ACCA examiner's answers: June and December 2009 papers

1 (a) Weighted average cost of capital (WACC) calculation

Cost of equity of KFP Co = 4·0 + (1·2 x (10·5 – 4·0)) = 4·0 + 7·8 = 11·8% using the capital asset pricing model

To calculate the after-tax cost of debt, linear interpolation is needed
After-tax interest payment = 100 x 0·07 x (1 – 0·3) = $4·90

Year	Cash flow	$	10% discount	PV ($)	5% discount	PV ($)
0	Market value	(94·74)	1·000	(94·74)	1·000	(94·74)
1 to 7	Interest	4·9	4·868	23·85	5·786	28·35
7	Redemption	100	0·513	51·30	0·711	71·10
				(19·59)		4·71

After-tax cost of debt = 5 + ((10 – 5) x 4·71)/(4·71 + 19·59) = 5 + 1·0 = 6·0%

Number of shares issued by KFP Co = $15m/0·5 = 30 million shares
Market value of equity = 30m x 4·2 = $126 million
Market value of bonds issued by KFP Co = 15m x 94·74/100 = $14·211 million
Total value of company = 126 + 14·211 = $140·211 million

WACC = ((11·8 x 126) + (6·0 x 14·211))/140·211 = 11·2%

(b) (i) Price/earnings ratio method
Earnings per share of NGN = 80c per share
Price/earnings ratio of KFP Co = 8
Share price of NGN = 80 x 8 = 640c or $6·40
Number of ordinary shares of NGN = 5/0·5 = 10 million shares
Value of NGN = 6·40 x 10m = $64 million

However, it can be argued that a reduction in the applied price/earnings ratio is needed as NGN is unlisted and therefore its shares are more difficult to buy and sell than those of a listed company such as KFP Co. If we reduce the applied price/earnings ratio by 10% (other similar percentage reductions would be acceptable), it becomes 7·2 times and the value of NGN would be (80/100) x 7·2 x 10m = $57·6 million

(ii) Dividend growth model
Dividend per share of NGN = 80c x 0·45 = 36c per share
Since the payout ratio has been maintained for several years, recent earnings growth is the same as recent dividend growth, i.e. 4·5%. Assuming that this dividend growth continues in the future, the future dividend growth rate will be 4·5%.
Share price from dividend growth model = (36 x 1·045)/ (0·12 – 0·045) = 502c or $5·02
Value of NGN = 5·02 x 10m = $50·2 million

(c) A discussion of capital structure could start from recognising that equity is more expensive than debt because of the relative risk of the two sources of finance. Equity is riskier than debt and so equity is more expensive than debt. This does not depend on the tax efficiency of debt, since we can assume that no taxes exist. We can also assume that as a company gears up, it replaces equity with debt. This means that the company's capital base remains constant and its weighted average cost of capital (WACC) is not affected by increasing investment.

The traditional view of capital structure assumes a non-linear relationship between the cost of equity and financial risk. As a company gears up, there is initially very little increase in the cost of equity and the WACC decreases because the cost of debt is less than the cost of equity. A point is reached, however, where the cost of equity rises at a rate that exceeds the reduction effect of cheaper debt and the WACC starts to increase. In the traditional view, therefore, a minimum WACC exists and, as a result, a maximum value of the company arises.

Modigliani and Miller assumed a perfect capital market and a linear relationship between the cost of equity and financial risk. They argued that, as a company geared up, the cost of equity increased at a rate that exactly cancelled out the reduction effect of cheaper debt. WACC was therefore constant at all levels of gearing and no optimal capital structure, where the value of the company was at a maximum, could be found.

It was argued that the no-tax assumption made by Modigliani and Miller was unrealistic, since in the real world interest payments were an allowable expense in calculating taxable profit and so the effective cost of debt was reduced by its tax efficiency. They revised their model to include this tax effect and showed that, as a result, the WACC decreased in a linear fashion as a company geared up. The value of the company increased by the value of the 'tax shield' and an optimal capital structure would result by gearing up as much as possible.

It was pointed out that market imperfections associated with high levels of gearing, such as bankruptcy risk and agency costs, would limit the extent to which a company could gear up. In practice, therefore, it appears that companies can reduce their WACC by increasing gearing, while avoiding the financial distress that can arise at high levels of gearing.

It has further been suggested that companies choose the source of finance which, for one reason or another, is easiest for them to access (pecking order theory). This results in an initial preference for retained earnings, followed by a preference for debt before turning to equity. The view suggests that companies may not in practice seek to minimise their WACC (and consequently maximise company value and shareholder wealth).

Turning to the suggestion that debt could be used to finance a cash bid for NGN, the current and post acquisition capital structures and their relative gearing levels should be considered, as well as the amount of debt finance that would be needed. Earlier calculations suggest that at least $58m would be needed, ignoring any premium paid to persuade target company shareholders to sell their shares. The current debt/equity ratio of KFP Co is 60% (15m/25m). The debt of the company would increase by $58m in order to finance the bid and by a further $20m after the acquisition, due to taking on the existing debt of NGN, giving a total of $93m. Ignoring other factors, the gearing would increase to 372% (93m/25m). KFP Co would need to consider how it could service this dangerously high level of gearing and deal with the significant risk of bankruptcy that it might create. It would also need to consider whether the benefits arising from the acquisition of NGN would compensate for the significant increase in financial risk and bankruptcy risk resulting from using debt finance.

2 (a) The key stages in the capital investment decision-making process are identifying investment opportunities, screening investment proposals, analysing and evaluating investment proposals, approving investment proposals, and implementing, monitoring and reviewing investments.

Identifying investment opportunities

Investment opportunities or proposals could arise from analysis of strategic choices, analysis of the business environment, research and development, or legal requirements. The key requirement is that investment proposals should support the achievement of organisational objectives.

Screening investment proposals

In the real world, capital markets are imperfect, so it is usual for companies to be restricted in the amount of finance available for capital investment. Companies therefore need to choose between competing investment proposals and select those with the best strategic fit and the most appropriate use of economic resources.

Analysing and evaluating investment proposals

Candidate investment proposals need to be analysed in depth and evaluated to determine which offer the most attractive opportunities to achieve organisational objectives, for example to increase shareholder wealth. This is the stage where investment appraisal plays a key role, indicating for example which investment proposals have the highest net present value.

Approving investment proposals

The most suitable investment proposals are passed to the relevant level of authority for consideration and approval. Very large proposals may require approval by the board of directors, while smaller proposals may be approved at divisional level, and so on. Once approval has been given, implementation can begin.

Implementing, monitoring and reviewing investments

The time required to implement the investment proposal or project will depend on its size and complexity, and is likely to be several months. Following implementation, the investment project must be monitored to ensure that the expected results are being achieved and the performance is as expected. The whole of the investment decision-making process should also be reviewed in order to facilitate organisational learning and to improve future investment decisions.

(b) (i) Calculation of NPV

Year	0	1	2	3	4
	$	$	$	$	$
Investment	(2,000,000)				
Income		1,236,000	1,485,400	2,622,000	1,012,950
Operating costs		676,000	789,372	1,271,227	620,076
Net cash flow	(2,000,000)	560,000	696,028	1,350,773	392,874
Discount at 10%	1·000	0·909	0·826	0·751	0·683
Present values	(2,000,000)	509,040	574,919	1,014,430	268,333

Net present value $366,722

Workings

Calculation of income

Year	1	2	3	4
Inflated selling price ($/unit)	20·60	21·22	21·85	22·51
Demand (units/year)	60,000	70,000	120,000	45,000
Income ($/year)	1,236,000	1,485,400	2,622,000	1,012,950

Calculation of 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

Year	1	2	3	4
Variable cost ($/unit)	8	8	8	8
Demand (units/year)	60,000	70,000	120,000	45,000
Variable costs ($/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) Calculation of internal rate of return

Year	0	1	2	3	4
	$	$	$	$	$
Net cash flow	(2,000,000)	560,000	696,028	1,350,773	392,874
Discount at 20%	1·000	0·833	0·694	0·579	0·482
Present values	(2,000,000)	466,480	483,043	782,098	189,365

Net present value ($79,014)

Internal rate of return = 10 + ((20 – 10) x 366,722)/(366,722 + 79,014) = 10 + 8·2 = 18·2%

(iii) Calculation of return on capital employed

Total cash inflow = 560,000 + 696,028 + 1,350,773 + 392,874 = $2,999,675
Total depreciation and initial investment are same, as there is no scrap value
Total accounting profit = 2,999,675 – 2,000,000 = $999,675
Average annual accounting profit = 999,675/4 = $249,919
Average investment = 2,000,000/2 = $1,000,000
Return on capital employed = 100 x 249,919/1,000,000 = 25%

(iv) Calculation of discounted payback

Year	0	1	2	3	4
	$	$	$	$	$
PV of cash flows	(2,000,000)	509,040	574,919	1,014,430	268,333
Cumulative PV	(2,000,000)	(1,490,960)	(916,041)	98,389	366,722

Discounted payback period = 2 + (916,041/1,014,430) = 2 + 0·9 = 2·9 years

(c) The investment proposal has a positive net present value (NPV) of $366,722 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 PV 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 be preferred.

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 why PV Co has a target return on capital employed of 30% should be investigated. This may be an out-of-date hurdle rate that has not been updated for changed economic circumstances.

The discounted payback period of 2·9 years is a significant proportion of the forecast life of the investment proposal of four years, a time period which the information provided suggests is limited by technological change. The sensitivity of the investment proposal to changes in demand and life-cycle period should be analysed, since an earlier onset of technological obsolescence may have a significant impact on its financial acceptability.

3 (a) When considering the financing of working capital, it is useful to divide current assets into fluctuating current assets and permanent current assets. Fluctuating current assets represent changes in the level of current assets due to the unpredictability of business activity. Permanent current assets represent the core level of investment in current assets needed to support a given level of turnover or business activity. As turnover or level of business activity increases, the level of permanent current assets will also increase. This relationship can be measured by the ratio of turnover to net current assets.

The financing choice as far as working capital is concerned is between short-term and long-term finance. Short-term finance is more flexible than long-term finance: an overdraft, for example, is used by a business organisation as the need arises and variable interest is charged on the outstanding balance. Short-term finance is also more risky than long-term finance: an overdraft facility may be withdrawn, or a short-term loan may be renewed on less favourable terms. In terms of cost, the term structure of interest rates suggests that short-term debt finance has a lower cost than long-term debt finance.

The matching principle suggests that long-term finance should be used for long-term investment. Applying this principle to working capital financing, long-term finance should be matched with permanent current assets and non-current assets. A financing policy with this objective is called a 'matching policy'. HGR Co is not using this financing policy, since of the $16,935,000 of current assets, $14,000,000 or 83% is financed from short-term sources (overdraft and trade payables) and only $2,935,000 or 17% is financed from a long-term source, in this case equity finance (shareholders' funds) or traded bonds.

The financing policy or approach taken by HGR Co towards the financing of working capital, where short-term finance is preferred, is called an aggressive policy. Reliance on short-term finance makes this riskier than a matching approach, but also more profitable due to the lower cost of short-term finance. Following an aggressive approach to financing can lead to overtrading (undercapitalisation) and the possibility of liquidity problems.

(b) Bank balance in three months' time if no action is taken:

Month	1	2	3
	$000	$000	$000
Receipts	4,220	4,350	3,808
Payments	(3,950)	(4,100)	(3,750)
Interest on bonds		(200)	
Overdraft interest	(19)	(18)	(18)
Capital investment			(2,000)
Net cash flow	251	32	(1,960)
Opening balance	(3,800)	(3,549)	(3,517)
Closing balance	(3,549)	(3,517)	(5,477)

Bank balance in three months' time if the finance director's proposals are implemented:

Month	1	2	3
	$000	$000	$000
Receipts	4,220	4,350	3,808
Payments	(3,950)	(4,100)	(3,750)
Interest on bonds		(200)	
Overdraft interest	(19)	(15)	(13)
Capital investment			(2,000)
Accounts receivable	270	270	270
Inventory	204	204	204
Net cash flow	725	509	(1,481)
Opening balance	(3,800)	(3,075)	(2,566)
Closing balance	(3,075)	(2,566)	(4,047)

Workings:

Reduction in accounts receivable days

Current accounts receivable days = (8,775/49,275) x 365 = 65 days
Reduction in days over six months = 65 – 53 = 12 days
Monthly reduction = 12/6 = 2 days
Each receivables day is equivalent to 8,775,000/65 =$135,000
(Alternatively, each receivables day is equivalent to 49,275,000/365 =$135,000)
Monthly reduction in accounts receivable = 2 x 135,000 = $270,000

Reduction in inventory days

Current inventory days = (8,160/37,230) x 365 = 80 days
Each inventory day is equivalent to 8,160,000/80 = $102,000
(Alternatively, each inventory day = 37,230,000/365 = $102,000)
Monthly reduction in inventory = 102,000 x 2 = $204,000

Overdraft interest calculations

Monthly overdraft interest rate = $1{\cdot}0617^{1/12} = 1{\cdot}005$ or 0·5%

If no action is taken: Period 1 interest = 3,800,000 x 0·005 = $19,000
Period 2 interest = 3,549,000 x 0·005 = $17,745 or $18,000
Period 3 interest = 3,517,000 x 0·005 = $17,585 or $18,000

If action is taken: Period 1 interest = 3,800,000 x 0.005 = $19,000
Period 2 interest = 3,075,000 x 0.005 = $15,375 or $15,000
Period 3 interest = 2,566,000 x 0.005 = $12,830 or $13,000

Discussion

If no action is taken, the cash flow forecast shows that HGR Co will exceed its overdraft limit of $4 million by $1·48 million in three months' time. If the finance director's proposals are implemented, there is a positive effect on the bank balance, but the overdraft limit is still exceeded in three months' time, although only by $47,000 rather than by $1·47 million.

In each of the three months following that, the continuing reduction in accounts receivable days will improve the bank balance by $270,000 per month. Without further information on operating receipts and payments, it cannot be forecast whether the bank balance will return to less than the limit, or even continue to improve.

The main reason for the problem with the bank balance is the $2 million capital expenditure. Purchase of non-current assets should not be financed by an overdraft, but a long-term source of finance such as equity or bonds. If the capital expenditure were removed from the area of working capital management, the overdraft balance at the end of three months would be $3·48 million if no action were taken and $2·05 million if the finance director's proposals were implemented. Given that HGR Co has almost $50 million of non-current assets that could possibly be used as security, raising long-term debt through either a bank loan or a bond issue appears to be sensible. Assuming a bond interest rate of 10% per year, current long-term debt in the form of traded bonds is approximately ($200m x 2)/0·1 = $4m, which is much less than the amount of non-current assets.

A suitable course of action for HGR Co to follow would therefore be, firstly, to implement the finance director's proposals and, secondly, to finance the capital expenditure from a long-term source. Consideration could also be given to using some long-term debt finance to reduce the overdraft and to reduce the level of accounts payable, currently standing at 100 days.

(c) When credit is granted to foreign customers, two problems may become especially significant. First, the longer distances over which trade takes place and the more complex nature of trade transactions and their elements means foreign accounts receivable need more investment than their domestic counterparts. Longer transaction times increase accounts receivable balances and hence the level of financing and financing costs. Second, the risk of bad debts is higher with foreign accounts receivable than with their domestic counterparts. In order to manage and reduce credit risks, therefore, exporters seek to reduce the risk of bad debt and to reduce the level of investment in foreign accounts receivable.

Many foreign transactions are on 'open account', which is an agreement to settle the amount outstanding on a predetermined date. Open account reflects a good business relationship between importer and exporter. It also carries the highest risk of non-payment.

One way to reduce investment in foreign accounts receivable is to agree early payment with an importer, for example by payment in advance, payment on shipment, or cash on delivery. These terms of trade are unlikely to be competitive, however, and it is more likely that an exporter will seek to receive cash in advance of payment being made by the customer.

One way to accelerate cash receipts is to use bill finance. Bills of exchange with a signed agreement to pay the exporter on an agreed future date, supported by a documentary letter of credit, can be discounted by a bank to give immediate funds. This discounting is without recourse if bills of exchange have been countersigned by the importer's bank.

Documentary letters of credit are a payment guarantee backed by one or more banks. They carry almost no risk, provided the exporter complies with the terms and conditions contained in the letter of credit. The exporter must present the documents stated in the letter, such as bills of lading, shipping documents, bills of exchange, and so on, when seeking payment. As each supporting document relates to a key aspect of the overall transaction, letters of credit give security to the importer as well as the exporter.

Companies can also manage and reduce risk by gathering appropriate information with which to assess the creditworthiness of new customers, such as bank references and credit reports.

Insurance can also be used to cover some of the risks associated with giving credit to foreign customers. This would avoid the cost of seeking to recover cash due from foreign accounts receivable through a foreign legal system, where the exporter could be at a disadvantage due to a lack of local or specialist knowledge.

Export factoring can also be considered, where the exporter pays for the specialist expertise of the factor as a way of reducing investment in foreign accounts receivable and reducing the incidence of bad debts.

4 (a) *Financial Analysis*

	2008	2007	2006	2005
Turnover ($m)	28·0	24·0	19·1	16·8
Turnover growth	17%	26%	14%	
Geometric average growth: 18·6%				
Profit before interest and tax ($m)	9·8	8·5	7·5	6·8
PBIT growth	15%	13%	10%	
Geometric average growth: 13·0%				
Earnings ($m)	5·5	4·7	4·1	3·6
Earnings per share (cents)	100	85	75	66
EPS growth	18%	13%	14%	
Geometric average growth: 14·9%				
Dividends ($m)	2·2	1·9	1·6	1·6
Dividends per share (cents)	40	35	29	29
DPS growth	14%	21%	nil	
Geometric average growth: 11·3%				
Ordinary shares ($m)	5·5	5·5	5·5	5·5
Reserves ($m)	13·7	10·4	7·6	5·1
Shareholders' funds ($	19·2	15·9	13·1	10·6
8% Bonds, redeemable 2015 ($m)	20	20	20	20
Capital employed ($m)	39·2	35·9	33·1	30.6
Profit before interest and tax ($m)	9·8	8·5	7·5	6·8
Return on capital employed	25%	24%	23%	22%
Earnings ($m)	5·5	4·7	4·1	3·6
Return on shareholders' funds	29%	30%	31%	34%
8% Bonds, redeemable 2015 ($m)	20	20	20	20
Market value of equity ($m)	47·5	31·6	18·4	14·7
Debt/equity ratio (market value)	42%	63%	109%	136%
Share price (cents)	864	574	335	267
Dividends per share (cents)	40	35	29	
Total shareholder return	58%	82%	36%	

Achievement of corporate objectives

JJG Co has shareholder wealth maximisation as an objective. The wealth of shareholders is increased by dividends received and capital gains on shares owned. Total shareholder return compares the sum of the dividend received and the capital gain with the opening share price. The shareholders of JJG Co had a return of 58% in 2008, compared with a return predicted by the capital asset pricing model of 14%. The lowest return shareholders have received was 21% and the highest return was 82%. On this basis, the shareholders of the company have experienced a significant increase in wealth. It is debatable whether this has been as a result of the actions of the company, however. Share prices may increase irrespective of the actions and decisions of managers, or even despite them. In fact, looking at the dividend per share history of the company, there was one year (2006) where dividends were constant, even though earnings per share increased. It is also difficult to know when wealth has been maximised.

Another objective of the company was to achieve a continuous increase in earnings per share. Analysis shows that earnings per share increased every year, with an average increase of 14·9%. This objective appears to have been achieved.

Comment on financial performance

Return on capital employed (ROCE) has been growing towards the sector average of 25% on a year-by-year basis from 22% in 2005. This steady growth in the primary accounting ratio can be contrasted with irregular growth in turnover, the reasons for which are unknown.

Return on shareholders' funds has been consistently higher than the average for the sector. This may be due more to the capital structure of JJG Co than to good performance by the company, however, in the sense that shareholders' funds are smaller on a book value basis than the long-term debt capital. In every previous year but 2008 the gearing of the company was higher than the sector average.

(b) *Calculation of theoretical ex rights per share*

Current share price = $8·64 per share
Current number of shares = 5·5 million shares
Finance to be raised = $15m
Rights issue price = $7·50 per share
Number of shares issued = 15m/7·50 = 2 million shares
Theoretical ex rights price per share = ((5·5m x 8·64) + (2m x 7·50))/7·5m = $8·34 per share
The share price would fall from $8·64 to $8·34 per share
However, there would be no effect on shareholder wealth

Effect of rights issue on earnings per share
Current EPS = 100 cents per share
Revised EPS = 100 x 5·5m/7·5m = 73 cents per share
The EPS would fall from 100 cents per share to 73 cents per share
However, as mentioned earlier, there would be no effect on shareholder wealth

Effect of rights issue on the debt/equity ratio
Current debt/equity ratio = 100 x 20/47·5 = 42%
Revised market value of equity = 7·5m x 8·34 = $62·55 million
Revised debt/equity ratio = 100 x 20/62·55 = 32%
The debt/equity ratio would fall from 42% to 32%, which is well below the sector average value and would signal a reduction in financial risk

(c) The current debt/equity ratio of JJG Co is 42% (20/47·5). Although this is less than the sector average value of 50%, it is more useful from a financial risk perspective to look at the extent to which interest payments are covered by profits.

	2008	2007	2006	2005
Profit before interest and tax ($m)	9·8	8·5	7·5	6·8
Bond interest ($m)	1·6	1·6	1·6	1·6
Interest coverage ratio (times)	6·1	5·3	4·7	4·3

The interest on the bond issue is $1·6 million (8% of $20m), giving an interest coverage ratio of 6·1 times. If JJG Co has overdraft finance, the interest coverage ratio will be lower than this, but there is insufficient information to determine if an overdraft exists. The interest coverage ratio is not only below the sector average, it is also low enough to be a cause for concern. While the ratio shows an upward trend over the period under consideration, it still indicates that an issue of further debt would be unwise.

A placing, or any issue of new shares such as a rights issue or a public offer, would decrease gearing. If the expansion of business results in an increase in profit before interest and tax, the interest coverage ratio will increase and financial risk will fall. Given the current financial position of JJG Co, a decrease in financial risk is certainly preferable to an increase.

A placing will dilute ownership and control, providing the new equity issue is taken up by new institutional shareholders, while a rights issue will not dilute ownership and control, providing existing shareholders take up their rights. A bond issue does not have ownership and control implications, although restrictive or negative covenants in bond issue documents can limit the actions of a company and its managers.

All three financing choices are long-term sources of finance and so are appropriate for a long-term investment such as the proposed expansion of existing business.

Equity issues such as a placing and a rights issue do not require security. No information is provided on the non-current assets of JJG Co, but it is likely that the existing bond issue is secured. If a new bond issue was being considered, JJG Co would need to consider whether it had sufficient non-current assets to offer as security, although it is likely that new non-current assets would be bought as part of the business expansion.

			Marks	*Marks*
1	**(a)**	Cost of equity calculation	2	
		Correct use of taxation rate	1	
		Cost of debt calculation	3	
		Market value of equity	1	
		Market value of debt	1	
		WACC calculation	2	
				10
	(b)	Price/earnings ratio value of company	2	
		Current dividend per share	1	
		Dividend growth model value of company	3	
				6
	(c)	Traditional view of capital structure	1–2	
		Miller and Modigliani and capital structure	2–3	
		Market imperfections	1–2	
		Other relevant discussion	1–2	
		Comment on debt finance for cash offer	2–3	
			Maximum	9
				25
2	**(a)**	Identification of decision-making stages	1–2	
		Explanation of decision-making stages	4–6	
		Role of investment appraisal	1–2	
			Maximum	7
	(b)	Inflated income	2	
		Inflated operating costs	2	
		Discount factors	1	
		Net present value	1	
		Internal rate of return	3	
		Return on capital employed	2	
		Discounted payback	2	
				13
	(c)	Discussion of investment appraisal findings	4	
		Advice on acceptability of project	1	
				5
				25

			Marks	*Marks*
3	**(a)**	Analysis of current assets	1–2	
		Short-term and long-term finance	2–3	
		Matching principle	1–2	
		Financing approach used by company	1–2	
			Maximum	7
	(b)	Bank balance if no action is taken	2	
		Bank balance if action is taken	5	
		Working capital management implications	1–2	
		Advice on course of action	1–2	
			Maximum	10
	(c)	Relevant discussion		8
				25
4	**(a)**	Relevant financial analysis	6–7	
		Shareholder wealth discussion	2–3	
		Earnings per share growth discussion	2–3	
		Comment on financial performance	1–2	
			Maximum	12
	(b)	Share price calculation and comment	2–3	
		Earnings per share calculation and comment	2–3	
		Debt/equity ratio calculation and comment	1–2	
			Maximum	6
	(c)	Financial analysis	1–2	
		Discussion of rights issue and placing	2–3	
		Discussion of bond issue	2–3	
			Maximum	7
				25

1 (a) After-tax cost of borrowing = 8·6 x (1 – 0·31 = 6% per year

Evaluation of leasing

Year	Cash flow	Amount ($)	6% Discount factors	Present value ($)
0–3	Lease rentals	(380,000)	1·000 + 2·673 = 3·673	(1,395,740)
2–5	Tax savings	114,000	4·212 – 0·943 = 3·269	372,666
				(1,023,074)

Present value of cost of leasing = $1,023,074

Evaluation of borrowing to buy

Year	Capital $	Licence fee $	Tax benefits $	Net cash flow $	6% discount factors	Present value $
0	(1,000,000)			(1,000,000)	1·000	(1,000,000)
1		(104,000)		(104,000)	0·943	(98,072)
2		(108,160)	106,200	(1,960)	0·890	(1,744)
3		(112,486)	88,698	(23,788)	0·840	(19,982)
4	100,000	(116,986)	75,934	58,948	0·792	46,687
5			131,659	131,659	0·747	98,349
						(974,762)

Present value of cost of borrowing to buy = $974,762

Workings

Year	Capital allowance $	Tax benefits $	Licence fee tax benefits $	Total $
2	1,000,000 x 0·25 = 250,000	75,000	31,200	106,200
3	750,000 x 0·25 = 187,500	56,250	32,448	88,698
4	562,500 x 0·25 =140,625	42,188	33,746	75,934
5	421,875 – 100,000 = 321,875	96,563	35,096	131,659

ASOP Co should buy the new technology, since the present cost of borrowing to buy is lower than the present cost of leasing.

(b) Nominal terms net present value analysis

Year	1 $	2 $	3 $	4 $	5 $
Cost savings	365,400	479,250	637,450	564,000	
Tax liabilities		(109,620)	(143,775)	(191,235)	(169,200)
Net cash flow	365,400	369,630	493,675	372,765	(169,200)
Discount at 11%	0·901	0·812	0·731	0·659	0·593
Present values	329,225	300,140	360,876	245,652	(100,336)
Present value of benefits		1,135,557			
Present cost of financing		(974,762)			
Net present value		160,795			

The investment in new technology is acceptable on financial grounds, as it has a positive net present value of $160,795.

Workings

Year	1	2	3	4
Operating cost saving ($/unit)	6·09	6·39	6·71	7·05
Production (units/year)	60,000	75,000	95,000	80,000
Operating cost savings ($/year)	365,400	479,250	637,450	564,000
Tax liabilities at 30% ($/year)	109,620	143,775	191,235	169,200

(Examiner's note: Including the financing cash flows in the NPV evaluation and discounting them by the WACC of 11% is also acceptable)

(c) The equivalent annual cost or benefit method can be used to calculate the equal annual amount of cost or benefit which, when discounted at the appropriate cost of capital, produces the same present value of cost or net present value as a set of varying annual costs or benefits.

For example, the net present value (NPV) of investing in the new technology of $160,795 in part (b) was calculated using a weighted average cost of capital (WACC) of 11% over an expected life of four years. The annuity factor for 11% and four years is 3·102. The equivalent annual benefit (EAB) is therefore 160,795/3·102 = $51,835·9 per year. This can be checked by multiplying the EAB by the annuity factor, i.e. 51,835·9 x 3·102 = $160,795.

If an alternative investment in similar technology over five years had a lower EAB, the four-year investment would be preferred as it has the higher EAB.

(d) When capital is rationed, the optimal investment schedule is the one that maximises the return per dollar invested. The capital rationing problem is therefore concerned with limiting factor analysis, but the approach adopted is slightly different depending on whether the investment projects being evaluated are divisible or indivisible.

With divisible projects, the assumption is made that a proportion rather than the whole investment can be undertaken, with the net present value (NPV) being proportional to the amount of capital invested. If 70% of a project is undertaken, for example, the resulting NPV is assumed to be 70% of the NPV of investing in the whole project.

For each divisible project, a profitability index can be calculated, defined either as the net present value of the project divided by its initial investment, or as the present value of the future cash flows of the project divided by its initial investment. The profitability index represents the return per dollar invested and can be used to rank the investment projects. The limited investment funds can then be invested in the projects in the order of their profitability indexes, with the final investment selection being a proportionate one if there is insufficient finance for the whole project. This represents the optimum investment schedule when capital is rationed and projects are divisible.

With indivisible projects, ranking by profitability index will not necessarily indicate the optimum investment schedule, since it will not be possible to invest in part of a project. In this situation, the NPV of possible combinations of projects must be calculated. The most likely combinations are often indicated by the profitability index ranking. The combination of projects with the highest aggregate NPV will then be the optimum investment schedule.

2 (a) The cost of debt of Bond A can be found by linear interpolation.

Using 11%, the difference between the present value of future cash flows and the ex interest market value = (9 x 5·889) + (100 x 0·352) – 95·08 = 53·00 + 35·20 – 95·08 = (6·88)
As the net present value is negative, 11% is higher than the cost of debt.

Using 9%, the difference between the present value of future cash flows and the ex interest market value = (9 x 6·418) + (100 x 0·422) – 95·08 = 57·76 + 42·20 – 95·08 = $4·88
As the net present value is positive, 9% is lower than the cost of debt.

Cost of debt = 9 + ((11 – 9) x 4·88)/(4·88 + 6·88) = 9 + 0·83 = 9·83%

Using estimates other than 11% and 9% will give slightly different values of the cost of debt.

(b) A key factor here could be the duration of the bond issues, linked to the term structure of interest rates. Normally, the longer the time to maturity of a debt, the higher will be the interest rate and the cost of debt. Bond A has the greater time to maturity and therefore would be expected to have a higher interest rate and a higher cost of debt than Bond B, which is the case here.

Liquidity preference theory suggests that investors require compensation for deferring consumption, i.e. for not having access to their cash in the current period, and so providers of debt finance require higher compensation for lending for longer periods. The premium for lending for longer periods also reflects the way that default risk increases with time.

Expectations theory suggests that the shape of the yield curve depends on expectations as to future interest rates. If the expectation is that future interest rates will be higher than current interest rates, the yield curve will slope upwards. If the expectation is that future interest rates will be lower than at present, the yield curve will slope downwards.

Market segmentation theory suggests that future interest rates depend on conditions in different debt markets, e.g. the short-term market, the medium-term market and the long-term market. The shape of the yield curve therefore depends on the supply of, and demand for, funds in the market segments.

Since the two bonds were issued at the same time by the same company, the business risk of DD Co can be discounted as a reason for the difference between the two costs of debt. If the two bonds had been issued by different companies, a different business risk might have been a reason for the difference in the costs of debt.

The size of the debt could be a contributory factor, since the Bond A issue is twice the size of the Bond B issue. The greater size of the Bond A issue could be one of the reasons it has the higher cost of debt.

(c) (i) Cost of equity = 4 + (1·2 x (11 – 4)) = 4 + 8·4 = 12·4%

(ii) Dividend growth rate = 100 x ((52/50) – 1) = 100 x (1·04 – 1) = 4% per year
Share price using DGM = (50 x 1·04)/(0·124 – 0·04) = 52/0·84 = 619c or $6·19

(iii) Number of ordinary shares = 25 million
Market value of equity = 25m x 6·19 = $154·75 million
Market value of Bond A issue = 20m x 95·08/100 = $19·016m
Market value of Bond B issue = 10m x 102·01/100 = $10·201m
Market value of debt = $29·217m
Market value of capital employed = 154·75m + 29·217m = $183·967m

Capital gearing = 100 x 29·217/183·967 = 15·9%

(iv) WACC = ((12·4 x 154·75) + (9·83 x 19·016) + (7·82 x 10·201))/183·967 = 11·9%

(d) Miller and Modigliani showed that, in a perfect capital market, the value of a company depended on its investment decision alone, and not on its dividend or financing decisions. In such a market, a change in dividend policy by DD Co would not affect its share price or its market capitalisation. They showed that the value of a company was maximised if it invested in all projects with a positive net present value (its optimal investment schedule). The company could pay any level of dividend and if it had insufficient finance, make up the shortfall by issuing new equity. Since investors had perfect information, they were indifferent between dividends and capital gains. Shareholders who were unhappy with the level of dividend declared by a company could gain a 'home made dividend' by selling some of their shares. This was possible since there are no transaction costs in a perfect capital market.

Against this view are several arguments for a link between dividend policy and share prices. For example, it has been argued that investors prefer certain dividends now rather than uncertain capital gains in the future (the 'bird-in-the-hand' argument). It has also been argued that real world capital markets are not perfect, but semi-strong form efficient. Since perfect information is therefore not available, it is possible for information asymmetry to exist between shareholders and the managers of a company. Dividend announcements may give new information to shareholders and as a result, in a semi-strong form efficient market, share prices may change. The size and direction of the share price change will depend on the difference between the dividend announcement and the expectations of shareholders. This is referred to as the 'signalling properties of dividends'.

It has been found that shareholders are attracted to particular companies as a result of being satisfied by their dividend policies. This is referred to as the 'clientele effect'. A company with an established dividend policy is therefore likely to have an established dividend clientele. The existence of this dividend clientele implies that the share price may change if there is a change in the dividend policy of the company, as shareholders sell their shares in order to reinvest in another company with a more satisfactory dividend policy. In a perfect capital market, the existence of dividend clienteles is irrelevant, since substituting one company for another will not incur any transaction costs. Since real-world capital markets are not perfect, however, the existence of dividend clienteles suggests that if DD Co changes its dividend policy, its share price could be affected.

3 **(a)** Amount of equity finance to be invested in euros = 13m/2 = €6·5 million
Amount of equity to be invested in dollars = 6·5m/1·3000 = $5 million
The amount of equity finance to be raised in dollars = 5m ÷ 0·912m = $5·312m

Rights issue price = 4·00 x 0·83 = $3·32 per share

Number of new shares issued = 5·312m/3·32 = 1·6 million shares
Current number of ordinary shares in issue = $100m/4·00 = 25 million shares
Total number of shares after the rights issue = 25m + 1·6m = 26·6 million shares
Theoretical ex rights price = ((25m x 4) + (1·6m x 3·32))/26·6 = 105·312/26·6 = $3·96 per share

(b) **(i)** *Effect on earnings per share*
Current EPS = 100 x 4·00/10 = 40 cents per share

(Alternatively, current profit after tax = 100m/10 = $10 million
Current EPS = 100 x 10m/25m = 40 cents per share)

Increase in profit before interest and tax = 13m x 0·2 = €2,600,000
Dollar increase in profit before interest and tax = 2,600,000/1·3000 = $2 million

	$000
Increase in profit before interest and tax	2,000
Increase in interest = 6·5m x 0·08 = 0·52m/1·3000 =	400
Increase in profit before tax	1,600
Taxation = 1·6m x 0·3 =	480
Increase in profit after tax	1,120
Current profit after tax = 100m/10 =	10,000
Revised profit after tax	11,120

Alternatively, using euros:

	€000
Increase in profit before interest and tax = 13m x 0·2 =	2,600
Increase in interest = 6·5m x 0·08 =	520
Increase in profit before tax	2,080
Taxation = 2·08m x 0·3 =	624
Increase in profit after tax	1,456
	$000
Increase in dollar profit after tax = 1·456m/1·300 =	1,120
Current profit after tax = 100m/10 =	10,000
Revised profit after tax	11,120

Revised EPS = 100 x 11·12m/26·6m = 41·8 cents/share

(ii) *Effect on shareholder wealth*

Expected share price using PER method = (41·8 x 10)/100 = $4·18 per share

This should be compared to the theoretical ex rights price per share in order to evaluate any change in shareholder wealth.

The investment produces a capital gain of 22 cents per share ($4·18 – $3·96)

In the absence of any information about dividend payments, it appears that the investment will increase the wealth of shareholders.

(c) Transaction risk is exchange rate risk that arises as a result of short-term transactions. Because it is short term in nature, it has a direct effect on cash flows, which can either increase or decrease, depending on the movement in exchange rates before the settlement dates of individual short-term transactions.

NG Co is exposed to transaction risk on its euro-denominated European sales and interest payments. The dollar value of its euro-denominated sales, for example, would decrease if the dollar appreciated against the euro.

Translation risk is exchange rate risk that arises from the need to consolidate financial performance and financial position when preparing consolidated financial statements. For this reason, it is also referred to as accounting exposure.

NG Co is exposed to translation risk on its euro-denominated non-current assets. The dollar value of the non-current assets acquired by investing in the storage, packing and distribution network, for example, will change as the euro/dollar exchange rate changes.

(d) NG Co will receive euro-denominated income and will incur euro-denominated expenses as a result of its European operations. One hedging method is to maintain a euro-denominated bank account for all euro-denominated transactions. This natural hedge will minimise the need for cash to be exchanged from one currency to another.

Transactions that are deemed to have significant exchange-rate risk could be hedged using the forward market, i.e. using a forward exchange contract or FEC. This is a binding contract between a company and a bank for delivery or receipt of an agreed amount of foreign currency at an agreed exchange rate on an agreed future date.

The six-monthly interest payment of €260,000 can be used to illustrate an FEC. The current cost of the interest payment is $200,000. In six months and twelve months, as the euro is expected to strengthen against the dollar, the dollar cost of the interest payment is expected to rise. In order to protect against unexpected adverse exchange rate movements, NG Co can lock into the six-month and twelve-month forward rates of 1·2876 €/$ and 1·2752 €/$ using forward exchange contracts, thereby guaranteeing the dollar cost of its euro-denominated interest payments. The dollar cost of the six-month interest payment would be $201,926 (€260,000/1·2876) and the dollar cost of the twelve-month interest payment would be $203,890 (€260,000/1·2752).

An alternative to an FEC is a money market hedge. NG Co could borrow now in dollars in order to make a euro deposit which, with accrued interest, will be sufficient to pay the euro-denominated interest in six months' time.

The six-month euro deposit rate available to NG Co is 1·39% (100 x (1·0280·5 – 1)) and the six-month dollar borrowing rate available to NG Co is 2·62% (100 x (1·0530·5 – 1)). The amount of dollars to deposit now would be €256,436 (260,000/1·0139) and to make this payment NG Co would need to borrow $197,259 (256,436/1·3000). The six-month dollar cost of this debt would be $202,427 (197,259 x 1·0262). This is more expensive than using the six-month forward exchange contract.

(Examiner's note: an illustration using the interest payment due in twelve months would also be acceptable. It would also be acceptable to use six-monthly interest rates that are one half of the annual interest rates.)

Other hedging methods that could be identified and briefly discussed are currency futures, currency options and currency swaps.

(a) The role of financial intermediaries in providing short-term finance for use by business organisations is to provide a link between investors who have surplus cash and borrowers who have financing needs. The amounts of cash provided by individual investors may be small, whereas borrowers need large amounts of cash: one of the functions of financial intermediaries is therefore to aggregate invested funds in order to meet the needs of borrowers. In so doing, they provide a convenient and readily accessible route for business organisations to obtain necessary funds.

Small investors are likely to be averse to losing any capital value, so financial intermediaries will assume the risk of loss on short-term funds borrowed by business organisations, either individually or by pooling risks between financial intermediaries. This aspect of the role of financial intermediaries is referred to as risk transformation. Financial intermediaries also offer maturity transformation, in that investors can deposit funds for a long period of time while borrowers may require funds on a short-term basis only, and vice versa. In this way the needs of both borrowers and lenders can be satisfied.

(b) Forecast income statement

	$m
Turnover = 16·00m x 1·084 =	17·344
Cost of sales = 17·344m – 5·203m =	12·141
Gross profit = 17·344m x 30% =	5·203
Other expenses = 5·203m – 3·469m =	1·734
Net profit = 17·344m x 20% =	3·469
Interest = (10m x 0·08) + 0·140m =	0·940
Profit before tax	2·529
Tax = 2·529m x 0·3 =	0·759
Profit after tax	1·770
Dividends = 1·770m x 50% =	0·885
Retained profit	0·885

Forecast statement of financial position

	$m	$m
Non-current assets		22·00
Current assets		
Inventory	3·66	
Trade receivables	3·09	
		6·75
Total assets		28·75
Equity finance:	$m	$m
Ordinary shares	5·00	
Reserves	8·39	
		13·39
Bank loan		10·00
		23·39
Current liabilities		
Trade payables	2·49	
Overdraft	2·87	
		5·36
Total liabilities		28·75

Workings
Inventory = 12·141m x (110/365) = $3·66m
Trade receivables = 17·344m x (65/365) = $3·09m
Trade payables = 12·141m x (75/365) = $2·49m
Reserves = 7·5m + 0·885m = $8·39m
Overdraft = 28·75m – 23·39m – 2·49 = $2·87m (balancing figure)

(c) Working capital financing policies can be classified into conservative, moderate (or matching) and aggressive, depending on the extent to which fluctuating current assets and permanent current assets are financed by short-term sources of finance. Permanent current assets are the core level of investment in current assets needed to support a given level of business activity or turnover, while fluctuating current assets are the changes in the levels of current assets arising from the unpredictable nature of some aspects of business activity.

A conservative working capital financing policy uses long-term funds to finance non-current assets and permanent current assets, as well as a proportion of fluctuating current assets. This policy is less risky and less profitable than an aggressive

working capital financing policy, which uses short-term funds to finance fluctuating current assets and a proportion of permanent current assets as well. Between these two extremes lies the moderate (or matching) policy, which uses long-term funds to finance long-term assets (non-current assets and permanent current assets) and short-term funds to finance short-term assets (fluctuating current assets).

The current statement of financial position shows that APX Co uses trade payables and an overdraft as sources of short-term finance. In terms of the balance between short- and long-term finance, 89% of current assets (100 x 4·1/4·6) are financed from short-term sources and only 11% are financed from long-term sources. Since a high proportion of current assets are permanent in nature, this appears to be a very aggressive working capital financing policy which carries significant risk. If the overdraft were called in, for example, APX Co might have to turn to more expensive short-term financing.

The forecast statement of financial position shows a lower reliance on short-term finance, since 79% of current assets (100 x 5·36/6·75) are financed from short-term sources and 21% are financed from long-term sources. This decreased reliance on an aggressive financing policy is sensible, although with a forecast interest coverage ratio of only 3·7 times (3·469/0·94), APX Co has little scope for taking on more long-term debt. An increase in equity funding to decrease reliance on short-term finance could be considered.

(d) *Working capital management*

Financial analysis shows deterioration in key working capital ratios. The inventory turnover period is expected to increase from 81 days to 110 days, the trade receivables period is expected to increase from 50 days to 65 days and the trade payables period is expected to increase from 64 days to 75 days. It is also a cause for concern here that the values of these working capital ratios for the next year are forecast, i.e. APX Co appears to be anticipating a worsening in its working capital position. The current and forecast values could be compared to average or sector values in order to confirm whether this is in fact the case.

Because current assets are expected to increase by more than current liabilities, the current ratio and the quick ratio are both expected to increase in the next year, the current ratio from 1·12 times to 1·26 times and the quick ratio from 0·54 times to 0·58 times. Again, comparison with sector average values for these ratios would be useful in making an assessment of the working capital management of APX Co. The balance between trade payables and overdraft finance is approximately the same in both years (trade payables are 46% of current liabilities in the current statement of financial position and 47% of current liabilities in the forecast statement of financial position), although reliance on short-term finance is expected to fall slightly in the next year.

The deteriorating working capital position may be linked to an expected deterioration in the overall financial performance of APX Co. For example, the forecast gross profit margin (30%) and net profit margin (20%) are both less than the current values of these ratios (32% and 23% respectively), and despite the increase in turnover, return on capital employed (ROCE) is expected to fall from 16·35% to 14·83%.

Analysis

Extracts from current income statement

	$m
Turnover	16·00
Cost of sales	10·88
Gross profit	5·12
Other expenses	1·44
Net profit	3·68

	Current	Forecast
Gross profit margin (100 x 5·12/16·00)	32%	
		30%
Net profit margin (100 x 3·68/16·00)	23%	
		20%
ROCE (100 x 3·68/22·5)	16·35%	
(100 x 3·469/23·39)		14·83%
Inventory period (365 x 2·4/10·88)	81 days	
		110 days
Receivables period (365 x 2·2/16·00)	50 days	
		65 days
Payables period (365 x 1·9/10·88)	64 days	
		75 days
Current ratio (4·6/4·1)	1·12 times	
(6·75/5·36)		1·26 times
Quick ratio (2·2/4·1)	0·54 times	
(3·09/5·36)		0·58 times

Fundamentals Level – Skills Module, Paper F9
Financial Management

December 2009 Marking Scheme

			Marks	*Marks*
1	(a)	Present value of lease rentals	2	
		Present value of lease rental tax benefits	1	
		Present value of cost of leasing	1	
		Investment and scrap values	1	
		Licence fee	1	
		Capital allowance tax benefits	2	
		Licence fee tax benefits	1	
		Present value of cost of borrowing to buy	1	
		Appropriate decision on leasing versus buying	1	
				11
	(b)	Inflated cost savings	2	
		Tax liabilities	1	
		Present values of net cash flows	1	
		Net present value	1	
		Advice on acceptability of investment	1	
				6
	(c)	Definition of equivalent cost or benefit	1	
		Relevant discussion	1	
		Appropriate illustration	1	
				3
	(d)	Capital rationing	1–2	
		Divisible projects and profitability index	2–3	
		Indivisible projects and combinations	1–2	
			Maximum	5
				25
2	(a)	Calculation of cost of debt of Bond A		3
	(b)	Term structure of interest rates	1–2	
		Liquidity preference theory	1–2	
		Expectations theory	1–2	
		Market segmentation theory	1–2	
		Other relevant discussion	1–2	
			Maximum	6
	(c)	Cost of equity	2	
		Dividend growth rate	1	
		Share price using dividend growth model	2	
		Capital gearing	2	
		Weighted average cost of capital	2	
				9
	(d)	Dividend irrelevance	3–4	
		Dividend relevance	3–4	
			Maximum	7
				25

			Marks	Marks
3	(a)	Amount of equity finance to be raised in dollars	1	
		Rights issue price	1	
		Theoretical ex rights price	2	
				4
	(b)	Current EPS	1	
		Increase in PBIT from investment	1	
		Interest on bond issue	1	
		Revised dollar profit after tax	2	
		Revised EPS	1	
		Revised share price using PER method	1	
		Comment on effect on shareholder wealth	1–3	
			Maximum	9
	(c)	Transaction risk	1–2	
		Translation risk	1–2	
		Link to question	1–2	
			Maximum	4
	(d)	Euro account	1	
		Forward market hedge	1	
		Illustration of forward market hedge	1–2	
		Money market hedge	1	
		Illustration of money market hedge	1–2	
		Other hedging strategies, including derivatives	1–2	
			Maximum	8
				25
4	(a)	Relevant discussion on financial intermediaries		4
	(b)	Gross profit	1	
		Net profit	1	
		Profit before tax	1	
		Retained profit	1	
		Inventory	1	
		Trade receivables	1	
		Trade payables	1	
		Reserves	1	
		Overdraft	1	
		Layout and format	1	
			Maximum	9
	(c)	Working capital financing policies	2–3	
		Financial analysis	1–2	
		Working capital financing policy of company	2–3	
			Maximum	6
	(d)	Discussion of working capital management	3–4	
		Financial analysis	2–4	
			Maximum	6
				25