

Suggested solution

Section A

1 **\$9.80**

Current share price = $\$0.50 \times 20 = \10 per share

Rights issue price = $\$10 \times 90/100 = \9 per share

Number of shares to be issued = $(50\text{m}/\$10)/4 = 1.25\text{m}$ shares

TERP = $(\$10 \times 5\text{m} + (\$9 \times 1.25\text{m}))/6.25\text{m} = \9.80 per share

2 **D**

If the 1.5% discount is accepted, the company must pay the following amount within one month:

$$\$2,500 \times (1 - 0.015) = \$2,462.50$$

Alternatively, the company can effectively borrow the \$2,462.50 for an additional two months at a cost of \$37.50.

The two-month rate of interest is therefore $\$37.50/\$2,462.5 \times 100 = 1.5228\%$

The annual equivalent rate (AER) is therefore:

$$(1 + 0.015228)^6 - 1 = 0.0949 \text{ (or } 9.49\%)$$

3 **Loss of €55,300**

The company enters its position by selling futures (i.e. going short) at $\text{€}/\text{\$}0.8537$ and will therefore close out by buying futures at $\text{€}/\text{\$}0.8616$. A rise in the futures price results in a loss on a short position.

$$\text{Loss} = (\text{€}/\text{\$}0.8616 - \text{€}/\text{\$}0.8537) \times \$125,000 \times 56 = \text{€}55,300$$

4 D

Working capital management may have an impact on dividend policy but the impact on other factors is likely to be more significant.

Working capital management will have a significant impact upon liquidity through the funding policy.

The levels of interest rates which a business can obtain will be determined by the funding it requires and its risk profile. Working capital management will have a significant impact on both through the funding and investment policies.

The bank will want to obtain evidence that the business is being run well if it is to supply funding. Working capital management is therefore an area that will interest the bank.

5 B and D

Basis risk is the risk that futures exchange rates do not move exactly in line with spot exchange rates.

It is one of the reasons for an imperfect currency futures hedge.

Basis is the difference between the spot price of an asset (e.g. the spot exchange rate) and the futures price of the same asset (e.g. currency futures exchange rate). Basis risk, on the other hand, is the risk that basis changes unpredictably over time.

6 A

Investors require a higher return to compensate them for higher risk. As the interest is fixed, the only way this higher return can be achieved is through a reduction in the market value of the security.

7 Statement 1 – True**Statement 2 – False**

The market capitalisation is calculated as the share price of a company multiplied by the number of its shares. As the share price moves, so will the market capitalisation.

The share price is only based upon minority share transactions and will not incorporate any premium offered to shareholders for acquiring control of the company.

8 5.3%

The sales volume will impact both sales revenue and variable costs.

Therefore, the sensitivity of the NPV to a change in sales volume needs to be calculated with reference to both cash flows. This is achieved using the contribution figure i.e. \$24,550,000.

Sensitivity = (NPV / PV of contribution cash flow) x 100

Sensitivity = (\$1,300/\$24,550) x 100 = 5.3%

9 19%

The cost of equity can be calculated using the dividend growth model.

$$r_e = (d_0 \times (1+g) / P) + g = (\$7m \times 1.02 / \$42m) + 0.02 = 19\%$$
10 B

An increase in shareholder wealth will depend on an increase in cash flow, rather than an increase in earnings per share, i.e. an increase in profit.

If the financial rewards of directors are linked to increasing earnings per share through a performance-related reward scheme, for example, there is an incentive to increase short-term profit at the expense of longer-term growth in cash flows and hence shareholder wealth.

11 B and D

Controlling the growth of the money supply and keeping interest rates low are targets which predominantly relate to monetary policy.

Tax revenue, public expenditure and income equality are mainly fiscal policy concerns whilst the money supply and interest rates predominantly relate to the government's monetary policy.

12 C

Risk pooling and maturity transformation are always included in a list of benefits of financial intermediation.

Interest rate fixing is generally not considered a benefit of financial intermediation.

13 D

Capital structure decisions affect financial risk, not business risk. Capital structure theories generally assume that business risk is constant. Only financial risk changes as the debt-equity mix changes.

According to the traditional view, the cost of equity does increase as financial risk increases. However, the relationship is not linear. At low levels of gearing, the cost of equity rises slowly. Beyond a certain point, financial risk increases sharply and the cost of equity rises more steeply.

In the absence of tax, Modigliani and Miller stated that the weighted average cost of capital would remain unchanged, not the cost of equity. In fact, this theory assumes there is a linear relationship between the cost of equity and financial risk.

According to pecking order theory, preference shares are less preferable than debt.

14 \$14.00

The carrying amounts for non-current assets and current assets need to be adjusted as follows:

Non-current assets and current assets = \$30m + \$18m + \$4m – \$2m = \$50m

Net assets = \$50m – \$12m – \$10m = \$28m

Minimum price per share = \$28m/2m shares = \$14.00

15 A

NPV can take account of changes in a company's weighted average cost of capital

IRR does not always offer correct investment advice with respect to mutually exclusive investments.

NPV is an absolute, not a relative, measure of investment value.

An investment is financially acceptable if its IRR is greater than a company's cost of capital. If the IRR of an investment was positive but less than the company's cost of capital, the investment would reduce shareholder value.

Section B

16 10.7%

$$k_e = 2.5 + (1.05 \times 7.8) = 10.7\%$$

17 D

Year	\$	5% df	PV	6% df	PV
0	(100.00)	1.000	(100.00)	1.000	(100.00)
1 – 5	3.00	4.329	12.99	4.212	12.64
5	115.00	0.784	90.16	0.747	85.91
			3.15		(1.45)

$$k_d = 5 + (1 \times 3.15)/(3.15 + 1.45) = 5 + 0.69 = 5.68\% \text{ (rounded to 5.7\%)}$$

18 If the proposed investment goes ahead, Tulip Co's cost of equity will **INCREASE** since business risk will **REMAIN THE SAME** and financial risk will **INCREASE**.

There is no change in business risk since Tulip Co is expanding its existing business operations. However, the expansion is due to be funded by debt, which will increase the financial risk borne by the shareholders. There will therefore be no change to the asset beta but there will be an increase in Tulip Co's equity beta due to the new debt. Overall, this will lead to an increase in Tulip Co's cost of equity.

19 C

Retained earnings are a source of equity finance.

Equity finance reserves do not represent cash which is available to a company to invest. The company's cash balance can be found as part of its current assets.

A rights issue can be used to raise equity finance but no funds are raised as part of a bonus issue. A bonus issue is a method of changing the capital structure without raising cash.

Equity finance refers to ordinary shares, not preference shares.

20 1 – Ordinary shares**2 – Redeemable preference shares****3 – Bank loan****4 – Loan notes**

The secured loan notes are safer than the bank loan as they will be secured by a fixed charge against the non-current assets, whereas the bank loan is only secured by a floating charge on the current assets. A fixed charge has lower risk compared to a floating charge. The redeemable preference shares are riskier than debt in the creditor hierarchy.

Ordinary shares are riskier than redeemable preference shares since the latter enjoy better downside protection and, unlike ordinary shares, non-discretionary dividends.

21 A

Net asset value (NAV) = total assets - preference shares - non-current liabilities - current liabilities

Therefore, NAV (\$000) = \$1,032 – \$110 – \$120 – \$76 = \$726

Alternatively, equity – preference shares (\$000) = \$836 – \$110 = \$726

Net asset value per share = \$726,000/600,000 = \$1.21

22 \$9.45

The dividend has increased from \$0.37 to \$0.45 over a four year period.

Therefore, the historic dividend growth rate = $100 \times ((0.45/0.37)^{0.25} - 1) = 5\%$

Share price = $(0.450 \times 1.05)/(0.1 - 0.05) = \9.45

23 B

Market value = $(6 \times 6.002) + (100 \times 0.760) = 36.01 + 76.0 = \112.01

24 C

The dividend valuation model makes the unreasonable assumption that average dividend growth is constant. This statement is true.

The earnings yield valuation method multiplies earnings by the inverse of the earnings yield.

The equity market value is simply the number of shares multiplied by the share price. There is no further adjustment which needs to be made for the market value of debt.

The price/earnings ratio method multiplies, rather than divides, earnings by the price/earnings ratio.

25 Marketing director view – Semi-strong**Finance director view – Strong**

In a semi-strong form efficient market, the share price incorporates all past and all publicly available information. However, it would not incorporate any privately held information. This is consistent with the marketing director's prediction about the future direction of the share price.

According to strong form market efficiency, Ring Co's share price will incorporate all information about the company, whether that information is public or private. This will include details about the new investment even though this information will not be made public for another month. This is consistent with the finance director's prediction that the share price will not change when that information is made public.

26 \$726,720

Since Peony Co must pay €600,000 to its supplier in three months' time, the company is exposed to a strengthening of the euro. To hedge against a strengthening euro, the company should buy a euro call option. The put option would protect against a weakening euro, which is not the risk the company faces in this situation.

If the euro strengthens beyond the exercise price, the company will exercise the option and buy euros as follows:

$$€600,000 \times \$1.1812 \text{ per } €1 = \$708,720$$

The premium is calculated as follows:

$$€600,000 \times 0.03 = \$18,000$$

Therefore, the maximum dollar cost = $\$708,720 + \$18,000 = \$726,720$

27 Peony Co pays bank \$300,000

The forward rate agreement allows Peony Co to fix the borrowing rate at 7.1%. When the interest rate falls to 6.7%, Peony Co will pay the bank the following amount:
 $\$100\text{m} \times (9/12) \times (7.1\% - 6.7\%)/100 = \$300,000$

28 \$112.9m

12-month forward rate = $5 \times 1.1/1.065 = 5.1643$ pesos per \$1
6-month forward rate = $5 \times 1.05/1.0325 = 5.0847$ pesos per \$1
Dollar income = $(200/5.0847) + (380/5.1643) = \112.9m

29 C

Both statements are correct.

30 C and E

A kink (discontinuity) in the normal yield curve can be due to differing yields in different market segments. This statement is correct.

An inverted yield curve can highlight expectations of an economic slowdown or recession. This statement is correct.

Long-term debt carries greater risk to lenders and so typically offers higher yields. For this reason, the yield curve is normally upward sloping, not downward sloping.

Government action to increase its long-term borrowing will not lead to an inverted yield curve, since it will drive up long-term yields.

The corporate yield curve can rise more steeply than the government yield curve due to default risk, not basis risk.

Section C

31

(a)

Cost of sales = $\$6,000,000 \times (1 - 0.6) = \$2,400,000$

Credit sales = $\$6,000,000 \times 0.75 = \$4,500,000$

Credit purchases = $\$2,160,000 \times 0.9 = \$1,944,000$

Inventory holding period:

Raw materials = $120,000/2,160,000 \times 360 = 20$ days

Work in progress = $20,000/2,400,000 \times 360 = 3$ days

Finished goods = $80,000/2,400,000 \times 360 = 12$ days

Receivables collection = $850,000/4,500,000 \times 360 = 68$ days

Payables payment = $162,000/1,944,000 \times 360 = 30$ days

Cash operating cycle = $20 + 3 + 12 + 68 - 30 = 73$ days

(b)

Improve credit control/receivables collection

At 68 days, average receivables collection period is over twice the standard terms of 30 days. This would suggest very poor credit control, particularly in relation to chasing up overdue debt. It would appear that the finance department is not taking ownership/responsibility for this and leaving it to the account managers who are probably (and perhaps understandably) more interested in increasing sales rather than chasing up old ones. Credit control should be brought within the finance department's responsibilities and overdue accounts suspended until up to date.

Improve process efficiency

On average, the product is taking three days to manufacture according to the work in progress calculation which would suggest the production process is running at only 67% efficiency (the product should take two days to manufacture). The production process should be looked at to determine if there is a bottleneck in the process which needs addressing or other efficiency improvements which could be made. This would have other knock-on benefits such as being able to reduce the level of finished goods held as demand could be more readily met from production.

Raw material inventory holding

Raw material holding is 20 days which given the 3-day production period (see above) would suggest that Guillermo Co's holding of raw may be considered high. If so, then raw material holding should be reduced, perhaps even considering if just-in-time purchasing of raw material should be adopted.

Trade payables payment

The average credit terms with its trade suppliers are 35 days and yet Guillermo Co is paying its suppliers after 30 days on average. Paying earlier than term is detrimental to its cash cycle and even though it likes to maintain a good supplier relationship, this could still be achieved by paying on 35 days and consequently improving the cash cycle by 5 days.

Tutorial note: Only three ways were required.

(c)

Daily variance = $\$15,000^2 = \$225,000,000$ per day

Daily interest rate = $9\%/360 = 0.025\%$ per day

Transaction cost = \$55 per transaction

Spread = $3 \times [(0.75 \times \$55 \times \$225,000,000) / 0.00025]^{1/3} = \$100,079$

Target cash balance (return point) = $\$40,000 + 1/3 \times \$100,079 = \$73,360$

Upper limit: Lower limit + spread $\$40,000 + \$100,079 = \$140,079$

When cash reaches upper limit, securities must be bought to reduce cash down to the return point:

$\$140,079 - \$73,360 = \$66,719$ of securities must be bought.

When cash reaches the lower limit, securities must be sold to increase cash up to the return point:

$\$73,360 - \$40,000 = \$33,360$ of securities must be sold.

(d)

As the finance director has implied, the Baumol model is indeed simpler to use than the Miller-Orr model. However, it assumes that cash flows are steady and predictable whereas the cash flows of Guillermo Co have become increasingly volatile. Given the significant changes in the industry in recent years, such as new regulations and stronger competition, it is important to use the Miller-Orr model as it factors in the current level of cashflows, whatever they may be, rather than assumes the cashflows are constant as the Baumol model does. In this way it handles randomness well whilst at the same time avoiding over or under reactions to volatility. Continuing to use the Baumol model and thereby sticking to the same periodic cash transfer size could result in Guillermo Co maintaining cash balances which are too high or low.

The Miller-Orr model is specifically designed for volatile cashflows so is more relevant to Guillermo Co's current situation. The model sets upper and lower control limits as well as providing guidance about what to do when cash reaches these limits, as shown in the workings above.

32

(a)

(i) Net present value

Year	0	1	2	3	4
	\$	\$	\$	\$	\$
Investment	-2,000,000				
Income		1,236,000	1,485,400	2,623,200	1,013,400
Operating costs		-676,000	-789,372	-1,271,227	-620,076
Net cash flow	-2,000,000	560,000	696,028	1,351,973	393,324
Discount at 10%	1	0.909	0.826	0.751	0.683
Present values	-2,000,000	509,040	574,919	1,015,332	268,640

Net present value: \$367,931

Workings:**Income**

Year	1	2	3	4
Inflated selling price (\$/unit)	20.60	21.22	21.86	22.56
Demand (units/year)	60,000	70,000	120,000	45,000
Income (\$/year)	1,236,000	1,485,400	2,623,200	1,013,400

Operating costs

Year	1	2	3	4
Inflated variable cost (\$/unit)	8.32	8.65	9.00	9.36
Demand (units/year)	60,000	70,000	120,000	45,000
Variable costs (\$/year)	499,200	605,500	1,080,000	421,200
Inflated fixed costs (\$/year)	176,800	183,872	191,227	198,876
Operating costs (\$/year)	676,000	789,372	1,271,227	620,076

Alternative calculation of operating costs (ignore rounding differences)

Year	1	2	3	4
Variable cost (\$/unit)	8.00	8.00	8.00	8.00
Demand (units/year)	60,000	70,000	120,000	45,000
Variable costs (\$/year)	480,000	560,000	960,000	360,000
Fixed costs (\$/year)	170,000	170,000	170,000	170,000
Operating costs (\$/year)	650,000	730,000	1,130,000	530,000
Inflated costs (\$/year)	676,000	789,568	1,271,096	620,025

(ii) Internal rate of return

Year	0	1	2	3	4
	\$	\$	\$	\$	\$
Net cash flow	-2,000,000	560,000	696,028	1,351,973	393,324
Discount at 20%	1	0.833	0.694	0.579	0.482
Present values	-2,000,000	466,480	483,043	782,792	189,582

Net present value: -\$78,103

Internal rate of return = $10 + (20 - 10) \times (\$367,931 / (\$367,931 + \$78,103))$
= 18.2%

(iii) Return on capital employed

Total cash inflow: \$3,001,325 (\$560,000 + \$696,028 + \$1,351,973 + \$393,324)

Total depreciation and initial investment are same, as there is no scrap value

Total accounting profit	\$1,001,325 (\$3,001,325 - \$2,000,000)
Average annual accounting profit	\$ 250,331.25 (\$1,001,325/4 years)
Average investment	\$1,000,000 (\$2,000,000/2)
Return on capital employed	25.0% (\$250,331.25/\$1,000,000)

(b)

The investment proposal has a positive net present value (NPV) of \$367,931 and is therefore financially acceptable. The results of the other investment appraisal methods do not alter this financial acceptability, as the NPV decision rule will always offer the correct investment advice.

The internal rate of return (IRR) method also recommends accepting the investment proposal, since the IRR of 18.2% is greater than the 10% return required by Vip Co. If the advice offered by the IRR method differed from that offered by the NPV method, the advice offered by the NPV method would still be preferred. The aim of the business is to maximise shareholder wealth and the NPV is the only investment appraisal method which directly measures the potential increase in shareholder wealth.

The calculated return on capital employed of 25% is less than the target return of 30%, but as indicated earlier, the investment proposal is financially acceptable as it has a positive NPV. The reason Vip Co has a target return on capital employed of 30% should be investigated. This may be an out-of-date hurdle rate which has not been updated for changed economic circumstances.

(c)

As a large, listed company, Vip Co's primary financial objective is assumed to be the maximisation of shareholder wealth. In order to pursue this objective, Vip Co should undertake projects, such as the Product W33 proposal, which have a positive NPV and generate additional value for shareholders. However, the non-financial factors are relevant to the board's decision because they may affect the timing, magnitude and risk associated with the project's cash flows.

The additional noise created by the production of Product W33 will affect the local community and is likely to lead to objections to the local planning authority. The noise issue may also conflict with objectives from environmental pressure groups and government standards on noise levels. This could result in fines being imposed if noise regulations are breached and additional costs related to sound insulation and restricted operating hours. If planning delays occur, cash flows will be postponed further into the future which will reduce the NPV.

The proposal to fully automate the manufacturing process will result in significant redundancies being made. This will conflict with employees' objectives of continuity or security in their employment. If this has the effect of lowering employee morale, it could impact the productivity of Vip Co's remaining operations.

The intensive use of scarce resources raises sustainability concerns. The government may introduce regulatory controls or environmental taxes to guard against resource depletion. Resource prices may also increase over time due to the scarcity factor and it is not clear from the information provided whether this has been incorporated into the operating costs mentioned in the scenario. Supply interruptions could potentially be an issue which would disrupt production and postpone revenues further into the future.

There is also the potential for reputational damage. Negative publicity arising from noise pollution, redundancies or sustainability concerns could lead to unwanted media attention, reduced customer loyalty, difficulties in recruiting skilled labour or increased regulatory scrutiny, potentially reducing or delaying future cash flows.

Even though the Product W33 proposal has a positive NPV, the non-financial factors are relevant to the investment decision because such risks increase the uncertainty of the cash flows and may justify the need for a higher discount rate, which would have the effect of reducing the NPV. The board should therefore attempt to quantify the impact of the non-financial factors so that it can adjust its forecasts and risk assumptions before making a final decision.

Mark scheme

Section A

Questions 1 – 15 (all questions worth two marks)

Maximum 30 marks

Section B

Questions 16 – 30 (all questions worth two marks)

Maximum 30 marks

Section C

Question 31

a	Cash operating cycle calculation:	
	- Cost of sales	0.5
	- Credit sales	0.5
	- Credit purchases	0.5
	- Raw materials holding	0.5
	- Work in progress holding	0.5
	- Finished goods holding	0.5
	- Receivables collection	0.5
	- Payables payment	0.5
- Cash operating cycle	1	
Maximum 5 marks		
b	Suggestion 1	2
	Suggestion 2	2
	Suggestion 3	2
Maximum 6 marks		
c	Daily variance	0.5
	Daily interest rate	0.5
	Spread	1
	Target cash balance	0.5
	Upper limit	0.5
	Buy/sell action	1
	Buy/sell amounts	1
	Maximum 5 marks	
d	1 mark per relevant point, including	
	- Cash flow volatility	1
	- Avoids under or over-reactions to volatility	1
	- Controls limits and guidance	2
Maximum 4 marks		
Total 20 marks		

Question 32

a (i)	Inflated income	2
	Inflated operating costs	2
	Net present value	1
Maximum 5 marks		
a (ii)	Internal rate of return	2
Maximum 2 marks		
a (iii)	Return on capital employed	2
Maximum 2 marks		
b	Analysis	2
	Recommendation	1
Maximum 2 marks		
c	Non-financial factors, including	
	- Noise pollution	2
	- Redundancies	2
	- Scarce resources	2
	- Reputation damage	1
	- Impact on investment decision	1
- Other	2	
Maximum 8 marks		
Total 20 marks		