Tax benefit | Year benefit received |
|------|-------------------|-------------|-----------------------|
| 1 | 1,500,000 x 0·25 = $375,000 | 375,000 x 0·3 = $112,500 | 2 |
| 2 | 1,125,000 x 0·25 = $281,250 | 281,250 x 0·3 = $84,375 | 3 |
| 3 | 843,750 x 0·25 = $210,938 | 210,938 x 0·3 = $63,281 | 4 |
| 4 | $532,812* | 532,812 x 0·3 = $159,844 | 5 |

*843,750 – 210,938 – 100,000 = $532,812

Alternative calculation of net cash flow

| Year | 1 | 2 | 3 | 4 | 5 |
|------|------|------|------|------|------|
| | $000 | $000 | $000 | $000 | $000 |
| Taxable cash flow | 682 | 1,253 | 1,688 | 858 | |
| Capital allowances | (375) | (281) | (211) | (533) | |
| Taxable profit | 307 | 972 | 1,477 | 325 | |
| Taxation | | (92) | (292) | (443) | (98) |
| After-tax profit | 307 | 880 | 1,185 | (118) | (98) |
| Add back allowances | 375 | 281 | 211 | 533 | |
| After-tax cash flow | 682 | 1,161 | 1,396 | 415 | (98) |
| Scrap value | | | | 100 | |
| Net cash flow | 682 | 1,161 | 1,396 | 515 | (98) |
| Discount at 7% | 0·935 | 0·873 | 0·816 | 0·763 | 0·713 |
| Present values | 638 | 1,014 | 1,139 | 393 | (70) |

There are slight differences due to rounding.

**(b)** Calculation of equivalent annual cost for machine 1

Since taxation and capital allowances are to be ignored, and where relevant all information relating to project 2 has already been adjusted to include future inflation, the correct discount rate to use here is the nominal before-tax weighted average cost of capital of 12%.

| Year | 0 | 1 | 2 | 3 | 4 |
|------|------|------|------|------|------|
| Maintenance costs ($) | | (25,000) | (29,000) | (32,000) | (35,000) |
| Investment and scrap ($) | (200,000) | | | | 25,000 |
| Net cash flow ($) | (200,000) | (25,000) | (29,000) | (32,000) | (10,000) |
| Discount at 12% | 1·000 | 0·893 | 0·797 | 0·712 | 0·636 |
| Present values | (200,000) | (22,325) | (23,113) | (22,784) | (6,360) |

Present value of cash flows      $274,582
Cumulative present value factor      3·037
Equivalent annual cost = 274,582/3·037 = $90,412

Calculation of equivalent annual cost for machine 2

| Year | 0 | 1 | 2 | 3 |
|------|------|------|------|------|
| Maintenance costs ($) | | (15,000) | (20,000) | (25,000) |
| Investment and scrap ($) | (225,000) | | | 50,000 |
| Net cash flow ($) | (225,000) | (15,000) | (20,000) | 25,000 |
| Discount at 12% | 1·000 | 0·893 | 0·797 | 0·712 |
| Present values | (225,000) | (13,395) | (15,940) | 17,800 |

Present value of cash flows      $236,535
Cumulative present value factor      2·402
Equivalent annual cost = 236,535/2·402 = $98,474

The machine with the lowest equivalent annual cost should be purchased and calculation shows this to be Machine 1. If the present value of future cash flows had been considered alone, Machine 2 (cost of $236,535) would have been preferred to Machine 1 (cost of $274,582). However, the lives of the two machines are different and the equivalent annual cost method allows this to be taken into consideration.

**(c)** Within the context of investment appraisal, risk relates to the variability of returns and so it can be quantified, for example by forecasting the probabilities related to future cash flows. From this point of view, risk can be differentiated from uncertainty, which cannot be quantified. Uncertainty can be said to increase with project life, while risk increases with the variability of returns.

It is commonly said that risk can be included in the investment appraisal process by using sensitivity analysis, which determines the effect on project net present value of a change in individual project variables. The analysis highlights the project variable to which the project net present value is most sensitive in relative terms. However, since sensitivity analysis changes only one variable at a time, it ignores interrelationships between project variables.

While sensitivity analysis can indicate the key or critical variable, it does not indicate the likelihood of a change in the future value of this variable, i.e. sensitivity analysis does not indicate the probability of a change in the future value of the key or critical variable. For this reason, given the earlier comments on risk and uncertainty, it can be said that sensitivity analysis is not a method of including risk in the investment appraisal process.

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Probability analysis, as its name implies, attaches probabilities to the expected future cash flows of an investment project and uses these to calculate the expected net present value (ENPV). The ENPV is the average NPV that would be expected to occur if an investment project could be repeated a large number of times. The ENPV can also be seen as the mean or expected value of an NPV probability distribution. Given the earlier discussion of risk and uncertainty, it is clear that probability analysis is a way of including a consideration of risk in the investment appraisal process. It is certainly a more effective way of considering the risk of investment projects than sensitivity analysis.

A weakness of probability analysis, however, lies in the difficulty of estimating the probabilities that are to be attached to expected future cash flows. While these probabilities can be based on expert judgement and previous experience of similar investment projects, there remains an element of subjectivity which cannot be escaped.

**2 (a)** Overtrading arises when a company does not have enough long-term finance to support its level of trading activity. There are a number of signs of overtrading, which are referred to in the following discussion.

### Rapid increase in revenue or turnover compared to long-term finance

Revenue has increased by 40%, from $10,375,000 to $14,525,000, while long-term finance has increased by only 4·7% ($16,268,000/$15,541,000).

### Increase in trade receivables days

A rapid increase in revenue may be due to offering more generous credit terms to customers, in which case the trade receivables ratio would be expected to increase. Trade receivables days have in fact increased from 61 days to 80 days, an increase of 31%. In 2010 trade receivables days were close to the average value for similar companies of 60 days, but they are now 33% more than this. While revenue has increased by 40%, trade receivables have increased by 85% ($3,200,000/$1,734,000). It appears that Wobnig Co has offered more generous credit terms to its customers, although another explanation could be that the company's customers are struggling to settle their accounts on time due a downturn in economic activity, for example a recession, leading to an increase in overdue payments and outstanding invoices.

### Decrease in profitability

A rapid increase in revenue may also be due to offering lower prices on products sold, affecting gross profit margin or net profit margin. The net profit margin of Wobnig Co has decreased from 36% in 2010 to 28% in 2011. While revenue increased by 40%, profit before interest and tax increased by only 8·9% ($4,067,000/$3,735,000). While this decrease in profitability supports the possibility that Wobnig Co has decreased selling prices in order to increase sales volume, such a decrease in profitability may also be caused by an increase in cost of sales or other operating costs.

### Rapid increase in current assets

The increase in trade receivables has already been discussed. Inventory increased by 97% ($2,149,000/$1,092,000) compared to the revenue increase of 40%, indicating perhaps that further increases in sales volume are being planned by Wobnig Co. Inventory days also increased from 60 days in 2010 to 75 days in 2011, well above the average value for similar companies of 55 days. There has therefore been a rapid increase in current assets of 89% ($5,349,000/$2,826,000), compared to the increase in long-term finance of only 4·7%.

### An increased dependence on short-term finance

Wobnig Co has certainly increased its dependence on short-term finance and this can be shown in several ways. The sales revenue/net working capital ratio has increased from 11 times in 2010 to 15 times in 2011, compared to the average value for similar companies of 10 times. There has been a 500% increase in the company's overdraft ($1,500,000/$250,000) and a 75% increase in trade payables ($2,865,000/$1,637,000). Furthermore, trade payables days rose from 90 days in 2010 to 100 days in 2011, higher than the average value for similar companies of 85 days. Short-term debt as a proportion of total debt increased from 6% in 2010 ($250,000/$4,250,000) to 27% in 2011 ($1,500,000/$5,500,000). This analysis supports the view that Wobnig Co is more dependent on short-term finance in 2011 than in 2010.

### A decrease in liquidity

A key problem arising from overtrading is a decrease in liquidity and a shortage of cash. The current ratio of Wobnig Co has fallen from 1·5 times in 2010 to 1·2 times in 2011, compared to an average value for similar companies of 1·7 times. The quick ratio or acid test ratio, which is a more sensitive measure of liquidity, has fallen from 0·9 times in 2010 to 0·7 times in 2011, compared to an average value for similar companies of 1·1 times. There are therefore clear indications that liquidity has fallen over the period and that Wobnig Co has a weaker liquidity position than similar companies on an average basis. However, the current assets of the company do still exceed its current liabilities, so it does not yet have a liquid deficit.

### Conclusion

Overall, it can be concluded that there are several indications that Wobnig Co is moving, or has moved, into an overtrading (undercapitalisation) position.

### Workings

Increase in revenue = 100 x (14,525 − 10,375)/10,375 = 40%
Increase in long-term finance = 100 x (16,268 − 15,541)/15,541 = 4·7%

| | 2011 | 2010 |
|---|---|---|
| Net profit margin | 100 x 4,067/14,525 = 28% | 100 x 3,735/10,375 = 36% |
| Current ratio | 5,349/4,365 = 1·2 times | 2,826/1,887 = 1·5 times |
| Quick ratio | 3,200/4,365 = 0·7 times | 1,734/1,887 = 0·9 times |
| Inventory days | 365 x 2,149/10,458 = 75 days | 365 x 1,092/6,640 = 60 days |
| Receivables days | 365 x 3,200/14,525 = 80 days | 365 x 1,734/10,375 = 61 days |
| Payables days | 365 x 2,865/10,458 = 100 days | 365 x 1,637/6,640 = 90 days |
| Net working capital | 5,349 – 4,365 = $984,000 | 2,826 – 1,887 = $939,000 |
| Sales/net working capital | 14,525/984 = 15 times | 10,375/939 = 11 times |

**(b)** Working capital investment policy is concerned with the level of investment in current assets, with one company being compared with another. Working capital financing policy is concerned with the relative proportions of short-term and long-term finance used by a company. While working capital investment policy is therefore assessed on an inter-company comparative basis, assessment of working capital financing policy involves analysis of financial information for one company alone.

Working capital financing policy uses an analysis of current assets into permanent current assets and fluctuating current assets. Working capital investment policy does not require this analysis. Permanent current assets represent the core level of investment in current assets that supports a given level of business activity. Fluctuating current assets represent the changes in the level of current assets that arise through, for example, the unpredictability of business operations, such as the level of trade receivables increasing due to some customers paying late or the level of inventory increasing due to demand being less than predicted.

Working capital financing policy relies on the matching principle, which is not used by working capital investment policy. The matching principle holds that long-term assets should be financed from a long-term source of finance. Non-current assets and permanent current assets should therefore be financed from a long-term source, such as equity finance or bond finance, while fluctuating current assets should be financed from a short-term source, such as an overdraft or a short-term bank loan.

Both working capital investment policy and working capital financing policy use the terms conservative, moderate and aggressive. In investment policy, the terms are used to indicate the comparative level of investment in current assets on an inter-company basis. One company has a more aggressive approach compared to another company if it has a lower level of investment in current assets, and *vice versa* for a conservative approach to working capital investment policy. In working capital financing policy, the terms are used to indicate the way in which fluctuating current assets and permanent current assets are matched to short-term and long-term finance sources.

An aggressive financing policy means that fluctuating current assets and a portion of permanent current assets are financed from a short-term finance source. A conservative financing policy means that permanent current assets and a portion of fluctuating current assets are financed from a long-term source. An aggressive financing policy will be more profitable than a conservative financing policy because short-term finance is cheaper than long-term finance, as indicated for debt finance by the normal yield curve (term structure of interest rates). However, an aggressive financing policy will be riskier than a conservative financing policy because short-term finance is riskier than long-term finance. For example, an overdraft is repayable on demand, while a short-term loan may be renewed on less favourable terms than an existing loan. Provided interest payments are made, however, long-term debt will not lead to any pressure on a company and equity finance is permanent capital.

Overall, therefore, it can be said that while working capital investment policy and working capital financing policy use similar terminology, the two policies are very different in terms of their meaning and application. It is even possible, for example, for a company to have a conservative working capital investment policy while following an aggressive working capital financing policy.

**(c)** Calculation of upper limit

The upper limit is the sum of the lower limit and the spread. If we use the minimum cash balance as the lower limit, the upper limit = 200,000 + 75,000 = $275,000

Calculation of return point

The return point is the sum of the lower limit and one-third of the spread.
Return point = 200,000 + (75,000/3) = 200,000 + 25,000 = $225,000

Use in managing cash balances

The Miller-Orr model provides decision rules about when to invest surplus cash (if a cash balance increases to a high level), and about when to sell short-term investments (if a cash balance falls to a low level). By using these decision rules, the cash balance is kept between the upper and lower limits set by the Miller-Orr model. When the cash balance reaches the upper limit, $50,000 is invested in short-term securities. This is equal to the upper limit minus the return point ($275,000 – $225,000). When the cash balance falls to the lower limit, short-term securities worth $25,000 are sold for cash. This is equal to the return point minus the lower limit ($225,000 – $200,000).

**3** **(a)** Conflict between the objectives of shareholders and directors in a listed company is associated with the agency problem, which has three main causes. First, the objectives of shareholders and directors may be different. Second, there is asymmetry of information, so that shareholders have access to less information about the company than directors, making it hard for shareholders to monitor the actions and decisions of directors. Third, there is a separation between ownership and control, as shareholders and directors are different people.

One reason why small and medium-sized entities (SMEs) might experience less conflict between shareholders and directors than larger listed companies is that in many cases shareholders are not different from directors, for example in a family-owned company. Where that is the case, there is no separation between ownership and control, there is no difference between the objectives of shareholders and directors, and there is no asymmetry of information. Conflict between the objectives of shareholders and directors will therefore not arise.

Another reason why there may be less conflict between the objectives of shareholders and directors in SMEs than in larger listed companies is that the shares of SMEs are often owned by a small number of shareholders, who may be in regular contact with the company and its directors. In these circumstances, the possibility of conflict is very much reduced.

**(b)** **Factors to consider when choosing a source of debt finance**

There are a number of factors that should be considered when choosing a suitable source of debt finance. Essentially a company should look to match the characteristics of the debt finance with its corporate needs.

**Cost**
Zigto Co should consider both issue costs and the rate of interest to be charged on the funds borrowed. The company should also consider the repayment terms. With a bank loan, for example, there may be an annual capital payment in addition to the annual interest payment. Additionally, some types of debt have early repayment penalties.

**Maturity**
The period over which the debt is taken should be matched against the period for which the company needs the finance and the ability of the company to meet the financial commitments associated with the debt finance selected. Another factor to consider is that short-term finance can be more flexible than long-term finance. If a company takes on long-term debt finance it takes on a long-term commitment to which it has a contractual obligation.

**Financial risk**
Debt will increase gearing and hence the financial risk of Zigto Co. The company should consider how gearing will change over the life of the debt finance selected and how the company will be viewed from a risk perspective by future investors.

**Availability**
The kinds of debt finance available to Zigto Co will depend upon the relative size of the company, its relationship with its bank and the capital markets to which it has access. It is likely that a bank loan, rather than any other kind of debt finance, will be selected by Zigto Co, since very few SMEs are able to issue traded bonds.

**Factors to be considered by providers of finance**

There are a number of factors that may be considered by providers of finance in deciding how much to lend to a company.

**Risk and the ability to meet financial obligations**
When considering the amount and the terms of the funds to be made available to Zigto Co, providers of debt finance will assess the ability of the company to meets its future financial obligations and the risk of the company. The previous record of the company can be used as a guide to the ability of its board of directors to manage its finances in a responsible and effective manner. The business plan of Zigto Co relating to the proposed business expansion will be carefully scrutinised by potential investors in order to make sure that it rests on reasonable assumptions and that the forecast cash flows can be achieved. This helps to reduce the uncertainty associated with the proposed expansion.

**Security**
The amount of funds made available to Zigto Co will also depend on the availability of assets to offer as security. Debt investors will expect security in order to reduce the risk of the investment from their point of view. If security is not available or is limited, Zigto Co will have to pay a higher rate of interest in compensation for the higher level of risk.

**Legal restrictions on borrowing**
Another factor to consider is whether there are any legal restrictions on the amount of debt that the company can take on, for example in existing debt contracts (restrictive or negative covenants), or in the company's memorandum or articles of association.

**(c)** One central principle of Islamic finance is that making money out of money is not acceptable, i.e. interest is prohibited. A *mudaraba* contract, in Islamic finance, is a partnership between one party that brings finance or capital into the contract and another party that brings business expertise and personal effort into the contract. The first party is called the owner of capital, while the second party is called the agent, who runs or manages the business. The *mudaraba* contract specifies how profit from the business is shared proportionately between the two parties. Any loss, however, is borne by the owner of capital, and not by the agent managing the business. It can therefore be seen that three key characteristics of a *mudaraba* contract are that no interest is paid, that profits are shared, and that losses are not shared.

If Zigto Co were to decide to seek Islamic finance for the planned business expansion and if the company were to enter into a *mudaraba* contract, the company would therefore be entering into a partnership as an agent, managing the business and

sharing profits with the Islamic bank that provided the finance and which was acting as the owner of capital. The Islamic bank would not interfere in the management of the business and this is what would be expected if Zigto Co were to finance the business expansion using debt such as a bank loan. However, while interest on debt is likely to be at a fixed rate, the *mudaraba* contract would require a sharing of profit in the agreed proportions.

**(d)** Forward exchange contract

Zigto Co needs to use the six-month forward exchange rate to hedge its six-month euro receipt.

Dollar value in six months' time = 500,000/1·990 = $251,256

**Money market hedge**

The six-month euro receipt is a future asset and needs to be hedged by a future euro liability. Zigto Co needs to borrow sufficient euros now so that in six months' time the debt is equal to €500,000. The six month euro borrowing rate is 2·5% (5%/2).

Euros borrowed now = 500,000/1·025 = €487,805
Dollar value of this euro debt = 487,805/2·000 = $243,903
The six-month dollar deposit rate is 2% (4%/2)
Future value of these dollars placed on deposit = 243,903 x 1·02 = $248,781

The forward contract gives the higher value and hence is preferred to the money market hedge.

**(e)** Expected (future) spot exchange rate

Using purchasing power parity, the expected (future) spot exchange rate can be calculated from the relative inflation rates, i.e. expected spot rate = 2·00 x (1·03/1·045) = €1·971 per $. The change in the spot rate over time can therefore, according to purchasing power parity, be related to relative inflation rates. This expected spot rate can be compared with the current twelve-month forward rate of €1·981 per $

**Relationship between the expected (future) spot rate and the current forward rate**

The twelve-month forward exchange rate is a rate currently offered in the forward exchange market and a company can lock into this rate using a forward exchange contract. Forward rates are set using interest rate parity, i.e. by relative interest rates between two countries.

If there were equilibrium between relative inflation rates and relative interest rates between two countries, the expected spot rate and the current forward rate would be the same. This is referred to as expectations theory. In practice, purchasing power parity tends to hold over long periods of time, and the existence of short-term disequilibrium leading to a difference between the expected spot rate and the current forward rate is not unusual.

**4 (a)** Price/earnings ratio valuation

The value of the company using this valuation method is found by multiplying future earnings by a price/earnings ratio. Using the earnings of Corhig Co in Year 1 and the price/earnings ratio of similar listed companies gives a value of 3,000,000 x 5 = $15,000,000.

Using the current average price/earnings ratio of similar listed companies as the basis for the valuation rests on two questionable assumptions. First, in terms of similarity, the valuation assumes similar business operations, similar capital structures, similar earnings growth prospects, and so on. In reality, no two companies are identical. Second, in terms of using an average price/earnings ratio, this may derive from companies that are large and small, successful and failing, low-geared and high-geared, and domestic or international in terms of markets served. The calculated company value therefore has a large degree of uncertainty attached to it.

The earnings figure used in the valuation does not include expected earnings growth. If average forecast earnings over the next three years are used ($3·63 million), the price/earning ratio value increases by 21% to $18·15 million (3·63 x 5). Although earnings growth beyond the third year is still ignored, $18·15 million is likely to be a better estimate of the value of the company than $15 million because it recognises that earnings are expected to increase by almost 50% in the next three years.

**(b)** Value of company using the dividend valuation model

The current cost of equity using the capital asset pricing model = 4 + (1·6 x 5) = 12%

Since a dividend will not be paid in Year 1, the dividend growth model cannot be applied straight away. However, dividends after Year 3 are expected to grow at a constant annual rate of 3% per year and so the dividend growth model can be applied to these dividends. The present value of these dividends is a Year 3 present value, which will need discounting back to year 0. The market value of the company can then be found by adding this to the present value of the forecast dividends in Years 2 and 3.

PV of year 2 dividend = 500,000/1·12$^2$ = $398,597
PV of year 3 dividend = 1,000,000/1·12$^3$ = $711,780

Year 3 PV of dividends after year 3 = (1,000,000 x 1·03)/(0·12 – 0·03) = $11,444,444
Year 0 PV of these dividends = 11,444,444/1·12$^3$ = $8,145,929

Market value from dividend valuation model = 398,597 + 711,780 + 8,145,929 = $9,256,306 or approximately $9·3 million

### Alternative calculation of dividend valuation method market value

The year 3 dividend of $1m can be treated as $D_1$ from the perspective of year 2

The year 2 value of future dividends using the dividend growth model will then be:

$1,000,000/(0·12 – 0·03) = $11,111,111

Year 0 PV of these dividends = 11,111,111/1·12$^2$ = $8,857,710

Adding the PV of the year 2 dividend gives a market value of 8,857,710 + 398,597 = $9,256,308 which, allowing for rounding, is the same as the earlier calculated value.

**(c)  Current weighted average after-tax cost of capital**

Current cost of equity using the capital asset pricing model = 12%
After-tax cost of debt = 5 x (1 – 0·2) = 5 x 0·8 = 4%
Current after-tax WACC = (12 x 0·75) + (4 x 0·25) = 10% per year

### Weighted average after-tax cost of capital after new debt issue

Revised cost of equity = $K_e$ = 4 + (2·0 x 5) = 14%
Revised after-tax cost of debt = 6 x (1 – 0·2) = 6 x 0·8 = 4·8%
Revised after-tax WACC = (14 x 0·6) + (4·8 x 0·4) = 10·32% per year

### Comment

The after-tax WACC has increased slightly from 10% to 10·32%. This change is a result of the increases in the cost of equity and the after-tax cost of debt, coupled with the change in gearing. Although the cost of equity has increased, the effect of the increase has been reduced because the proportion of equity finance has fallen from 75% to 60% of the long-term capital employed. Although the after-tax cost of debt has increased, the cost of debt is less than the cost of equity and the proportion of cheaper debt finance has increased from 25% to 40% of the long-term capital employed.

**(d)  Nature and assessment of business risk**

Business risk arises due to the nature of a company's business operations, which determines the business sector into which it is classified, and to the way in which a company conducts its business operations. Business risk is the variability in shareholder returns that arises as a result of business operations. It can therefore be related to the way in which profit before interest and tax (PBIT or operating profit) changes as revenue or turnover changes. This can be assessed from a shareholder perspective by calculating operational gearing, which essentially looks at the relative proportions of fixed operating costs to variable operating costs. One measure of operational gearing that can be used is (100 x contribution/PBIT), although other measures are also used.

### Nature and assessment of financial risk

Financial risk arises due to the use of debt as a source of finance, and hence is related to the capital structure of a company. Financial risk is the variability in shareholder returns that arises due to the need to pay interest on debt. Financial risk can be assessed from a shareholder perspective in two ways. Firstly, balance sheet gearing can be calculated. There are a number of gearing measures that can be used, such as the debt/equity ratio, the debt ratio and financial gearing, and the calculation can be based on either market values or book values. Secondly, the interest coverage ratio can be calculated.

### Nature and assessment of systematic risk

From a shareholder perspective, systematic risk is the sum of business risk and financial risk. Systematic risk is the risk that remains after a shareholder has diversified investments in a portfolio, so that the risk specific to individual companies has been diversified away and the shareholder is faced with risk relating to the market as a whole. Market risk and undiversifiable risk are therefore other names for systematic risk.

From a shareholder perspective, the systematic risk of a company can be assessed by the equity beta of the company. If the company has debt in its capital structure, the systematic risk reflected by the equity beta will include both business risk and financial risk. If a company is financed entirely by equity, the systematic risk reflected by the equity beta will be business risk alone, in which case the equity beta will be the same as the asset beta.

**Fundamentals Level – Skills Module, Paper F9**
**Financial Management**

**June 2012 Marking Scheme**

| | | | *Marks* | *Marks* |
|---|---|---|---|---|
| **1** | **(a)** | Sales revenue | 2 | |
| | | Variable costs | 1 | |
| | | Fixed costs | 0·5 | |
| | | Tax liabilities | 1 | |
| | | Balancing allowance | 1 | |
| | | Capital allowance tax benefits | 2 | |
| | | Timing of taxation benefits and liabilities | 1 | |
| | | Scrap value | 0·5 | |
| | | Initial investment | 0·5 | |
| | | Using correct discount rate | 0·5 | |
| | | Net present value | 1 | |
| | | Comment on financial acceptability | 1 | |
| | | | | 12 |
| | **(b)** | Equivalent annual cost of Machine 1 | 2 | |
| | | Equivalent annual cost of Machine 2 | 2 | |
| | | Discussion of which machine to purchase | 2 | |
| | | | | 6 |
| | **(c)** | Explanation of risk and uncertainty | 1 | |
| | | Discussion of sensitivity analysis | 2–3 | |
| | | Discussion of probability analysis | 2–3 | |
| | | Other relevant discussion | 1–2 | |
| | | Maximum | | 7 |
| | | | | **25** |
| **2** | **(a)** | Rapid increase in revenue | 1–2 | |
| | | Increase in trade receivables days | 2–3 | |
| | | Decrease in profitability | 2–3 | |
| | | Rapid increase in current assets | 2–3 | |
| | | Increased dependence on short-term finance | 2–3 | |
| | | Decrease in liquidity | 2–3 | |
| | | Conclusion as regards overtrading | 1 | |
| | | Maximum | | 12 |
| | **(b)** | Working capital investment policy | 3–4 | |
| | | Working capital financing policy | 5–6 | |
| | | Maximum | | 9 |
| | **(c)** | Calculation of upper limit | 1 | |
| | | Calculation of return point | 1 | |
| | | Explanation of use in managing cash balances | 2 | |
| | | | | 4 |
| | | | | **25** |

|  |  |  | *Marks* | *Marks* |
|---|---|---|---|---|
| **3** | **(a)** | Causes of conflict between objectives | 2–3 | |
| | | Reasons for less conflict in SMEs | 1–2 | |
| | | | Maximum | 4 |
| | **(b)** | Factors to consider when choosing source of debt | 4–5 | |
| | | Factors considered by providers of finance | 4–5 | |
| | | | Maximum | 8 |
| | **(c)** | Nature of a *mudaraba* contract | 3 | |
| | | Financing business expansion using mudaraba | 2 | |
| | | | | 5 |
| | **(d)** | Calculated value of a forward exchange contract | 1 | |
| | | Calculated value of a money market hedge | 3 | |
| | | Comment on hedge to select | 1 | |
| | | | | 5 |
| | **(e)** | Calculation of one-year future spot rate | 1 | |
| | | Link between future spot rate and forward rate | 2 | |
| | | | | 3 |
| | | | | **25** |
| **4** | **(a)** | Price/earnings value using year 1 earnings | 1 | |
| | | Price/earnings value using average earnings | 1 | |
| | | Discussion of variables | 2 | |
| | | | | 4 |
| | **(b)** | Calculation of current cost of equity using CAPM | 1 | |
| | | PV of year 2 dividends | 0·5 | |
| | | PV of year 3 dividends | 0·5 | |
| | | Year 3 DGM value | 2 | |
| | | Year 0 PV of year 3 DGM value | 1 | |
| | | Company value using dividend valuation model | 1 | |
| | | | | 6 |
| | **(c)** | After-tax cost of debt | 1 | |
| | | After-tax WACC | 1 | |
| | | Revised cost of equity using CAPM | 1 | |
| | | Revisied after-tax cost of debt | 1 | |
| | | Revised after-tax WACC | 1 | |
| | | Comment on change in WACC | 1 | |
| | | | | 6 |
| | **(d)** | Nature of business risk | 1–2 | |
| | | Assessment of business risk | 1–2 | |
| | | Nature of financial risk | 1–2 | |
| | | Assessment of financial risk | 1–2 | |
| | | Nature of systematic risk | 1–2 | |
| | | Assessment of systematic risk | 1–2 | |
| | | | Maximum | 9 |
| | | | | **25** |

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