

May 2011 paper - Section A 50 marks

Question 1

Required:

Assume that you are the Management Accountant of the Snacks Division and have been asked to write a Report addressed to the Divisional Board of the Snacks Division of F plc that will assist it in deciding whether or not to proceed with the proposed product launch. In your report you are required to:

(a) Ignoring the abandonment option:

(i) **Calculate** the NPV for the project as at 1 January 2012 for Scenarios A and B individually as well as the overall total expected NPV. **(13 marks)**

(ii) **Calculate** the payback period for the project for each of Scenarios A and B. **(4 marks)**

(iii) **Interpret** your results from (a)(i) and (a)(ii). **(6 marks)**

(b) **Evaluate** whether or not the project should be abandoned on 1 January 2013 if Scenario B occurs. **(8 marks)**

(c) **Advise** how real options and other strategic financial issues might influence the initial investment decision. **(12 marks)**

(d) **Recommend**, with reasons, whether or not to proceed with the proposed product launch on 1 January 2012. **(4 marks)**

Additional marks available for structure and presentation: **(3 marks)**
(Total for Question One = 50 marks)

Report

To: Divisional Board of the Snacks Division
 From: Management Accountant
 Date: May 2011
 Subject: MATT SNACKS launch in France

The report will assess the suitability of the new project in France to launch MATT SNACKS. The report will undertake investment appraisals of the different scenarios and evaluate whether to proceed with this project.

(ai) Calculation of the NPV for both scenarios

Forecast exchange rates

Spot	€1.2 / £	
Year 1	€1.2 x 1.02	€1.2240
Year 2	€1.2240 x 1.02	€1.2485
Year 3	€1.2485 x 1.02	€1.2734
Year 4	€1.2734 x 1.02	€1.2989

NPV - scenario A

Note: some cash flows are in £ and some in €

Year	0 (01/01/12)	1 (31/12/12)	2 (31/12/13)	3(31/12/14)	4 (31/12/15)
Distribution centre (€m)	(8.40)				5.20
Net operating cash flows (€m) (x 1.05)		9.0	9.45	9.92	10.42
Total €m cash flows	(8.40)	9.0	9.45	9.92	15.62
Exchange rate	1.2000	1.2240	1.2485	1.2734	1.2989
£ cash flows (£m)	(7.0)	7.35	7.57	7.79	12.03
£ additional operating costs (x 1.05) (£m)		(2.0)	(2.10)	(2.21)	(2.32)
Market research (£m)	(2.0)				
Cost of launch (£m)	(1.0)				
Net cash flows before tax (£m)	(10.0)	5.35	5.47	5.58	9.71
		1.05			
		(3 x 35%)			
Tax at 35% on operating cash flows (£m)		(1.87)	(1.91)	(1.95)	(2.00)
					(10.42 / 1.2989 x 2.32) x 35%
Tax relief on distribution centre (£m) (100% x 7.0 x 35%)		2.45			
Balancing charge (£m) (5.2 / 1.2989 x 35%)					(1.40)
Net cash flows after tax (£m)	(10.0)	6.98	3.56	3.63	6.31
Discount factor at 15%	1.00	0.870	0.756	0.658	0.572
PV (£m)	(10.0)	6.07	2.69	2.39	3.61
NPV (£M)	4.76				

NPV - scenario B

Note: some cash flows are in £ and some in €

Year	0 (01/01/12)	1 (31/12/12)	2 (31/12/13)	3 (31/12/14)	4 (31/12/15)
Distribution centre (€m)	(8.40)				5.20
Net operating cash flows (€m) (x 1.05)		4.5	4.73	4.96	5.22
Total €m cash flows	(8.40)	4.5	4.73	4.96	10.42
Exchange rate	1.2000	1.2240	1.2485	1.2734	1.2989
£ cash flows (£m)	(7.0)	3.68	3.79	3.90	8.02
£ additional operating costs (x 1.05) (£m)		(1.5)	(1.58)	(1.66)	(1.74)
Market research (£m)	(2.0)				
Cost of launch (£m)	(1.0)				
Net cash flows before tax (£m)	(10.0)	2.18	2.21	2.24	6.28
Tax at 35% on operating cash flows (£m)		1.05 (3 x 35%) (0.76)	(0.77)	(0.78)	(0.80) <small>(5.22 / 1.2989 + 1.74) x 35%</small>
Tax relief on distribution centre (£m) (100% x 7.0 x 35%)		2.45			
Balancing charge (£m) (5.2 / 1.2989 x 35%)					(1.40)
Net cash flows after tax (£m)	(10.0)	4.92	1.44	1.46	4.08
Discount factor at 15%	1.00	0.870	0.756	0.658	0.572
PV (£m)	(10.0)	4.28	1.09	0.96	2.33
NPV (£M)	(1.34)				

	Scenario A	Scenario B
Individual NPV	£4.76m	(£1.34m)
Expected value	4.76 x 70% = £3.33m	1.34 x 30% = (£0.40m)
Total expected value (3.33 – 0.4) = £2.93m		

a(ii)

Payback period

The initial investment after tax

Distribution centre + market research and launch	£10.0m
Less tax (2.45 + 1.05)	(£3.50m)
	£6.50m

Alternatively you could have used the cash flows as they for each period.

Scenario A

Year	Net cash flow (£m)	Cumulative cash flow (£m)
0	(6.50)	(6.50)
1	(5.35 ó 1.87) 3.48	(3.02)
2	3.56	0.54

Payback period for scenario A = 1 year + (12 months x 3.02 / (3.02 + 0.54))
 = **1 year and 10 months**

Scenario B

Year	Net cash flow (£m)	Cumulative cash flow (£m)
0	(6.50)	(6.50)
1	(2.18 ó 0.76) 1.42	(5.08)
2	1.44	(3.64)
3	1.46	(2.18)
4	4.08	1.9

Payback period for scenario A = 3 year + (12 months x 2.18 / (2.18 + 1.9))
 = **3 year and 6 months**

a(iii) Interpretation of results

Summary of results

	Scenario A	Scenario B
Payback period	1 year and 10 months	3 years and 6 months
Individual NPV	£4.76m	(£1.34m)
Expected value	4.76 x 70% = £3.33m	1.34 x 30% = (£0.40m)
Total expected value (3.33 – 0.4) = £2.93m		

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Discounting cash flows is the superior way of appraising a project as it looks at the incremental cash flows discounted using an appropriate level of risk.

Payback period shows the liquidity of a project, how quickly will the cash inflows cover the investment cost.

From the results scenario A (70% chance of achieving) yields a higher NPV at £4.76m and a shorter payback period of 1.8 years. Therefore this scenario is less risky and will add more to shareholder wealth.

Scenario B (30% chance of achieving), yields a negative NPV of £1.34m and a much riskier longer payback period of 3.5 years.

The expected value of the projects is £2.93m; however expected value doesn't mean the value that would be added to shareholder wealth. Expected values incorporate the risk factor of certain outcomes occurring. For the Board to decide whether to go ahead with the project, they have to look at the individual scenarios and assess the risk of those scenarios on their own merits.

The Snacks Division's Board will have to look at their attitude towards risk and decide whether going into France will achieve scenario A. From the results it looks like a good investment. But before a final decision is made, the Board needs to consider other factors and ensure the forecast cash flows are as accurate as can be.

(b) Evaluation of abandoning the project if scenario B occurs

The abandonment of the project will result in the distribution centre being sold for £7m. This will be a cash inflow in year 1. However the capital allowances claimed on this will have to be paid back (balancing charge). Assuming the first years operating cash flows will be achieved.

NPV - scenario B - abandon

Note: some cash flows are in £ and some in €

Year	0 (01/01/12)	1 (31/12/12)	2 (31/12/13)
Net operating cash flow		4.50	
Sale of distribution centre		7.00	
Cost of distribution centre	(8.40)		
Total €m cash flows	(8.40)	11.50	
Exchange rate	1.2000	1.2240	
£ cash flows (£m)	(7.00)	9.40	
£ additional operating costs (x 1.05) (£m)		(1.50)	
Tax relief on distribution centre (£m) (100% x 7.0 x 35%)		2.45	
Balancing charge (£m) (7/1.224 = 5.72 x 35%)			(2.00)
Market research (£m)	(2.0)		
Cost of launch (£m)	(1.0)		
Tax at 35% on operating cash flows (4.5 / 1.224 ó 1.50) x 35% (£m)		(0.76)	
Tax relief on market research and launch (3 x 35%)		1.05	
Net cash flows after tax (£m)	(10.00)	10.64	(2.00)
Discount factor at 15%	1.000	0.870	0.756
PV (£m)	(10.00)	9.26	(1.51)
NPV (£M)	(2.25)		

The NPV of scenario B without abandoning was negative £1.34m (part ai)

From the evaluation, continuing with the project under scenario B yields a higher NPV than abandoning. Therefore the project should not be abandoned.

Other factors need to be considered carefully before any decision made:

- The sensitivity of the cash flows is crucial. With any new geographical location, the first few years may not generate enough sales, but as the advertising campaign and the reputation grow, higher sales can be achieved.
- Abandoning the project may signal failure for the organisation and this will not be good for their reputation.

Conclusion

Continuing with the project under scenario B appears to be the better option rather than abandoning it 1st Jan 2013. As one of F plc's strategic aims to increase market share in both domestic and overseas markets, launching into the French market will help them achieve this aim.

(c) Advise on real options and other strategic financial issues on investment decision

The technique of real options can be used when projects face a high degree of uncertainty. Due to the dynamic and complex environment faced today by many businesses, they must look beyond conventional NPV approaches and keep their options open.

Recognising real options can help decision makers assess the profitability of new projects and understand whether and when to proceed with the later phases of projects that have already been initiated, particularly if they are close to breakeven. Real options are a valuable way for projects to measure and understand the high level of uncertainty and project opportunities that exist.

Real options are inherent in capital projects. When a proposed capital project is being appraised, there will be several options inherent in the project:

Expansion – a call option

The option to make follow-on investments if the project is a success. This is when initially for the short term the project may have a negative NPV, but sticking with the project will result in much more future profits

Abandonment – a put option

The option to abandon the project part way through its life.

Deferment – a call option

The option to wait before investing. This allows more time to investigate the project before a commitment is made. The benefits of waiting must be weighed against any opportunity of inflows and other costs during the weighting period.

For F plc, the abandonment option is clearly not viable as it's better to continue under scenario B where there is a 30% chance of this situation occurring. Therefore the abandonment option has little value for the initial investment decision. Currently, at the date of investment (01/01/12) the abandonment option is "out of money". However if scenario B's outcome worsens over the year, it may be that the abandonment option becomes more viable.

The expansion option (follow on or strategic option), is more likely for F plc. The launch of MATT SNACKS in France could be successful as per scenario A, and F plc may want

to expand into other European markets, or offer other lines of products in France. The expansion option would add considerable shareholder wealth and this should be evaluated into the investment appraisal.

The deferment option doesn't appear to have any viability for F plc as there are no legal or others restrictions placed on this project. Therefore for F plc the quicker they launch MATT SNACKS in France the better it would be to achieve their strategic aims.

Other strategic financial issues that F plc will have to consider before undertaking this project:

- F plc needs to ensure that they will be fully compliant with France's legal requirements on food standards before embarking on this project. There may be certain ingredients which cannot be used in France which are allowed in the UK ie certain types of fats
- The finance requirements need careful consideration. F plc has £234 million of borrowings of which £160 are repayable on 1/01/2018, which is in 8 years time. The revolving credit facility (RCF) consists of the remainder at £74 million. F plc has a limit of £80 under this facility and this facility expires on 31/12/2013. In 3 years time F plc may have to raise additional finance if the RCF is withdrawn. F plc is currently highly geared ($234 / (241 + 234) \times 100\% = 49\%$), so therefore raising equity finance may be the better solution. The market conditions may not be conducive for share issue, so F plc may struggle to raise the necessary finance. Ideally a euro denominated loan would be suitable for this overseas projects to hedge against currency risk, so perhaps F plc could raise finance on the international markets in foreign currency.
- The impact on working capital may worsen for F plc with this new investment, currently F plc has a negative working capital days. This high reliance on trade payables and overdraft for financing could put F plc at risk of liquidity problems and overtrading, although they do have £20m in cash and cash equivalents

Inventory days

Inventory / operating costs x 365 days
 $90 / 938 \times 365 = 35.0$ days

Trade receivables (TR) days

TR / Revenue x 365 days
 $112 / 986 \times 365 = 41.5$ days

Trade payable (TP) days

TP / operating costs x 365 days
 $212 / 938 \times 365 = 82.5$ days

Working capital cycle

Inventory days + trade receivable days - trade payables days
 $35.0 + 41.5 - 82.5 = (6.0)$ days

- The impact on other key investors' ratios also needs careful consideration as any losses on this new project could reduce shareholder returns. F plc's attitude towards risk may result in high returns if they take on the high risk ventures, with scenario B, this may be achieved, but there is a 30% chance of scenario B occurring resulting in losses. This information needs to be communicated to the shareholders.

(d) Recommendation

The investment in France to launch MATT SNACKS for the snacks division will help this division and F plc to achieve its strategic aim of expanding into the overseas markets.

However there is a risk to this project with 70% chance of the project achieving £4.76 million to shareholder wealth. The option to abandon this project is not viable even with the disposal proceeds under scenario B, it is still better to continue with the project.

Financing may be a problem for F plc as they are currently highly geared and have refinancing and overdraft repayment issues. F plc will need to raise additional finance and it may be advisable to take on a foreign currency debt to finance this overseas project.

As so much has already been spent on this project, I would recommend F plc continue to proceed with this project and review it very year.

Signed

Management Accountant

Question Two

Required:

(a) **Evaluate** the current dividend policy of HJK.

(6 marks)

(b) (i) **Describe** the process involved in an IPO.

(3 marks)

(ii) **Advise** on the potential risks with an IPO and what action can be taken to minimise such risks.

(4 marks)

(c) **Discuss** the concerns of the Directors regarding the possible implications of becoming a listed company on dividend, financing and investment strategies and the interrelationship between them.

(12 marks)

(Total for Question Two = 25 marks)

Year	PAT	Investments	Dividend paid	Div / PAT	Div / PAT - Investment
2006	6		3	50%	50%
2007	7	10	2	29%	0
2008	10		5	50%	50%
2009	11	15	2	18%	0
2010	16		8	50%	50%

HJK is a family owned and run private company. The dividend policy will therefore be heavily influenced by the owners of the business. From the data given, HJK pays 50% of its profits as dividends in years of no investment. However when there is capital investment, the dividends paid is always £2m.

This is a cross between a residual and constant dividend policy.

Types of dividend policies

- **Stable policy**

A stable policy of dividends is paid with constant growth. This means even if the company has a bad year, dividends will still be maintained. This is the most common approach as shareholders always get a certain level of dividends. It is not as good for the

company as during period of low profits, retention is also low and therefore investment opportunities may be foregone.

- **Constant payout ratio**

A certain percentage of the profit after tax is paid out as dividends. This means during periods of varying profits, the dividends paid out will also vary. This is not as good for the shareholders as they may not always see growth in their dividends. The company however always ensures that it retains the necessary proportion of profits for growth.

- **Residual dividend policy**

This is the policy where only profits remaining after all investments have been considered are distributed to the shareholders. This will give varying returns to the shareholders, but the company benefits from ensuring they don't miss out on profitable projects.

HJK's current dividend policy is quite erratic. The shareholders always receive 50% payout ratio in periods of no investment and guaranteed £2m dividend payout during periods of capital investment. As the shareholders run the business, they are willing to reduce their dividend payout when profitable project opportunities arise. This allows HJK to expand as necessary. The shareholders obviously require a guaranteed income; hence they receive £2m dividends in any case.

HJK currently uses its cash from retained earnings to finance its expansion and the expense of paying fewer dividends. For a private company this is easier to do as the shareholders run the business and there is no pressure from external forces on dividend policy and share price.

The use of retained earnings cash to finance investments, ensures that HJK minimised gearing which reduces the financial risk to shareholders.

(b) (i) The process involved in IPO

In the UK, a limited company (Ltd) can only sell its shares privately. A public limited company (plc) can offer its shares to the public. If the plc is listed on a stock exchange, it makes their shares more marketable. Only a small number of plcø have their shares listed on the stock exchange (quoted shares). Unlisted plcø are often referred to as companies with unquoted shares.

Stock market listing (also referred to as floatation, going public, initial public offering - IPO)

The stock market is a secondary market, allowing investors to buy and sell shares without it affecting the company. Investors buy and sell shares in the hope of making a gain. In the UK there are two main types of stock exchanges, The London stock exchange which is for very large companies. Smaller companies can get listed on the alternative investment market (AIM).

Shares are issued through a issuing house (ie merchant banks) and they are either offered to the public at large through offer for sale (fixed price or tender), or through a placing. The issuing house will normally underwrite shares in case the offer is not taken up fully, they will purchase the remaining shares.

(b) (ii)

Potential risks with IPO and actions to minimise risks

Risk

HJK may not sell all the shares they have issued. This could be due to various factors. The share price may be too high thereby putting off investors. The economic market conditions may not be right due to perhaps a recession or the bubble bursting on IT companies. It could even be due to the fact not enough advertising is done, so potential investors are unaware of the IPO.

Action

HJK need to ensure that the share price is affordable for investors and priced as accurately as possible. Considerations for pricing shares include:

- Price of similar companies. Using the PE ratio of companies in the similar industry and extending this to the companyø own earnings.
- Current market conditions. Confidence in the market and the economy will have an impact on the price set.
- Future trading prospects. Investors will need to know forecasts and future strategies

HJK also needs to ensure that enough advertising and promotion has been done (this is usually done by the merchant bank).

There is very little that HJK can do about market conditions but if they price their shares correctly and promote effectively, they can minimise the risk.

HJK could also have their shares underwritten (basically it's like insurance). This is where any unsold shares will be purchased (usually by the merchant bank), however this is a very expensive process.

Risk

Over-subscription of shares

HJK may face a situation whereby there is too much demand for their shares, perhaps because of the low price or investors hungry for shares in IT companies.

Action

Market research will help HJK evaluate the number of shares they need to issue. Instead of offer for sale by fixed price or placing, they could get investors to tender for their shares. This would avoid the risk of oversubscription and HJK's reputation won't be tarred. However offer for sale by tender is a very expensive process with lots of administration work.

(c) Implications of IPO on financing, dividend and investment strategy

There are 3 key decisions in financial management.

- Investment
- Financing
- Dividends

1 Investment decisions

An investment decision decides which projects should be undertaken by the organisation. The decision to invest considers the purchase of capital assets or a company containing capital assets. Most investment decisions are long term, so it is important to choose the correct and the one that fits in with the organisations objectives.

2 Financing decisions

Once a decision has been made on a project or investment, the way it's going to be funded needs to be established. This is done by looking at the overall capital structure of the company, and the sort of risks it faces with regards to gearing, liquidity etc.

The key to funding decisions is to minimise the cost of funding, debt is cheaper than equity as interest payments are usually tax allowable, and short-term funds may be cheaper than long term funds. A capital asset may be acquired under a lease rather than purchased. In lease or buy decisions taxation may have the effect of making leasing more advantageous.

3 Dividend decisions

Dividend is the distribution of funds back to shareholders. The payment of a dividend has both positive and negative implications.

If the main objective of an organisation is to maximise shareholder's wealth, then paying no dividends means that the company can re-invest in projects which earn higher return than WACC, this results in an increase in share price due to increased profits.

Paying dividends to shareholders has obvious cash advantages to the shareholders but also tax complications. Shareholders wealth is maximised either by *capital growth* or *dividend payout*.

Implications on dividend strategy

With the IPO HJK will have shareholders who are 3rd parties and depending on how many shares they sell, these shareholders may have significant influence over HJK. Therefore the HJK will have to provide information to these shareholders on a regular basis about their 3 key strategies on dividend, financing and investment.

A suitable dividend policy will have to be implemented to ensure the shareholders are kept satisfied. Most equity shareholders on the stock market are institutional investors and rely heavily on dividend income. HJK may have to change their dividend policy to a more stable one. This means paying a dividend every year and perhaps increasing year on year.

Dividends act as a signal effect to the market due to the imperfect market conditions we live in. Any changes in dividends may result in the share price being affected negatively.

HJK will have to communicate to its shareholders about their dividend policy. Any changes need to be given in advance to the markets to ensure the share price remains stable. Their current dividend policy would be inappropriate once they are listed on the stock market.

Implications on investment strategy

Any investment opportunities will have to be carefully considered and evaluated to ensure that they will maximise shareholder wealth. These are factors that HJK would currently be doing, however any bad investments will have a negative effect on the share price. The risks of the investments will also impact shareholders, it is therefore very important that information about new projects is communicated to the markets on a timely basis with accurate information and forecasts.

Implications on financing strategy

Being a listed company means you have access to a much wider finance pool. HJK may be able to undertake more projects to increase shareholder wealth. HJK currently uses its retained earnings cash reserves to finance investments. Now HJK can raise additional equity finance (rights issue or placing) or debt finance.

Interrelationships between the investment, finance and dividend decisions

The decision to invest in new assets will directly affect the amount of finance required.

The level of dividends that are paid to shareholders will depend on how much profit is being generated with the investment decision and this in return will determine the amount of internally generated funds and hence the need to finance.

The 3 strategies are inter-related. Paying dividends to shareholders will mean that HJK will need to raise additional finance for investments. If dividends are withheld, there is less need to raise additional finance (which could impact WACC) and the investment can go ahead. However if dividends are withheld, the shareholders may get nervous and start selling their shares which may depress HJK's share price once they are listed.

Investments in profitable projects, increase earnings, thereby increasing the amount of profits available to distribute as dividends in the future.

Question Three

(a) **Calculate** the present value, as at 1 July 2011, of the cash-flows associated with each of the three alternative financing methods under consideration. **(13 marks)**

(b) **Recommend**, with reasons, which of the three alternative financing methods should be chosen. **(8 marks)**

(c) **Discuss** how an immediate change in government policy to improve tax depreciation allowances on equipment used in low carbon emission technology would impact on the decision. No further calculations are required.

(4 marks)

(Total for Question Three = 25 marks)

(a)

Alternative 1 – Buy the asset

- After tax cost of debt = 7% will be used as a discount factor for all options
- Tax depreciation allowance, straight line over UEL = $50 / 5 \times 25\% = \$2.5\text{m}$ per year.

Year	Details	Cash flow \$m	Discount factor at 7%	PV \$m
0	Purchase	(50.00)	1.000	(50.00)
1-5	Tax relief	2.50	4.100	10.25
1-5	Maintenance costs (after tax)	$2 \times 0.75 = (1.50)$	4.100	(6.15)
			NPV	(45.90)

Alternative 2 – Finance lease

- Depreciation = $\$50\text{m} / 5 \text{ yrs} = \10m per annum = tax allowable
- Implied interest = tax allowable
- Lease rentals are in advance

Year	0	1	2	3	4	5
Depreciations		(10.0)	(10.0)	(10.0)	(10.0)	(10.0)
Interest		(3.0)	(2.5)	(2.0)	(1.4)	(0.7)
		(13.0)	(12.5)	(12.0)	(11.4)	(10.7)
Relevant cash flows						
Tax savings at 25% on depreciation and interest		3.25	3.13	3.00	2.85	2.7
Lease rentals	(14.00)	(9.00)	(9.00)	(9.00)	(9.00)	(9.00)
Maintenance less tax at 25% (2×0.75)		(1.50)	(1.50)	(1.50)	(1.50)	(1.50)
Net cash flows	(14.00)	(7.25)	(7.37)	(7.50)	(7.65)	(7.80)
DF at 7%	1.000	0.935	0.873	0.816	0.763	0.713
PV \$m	(14.00)	(6.78)	(6.43)	(6.12)	(5.84)	(5.56)
NPV \$m						(44.73)

Alternative 3 – Operating lease

Year	0	1	2	3	4	5
Lease rentals		(16.50)	(16.50)	(16.50)	(15.00)	(15.00)
Tax savings at 25%		4.13	4.13	4.13	3.75	3.75
Net cash flows		(12.37)	(12.37)	(12.37)	(11.25)	(11.25)
DF at 7%	1.000	0.935	0.873	0.816	0.763	0.713
PV \$m		(11.57)	(10.80)	(10.09)	(8.58)	(8.02)
NPV \$m	(49.06)					

(b) Recommendation

Summary of results

	Alternative 1 Buy	Alternative 2 Finance lease	Alternative 3 Operating lease
NPV \$m	(45.90)	(44.73)	(49.06)

From the calculations, the finance lease is the cheapest option.

However some important considerations need to be factored before making a final decision.

Impact on gearing

With both the buy and finance lease, AB will see its gearing rise. Under the buy decision the loan will be a long term loan thereby increasing gearing. Under the finance lease, the asset will be capitalised and obligations under finance lease shown under liabilities thereby increasing gearing. So the impact on the financial statements for both the buy and finance lease will be similar. For the operating lease, the asset is not capitalised and therefore there is no impact on gearing.

Risk of obsolescence

The nature of the specialist equipment indicates that after 3 years it will require upgrading. This will be done automatically under the operating lease. The finance lease will be locked in for 5 years and the buy decision, upgrading will cost extra. Therefore on this basis the cost of the upgrade needs to be established and factored into the NPV which may mean the operating lease is a more viable option.

If AB were to consider hiring the asset for 3 years only to reduce the risk of obsolescence, the operating lease is a cheaper option.

	Alternative 2 Finance lease	Alternative 3 Operating lease
NPV for first 3 years	(36.12)	(32.46)

Maintenance

Under the buy and finance lease alternatives, AB is responsible for the maintenance. AB will have to consider if they have the skills and equipment to undertake the maintenance work and how much downtime it will involve. Under the operating lease, maintenance is borne by the lessor, which reduces the cost to AB, however relying on a third party for repair works could result in additional downtime.

Cash flows

Under the buy option, AB will have to service its debt with (\$50m x 7%) \$3.5 million of interest annually. This is much lower than the lease rentals that have to be paid. So therefore the buy option will have less impact on cash flows for AB. However if AB borrow and buy, it reduces their borrowing capacity for future investments.

Recommendation

On the basis of the NPV, AB should go for the finance lease as the overall cost is lower than the other 2 options.

On cash flow basis, AB should go for the buy option as the annual cash outflows for interest are a lot lower than leasing rentals.

On the basis of the equipment becoming out of date after 3 years, AB should go for the operating lease option.

AB needs to decide what factors are important for them and then make a decision, but overall it appears that finance lease is the best option.

(c) Impact on improved tax depreciation allowances

In the UK only the owner of the asset can claim tax depreciation allowances. Currently AB is entitled to claim tax depreciation allowances on a straight line basis over the useful economic life of the asset. If the government allowed improved allowances (either 100% full in year of purchase, or reducing balance method), the buy decision could become more viable as the tax savings would be realised in the earlier years.

To claim the tax depreciation allowances, AB must generate enough taxable profits to claim the savings. AB is forecast to make its first profits for year ending 30/06/11, so there is risk that AB may not have enough taxable profits to offset the allowances in the

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earlier years, in which case they will be carried forward. This will then make the decision to buy more difficult.

The lessor for both the finance lease and operating lease would claim the tax depreciation allowances and AB would have no control over this. The lessor may reduce its lease rentals so that AB may benefit from the reduction in tax paid by the lessor.

Question 4

(a) Calculate:

(i) XXø existing cost of equity.

(1 mark)

(ii) XXø existing weighted average cost of capital (WACC).

(2 marks)

(iii) A suitable WACC for the Specialist Division based on proxy YY, adjusted for XXø gearing.

(5 marks)

(b) (i) Calculate a range of values for the Specialist Division based on the different methods suggested by Directors A, B and C (but not Director D).

(5 marks)

(ii) Discuss the validity of the methods suggested by each of the four Directors A, B, C and D.

(8 marks)

(iii) Advise XX on an appropriate price for the purchase of the Specialist Division.

(4 marks)

(Total for Question Four = 25 marks)

a(i) XXø existing cost of equity

Using the CAPM

$$K_e = R_f + (R_m - R_f)\beta$$

$$\text{Risk premium} = R_m - R_f$$

$$= 5\% + 6\% \times 1.5$$

$$= \mathbf{14\%}$$

(ii) XXø WACC

$$k_o = k_e \times \left\{ \frac{V_e}{V_e + V_D} \right\} + k_d \times \left\{ \frac{V_d}{V_e + V_D} \right\}$$

Where

- k_o = weighted average cost of capital
- k_e = cost of equity = 14%
- k_d = cost of debt = 6% × (1 - 0.3) = 4.2%
- V_E = market value of equity = 60% = 0.6
- V_D = market value of debt = 40% = 0.4

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$$\begin{aligned}k_o &= 14\% \times 0.6 + 4.2\% \times 0.4 \\ &= \mathbf{10.08\%}\end{aligned}$$

(iii) Suitable WACC for Specialist Division using proxy YY and adjusted for XX gearing

Firstly YY's equity beta to remove the financial risk and leave with asset beta, which measures the business risk only for that industry area.

Exam formula (un-gearing β)

$$\beta_a = \beta_g \times \left\{ \frac{V_e}{V_e + V_d(1-t)} \right\} + \beta_d \times \left\{ \frac{V_d(1-t)}{V_e + V_d(1-t)} \right\}$$

Where

β_a	=	asset beta = beta for the equity for un-g geared company
β_g	=	equity beta = beta of the equity for the geared company
β_d	=	beta of debt
V_d	=	market value of debt
V_e	=	market value of equity
t	=	corporation tax rate

$$\begin{aligned}\beta_a &= 0.8 \times \{0.75 / 0.75 + 0.25(1-0.3)\} \\ &= \mathbf{0.65}\end{aligned}$$

Now re-gear to XX's debt to equity ratio

Re-gearing formula - No beta for debt

$$\begin{aligned}\beta_g &= \beta_a \times \left\{ \frac{V_e + V_d(1-t)}{V_e} \right\} \\ &= 0.65 \times \{0.6 + 0.4(1.03) / 0.6\} \\ &= \mathbf{0.95}\end{aligned}$$

This now measure the business risk of the Specialist division area and the financial risk of XX

Now plug into CAPM to find K_e

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$$\begin{aligned}K_e &= R_f + (R_m - R_f)\beta \\ &= 5\% + 6\% \times 0.95 \\ &= \mathbf{10.7\%}\end{aligned}$$

Now calculate suitable WACC for Specialist Division:

$$\begin{aligned}k_o &= k_e \times \left\{ \frac{V_e}{V_e + V_D} \right\} + k_d \times \left\{ \frac{V_d}{V_e + V_D} \right\} \\ &= 10.7\% \times 0.6 + 6\% (1-0.3) \times 0.4 \\ &= 6.42 + 1.68 \\ &= \mathbf{8.1\%}\end{aligned}$$

Suitable WACC for Specialist Division = 8.1%

b(i)

Director A has suggested that an asset-based valuation should be used.

$$\begin{aligned}\text{Net assets} &= \mathbf{A\$15.0 million} \text{ based on book value} \\ &= \mathbf{A\$20.0 million} \text{ based on replacement value}\end{aligned}$$

Director B has proposed that the valuation should be based on the future operating cash flows of the division, adjusted for tax and discounted by XX% existing weighted average cost of capital (WACC).

Operating cash flows = A\$ 2.5 million into perpetuity at growth of 1% per annum and discounted at 10.08% ($c/f \times (1+g) / r-g$)

$$\begin{aligned}\text{Value} &= A\$2.5m \times 1.01 / (0.1008 - 0.001) \\ &= \mathbf{A\$27.8 million}\end{aligned}$$

Director C has suggested that the WACC used in the valuation should be derived from a proxy company. He has identified YY as a possible proxy for the Specialist Division. YY's sole activity is publishing specialist magazines in a similar market to the Specialist Division.

Operating cash flows = A\$2.5 million into perpetuity at growth of 1% per annum and discounted at 8.1% ($c/f \times (1+g) / r-g$)

$$\begin{aligned}\text{Value} &= A\$2.5m \times 1.01 / (0.081 - 0.001) \\ &= \mathbf{A\$35.6 million}\end{aligned}$$

Range of values – A\$15 million to A\$35.6 million

b(ii) Validity of the methods used

Director A

Asset based valuations

Valuation of the company is based on the net assets acquired. Therefore this method is simpler as access to the statement of financial position (balance sheet) is available. However the problem with this method is that intellectual assets are either not included in the statement of financial position (balance sheet) or are difficult to value (i.e. key staff, patents, copyrights etc).

Net asset based valuation		
Advantages	Disadvantages	Relevance
<ul style="list-style-type: none"> ✓ Simple to calculate ✓ Easy to understand ✓ Cost effective ✓ Information readily available ✓ Gives a starting point 	<ul style="list-style-type: none"> X Future projects not incorporated. X No allowance for intellectual capital, which really adds value to a business. X Uses historical financial statements which are can be manipulated 	<p>The least relevant method, but does give a starting point</p>

This is not relevant for valuing the Specialist division

Director B

Future operating cash flows based on XX's existing WACC.

This method of valuation is very suitable for valuing an entire business as the future cash flows of the business are discounted. Discounting cash flows is seen as the superior method of valuing business. However the accuracy of the forecast figures and estimates makes this method risky.

The discount rate being used is XX's own existing WACC. However XX may not have the same business risk as the Specialist Division, which makes the valuation less accurate and could either undervalue or overvalue the business.

Discounted cash flows		
Advantages	Disadvantages	Relevance
<ul style="list-style-type: none"> ✓ Takes time value of money into account discounting all future cash flows. ✓ The most accurate method of valuing entire business. ✓ This will ensure fair price paid 	<ul style="list-style-type: none"> X Forecasting data may be unrealistic X Difficult to forecast so far in the future, this causes inaccuracies X Difficult to factor in uncertainties X Difficulties in finding a suitable discount rate X Difficulties in determining a terminal value 	<p>The best method for valuing an entire business. However the quality of the valuation depends on the forecast data used. This method is essentially a detailed investment appraisal, which is the best method for evaluating projects / assets.</p>

Although this method is a good one for valuing business, the drawback is the discount rate being used as it doesn't reflect the business risk of the division.

Director C

Using a proxy company adjusted WACC to discount future cash flows

YY has a lower equity beta and asset beta compared to XX which means YY is much lower risk. The specialist magazine business appears to be less risky than book publishing business that XX undertakes. Therefore a more appropriate discount needs to be used to discount the future operating cash flows of the Specialist division.

Using YY's data, an appropriate beta can be established which reflects the business risk of that sector. Re-gearing this asset beta to XX's own financial risk gives a more accurate cost of equity which can be used for the WACC. This is the ideal discount rate and therefore the valuation should be more valid. As YY sector is lower risk than XX, the valuation is much higher than using XX's existing WACC.

However the question lies in how similar the Specialist division is to YY the proxy company. YY may be a much larger, developed organisation with greater efficiencies and economies of scale. So therefore comparing the Specialist Division to YY may not be appropriate.

Director D

Earnings valuation model

Earnings yield

The earnings yield is calculated as: $\text{earnings per share} / \text{share price} \times 100\%$

It is basically the reciprocal of the PE ratio and can be also be used to find the share price as follows:

Share price = earnings per share / earnings yield.

A company with high growth prospects will have a low earnings yield and vice versa. The use of the earnings yield as a valuation tool is effectively discounting the earnings using the earning yields as a discount rate.

There is not enough information to establish a valuation using the earnings valuation model. As the Specialist division is part of the group of WW, we don't have information on this division's earnings. The earnings for the division should include an appropriate level of interest allocated for the gearing for WW.

This method only values the equity and not the entire company including the debts which are the net assets. Therefore the value of the debt will also need to be established.

Due to the lack of data this method is not valid in this case.

b(iii)

Advice on an appropriate price that XX could offer for the Specialist Division

Summary of valuations

Net assets ó book value	A\$15m
Net assets ó replacement value	A\$20m
DCF ó XX's existing WACC	A\$27.8m
DCF ó XX's revised WACC with proxy asset beta	A\$35.6m

As discussed earlier, the net assets based method is not a suitable one for valuation due to the lack of future earnings, intellectual capital and goodwill. Therefore XX should use the DCF valuation methods to make an offer.

XX should go in with a low price as inevitably this will be rejected by WW. XX can then offer a higher price up to a maximum of A\$35.6m

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XX should initially offer a price of around A\$25 million which is very close to discounted cash flows based on XX's existing WACC.

It is also important to bear in mind that the discounted cash flows are forecast to grow only by 1%. XX may think that it could increase the growth rate and therefore it may be prepared to pay a much higher price.

It all depends how badly XX would like to purchase this business and it needs to ensure that it doesn't lose shareholder wealth in the process.

WW may have its own valuation for the Specialist Division, which could make negotiations difficult.

I would recommend a 2 bid strategy for XX. The initial offer should be A\$25 million with a maximum offer of A\$35 million.