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ACCA

Paper P4

Advanced Financial Management
2012

Interim Assessment – Answers

To gain maximum benefit, do not refer to these answers until you have completed the interim assessment questions and submitted them for marking.

ANSWER 1

Key answer tips:

This question involves identifying two sets of cash flows and two discount rates. Time is likely to be the main problem. Try to cover as much of the answer as possible even if no one aspect is completed. To facilitate discussion, make assumptions where necessary.

With such long time scales you must work in real terms. Remember to adjust the WACC calculated discount rate to a real rate. The conclusions reached by this solution might seem unrealistic, given the financial problems of the nuclear power industry!

(a) **Financial evaluation of the alternative power stations**

Alternative 1: Gas-fuelled power station

Cash flows at current prices (£ million)

	Years 4–13 (annual)	*Years 14–28 (annual)*
Revenue	800.0	800.0
Labour	75.0	75.0
Fuel purchases	500.0	500.0
Sales and marketing	40.0	40.0
Customer relations	5.0	5.0
Other	5.0	5.0
Tax allowable depreciation (10% of 600, years 4–13)	60.0	–
	685.0	625.0
Taxable profit	115.0	175.0
Tax at 30%	(34.5)	(52.5)
	80.5	122.5
Add back depreciation	60.0	–
Annual net operating cash flows	140.5	122.5

Tutorial note: *Interest costs are included in the discount rate and should not be in the cash flow table as a cash flow item.*

Cost of capital, gas

Cost of equity using CAPM is 4.5% + (14% – 4.5%) 0.7 = 11.15%

WACC = 11.15% $\times$ 0.65 + 8.5% (1 – 0.3) $\times$ 0.35 = 9.33%

However, this is the nominal cost of capital which includes inflation. The cash flow projections exclude inflation and must be discounted at a real cost of capital. Given the assumption of annual inflation of 3% per annum, the real cost of capital is:

$$\frac{1.0933}{1.03} = 1.061$$

6% will be used as the real discount rate for gas.

NPV calculation, gas

Discount factors at 6%

Cumulative discount factor, years 1–10 = 7.360

Cumulative discount factor, years 4–13 (10 years) at year 3 value = 7.360

Present value of cumulative discount factor, years 4–13 = 7.360 × discount factor for year 3 = 7.360 × 0.840 = 6.182

Cumulative discount factor, years 1–15 = 9.712

Cumulative discount factor, years 14–28 (15 years) at year 13 value = 9.712

Present value of cumulative discount factor, years 14–28 = 7.360 × discount factor for year 13 = 9.712 × 0.469 = 4.555

Discount factor year 28 = discount factor year 15 × discount factor year 13

(since 15 + 13 = 28) = 0.417 × 0.469 = 0.196

Year	*Item*	*Cash flow*	*Discount factor at 6%*	*PV*
		£ million		£ million
1	Capital outlay	(300.0)	0.943	(282.9)
2	Capital outlay	(300.0)	0.890	(267.0)
3	Decommissioning cost	(10.0)	0.840	(8.40)
28	Decommissioning cost	(25.0)	0.196	(4.90)
4	Redundancy costs	(4.0)	0.792	(3.17)
4–13	Operating cash flows	140.5	6.182	868.6
14–28	Operating cash flows	122.5	4.555	558.0
	Project NPV			860.23

The NPV of an investment in a gas-fuelled power station is + £860.23 million.

Alternative 2: Nuclear-fuelled power station

Cash flows at current prices (£ million)

	Years 4–13 (annual)	*Years 14–28 (annual)*
Revenue	800.0	800.0
Labour	20.0	20.0
Fuel purchases	10.0	10.0
Sales and marketing	40.0	40.0
Customer relations	20.0	20.0
Other	25.0	25.0
Tax allowable depreciation (10% of 3,300, years 4–13)	330.0	–
	445.0	115.0
Taxable profit	355.0	685.0
Tax at 30%	(106.5)	(205.5)
	248.5	479.5
Add back depreciation	330.0	–
Annual net operating cash flows	578.5	479.5

Cost of capital, nuclear power

Cost of equity using CAPM is 4.5% + (14% – 4.5%) 1.4 = 17.8%

WACC = 17.8 × 0.40 + l0% (1 – 0.3) × 0.60 = 11.32%

The real cost of capital is $\frac{1.1132}{1.03}$ = 1.081

8% will be used as the real discount rate for nuclear power.

Estimates of the discount rates assume that the value of the pound will not change relative to the euro, or alternatively that the UK will join the eurozone in the near future. If this does not occur and inflation differentials between the UK and eurozone remain similar, the cost of debt should be slightly less as the euro is expected to fall in value relative to the pound (since inflation in the eurozone is estimated at 5% and in the UK at only 3%).

NPV calculation, nuclear power

Discount factors at 8%

Cumulative discount factor, years 1–10 = 6.710

Cumulative discount factor, years 4–13 (10 years) at year 3 value = 6.710

Present value of cumulative discount factor, years 4–13 = 6.710 × discount factor for year 3 = 6.710 × 0.794 = 5.328

Cumulative discount factor, years 1–15 = 8.559

Cumulative discount factor, years 14–28 (15 years) at year 13 value = 8.559

Present value of cumulative discount factor, years 14–28 = 8.559 × discount factor for year 13 = 8.559 × 0.368 = 3.150

Discount factor year 28 = discount factor year 15 × discount factor year 13

(since 15 + 13 = 28) = 0.315 × 0.368 = 0.116

Year	*Item*	*Cash flow*	*Discount factor at 8%*	*PV*
		£ million		£ million
1	Capital outlay	(1,650)	0.926	(1,527.90)
2	Capital outlay	(1,650)	0.857	(1,414.05)
3	Decommissioning cost	(10.0)	0.794	(7.94)
28	Decommissioning cost	(1,000.0)	0.116	(116.00)
4	Redundancy costs	(36.0)	0.735	(26.50)
4–13	Operating cash flows	578.5	5.328	3,082.25
14–28	Operating cash flows	479.5	3.150	1,510.40
	Project NPV			1,500.26

The NPV of an investment in a nuclear power station is + £1,500.26 million.

If decommissioning in year 28 costs only £500 million, the expected NPV will be higher by £500 million × 0.116 = £58 million. The NPV will therefore be £1,558 million.

Conclusion

On the basis of these figures, the **nuclear energy option would produce a higher NPV**.

(b) Information that might assist the decision process includes:

(i) How accurate are the projected cash flows? Are the various revenues and costs likely to be subject to the same price level changes?

(ii) Is the risk of the project correctly measured by the beta estimates?

(iii) What is the chance of significant changes in tax rates or tax allowable depreciation?

(iv) Are there likely to be delays in construction?

(v) How accurate is the estimate of the working life of the power stations? What happens if technology changes?

(vi) Is the technology well tested, especially for the nuclear alternative? Sensitivity and/or simulation analysis to investigate outcomes under different assumptions is strongly recommended.

(vii) What will be the impact of the alternative levels of gearing on other activities of the company and on the company's share price?

(viii) What real options might exist with the alternative projects?

(ix) How significant are non-financial factors? In the light of nuclear accidents in Russia and Japan how safe is the nuclear alternative? How environmentally or politically acceptable would this alternative be? Even if the nuclear alternative is the better choice financially, this might be outweighed by non-financial considerations.

(c) The external advisor has suggested adjusting the discount rate as the decommissioning costs are not known with any certainty. As these cash flows are relatively risky an adjustment to the discount rate might be justified. The decommissioning costs are cash outflows. In order to reflect the higher risk, the discount rate of these cash flows should be reduced to result in a higher negative present value.

(d) Capital investment decisions are often based upon the present value of expected future cash flows, discounted at a rate that reflects the risk of the project. However this ignores any actions that can be taken after the project has commenced to alter the cash flows, or any future opportunities that might arise as a direct result of having undertaken the project. Opportunities to respond to changing future circumstances are known as options. When such options relate to capital investments they are commonly known as real options. The existence of real options can significantly add to the value of an investment. If investments are judged only on their expected NPV, and the value embedded in the options is ignored, then an incorrect investment decision might result. Unfortunately the valuation of real options is extremely difficult.

In the context of the power station investment a number of options might exist including:

(i) The option to abandon the project. This is likely to be easier and more valuable with the gas project than the nuclear project because of the lower cost, and much fewer decommissioning problems of the gas project.

(ii) The option to expand production. This is also likely to be more valuable with the gas project as much lower investment is required in new plant to expand.

(iii) The option to adjust the nature of production, for example the fuel used. This is far easier for the gas project which could probably switch to oil or other fuels at a much lower cost than the nuclear project.

(iv) The option to take advantage of new technology. Once again there is likely to be more flexibility in the gas project.

In conclusion there are likely to be more valuable real options associated with the gas-fuelled power station project.

ACCA marking scheme		
		Marks
(a)	State why using NPV	1
	Assumptions clearly listed, max	2
	Any sensible NPV with consistent conclusion, 1 each project = max	2
	Discount rate using CAPM ke	1
	WACC	1
	Use of real rate	1
	Correct annuity factors	2
	Ignoring interest flows (give mark even if not explicitly stated)	1
	Correct TADs and treatment	2
	Tax charge	1
	Annual revenues	1
	Annual costs	1
	Capital outlay	1
	Decommissioning	½
	Redundancy	½
	Part (a) total	**18**
Parts (b), (c) and (d) – 1 mark for each ***well explained point***		

ANSWER 2

(a) **Investment Decision**

First we must calculate the base-case present value.

Base-case discount rate (£-terms)

$\beta_{asset} = 1.40 \times \frac{4}{4 + 1(1 - 0.35)} = 1.20$

Base-case discount rate = 5.6% + (12% × 1.20) = 20%

A$ Project cash flows (A$m)

Year	*0*	*1*	*2*	*3*	*4*
Revenues		18	18	18	18
Costs		(5)	(5)	(5)	(5)
Net operating cashflows		13	13	13	13
Tax on operating cashflows (50%)		(6.5)	(6.5)	(6.5)	(6.5)
Capital equipment	(15)				
Tax relief on capital allowances (A$ 15m x 25% x 50%)		1.875	1.875	1.875	1.875
Working capital	(5)				5
Net cash flow	(20)	8.375	8.375	8.375	13.375

£m Base-case present value calculation

Year	*A$m*		*Exchange rate*		*£m*		*20% Discount factor*		*£m PV Cash flows*
0	(20)	÷	2	=	(10)	×	1	=	(10)
1	8.375	÷	$2(1.10)^1$	=	3.807	×	0.833	=	3.171
2	8.375	÷	$2(1.10)^2$	=	3.461	×	0.694	=	2.402
3	8.375	÷	$2(1.10)^3$	=	3.146	×	0.579	=	1.821
4	13.375	÷	$2(1.10)^4$	=	4.568	×	0.482	=	2.202
							Base Case PV	=	(£0.404m)

FINANCING DECISION – PV of financing side-effects

PV of issue costs

Issue costs = £5m x 2.5/97.5 = £128,205 – assume paid immediately.

Net of tax PV of issue costs = £128,205 x (1– 0.35) = £83,333

PV of tax shield

£5,128,205 × 6% (W1)	=	£307,692	= Annual interest
£307,692 × 0.35	=	£107,692	= Annual tax relief

PV of tax relief (discounted at the risk free rate)

= £107,692 x AF_{1-4} (5.6%) = £107,692 x 3.460 = £372,614

(W1) The interest rate on the Euro-sterling loan is 40 basis points above the current UK risk free rate of 5.6% i.e. 5.6% + 0.40% = 6%

Adjusted present value = INVESTMENT DECISION + FINANCING DECISION:

		£m
INVESTMENT DECISION:		
Base-case PV	:	(0.404)
FINANCING DECISION:		
PV tax shield	:	0.373
PV issue costs	:	(0.083)
Adjusted present value	:	(£0.114m) or – £114,000 approx

Therefore, reject the project with this financing method, since it has a negative APV.

(b) **Comparison of APV and NPV**

Both APV and NPV are discounted cash flow techniques.

They differ in the way project finance is incorporated into the process. With NPV, finance is usually incorporated into the discount rate which is then applied to project-only (i.e. excluding finance) cash flows. The clearest example of this is when a project (or company) WACC is used to discount project cash flows.

APV involves a two stage process dealing with project and financing flows separately. Project cash flows are discounted at an ungeared cost of equity to calculate a base case NPV. Financing side effects are then discounted at an appropriate rate – usually the pre-tax risk free rate.

When to use APV

APV may be a better technique to use than NPV when:

(i) There is a significant change in capital structure as a result of the investment.

(ii) The investment involves complex tax payments and tax allowances, and/or has periods when taxation is not paid.

(iii) Subsidised loans, grants or issue costs exist.

(iv) Financing side effects exist (e.g. a subsidised loan), which require discounting at a different rate than that applied to the mainstream project.

(c) The current proposal is to use a 6% coupon Euro-sterling loan to fund Project XY.

Advantages

- The interest rate on the loan is quite low, so the debt will be cheap to service. Indeed given that the current return on UK government stock is 5.6%, it is difficult to imagine that any other source of sterling denominated debt finance would be much cheaper than the quoted 6% on this loan.
- Using debt finance gives tax advantages which would not be obtained if equity finance were used (however, note the comments on the value of this tax relief under “Disadvantages” below).
- Using debt finance for the project would increase Rosy plc’s gearing level. Theoretically this should reduce the company’s cost of capital (unless Rosy plc already has a high gearing level, in which case the increased threat of financial distress might outweigh any positive impact of the new debt finance).
- Rosy plc is a UK company; so much of its activities will probably be denominated in sterling. There will be no need to convert the Euro-sterling loan into a different currency for accounting purposes.

Disadvantages

- The returns from Project XY are denominated in Australian $, but the proposed finance is denominated in sterling. Given that the A$ is forecast to weaken against sterling, this means that (in sterling terms) the value of the project inflows will diminish over time, while the interest payments will stay constant.
- The tax relief generated by the Euro-sterling loan is relatively small. In fact, the value of the tax relief is not expected to be sufficient to convert the negative base case NPV of the project into a positive APV. Therefore, the project financed by this Euro-sterling loan is not financially beneficial to Rosy plc (more detail in part (a)).
- For accounting purposes, the value of the Australian project will have to be converted into sterling at each year end. Because the finance for the project will be denominated in sterling, there will be no balance sheet hedge to protect against falls in value of the assets.

Other financing options

Australian dollar loan

An Australian dollar loan would still be a debt financing option, so the general advantages of debt finance would still apply i.e.

- the cost of servicing the debt would be low, although it is not clear whether the interest rate on an Australian loan is likely to be cheaper or more expensive than that on a sterling loan at present.
- tax relief would be claimed on the debt interest. Calculations could be performed to assess whether the value of this tax relief would help to create a positive APV for the project.

However, given that the Project XY cashflows are denominated in Australian dollars, raising finance in the same currency would have the following additional advantages:

- a hedge would be created against the depreciating currency. As the A$ weakens against the £, the value of the interest payments in sterling terms will fall.
- A$ inflows from Project XY could be used to repay the debt and pay the interest without the need to convert money from one currency to another, thus saving transaction costs.

The only potential problem for Rosy plc is the availability of the finance. As a UK based company, it might find that rates quoted on A$ loans are not as competitive as rates on loans in its home currency.

Rights issue

A rights issue of shares is an equity financing option. Consequently, there are no tax benefits such as those which would be generated by tax relief on debt interest. Also, equity finance tends to have a higher cost than debt finance because of its extra risk to the investor, and it usually involves higher issue costs than a debt finance option.

The main advantage of equity finance is that the company's gearing would not be increased. In the case of Rosy plc it is not clear whether the gearing is at an optimal level. Equity finance should be considered if it is felt that the current gearing level is too high.

ACCA marking scheme		
		Marks
(a)	Ungeared cost of equity	2
	Net of tax operating cashflows (A$)	2
	Capital investment	½
	Working capital	½
	Tax relief on capital allowances	1
	Exchange rates	2
	NPV in £ at ungeared cost of equity	1
	PV of issue costs	1
	Interest rate = 6%	1
	PV of tax shield	2
	APV	1
	Comment	1
		Max 14
(b)	Comparison of APV and NPV – 1 mark per sensible point	Max 3
	When to use APV – 1 mark per sensible point	Max 3
		Max 6
(c)	Advantages of Euro-sterling loan	Max 3
	Disadvantages of Euro-sterling loan	Max 3
	Comments on A$ loan	Max 3
	Comments on rights issue (1 mark per sensible point throughout)	Max 3
		Max 10
Total		**30**

ANSWER 3

(a) The risk of the portfolio can be measured by the weighted average beta factor for the shares in the portfolio. The average should be weighted according to the market prices of the shares.

Shares	*Number*	*Market price*	*Total market value*	*Beta factor*	*Weighting ($MV \times \beta$)*
		£	£		
A plc	100,000	2.80	280,000	1.55	434,000
B plc	155,000	3.40	527,000	0.65	342,550
C plc	260,000	1.50	390,000	1.26	491,400
D plc	430,000	0.95	408,500	1.14	465,690
			1,605,500		1,733,640

The estimated beta factor for the portfolio as a whole is:

$$\frac{1{,}733{,}640}{1{,}605{,}000} = 1.08$$

Since the beta factor is over 1, we can conclude that the risk of the portfolio is higher than the risk of the market as a whole.

(b) The composition of the portfolio should be considered in two ways.

(i) Are the individual shares in the portfolio performing suitably well, and should an investor sell, hold or buy more of the shares?

(ii) Is the composition of the portfolio as a whole satisfactory, bearing in mind that it is intended as a portfolio of short-term rather than long-term investments?

Individual shares in the portfolio

We can assess whether each individual share is expected to yield a return which is satisfactory for the amount of its systematic risk by preparing an Alpha table:

Shares	*Expected return*	*Required return*	*Alpha*
A plc	21%	6% + 1.55 (16–6)% = 21.5%	–0.5%
B plc	12.5%	6% + 0.65 (16–6)% = 12.5%	0
C plc	18%	6% + 1.26 (16–6)% = 18.6%	–0.6%
D plc	18.5%	6% + 1.14 (16–6)% = 17.4%	+1.1%

Shares in A and C are not expected to give a satisfactory return relative to their systematic risk, and so should be sold. In contrast, shares in D are expected to yield a high return relative to their systematic risk, so an investor should buy more of them. Shares in B where expected and required returns are the same, should be retained.

However, with A and C, the difference between required and estimated returns is less than 1%, and so given the obvious uncertainty about future returns, the transaction costs involved in sale and the probability of abnormal returns affecting the actual outcome, a financial manager might decide to hold the shares in these companies.

The portfolio as a whole

(i) The portfolio consists of shares in only four companies, and so it is not well diversified. This means that the actual risk for the investor will be much higher than the systematic risk would suggest. By failing to diversify sufficiently, an investor's portfolio would be exposed to total risk.

(ii) A company's short term investment portfolio is usually intended to provide a temporary use for a short term cash surplus, which can be drawn on by the company when it eventually needs the cash. The portfolio should yield a good return, but companies may be reluctant to risk sharp falls in prices, and a big loss in capital value. Some risk of capital loss will often be acceptable, but companies will usually prefer to invest short term in interest-bearing marketable securities, where the risks of capital losses are smaller.

Recommendation

Sadlier plc should change the composition of its portfolio, because it consists of just four different shares, the unsystematic risk level will be very high. The portfolio could yield very high returns, but it might also yield poor returns or even a capital loss. This is not suitable for short term investments.

A new portfolio of interest-bearing securities (either marketable securities or short-term securities) should be built up.

ACCA marking scheme		
		Marks
(a)	Calculation of the portfolio beta and interpretation of its meaning	6
(b)	Calculation and interpretation of the alpha values of the individual investments	8
	Comment that the portfolio is currently not well diversified and thus would suffer total risk	3
	Short-term investments usually interest bearing securities rather than equities	3
	Maximum	**14**
Total		**20**

ANSWER 4

(a) There is considerable debate as to whether dividend policy can influence corporate value. Much of the debate concerns the question of whether it is the dividend that affects share value, or the information implied by the payment of the dividend. Dividends may provide, in the cheapest and most efficient manner, unambiguous signals about a company's future prospects and management performance. Managers have an incentive to send truthful signals via dividends, as any changes in dividends that are not likely to be accompanied by changes in cash flows will not fool a market that is at least semi-strong form efficient. Dividends therefore may be a valuable communication medium.

There are a number of possible practical influences on dividend policy including:

(i) Dividends are to be discouraged as they may lead to issue costs associated with raising additional external finance.

(ii) Corporate growth. The faster a company is growing the lower the dividend payment is likely to be.

(iii) Liquidity. Cash is needed to pay dividends. The level of corporate liquidity might influence dividend payouts.

(iv) The volatility of corporate cash flows. Companies may be reluctant to increase dividends unless they believe that future cash flows will be large enough to sustain the increased dividend payment.

(v) Legal restrictions, for example, government constraints, limitations on payments from reserves, and covenants on debt that restrict dividends.

(vi) The rate of inflation. Many shareholders like dividends to increase by at least as much as inflation.

(vii) The desires and tax position of the shareholder clientele. However, most companies have a broad spread of shareholders with different needs and tax positions.

(b)

Statistical data:	*20X3*	*20X4*	*20X5*	*20X6*	*20X7*
Earnings per share (pence)	25.6	32.5	39.2	42.4	50.8
Retained earnings (£m)	80	129	172	198	328
Payout ratio (%)	38.1	33.8	32.5	33.0	30.5
Dividends (£m)	49.5	66.0	82.9	97.3	144.1
Real growth in dividend per share (%)		8.48	12.53	6.60	7.49

The company's dividend per share has increased, in real terms, by between 6.6% and 12.53% per year during the last five years. Although no comparative industry data is available, this appears to be a good performance. The payout ratio has reduced from 38% in 20X3 to 30.5% in 20X7, which may be why the institutional shareholder has made the criticism. However, there is little point in the company paying out large dividends if it has positive NPV investments which can be financed partially by dividend retention. Although there is by no means a perfect correlation between NPV and earnings per share, the fact that earnings per share have consistently increased over the period suggests that the company's investments are financially viable. The company has consistently had high net capital expenditure relative to earnings, and in such circumstances it is not unusual for dividend payments to be relatively low.

The company's share price has not increased by as much as earnings per share but, without information on stock market trends and the relative risk of the company, it is not clear whether or not the company's share price is under performing. Unless the institutional shareholder could invest any dividends received to earn a higher yield (adjusted for any differences in risk) there is little evidence to support the validity of the criticism.

(c) The argument by Miller and Modigliani (MM) that dividend policy is irrelevant to the value of company was formulated under very restrictive perfect market conditions. If such conditions existed then shareholders would not value an increase in dividend payments. However, there are several real world factors that are likely to influence the preference of shareholders towards dividends or retentions (and hence expected capital gains). These include:

- Taxation. In some countries dividends and capital gains are subject to different marginal rates of taxation usually with capital gains being subject to a lower level of taxation than dividends.
- Brokerage fees. MM ignore brokerage fees. However, if shareholders have a preference for some current income and are paid no or low dividends, their wealth will be reduced if they have to sell some of their shares and incur brokerage fees in order to create current income.
- If a company needs to finance more new investment it is usually cheaper to fund investment through retained earnings as most forms of external finance involve issue costs.

- Information asymmetry may exist between shareholders and directors. If the market is not strong form efficient, shareholders may have less complete knowledge of the likely future prospects of the company than directors, which may influence the shareholders' desire for dividends or capital gains.

The implications of an increase in dividends need to be considered by the company. Dividends are often regarded as an unbiased signal of a company's future prospects, an increase in dividends signalling higher expected earnings. The company should be careful to inform its shareholders of the reason for any increase in dividends. A further factor is the use that the company can make of funds. If the company has a number of possible positive NPV investments, then shareholders will normally favour undertaking these investments (at least on financial grounds), as they will lead to an increase in shareholder wealth. If, however, the company has relatively few projects and can only invest surplus cash at an expected zero NPV, the arguments for retentions is weakened. For strategic and operational reasons most companies keep some funds in the form of cash or near cash, for transactional and precautionary motives and to be in the position to take advantage of unexpected opportunities that may arise.

The need for cash for such purposes may influence the level of dividend payout.

ACCA marking scheme		
		Marks
(a)	One mark for each valid point	Max 6
(b)	Two marks for calculations. 4 marks for detailed analysis/explanation	Max 6
(c)	Two marks for each well-explained point	Max 8
Total		**20**

ANSWER 5

(a) (1) Ke – DVM with growth

$$Ke = \frac{Do \times (1+g)}{Po} + g$$

$$Ke = \frac{10.50(1.11)}{200} + 0.11 = 16.83\%$$

Calculation of growth in dividends: $\left(\frac{10.5}{6.9}\right)^{\left(\frac{1}{4}\right)} \quad 1 = 0.11$

(2) Kd(1 – t) –irredeemable debt

Kd(1 – t) = 8 × (1 – 0.3)/75 = 7.47%

(3) Kd(1 – t) – bank term loan

10% (1 – 0.3) = 7%

(4) Market values

		£m	£m
Equity	250 ÷ 0.25 × £2 =		2,000
Debt			
Fixed	600m × 75/100 =	450	
Term loan	300m =	300	750
E + D			2,750

(5) WACC

$$WACC = 16.83\% \times \frac{2,000}{2,750} + 7.47\% \times \frac{450}{2,750} + 7\% \times \frac{300}{2,750} = 14.23\%$$

(b) **Foxes plc**

The current beta equity of Foxes plc is 1.20.

Hence its beta asset is (assuming debt is risk free):

$$\text{Beta asset} = \text{beta equity} \times \frac{V_E}{V_E + V_D(1-t)}$$

$$= 1.20 \text{ x } \frac{80}{80+20(1-0.30)}$$

$$= 1.02$$

Given that Foxes has 65% of its business in the leisure sector and 35% in publishing, this total beta asset will be the weighted average of the individual beta assets of the individual industries.

i.e. Foxes ßa = (0.65 x Leisure ßa) + (0.35 x Publishing ßa)

Therefore it is first necessary to calculate the beta asset of the leisure industry, then use the formula to find the balancing figure for the publishing industry.

Leisure industry

$$\text{Beta asset} = \text{beta equity} \times \frac{V_E}{V_E + V_D(1-t)}$$

$$= 1.1 \times \frac{70}{70+30(1-0.30)} = 0.85$$

Thus,

Foxes ßa = (0.65 x Leisure ßa) + (0.35 x Publishing ßa)

1.02 = (0.65 x 0.85) + (0.35 x Publishing ßa)

So, Publishing ßa = 1.34

Publishing industry

Given that this is a beta asset (ungeared) we now need to gear it up to reflect the industry average D:E gearing of 40:60

$$\text{Beta asset} = \text{beta equity} \times \frac{V_E}{V_E + V_D(1-t)}$$

$$1.34 = \text{beta equity x } \frac{60}{60+40(1-0.30)}$$

So, beta equity = 1.97 for the publishing industry.

(c) **Leisure project**

Assuming the systematic risk of the leisure industry is accurately reflected by the beta equity of other leisure providers, this risk may be estimated by ungearing the equity beta of the other leisure providers and regearing it to take into account the different financial risk of Foxes plc.

In part (b) above we found that the ungeared beta asset of the leisure industry was 0.85.

Regearing this to reflect the gearing of Foxes plc gives:

$$\beta \text{ asset} = \beta \text{ equity} \times \frac{V_E}{V_E + V_D(1-t)}$$

$$0.85 = \beta \text{ equity} \times \frac{80}{80+20(1-0.30)}$$

$$0.85 = \beta \text{ equity x } 0.85$$

$$\beta \text{ equity} = \frac{0.85}{0.85} = 1.00$$

So, using CAPM, Ke = 10% (= Rm as the beta is 1)

Kd(1 − t) = 6%

WACC = 10% × 0.8 + 6% × 0.2 = 9.20%

ACCA marking scheme				
				Marks
(a)	Current WACC	–	dividend growth	2
		–	Ke	2
		–	Kd(1–t) – irredeemable debt	1
		–	Kd(1–t) – bank loan	1
		–	Market values	1
		–	WACC	1
	Total part (a)			**Max 8**
(b)	Publishing beta equity	–	Foxes ß asset	2
		–	weighted average formula	1
		–	leisure industry ß asset	2
		–	publishing ß asset	1
		–	publishing ß equity	2
	Total part (b)			**Max 8**
(c)	Leisure project	–	regearing	1
		–	Ke	1
		–	Kd(1–t)	1
		–	WACC	1
	Total part (c)			**Max 4**
Total				**Max 20**