

Practice Questions

Part 2

Chartered Accountancy

Strategic Level

Corporate Finance & Risk Management (CFRM)

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CORPORATE FINANCE & RISK MANAGEMENT

(SL2)

Strategic Level Examination - **June 2022**

Practice Questions on:

02

- ✓ Long Term Financing
- ✓ Cost of Capital
- ✓ Capital Structure
- ✓ Valuations of Bonds & Shares



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QUESTION 01

You are the Chief Financial Officer of Moose Co. Moose Co is a manufacturer of cleaning equipment and has an international market for its products. Your company places a strong emphasis on innovation and design with patent protection across all its product range.

The company has two principal manufacturing centres, one in Europe which has been reduced in size in recent years because of high labour costs and the other in South East Asia. However, Moose Co's development has relied upon ready access to the debt market both in Europe and in South East Asia and the company is planning significant expansion with a new manufacturing and distribution centre in South America. Your company is highly profitable with strong cash flows although in the last two quarters there has been a downturn in sales in all markets as the global recession has begun to take effect.

Since August 20X7, credit conditions have deteriorated across all of the major economies as banks have curtailed their lending following the downgrading of US asset-backed securities. In 20X8 and 20X9 many banks recorded significant multibillion dollar losses as they attempted to sell off what had become known as 'toxic debt', leading to a further collapse in their value. In response many banks also attempted to repair their balance sheets by rights and other equity issues.

The founder and executive chairman of the company, Alan Bison, is planning a round of meetings with a number of investment banks in leading financial centres around the world to explore raising a \$350 million dollar loan for the new development. It has already been suggested that a loan of this size would need to be syndicated or alternatively raised through a bond issue.

The chairman has also heard about Islamic finance providing an alternative to conventional forms of finance and is keen to find out more about the benefits and drawbacks of using Islamic finance. In preparation for those meetings he has asked you to provide him with some briefing notes.

Required

- (a) Given conditions in the global debt market as described above, advise on the likely factors banks will consider in offering a loan of this size. **(7 marks)**
- (b) Assess the relative advantages of loan syndication versus a bond issue to Moose Co. **(7 marks)**
- (c) Assess the relative advantages and disadvantages of entering into a capital investment of this scale at this stage of the global economic cycle. **(6 marks)**
- (d) Discuss the benefits and drawbacks for Moose Co of using Islamic finance. **(5 marks)**

(Total = 25 marks)

ANSWER

(a) Likely factors that a bank might consider in offering a \$350 million loan

The 'credit crunch' had its origins in years of lax lending by financial institutions. Funds were both easy and cheap to obtain, even to those with weak credit ratings (sub-prime borrowers) and were ploughed into property. The idea was that if such borrowers had difficulty in making repayments, the rising house prices would allow them to remortgage their property. However when interest rates started to climb, as they inevitably have to, house prices fell. Borrowers began to default on mortgage payments, leaving banks with huge losses, as the value of collateralised debt obligations plummeted.

Numerous banks came close to bankruptcy, many of which had to be bailed out by their respective governments. As a result there has been greater reluctance by banks to lend money. Banks with no government bail-out package were forced to raise additional equity capital in order to maintain their capital adequacy ratios which meant that liquidity was significantly reduced. More stringent requirements were put in place for potential borrowers, both corporate and individual, and the effects have been widely felt.

Lending rates, particularly to those seeking mortgages, rose and people found it more difficult to raise capital to buy property. The pessimism in the market in general has been felt by many industrialised countries in the form of slow-down or cessation of investment which has led to recession in numerous economies. Interest rates remain low to try to stimulate economies back into growth and whilst banks are slowly increasing their willingness to lend they remain cautious. Default risk remains a concern but as Moose Co is in a relatively strong liquidity position it may be looked on more favourably by the banks. Its highly profitable position, coupled with strong cash flows, suggests a high credit rating which will be more attractive to lenders. Despite this position however the company will no doubt be subject to a stringent credit risk assessment with particular emphasis on its cash flow position relative to its debt obligations.

As well as cash flow strength, asset strength will be a major factor in determining the likelihood of the company raising the necessary finance. Banks will be interested in the level of collateral the company can offer to support the loan as this will offer reassurance that they will be compensated in the event of default.

If the value of the assets offered to support the loan exceed the value of the loan itself (known as overcollateralisation) the company is likely to be in a strong position to secure the necessary finance.

(b) Loan syndication versus bond issue

Loan syndication is the combination of several lenders to provide various proportions of a loan. One lender normally 'leads' the syndicate. One of the benefits of syndication is that it allows banks to offer much higher loans that would normally be feasible if acting singly, as several banks provide smaller portions of the total principal. Whilst the effective cost of a syndicated loan is likely to be higher than that obtained from a single lender, it is usually still lower than the cost of a bond issue.

Bonds are where the borrowing is securitised and floated on the capital market, with a coupon rate and set redemption date. One of the disadvantages of bonds is the high issue costs. As with bank loans, some bonds may be syndicated with an investment bank managing the process. The size of the loan being sought is at the lower end of the scale of loan that might be raised through bond issue.

There is evidence to suggest that large companies with high credibility and performance (but fewer growth opportunities) prefer syndicated loans. Companies with higher levels of short-term debt and are perceived by the market to have more growth opportunities tend to favour bond issues.

The main advantage of syndicated loans over bond issues is the lower issue costs. However bonds tend to be more flexible in terms of coupon rate and date of redemption.

(c) Advantages and disadvantages of entering capital market

One of the issues to be considered is whether there is an option to delay on the project being financed.

Options to delay (if they exist) can be appraised using the Black-Scholes model. If there is a positive option to delay then this should be taken up.

There are various uncertainties surrounding the economic climate which leads to numerous assumptions being made. This increases the risk of the project which could in turn increase the rate of return required.

Moose Co should undertake sensitivity analysis on the project to determine the extent to which critical factors can change before NPV becomes negative.

There are also strategic and operational factors to consider. How will the company be perceived by the market if the project is delayed? Will this decision reduce confidence in the company's future success? Will potential investors increase the perceived risk attached to the company? Could a competitor take advantage of the delay by moving operations into South America first? All of these issues may have long-term effects on the company's continued success and development, including availability of future finance.

From an operational perspective, will the delay to development affect the day-to-day business of the company? Will it affect current products and customers? What about financial results? These issues must be considered before a final decision is taken on whether the project should be delayed.

(d) Benefits of Islamic finance

Islamic finance operates by the underlying principle that there should be a link between the economic activity that creates value and the financing of that economic activity. The main advantages of Islamic finance for Moose Co are that excessive profiteering is not allowed, only reasonable mark-ups are allowed, and that since Islamic banks cannot use excessive leverage they are less likely to collapse.

Drawbacks of Islamic finance

The use of Islamic finance does not remove all commercial risk, indeed there may even be additional risk from the use of Islamic finance. For example, there may be the risk that after an Islamic finance product has been designed it does not receive approval from Islamic scholars as being Sharia compliant.

There are also the following drawbacks from the use of Islamic finance:

There is no standard Sharia'a model for the Islamic finance market, meaning that documentation is often tailor-made for the transaction, leading to higher transaction costs than for the conventional finance alternative.

Due to governmental and Sharia'a restrictions, Islamic finance institutions are subject to additional compliance work, which can also increase transaction costs.

QUESTION 02

Your company, which is in the airline business, is considering raising new capital of \$400 million in the bond market for the acquisition of new aircraft. The debt would have a term to maturity of four years. The market capitalisation of the company's equity is \$1.2 billion and it has a 25% market gearing ratio (market value of debt to total market value of the company). This new issue would be ranked for payment, in the event of default, equally with the company's other long-term debt and the latest credit risk assessment places the company at AA. Interest would be paid to holders annually. The company's current debt carries an average coupon of 4% and has three years to maturity. The company's effective rate of tax is 30%.

The current yield curve suggests that, at three years, government treasuries yield 3.5% and at four years they yield 5.1%. The current credit risk spread is estimated to be 50 basis points at AA. If the issue proceeds, the company's investment bankers suggest that a 90 basis point spread will need to be offered to guarantee take up by its institutional clients.

Required

- (a) Advise on the coupon rate that should be applied to the new debt issue to ensure that it is fully subscribed. (4 marks)
- (b) Estimate the current and revised market valuation of the company's debt and the increase in the company's effective cost of debt capital. (8 marks)
- (c) Discuss the relative advantages and disadvantages of this mode of capital financing in the context of the company's stated financial objectives. (8 marks)
- (d) Briefly consider company-specific factors that will be used in the credit rating assessment to classify the company as AA. (5 marks)

(Total = 25 marks)

ANSWER

- (a) The appropriate coupon rate for the new debt issue should be the same as the yield for the four year debt, which is calculated as follows:

$$\begin{aligned}\text{Yield for 4 year debt} &= \text{risk free rate} + \text{credit spread} \\ &= 5.1\% + 0.9\% \text{ (0.9\% is the 90 base point spread)} = 6\%\end{aligned}$$

The investment bankers have suggested that at a spread of 90 base points will guarantee that the offer will be taken up by the institutional investors. If the spread was set too high, the debt would be issued at a premium; if it was too low then it would have to be issued at a discount as there would not be a full take-up.

(b) **Impact of new issue on the company's cost of debt and market valuation**

When new debt is issued this will increase the risk of the company, resulting in a reduction in the company's credit rate and/or an increase in the company's cost of debt.

Current amount of debt in issue

Using the company's current gearing ratio of 25%, we can calculate the current amount of debt in issue:

$$\text{Gearing} = \frac{\text{MV of debt}}{\text{MV of debt} + \text{MV of equity}}$$

$$0.25 = \frac{\text{MV of debt}}{1.2\text{bn} + \text{MV of debt}}$$

$$0.25 (1.2\text{bn} + \text{MV of debt}) = \text{MV of debt}$$

$$0.25 \times 1.2\text{bn} + 0.25\text{MV of debt} = \text{MV of debt}$$

$$0.3\text{bn} = 0.75\text{MV of debt}$$

$$\text{MV of debt} = 0.4 \text{ bn}$$

Thus the current market value of debt in issue is \$0.4 billion. This is actually the par value as well, given that the coupon rate of 4% and the market yield (3.5% + 50 basis points) are the same.

Effect of new debt on market value of current debt

As mentioned in part (a) above, the yield on the new debt will be 6% (5.1% + 90 basis points). If we assume that this new debt is issued at par at 6%, the market value of existing debt will be reduced by the reduction in credit rating and the increase in yield to 4.4% (that is, original yield of 4% + [90 – 50] basis points).

$$\text{Effect} = \frac{0.4}{1.044} + \frac{0.4}{1.044^2} + \frac{0.4}{1.044^3} = 110 \text{ basis points reduction}$$

This means that the new market value of current debt will be 98.9% (100 – 1.1%) of the current market value.

$$\text{New market value} = 98.9\% \text{ of } \$400 \text{ million} = \$395.6 \text{ million}$$

If the new debt of \$400 million is – as expected – taken up at the par value then total market value of debt in issue will be:

$$\$395.6 \text{ million} + 400 \text{ million} = \$795.6 \text{ million}$$

Effect of new debt on cost of debt capital

Using the yields calculated above (6% for new debt 4.4% for existing debt), the revised cost of debt capital can be calculated on a weighted average basis, adjusted for the effect of tax

$$\begin{aligned} \text{Cost of debt} &= \left[\frac{400 \text{ million}}{(400\text{m} + 395.6\text{m})} \times 6\% + \frac{395.6 \text{ million}}{(400\text{m} + 395.6\text{m})} \times 4.4\% \right] \times (1 - 0.30) \\ &= [3.02\% + 2.19\%] \times 0.7 = 3.64\% \end{aligned}$$

$$\text{Current cost of debt} = 4\% \times (1 - 0.30) = 2.8\%$$

The effect of the new debt issue on cost of debt is to increase it by 84 basis points (3.64% – 2.8%).

What should be borne in mind is that part of this increase will be due to the longer term to maturity (4 years rather than 3 years).

(c) **Advantages and disadvantages of debt as a method of financing**

Relative lower cost of debt compared with equity

One of the advantages of debt is that, due to the tax shield on interest payments, it is a relatively cheaper form of financing than equity (whose dividends are paid out of earnings after tax). As such we would expect the higher level of gearing to lead to a fall in the weighted average cost of capital.

Appropriate to the industry and specific assets

The company is in the airline industry where debt tends to be a more appropriate method of finance, given that many of the assets can be sold when they are being replaced. In this case, the company is using debt to acquire new aircraft where a second-hand market does exist.

Signalling and agency effects

Companies tend to prefer debt to equity as a method of financing. This is mainly due to the tax shield offered by interest payments on debt. If the company increases its level of debt financing, the market could interpret this as meaning that management believe the company is undervalued. There is a significant agency effect arising from the legal obligation to make interest payments. Managers are less inclined to divert money towards financing their own incentives and perks if they know they have such legal obligations to meet.

Alteration of capital structure

One of the problems with debt financing is that it could be viewed as increasing the risk of the company to equity holders, given that there is a legal obligation to pay interest before dividends can be paid. As a result, investors may require a higher rate of return before they will be tempted to invest money in the company.

(d) **Management evaluation**

The rating agencies will look at the overall quality of management and succession planning, as well as performance from mergers and acquisitions and financial performance based on financial statements.

Financial gearing

The level of financial gearing will be considered; typically, companies with a low level of gearing will have a higher credit rating.

Position in the airline industry

The relative position of the company within the airline industry in terms of operating efficiency will be taken into account.

Accounting quality

There will be a general consideration of the accounting policies which could be used to manipulate profits (such as goodwill and depreciation) and whether there have been any qualifications to the audit report.

Earnings protection

Existing and projected measures such as return on capital and profit margins will be considered. Sources of future earnings growth will also be taken into account.

Cash flow adequacy

The relationship between cash flow and gearing and the ability to finance the cash needs of the business are important factors to be considered.

Financial flexibility

Financing needs will be evaluated, including alternatives in situations of financial stress. Agencies will also consider banking relationships and any restrictive debt covenants.

QUESTION 03

Coeden Co is a listed company operating in the hospitality and leisure industry. Coeden Co's board of directors met recently to discuss a new strategy for the business. The proposal put forward was to sell all the hotel properties that Coeden Co owns and rent them back on a long-term rental agreement. Coeden Co would then focus solely on the provision of hotel services at these properties under its popular brand name. The proposal stated that the funds raised from the sale of the hotel properties would be used to pay off 70% of the outstanding non-current liabilities and the remaining funds would be retained for future investments.

The board of directors are of the opinion that reducing the level of debt in Coeden Co will reduce the company's risk and therefore its cost of capital. If the proposal is undertaken and Coeden Co focuses exclusively on the provision of hotel services, it can be assumed that the current market value of equity will remain unchanged after implementing the proposal.

Coeden Co financial information

Extract from the most recent statement of financial position

	\$'000
Non-current assets (re-valued recently)	42,560
Current assets	<u>26,840</u>
Total assets	69,400
Share capital (25c per share par value)	3,250
Reserves	21,780
Non-current liabilities (5.2% redeemable bonds)	42,000
Current liabilities	<u>2,370</u>
Total capital and liabilities	69,400

Coeden Co's latest free cash flow to equity of \$2,600,000 was estimated after taking into account taxation, interest and reinvestment in assets to continue with the current level of business. It can be assumed that the annual reinvestment in assets required to continue with the current level of business is equivalent to the annual amount of depreciation. Over the past few years, Coeden Co has consistently used 40% of its free cash flow to equity on new investments while distributing the remaining 60%. The market value of equity calculated on the basis of the free cash flow to equity model provides a reasonable estimate of the current market value of Coeden Co.

The bonds are redeemable at par in three years and pay the coupon on an annual basis. Although the bonds are not traded, it is estimated that Coeden Co's current debt credit rating is BBB but would improve to A+ if the non-current liabilities are reduced by 70%.

Other information

Coeden Co's current equity beta is 1.1 and it can be assumed that debt beta is 0. The risk free rate is estimated to be 4% and the market risk premium is estimated to be 6%.

There is no beta available for companies offering just hotel services, since most companies own their own buildings.

The average asset beta for property companies has been estimated at 0.4. It has been estimated that the hotel services business accounts for approximately 60% of the current value of Coeden Co and the property company business accounts for the remaining 40%.

Coeden Co's corporation tax rate is 20%. The three-year borrowing credit spread on A+ rated bonds is 60 basis points and 90 basis points on BBB rated bonds, over the risk free rate of interest.

Required

(a) Calculate, and comment on, Coeden Co's cost of equity and weighted average cost of capital before and after implementing the proposal. Briefly explain any assumptions made. (20 marks)

(b) Discuss the validity of the assumption that the market value of equity will remain unchanged after the implementation of the proposal. (5 marks)

(Total = 25 marks)

ANSWER

(a) **Before implementing proposal**

$$\text{Cost of equity} = 4\% + (1.1 \times 6\%) = 10.6\%$$

$$\text{Cost of debt} = 4\% + 0.90 = 4.9\%$$

Market value of debt (MV_d)

$$(\$5.20 \times 1/1.049) + (\$5.20 \times 1/1.049^2) + (\$105.20 \times 1/1.049^2) = \$100.82$$

$$\text{Total value} = \$42 \text{ million} \times 100.82/100 = \$42,344,400$$

Market value of equity (MV_e)

As stated in the question the free cash flow to equity model provides a reasonable estimate of the market value of the company.

Assumption

The growth rate can be estimated using the rb model. It is assumed that the retained free cash flows to equity will be invested to generate a return at least equal to the shareholders' required rate of return.

$$r = 10.6\% \text{ and } b = 0.4$$

$$g = rb = 10.6\% \times 0.4 = 4.24\%$$

$$MV_e = \frac{FCF \times g}{k_e - g} = 2.6m \times 1.0424 / (0.106 - 0.0424) = \$42,614,000 \text{ (rounded)}$$

The proportion of MV_1 to MV_0 is close to 50:50, which will be used here to simplify the calculations.

$$WACC = 10.6\% \times 0.5 + 4.9\% \times 0.5 \times 0.8 = 7.3\%$$

After implementing the proposal

The estimate of the asset beta for Coeden Co is:

$$\beta_A = 1.1 \times 0.5 / (0.5 + 0.5 \times 0.8) = 0.61$$

Asset beta for hotel services

It has been assumed that Coeden Co's asset beta is a weighted average of the average property company beta and the hotel services beta.

Therefore:

$$0.61 = (\text{Asset beta (hotel services)} \times 0.6) + (0.4 \times 0.4)$$

$$0.45 = \text{Asset beta (hotel services)} \times 0.6$$

$$\text{Asset beta (hotel services)} = 0.75$$

Equity beta for Coeden Co, hotel services only

MV_1 is unchanged as stated in the question.

$$MV_1 = \$42,614,000$$

$$k_E = 4 + 0.6 = 4.6\%$$

$$MV_1 = (\$5.20 \times 1/1.046) + (\$5.20 \times 1/1.046^2) + (\$105.20 \times 1/1.046^2) = \$101.65$$

$$\text{Total value} = \$12.6 \text{ million} \times 101.65/100 = \$12,808,000 \text{ (rounded)}$$

Equity beta calculation

$$0.75 = \beta_E \times (42,614 / (42,614 + 12,808 \times 0.8))$$

$$0.75 = \beta_E \times 0.806$$

$$\beta_E = 0.93$$

Hotel services cost of equity and WACC

$$k_E = 4\% + 0.93 \times 6\% = 9.6\%$$

$$WACC = 9.6\% \times (42,614 / (42,614 + 12,808)) + 4.6\% \times 0.8 \times (12,808 / (42,614 + 12,808)) = 8.2\%$$

Comment

	Before proposal	After proposal
Cost of equity	10.6%	9.6%
WACC	7.3%	8.2%

The proposal will increase the asset beta of Coeden Co because the hotel services industry has a **higher business risk** than a business that also owns hotels too. However the equity beta and the cost of equity are both lower because of the **reduction in the level of debt**. This is because the reduction in debt means that the financial risk of Coeden Co is lower. However the WACC increases because this lower debt level means there is less cheap debt in the financing mix. As a result the board of directors' assertion that the lower level of debt will reduce WACC is incorrect.

(b) The assumption that the market value of equity will not change is unlikely to hold in reality. The change in the growth rate of free cash flows and sales revenue and the changes in the business and financial risks of the new business are all likely to have an effect.

In estimating the asset beta of Coeden Co for offering hotel services only there has been no consideration of the **change in business risk** as a result of renting rather than owning the hotels. A revised asset beta should be estimated to reflect the change in business risk.

The market value of equity has been used to estimate the post-implementation equity beta and cost of equity of the business. However, the market value of equity is dependent on the cost of equity, which is itself dependent on the equity beta. Therefore both the cost of equity and the market value of equity will **change** as a result of the implementation of this proposal.

QUESTION 04

AWP Co is a multinational listed company which has a credit rating of AA from major credit rating agencies. AWP Co currently has a financial gearing level measured by debt divided by debt plus equity ($\text{Debt} / (\text{Debt} + \text{Equity})$) of 8%. The average gearing ratio for AWP Co's industry is 35%. The Chief Executive understands Modigliani and Miller's theory and wants AWP Co to issue more debt as he believes this will increase the value of AWP Co.

The Chief Executive has also been quoted as saying 'I don't understand why the industry average gearing ratio is only 35%. Surely companies should be issuing as much debt as possible, as a 100% geared company would have a much greater value.'

In response to the Chief Executive's wishes, AWP Co will issue bonds of \$200 million. There are two different bonds that it is currently considering.

Option 1

A four-year bond with an annual coupon rate of 5%. The bonds will be redeemable at par.

Option 2

A three-year bond with an annual coupon rate of 4%, redeemable at a premium of 5% to nominal value.

The current annual spot yield curve for government bonds is as follows:

One-year	3.3%
Two-year	3.8%
Three-year	4.5%
Four-year	5.3%

The following table of spreads (in basis points) is given for the retail sector:

Rating	1 year	2 year	3 year	4 year
AAA	12	23	36	50
AA	27	40	51	60
A	43	55	67	80

Required

- (a)
- (i) Calculate the theoretical issue prices and the duration of the two bonds. (12 marks)
- (ii) Analyse the results obtained in part (a) (i). (4 marks)
- (b) Evaluate the comments made by the Chief Executive, making reference to other theories of capital structure. (9 marks)
- (Total = 25 marks)

ANSWER

(a) (i) Issue price

The spot yield curve should be used to calculate a likely issue price. This government bond yield curve needs to be adjusted by the credit spread for an AA rated company.

	1 year	2 year	3 year	4 year
Gov't bond annual spot yield curve	3.30	3.80	4.50	5.30
AA rated spread	0.27	0.40	0.51	0.60
	3.57	4.20	5.01	5.90

Each of the bonds can be separated into separate bonds.

Option 1

	1 year	2 year	3 year	4 year
Bond 1	5			
Bond 2		5		
Bond 3			5	
Bond 4				105

Option 2

	1 year	2 year	3 year
Bond 1	4		
Bond 2		4	
Bond 3			109

The present values of these payments (using the yield curve calculated above will be the likely issue price.

Option 1

$$\text{Issue price} = \left(5 \times \frac{1}{1.0357}\right) + \left(5 \times \frac{1}{1.0420^2}\right) + \left(5 \times \frac{1}{1.0501^3}\right) + \left(105 \times \frac{1}{1.0590^4}\right) = \$97.24$$

Option 2

$$\text{Issue price} = \left(4 \times \frac{1}{1.0357}\right) + \left(4 \times \frac{1}{1.0420^2}\right) + \left(109 \times \frac{1}{1.0501^3}\right) = \$101.68$$

Yield to maturity (YTM)

The yield to maturity for each bond can be calculated as follows:

Option 1

Year	Cash flow	DF 5%	PV	DF 6%	PV
0	(97.24)	1.000	(97.24)	1.000	(97.24)
1 - 4	5	3.546	17.73	3.465	17.39
4	100	0.823	82.30	0.792	79.20
			2.79		(0.71)

$$\text{For option 1 the YTM is } 5 + \left[\left(\frac{2.79}{2.79 + 0.71} \right) (6 - 5) \right] = 5.80\%$$

Option 2

Year	Cash flow	DF 4%	PV	DF 5%	PV
0	(101.68)	1.000	(101.68)	1.000	(101.68)
1 - 3	4	2.775	11.10	2.723	10.89
3	105	0.889	93.35	0.864	90.72
			2.77		(0.07)

$$\text{For option 2 the YTM is } 4 + \left[\left(\frac{2.77}{2.77 + 0.07} \right) (5 - 4) \right] = 4.98\%$$

Duration**Option 1**

	Year 1	Year 2	Year 3	Year 4	
Cash flows	5	5	5	105	
Discount factor (5.80%)	0.945	0.893	0.844	0.798	
Present value	4.725	4.465	4.220	83.790	97.20
Duration weighting	1	2	3	4	
Weighted total	4.725	8.93	12.66	335.16	361.475

$$\text{Duration} = 361.475/97.20 = 3.72 \text{ years}$$

Option 2

	Year 1	Year 2	Year 3	
Cash flows	4	4	109	
Discount factor (4.98%)	0.953	0.907	0.864	
Present value	3.812	3.628	94.176	101.616
Duration weighting	1	2	3	
Duration	3.812	7.256	282.528	293.596

$$\text{Duration} = 293.596/101.616 = 2.89 \text{ years}$$

(ii) Duration gives each bond an overall risk weighting which allows bonds of different maturities and coupon rates to be directly compared. Duration is a composite measure of risk expressed in terms of years. In general terms longer-dated bonds will have longer durations and lower-coupon bonds will have longer durations. A bond that is redeemed at a premium will also have a longer duration to one redeemed at par or even at a discount.

The first of these general points is shown by the calculations in part (a) (i) where the longer-dated bond has the longer duration. The points about lower coupons and bonds redeemed at a premium is also shown as the duration of option 2 is only marginally less than the three-year length of the bond.

This is because the vast majority of the returns are in the redemption payment received in year 3.

(b) The Chief Executive understands that the use of debt financing can increase the value of a company due to the tax relief available on the debt. This comes from Modigliani and Miller's theory which assumes that debt is risk-free.

However, an increase in debt financing will also result in an **increase in the chance of bankruptcy** because of the increased commitment in interest payments. Failure to meet those interest payments because of inadequate cash on hand will cause the firm some financial distress, and the ultimate form of financial distress is bankruptcy.

As a result of these **increased distress costs** the gearing-adjusted value of the firm should be decreased.

The value of the company in this case will be: Value of the ungeared company + (tax rate × interest payments) – present value of the bankruptcy costs.

Starting from the empirical observation that firms in AWP Co's industry **do not have 100 percent gearing ratios**, it is plausible that a firm's WACC will start to increase and its value will start to decrease after a certain value of the gearing ratio, to reflect the increasing costs of gearing.

The conclusion is that a company should gear up to take advantage of any tax benefits available, but only to the extent that the **marginal benefits exceed the marginal costs of financial distress**. After this point, the market value of the firm will start to fall and its WACC will start to rise. This is known as the **static trade-off theory** of capital structure. In this scenario it may well be that the optimum point is around the average industry gearing ratio.

Agency theory provides a rationale for an optimal structure based on the existence of agency costs associated with the issue of debt and equity. There are agency problems in directors trying to reconcile the interests of debtholders and equityholders as well as potentially trying to reconcile the interests of new and old shareholders following an issue of equity. Agency theory states that the optimal capital structure of the company will be formed at the particular level of debt and equity where the benefits of the debt that can be received by the shareholders equal the costs of debt imposed by the debt holders. It could be argued that, given AWP Co's relatively low level of gearing, it has not reached this optimum point.

Pecking order theory states that the preferred order for sources of finance is initially retained earnings, then debt and lastly equity. It is this order that the Chief Executive appears to want AWP Co to move towards, although in the past it seems likely that equity was preferred to debt.

QUESTION 05

Mercury Training was established in 1999 and since that time it has developed rapidly. The directors are considering either a flotation or an outright sale of the company.

The company provides training for companies in the computer and telecommunications sectors. It offers a variety of courses ranging from short intensive courses in office software to high level risk management courses using advanced modelling techniques. Mercury employs a number of in-house experts who provide technical materials and other support for the teams that service individual client requirements. In recent years, Mercury has diversified into the financial services sector and now also provides computer simulation systems to companies for valuing acquisitions. This business now accounts for one third of the company's total revenue.

Mercury currently has 10 million, 50c shares in issue. Jupiter is one of the few competitors in Mercury's line of business. However, Jupiter is only involved in the training business. Jupiter is listed on a small company investment market and has an estimated beta of 1.5. Jupiter has 50 million shares in issue with a market price of 580c. The average beta for the financial services sector is 0.9. Average market gearing (debt to total market value) in the financial services sector is estimated at 25%.

Other summary statistics for both companies for the year ended 31 December 2007 are as follows:

Other summary statistics for both companies for the year ended 31 December 2007 are as follows:

	Mercury	Jupiter
Net assets at book value (\$million)	65	45
Earnings per share (c)	100	50
Dividend per share (c)	25	25
Gearing (debt to total market value)	30%	12%
Five year historic earnings growth (annual)	12%	8%

Analysts forecast revenue growth in the training side of Mercury's business to be 6% per annum, but the financial services sector is expected to grow at just 4%.

Background information:

The equity risk premium is 3.5% and the rate of return on short-dated government stock is 4.5%.

Both companies can raise debt at 2.5% above the risk free rate.

Tax on corporate profits is 40%.

Required

(a) Estimate the cost of equity capital and the weighted average cost of capital for Mercury Training. (8 marks)

(b) Advise the owners of Mercury Training on a range of likely issue prices for the company. (10 marks)

(c) Discuss the advantages and disadvantages, to the directors of Mercury Training, of a public listing versus private equity finance as a means of disposing of their interest in the company. (7 marks)

(Total = 25 marks)

ANSWER

(a) Step 1

Ungear beta of Jupiter and Financial Services sector

$$\beta_i = \beta_i \frac{V_e}{V_e + V_d(1-T)}$$

$$\text{Jupiter} = 1.5 \times \frac{88}{88 + (12 \times 0.6)} = 1.3865$$

$$\text{FS sector} = 0.9 \times \frac{75}{75 + (25 \times 0.6)} = 0.75$$

$$B_a = B_g \times \frac{V_e}{V_e + V_d(1-t)}$$

Step 2

Calculate average asset beta for Mercury

$$\beta_i = (0.67 \times 1.3865) + (0.33 \times 0.75) = 1.175$$

Step 3

Regear Mercury's beta

$$\beta_i = \beta_i \times \frac{V_e}{V_e + V_d(1-T)}$$

$$1.175 = \beta_i \times \frac{70}{70 + 30(1-0.4)}$$

$$1.175 = \beta_e \times 0.795$$

$$\beta_i = 1.48$$

Step 4

Calculate cost of equity capital and WACC

Using CAPM

$$\text{Cost of equity capital} = R_f + \beta_i(E(r_m) - R_f) = 4.5 + 1.48 \times 3.5 = 9.68\%$$

$$\text{WACC} = \left[\frac{V_e}{V_e + V_d} \right] k_e + \left[\frac{V_d}{V_e + V_d} \right] k_d(1-T)$$

$$= (0.7 \times 0.0968) + (0.3 \times [0.045 + 0.025]) \times 0.6$$

$$= 8.04\%$$

Where k_e = risk free rate (4.5%) + premium on risk free rate (2.5%)

When to use cost of equity and WACC

Cost of equity is the rate of return required by the company's ordinary shareholders. The return includes a risk free rate (to reflect that investors are rational) and a risk premium (to reflect that investors are risk averse). Cost of equity is used to value income streams to the shareholders (that is, dividends).

WACC is the average cost of capital of the business and is based the company's level of gearing. WACC is used to value income streams to the business as a whole ie free cash flow (for example, it is used as the discount rate to appraise potential investments).

(b) Range of likely issue prices

Lower range of issue price will be the net assets at fair value divided by the number of shares

= \$65 million /10 million shares

= \$6.50 per share

Upper range – use dividend valuation model

Three possible earnings rates:

(i) Historical earnings growth rate of 12% is greater than the cost of equity capital, therefore cannot be sustained in the long run

(ii) The weighted anticipated growth rate of the two business sectors in which Mercury operates ($0.67 \times 6\% + 0.33 \times 4\% = 5.34\%$)

(iii) The rate implied from the firm's reinvestment (9.68% – see part (a) step 4 above)

$$g = br_s = \frac{(100 - 25)}{100} \times 0.0968 = 7.26\%$$

The higher of the two feasible rates – that is, 7.26% – should be used to calculate the higher issue price

$$P_s = \frac{d_0(1+g)}{(k_e - g)}$$

$$P_s = \frac{25(1+0.0726)}{(0.0968 - 0.0726)} = \$11.08 \text{ per share}$$

If the company was floated, the higher price above (which is based on a minority shareholding earning a dividend from the shares) could be achieved. This implies that a portion of the equity and effective control are retained. Private equity investors are likely to be willing to pay a premium for the benefits of control (control premium) – often as much as 30 – 50% of the share price. In this case negotiations may start at a share price of \$16.62 ($\11.08×1.5).

(c) To: Directors of Mercury Training
From: Treasury department
Subject: Public listing versus private equity finance

As you are currently considering either a flotation or an outright sale of Mercury Training, I would like to outline the relative advantages and disadvantages of a public listing versus private equity finance.

Public listing

This is the traditional method of raising finance by firms who have reached a certain size. Where a public listing is sought, owners will be looking to release their equity stake in the firm (either partially or in total). A public listing gives the company access to a wider pool of finance and makes it easier to grow by acquisition. As owners, you will be able to release your holding and use the money to fund other projects.

However, public listings lead to the company being subject to increased scrutiny, accountability and regulation. There are greater legal requirements and the company will also be required to adhere to the rules of the stock exchange.

Obtaining a public listing is expensive – for example brokerage commission and underwriting fees.

New investors may have more exacting requirements and different ideas of how the business should progress. This may put additional strain on the directors responsible for the company's overall strategy.

Private equity

Private equity finance is raised via venture capital companies or private equity businesses. There are fewer regulatory restrictions attached to private equity finance than there are to public listings. The cost of accessing private equity finance is lower and in certain jurisdictions there are favourable tax advantages to private equity investors.

Directors of a company seeking private equity finance must realise however that the financial institution will require an equity stake in the company. The directors responsible for the overall company strategy will still be subject to considerable scrutiny as the finance providers may want to have a representative appointed to the company's board to look after their interests. They may even require the appointment of an independent director.

Private equity providers will need to be convinced that the company can continue its business operations successfully, otherwise there will be no incentive to invest.

I hope this information is useful but please contact me if you wish to discuss further.

QUESTION 06

Kodiak Company is a small software design business established four years ago. The company is owned by three directors who have relied upon external accounting services in the past. The company has grown quickly and the directors have appointed you as a financial consultant to advise on the value of the business under their ownership.

The directors have limited liability and the bank loan is secured against the general assets of the business. The directors have no outstanding guarantees on the company's debt.

The company's latest statement of profit or loss and the extracted balances from the latest statement of financial position are as follows:

Profit/loss	\$'000	Financial Position	\$'000
Revenue	5,000	Opening non-current assets	1,200
Cost of Sales	<u>3,000</u>	Additions	<u>66</u>
Gross profit	2,000	Non-current assets (gross)	1,266
Other operating costs	<u>1,877</u>	Accumulated depreciation	<u>367</u>
Operating profit	123	Net book value	899
Interest on loan	<u>74</u>	Net current assets	270
Profit before tax	49	Loan	<u>(990)</u>
Income tax expense	<u>15</u>	Net Assets Employed	<u>179</u>
Profit for the period	<u>34</u>		

During the current year:

1 Depreciation is charged at 10% per annum on the year end non-current asset balance before accumulated depreciation, and is included in other operating costs in the statement of profit or loss.

2 The investment in net working capital is expected to increase in line with the growth in gross profit.

3 Other operating costs consisted of:

	\$'000
Variable component at 15% of sales	750
Fixed costs	1,000
Depreciation on non-current assets	127

4 Revenue and variable costs are projected to grow at 9% per annum and fixed costs are projected to grow at 6% per annum.

5 The company pays interest on its outstanding loan of 7.5% per annum and incurs tax on its profits at 30%, payable in the following year. The company does not pay dividends.

6 The net current assets reported in the statement of financial position contain \$50,000 of cash.

One of your first tasks is to prepare for the directors a forward cash flow projection for three years and to value the firm on the basis of its expected free cash flow to equity. In discussion with them you note the following:

- The company will not dispose of any of its non-current assets but will increase its investment in new noncurrent assets by 20% per annum. The company's depreciation policy matches the currently available tax write off for capital allowances. This straight-line write off policy is not likely to change.
- The directors will not take a dividend for the next three years but will then review the position taking into account the company's sustainable cash flow at that time.
- The level of the loan will be maintained at \$990,000 and, on the basis of the forward yield curve, interest rates are not expected to change.
- The directors have set a target rate of return on their equity of 10% per annum which they believe fairly represents the opportunity cost of their invested funds.

Required

- (a) Prepare a three-year cash flow forecast for the business on the basis described above highlighting the free cash flow to equity in each year. (12 marks)
 - (b) Estimate the value of the business based upon the expected free cash flow to equity and a terminal value based upon a sustainable growth rate of 3% per annum thereafter. (6 marks)
 - (c) Advise the directors on the assumptions and the uncertainties within your valuation. (7 marks)
- (Total = 25 marks)



ANSWER

- (a) Using the information in the question it is clear that in order to produce a projected cash flow statement we must first produce a projected statement of profit or loss for each of the next three years.

Projected statement of profit or loss

	Year 1	Year 2	Year 3
	\$'000	\$'000	\$'000
Revenue (9% growth per annum)	5,450	5,941	6,476
Cost of sales (9% growth per annum)	(3,270)	(3,564)	(3,885)
Gross profit	2,180	2,377	2,591
Other operating costs (W1)	(2,013)	(2,160)	(2,318)
Operating profit	<u>167</u>	<u>217</u>	<u>273</u>

Projected cash flow statement

	Year 1	Year 2	Year 3
	\$'000	\$'000	\$'000
Operating profit	167	217	273
Add: Depreciation (W2)	135	144	155
Less: Incremental working capital (W3)	(20)	(22)	(24)
Less: interest	(74)	(74)	(74)
Less: taxation (W4)	(15)	(28)	(43)
	193	237	287
Less: new additions to non-current assets (W2)	(79)	(95)	(114)
Free cash flow to equity	<u>114</u>	<u>142</u>	<u>173</u>

Workings

1 Operating costs

	Year 1	Year 2	Year 3
	\$'000	\$'000	\$'000
Variable costs (9% growth per annum)	818	892	972
Fixed costs (6% growth per annum)	1,060	1,124	1,191
Depreciation (10%) (Working 2)	135	144	155
Total operating costs	<u>2,013</u>	<u>2,160</u>	<u>2,318</u>

2 Depreciation and non-current assets

	Year 1	Year 2	Year 3
	\$'000	\$'000	\$'000
Non-current assets at start of year	1,266	1,345	1,440
Additions (20% growth)	79	95	114
Non-current assets at end of year	1,345	1,440	1,554
Depreciation (10%)	135	144	155

3 Working capital

	Year 1	Year 2	Year 3
	\$'000	\$'000	\$'000
Working capital requirements (9% growth pa)	240	262	286
Incremental working capital	(240 - 220) = 20	(262 - 240) = 22	(286 - 262) = 24

Note that the working capital figure excludes cash, therefore the current (year 0) working capital figure is \$270,000 - \$50,000 = \$220,000.

4 Taxation

	Year 1	Year 2	Year 3
	\$'000	\$'000	\$'000
Charged on previous year's profit after interest Given in question	15		
Previous year's operating profit (from projected statement of profit or loss)		167	217
Interest		(74)	(74)
Profit before tax		93	143
Tax at 30%		28	43

(b) Value of business using free cash flow to equity and terminal value

	Year 1	Year 2	Year 3
	\$'000	\$'000	\$'000
Free cash flow to equity (from (a))	114	142	173
Terminal value (W1)			2,546
Total			2,719
Discount factor (10%)	0.909	0.826	0.751
Present value	104	117	2,042

Value of the business = \$2,263,000

Working

1 Terminal value

$$\text{Terminal value} = \frac{FCF_N (1+g)}{k-g}$$

where g = growth rate
k = required rate of return

$$\text{Terminal value} = \frac{173(1+0.03)}{0.10-0.03} = \$2,546$$

(c) Assumptions and uncertainties within the valuation

Whilst the valuation of the business is a useful estimate, it should be treated with caution as it is subject to certain assumptions.

Rate of return

The rate of return of 10% is assumed to fairly reflect the required market rate of return for a business of this type, which compensates you for the business risk to which you are exposed. Whilst the required return for an investment held in a widely diversified portfolio should only compensate you for market risk, if you hold the same investment individually you may expect a higher return due to your increased exposure to risk.

Growth rates

The growth rate applied to terminal value is assumed to be certain into the indefinite future. In the case of a three year projection this is unlikely to be the case, due to unexpected economic conditions and the type of business. In order to reduce the effects of such uncertainties, different growth rates could be applied to the calculations to determine business valuation in a variety of scenarios.

Interest rates and tax rates

Similar to the growth rate, it has been assumed that interest rates and tax rates will remain unchanged during the three year period. If economic conditions suggest that changes may take place revised calculations could reflect different possible rates to update the estimate of business valuation. Costs, revenues and non-current assets It has been assumed that the figures used for these factors are certain and that the business is a going concern. It may be worth investigating the potential variability of these factors and the range of values that may result for such variability. Changes in estimates will obviously affect operating profit and projected cash flows, which in turn will affect the estimated value of the business.

QUESTION 07

Burcolene is a large European-based petrochemical manufacturer, with a wide range of basic bulk chemicals in its product range and with strong markets in Europe and the Pacific region. In recent years, margins have fallen as a result of competition from China and, more importantly, Eastern European countries that have favourable access to the Russian petrochemical industry. However, the company has managed to sustain a 5% growth rate in earnings through aggressive management of its cost base, the management of its risk and careful attention to its value base. As part of its strategic development, Burcolene is considering a leveraged (debt-financed) acquisition of PetroFrancais, a large petrochemical business that has engaged in a number of high

quality alliances with oil drilling and extraction companies in the newly opened Russian Arctic fields. However, the growth of the company has not been particularly strong in recent years, although Burcolene believes that an expected long term growth of 4% per annum is realistic under its current management.

Preliminary discussions with its banks have led Burcolene to the conclusion that an acquisition of 100% of the equity of PetroFrancais, financed via a bond issue, would not have a significant impact upon the company's existing credit rating. The key issues, according to the company's advisors, are the terms of the deal and the likely effect of the acquisition on the company's value and its financial leverage. Both companies are quoted on an international stock exchange and below are relevant data relating to each company:

Financial data as at 30 November 20X7

	<i>Burcolene</i>	<i>PetroFrancais</i>
Market value of debt in issue (\$bn)	3.30	5.80
Market value of equity in issue (\$bn)	9.90	6.70
Number of shares in issue (million)	340.00	440.00
Share options outstanding (million)	25.40	–
Exercise price of options (\$ per share)	22.00	–
Company tax rate (%)	30.00	25.00
Equity beta	1.85	0.95
Default risk premium	1.6%	3.0%
Net operating profit after tax and new reinvestment (\$ million)	450.00	205.00
Current EPS (\$ per share)	1.19	0.44

The global equity risk premium is 4.0% and the most appropriate risk free rate derived from the returns on government stock is 3.0%.

Burcolene has a share option scheme as part of its executive remuneration package. In accordance with the accounting standards, the company has expensed its share options at fair value. The share options held by the employees of Burcolene were granted on 1 January 20X4. The vesting date is 30 November 20X9 and the exercise date is 30 November 20Y0. Currently, the company has a 5% attrition rate as members leave the company and, of those remaining at the vesting date, 20% are expected not to have achieved the standard of performance required.

Your estimate is that the options have a time value of \$7.31.

PetroFrancais operates a defined benefits pension scheme which, at its current actuarial valuation, shows a deficit of \$430 million.

You have been appointed to advise the senior management team of Burcolene on the validity of the free cash flow to equity model as a basis for valuing both firms and on the financial implications of this acquisition for Burcolene.

Following your initial discussions with management, you decide that the following points are relevant:

- 1 The free cash flow to all classes of capital invested can be reliably approximated as net operating profit after tax (NOPAT) less net reinvestment.
- 2 Given the rumours in the market concerning a potential acquisition, the existing market valuations may not fully reflect each company's value.
- 3 The acquisition would be financed by a new debt issue by Burcolene.

Required

- (a) Estimate the weighted average cost of capital and the current entity value for each business, taking into account the impact of the share option scheme and the pension fund deficit on the value of each company. (16 marks)
 - (b) Write a briefing paper for management, advising them on:
 - (i) The validity of the free cash flow model, given the growth rate assumptions made by management for both firms
 - (ii) The implications of an acquisition such as this for Burcolene's gearing and cost of capital (9 marks)
- (Total = 25 marks)



ANSWER

(a) WACC and current entity value for both Burcolene and PetroFrancais

We will calculate WACC first (post tax):

	<i>Burcolene</i>	<i>PetroFrancais</i>
Cost of equity (using CAPM)	$0.03 + 1.85 \times 0.04$ = 10.4%	$0.03 + 0.95 \times 0.04$ = 6.8%
Market gearing	$3.30 / (3.30 + 9.90)$ = 25%	$5.80 / (5.80 + 6.70)$ = 46.4%
Cost of debt	$0.03 + 0.016$ = 4.6%	$0.03 + 0.03$ = 6%
WACC	$(1 - 0.25) \times 0.104$ $+ 0.25 \times 0.046 \times 0.7$ = 8.6%	$(1 - 0.464) \times 0.068$ $+ 0.464 \times 0.06 \times 0.75$ = 5.7%

The valuation of a company can be calculated using the following formula:

$$V_0 = \frac{\text{Free cash flow at time 1}}{\text{WACC} - g}$$

Where:

V_0 is the value at time 0

g is the annual growth rate

As Free Cash Flow = NOPAT – net reinvestment, the formula can be rewritten as:

$$V_0 = \frac{(\text{NOPAT} - \text{net reinvestment}) \text{ at time 1}}{\text{WACC} - g}$$

Burcolene

$$V_0 = \frac{450 \times 1.05}{0.086 - 0.05} = \$13,125 \text{ million}$$

PetroFrancais

$$V_0 = \frac{205 \times 1.04}{0.057 - 0.04} = \$12,541 \text{ million}$$

Share option scheme adjustments – Burcolene

Option value = Intrinsic value + time value

Where:

Intrinsic value = Actual price – exercise price

$$\text{Actual price} = \frac{\text{Value of equity}}{\text{No of shares outstanding}} = \frac{\$9,900 \text{ million}}{340 \text{ million}} = \$29.12 \text{ per share}$$

$$\text{Option value} = (\$29.12 - 22) + 7.31 = \$14.43$$

PetroFrancais

$$V_s = \frac{205 \times 1.04}{0.057 - 0.04} = \$12,541 \text{ million}$$

Share option scheme adjustments – Burcolene

Option value = Intrinsic value + time value

Where:

Intrinsic value = Actual price – exercise price

$$\text{Actual price} = \frac{\text{Value of equity}}{\text{No of shares outstanding}} = \frac{\$9,900 \text{ million}}{340 \text{ million}} = \$29.12 \text{ per share}$$

$$\text{Option value} = (\$29.12 - 22) + 7.31 = \$14.43$$

Number of options to be exercised:

We have to take into account the attrition rate of 5% per annum and the percentage not expected to achieve the standard of performance required (20%).

$$\text{Number of options} = 25.4 \text{ million} \times (1 - 0.05)^2 \times (1 - 0.2) = 17.42 \text{ million}$$

$$\text{Value of options outstanding} = 17.42 \text{ million} \times \$14.43 = \$251.4 \text{ million}$$

$$\text{Burcolene's market valuation} = \$13,125 \text{ million} - 251.4 \text{ million} = \$12,873.6 \text{ million}$$

Pension scheme deficit adjustment – PetroFrancais

The deficit on the pension scheme of \$430 million will reduce the market value of PetroFrancais by the same amount

$$\text{PetroFrancais' market valuation} = \$12,541 \text{ million} - 430 \text{ million} = \$12,111 \text{ million}$$

(b) Briefing paper to management of Burcolene Valuation and financial implications of acquisition of PetroFrancais The proposed acquisition of PetroFrancais is likely to affect both the business and financial risk of Burcolene. This means that the combined business entity should be valued using the free cash flow model – that is, a combination of the cash flows of the acquiring and target companies plus the cash flows resulting from any synergies net of acquisition costs. The problem with using the above approach is that the cash flows cannot be estimated until we know the post-acquisition rate of return – which in turn cannot be estimated until the cash flows are known. This can be solved using suitable spreadsheet packages.

Validity of free cash flow model

The current market values of Burcolene and PetroFrancais are \$13.2 billion and \$12.5 billion respectively.

The free cash flow model values the companies at \$12.874 billion and \$12.111 billion respectively, resulting in respective estimation errors of 2.5% and 3.1%. Such low levels of error suggest that the free cash flow model is appropriate for valuing the combined entity.

The errors may have arisen due to any combination of the following:

- Inefficient capital markets
- Positive market reaction to the acquisition announcement
- Growth estimates being over-optimistic
- The model used to estimate the cost of capital not taking all elements of risk into consideration, perhaps rendering it invalid

Implications of acquisition for Burcolene's gearing and cost of capital

Burcolene intends to finance the acquisition via a bond issue. This will have an effect on the book gearing of the firm although what effect this method of financing will have on market gearing is more difficult to estimate. A lot will depend on how much (if any) surplus shareholder value is generated and how it is distributed. Market gearing is likely to increase if the majority of the benefits fall to PetroFrancais' shareholders; the reverse will be the case if Burcolene's shareholders enjoy the bulk of the benefits.

The implications for the cost of capital will depend on the bid price and the way in which the acquisition value is distributed amongst the two groups of shareholders.

QUESTION 08

Sigra Co is a listed company producing confectionary products which it sells around the world. It wants to acquire Dentre Co, an unlisted company producing high quality, luxury chocolates. Sigra Co proposes to pay for the acquisition using one of the following three methods:

Method 1

A cash offer of \$5.00 per Dentre Co share

Method 2

An offer of three of its shares for two of Dentre Co's shares

Method 3

An offer of a 2% coupon bond in exchange for 16 Dentre Co's shares. The bond will be redeemed in three years at its par value of \$100.

Extracts from the latest financial statements of both companies are as follows:

	<i>Sigra Co</i>	<i>Dentro Co</i>
	\$'000	\$'000
Sales revenue	<u>44,210</u>	<u>4,680</u>
Profit before tax	6,190	780
Taxation	<u>(1,240)</u>	<u>(155)</u>
Profit after tax	4,950	625
Dividends	<u>(2,700)</u>	<u>(275)</u>
Retained earnings for the year	<u><u>2,250</u></u>	<u><u>350</u></u>
Non-current assets	22,450	3,350
Current assets	3,450	247
Non-current liabilities	9,700	873
Current liabilities	3,600	436
Share capital (40c per share)	4,400	500
Reserves	8,200	1,788

Sigra Co's current share price is \$3.60 per share and it has estimated that Dentro Co's price to earnings ratio is 12.5% higher than Sigra Co's current price to earnings ratio. Sigra Co's non-current liabilities include a 6% bond redeemable in three years at par which is currently trading at \$104 per \$100 par value.

Sigra Co estimates that it could achieve synergy savings of 30% of Dentro Co's estimated equity value by eliminating duplicated administrative functions, selling excess non-current assets and through reducing the workforce numbers, if the acquisition were successful.

Required

- (a) Estimate the percentage gain on a Dentro Co share under each of the above three payment methods. Comment on the answers obtained. (16 marks)
- (b) Briefly discuss the issues, in this case, that may prevent the acquisition being successful. (5 marks)
- (c) In relation to the acquisition, the board of directors of Sigra Co are considering the following two proposals:

Proposal 1

Once Sigra Co has obtained agreement from a significant majority of the shareholders, it will enforce the remaining minority shareholders to sell their shares.

Proposal 2

Sigra Co will offer an extra 3 cents per share, in addition to the bid price, to 30% of the shareholders of Dentro Co on a first-come, first-serve basis, as an added incentive to make the acquisition proceed more quickly.

Required

With reference to the key aspects of the global regulatory framework for mergers and acquisitions, briefly discuss the above proposals.

(4 marks)

(Total = 25 marks)

ANSWER

- (a) To assess the gain on a Dentro Co share under each offer, we need to calculate a current value for a Dentro Co share, based on Sigra Co's price earnings ratio.

Number of Sigra Co shares = 4.4 million/0.40 = 11 million

Sigra Co Earnings = \$4.95 million

Sigra Co EPS = 4.95/11 = \$0.45

Sigra Co P/E ratio = \$3.60/\$0.45 = 8

Dentro Co P/E ratio = 8 × 1.125 = 9

Number of Dentro Co Shares = 0.5 million/0.40 = 1.25 million

Dentro Co EPS = 0.625/1.25 = \$0.50

Estimated value of Dentro Co share = \$0.50 × 9 = \$4.50

Gain under cash offer

Cash offer is \$5.00 therefore gain is \$0.50.

Percentage gain is $\$0.50/\$4.50 \times 100 = 11\%$

Gain under share-for-share exchange

Equity value of Sigra Co	11 million × \$3.60	\$39,600,000
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Equity value of Dentro Co	1.25 million × \$4.50	\$5,625,000
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Synergy savings	\$5.625 million × 0.30	\$1,688,000
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Total equity value		\$46,913,000
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Total number of shares	11 million + (1.25 million × 3/2)	12,875,000
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Expected share price	Equity value/ Number of shares	\$3.644 per share
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Gain per Dentro Co share = $[(3 \times 3.644) - (2 \times 4.50)]/2 = \0.966

Percentage gain is $\$0.966/\$4.50 \times 100 = 21.5\%$

Bond offer

To work out the rate of return for the existing three-year bond in Sibra Co with a market price of \$104, an IRR style calculation is needed.

Year	Cash flow	DF at 4%	PV	DF at 5%	PV
0	(104)	1.000	(104.00)	1.000	(104.00)
1	6	0.962	5.77	0.952	5.71
2	6	0.925	5.55	0.907	5.44
3	106	0.889	94.23	0.864	91.58
			<u>1.55</u>		<u>(1.27)</u>

$$\text{Rate of return} = 4\% + (1.55 / (1.55 + 1.27)) \times 1\% = 4.55\%$$

Applying this rate of return to the proposed 2% bond gives a value for this bond of

Year	Cash flow	DF at 4.55%	PV
1	2	0.956	1.91
2	2	0.915	1.83
3	102	0.875	89.25
			<u>92.99</u>

$$\text{Value per share} = \$92.99 / 16 = \$5.81$$

$$\text{Gain per share} = \$5.81 - \$4.50 = \$1.31$$

$$\text{Percentage gain is } \$1.31 / \$4.50 \times 100 = 29.1\%$$

Comment

The share-for-share exchange gives a higher return than the cash offer. However, the share-for-share exchange depends on gains in the share price which are dependent on the projected synergy gains being achieved. As a result, Dentro Co shareholders may prefer the cash offer. However, a cash purchase could also mean that there is an immediate tax burden for Dentro Co's shareholders. Sibra Co's shareholders are likely to prefer the cash offer as it offers the lowest premium to Dentro Co's shareholders and retains more of the synergy benefits for Sibra Co shareholders. The cash offer premium would only cost \$625,000 of the synergy benefits ($\$0.50 \times 1.25$ million shares), but the share-for-share exchange would distribute around \$1.2 million of the synergy gains ($21.5\% \times \$4.50 \times 1.25$ million). This represents over 70% of the synergy benefits.

The bond offer option may be attractive to both sets of shareholders. Dentro Co shareholders stand to receive the highest return and Sibra Co shareholders may prefer the fact that the vast majority of the payment is delayed for three years. However, Sibra Co shareholders may be less happy with the fact that virtually all of the synergy gains (\$1,637,000) are given to Dentro

Co's shareholders ($29.1\% \times \$4.50 \times 1.25$ million). This represents approximately 97% of the total synergy gains.

(b) Dentro Co produces high quality luxury chocolates, it is not known whether Sigra Co produces luxury chocolates, but it is assumed that overall their products are of a lower quality. Therefore Dentro Co products may be perceived to have lost value following the takeover, which could damage the brand.

If the level of synergies obtained are less than predicted the acquisition of Dentro Co may fail as a result of having paid too much and therefore giving too much of the projected synergies to the Dentro Co shareholders.

It is not known why Sigra Co wants to acquire Dentro Co, but if the motives are in management's interests rather than the shareholders' the takeover is more likely to fail. In such a situation Dentro Co may prove to be a poor strategic fit.

As with all other acquisitions, it is crucial that Sigra Co can integrate its systems with those of Dentro Co, in order to integrate both businesses and make the most of available synergies.

In addition, the takeover could fail if Sigra Co is unable to manage any cultural differences between itself and Dentro Co. Dentro Co is unlisted and could have a different culture to a listed company such as Sigra Co.

(c) Note. The EU Takeover Directive is the regulatory framework discussed here. Credit would be given for discussing other valid regulatory frameworks.

Proposal 1

The EU directive gives a bidder the right to squeeze-out a minority of shareholders and force them to sell their shares once a squeeze-out limit has been acquired. This limit varies from country to country, but is generally high, around 80 - 90%, so Sigra would need to acquire a very large proportion of shares before it could force Dentro Co shareholders to sell their shares. The reverse situation can also apply, where Dentro Co's remaining minority shareholders can force Sigra Co to purchase their shares. This is known as sell-out rights.

Proposal 2

A key element of the EU Directive is the equal treatment of all shareholders. This means that minority shareholders must be offered the same terms as earlier shareholders. Because this is not the case under proposal 2, where later shareholders would not receive the additional 3 cents, it is very unlikely that these terms would be allowed.

QUESTION 09

Hav Co is a publicly listed company involved in the production of highly technical and sophisticated electronic components for complex machinery. It has a number of diverse and popular products, an active research and development department, significant cash reserves and a highly talented management who are very good in getting products to market quickly.

A new industry that Hav Co is looking to venture into is biotechnology, which has been expanding rapidly and there are strong indications that this recent growth is set to continue. However, Hav Co has limited experience in this industry. Therefore it believes that the best and quickest way to expand would be through acquiring a company already operating in this industry sector.

Strand Co is a private company operating in the biotechnology industry and is owned by a consortium of business angels and company managers. The owner-managers are highly skilled scientists who have developed a number of technically complex products, but have found it difficult to commercialise them. They have also been increasingly constrained by the lack of funds to develop their innovative products further.

Discussions have taken place about the possibility of Strand Co being acquired by Hav Co. Strand Co's managers have indicated that the consortium of owners is happy for the negotiations to proceed. If Strand Co is acquired, it is expected that its managers would continue to run the Strand Co part of the larger combined company. Strand Co is of the opinion that most of its value is in its intangible assets, comprising intellectual capital.

Therefore, the premium payable on acquisition should be based on the present value to infinity of the after tax excess earnings the company has generated in the past three years, over the average return on capital employed of the biotechnological industry. However, Hav Co is of the opinion that the premium should be assessed on synergy benefits created by the acquisition and

the changes in value, due to the changes in the price-to-earnings (PE) ratio before and after the acquisition.

Given below are extracts of financial information for Hav Co for 20X3 and Strand Co for 20X1, 20X2 and 20X3:

Year ended 30 April	Hav Co		Strand Co	
	20X3	20X3	20X2	20X1
	\$ million	\$ million	\$ million	\$ million
Earnings before tax	1,980	397	370	352
Non-current assets	3,965	882	838	801
Current assets	968	210	208	198
Share capital (25c/share)	600	300	300	300
Reserves	2,479	183	166	159
Non-current liabilities	1,500	400	400	400
Current liabilities	354	209	180	140

The current average PE ratio of the biotechnology industry is 16.4 times and it has been estimated that Strand Co's PE ratio is 10% higher than this. However, it is thought that the PE ratio of the combined company would fall to 14.5 times after the acquisition. The annual after tax earnings will increase by \$140 million due to synergy benefits resulting from combining the two companies.

Both companies pay tax at 20% per annum and Strand Co's annual cost of capital is estimated at 7%. Hav Co's current share price is \$9.24 per share. The biotechnology industry's pre-tax return on capital employed is currently estimated to be 20% per annum.

Hav Co has proposed to pay for the acquisition using one of the following three methods:

- (i) A cash offer of \$5.72 for each Strand Co share; or
- (ii) A cash offer of \$1.33 for each Strand Co share plus one Hav Co share for every two Strand Co shares; or
- (iii) A cash offer of \$1.25 for each Strand Co share plus one \$100 3% convertible bond for every \$5 nominal value of Strand Co shares. In six years, the bond can be converted into 12 Hav Co shares or redeemed at par.

Required

- (a) Distinguish between the different types of synergy and discuss possible sources of synergy based on the above scenario. (9 marks)
- (b) Based on the two different opinions expressed by Hav Co and Strand Co, calculate the maximum acquisition premium payable in each case. (6 marks)
- (c) Calculate the percentage premium per share that Strand Co's shareholders will receive under each acquisition payment method and justify, with explanations, which payment method would be most acceptable to them. (10 marks)
- (Total = 25 marks)

ANSWER

(a) Synergies arise from an acquisition when the value of the new, combined entity is greater than the sum of the two individual values before the acquisition. There are three types of synergies: revenue, cost and financial.

Revenue synergies create higher revenues for the combined entity, also creating a higher return on equity and an extended period of competitive advantage.

Cost synergies arise from eliminating duplication of functions and also from economies of scale due to the size of the new entity.

Financial synergies may result from the ability to increase debt capacity or from transferring group funds to companies where they can be best utilised.

In this scenario, there may be financial synergies available as Hav Co has significant cash reserves, but Strand Co is constrained by a lack of funds. This means that the new entity may have the funds to undertake projects that would have been rejected by Strand Co due to a lack of funds. The larger company may also have an increased debt capacity and therefore additional access to finance. It is also possible that the new entity will have a lower cost of capital as a result of the acquisition.

Cost synergies may be available, through the removal of duplication in areas such as head office functions, but also in research and development. These synergies are likely to be more short-term.

Other cost synergies may arise from a stronger negotiating position with suppliers due to the size of the new entity, meaning better credit terms and also lower costs. A major challenge in an effective acquisition is to integrate processes and systems between the two companies efficiently

and effectively in order to gain the full potential benefits. Often, this is done poorly and can mean that the acquisition is ultimately seen as a failure. Hav Co needs to plan for this before proceeding with the acquisition.

Revenue synergies have the potential to be the biggest synergies from this acquisition, although they are likely to be the hardest to achieve, and also to sustain. Hav Co can help Strand Co with the marketing of its products, which should result in higher revenues and a longer period of competitive advantage. Combining the research and development activity and the technologies of both companies may mean products can be brought to market faster too. To achieve these synergies it is important to retain the services of the scientist managers of Strand Co. They have been used to complete autonomy as the managers of Strand Co, so this relationship should be managed carefully.

(b) Maximum premium based on excess earnings

Average pre-tax earnings of Strand Co = $(397 + 370 + 352)/3 = \$373\text{m}$

Average capital employed = $[(882 + 210 - 209) + (838 + 208 - 180) + (801 + 198 - 140)]/3 = \869.3m

Excess annual premium (pre-tax) = $373 - (869.3 \times 0.2) = \199.1m

Post-tax annual premium = $\$199.1 \times 0.8 = \159.3m

PV of annual premium in perpetuity = $159.3/0.07 = \$2,275.7\text{m}$

The maximum premium payable is \$2,275.7m

Maximum premium based on PE ratio

Strand Co's estimated PE ratio = $16.4 \times 1.10 = 18.04$

Strand Co's post-tax profit (most recent) = $397\text{m} \times 0.8 = \317.6m

Hav Co's post-tax profit = $1,980 \times 0.8 = \$1,584\text{m}$

Hav Co current value = $\$9.24 \times 2,400\text{m shares} = \$22,176\text{m}$

Strand Co current value = $18.04 \times \$317.6 = \$5,729.5\text{m}$

Value of combined company = $(1,584 + 317.6 + 140) \times 14.5 = \$29,603.2\text{m}$

Maximum premium = $29,603.2 - (22,176 + 5,729.5) = \$1,697.7\text{m}$

(c) Current value of a Strand Co share = $\$5,729.5\text{m}/1,200\text{m shares} = \4.77 per share

Maximum premium % based on excess earnings = $2,275.7/5,729.5 \times 100 = 39.7\%$

Maximum premium % based on PE ratio = $1,697.7/5,729.5 \times 100 = 29.6\%$

Cash offer: premium % to Strand Co shareholder

$(5.72 - 4.77)/4.77 \times 100 = 19.9\%$

Cash and share offer: premium % to Strand Co shareholder

1 Hav Co share for 2 Strand Co shares

Hav Co share price = $\$9.24$

Price per Strand Co share = $9.24/2 = \$4.62$

Cash payment per Strand Co share = $\$1.33$

Total return = $4.62 + 1.33 = \$5.95$

Premium = $(5.95 - 4.77)/4.77 \times 100 = 24.7\%$

Cash and bond offer: premium % to Strand Co shareholder

Each share has nominal value of $\$0.25$ so $\$5$ is 20 shares

Bond value $\$100/20$ shares = $\$5$ per share

Cash payment per Strand Co share = $\$1.25$

Total return = $5 + 1.25 = \$6.25$

Premium = $(6.25 - 4.77)/4.77 \times 100 = 31.0\%$

Tutorial note. Although these evaluations have been carried out using the current share price given in the question, an equally valid approach would have been to have used a post-acquisition share price based on earlier calculations.

Based on the calculations above, the cash plus bond offer will give the highest return to Strand Co shareholders. In addition, the bond can be converted to 12 Hav Co shares, giving a value per share of $\$8.33 (\$100/12)$, which is below the current share price and so already **in-the-money**. If the share price increases over the 6-year period, then the value of the bond should also increase. The bond will also earn interest of 3% per year for the holder.

The 31% return is the closest to the maximum premium based on excess earnings and higher than the maximum premium based on PE ratios. Thus this method appears to transfer more of the value to the owners of Strand Co.

However, this payment method gives the lowest initial cash payment of the 3 methods being considered. This may make it seem more attractive to the Hav Co shareholders as well, although they stand to have their shareholding diluted most by this method, but not until six years have passed.

The cash and share offer gives a return in between the other options. Although the return is lower than the cash and bond offer, Strand Co's shareholders could sell the Hav Co shares immediately, if they wish to.

However, if the share price of Hav Co falls between now and the acquisition, the return to Strand Co shareholders will be lower.

The cash only offer gives an immediate return to Strand Co shareholders, but it is the lowest return and may also place a strain on the cash flow of Hav Co, who may need to increase borrowings as a result.

It seems most likely that Strand Co's shareholder/managers, who will continue to work in the new entity, will accept the mixed cash and bond offer. This maximises their current return and also gives them the chance to gain in the future when converting the bond. The choice of payment method could be influenced by the impact on personal taxation situations though.

QUESTION 10

Makonis Co, a listed company producing motor cars, wants to acquire Nuvola Co, an engineering company involved in producing innovative devices for cars. Makonis Co is keen to incorporate some of Nuvola Co's innovative devices into its cars and thereby boosting sales revenue.

The following financial information is provided for the two companies:

	<i>Makonis Co</i>	<i>Nuvola Co</i>
Current share price	\$5.80	\$2.40
Number of issued shares	210 million	200 million
Equity beta	1.2	1.2
Asset beta	0.9	1.2

It is thought that combining the two companies will result in several benefits. Free cash flows to firm of the combined company will be \$216 million in current value terms, but these will increase by an annual growth rate of 5% for the next four years, before reverting to an annual growth rate of 2.25% in perpetuity. In addition to this, combining the companies will result in cash synergy benefits of \$20 million per year, for the next four years. These synergy benefits are not subject to any inflationary increase and no synergy benefits will occur after the fourth year.

The debt-to-equity ratio of the combined company will be 40:60 in market value terms and it is expected that the combined company's cost of debt will be 4.55%.

The corporation tax rate is 20%, the current risk free rate of return is 2% and the market risk premium is 7%. It can be assumed that the combined company's asset beta is the weighted average of Makonis Co's and Nuvola Co's asset betas, weighted by their current market values.

Makonis Co has offered to acquire Nuvola Co through a mixed offer of one of its shares for two Nuvola Co shares plus a cash payment, such that a 30% premium is paid for the acquisition. Nuvola Co's equity holders feel that a 50% premium would be more acceptable. Makonis Co has sufficient cash reserves if the premium is 30%, but not if it is 50%.

Required:

- (a) Estimate the additional equity value created by combining Nuvola Co and Makonis Co, based on the free cash flows to firm method. Comment on the results obtained and briefly discuss the assumptions made. (13 marks)
- (b) Estimate the impact on Makonis Co's equity holders if the premium paid is increased to 50% from 30%. (5 marks)
- (c) Estimate the additional funds required if a premium of 50% is paid instead of 30% and discuss how this premium could be financed. (7 marks)
- (Total = 25 marks)

ANSWER

(a) **Combined company, cost of capital**

Asset beta

$$(1.2 \times 480 + 0.9 \times 1,218) / (480 + 1,218) = 0.985$$

Equity beta

$$0.985 \times (60 + 40 \times 0.8) / 60 = 1.51$$

Cost of equity

$$2\% + 1.51 \times 7\% = 12.57\%$$

Cost of capital

$$12.57\% \times 0.6 + 4.55\% \times 0.8 \times 0.4 = 9.00\%$$

Combined company equity value

Years 1 to 4 (\$ millions)

Year	1	2	3	4
Free cash flows before synergy (growing at 5%)	226.80	238.14	250.05	262.55
Synergies	20.00	20.00	20.00	20.00
Free cash flows	<u>246.80</u>	<u>258.14</u>	<u>270.05</u>	<u>282.55</u>
PV of free cash flows at 9%	226.42	217.27	208.53	200.17

(Note. The present value (PV) figures are slightly different if discount table factors are used, instead of formulae. Full credit will be given if discount tables are used to calculate PV figures.)

Total PV of cash flows (years 1 to 4) = \$852.39 million

Total PV of cash flows (years 5 to perpetuity) = $262.55 \times 1.0225 / (0.09 - 0.0225) \times (1.09 \text{ to the power of } -4)$ = \$2,817.51 million

Total value to firm = \$3,669.90 million

Value attributable to equity holders = \$3,669.90 million \times 0.6 = \$2,201.94 million

Additional value created from the combined company = \$2,201.94 million - (\$1,218 million + \$480 million) = \$2,201.94 million - \$1,698.00 million = \$503.94 million (or 29.7%)

Although the equity beta and therefore the risk of the combined company is more than Makonis Co on its own, probably due to Nuvola Co's higher business risk (reflected by the higher asset beta), overall the benefits from growth in excess of the risk free rate and additional synergies have led to an increase in the value of combined company of just under 30% when compared to the individual companies' values.

However, a number of assumptions have been made in obtaining the valuation, for example:

- The assumption of growth of cash flows in perpetuity and whether this is realistic or not;
- Whether the calculation of the combined company's asset beta when based on the weighted average of market values is based on good evidence or not;
- It has been assumed that the figures such as growth rates, tax rates, free cash flows, risk free rate of return, risk premium, and so on are accurate and do not change in the future.

In all these circumstances, it may be appropriate to undertake sensitivity analysis to determine how changes in the variables would impact on the value of the combined company, and whether the large increase in value is justified.

(b) If 30% premium is paid to Nuvola Co's equity holders, they will receive = $30\% \times \$480 \text{ million}$ = \$144 million of the additional value created.

Makonis Co's equity holders will receive about \$359.94 million or \$1.71 per share of the additional value created, which is 29.5% of the current share price.

If 50% premium is paid to Nuvola Co's equity holders, they will receive = $50\% \times \$480 \text{ million}$ = \$240 million of the additional value created.

Makonis Co's equity holders will receive about \$263.94 million or \$1.26 per share of the additional value created, which is 21.7% of the current share price.

Hence, Makonis Co's equity holders will receive almost 8% less return if a premium of 50% were paid.

(c) One Makonis Co share for two Nuvola Co shares implies a premium of \$0.50 $(\$5.80 - \$4.80)/2$ per Nuvola Co share.

If a 30% premium is offered to Nuvola Co's equity holders, then they will expect \$144 million premium or \$0.72 per share, and therefore the cash paid will be \$0.22 for each Nuvola Co share or \$44 million in total.

If a 50% premium is offered to Nuvola Co's equity holders, then they will expect \$240 million premium or \$1.20 per share, and therefore the cash paid will be \$0.70 per Nuvola Co share or \$140 million in total.

The amount of cash required will increase substantially, by about \$96 million, if Makonis Co agrees to the demands made by Nuvola Co's equity holders and pays the 50% premium. Makonis Co needs to determine how it is going to acquire the additional funds and the implications from this. For example, it could borrow the money required for the additional funds, but taking on more debt may affect the cost of capital and therefore the value of the company. It could raise the funds by issuing more equity shares, but this may not be viewed in a positive light by the current equity holders.

Makonis Co may decide to offer a higher proportion of its shares in the share-for-share exchange instead of paying cash for the additional premium. However, this will affect its equity holders and dilute their equity holding further. Even the current proposal to issue 100 million new shares will mean that Nuvola Co's equity holders will own just under 1/3 of the combined company and Makonis Co's shareholders would own just over 2/3 of the combined company. Makonis Co should also consider what Nuvola Co's equity holders would prefer. They may prefer less cash and more equity due to their personal tax circumstances, but, in most cases, cash is preferred by the target firm's equity holders.

QUESTION 11

Vogel Co, a listed engineering company, manufactures large scale plant and machinery for industrial companies. Until ten years ago, Vogel Co pursued a strategy of organic growth. Since then, it has followed an aggressive policy of acquiring smaller engineering companies, which it feels have developed new technologies and methods, which could be used in its manufacturing processes. However, it is estimated that only between 30% and 40% of the acquisitions made in the last ten years have successfully increased the company's shareholder value.

Vogel Co is currently considering acquiring Tori Co, an unlisted company, which has three departments. Department A manufactures machinery for industrial companies, Department B produces electrical goods for the retail market, and the smaller Department C operates in the construction industry. Upon acquisition, Department A will become part of Vogel Co, as it contains the new technologies which Vogel Co is seeking, but Departments B and C will be unbundled, with the assets attached to Department C sold and Department B being spun off into a new company called Ndege Co.

Given below are extracts of financial information for the two companies for the year ended 30 April 2014.

	<i>Vogel Co</i>	<i>Tori Co</i>
	<i>\$ million</i>	<i>\$ million</i>
Sales revenue	790.2	124.6
Profit before depreciation, interest and tax (PBDIT)	244.4	37.4
Interest	13.8	4.3
Depreciation	72.4	10.1
Pre-tax profit	158.2	23.0
	<i>Vogel Co</i>	<i>Tori Co</i>
	<i>\$ million</i>	<i>\$ million</i>
Non-current assets	723.9	98.2
Current assets	142.6	46.5
7% unsecured bond	—	40.0

Other non-current and current liabilities	212.4	20.2
Share capital (50c/share)	190.0	20.0
Reserves	464.1	64.5

Share of current and non-current assets and profit of Tori Co's three departments:

	<i>Department A</i>	<i>Department B</i>	<i>Department C</i>
Share of current and non-current assets	40%	40%	20%
Share of PBDIT and pre-tax profit	50%	40%	10%

Other information

It is estimated that for Department C, the realisable value of its non-current assets is 100% of their book value, but its current assets' realisable value is only 90% of their book value. The costs related to closing Department C are estimated to be \$3 million.

The funds raised from the disposal of Department C will be used to pay off Tori Co's other non-current and current liabilities.

The 7% unsecured bond will be taken over by Ndege Co. It can be assumed that the current market value of the bond is equal to its book value.

At present, around 10% of Department B's PBDIT come from sales made to Department C.

Ndege Co's cost of capital is estimated to be 10%. It is estimated that in the first year of operation Ndege Co's free cash flows to firm will grow by 20%, and then by 5.2% annually thereafter.

The tax rate applicable to all the companies is 20%, and Ndege Co can claim 10% tax allowable depreciation on its non-current assets. It can be assumed that the amount of tax allowable depreciation is the same as the investment needed to maintain Ndege Co's operations.

Vogel Co's current share price is \$3 per share and it is estimated that Tori Co's price-to-earnings (PE) ratio is 25% higher than Vogel Co's PE ratio. After the acquisition, when Department A becomes part of Vogel Co, it is estimated that Vogel Co's PE ratio will increase by 15%.

It is estimated that the combined company's annual after-tax earnings will increase by \$7 million due to the synergy benefits resulting from combining Vogel Co and Department A.

Required

01. Discuss the possible reasons why Vogel Co may have switched its strategy of organic growth to one of growing by acquiring companies. (4 marks)
02. Discuss the possible actions Vogel Co could take to reduce the risk that the acquisition of Tori Co fails to increase shareholder value. (7 marks)
03. Estimate, showing all relevant calculations, the maximum premium Vogel Co could pay to acquire Tori Co, explaining the approach taken and any assumptions made. (14 marks)

(Total = 25 marks)

ANSWER

(a) Vogel Co may have switched from a strategy of organic growth to one of growth by acquisition, if it was of the opinion that such a change would result in increasing the value for the shareholders.

Acquiring a company to gain access to new products, markets, technologies and expertise will almost certainly be quicker and may be less costly than developing these internally. Horizontal acquisitions may help Vogel Co eliminate key competitors and thereby reduce rivalry and possible over-capacity in its industry, they may also have enabled Vogel Co to take advantage of economies of scale and to compete against large rivals. Vertical acquisitions may help Vogel Co to secure the supply chain and maximise returns from its value chain.

Organic growth may take a long time, can be expensive and may result in little competitive advantage being established due to the time taken. Also organic growth, especially into a new area, would need managers to gain knowledge and expertise of an area or function, which they are not currently familiar with. Furthermore, in a saturated market, there may be little opportunity for organic growth.

(Note. Credit will be given for alternative relevant comments.)

(b) Vogel Co can take the following actions to reduce the risk that the acquisition of Tori Co fails to increase shareholder value.

Since Vogel Co has a poor track record of adding value from its acquisitions it needs to review recent acquisitions to understand why they have not added value ie it should do a post-audit of these acquisitions.

Vogel Co should also ensure that the valuation is based on reasonable input figures and that proper due diligence of the perceived benefits is undertaken prior to the offer being made. Often it is difficult to get an accurate picture of the target when looking at it from the outside. Vogel Co needs to ensure that it has sufficient data and information to enable a thorough and sufficient analysis to be undertaken.

The sources of synergy need to be properly assessed to ensure that they are achievable and what actions Vogel Co needs to undertake to ensure their achievement. Targets should be set for all areas of synergy and responsibility for achieving these targets should be clearly allocated to members of Vogels' senior management team.

The Board of Directors of Vogel Co needs to ensure that there are good reasons to undertake the acquisition, and that the acquisition should result in an increase in value for the shareholders. The non-executive directors should play a crucial role in ensuring that acquisitions are made to enhance the value for the shareholders. Procedures need to be established to ensure that the acquisition is not overpaid. Vogel Co should determine the maximum premium it is willing to pay and not go beyond that figure. Research indicates that often too much is paid to acquire a company and the resultant synergy benefits are not sufficient to cover the premium paid. Often this is the result of the management of the acquiring company wanting to complete the deal at any cost, because not completing the deal may be perceived as damaging to both their own, and their company's, reputation. Vogel Co needs to ensure that it has proper procedures in place to integrate the staff and systems of the target company effectively, and also to recognise that such integration takes time. Vogel Co may decide instead to give the target company a large degree of autonomy and thus make integration less necessary; however, this may result in a reduction in synergy benefits.

Vogel Co should also have strategies in place to retain key staff in the companies that it is acquiring - these people need to be identified at an early stage and given assurances over their role and responsibilities post acquisition. Vogel Co should also be mindful that its own and the acquired company's staff and management need to integrate and ensure a good working relationship between them

(c) **Approach taken**

The maximum premium payable is equal to the maximum additional benefit created from the acquisition of Tori Co, with no increase in value for the shareholders of Vogel Co. It should be noted that the shareholders of Vogel Co would probably not approve of the acquisition if they do not gain from it, but certainly they would not approve a bid in excess of this.

The additional benefit can be estimated as the sum of the cash gained (or lost) from selling the assets of Department C, spinning off Department B and integrating Department A, less the sum of the values of Vogel Co and Tori Co as separate companies.

Estimation of cash gained from selling the assets of Department C:

Non current assets = (20% × \$98.2m)	= \$19.64m
Current assets = (20% × \$46.5m × 0.9)	= \$8.37m
Liabilities & closure costs = (\$20.2 + \$3m)	= \$23.2m
Total	\$19.64m + \$8.37m – \$23.2m = <u>\$4.81m</u>

Value created from spinning off Department B into Ndege Co

<i>Free cash flow of Ndege Co</i>	<i>\$ million</i>
Current share of PBDIT (0.4 × \$37.4m)	14.96
Less: PBIT attributable to Department C (10% × 14.96)	(1.50)
Less: tax allowable depreciation (0.4 × 98.2 × 0.10)	<u>(3.93)</u>
Profits before tax	9.53
Tax (20%)	<u>(1.91)</u>
Free cash flows	<u>7.62</u>

Value of Ndege Co =

Present value of \$7.62m free cash flow growing at 20% in the first year and discounted at 10%:
 $\$7.62m \times 1.2 \times 0.909 = \$8.31m$

Add: present value of cash flows from year 2 onwards:
 $(\$9.14m \times 1.052)/(0.1 - 0.052) \times 0.909 = \$182.11m$

Less bond taken over by Ndege = \$40m

Value to shareholders of Ndege Co = $8.31 + 182.11 - 40 = \underline{\$150.42m}$

Current values

Vogel Co's current value = $\$3 \times 380m = \underline{\$1,140m}$

Vogel Co, profit after tax = $\$158.2m \times 0.8 = \underline{\$126.56m}$

Vogel Co, PE ratio before acquisition = $\$1,140.0m/\$126.56m = 9.01$ say 9

Vogel Co, PE ratio after acquisition = $9 \times 1.15 = 10.35$

Tori Co, PE ratio before acquisition = $9 \times 1.25 = 11.25$

Tori Co post tax profit = $\$23m \times 0.8 = \$18.4m$

Tori Co's current value = $11.25 \times \$18.4m = \underline{\$207.0m}$

Value created from combined company

Post acquisition 50% of Tori's earnings will remain after the disposal of dept C and the spin-off of dept B. So earnings will become:

$$\$126.56\text{m} + (0.5 \times \$18.4\text{m}) + \$7\text{m synergy} = \$142.76\text{m}$$

So the combined company should be worth the P/E of $10.35 \times \$142.76\text{m} = \$1,477.57\text{m}$.

Maximum premium =

Value of combined firm	\$1,477.57m
Value of Ndege	\$150.42m
Value for disposal of C	\$4.81m
Less current value (\$1,140m + \$207.0m)	\$1,347m
	<u>\$285.80m</u>

Assumptions

Based on the calculations given above, it is estimated that the value created will be \$285.80m.

However, Vogel Co needs to assess whether the numbers it has used in the calculations and the assumptions it has made are reasonable. For example, Ndege Co's future cash flows seem to be growing without any additional investment in assets and Vogel Co needs to establish whether or not this is reasonable. It also needs to establish how the increase in its PE ratio was determined after acquisition. Perhaps sensitivity analysis would be useful to show the impact on value changes, if these figures are changed. Given its poor record in generating value previously, Vogel Co needs to pay particular attention to these figures.

QUESTION 12

The directors of ER have decided to concentrate the company's activities on three core areas, bus services, road freight and taxis. As a result the company has offered for sale a regional airport that it owns. The airport handles a mixture of short-haul scheduled services, holiday charter flights and air freight, but does not have a runway long enough for long-haul international operations.

The existing managers of the airport, along with some employees, are attempting to purchase the airport through a leveraged management buy-out, and would form a new unquoted company, AIR. The total value of the airport (free of any debt) has been independently assessed at \$35 million.

The managers and employees can raise a maximum of \$4 million towards this cost. This would be invested in new ordinary shares issued at the par value of 50c per share. ER, as a

condition of the sale, proposes to subscribe to an initial 20% equity holding in the company, and would repay all debt of the airport prior to the sale.

EPP Bank is prepared to offer a floating rate loan of \$20 million to the management team, at an initial interest rate of LIBOR plus 3%. LIBOR is currently at 10%. This loan would be for a period of seven years, repayable upon maturity, and would be secured against the airport's land and buildings. A condition of the loan is that gearing, measured by the book value of total loans to equity, is no more than 100% at the end of four years. If this condition is not met the bank has the right to call in its loan at one month's notice. AIR would be able to purchase a four year interest rate cap at 15% for its loan from EPP Bank for an up-front premium of \$800,000.

A venture capital company, AV, is willing to provide up to \$15 million in the form of unsecured mezzanine debt with attached warrants. This loan would be for a five year period, with principal repayable in equal annual instalments, and have a fixed interest rate of 18% per year.

The warrants would allow AV to purchase 10 AIR shares at a price of 100 cents each for every \$100 of initial debt provided, at any time after two years from the date the loan is agreed. The warrants would expire after five years.

Most recent statement of profit or loss for the airport

	\$'000
Landing fees	14,000
Other revenues	<u>8,600</u>
	<u>22,600</u>
Labour	5,200
Consumables	3,800
Central overhead payable to ER	4,000
Other expenses	3,500
Interest paid	<u>2,500</u>
	<u>19,000</u>
Taxable profit	3,600
Taxation (33%)	<u>1,188</u>
Retained earnings	<u><u>2,412</u></u>

ER has offered to continue to provide central accounting, personnel and marketing services to AIR for a fee of \$3 million per year, with the first fee payable in year one. All revenues and cost (excluding interest) are expected to increase by approximately 5% per year.

Required

a. Prepare a report for the managers of the proposed new company AIR which:

Analyses the advantages and disadvantages for the management buy-out of the proposed financing mix. (9 marks)

b. Evaluates whether or not the EPP Bank's gearing restriction in four years' time is likely to be a problem. (10 marks)

c. All relevant calculations must be shown. State clearly any assumptions that you make.

As a possible alternative to obtaining finance from AV, assume that a venture capital company that you are employed by has been approached by the management buy-out team for a \$10 million loan. Discuss what information, other than that provided above, would be required from the MBO team in order to decide whether or not to agree to the loan. (6 marks)

(Total = 25 marks)

ANSWER

(a) Financing mix

If the airport can be purchased for \$35 million, the financing mix is proposed as:

Equity: 50 cents ordinary shares

	\$m
8 million purchased by managers and employees	4
2 million purchased by ER	1
EPP Bank: secured floating rate loan at LIBOR + 3%	20
AV: mezzanine debt with warrants (balancing figure)	10
Total finance	<u>35</u>

Up to \$15 million of the mezzanine debt is available, which could be used to replace some of the floating rate loan. However, this possibility has been rejected because its cost is 18% compared with 13% and the warrants, if exercised, could dilute the manager/employee shareholding.

Leveraged buyout

A leveraged buyout of the type proposed allows managers and employees to own 80% of the equity while only contributing \$4m out of \$35m capital (11%). However, it is important that the managers and employees agree on the company's strategy at the outset. If the shareholders break into rival factions, control over the company might be difficult to exercise. It would be useful to know the disposition of shareholdings among managers and employees in more detail.

Gearing

The initial gearing of the company will be extremely high: the debt to equity ratio is 600% (\$30 million debt to \$5 million equity). Clearly one of the main medium-term goals following a leveraged buyout is to reduce gearing as rapidly as possible, sacrificing high dividend payouts in order to repay loans. For this reason EPP Bank, the major creditor, has imposed a covenant that capital gearing (debt/equity) must be reduced to 100% within four years or the loan will be called in.

Repayment of mezzanine finance

The gearing will be reduced substantially by steady repayment of the unsecured mezzanine finance. This carries such a high interest rate because it is a very risky investment by the venture capital company AV. A premium of 5% over secured debt is quite normal. The debt must be repaid in five equal annual instalments, that is \$2 million each year. If profits dip in any particular year, AIR might experience cash flow problems, necessitating some debt refinancing.

Warrants

If the warrants attached to the mezzanine debt are exercised, AV will be able to purchase 1 million new shares in AIR for \$1 each. This is a cheap price considering that the book value per share at the date of buyout is \$3.50 (\$35m/10 million shares). The ownership by managers and staff will be diluted from 80% to approximately 73%, with ER holding 18% and AV holding 9%. This should not affect management control provided that managers and staff remain as a unified group.

(b) Gearing at period-end

Using these assumptions and ignoring the possible issue of new shares when warrants are exercised, the gearing at the end of four years is predicted to be 132%, which is significantly above the target of 100% needed to meet the condition on EPP's loan. If warrants are exercised, \$1 million of new share capital will be raised, reducing the year 4 gearing to 125%, still significantly above the target.

No dividends

A key assumption behind these predictions is that no dividends are paid over this period. This may not be acceptable to managers or employees. It is also assumed that cash generated from

operations is sufficient to repay \$2 million of mezzanine debt each year, which is by no means obvious from the figures provided.

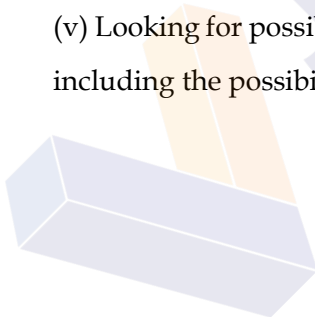
Increase in LIBOR

Results will be worse if LIBOR rises above 10%, over the period. However the purchase of the cap will stop interest payments on EPP's loan rising above 15%. Conversely if LIBOR falls, the increase in profit could be considerable, but it is still very unlikely that the loan condition will be met by year 4.

Problems in meeting loan condition

There will therefore definitely be a problem in meeting the EPP's loan conditions. However, if the company is still showing steady growth by year four, and there have been no problems in meeting interest payments, EPP bank will probably not exercise its right to recall the loan. If the loan condition is predicted to be a problem, the directors of AIR could consider:

- (i) Aiming for continuous improvement in cost effectiveness
- (ii) Renegotiating the central services contract with ER, or providing central services in-house, in order to save costs
- (iii) Renegotiating the allowed gearing ratio to a more realistic figure
- (iv) Going for further expansion after, say, one or two years (eg extension of a runway in order to handle long-haul flights); financing this expansion with an issue of equity funds. However, this may affect control of the company
- (v) Looking for possible alternative sources of debt or equity finance if the EPP loan is recalled, including the possibility of flotation on the stock market



APPENDIX

AIR: forecast statements of profit or loss for first four years and computation of debt/equity gearing ratios

	Estimates from				
	Year 0	Year 1	Year 2	Year 3	Year 4
	\$'000	\$'000	\$'000	\$'000	\$'000
Landing fees	14,000				
Other revenues	<u>8,600</u>				
	<u>22,600</u>				
Labour	5,200				
Consumables	3,800				
Other expenses	<u>3,500</u>				
	<u>12,500</u>				
Direct operating profit growing at 5% pa	10,100	10,605	11,135	11,692	12,277
Central services from ER		(3,000)	(3,150)	(3,308)	(3,473)
EPP loan interest at 13% on \$20m		(2,600)	(2,600)	(2,600)	(2,600)
Mezzanine debt interest at 18%					
on \$10m		(1,800)			
on \$8m			(1,440)		
on \$6m				(1,080)	
on \$4m					(720)
Profit before tax		<u>3,205</u>	<u>3,945</u>	<u>4,704</u>	<u>5,484</u>
Tax at 33%		<u>1,058</u>	<u>1,302</u>	<u>1,552</u>	<u>1,810</u>

	Estimates from				
	Year 0	Year 1	Year 2	Year 3	Year 4
	\$'000	\$'000	\$'000	\$'000	\$'000
Profit after tax		2,147	2,643	3,152	3,674
Reserves b/f		0	2,147	4,790	7,942
Reserves c/f		<u>2,147</u>	<u>4,790</u>	<u>7,942</u>	<u>11,616</u>
Share capital + reserves		7,147	9,790	12,942	16,616
Total debt at end of year		28,000	26,000	24,000	22,000
Gearing: debt/equity		392%	266%	185%	132%

If warrants are exercised, \$1 million of new share capital is issued, reducing the gearing at year 4 to 22,000/17,616 = 125%.

Assumptions

- (i) The central services will be provided by ER for the full 4-year period.
 - (ii) No dividend will be paid during the first four years.
 - (iii) Sufficient cash will be generated to repay \$2 million of mezzanine finance each year and to fund increased working capital requirements.
 - (iv) LIBOR is assumed to remain at 10%.
 - (v) Tax is payable one year in arrears.
- (c) In order to decide whether the management buy-out can be considered for a \$10 million loan, the venture capital company would need the following information:
- (i) The purpose of the buy-out
 - (ii) Full details of the management team, in order to evaluate expertise and experience and to check that there are no 'gaps' in the team
 - (iii) The company's business plan, based on a realistic set of strategies (apparently most approaches to venture capital companies fail on this criterion)
 - (iv) Detailed cash flow forecasts under different scenarios for economic factors such as growth, and interest rates. Forecasts of profit and statements of financial position
 - (v) Details of the management team's investment in the buy-out. Venture capital companies like to ensure that the team is prepared to back their idea with their own money
 - (vi) Availability of security for the loan, including personal guarantees from the management team. Any other 'sweeteners' that could be offered to the lender, such as warrants
 - (vii) The possibility of appointing a representative of the venture capital company as a director of AIR.

QUESTION 13

Doric Co has two manufacturing divisions: parts and fridges. Although the parts division is profitable, the fridges division is not, and as a result its share price has declined to 50c per share from a high of \$2.83 per share around three years ago. Assume it is now 1 January 2013.

The Board of Directors are considering two proposals:

- I. To cease trading and close down the company entirely.
- II. To close the fridge divisions and continue the parts division through a leveraged management buy-out. The new company will continue with manufacturing part only, but will make an additional investment of \$50 million in order to grow the parts division after-tax cash flows by 3.5% in perpetuity. The proceeds from the sale of the fridges division will be used to pay the outstanding liabilities. The finance raised from

the management buy-out will pay for any remaining liabilities, the funds required for the additional investment, and to purchase the current equity shares at a premium of 20%. The fridges division is twice the size of the parts division in terms of its assets attributable to it.

Extracts from the most recent financial statements:

Financial position as at 31 December 2012

	\$m
Assets	
Non-Current Assets	110
Current Assets	220
Share capital (\$0.40 per share par value)	40
Reserves	10
Liabilities (Non-current and current)	280

Statement of profit or loss for the year ended 31 December 2012

		\$m
Sales revenue: Parts division		170
Fridge division		340
Costs prior to depreciation, interest payments and tax	Parts division	(120)
	Fridge division	(370)
Depreciation, tax and interest		<u>(34)</u>
Loss		<u>(14)</u>

If the entire company's assets are sold, the estimated realisable values of assets are as follows:

	\$m
Non-current assets	100
Current assets	110

The following additional information has been provided:

Redundancy and other costs will be approximately \$54 million if the whole company is closed, and pro rata for individual divisions that are closed. These costs have priority for payment before any other liabilities in case of closure. The taxation effects relating to this may be ignored.

Corporation tax on profits is 20% and it can be assumed that tax is payable in the year incurred. Annual depreciation on non-current assets is 10% and this is the amount of investment needed to maintain the current level of activity. The new company's cost of capital is expected to be 11%.

Required

(a) Briefly discuss the possible benefits of Doric Co's parts division being divested through a management buyout. (4 marks)

(b) An estimate of the return the liability holders and the shareholders would receive in the event that Doric Co is closed and all its assets sold. (3 marks)

(c) Estimate the amount of additional finance needed and the value of the new company, if only the assets of the fridges division are sold and the parts division is divested through a management buy-out. Briefly discuss whether or not the management buy-out would be beneficial. (10 marks)

(d) Doric Co's directors are of the opinion that they could receive a better price if the fridges division is sold as a going concern instead of its assets sold separately. They have been told that they need to consider two aspects when selling a company or part of a company; (i) seeking potential buyers and negotiating the sale price; and, (ii) due diligence.

Discuss the issues that should be taken into consideration with each aspect. (8 marks)

(Total = 25 marks)



ANSWER

- (a) There are a number of possible benefits from disposing of a division through a management buy-out. These include: It may be the **fastest way of raising funds** compared to other divestment methods. It is likely that there would be **less resistance from the managers** and employees which would make a smoother process. It may also offer a **better price** to the selling company as the current management has knowledge of the division and is able to make it successful. Costs associated with a management buy-out may be less than other methods.
- (b) If the company is closed, the net proceeds will be:

	\$m
Sale of all assets	210
Less redundancy and other costs	<u>(54)</u>
Net proceeds from sale of all assets	<u>156</u>

Total liabilities are \$280m.

Therefore liability holders will receive \$0.56 per \$1 owing to them (\$156m/\$280m). Shareholders will not receive anything.

- (c) If the fridges division is sold:

	\$m
Sale of fridge division ($\frac{2}{3} \times 210$)	140
Redundancy and other costs ($\frac{2}{3} \times 54$)	<u>(36)</u>
Net proceeds from sale of all assets	<u>104</u>
Amount of current and non-current liabilities	280

Amount of MBO funds needed to pay current and non-current liabilities ($280 - 104$)	176
Amount of MBO funds needed to pay shareholders	60
Investment needed for new venture	<u>50</u>
Total funds required	<u>286</u>

Value of new company following buy-out

	\$m
Sales revenue	170.0
Costs	<u>(120.0)</u>
Profits before depreciation	50.0
Depreciation ($((\frac{1}{3} \times 100m) + 50m) \times 10\%$) *	<u>(8.3)</u>
Profits before tax	41.7
Tax at 20%	<u>(8.3)</u>
Cash flows before interest payments *	<u>33.4</u>

* It has been assumed that depreciation is available on the revalued non-current assets plus the new investment. It is also assumed that no further investment in non-current assets or working capital is needed.

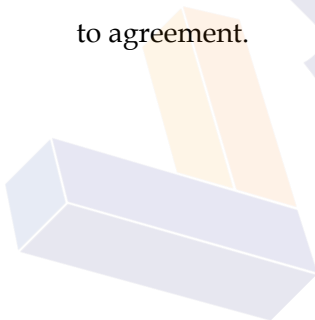
$$\text{Estimated value based on cash flows in perpetuity} = \$33.4m \times \frac{1.035}{(0.11 - 0.035)} = \$461 \text{ m}$$

This is about 61% over and above the funds invested in the new venture and therefore the MBO is likely to be beneficial. However, this assessment is based on estimates. Small changes in variables, particularly the growth rate, will have a large impact on the value. The assumption of growth in perpetuity may not be accurate either. Sensitivity analysis should be performed before a final decision is made.

(d) The search for a potential buyer will either involve an open tender or the use of an intermediary. It may be that a single bidder is sought or maybe Doric Co will look to have an auction of the business among interested parties. Potential purchasers may be found amongst industry competitors as well as Doric Co's suppliers and distributors. A good deal of discretion will be needed to protect the value of the business for sale from adverse competitive action. If this did not happen a dominant competitor in the industry could start a price war which would reduce prices and also the value of the division prior to them making a bid.

Once a potential purchaser is found, it will want to conduct its own due diligence to ensure that everything is as expected / as it has been told. Access should be given to the potential purchaser for this, including upto-date accounts and any legal documentation relating to the assets to be transferred. Doric Co should also perform some due diligence, on the ability of the potential purchaser to complete the transaction. It is necessary to establish how it will be able to finance the purchase and the timescale involved in obtaining this finance. Doric Co's lawyers will also need to assess any possible contractual issues relating to the sale, the transfer of employment rights, the transfer of intellectual property and any rights and responsibilities that will remain with Doric Co.

A sale price is likely to be negotiated and should be negotiated in a way that will maximise the return to Doric. Professionals should be used to conduct the negotiations and they must be fully informed of the situation around the sale, including any conditions and legal requirements. The consideration for the sale, the title deeds of the assets and terms for the transfer of staff and any accrued employment benefits (such as pension rights) will be subject to agreement.



QUESTION 14

Proteus Co, a large listed company, has a number of subsidiaries in different industries but its main line of business is developing surveillance systems and intruder alarms. It has decided to sell a number of companies that it considers are peripheral to its core activities. One of these subsidiary companies is Tyche Co, a company involved in managing the congestion monitoring and charging systems that have been developed by Proteus Co. Tyche Co is a profitable business and it is anticipated that its revenues and costs will continue to increase at their current rate of 8% per year for the foreseeable future.

Tyche Co's managers and some employees want to buy the company through a leveraged management buy-out. An independent assessment estimates Tyche Co's market value at \$81 million if Proteus Co agrees to cancel its current loan to Tyche Co. The managers and employees involved in the buy-out will invest \$12 million for 75% of the equity in the company, with another \$4 million coming from a venture capitalist for the remaining 25% equity.

Palaemon Bank has agreed to lend the balance of the required funds in the form of a 9% loan. The interest is payable at the end of the year, on the loan amount outstanding at the start of each year. A covenant on the loan states that the following debt-equity ratios should not be exceeded at the end of each year for the next five years:

Year	1	2	3	4	5
Debt / Equity (%)	350%	250%	200%	150%	125%

Shown below is an extract of the latest annual statement of profit or loss for Tyche Co

	\$'000
Sales revenue	60,000
Materials and consumables	12,000
Labour costs	22,000
Other costs	4,000
Allocated overhead charge payable to Proteus Co	14,000
Interest paid	2,000
Taxable profit	6,000
Taxation	1,500
Retained earnings	4,500

As part of the management buy-out agreement, it is expected that Proteus Co will provide management services costing \$12 million for the first year of the management buy-out, increasing by 8% per year thereafter.

The current tax rate is 25% on profits and it is expected that 25% of the after-tax profits will be payable as dividends every year. The remaining profits will be allocated to reserves. It is expected that Tyche Co will repay \$3 million of the outstanding loan at the end of each of the next five years from the cash flows generated from its business activity.

Required

- (a) Briefly discuss the possible benefits to Proteus Co of disposing of Tyche Co through a management buy-out. (5 marks)
 - (b) Calculate whether the debt-equity covenant imposed by Palaemon Bank on Tyche Co will be breached over the five-year period. (9 marks)
 - (c) Discuss briefly the implications of the results obtained in part (b) and outline two possible actions Tyche Co may take if the covenant is in danger of being breached. (5 marks)
 - (d) Discuss the reasons why a management buy-out may ultimately not succeed. (6 marks)
- (Total = 25 marks)

ANSWER

(a) Benefits to Proteus Co of disposing of Tyche Co through an MBO

It already has a potential buyer therefore there will be no costs involved in looking for an investor to purchase the company.

As the new owners are already known there should be less resistance from managers and employees to the sale than if the new owner was not known.

Proteus may secure a better price for the company. The managers and employees have very sound knowledge of the company and know how to build on its success therefore may be willing to pay more.

Proteus will provide management services for the first year of the MBO - this relationship may continue in the future which will be beneficial to both parties. This may not happen if an 'external' investor bought the company.

If it handles the disposal successfully and efficiently, Proteus may find its reputation increasing amongst external stakeholders, as well as such internal stakeholders as management and employees.

(b) Is the debt covenant breached over the five-year period?

In order to answer this question we will have to calculate the proportion of debt to equity each year. Debt will decrease by \$3 million each year as Tyche repays the loan in instalments. Equity will increase by reserves each year. We therefore have to calculate the amount being added to reserves each year (using forecast statements of profit or loss), as well as determining the book value of equity and outstanding debt at the end of each year. This will allow us to calculate the debt/equity ratio for each year and compare this ratio to the loan covenant maximum.

Forecast statement of profit or loss (Tyche)

Year	1	2	3	4	5
	\$000	\$000	\$000	\$000	\$000
Operating income before mgt fee (W1)	23,760	25,661	27,714	29,931	32,325
Management fee (increasing by 8% pa)	(12,000)	(12,960)	(13,997)	(15,116)	(16,326)
Interest payable (W2)	(5,850)	(5,580)	(5,310)	(5,040)	(4,770)
Profit before tax	5,910	7,121	8,407	9,775	11,229
Tax at 25%	(1,478)	(1,780)	(2,102)	(2,444)	(2,807)
Profit after tax	4,432	5,341	6,305	7,331	8,422
Dividend (25%)	(1,108)	(1,335)	(1,576)	(1,833)	(2,106)
Retained earnings transferred to reserves	3,324	4,006	4,729	5,498	6,316

Book value of equity

Year	1	2	3	4	5
	\$000	\$000	\$000	\$000	\$000
Opening equity balance	16,000	19,324	23,330	28,059	33,557
Reserves (see above)	3,324	4,006	4,729	5,498	6,316
Closing equity carried forward	19,324	23,330	28,059	33,557	39,873

Debt/equity calculations

Year	1	2	3	4	5
	\$000	\$000	\$000	\$000	\$000
Outstanding debt at year end	62,000	59,000	56,000	53,000	50,000
Closing equity carried forward	19,324	23,330	28,059	33,557	39,873
Debt/equity ratio	321%	253%	200%	158%	125%
Maximum as per loan covenant	350%	250%	200%	150%	125%
Covenant breached?	No	Yes	No	Yes	No

Workings

(1) *Current operating income before management fee*

	\$000
Sales revenue	60,000
Materials and consumables	(12,000)
Labour costs	(22,000)
Other costs	(4,000)
Operating income before management fee	<u>22,000</u>
Growth = 8% per annum	

(2) *Interest payable*

Loan at start of year 1 = \$81 million (market value of Tyche) - \$12 million - \$4 million = \$65 million

Year	1	2	3	4	5
	\$000	\$000	\$000	\$000	\$000
Loan outstanding at start of year	65,000	62,000	59,000	56,000	53,000
Interest at 9%	5,850	5,580	5,310	5,040	4,770

(c) Implications of the results

The covenant is breached in both years 2 and 4 and has only just been met in years 3 and 5. There are two issues to be considered as a result.

- (i) How will the bank react to the breaches in covenant restrictions and will these breaches threaten Tyche's business?
- (ii) Are the revenues and costs in years 3 and 5 likely to be achieved? Even a slight movement could cause the conditions to be breached. Tyche should carry out sensitivity analysis and put provisions in place to deal with any unexpected breaches in the covenant.

Possible actions (only two are required)

- (i) Reduce the dividend payout ratio (although this would have to be agreed with the shareholders).
- (ii) Pay off more of the loan from cash reserves (if available) to reduce the outstanding debt more quickly.
- (iii) Ask the venture capitalists to consider taking on a higher equity stake for more funding at the start of the venture. This would have to be discussed and agreed.
- (iv) Try to negotiate less restrictive terms with the bank or ask for greater flexibility when applying the restrictive covenant. It is unlikely that the restrictive covenant will be breached

by a significant amount therefore the bank will probably be reluctant to enter into legal proceedings to cease Tyche Co's trading. It is likely to be open to negotiations.

(d) Reasons for management buy-out failure

A major issue that a management buy-out may fail to overcome is that the managers may be able to run the business on an operational level, but they have little or no experience in business strategy, financial management and financial accounting.

The financial projections of the management team may not be realisable. In particular they may fail to generate sufficient cash flow to fund the business and the mandatory interest payments as a result of a leveraged buy-out, which most MBOs are.

Maintaining the existing customer base may be difficult. Some customers may take the change of

ownership as a reason to reassign their supplier.

Suppliers may no longer be happy to supply the new business on the same credit terms as before, as it will be a new company with no trading history and may be seen as significantly riskier to do business with.

If the buy-out is as a result of financial difficulties, then the new management may not be able to address the issues as to why the business was struggling in the first place.

Some key personnel may remain with the disposing company. It may then be difficult for the new company to attract a similar calibre of employee.

QUESTION 15

BBS Stores, a publicly quoted limited company, is considering unbundling a section of its property portfolio. The company believes that it should use the proceeds to reduce the company's medium-term borrowing and to reinvest the balance in the business (option 1). However, the company's investors have argued strongly that a sale and rental scheme would release substantial cash to investors (option 2). You are a financial consultant and have been given the task of assessing the likely impact of these alternative proposals on the company's financial performance, cost of capital and market value.

Attached is the summarised BBS Stores' statement of financial position. The company owns all its stores.

	<i>As at year end 20X8 \$m</i>	<i>As at year end 20X7 \$m</i>
ASSETS		
Non-current assets		
Intangible assets	190	190
Property, plant and equipment	4,050	3,600
Other assets	500	530
	<u>4,740</u>	<u>4,290</u>
Current assets	840	1,160
Total assets	<u>5,580</u>	<u>5,450</u>
EQUITY		
Called up share capital – equity	425	420
Retained earnings	1,535	980
Total equity	<u>1,960</u>	<u>1,400</u>
LIABILITIES		
Current liabilities	1,600	2,020
Non-current liabilities		
Medium-term loan notes	1,130	1,130
Other non-financial liabilities	890	900
Total liabilities	<u>3,620</u>	<u>4,050</u>
Total liabilities and equity	<u>5,580</u>	<u>5,450</u>

The company's profitability has improved significantly in recent years and earnings for 20X8 were \$670 million (20X7: \$540 million).

The company's property, plant and equipment within non-current assets for 20X8 are as follows:

	<i>Land and buildings \$m</i>	<i>Fixtures, fittings & equipment \$m</i>	<i>Assets under construction \$m</i>	<i>Total \$m</i>
Year end 20X8				
At revaluation	2,297	4,038	165	6,500
Accumulated depreciation		(2,450)		(2,450)
Net book value	<u>2,297</u>	<u>1,588</u>	<u>165</u>	<u>4,050</u>

The property portfolio was revalued at the year end 20X8. The assets under construction are valued at a market value of \$165 million and relate to new building. In recent years commercial property values have risen in real terms by 4% per annum. Current inflation is 2.5% per annum. Property rentals currently earn an 8% return.

The proposal is that 50% of the property portfolio (land and buildings) and 50% of the assets under construction would be sold to a newly established property holding company called RPH that would issue bonds backed by the assured rental income stream from BBS Stores. BBS Stores would not hold any equity interest in the newly formed company nor would they take any part in its management.

BBS Stores is currently financed by equity in the form of 25c fully paid ordinary shares with a current market value of 400c per share. The capital debt for the company consists of medium-term loan notes of which \$360 million are repayable at the end of two years and \$770 million are repayable at the end of six years. Both issues of medium term notes carry a floating rate of LIBOR plus 70 basis points. The interest liability on the six year notes has been swapped at a fixed rate of 5.5% in exchange for LIBOR which is also currently 5.5%. The reduction in the firm's gearing implied by option 1 would improve the firm's credit rating and reduce its current credit spread by 30 basis points. The change in gearing resulting from the second option is not expected to have any impact upon the firm's credit rating. There has been no alteration in the rating of the company since the earliest debt was issued.

The BBS Stores equity beta is currently 1.824. A representative portfolio of commercial property companies has an equity beta of 1.25 and an average market gearing (adjusted for tax) of 50%. The risk free rate of return is 5% and the equity risk premium is 3%. Using CAPM the current cost of equity is 10.47%. The current WACC is 9.55%. The company's current accounting rate of return on new investment is 13% before tax. You may assume that debt betas are zero throughout. The effective rate of company tax is 35%.

Required

On the assumption that the property unbundling proceeds, prepare a report for consideration by senior management which should include the following:

(a) A comparative statement showing the impact upon the statement of financial position and on the earnings per share on the assumption that the cash proceeds of the property sale are used:

(i) To repay the debt, repayable in two years, in full and for reinvestment in non-current assets

(ii) To repay the debt, repayable in two years, in full and to finance a share repurchase at the current share price with the balance of the proceeds **(13 marks)**

(b) An estimate of the weighted average cost of capital for the remaining business under both options on the assumption that the share price remains unchanged. **(8 marks)**

(c) An evaluation of the potential impact of each alternative on the market value of the firm (you are not required to calculate a revised market value for the firm). **(4 marks)**

(Total = 25 marks)



ANSWER

- (a) The proposal would involve the following:

	\$m
Sell 50% of land and buildings	1,148.50
Sell 50% of assets under construction	82.50
	<u>1,231.00</u>

Impact on statement of financial position

Option 1 is the proposal to use the proceeds (\$1,231m) to reduce medium-term borrowing and reinvest the balance in the business (non-current assets). The effect would be as follows:

	<i>Borrowings and other financial liabilities</i>	<i>Property, plant and equipment</i>	<i>Sales proceeds received (used)</i>
	\$m	\$m	\$m
Balance at end 20X8 (before adjustment)	1,130	4,050	
Sales proceeds		(1,231)	1,231
Repayment of medium-term notes	(360)		(360)
Reinvestment in company		871	(871)
Balance after adjustment	770	3,690	Nil

Option 2 is the sale and rental scheme proposed by the company's investors on the assumption that this scheme would release substantial cash to them. The proposal would involve the repayment of the medium-term notes and the balance (\$871m) used to execute a share buyback. This would involve (\$871m/\$4) 217.75m shares with a nominal value of \$54.44m.

	<i>Borrowings and other financial requirements</i>	<i>Property, plant and equipment</i>	<i>Called-up share capital – equity</i>	<i>Retained earnings</i>
	\$m	\$m	\$m	\$m
Balance at end 20X8 (before adjustment)	1,130	4,050	425	1,535
Sales proceeds		(1,231)		
Repayment of medium-term notes	(360)			
Share buyback			(54.44)	(817)
Balance at end 20X8 after adjustment	<u>770</u>	<u>2,819</u>	<u>370.56</u>	<u>718</u>

Comparative statements of financial position

	20X8 (original)	Sales proceeds	Option 1		Option 2	
	\$m	\$m	\$m	\$m	\$m	\$m
Non-current assets						
Intangible	190			190		190
Property etc	4,050	(1,231)	871	3,690	(1,231)	2,819
Other	500			500		500
	<u>4,740</u>			<u>4,380</u>		<u>3,509</u>
Current assets	840	1,231	(1,231)	840		840
Total assets	<u>5,580</u>			<u>5,220</u>		<u>4,349</u>
Equity						
Called-up equity capital	425			425	(54)	371
Retained earnings	1,535			1,535	(817)	718
Total equity	<u>1,960</u>			<u>1,960</u>		<u>1,089</u>
Liabilities						
Current liabilities	1,600			1,600		1,600
Non-current liabilities						
Borrowings etc	1,130		(360)	770	(360)	770
Other	890			890		890
Total liabilities	<u>3,620</u>			<u>3,260</u>		<u>3,260</u>
Total liabilities and equity	<u>5,580</u>			<u>5,220</u>		<u>4,349</u>

Gearing is affected as follows:

	20X8 (Option 1)	20X8 (Option 2)	20X8 (before adjustment)
Long-term debt (borrowings and other financial liabilities)	770	770	1,130
Total capital employed (total assets – current liabilities)	3,620	2,749	3,980
Gearing ratio	21.27%	28.01%	28.39%

Gearing has been reduced substantially with option 1. Whilst gearing is also reduced slightly under option 2, it is considerably higher than the gearing ratio that would result from paying off the medium-term notes and reinvesting the balance in the company.

Impact on Earnings per Share (EPS)

Both options will result in a reduction in interest payable due to paying off the medium-term notes. In addition, credit spread on the 6 year debt would be reduced by 30 basis points with option 1. The sale of the property would reduce property rent with both options. Under option 1, the funds reinvested in the company would earn a return of 13%.

The total effect would be as follows:

	Current position	Option 1	Option 2
	\$m	\$m	\$m
Earnings for 20X8	670.00	670.00	670.00
Add: interest saved on medium-term notes (net of tax): \$360m × 6.2% × 65% (interest is charged at LIBOR 5.5% + 70 basis points)		14.51	14.51
Add: return on reinvested funds (\$871m × 13% × 65%)		73.60	
Add: reduction in credit spread on 6 year debt (0.3% × \$770m × 65%)		1.50	
Less: property rent foregone (\$1,231m × 8% × 65%)		(64.01)	(64.01)
Adjusted earnings	670.00	695.60	620.50
Number of shares	1,700.00m	1,700.00m	1,482.00m
Adjusted EPS in cents per share	39.41	40.92	41.87

(b) **Impact of unbundling on the company's WACC**

Our starting point for this part of the report is to estimate the asset beta for the retail part of the business.

Current $k_e = 10.47\%$ and the current WACC = 9.55%

There are 1,700m shares (\$425 / 0.25) so $V_e = 1,700 \times 4 = \$6,800\text{m}$

$V_d = \$1,130\text{m}$

We now ungear the current company beta using the formula:

$$\beta_e = \beta_a \times \frac{V_e}{V_e + V_d(1-T)} = 1.824 \times (6,800 / (6,800 + 1,130(1-0.35)))$$

$$\beta_e = 1.646$$

The retail asset beta is the weighted average of the individual asset betas:

$$\beta_e = \left[\frac{V_R}{V_T} \times \beta_R \right] + \left[\frac{V_P}{V_T} \times \beta_P \right]$$

Where V_R = value of retail section β_R = asset beta of retail section

V_T = total value of business

β_P = asset beta of property section (this is calculated from the equity beta of other portfolio companies 1.25 x market gearing adjusted for tax of 0.5 = 0.625).

V_P = value of property

$$1.646 = \frac{4,338}{6,800} \times \beta_R + \frac{2,462}{6,800} \times 0.625$$

$$V_T = \$4 \times \text{no of shares} = \$4 \times (425\text{m} \div 0.25) = \$6,800\text{m}$$

$$V_P = 2,297 + 165 = \$2,462\text{m}$$

$$V_R = V_T - V_P = 6,800 - 2,462 = \$4,338\text{m}$$

Rearranging the equation we find:

$$\beta_R = 2.225$$

The asset beta of the company will be a combination of the retail beta (2.225) and the property beta (0.625). We can now calculate the cost of equity under each option as follows.

	<i>Option 1</i>	<i>Option 2</i>
Value of equity	= 425m × 4 × 4 = \$6,800m	[(425m × 4) – 217.75m] × 4 = \$5,929m

The value of property (half of which is sold) is now \$2,462m × 0.5 = \$1,231m

The remaining value of the equity (as above) is the value of the retail section (e.g. for option 1 6,800 – 1,231 = 5,569, and for option 2 5,929 – 1,231 = 4,698).

Average asset beta (adjusted)	$= \left[\frac{V_e}{V_e + V_d} \beta_R \right] + \left[\frac{V_p}{V_e + V_d} \beta_p \right]$	$= \left[\frac{V_e}{V_e + V_d} \beta_R \right] + \left[\frac{V_p}{V_e + V_d} \beta_p \right]$
	$= \frac{5,569}{6,800} \times 2.225 + \frac{1,231}{6,800} \times 0.625$	$= \frac{4,698}{5,929} \times 2.225 + \frac{1,231}{5,929} \times 0.625$
	= 1.935	= 1.893
Adjusting for gearing	$= \frac{V_e}{V_e + V_d(1-T)}$	$= \frac{V_e}{V_e + V_d(1-T)}$
	= 6,800 / (6,800 + (770 × 0.65))	= 5,929 / (5,929 + (770 × 0.65))
	= 0.931	= 0.922

Now using $\beta_a = \beta_e \times \frac{V_e}{V_e + V_d(1-T)}$ we can find the equity beta for either option.

$$\beta_a = \beta_e \times 0.931$$

$$\beta_a = \beta_e \times 0.922$$

$$1.935 = \beta_e \times 0.931 \quad 1.893 = \beta_e \times 0.922$$

$$\beta_e = 1.935 / 0.931 = 2.078$$

$$\beta_e = 1.893 / 0.922 = 2.053$$

$$\begin{aligned} \text{Cost of equity} &= 5\% + 2.078 \times 3\% \\ &= 11.23\% \end{aligned}$$

$$\begin{aligned} &= 5\% + 2.053 \times 3\% \\ &= 11.16\% \end{aligned}$$

Option (1) WACC

$$= \left[\frac{6,800}{(6,800 + 770)} \times 11.23\% \right] + \left[\frac{770}{(6,800 + 770)} \times 5.9\% \times 0.65 \right] = 10.48\%$$

(where 5.9% = LIBOR + 70bp – 30bp)

Option (2) WACC

$$= \left[\frac{5,929}{(5,929 + 770)} \times 11.16\% \right] + \left[\frac{770}{(5,929 + 770)} \times 6.2\% \times 0.65 \right] = 10.34\%$$

Note that both options will increase the current WACC of 9.55% by a considerable margin.

(c) Potential impact of each alternative on the market value of the firm

It is difficult to assess the impact of unbundling on the value of BBS Stores. Although the equity beta will increase with the removal of part of the existing property portfolio, this will be countered by a reduction in gearing. We have assumed that the balance of \$871 million in Option 1 could be reinvested at the current rate of return of 13%. If we fail to do so then shareholders' value will be significantly reduced. To reduce this risk, shareholders appear to favour Option 2 where they are guaranteed a cash return through a share buyback.

Whether the property is owned or leased should have no effect on the company's value if we can assume that the current use of the assets and the resultant value gained remain unchanged. If a separate property company can be set up we may be able to remove ownership from the statement of financial position.

However we must bear in mind that the ease with which this can be done will depend on accounting regulations in the country concerned.

A final observation is the assumption of a constant and known share price (400 cents). Share prices are not constant nor are they certain. In order to assess the potential impact of any movements in this variable, we should set up a simulation model and run the model for various share prices and equity betas.

QUESTION 16

Pursuit Co, a listed company which manufactures electronic components, is interested in acquiring Fodder Co, an unlisted company involved in the development of sophisticated but high risk electronic products. The owners of Fodder Co are a consortium of private equity investors who have been looking for a suitable buyer for their company for some time. Pursuit Co estimates that a payment of the equity value plus a 25% premium would be sufficient to secure the purchase of Fodder Co. Pursuit Co would also pay off any outstanding debt that Fodder Co owed. Pursuit Co wishes to acquire Fodder Co using a combination of debt finance and its cash reserves of \$20 million, such that the capital structure of the combined company remains at Pursuit Co's current capital structure level.

Information on Pursuit Co and Fodder Co

Pursuit Co

Pursuit Co has a market debt to equity ratio of 50:50 and an equity beta of 1.18. Currently Pursuit Co has a total firm value (market value of debt and equity combined) of \$140 million. Pursuit Co makes sales in America, Europe and Asia and has obtained some of its debt funding from international markets.

Fodder Co, extracts from the statement of profit or loss

Year ended	31 May 2011	31 May 2010	31 May 2009	31 May 2008
<i>All amounts are in \$'000</i>				
Sales revenue	16,146	15,229	14,491	13,559
Operating profit (after operating costs and tax allowable depreciation)	5,169	5,074	4,243	4,530
Net interest costs	489	473	462	458
Profit before tax	4,680	4,601	3,781	4,072
Taxation (28%)	1,310	1,288	1,059	1,140
After tax profit	3,370	3,313	2,722	2,932
Dividends	123	115	108	101
Retained earnings	3,247	3,198	2,614	2,831

Fodder Co has a market debt to equity ratio of 10:90 and an estimated equity beta of 1.53. It can be assumed that its tax allowable depreciation is equivalent to the amount of investment needed to maintain current operational levels. However, Fodder Co will require an additional investment in assets of 22c per \$1 increase in sales revenue, for the next four years. It is anticipated that Fodder Co will pay interest at 9% on its future borrowings.

For the next four years, Fodder Co's sales revenue will grow at the same average rate as the previous years. After the forecasted four-year period, the growth rate of its free cash flows will be half the initial forecast sales revenue growth rate for the foreseeable future.

Information about the combined company

Following the acquisition, it is expected that the combined company's sales revenue will be \$51,952,000 in the first year, and its profit margin on sales will be 30% for the foreseeable future. After the first year the growth rate in sales revenue will be 5.8% per year for the following three years. Following the acquisition, it is expected that the combined company will pay annual interest at 6.4% on future borrowings.

The combined company will require additional investment in assets of \$513,000 in the first year and then 18c per \$1 increase in sales revenue for the next three years. It is anticipated that after the forecasted four-year period, its free cash flow growth rate will be half the sales revenue growth rate.

It can be assumed that the asset beta of the combined company is the weighted average of the individual companies' asset betas, weighted in proportion of the individual companies' market value.

Other information

The current annual government base rate is 4.5% and the market risk premium is estimated at 6% per year. The relevant annual tax rate applicable to all the companies is 28%.

SGF Co's interest in Pursuit Co

There have been rumours of a potential bid by SGF Co to acquire Pursuit Co. Some financial press reports have suggested that this is because Pursuit Co's share price has fallen recently. SGF Co is in a similar line of business as Pursuit Co and, until a couple of years ago, SGF Co was the smaller company. However, a successful performance has resulted in its share price rising, and SGF Co is now the larger company.

The rumours of SGF Co's interest have raised doubts about Pursuit Co's ability to acquire Fodder Co. Although SGF Co has made no formal bid yet, Pursuit Co's board is keen to reduce the possibility of such a bid. The Chief Financial Officer has suggested that the most effective way to reduce the possibility of a takeover would be to distribute the \$20 million in its cash reserves to its shareholders in the form of a special dividend. Fodder Co would then be purchased using debt finance. He conceded that this would increase Pursuit Co's gearing level but suggested it may increase the company's share price and make Pursuit Co less appealing to SGF Co.

Required

(a) Prepare a report to the Board of Directors of Pursuit Co that:

(i) Evaluates whether the acquisition of Fodder Co would be beneficial to Pursuit Co and its shareholders. The free cash flow to firm method should be used to estimate the values of Fodder Co and the combined company assuming that the combined company's capital structure stays the same as that of Pursuit Co's current capital structure. Include all relevant calculations. **(16 marks)**

(ii) Discusses the limitations of the estimated valuations in part (i) above. **(4 marks)**

(iii) Estimates the amount of debt finance needed, in addition to the cash reserves, to acquire Fodder Co and concludes whether Pursuit Co's current capital structure can be maintained. **(3 marks)**

(iv) Explains the implications of a change in the capital structure of the combined company, to the valuation method used in part (i) and how the issue can be resolved. **(4 marks)**

(v) Assesses whether the Chief Financial Officer's recommendation would provide a suitable defence against a bid from SGF Co and would be a viable option for Pursuit Co. **(5 marks)**

Professional marks will be awarded in this question for the format, structure and presentation of the report. **(4 marks)**

(b) Assess how the global debt crisis may affect Pursuit Co. **(8 marks)**

(c) The CEO has heard that many companies in the industry use environmental reporting. Discuss what this would involve for Pursuit Co and the advantages and disadvantages to Pursuit Co of adding environmental reporting to its annual report. **(6 marks)**

(Total = 50 marks)



QUESTION 17

Nente Co, an unlisted company, designs and develops tools and parts for specialist machinery. The company was formed four years ago by three friends, who own 20% of the equity capital in total, and a consortium of five business angel organisations, who own the remaining 80%, in roughly equal proportions. Nente Co also has a large amount of debt finance in the form of variable rate loans. Initially the amount of annual interest payable on these loans was low and allowed Nente Co to invest internally generated funds to expand its business. Recently though, due to a rapid increase in interest rates, there has been limited scope for future expansion and no new product development.

The Board of Directors, consisting of the three friends and a representative from each business angel organisation, met recently to discuss how to secure the company's future prospects. Two proposals were put forward, as follows:

Proposal 1

To accept a takeover offer from Mije Co, a listed company, which develops and manufactures specialist machinery tools and parts. The takeover offer is for \$2.95 cash per share or a share-for-share exchange where two Mije Co shares would be offered for three Nente Co shares. Mije Co would need to get the final approval from its shareholders if either offer is accepted.

Proposal 2

To pursue an opportunity to develop a small prototype product that just breaks even financially, but gives the company exclusive rights to produce a follow-on product within two years. The meeting concluded without agreement on which proposal to pursue.

After the meeting, Mije Co was consulted about the exclusive rights. Mije Co's directors indicated that they had not considered the rights in their computations and were willing to continue with the takeover offer on the same terms without them.

Currently, Mije Co has 10 million shares in issue and these are trading for \$4.80 each. Mije Co's price to earnings (P/E) ratio is 15. It has sufficient cash to pay for Nente Co's equity and a substantial proportion of its debt, and believes that this will enable Nente Co to operate on a P/E level of 15 as well. In addition to this, Mije Co believes that it can find cost-based synergies of \$150,000 after tax per year for the foreseeable future. Mije Co's current profit after tax is \$3,200,000.

The following financial information relates to Nente Co and to the development of the new product.

Nente Co financial information

Extract from the most recent statement of profit or loss

	\$'000
Sales revenue	8,780
Profit before interest and tax	1,230
Interest	(455)
Tax	(155)
Profit after tax	620
Dividends	Nil

Extract from the most recent statement of financial position

	\$'000
Net non-current assets	10,060
Current assets	690
Total assets	<u>10,750</u>
Share capital (40c per share par value)	960
Reserves	1,400
Non-current liabilities: Variable rate loans	6,500
Current liabilities	1,890
Total liabilities and capital	<u>10,750</u>

In arriving at the profit after tax amount, Nente Co deducted tax allowable depreciation and other non-cash expenses totalling \$1,206,000. It requires an annual cash investment of \$1,010,000 in non-current assets and working capital to continue its operations.

Nente Co's profits before interest and tax in its first year of operation were \$970,000 and have been growing steadily in each of the following three years, to their current level. Nente Co's cash flows grew at the same rate as well, but it is likely that this growth rate will reduce to 25% of the original rate for the foreseeable future.

Nente Co currently pays interest of 7% per year on its loans, which is 380 basis points over the government base rate, and corporation tax of 20% on profits after interest. It is estimated that an overall cost of capital of 11% is reasonable compensation for the risk undertaken on an investment of this nature.

New product development (Proposal 2)

Developing the new follow-on product will require an investment of \$2,500,000 initially. The total expected cash flows and present values of the product over its five-year life, with a volatility of 42% standard deviation, are as follows:

Year(s)	Now	1	2	3 to 7 (total)
Cash flows (\$'000)	-	-	(2,500)	3,950
Present values (\$'000)	-	-	(2,029)	2,434

Required

(a) Prepare a report for the Board of Directors of Nente Co that:

(i) Estimates the current value of a Nente Co share, using the free cash flow to firm methodology. **(7 marks)**

(ii) Estimates the percentage gain in value to a Nente Co share and a Mije Co share under each payment offer. **(8 marks)**

(iii) Estimates the percentage gain in the value of the follow-on product to a Nente Co share, based on its cash flows and on the assumption that the production can be delayed following acquisition of the exclusive rights of production. **(8 marks)**

(iv) Discusses the likely reaction of Nente Co and Mije Co shareholders to the takeover offer, including the assumptions made in the estimates above and how the follow-on product's value can be utilized by Nente Co. **(8 marks)**

Professional marks will be awarded for the presentation, structure and clarity of the answer. **(4 marks)**

(b) Evaluate the current performance of Nente Co and comment on what this will mean for the proposed takeover bid. **(8 marks)**

(c) Since the approach to Nente Co, Mije Co has itself been the subject of a takeover bid from Tianhe Co, a listed company which specialises in supplying machinery to the manufacturing sector and has a market capitalisation of \$245 million.

Required

Evaluate the general post-bid defences and comment on their suitability for Mije Co to try and prevent the takeover from Tianhe Co. **(7 marks)**

(Total = 50 marks)