CIMA

Financial Management Pillar

Strategic Level Paper

P9 – Management Accounting Financial Strategy

22 November 2006 – Wednesday Morning Session

Instructions to candidates

You are allowed three hours to answer this question paper.

You are allowed 20 minutes reading time **before the examination begins** during which you should read the question paper and, if you wish, make annotations on the question paper. However, you will **not** be allowed, **under any circumstances**, to open the answer book and start writing or use your calculator during the reading time.

You are strongly advised to carefully read ALL the question requirements before attempting the question concerned (that is, all parts and/or sub-questions). The question requirements are highlighted in a dotted box.

Answer the ONE compulsory question in Section A on pages 2 to 5. The question requirements are on page 5, which is detachable for ease of reference.

Answer TWO of the four questions in Section B on pages 8 to 15.

Maths Tables and Formulae are provided on pages 17 to 21. These are detachable for ease of reference.

Write your full examination number, paper number and the examination subject title in the spaces provided on the front of the examination answer book. Also write your contact ID and name in the space provided in the right hand margin and seal to close.

Tick the appropriate boxes on the front of the answer book to indicate which questions you have answered.

P9 – Financial Strategy

TURN OVER

SECTION A – 50 MARKS

[the indicative time for answering this Section is 90 minutes]

READ THE SCENARIO AND ANSWER THIS QUESTION. THE QUESTION
REQUIREMENTS ARE ON PAGE 5, WHICH IS DETACHABLE FOR EASE OF
REFERENCE

Question One Scenario

SHINE

Business background
SHINE is a publicly owned multinational group based in Germany with its main business centred
on the production and distribution of gas and electricity to industrial and domestic consumers. It
has recently begun investing in research and development in relation to renewable energy,
exploiting solar, wave or wind energy to generate electricity.

Corporate objectives
Developing renewable energy sources is an important non-financial objective for the SHINE
Group in order to protect and enhance the group's reputation. Renewable energy projects have
been given a high profile in recent investor communications and television advertising
campaigns.

Wind farm investment project
The latest renewable energy project under consideration is the development of a wind farm in
the USA. This would involve the construction of 65 wind powered electricity generators which
would be owned and operated by a new, local subsidiary entity and electricity that is generated
by the farm would be sold to the local electricity grid. A suitable site, subject to planning
permission, has been located.

Forecast operating cash flows for the project are as follows:

	Year(s)	US$ million
Initial investment	0	200
(including working capital)		
Residual value	4	50
Pre-tax operating net cash inflows	1 to 4	70

Other relevant data and assumptions:

- The initial investment is expected to be made on 30 November 2006 and cash flows will
  arise at any point in the year;

- However, in any net present value (NPV) exercise, all cash flows should be assumed to
  arise on 31 December of each year;

- The local tax rate in the USA for this industry is set at a preferential rate of 10% to
  encourage environmentally-friendly projects rather than the normal rate of 25%;

- Tax is payable in the year in which it arises;

- No tax depreciation allowances are available;

- No additional tax is payable in Germany under the terms of the double tax treaties with
  the USA;

- Net cash flows are to be paid to the German parent entity as dividends at the end of each
  year.

Uncertainties affecting the outcome of the project

There is some uncertainty over the US tax rate over the period of the project, with extensive discussion at local government level about raising the tax rate to 25% with immediate effect. A vote will be taken in the next six months to decide whether to retain the preferential 10% tax rate, or to increase it to 25%. Once the vote has been taken and a decision made, the tax rate will not be open for debate again for at least four years.

Economic forecasters expect the value of the euro to either stay constant against the value of the US dollar for the next four years or to strengthen by 7% per annum. Assume that there is an equal probability of each of these two different exchange rate forecasts.

There is also significant risk to the project from strong objections to the wind farm scheme from local farmers in the USA who are concerned about the impact of acid water run-off from boring holes for the 65 windmills. In addition, there are a number of executive holiday homes nearby whose owners are objecting to the visual impact of the windmills.

Investment criteria

The SHINE Group evaluates foreign projects of this nature based on a euro cost of capital of 12% which reflects the risk profile of the proposed investment.

Extracts from the forecast financial statements for the SHINE Group at 31 December 2006, the end of the current financial year*:*

	€ million	*€ million*
ASSETS		
Total assets		28,000
EQUITY AND LIABILITIES		
Equity		
Share capital	3,000	
(3,000 million €1 ords)		
Retained earnings	8,300	
		11,300
Non-current liabilities		
Floating rate borrowings		4,000
Current liabilities		12,700
		28,000

Alternative financing methods

The SHINE Group aims to maintain the group gearing ratio (debt as a proportion of debt plus equity) below 40% based on book values.

The following alternative methods are being considered by the SHINE parent entity for financing the new investment:

- Long-term borrowings denominated in euro;

- Long-term borrowings denominated in US dollars.

The question requirements are on page 5, which is detachable for ease of reference

TURN OVER

[this page is blank]

Required:

(a) Calculate the NPV of the cash flows for the proposed investment for **each** of the following four possible scenarios:

- Constant exchange rate and a tax rate of 10%;
- Constant exchange rate and a tax rate of 25%;
- The euro to strengthen against the US dollar by 7% a year and a tax rate of 10%;
- The euro to strengthen against the US dollar by 7% a year and a tax rate of 25%.

In each case, assume that the exchange rate at year 0 is US$1·10 = €1·00.

(12 marks)

(b) Prepare the forecast balance sheet of the SHINE Group on 31 December 2006, incorporating the project under each of the two alternative financing structures and each of the following two exchange rate scenarios A and B:

Date	Exchange rates under scenario A	Exchange rates under scenario B
30 November 2006 (date of the initial investment and arrangement of financing)	US$1·10 = €1·00	US$1·10 = €1·00
31 December 2006 (financial reporting/balance sheet date)	US$1·10 = €1·00 (no change)	US$1·40 = €1·00

Assume that no other project cash flows occur until 2007.

(8 marks)

(c) Write a report addressed to the Directors of the SHINE Group in which you, as Finance Director, address the following issues relating to the evaluation and implementation of the proposed wind farm project:

(i) Discuss the internal and external constraints affecting the investment decision and advise the SHINE Group how to proceed. In your answer, include reference to your calculations in part *(a)* above.

(9 marks)

(ii) Discuss the comparative advantages of each of the two proposed alternative financing structures and advise the SHINE group which one to adopt. In your answer include reference to your results in part *(b)* above, and further analysis and discussion of the impact of each proposed financial structure on the group's balance sheet.

(9 marks)

(iii) Discuss the differing roles and responsibilities of the treasury department and finance department in evaluating and implementing the US project and the interaction of the two departments throughout the process.

(8 marks)

Marks available for structure and presentation in Question One.　　　*(4 marks)*

(Total for Question One = 50 marks)

(Total for Section A = 50 marks)

End of Section A

[This page is blank]

[Section B starts on the next page]

Question Two

AB is a telecommunications consultancy based in Europe that trades globally. It was established 15 years ago. The four founding shareholders own 25% of the issued share capital each and are also executive directors of the entity. The shareholders are considering a flotation of AB on a European stock exchange and have started discussing the process and a value for the entity with financial advisors. The four founding shareholders, and many of the entity's employees, are technical experts in their field, but have little idea how entities such as theirs are valued.

Assume you are one of AB's financial advisors. You have been asked to estimate a value for the entity and explain your calculations and approach to the directors. You have obtained the following information.

Summary financial data for the past three years and forecast revenue and costs for the next two years is as follows:

Income Statement for the years ended 31 March

	Actual			Forecast	
	2004	2005	2006	2007	2008
	€ million	€ million	€ million	€ million	€ million
Revenue	125·0	137·5	149·9	172·0	198·0
Less:					
Cash operating costs	37·5	41·3	45·0	52	59
Depreciation	20·0	22·0	48·0	48	48
Pre-tax earnings	67·5	74·2	56·9	72	91
Taxation	20·3	22·3	17·1	22	27

Balance Sheet at 31 March

	2004	2005	2006
	€ million	€ million	€ million
ASSETS			
Non-current assets			
Property, plant and equipment	150	175	201
Current assets	48	54	62
	198	229	263
EQUITY AND LIABILITIES			
Equity			
Share capital (Shares of €1)	30	30	30
Retained earnings	148	179	203
	178	209	233
Current liabilities	20	20	30
	198	229	263

Note: The book valuations of non-current assets are considered to reflect current realisable values.

Other information/assumptions

- Growth in after tax cash flows for 2009 and beyond (assume indefinitely) is expected to be 3% per annum. Cash operating costs can be assumed to remain at the same percentage of revenue as in previous years. Depreciation will fluctuate but, for purposes of evaluation, assume the 2008 charge will continue indefinitely. Tax has been payable at 30% per annum for the last three years. This rate is expected to continue for the foreseeable future and tax will be payable in the year in which the liability arises.

- The average P/E ratio for telecommunication entities' shares quoted on European stock exchanges has been 12·5 over the past 12 months. However, there is a wide variation around this average and AB might be able to command a rating up to 30% higher than this;

- An estimated cost of equity capital for the industry is 10% after tax;

- The average pre-tax return on total assets for the industry over the past 3 years has been 15%.

Required:

(a)

Calculate a range of values for AB, in total and per share, using methods of valuation that you consider appropriate. Where relevant, include an estimate of value for intellectual capital.

(12 marks)

(b)

Discuss the methods of valuation you have used, explaining the relevance of each method to an entity such as AB. Conclude with a recommendation of an approximate flotation value for AB, in total and per share.

(13 marks)

(Total for Question Two = 25 marks)

A report format is **not** required for this question.

Section B continues on the next page

Question Three

VCI is a venture capital investor that specialises in providing finance to small but established businesses. At present, its expected average pre-tax return on equity investment is a nominal 30% per annum over a five-year investment period.

YZ is a typical client of VCI. It is a 100% family owned transport and distribution business whose shares are unlisted. The company sustained a series of losses a few years ago, but the recruitment of some professional managers and an aggressive marketing policy returned the company to profitability. Its most recent accounts show revenue of $105 million and profit before interest and tax of $28·83 million. Other relevant information is as follows:

- For the last three years dividends have been paid at 40% of earnings and the directors have no plans to change this payout ratio;

- Taxation has averaged 28% per annum over the past few years and this rate is likely to continue;

- The directors are forecasting growth in earnings and dividends for the foreseeable future of 6% per annum;

- YZ's accountants estimated the entity's cost of equity capital at 10% some years ago. The data they worked with was incomplete and now out of date. The current cost could be as high as 15%.

Extracts from its most recent balance sheet *at 31 March 2006* are shown below.

	$ million
ASSETS	
Non-current assets	
Property, plant and equipment	35·50
Current assets	4·50
	40·00
EQUITY AND LIABILITIES	
Equity	
Share capital (Nominal value of 10 cents)	2·25
Retained earnings	18·00
	20·25
Non-current liabilities	
7% Secured bond repayable 2016	15·00
Current liabilities	4·75
	19.75
	40·00

Note: The entity's vehicles are mainly financed by operating leases.

YZ has now reached a stage in its development that requires additional capital of $25 million. The directors, and major shareholders, are considering a number of alternative forms of finance. One of the alternatives they are considering is venture capital funding and they have approached VCI. In preliminary discussions, VCI has suggested it might be able to finance the necessary $25 million by purchasing a percentage of YZ's equity. This will, of course, involve YZ issuing new equity.

Required:

(a)

Assume you work for VCI and have been asked to evaluate the potential investment.

(i)   Using YZ's forecast of growth and its estimates of cost of capital, calculate the number of new shares that YZ will have to issue to VCI in return for its investment and the percentage of the entity VCI will then own. Comment briefly on your result.

(9 marks)

(ii)   Evaluate exit strategies that might be available to VCI in five years' time and their likely acceptability to YZ.

(6 marks)

Note: Use sensible roundings in your calculations.

(Total for Requirement (a) = 15 marks)

(b)

Discuss the advantages and disadvantages to an established business such as YZ of using a venture capital entity to provide finance for expansion as compared with long term debt. Advise YZ about which type of finance it should choose, based on the information available so far.

(10 marks)

(Total for Question Three = 25 marks)

A report format is **not** required for this question.

Section B continues on the next page

Question Four

CD is a furniture manufacturer based in the UK. It manufactures a limited range of furniture products to a very high quality and sells to a small number of retail outlets worldwide.

At a recent meeting with one of its major customers it became clear that the market is changing and the final consumer of CD's products is now more interested in variety and choice rather than exclusivity and exceptional quality.

CD is therefore reviewing two mutually exclusive alternatives to apply to a selection of its products:

Alternative 1
To continue to manufacture, but expand its product range and reduce its quality. The net present value (NPV), internal rate of return (IRR) and modified internal rate of return (MIRR) for this alternative have already been calculated as follows:

NPV	=	£1·45 million using a nominal discount rate of 9%
IRR	=	10·5%
MIRR	=	Approximately 13·2%

Alternative 2
To import furniture carcasses in "flat packs" from the USA. The imports would be in a variety of types of wood and unvarnished. CD would buy in bulk from its US suppliers, assemble and varnish the furniture and re-sell, mainly to existing customers. An initial investigation into potential sources of supply and costs of transportation has already been carried out by a consultancy entity at a cost of £75,000.

CD's Finance Director has provided estimates of net sterling and US$ cash flows for this alternative. These net cash flows, in *real* terms, are shown below.

Year	0	1	2	3
US$m	-25·00	2·60	3·80	4·10
£m	0	3·70	4·20	4·60

The following information is relevant:

- CD evaluates all its investments using nominal Sterling cash flows and a nominal discount rate. All non-UK customers are invoiced in US$. US$ nominal cash flows are converted to Sterling at the forward rate and discounted at the UK nominal rate;

- For the purposes of evaluation, assume the entity has a three year time horizon for investment appraisals;

- Based on recent economic forecasts, inflation rates in the US are expected to be constant at 4% per annum. UK inflation rates are expected to be 3% per annum. The current exchange rate is £1 = US$1·6.

Note: Ignore taxation.

The requirement for Question Four is on the opposite page

Required:

Assume that you are the Financial Manager of CD.

(i)   Calculate the net present value (NPV), internal rate of return (IRR) and (approximate) modified internal rate of return (MIRR) of alternative 2.

(12 marks)

(ii)   Briefly discuss the appropriateness and possible advantages of providing MIRRs for the evaluation of the two alternatives.

(4 marks)

(iii)   Evaluate the two alternatives and recommend which alternative the entity should choose. Include in your answer some discussion about what other criteria could or should be considered before a final decision is taken.

(9 marks)

(Total for Question Four = 25 marks)

A report format is **not** required for this question.

Section B continues on the next page

Question Five

(a)

CCC is a local government entity. It is financed almost equally by a combination of central government funding and local taxation. The funding from central government is determined largely on a *per capita* (per head of population) basis, adjusted to reflect the scale of deprivation (or special needs) deemed to exist in CCC's region. A small percentage of its finance comes from the private sector, for example from renting out City Hall for private functions.

CCC's main objectives are:

- To make the region economically prosperous and an attractive place to live and work;
- To provide service excellence in health and education for the local community.

DDD is a large, listed entity with widespread commercial and geographical interests. For historic reasons, its headquarters are in CCC's region. This is something of an anomaly as most entities of DDD's size would have their HQ in a capital city, or at least a city much larger than where it is.

DDD has one financial objective: To increase shareholder wealth by an average 10% per annum. It also has a series of non-financial objectives that deal with how the entity treats other stakeholders, including the local communities where it operates.

DDD has total net assets of $1·5 billion and a gearing ratio of 45% (debt to debt plus equity), which is typical for its industry. It is currently considering raising a substantial amount of capital to finance an acquisition.

Required:

Discuss the criteria that the two very different entities described above have to consider when setting objectives, recognising the needs of each of their main stakeholder groups. Make some reference in your answer to the consequences of each of them failing to meet its declared objectives.

(13 marks)

(b)

MS is a private entity in a computer-related industry. It has been trading for six years and is managed by its main shareholders, the original founders of the entity. Most of the employees are also shareholders, having been given shares as bonuses. None of the shareholders has attempted to sell shares in the entity so the problem of placing a value on them has not arisen. Dividends have been paid every year at the rate of 60 cents per share, irrespective of profits. So far, profits have always been sufficient to cover the dividend at least once but never more than twice.

MS is all-equity financed at present although $15 million new finance is likely to be required in the near future to finance expansion. Total net assets as at the last balance sheet date were $45 million.

The requirement for Question Five part (b) is on the opposite page

(Total for Section B = 50 marks)

End of Question Paper

Maths Tables & Formulae are on pages 17-21

TURN OVER

[this page is blank]

MATHS TABLES AND FORMULAE

Present value table

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

Periods	Interest rates (r)									
(n)	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	0.980	0.961	0.943	0.925	0.907	0.890	0.873	0.857	0.842	0.826
3	0.971	0.942	0.915	0.889	0.864	0.840	0.816	0.794	0.772	0.751
4	0.961	0.924	0.888	0.855	0.823	0.792	0.763	0.735	0.708	0.683
5	0.951	0.906	0.863	0.822	0.784	0.747	0.713	0.681	0.650	0.621
6	0.942	0.888	0.837	0.790	0.746	0705	0.666	0.630	0.596	0.564
7	0.933	0.871	0.813	0.760	0.711	0.665	0.623	0.583	0.547	0.513
8	0.923	0.853	0.789	0.731	0.677	0.627	0.582	0.540	0.502	0.467
9	0.914	0.837	0.766	0.703	0.645	0.592	0.544	0.500	0.460	0.424
10	0.905	0.820	0.744	0.676	0.614	0.558	0.508	0.463	0.422	0.386
11	0.896	0.804	0.722	0.650	0.585	0.527	0.475	0.429	0.388	0.350
12	0.887	0.788	0.701	0.625	0.557	0.497	0.444	0.397	0.356	0.319
13	0.879	0.773	0.681	0.601	0.530	0.469	0.415	0.368	0.326	0.290
14	0.870	0.758	0.661	0.577	0.505	0.442	0.388	0.340	0.299	0.263
15	0.861	0.743	0.642	0.555	0.481	0.417	0.362	0.315	0.275	0.239
16	0.853	0.728	0.623	0.534	0.458	0.394	0.339	0.292	0.252	0.218
17	0.844	0.714	0.605	0.513	0.436	0.371	0.317	0.270	0.231	0.198
18	0.836	0.700	0.587	0.494	0.416	0.350	0.296	0.250	0.212	0.180
19	0.828	0.686	0.570	0.475	0.396	0.331	0.277	0.232	0.194	0.164
20	0.820	0.673	0.554	0.456	0.377	0.312	0.258	0.215	0.178	0.149

Periods	Interest rates (r)									
(n)	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	0.812	0.797	0.783	0.769	0.756	0.743	0.731	0.718	0.706	0.694
3	0.731	0.712	0.693	0.675	0.658	0.641	0.624	0.609	0.593	0.579
4	0.659	0.636	0.613	0.592	0.572	0.552	0.534	0.516	0.499	0.482
5	0.593	0.567	0.543	0.519	0.497	0.476	0.456	0.437	0.419	0.402
6	0.535	0.507	0.480	0.456	0.432	0.410	0.390	0.370	0.352	0.335
7	0.482	0.452	0.425	0.400	0.376	0.354	0.333	0.314	0.296	0.279
8	0.434	0.404	0.376	0.351	0.327	0.305	0.285	0.266	0.249	0.233
9	0.391	0.361	0.333	0.308	0.284	0.263	0.243	0.225	0.209	0.194
10	0.352	0.322	0.295	0.270	0.247	0.227	0.208	0.191	0.176	0.162
11	0.317	0.287	0.261	0.237	0.215	0.195	0.178	0.162	0.148	0.135
12	0.286	0.257	0.231	0.208	0.187	0.168	0.152	0.137	0.124	0.112
13	0.258	0.229	0.204	0.182	0.163	0.145	0.130	0.116	0.104	0.093
14	0.232	0.205	0.181	0.160	0.141	0.125	0.111	0.099	0.088	0.078
15	0.209	0.183	0.160	0.140	0.123	0.108	0.095	0.084	0.079	0.065
16	0.188	0.163	0.141	0.123	0.107	0.093	0.081	0.071	0.062	0.054
17	0.170	0.146	0.125	0.108	0.093	0.080	0.069	0.060	0.052	0.045
18	0.153	0.130	0.111	0.095	0.081	0.069	0.059	0.051	0.044	0.038
19	0.138	0.116	0.098	0.083	0.070	0.060	0.051	0.043	0.037	0.031
20	0.124	0.104	0.087	0.073	0.061	0.051	0.043	0.037	0.031	0.026

Cumulative present value of 1.00 unit of currency per annum

Receivable or Payable at the end of each year for *n* years $\left[\dfrac{1-(1+r)^{-n}}{r} \right]$

Periods	Interest rates (*r*)									
(*n*)	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	Interest rates (*r*)									
(*n*)	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	4.988	7.793	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

FORMULAE

Valuation models

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

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

(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:

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

or, without tax: $$P_0 = \frac{i}{k_d}$$

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

$$V_g = V_u + TB_c$$

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

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

(vii)   Present value of 1·00 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 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 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 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:

$$k_{d\,\text{net}} = \frac{i[1 - t]}{P_0}$$

(iii)   Cost of ordinary (equity) shares, 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:

$$k_e = R_f + [R_m - R_f]\,\text{ß}$$

(vi)   Cost of ordinary (equity) shares in a geared firm (no tax):

$$k_{eg} = k_0 + [k_o - k_d]\,\frac{V_D}{V_E}$$

(vii)   Cost of ordinary (equity) share capital in a geared firm (with tax):

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

(viii) Weighted average cost of capital, k_0:

$$k_0 = k_{eg}\left[\frac{V_E}{V_E + V_D}\right] + k_d\left[\frac{V_D}{V_E + V_D}\right]$$

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

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

In the following formulae, ß_u is used for an ungeared ß and ß_g is used for a geared ß:

(x) ß_u from ß_g, taking ß_d as zero (no tax):

$$\text{ß}_u = \text{ß}_g\left[\frac{V_E}{V_E + V_D}\right]$$

(xi)   If ß_d is not zero:

$$\text{ß}_u = \text{ß}_g\left[\frac{V_E}{V_E + V_D}\right] + \text{ß}_d\left[\frac{V_D}{V_D + V_E}\right]$$

(xii) ß_u from ß_g, taking ß_d as zero (with tax):

$$\text{ß}_u = \text{ß}_g\left[\frac{V_E}{V_E + V_D\,[1 - t]}\right]$$

(xiii)   Adjusted discount rate to use in international capital budgeting using interest rate parity:

$$\frac{1+ \text{annual discount rate C\$}}{1+ \text{annual discount rate euro}} = \frac{\text{Exchange rate in 12 months' time C\$/euro}}{\text{Spot rate C\$/euro}}$$

Other formulae

(i)   Interest rate parity (international Fisher effect):

$$\text{Forward rate US\$/£} = \text{Spot US\$/£} \times \frac{1+ \text{nominal US interest rate}}{1+ \text{nominal UK interest rate}}$$

(ii)   Purchasing power parity (law of one price):

$$\text{Forward rate US\$/£} = \text{Spot US\$/£} \times \frac{1+ \text{US inflation rate}}{1+ \text{UK inflation rate}}$$

(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:

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

(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:

$$\text{Value of a right} = \frac{\text{Rights on price} - \text{issue price}}{N + 1}$$

or

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

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

[this page is blank]

Financial Management Pillar

Strategic Level Paper

P9 – Management Accounting Financial Strategy

November 2006

Wednesday Morning Session