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# Answers

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- 1 (a) Given the details supplied, a forward forecast of the income statement and of the statement of financial position is a precursor to the cash flow forecast. On the assumptions (as stated in the question but not reproduced here) the following projection is obtained (all figures in \$'000):

Projected income statement	Year 1	Year 2	Year 3
Revenue (9% growth)	5,450	5,941	6,475
Cost of Sales (9% growth)	3,270	3,564	3,885
Gross Profit	2,180	2,377	2,590
Operating costs (w1)	2,012	2,159	2,318
Operating profit	168	218	272

Projected cash flows	Year 1	Year 2	Year 3
Operating profit	168	218	272
Add depreciation (w2)	134	144	155
Less incremental working capital (w3)	(20)	(21)	(24)
Less taxation (w4)	(15)	(28)	(43)
Less interest	(74)	(74)	(74)
Free cash flow to equity	193	239	286
Less investment in non-current assets (w2)	(79)	(95)	(114)
Free cash flow	114	144	172

**Workings**

**w1: Operating costs**

Variable costs (9% growth)	818	891	971
Fixed costs (6% growth)	1,060	1,124	1,192
Depreciation (w2)	134	144	155
Total operating costs	2,012	2,159	2,318

**w2: Non-current assets and depreciation**

Non-current assets at beginning	1,266	1,345	1,440
Additions (20% growth)	79	95	114
Non-current assets	1,345	1,440	1,554
Depreciation (10%)	134	144	155

**w3: Working Capital**

Working capital (9% growth)	240	261	285
Incremental WC	240 – 220 = 20	261 – 240 = 21	285 – 261 = 24

**w4: Taxation**

One year in arrears (30%)	15 (given)	30% x (168 – 74) = 28	30% x (218 – 74) = 43
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- (b) Our estimate of the value of this business on a going concern basis assumes that cash will be generated and reinvestment made according to the above projection. The free cash flow after reinvestment which is potentially distributable and the terminal value of the business assuming a constant rate of reinvestment of 3% forward is as follows:

	0	1	2	3
Free cash flow after reinvestment		112	145	174
Terminal value				2,564
Required rate of return	10%			
Present value of cash flows (discounted at 10%)		101	122	2,057
Value of the firm	2,282			

The terminal value is calculated as follows:

$$Value_3 = \frac{FCFE_3(1.03)}{R_e - 3\%}$$
$$Value_3(\$'000) = \frac{174 \times (1.03)}{10\% - 3\%} = 2,057$$

Where  $R_e$  is the required rate of return of 10% per annum.

The value of the firm, on the basis of the above projections, is \$2,282,000.

- (c) This valuation is based upon a number of assumptions which you should consider when reviewing this analysis. We have taken your judgement that 10% fairly reflects the market rate of return required for an investment of this type. This rate should compensate you for the business risk to which your firm is exposed. For an investment held within the context of a widely diversified portfolio the rate of return you should expect will only be conditioned by your exposure to market risk. However, in the context of a sole equity investment then the rate of return you may require could be more than that which would be available from the market for an investment of this type.

In generating our projections we have assumed the estimates are certain and that the firm is a going concern. In considering this investment further you may wish to explicitly consider the variability attaching to the underlying variables in the projection and the possible range of values that may result. Of particular importance is the assumption of a three-year forecast. In practice the period chosen does depend upon the nature of the business and in particular the uncertainties to which it is exposed.

Finally we have assumed a terminal value based upon future cash flows from year three forward growing at a compound rate of 3% into the indefinite future. The resulting value will be particularly sensitive to this figure and it may be that you may wish to consider a different rate depending upon what you regard as sustainable in the long term for a business of this type.

- (d) In considering the value of this business you should note that the company has a very high level of gearing and that this imparts additional value to you through your possession of limited liability. The value quoted above is a fair value of the business in your hands based upon the expected value of the future cash flows of the enterprise accruing to you. This is the equivalent of the fair value of the firm's assets less its outstanding liabilities including its debt.

However, the possession of limited liability gives you an effective call option on the value of the business against the lenders in that, *in extremis*, if the value of your equity fell to zero, you could liquidate and the lenders would bear any loss. As shareholders you have the potential of 'upside' gains but are not exposed to downside losses. This advantage on the upside means that your limited liability represents an asymmetric claim on the business and this is a valuable right which is particularly important during the growth stage of a business.

This additional value is termed its 'structural value' and it is at its maximum when the value of the assets of the firm approximate to the value of the outstanding debt but it diminishes as that differential widens. A structural valuation of your firm could be undertaken but would need estimates of the volatility of the returns generated by the firm's assets and the length of time which the debt will be held to maturity.

## 2 To Polar Finance

### Report on Anchorage Retail Limited

Following your terms of reference we report as follows:

- (a) There are many risks in acquisitions which have both a high likelihood of occurring and potentially a significant impact upon your business if they do occur. The principal risks to which Polar Finance might be exposed in an acquisition of this type are as follows:
1. Disclosure risk: in making an acquisition of this type it is important to ensure that the information upon which the acquisition is made is reliable and fairly represents the potential earning power, financial position and cash generation of the business. As part of a due diligence exercise it would be necessary to ensure that the financial accounts have not been unduly manipulated to give a more attractive view of the business than the underlying reality would support. To this end it is important to ensure that the income statement can be supported by the reported cash flow. In addition to this all other company documents should, in due course, be scrutinised as part of a full due diligence exercise.
  2. Valuation risk: a substantial acquisition has the potential to alter the risk of the acquirer either because of an alteration in the fund's exposure to financial risk or in its exposure to market risk. Ultimately the value of Polar Finance to its equity investors depends upon the potential returns it offers to them and the risk of those returns. A substantial acquisition of this type can impact upon the perceived risk attaching to the equity which investors have already subscribed and hence the value they place upon the fund. As a consequence, the post acquisition value of Polar Finance may not be a simple sum of the fund's current value and the existing equity valuation of Anchorage Retail.

3. Regulatory risk: an acquisition of the size proposed may raise concern with the government or with other regulatory agencies if it is seen to be against the public interest. As Polar Finance is not another retail company then the acquisition is unlikely to be seen as against the public interest on competition grounds. However, concern has been raised in a number of jurisdictions about the lack of accountability of private equity funds and, given the reputation of Anchorage Retail, this acquisition may result in adverse regulatory scrutiny and pressure.

Each of these risks would need to be explicitly considered as part of your due diligence investigation to ensure that they are either mitigated or avoided.

- (b) In examining the reported return we have considered the following measures (only two are required in addition to EVA):

Return on capital employed which can be measured as either net operating profit before tax or net operating profit after tax (NOPAT) as a percentage of capital employed.

Economic Value Added which is the difference in a firm's reported return on capital employed and its weighted average cost of capital. EVA measures that rate of value creation within a business reflecting the degree of economic 'super normal profit' or, in other terms, the residual income of the business. EVA return is also reported as the difference between return on capital employed and the weighted average cost of capital for the business.

Return on fixed capital employed which, in comparison with return on capital employed, indicates the return advantage associated with the company's management of its working capital.

Return on equity which measures the rate of return earned on the total equity funds employed.

Each of the above return measures is presented using the year end figures (although mid-year averages for capital employed are more appropriate in each case).

Return on Capital Employed

Return on capital employed focuses attention upon the return generated by all classes of asset. Its measurement in post tax form as  $\text{NOPAT}/(\text{Equity} + \text{Debt})$  gives a measure of the return excluding the benefit of the tax shield on debt. Alternatives, not given here, are (i) to measure the gross return using net operating profit before tax or (ii) the distributable profit plus interest payable. ROCE, using our preferred method and year end capital figures is:

$$\text{ROCE (2009)} = 1,250 \times (1 - 30\%) / (2,030 + 1,900) = 22.26\%$$

$$\text{ROCE (2008)} = 1,030 \times (1 - 30\%) / (1,555 + 1,865) = 21.08\%$$

ROCE has shown a modest improvement but a further investigation of the accounting information would be required to establish whether the improvement is a genuine improvement in the underlying performance of the business. A thorough accounting investigation as part of a due diligence exercise should answer the question as to whether the ROCE measure can be trusted.

Marginal ROCE

Marginal ratios can be calculated for one or all of the return ratios. They measure the return generated by the latest capital reinvested within the business. Marginal return on capital employed measures the return generated on capital introduced or reinvested over the last period of account. It is measured as:

$$\Delta \text{ROCE} = \frac{\Delta \text{NOPAT}}{\Delta \text{CE}} = \frac{(1,250 - 1,030) \times 0.7}{3,930 - 3,420} = 30.20\%$$

Movements in this ratio year-on-year give a clearer indication of the improvement or deterioration in the company's performance. In the case of Anchorage, the performance on new capital is considerably better than that on the accumulated capital employed in the business.

Economic Value Added and Economic Value Added Return

EVA is derived from the difference between accounting return on capital employed and the weighted average cost of capital:

$$\text{EVA\%} = \text{ROCE} - \text{WACC}$$

Where ROCE is measured as net operating profit after tax (NOPAT) over total capital employed.

In absolute terms EVA can be expressed as a financial surplus by multiplying throughout by the denominator of the ROCE ratio:

$$\text{EVA} = \text{NOPAT} - \text{WACC} \times \text{Capital Employed}$$

Proponents of the EVA measure offer a variety of procedures for 'cleaning' the NOPAT and capital employed figures to increase their economic significance and to reduce distortion through accounting manipulation. Insufficient detail is available at this stage to make any such adjustments. The calculation of the weighted average cost of capital is shown in Annex 1 to this report.

On the stated assumptions and on the basis that WACC has not changed, EVA and the percentage EVA return for the two years of account is as follows:

$$\text{EVA (2009)} = 1,250 \times (1 - 30\%) - 6 \cdot 12\% \times (2,030 + 1,900) = \$634 \text{ million (16.14\%)}$$

$$\text{EVA (2008)} = 1,030 \times (1 - 30\%) - 6 \cdot 12\% \times (1,555 + 1,865) = \$512 \text{ million (14.96\%)}$$

This suggests that there has been a significant improvement in EVA for the business over the two years both in absolute terms and in terms of EVA return. As with ROCE, reliance should only be placed on these figures once a full accounting investigation has been conducted.

Return on equity

This ratio measures in both its absolute and marginal form the return exclusively for the equity investor within the business:

$$\text{ROE (2009)} = 860/2,030 = 42.36\%$$

$$\text{ROE (2008)} = 650/1,555 = 41.80\%$$

As with ROCE this return measure has shown a modest improvement over the year.

Return on Fixed Capital Employed

This measure reflects the return on the capital employed in investment in non-current assets. When compared with ROCE it indicates the return leverage through the firm's working capital policy.

$$\text{ROFCE (2009)} = 1,250 \times (1 - 30\%)/4,980 = 17.57\%$$

$$\text{ROFCE (2008)} = 1,030 \times (1 - 30\%)/4,540 = 15.88\%$$

If the current asset ratio of a company is one, then ROFCE and ROCE should be identical. If the CAR is greater than one, capital in the form of owner's equity and long-term liabilities is being diverted into financing working as opposed to fixed capital employed in the business and *vice versa*. The comparison of ROFCE with ROCE for Anchorage suggests that, on the basis of the accumulated capital of the business, the company is leveraging additional return through its working capital management policy.

- (c) The impact upon the equity cost of capital of this acquisition is an approximation at this stage, pending a more intensive valuation exercise focusing on the impact it would have upon the equity valuation of the fund overall. Unravelling the gearing effect upon the betas of both Anchorage and Polar finance we estimate that the asset beta of each is as follows (assuming that debt beta is zero):

Where there is no tax benefit attaching to debt:

$$\beta_a = \beta_e \left[ \frac{V_e}{V_e + V_d} \right]$$

Where there is a tax benefit attaching to debt

$$\beta_a = \beta_e \left[ \frac{V_e}{V_e + V_d(1-T)} \right]$$

Note that Polar Finance does not pay tax on its income and thus there is no benefit attributable to the tax shield on debt. In this case the market value of debt will not be tax adjusted. However, with Anchorage this is not the case as the current equity beta will reflect a tax shield on its debt.

Polar asset beta = 0.285 (given)

Anchorage asset beta can be calculated as follows:

Anchorage equity beta = 0.75

Anchorage debt proportion = 24%

Therefore equity proportion = 76%

1 - tax rate = 1 - 0.3 = 0.7

Anchorage asset beta =  $0.75 \times 76 / (76 + 24 \times 0.7) = 0.614$

Asset beta of combined entity (Polar + Anchorage) =  $0.8 \times 0.285 + 0.2 \times 0.614 = 0.351$

(this is based on the information that if Anchorage's proportion of cash flows is 20%, then Polar's cash flows without Anchorage would be 80%).

Polar debt before acquisition is 85%, therefore equity is 15% and \$1.125bn. Therefore, debt is  $\$1.125 / 0.15 \times 0.85 = \$6.375\text{bn}$ .

Level of debt after acquisition is  $\$6.375\text{bn} + \$2.5\text{bn} = \$8.875\text{bn}$ .

Equity beta of the combined entity =  $0.351 \times (8.875 + 1.125) / 1.125 = 3.12$

Equity beta of Polar before acquisition =  $0.285 \times (6.375 + 1.125) / 1.125 = 1.9$

Required rate of return of equity investors before acquisition =  
Cost of equity =  $5\% + 1.9 \times 2.224\%$  (see annex) = 9.23%

Required rate of return of equity investors after acquisition =  
Cost of equity =  $5\% + 3.12 \times 2.224\%$  = 11.94%

Hence Polar's shareholders will require an increase of 2.71% return as a result of the acquisition.

- (d) The view that Anchorage Retail has been undervalued by the market implies that the market is inefficient in pricing the equity of firms of this size. The evidence from tests of the efficient market hypothesis suggests that this is unlikely and, given the number of investors involved in an active market for a company of this type, we should not assume that, on average, they have mispriced this business. It may be that investors have irrational as well as rational expectations about this company but we would expect that, in the aggregate, the irrational component would be unsystematic with respect to the underlying value of the business and thus diversified away in the pricing process.

Assuming that the market has priced in zero growth for Anchorage, capitalising the current dividend payments of \$270 million at an equity cost of 6.668% suggests an equity market capitalisation of \$4.049bn. The current share price of \$2.6 per share, with 1.6 bn shares in issue implies an equity value of \$4.16 bn, which suggests that the market expects little growth in the business over the longer term. This probably reflects both perceptions of weakness in Anchorage Retail and in its ability to compete in a weakening market. Given what the price reveals about expectations, it is likely that a bid of \$3.20 would be attractive to Anchorage shareholders. Whether it is an attractive purchase for Polar depends on how Polar's management deploy their strategies to improve Anchorage's performance.

Yours sincerely

A. Consultant

Annex 1

Estimation of the Weighted Average Cost of Capital (WACC) for Anchorage Retail

To estimate the cost of equity capital for the company we first measure the expected return on the market using the rearranged dividend valuation model on the broadly based market index:

$$r_e = \frac{D_0}{P_0}(1+g) + g$$

$$r_e = 3.1\% \times (1.04) + 4\% = 7.224\%$$

Given that the market index should have a beta of 1 and with a risk-free rate of interest of 5% this suggests that the rate of return expected on the market is 7.224% and the equity risk premium is 2.224%

Putting this result into the Capital Asset Pricing Model:

$$r_e = R_F + \beta(r_m - R_F)$$

$$r_e = 5\% + 0.75 \times 2.224\% = 6.668\%$$

This gives a weighted average cost of capital as follows:

$$WACC = 76\% \times 6.668\% + 24\% \times 6.2\% \times (1 - 30\%) = 6.12\%$$

- 3 (a)** A warrant is an option attached to another financial instrument on issue which can be detached and negotiated independently of the underlying issue. Warrants are usually exercised over a longer term than traded options but can be valued in exactly the same way using the Black Scholes Option Pricing Model by inserting into the standard formula.

The calculation has been performed as follows:

$$c = 85_a N(d_1) - 90N(d_2)e^{-0.05 \times 5}$$

Where:

$$d_1 = \frac{\ln(85/90) + (0.05 + 0.5 \times 0.2^2) \times 5}{0.2 \times \sqrt{5}} = 0.6548$$

$$d_2 = d_1 - 0.2 \times \sqrt{5} = 0.2076$$

From normal tables we calculate the area under the normal curve represented by  $d_1$  and  $d_2$ :

$$c = 85 \times 0.7437 - 90 \times 0.5822 \times e^{-0.05 \times 5} = 22.41$$

Given that each warrant represents an option on 100 equity shares the value of each warrant is \$2,241.

The Black Scholes model makes a number of restrictive assumptions:

1. The warrant is a 'European' style option.
2. The share price follows a log-normal distribution and is continuously traded.
3. Unrestricted short selling of the underlying security is permitted.
4. There are no market frictions such as taxes or transaction costs.
5. No dividends are paid during the life of the warrant.

These assumptions are less realistic with a company such as Alaska Salvage than with a large enterprise with a full listing. It is unlikely, for example, that the company's shares will be actively traded or that the share market is efficient in its pricing of the equity.

- (b)** The coupon rate is derived from the cash flow to the lender as follows:

1. Lay out the cash flow to the lender showing the value of the warrant as a benefit accruing immediately to the lender.

	0	1	2	3	4	5
Coupon	(10,000)	100 × c%	100 × c%	100 × c%	100 × c%	100 × c%
Repayment						10,000
Call value	2,241					
Cash flow to lender	(7,759)	100 × c%	100 × c%	100 × c%	100 × c%	10,000 + 100 × c%

2. Solve the following equation where c% is the coupon rate and A and V are the five-year annuity and discount factors at 13% respectively:

$$7,759 = 100 \times c\% \times A + 10,000 \times V$$

Therefore:

$$7,759 = 100 \times c\% \times 3.517 + 10,000 \times 0.543$$

By rearrangement:

$$c\% = \frac{7,759 - 10,000 \times 0.543}{100 \times 3.517} = 6.62\%$$

Therefore a 6.62% coupon rate will give an effective rate of return on the investment to the lender of 13%.

- (c)** Mezzanine debt such as this is one mechanism by which a small, high growth firm such as Alaska Salvage can raise debt finance where the risk of default is high and/or there is a low level of asset coverage for the loan. In this case raising a loan of \$16 million would raise the market gearing of the firm from zero (assuming there is no current outstanding debt) to 61% (debt to total capitalisation). This increase in borrowing against what might be presumed to be specialised salvaging equipment and the forward cost of operation would not be attractive to the commercial banking sector and would need specialised venture finance. The issue of warrants gives the lender the opportunity to participate in the success of the venture but with a reasonable level of coupon assured. However, the disadvantage for the current equity investors is that the value of their investment will be reduced by the value of the warrants issued. The extent to which this will be worthwhile depends upon the value of the firm on the assumption that the project proceeds and is financed in the way described. This should ultimately decide the maximum value that they would be prepared to pay to finance the new project.

- 4 (a) Given the collapse of domestic property prices in the United States and the subsequent fall in the value of mortgage-backed securities issued by US lenders, banks around the world holding these securities have been forced to revalue their balance sheets and to record substantial losses as they attempted to sell off what had become known as 'toxic debt'. As a result in 2007/8 large banks were reporting significant losses and have had to raise new equity capital to maintain their capital adequacy ratios. This has led to two effects: an unwillingness of banks to lend, particularly to one another; and a drain in liquidity across the capital markets more generally. However, the business of banks is to earn profits by borrowing short and lending long and they are still willing to lend to high class corporate customers.

The so called 'credit crunch' had the effect of raising borrowing costs, particularly in the retail mortgage market. However, the problems in the banking sector have fed into the wider economies of the major industrial countries and many, including the majority of the G8 have moved into recession. This has led to a slow-down in global demand and both food and oil prices which peaked in early 2008 are now reduced and global inflationary pressure is beginning to ease. As a result interest rates are now expected to decline as central banks attempt to stimulate their economies. In general, the current global situation indicates that the banks are willing to lend but they will be concerned about the following:

The risk of default: although there has been a slackening of demand for the company's product our relatively high credit rating would still make us an attractive prospect for lenders. They will need to undertake a credit risk assessment which will include a thorough examination of our asset strength, existing capitalisation, operating strength and income gearing. An important measure will be the firm's current cash flow/debt obligations ratio.

Recovery: the assessment of our asset strength will form a part of their assessment of the potential recoverability of the debt in the event of default.

- (b) Syndication is where a group of banks combine with one bank taking the lead in the arrangement. Syndication allows banks to offer much larger loans in combination than would be feasible singly and, given the range of banks involved, can tailor loans (perhaps across different currencies) to more exactly match our requirements. The management of the syndicate lies with the arranging bank but the effective cost will be somewhat higher than with a conventional loan, but usually much lower than the cost of raising the necessary finance through a bond issue.

A bond issue is where the debt is securitised and floated onto the capital market normally with a fixed interest coupon and a set redemption date. Initial set up costs can be high especially if the issue is underwritten. A loan of the size envisaged is towards the low end of what would normally be raised through this means. Some bond issues can be syndicated in that a number of borrowers of similar risk are combined by the investment bank chosen to manage the issue.

The advantage of syndication is that it reduces the costs of issue. However, it may be that the best offer would entail accepting a variable rate based on LIBOR, which would have to be swapped out if we wished to minimise interest rate risk.

- (c) In assessing this capital investment, we have to make some assumptions about the immediate future in terms of the general economic conditions and to what extent we have a delay option on the project concerned. Where there is a positive delay option, then from a financial perspective the best advice is always to delay investment. Where there are significant competitive reasons for proceeding we should only proceed if the net present value of the project is worthwhile. Given the magnitudes of the uncertainties involved at this stage of the economic cycle the decision to proceed should only be made when we are sure that we have estimated the potential magnitude of the risks and taken them into account in our analysis.

- 5 (a) There are three strategies available to the Katmai company:

- (i) Do nothing: with this strategy the company is taking a gamble on the yield curve that future interest rates will remain unchanged or indeed may fall. Much would depend on the degree of interest rate diversification the company may have on overseas debt and on the magnitude of any interest receivable.
- (ii) Retire and reissue fixed rate debt: with this strategy the company will issue fixed rate bonds and use the proceeds to retire the floating rate notes. This will eliminate any downside risk associated with increasing interest rates but will be an expensive option to pursue as commissions, arrangement fees and underwriting costs can be between 2–3% of the value of the loan.
- (iii) Enter a fixed for variable interest rate swap: with this strategy the company will enter into a swap agreement with a market maker for the term of the loan. Normally this will entail swapping the liability for the LIBOR component of the swap for a fixed rate. The advantage of a swap agreement is that it is easy to establish through the highly organised OTC swap market. The disadvantage is that the company will be committed for the term of the swap which means that the company would have to reverse out of the swap if it found itself in a position to retire the loan notes earlier than planned.

Moving from variable to fixed interest rates is unlikely to have a significant impact upon the company's weighted average cost of capital or its value but it will stabilise the firm's financing flows which should make forward planning and budgeting easier. Therefore, in deciding between the three alternatives the directors should assess whether taking risk of this sort is a part of its core business or whether managing interest rate volatility in the budgeting process is a diversionary activity. Either (ii) or (iii) will reduce managerial and labour risk exposure by reducing the volatility of the surplus from which their remuneration and other compensation is drawn. From an equity investor point of view therefore, given the costs of hedging, (i) may be the preferred strategy. From the perspective of other stakeholders (iii) is likely to be the least costly alternative for achieving stability in future financing flows. From a managerial perspective (iii) is the recommended course of action.



(b) The six monthly interest rate under a vanilla swap given the quoted spread would be as follows:

Payments	LIBOR/2 + 0.6%
Receipt under a vanilla swap	LIBOR/2
Payment on fixed leg	5.4%/2 = 2.7%
Net payment	<u>3.30%</u>

The six-monthly rate is therefore 3.30% or an effective annual rate:

$$EAR = (1 + I_6)^2 - 1 = 1.033^2 - 1 = 6.71\%$$

(c) Given that the annual interest rate volatility is 1.5%, the standard deviation of six-monthly rates is:

$$\sigma_6 = \sigma_a \times \sqrt{\frac{1}{2}} = 1.5\% \times 0.7071 = 1.061$$

This means that at the 95% confidence level the interest rate will be 2.08% above or below the current value for LIBOR. The Value at Risk (VAR) is given by:

$$VAR = \text{Loan} \times \sigma_6 \times CL = \$150 \text{ million} \times 1.061\% \times 1.645 = \$2.62 \text{ million}$$

Where the confidence level of 95% is taken from the normal tables supplied and is, assuming a single tail, 1.645 standard deviations away from the mean.

VAR is defined (Jorion, 2007) as the 'worst loss over a target horizon such that there is a low, prespecified probability that the actual loss will be larger'. Currently the six-monthly interest rate is LIBOR plus 120 basis points. Let us assume for the moment that LIBOR is 5% per annum. The six-monthly interest on this loan will be 3.1% or \$4.65 million. There is a 5% chance that the actual interest paid would be greater than (\$4.65 million + \$2.62 million) \$7.27 million or, to put it another way, there is a 95% likelihood that the actual interest payable will be less than this figure. A number of assumptions constrain our interpretation of VAR. The first is that interest rates are assumed to follow a 'random walk' in that the current rate is the mean of the distribution of future possible rates; second that the volatility of future rates remains unchanged; and third, that the distribution of rates is normal. In practice, although the 'normality' assumption may be useful in simplifying the mathematics of VAR, calculation shows that actual rate distributions exhibit significant skew and that the likelihood of extreme outcomes is somewhat higher than would be expected. However, VAR does simplify the representation of risk by placing a monetary value on the exposure arising from different sources.

		<i>Marks</i>
<b>1</b>	<b>(a)</b> Estimation of depreciation Estimation of taxation Estimation of changes in working capital Projection of income statements Projection of cash flows	1
		1
		2
		4
		4
	<b>Total</b>	<b>12</b>
	<b>(b)</b> Calculation/identification of free cash flow Calculation of terminal value Calculation of present values and business value	1
		2
		3
	<b>Total</b>	<b>6</b>
	<b>(c)</b> Commentary on required rate of return Assumptions about the growth rates Other relevant points	2–3
		2–3
		1–2
		<b>Max</b>
	<b>(d)</b> Discussion of equity as a call option on business assets, issues relating to gearing and time value of the limited liability option	4
<b>Total</b>		<b>28</b>
<b>2</b>	Note candidates may answer this question in a variety of ways and in different order to that set.	
<b>(a)</b>	Identification of principal risks (2 each to a maximum of 6) Disclosure Valuation Regulatory Other	
	<b>Total</b>	<b>6</b>
	<b>(b)</b> Calculation of the equity risk premium and return on equity Estimation of the WACC Calculation of the EVA for each year Other performance ratios and associated commentary	2
		1
		3
		up to 6
		<b>Total</b>
	<b>(c)</b> Ungearing the component betas Calculation of the combined beta Estimation of impact upon required equity rate of return	1
		2
		3
		<b>Total</b>
<b>(d)</b> Undervaluation and the implication of inefficiency Review of current price and whether the acquisition may be attractive	2	
	2	
	<b>Total</b>	<b>4</b>
<b>(e)</b> Professional marks	<b>Total</b>	<b>4</b>
	<b>Total</b>	<b>32</b>

		<i>Marks</i>
<b>3</b>	<b>(a)</b> Calculation of:	
	d1	3
	d2	1
	value of the warrant	2
	assumptions (one each to a maximum of 4)	4
	<b>Total</b>	<b>10</b>
<b>(b)</b> Estimation of the coupon rate		4
	<b>Total</b>	<b>4</b>
<b>(c)</b> Identification of mezzanine debt as a source of high risk finance		2
Disadvantage for equity investors (reduction in equity value on exercise)		2
Advantages: low coupon, additional equity participation		2
	<b>Total</b>	<b>6</b>
	<b>Total</b>	<b>20</b>
<b>4</b>	The mark ranges reflect the flexibility the examiners use in assessing this question. The following points are indicative only:	
<b>(a)</b>	Origins of the credit crunch and its impact upon lenders	1–2
	Impact of the credit crunch on bank attitudes to borrowers and wider economy	1–2
	Importance of asset strength and default assessment	2–3
	Other relevant comments	2–3
		<b>Max</b>
<b>(b)</b>	Loan syndication as a means of spreading load and risk	1–2
	Flexibility of syndication and possibility of cross-border finance	2–3
	Cost of loan syndication versus bond issues	1–2
	Flexibility of bonds in terms of repayment and size of issue	1–2
		<b>Max</b>
<b>(c)</b> Note on the significance of the real option to delay and the factors that might influence that decision. And other relevant points such as strategic and operational benefits of not delaying.	up to	6
	<b>Total</b>	<b>20</b>
<b>5</b>	<b>(a)</b> Enumeration and evaluation of the three choices. (credit will be given for reasonable alternative choices)	
	Do nothing	2
	Retire and reissue	2
	Swap	2
	Recommendation of appropriate course of action in the case	3
	<b>Total</b>	<b>9</b>
<b>(b)</b>	Calculation of 3·3%	4
	Calculation of annual rate	1
	<b>Total</b>	<b>5</b>
<b>(c)</b>	Calculation of six-month volatility	1
	Calculation of VAR	3
	Comments on the results	2
		<b>Total</b>
	<b>Total</b>	<b>20</b>