

CIMA FINAL ASSESSMENT

Financial Strategy

November 2011

Time allowed

Reading and planning: 20 minutes

Writing: 3 hours

Section A is compulsory and **MUST** be attempted. Choose two questions from the three in Section B.

Mathematical tables and formulae are on pages 15 – 20

Do NOT open this paper until instructed by the supervisor.

During reading and planning time only the question paper may be annotated. You must NOT write in your answer booklet until instructed by the supervisor.

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Aybe

Pre-seen Case Study

Background

Aybe, located in Country C, was formed by the merger of two companies in 2001. It is a listed company which manufactures, markets and distributes a large range of components throughout Europe and the United States of America. Aybe employs approximately 700 people at its three factories in Eastern Europe and supplies products to over 0.5 million customers in 20 countries. Aybe holds stocks of about 100,000 different electronic components.

Aybe is regarded within its industry as being a well-established business. Company Ay had operated successfully for nearly 17 years before its merger with Company Be. Company Ay can therefore trace its history back for 25 years which is a long time in the fast moving electronic component business.

The company is organised into three divisions, the Domestic Electronic Components division (DEC), the Industrial Electronic Components division (IEC) and the Specialist Components division (SC). The Domestic and Industrial Electronic Components divisions supply standard electronic components for domestic and industrial use whereas the Specialist Components division supplies components which are often unique and made to specific customer requirements. Each of the three divisions has its own factory in Country C.

Composition of the Board of Directors

The Board of Directors has three executive directors, the Company Secretary and five non-executive directors. The Chairman is one of the five independent non-executive directors. The executive directors are the Chief Executive, Finance Director and Director of Operations. There is also an Audit Committee, a Remuneration Committee and a Nominations Committee. All three committees are made up entirely of the non-executive directors.

Organisational structure

Aybe is organised along traditional functional/unitary lines. The Board considers continuity to be a very important value. The present structure was established by Company Ay in 1990 and continued after the merger with Company Be. Many of Aybe's competitors have carried out structural reorganisations since then. In 2008, Aybe commissioned a review of its organisational structure from a human resource consultancy. The consultants suggested alternative structures which they thought Aybe could employ to its advantage. However, Aybe's Board felt that continuity was more important and no change to the organisational structure took place.

Product and service delivery

Customers are increasingly seeking assistance from their component suppliers with the design of their products and the associated manufacturing and assembly processes. Aybe's Board views this as a growth area. The Board has recognised that Aybe needs to develop web-based services and tools which can be accessed by customers. The traditional method of listing the company's range of components in a catalogue is becoming less effective because customers are increasingly seeking specially designed custom made components as the electronics industry becomes more sophisticated.

Financial data

Aybe's historical financial record, denominated in C's currency of C\$, over the last five years is shown below.

Year ended 31 December:

	2009	2008	2007	2006	2005
	C\$m	C\$m	C\$m	C\$m	C\$m
Revenue	620	600	475	433	360
Operating profit	41	39	35	20	13
Profit for the year	23	21	16	9	5
Earnings per share (C\$)	0.128	0.117	0.089	0.050	0.028
Dividend per share (C\$)	0.064	0.058	0	0	0

Extracts from the 2009 financial statements are given at Appendix A. There are currently 180 million ordinary shares in issue with a nominal value of C\$0.10 each. The share price at 31 December 2009 was C\$0.64. No dividend was paid in the three years 2005 to 2007 due to losses sustained in the first few years after the merger in 2001.

Aybe's bank has imposed an overdraft limit of C\$10 million and two covenants: (i) that its interest cover must not fall below 5 and (ii) its ratio of non-current liabilities to equity must not increase beyond 0.75:1. Aybe's Finance Director is comfortable with this overdraft limit and the two covenants.

The ordinary shareholding of Aybe is broken down as follows:

	<i>Percentage of ordinary shares held at 31 December 2009</i>
Institutional investors	55
Executive Directors and Company Secretary	10
Employees	5
Individual investors	30

The Executive Directors, Company Secretary and other senior managers are entitled to take part in an Executive Share Option Scheme offered by Aybe.

Performance Review

Aybe's three divisions have been profitable throughout the last five years. The revenue and operating profit of the three divisions of Aybe for 2009 were as follows:

	<i>DEC Division</i>	<i>IEC Division</i>	<i>SC Division</i>
	C\$m	C\$m	C\$m
Revenue	212	284	124
Operating profit	14	15	11

Financial objectives of Aybe

The Board has generally taken a cautious approach to providing strategic direction for the company. Most board members feel that this has been appropriate because the company was unprofitable for the three year period after the merger and needed to be turned around. Also, most board members think a cautious approach has been justified given the constrained economic circumstances which have affected Aybe's markets since 2008. While

shareholders have been disappointed with Aybe's performance over the last five years, they have remained loyal and supported the Board in its attempts to move the company into profit. The institutional shareholders however are now looking for increased growth and profitability.

The Board has set the following financial objectives which it considers reflect the caution for which Aybe is well known:

- (i) Dividend payout to remain at 50% of profit for the year;
- (ii) No further equity shares to be issued over the next five years in order to avoid diluting earnings per share.

Capital budget overspends

Aybe has an internal audit department. The Chief Internal Auditor, who leads this department, reports directly to the Finance Director. Investigation by the Internal Audit department has revealed that managers with responsibility for capital expenditure have often paid little attention to expenditure authorisation levels approved by the Board. They have justified overspending on the grounds that the original budgets were inadequate and in order not to jeopardise the capital projects, the overspends were necessary.

An example of this was the building of an extension to the main factory at the DEC division that was completed in 2009 at a final cost of nearly C\$3 million which was almost 50% over budget. The capital budget for the extension was set at the outset and the capital investment appraisal showed a positive net present value. It subsequently became apparent that the site clearance costs and on-going construction expenditure were under-estimated. These estimates were provided by a qualified quantity surveyor who was a contractor to Aybe. The estimates supplied by the quantity surveyor were accurately included in Aybe's capital investment appraisal system which was performed on a spreadsheet. However, no regular checks were carried out to compare the phased budgeted expenditure with actual costs incurred. It came as a surprise to the Board when the Finance Director finally produced the capital expenditure project report which showed the cost of the extension was nearly 50% overspent.

Strategic development

Aybe applies a traditional rational model in carrying out its strategic planning process. This encompasses an annual exercise to review the previous plan, creation of a revenue and capital budget for the next five years and instruction to managers within Aybe to maintain their expenditure within the budget limits approved by the Board.

Debates have taken place within the Board regarding the strategic direction in which Aybe should move. Most board members are generally satisfied that Aybe has been turned around over the last five years and were pleased that the company increased its profit in 2009 even though the global economy slowed down. Aybe benefited from a number of long-term contractual arrangements with customers throughout 2009 which were agreed in previous years. However, many of these are not being renewed due to the current economic climate.

The Board stated in its annual report, published in March 2010, that the overall strategic aim of the company is to:

“Achieve growth and increase shareholder returns by continuing to produce and distribute high quality electronic components and develop our international presence through expansion into new overseas markets.”

Aybe's Chief Executive said in the annual report that the strategic aim is clear and straightforward. He said "Aybe will strive to maintain its share of the electronic development, operational, maintenance and repair markets in which it is engaged. This is despite the global economic difficulties which Aybe, along with its competitors, has faced since 2008. Aybe will continue to apply the highest ethical standards in its business activities."

In order to facilitate the achievement of the strategic aim, Aybe's Board has established the following strategic goals:

- 1 Enhance the provision of products and services which are demanded by customers;
- 2 Invest in engineering and web-based support for customers;
- 3 Maintain the search for environmentally friendly products;
- 4 Pursue options for expansion into new overseas markets.

The Board has also stated that Aybe is a responsible corporate organisation and recognises the social and environmental effects of its operational activities.

Concern over the rate of growth

Aybe's recently appointed Director of Operations and one of its Non-Executive Directors have privately expressed their concern to the Chief Executive at what they perceive to be the very slow growth of the company. While they accept that shareholder expectations should not be raised too high, they feel that the Board is not providing sufficient impetus to move the company forward. They fear that the results for 2010 will be worse than for 2009. They think that Aybe should be much more ambitious and fear that the institutional shareholders in particular, will not remain patient if Aybe does not create stronger earnings growth than has previously been achieved.

Development approaches

The Board has discussed different ways of expanding overseas in order to meet the overall strategic aim. It has, in the past, been reluctant to move from the current approach of exporting components. However the Director of Operations has now begun preparing a plan for the IEC division to open up a trading company in Asia. The DEC division is also establishing a subsidiary in Africa.

APPENDIX A

Extracts of Aybe's Income Statement and Statement of Financial Position

Income statement for the year ended 31 December 2009

	<i>2009</i> C\$million
Revenue	620
Operating costs	(579)
Finance costs	(4)
	37
Profit before tax	37
Income tax expense	(14)
	23
PROFIT FOR THE YEAR	23

Statement of financial position as at 31 December 2009

	<i>2009</i> C\$ million
ASSETS	
Non-current assets	111
	—
Current assets	
Inventories	40
Trade and other receivables	81
Cash and cash equivalents	3
	—
Total current assets	124
Total assets	235
EQUITY AND LIABILITIES	
Equity	
Share capital	18
Share premium	9
Other reserves	8
Retained earnings	75
	—
Total equity	110
	—
Non-current liabilities	
Bank loan (8% interest, repayable 2015)	40
	—
Current liabilities	
Trade and other payables	73
Current tax payable	8
Bank overdraft	4
	—
Total current liabilities	85
	—
Total liabilities	125
	—
Total equity and liabilities	235
	—

End of Pre-seen Material

SECTION A – 50 Marks

(Note: The indicative time for answering this section is 90 minutes.)

ANSWER THIS QUESTION

QUESTION 1

Unseen material for Case Study

Future strategy for the IEC division

As part of his plan for the IEC division to open up a trading company in Asia, the Director of Operations has identified three potential acquisition targets in a developing Asian country, Jumdia.

Several electronics companies from country C have already expanded into Jumdia, attracted by low labour costs and its proximity to the huge developing markets in East Asia. Also, since 75% of Jumdia's international trade is with country C, the Jumdia government operates a fixed exchange rate system whereby the country's currency (the Jumdia dollar, J\$) is pegged to the value of the C\$ in the ratio 1:1.

Three potential acquisitions

Option 1: X Co

X Co is a listed company which owns a distribution network of 15 warehouses and retail outlets in the south of Jumdia. These sites are quite run down, the company having, in the past, aimed at selling basic electronic components at the lowest possible prices and providing little in the way of other services or products. However, the sites are in good locations and therefore suitable for renovation and development. Potentially Aybe could build manufacturing facilities on some of the sites in future.

The institutional investors in X Co are known to be dissatisfied with the company's recent performance and can be expected to support a bid if the terms are right. Aybe foresees little competition from alternative buyers. One of the local suppliers of components has indicated it might be willing to provide development finance for up to 50% of the acquisition cost at only 2% interest per annum, repayable over 10 years. However, this would involve Aybe entering into a long-term supply agreement for all 15 sites for the 10 year period.

Option 2: Y Co

Y Co specialises in electronic component distribution from the major global manufacturers to retail outlets throughout Jumdia and neighbouring countries. Its shares have been quoted on Jumdia's Alternative Investment Market for the past two years. Y Co operates a fleet of articulated trucks, some owned and some leased. Aybe has used Y Co's distribution services in the past and knows it has an up-to-date and well-managed fleet. However, a bid for Y Co would almost certainly be regarded as hostile and, as 40% of the shares are owned by the directors and their families, a successful bid is far from assured.

Option 3: Z Co

Z Co owns a well-equipped, high-technology, component manufacturing factory. It is a long-established family-owned business, which manufactures components for industrial customers throughout Jumdia. The managing director and major shareholder is planning to retire shortly and his children have shown no interest in taking over the business. He has

therefore approached the Director of Operations of Aybe, whom he has known for some years, asking if Aybe would be interested in buying Z Co.

Financial information

Aybe’s financial advisors have produced estimates of the expected first full-year post-merger earnings of Aybe with each of the three acquisition options, and the corresponding expected market values.

These are as follows:

	<i>Estimated post-merger earnings in first full year following merger</i>	<i>Estimated market value of combined organisation</i>
	C\$ million	C\$ million
Aybe plus X Co	32.03	160.15
Aybe plus Y Co	31.61	165.95
Aybe plus Z Co	25.02	125.10

Financial statistics and other information on Aybe and the three possible acquisitions are shown below:

Summary financial statistics

	<i>Aybe</i>	<i>X Co</i>	<i>Y Co</i>	<i>Z Co</i>
<i>Last year end</i>	<i>31.12.09</i>	<i>31.12.09</i>	<i>31.12.09</i>	<i>30.09.09</i>
Shares in issue (millions)		10	12	0.5
Earnings per share		J\$0.75	J\$0.545	J\$1.60
Dividend per share		J\$0.235	J\$0.42	J\$1.12
Share price		J\$3.35	J\$3.00	N/A
Net asset value		J\$30m	J\$26m	J\$8m
Debt ratio (outstanding debt as % of total market value)		30	15	0
Forecast annual growth rate %	5	5	14	9
Beta co-efficient	1.2	0.9	1.3	1.25

(1) The forecast growth rates have been provided by Aybe’s financial advisors. They are based on publicly-available information and assume all companies continue to operate independently and that dividend policies, capital structure and risk characteristics remain unchanged.

(2) The beta shown for Z Co is the equity beta of a larger, quoted company in a similar line of business. This company has a gearing ratio (debt : debt + equity) of 20%. Assume a debt beta of zero.

You should ignore taxation issues throughout this question.

Required:

- (a) Calculate, for Aybe and, where relevant, for the three acquisition options before the merger:
- (i) the current market value and P/E ratio
 - (ii) the cost of equity using the CAPM
 - (iii) the prospective market value using the constant growth dividend valuation model

assuming the return on the market is 12% and the return on the risk-free asset is 6%.
(10 marks)

- (b) You now have up to three values for each company as an independent entity. These are the current market value and the value using the Dividend Valuation Model (as you have calculated for part (a)) and asset value (given in the scenario).

Discuss the usefulness and limitations of each of these methods of company valuation to Aybe in its acquisition decision. (12 marks)

- (c) Explain how the advisors derived the forecast earnings and post-acquisition value figures for Aybe and each of the three acquisition options. Use appropriate calculations to support your explanation. (8 marks)

- (d) Assume you are working as Aybe's management accountant. Write a report to the Director of Operations which addresses the following issues for EACH acquisition option:

- Recommend the price to be offered to the target company's shareholders. You should recommend a range of terms within which Aybe should be prepared to negotiate (9 marks)
- Discuss the business implications (e.g. effect on existing operation, growth prospects, risk, etc). (6 marks)
- Evaluate the alternative methods of financing the takeover which are available to Aybe. (5 marks)

(Total: 50 marks)

SECTION B – 50 MARKS

(Note: The indicative time for answering this section is 90 minutes.)

Answer TWO of the THREE questions – 25 marks each

QUESTION 2

ZX is a relatively small US-based company in the agricultural industry. It is highly mechanised and uses modern techniques and equipment. In the past, it has operated a very conservative policy in respect of the management of its working capital. Assume that you are a newly-recruited management accountant. The Finance Director, who is responsible for both financial control and treasury functions, has asked you to review this policy.

You assemble the following information about the company's forecast end-of-year financial outcomes. The company's year end is in six months' time.

	US\$000
Receivables	2,500
Inventory	2,000
Cash at bank	500
	—————
Current assets	5,000
Non-current assets	1,250
Current liabilities	1,850
Forecast sales for the full year	8,000
Forecast operating profit (18% of sales)	1,440

You wish to evaluate the likely effect on the company if it introduced one of two alternative approaches to working capital management. The Finance Director suggests you adjust the figures in accordance with the following parameters:

	<i>'Moderate' policy</i>	<i>'Aggressive' policy</i>
Receivables and inventory	– 20%	– 30%
Cash	Reduce to \$250,000	Reduce to \$100,000
Non-current assets	No change	No change
Current liabilities	+ 10%	+ 20%
Forecast sales	+ 2%	+ 4%
Forecast profit	No change in percentage profit/sales.	

Required:

Write a report to the Finance Director that includes the following:

- (a) A discussion of the main aspects to consider when determining policy in respect of the investment in, and financing of, working capital, in general and in the circumstances of ZX. (10 marks)

- (b) Calculations of the return on net assets and the current ratio under each of three scenarios shown below:
- the company continues with its present policy
 - the company adopts the 'moderate' policy
 - the company adopts the 'aggressive' policy. (8 marks)
- (c) A recommendation to the company of a proposed course of action. Your recommendation should be based on your evaluation as discussed above and on your opinion of what further action is necessary before a final decision can be taken. (7 marks)
- (Total: 25 marks)**

QUESTION 3

Emlyn Co is a company which owns and runs a large chain of bookshops located throughout the UK. Over the past three years the company has struggled to maintain its market share in the face of fierce competition from internet retailers and from large supermarket chains. Consequently, the company's share price has fallen from £4.33 three years ago, to £2.71 at the end of last week, and all three of the big credit rating agencies (Moody's, Fitch and Standard and Poor's) have downgraded Emlyn Co's rating on its corporate bonds.

Then, last weekend, an article by a respected financial analyst in The Sunday Times advised shareholders to sell their shares in Emlyn Co immediately. In 3 days of trading this week, the share price has fallen further, and now stands at £2.12.

The directors of Emlyn Co have just held an emergency board meeting. They have discussed the firm's current plight, and have decided that the firm needs to reduce risk, secure future growth, and to ultimately aim to improve shareholder wealth.

In an attempt to achieve all three of these objectives, the directors have decided to consider a new strategy of diversification, by attempting to acquire an underperforming business in a different business sector.

You are an advisor to the board of directors. You have been asked to prepare some briefing notes in advance of next week's follow-up board meeting.

Required:

- (a) Briefly discuss whether diversification through acquisition is an effective means of reducing risk and securing future growth. (7 marks)
- (b) Explain how a takeover may lead to an increase in wealth for the bidding company's shareholders. (6 marks)
- (c) Explain why a takeover may fail to deliver an expected increase in wealth for the bidding company's shareholders. (7 marks)
- (d) Briefly outline the role that financial analysts play in creating an efficient stock market. (5 marks)
- (Total: 25 marks)**

QUESTION 4

Wyddfa Co is a medical research business that has recently patented a device which enables medical professionals to administer vaccinations without the use of needles. The new device has incurred total costs to date of £4.5 million, of which £0.5 million relates to consultancy fees that are due for payment in three months' time. The device is now fully developed and ready to launch; however, the directors of the company have still to decide which of three mutually exclusive options available should be pursued. These options are as follows:

Option 1: Manufacture the device in the UK

Wyddfa Co could manufacture and sell the device itself. This would involve immediately purchasing the necessary plant and equipment at a cost of £8.5 million, which would then be installed in part of the company's premises that is currently unused. Production of the new device could begin immediately and over the expected four-year life of the device, sales are forecast to be as follows:

	Year 1	Year 2	Year 3	Year 4
Forecast sales (000's units)	450	650	300	200
Expected selling price per unit	£35	£35	£30	£25

This option would require an immediate injection of working capital of £1.2 million, which could be released at the end of the expected life of the device. The plant and equipment would have no further use at the end of the four-year period and could be sold for an estimated £2.0 million at that point. The variable costs associated with producing and selling the device are estimated at £6 per unit and estimated annual fixed costs are as follows:

	£m
Manufacturing	4.4
Selling, administration and distribution	3.2
Total	7.6

Manufacturing fixed costs include an annual depreciation charge of £1.5 million.

Option 2: Outsource the manufacturing to India

Wyddfa Co could allow another company to manufacture the device in India. Under this option, sales volumes are expected to be 20% higher than those predicted under Option 1 above as greater manufacturing capacity will be available. The terms of a proposed agreement with the manufacturer requires that Wyddfa Co provides the manufacturer with an interest-free loan of 210 million Rupees (Rp) immediately in order to help re-equip a factory and that this amount will be repaid in three years' time. The terms also state that each device will be purchased from the manufacturer for 2100 Rp and that extended credit will be available so that payment to the manufacturer will be made one year after sale. Selling, administration and distribution costs of Wyddfa Co would be reduced by £0.4 million per year under this option.

The current rate of exchange is £/Rp 70.0 (that is £1 = 70 Rp). Over the next 5 years, the £ is expected to strengthen by 2% per annum against the Rupee.

Option 3: Sell the patent rights

Wyddfa Co could sell the patent rights to a large international pharmaceutical business for £7.5 million immediately.

Other information

Wyddfa Co has a cost of capital of 12%. Under a government scheme which exempts research companies from tax, Wyddfa Co will pay no tax over the term of the next parliament (5 years).

Required:

- (a) Calculate the net present value in £ of each option available to Wyddfa Co. (11 marks)
- (b) Evaluate how other relevant factors might affect the decision, and advise Wyddfa Co how to proceed. (14 marks)
- (Total: 25 marks)

A report format is not required for this question.

TABLES AND FORMULAE

Present value of 1.00 unit of currency i.e. $(1 + r)^{-n}$ where r = interest rate, n = number of periods until payment or receipt.

Periods (n)	Interest rates (r)									
	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	.990	.980	.971	.962	.952	.943	.935	.926	.917	.909
2	.980	.961	.943	.925	.907	.890	.873	.857	.842	.826
3	.971	.942	.915	.889	.864	.840	.816	.794	.772	.751
4	.961	.924	.888	.855	.823	.792	.763	.735	.708	.683
5	.951	.906	.863	.822	.784	.747	.713	.681	.650	.621
6	.942	.888	.837	.790	.746	.705	.666	.630	.596	.564
7	.933	.871	.813	.760	.711	.665	.623	.583	.547	.513
8	.923	.853	.789	.731	.677	.627	.582	.540	.502	.467
9	.914	.837	.766	.703	.645	.592	.544	.500	.460	.424
10	.905	.820	.744	.676	.614	.558	.508	.463	.422	.386
11	.896	.804	.722	.650	.585	.527	.475	.429	.388	.350
12	.887	.788	.701	.625	.557	.497	.444	.397	.356	.319
13	.879	.773	.681	.601	.530	.469	.415	.368	.326	.290
14	.870	.758	.661	.577	.505	.442	.388	.340	.299	.263
15	.861	.743	.642	.555	.481	.417	.362	.315	.275	.239
16	.853	.728	.623	.534	.458	.394	.339	.292	.252	.218
17	.844	.714	.605	.513	.436	.371	.317	.270	.231	.198
18	.836	.700	.587	.494	.416	.350	.296	.250	.212	.180
19	.828	.686	.570	.475	.396	.331	.277	.232	.194	.164
20	.820	.673	.554	.456	.377	.312	.258	.215	.178	.149

Periods (n)	Interest rates (r)									
	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%
1	.901	.893	.885	.877	.870	.862	.855	.847	.840	.833
2	.812	.797	.783	.769	.756	.743	.731	.718	.706	.694
3	.731	.712	.693	.675	.658	.641	.624	.609	.593	.579
4	.659	.636	.613	.592	.572	.552	.534	.516	.499	.482
5	.593	.567	.543	.519	.497	.476	.456	.437	.419	.402
6	.535	.507	.480	.456	.432	.410	.390	.370	.352	.335
7	.482	.452	.425	.400	.376	.354	.333	.314	.296	.279
8	.434	.404	.376	.351	.327	.305	.285	.266	.249	.233
9	.391	.361	.333	.308	.284	.263	.243	.225	.209	.194
10	.352	.322	.295	.270	.247	.227	.208	.191	.176	.162
11	.317	.287	.261	.237	.215	.195	.178	.162	.148	.135
12	.286	.257	.231	.208	.187	.168	.152	.137	.124	.112
13	.258	.229	.204	.182	.163	.145	.130	.116	.104	.093
14	.232	.205	.181	.160	.141	.125	.111	.099	.088	.078
15	.209	.183	.160	.140	.123	.108	.095	.084	.074	.065
16	.188	.163	.141	.123	.107	.093	.081	.071	.062	.054
17	.170	.146	.125	.108	.093	.080	.069	.060	.052	.045
18	.153	.130	.111	.095	.081	.069	.059	.051	.044	.038
19	.138	.116	.098	.083	.070	.060	.051	.043	.037	.031
20	.124	.104	.087	.073	.061	.051	.043	.037	.031	.026

Cumulative present value of 1.00 unit of currency per annum

Receivable or payable at the end of each year for n years $\frac{1-(1+r)^{-n}}{r}$.

Periods (n)	Interest rates (r)									
	1%	2%	3%	4%	5%	6%	7%	8%	9%	10%
1	0.990	0.980	0.971	0.962	0.952	0.943	0.935	0.926	0.917	0.909
2	1.970	1.942	1.913	1.886	1.859	1.833	1.808	1.783	1.759	1.736
3	2.941	2.884	2.829	2.775	2.723	2.673	2.624	2.577	2.531	2.487
4	3.902	3.808	3.717	3.630	3.546	3.465	3.387	3.312	3.240	3.170
5	4.853	4.713	4.580	4.452	4.329	4.212	4.100	3.993	3.890	3.791
6	5.795	5.601	5.417	5.242	5.076	4.917	4.767	4.623	4.486	4.355
7	6.728	6.472	6.230	6.002	5.786	5.582	5.389	5.206	5.033	4.868
8	7.652	7.325	7.020	6.733	6.463	6.210	5.971	5.747	5.535	5.335
9	8.566	8.162	7.786	7.435	7.108	6.802	6.515	6.247	5.995	5.759
10	9.471	8.983	8.530	8.111	7.722	7.360	7.024	6.710	6.418	6.145
11	10.368	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805	6.495
12	11.255	10.575	9.954	9.385	8.863	8.384	7.943	7.536	7.161	6.814
13	12.134	11.348	10.635	9.986	9.394	8.853	8.358	7.904	7.487	7.103
14	13.004	12.106	11.296	10.563	9.899	9.295	8.745	8.244	7.786	7.367
15	13.865	12.849	11.938	11.118	10.380	9.712	9.108	8.559	8.061	7.606
16	14.718	13.578	12.561	11.652	10.838	10.106	9.447	8.851	8.313	7.824
17	15.562	14.292	13.166	12.166	11.274	10.477	9.763	9.122	8.544	8.022
18	16.398	14.992	13.754	12.659	11.690	10.828	10.059	9.372	8.756	8.201
19	17.226	15.679	14.324	13.134	12.085	11.158	10.336	9.604	8.950	8.365
20	18.046	16.351	14.878	13.590	12.462	11.470	10.594	9.818	9.129	8.514

Periods (n)	Interest rates (r)									
	11%	12%	13%	14%	15%	16%	17%	18%	19%	20%
1	0.901	0.893	0.885	0.877	0.870	0.862	0.855	0.847	0.840	0.833
2	1.713	1.690	1.668	1.647	1.626	1.605	1.585	1.566	1.547	1.528
3	2.444	2.402	2.361	2.322	2.283	2.246	2.210	2.174	2.140	2.106
4	3.102	3.037	2.974	2.914	2.855	2.798	2.743	2.690	2.639	2.589
5	3.696	3.605	3.517	3.433	3.352	3.274	3.199	3.127	3.058	2.991
6	4.231	4.111	3.998	3.889	3.784	3.685	3.589	3.498	3.410	3.326
7	4.712	4.564	4.423	4.288	4.160	4.039	3.922	3.812	3.706	3.605
8	5.146	4.968	4.799	4.639	4.487	4.344	4.207	4.078	3.954	3.837
9	5.537	5.328	5.132	4.946	4.772	4.607	4.451	4.303	4.163	4.031
10	5.889	5.650	5.426	5.216	5.019	4.833	4.659	4.494	4.339	4.192
11	6.207	5.938	5.687	5.453	5.234	5.029	4.836	4.656	4.486	4.327
12	6.492	6.194	5.918	5.660	5.421	5.197	4.968	4.793	4.611	4.439
13	6.750	6.424	6.122	5.842	5.583	5.342	5.118	4.910	4.715	4.533
14	6.982	6.628	6.302	6.002	5.724	5.468	5.229	5.008	4.802	4.611
15	7.191	6.811	6.462	6.142	5.847	5.575	5.324	5.092	4.876	4.675
16	7.379	6.974	6.604	6.265	5.954	5.668	5.405	5.162	4.938	4.730
17	7.549	7.120	6.729	6.373	6.047	5.749	5.475	5.222	4.990	4.775
18	7.702	7.250	6.840	6.467	6.128	5.818	5.534	5.273	5.033	4.812
19	7.839	7.366	6.938	6.550	6.198	5.877	5.584	5.316	5.070	4.843
20	7.963	7.469	7.025	6.623	6.259	5.929	5.628	5.353	5.101	4.870

VALUATION MODELS

- (i) Irredeemable preference shares, paying a constant annual dividend, d , in perpetuity, where P_0 is the ex-div value:

$$P_0 = \frac{d}{k_{\text{pref}}}$$

- (ii) Ordinary (Equity) shares, paying a constant annual dividend, d , in perpetuity, where P_0 is the ex-div value:

$$P_0 = \frac{d}{k_e}$$

- (iii) Ordinary (Equity) shares, paying an annual dividend, d , growing in perpetuity at a constant rate, g , where P_0 is the ex-div value:

$$P_0 = \frac{d_1}{k_e - g} \quad \text{or} \quad P_0 = \frac{d_0[1+g]}{k_e - g}$$

- (iv) Irredeemable bonds, paying annual after tax interest, $i(1 - t)$, in perpetuity, where P_0 is the ex-interest value:

$$P_0 = \frac{i[1-t]}{k_{\text{dnet}}}$$

or, without tax:

$$P_0 = \frac{i}{k_d}$$

- (v) Total value of the geared firm, V_g (based on MM):

$$V_g = V_u + TB$$

- (vi) Future value S , of a sum X , invested for n periods, compounded at $r\%$ interest:

$$S = X[1+r]^n$$

- (vii) Present value of 1.00 unit of currency payable or receivable in n years, discounted at $r\%$ per annum:

$$PV = \frac{1}{[1+r]^n}$$

- (viii) Present value of an annuity of 1.00 unit of currency per annum, receivable or payable for n years, commencing in one year, discounted at r% per annum:

$$PV = \frac{1}{r} \left[1 - \frac{1}{[1+r]^n} \right]$$

- (ix) Present value of 1.00 unit of currency per annum, payable or receivable in perpetuity, commencing in one year, discounted at r% per annum:

$$PV = \frac{1}{r}$$

- (x) Present value of 1.00 unit of currency per annum, receivable or payable, commencing in one year, growing in perpetuity at a constant rate of g% per annum, discounted at r% per annum:

$$PV = \frac{1}{r - g}$$

COST OF CAPITAL

- (i) Cost of irredeemable preference shares, paying an annual dividend d in perpetuity, and having a current ex-div price P_0 :

$$k_{\text{pref}} = \frac{d}{P_0}$$

- (ii) Cost of irredeemable bonds, paying annual net interest $i(1 - t)$, and having a current ex-interest price P_0 :

$$k_{\text{dnet}} = \frac{i[1 - t]}{P_0}$$

- (iii) Cost of ordinary (Equity) share capital, paying an annual dividend d in perpetuity, and having a current ex-div price P_0 :

$$k_e = \frac{d}{P_0}$$

- (iv) Cost of ordinary (Equity) shares, having a current ex-div price, P_0 , having just paid a dividend, d_0 , with the dividend growing in perpetuity by a constant g% per annum:

$$k_e = \frac{d_1}{P_0} + g \quad \text{or} \quad k_e = \frac{d_0[1 + g]}{P_0} + g$$

- (v) Cost of ordinary (Equity) shares, using the CAPM:

$$k_e = R_f + [R_m - R_f] \beta$$

(vi) Cost of ordinary (Equity) share capital in a geared entity:

$$k_{eg} = k_{eu} + [k_{eu} - k_d] \frac{V_D[1-t]}{V_E}$$

(vii) Weighted average cost of capital, k_0 or WACC:

$$WACC = k_e \left[\frac{V_E}{V_E + V_D} \right] + k_d(1-t) \left[\frac{V_D}{V_E + V_D} \right]$$

(viii) Adjusted cost of capital (MM formula):

$$k_{adj} = k_{eu}[1-tL] \quad \text{or} \quad r^* = r[1-T*L]$$

(ix) Ungear β :

$$\beta_u = \beta_g \left[\frac{V_E}{V_E + V_D(1-t)} \right] + \beta_d \left[\frac{V_D(1-t)}{V_E + V_D(1-t)} \right]$$

(x) Regear β :

$$\beta_g = \beta_u + [\beta_u - \beta_d] \frac{V_D(1-t)}{V_E}$$

(xi) Adjusted discount rate to use in international capital budgeting (International Fisher Effect):

$$\frac{1 + \text{annual discount rate B\$}}{1 + \text{annual discount rate A\$}} = \frac{\text{Future Spot Rate A\$/B\$ in 12 months' time}}{\text{Spot rate A\$/B\$}}$$

where A\$/B\$ is the number of B\$ to each A\$

OTHER FORMULAE

(i) Expectations theory:

$$\text{Future spot rate A\$/B\$} = \text{Spot rate A\$/B\$} \times \frac{1 + \text{nominal country B interest rate}}{1 + \text{nominal country A interest rate}}$$

where A\$/B\$ is the number of B\$ to each A\$, and

A\$ is the currency of country A and B\$ is the currency of country B

(ii) Purchasing Power Parity (Law of one price):

$$\text{Future spot rate A\$/B\$} = \text{Spot rate A\$/B\$} \times \frac{1 + \text{country B inflation rate}}{1 + \text{country A inflation rate}}$$

(iii) Link between nominal (money) and real interest rates:

$$[1 + \text{nominal (money) rate}] = [1 + \text{real interest rate}] [1 + \text{inflation rate}]$$

(iv) Equivalent annual cost:

$$\text{Equivalent annual cost} = \frac{\text{PV of costs over n years}}{\text{n year annuity factor}}$$

(v) Theoretical ex-rights price:

$$\text{TERP} = \frac{1}{N+1} [(N \times \text{cum rights price}) + \text{issue price}]$$

(vi) Value of a right:

$$\frac{\text{Theoretical ex rights price} - \text{Issue price}}{N}$$

where N = number of rights required to buy one share.