



Financial Management Pillar

Strategic Level Paper

P9 – Management Accounting
Financial Strategy

23 November 2005 – 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 7 to 13.

Maths Tables and Formulae are provided on pages 15 to 19. 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 THE QUESTION. THE QUESTION REQUIREMENTS ARE ON PAGE 5, WHICH IS DETACHABLE FOR EASE OF REFERENCE

Question One

Scenario

GAS plc

Description of the business

GAS plc is an international energy entity with a head office in the UK. Through its principal operating subsidiaries based in the UK and elsewhere in Europe, it generates electricity and supplies gas and electricity via energy supply networks across Europe.

GAS plc's strategy is to generate future growth through investment in new power stations, energy supply networks and gas storage assets. Its current focus for new investment is Bustan, a large Asian country that is in urgent need of major improvements in its electricity generation and supply systems to support the recent rapid increase in industrial production.

Group profile

On 31 December 2004, GAS plc had 1,200 million 50 pence ordinary shares in issue and a share price of 335 pence ex-dividend. Shareholders expect a return on equity of 9.4%.

Dividends for GAS plc for the year ended 31 December 2004 were 14 pence a share, maintaining the 5% annual increase in dividends that has been achieved in recent years. For simplicity, dividends should be assumed to be declared and paid on 31 December each year.

Investment project

The new investment in Bustan has been at the planning stage since the beginning of 2004 when the government of Bustan first invited proposals for a large construction project from interested parties.

The project was evaluated over a 10-year period beginning January 2005 and the project net operating cashflows in B\$, the local currency of Bustan, were estimated to be as follows:

	<i>B\$ million</i>
Year 1	20
Year 2	150
Year 3	250
Years 4-10	300

All cash flows should be assumed to arise on 31 December of each year. It should also be assumed that annual cash flows, less tax, are paid across to the UK on the final day of each year.

The cost of the initial investment in plant and other equipment at the beginning of January 2005 was B\$700 million and this is subject to depreciation charged in the subsidiary accounts on a straight line basis at 5% per annum. An additional B\$50 million was required to finance working capital at the beginning of January 2005.

Tax

Bustan charges entity tax at a preferential rate of 20% for the first 10 years of such investment projects, rather than the normal rate of 40%. In Bustan, tax depreciation allowances are calculated on the same basis as accounting depreciation allowances. The tax rate in the UK is 30%, but a double tax treaty allows taxes charged in Bustan to be deducted from UK taxes charged in the same period. Assume that Bustan taxes are payable in the year in which they are incurred and that UK taxes are payable one year in arrears.

Exchange rates

At 31 December 2004, the spot exchange rate was £1 = B\$0.7778. The B\$ is expected to weaken against the British pound (sterling) in line with the differential in long term interest rates between the two countries over the life of the project. Long term interest rates are expected to remain stable at 4.8% per annum in the UK and 10% per annum in Bustan for the foreseeable future.

Financing the project

The total initial investment of B\$750 million was funded by GAS plc at the beginning of 2005. The B\$700 million investment in plant and equipment was funded by a rights issue and the B\$50 million working capital requirement out of surplus cash.

GAS plc evaluated the project on the basis of a realisable residual value of B\$350 million for the plant and equipment and that 80% of the investment in working capital would be realised at the end of the project. Both these amounts are to be repaid in full to the UK without any taxes payable in either Bustan or the UK.

Press statements

In June 2004, GAS plc issued a press statement announcing its intention to submit a proposal for the project. On the same day, it announced its plans to use a 1 for 4 rights issue to fund the B\$700 million capital investment in the event of the proposal being accepted.

GAS plc's proposal was accepted on 1 January 2005 and a press release issued to announce the acceptance of the proposal and GAS plc's intention to proceed with the project without delay. The press statement also announced GAS plc's intention to temporarily reduce dividend growth rates during the development stage of the project. Revised dividend plans are as follows:

2005-2007	Dividend per share to be frozen at December 2004 levels
2008 onwards	7% per annum growth

Investment criteria

Criterion 1

GAS plc requires overseas projects to generate an accounting rate of return in the overseas country, which is Bustan in this instance, of at least 25% per annum. Accounting rate of return is defined as:

$$\frac{\text{average annual accounting profit before interest and taxes}}{\text{average annual (written down) investment}}$$

Criterion 2

GAS plc also assesses investment projects based on the net present value of the cashflows and applies a risk-adjusted *sterling* discount rate of 10.5% to overseas projects of this nature.

The question requirements are on page 5

TURN OVER

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Question One

Required:

- (a) Show, by calculation, that the proposed investment project in Bustan met the two minimum investment criteria set by GAS plc. *(18 marks)*
- (b) Discuss the major risk issues that should have been considered by GAS plc when evaluating the project. *(7 marks)*
- (c) The board of GAS plc has been concerned about the unusually volatile movements in the entity's share price in 2004 and 2005 and has asked you, an external management consultant, to draft a report to the board of GAS plc that critically addresses the issues detailed below. Assume a semi-strong efficient market applies.
- (i) Explain the possible reasons for the unusually volatile movements in GAS plc's share price in the twelve months up to and including 1 January 2005. No calculations are required. *(6 marks)*
- (ii) Advise what would have been a fair market price for GAS plc's shares in January 2005 following the announcement of the acceptance of the proposal and after adjusting for the proposed rights issue. As part of your answer, calculate GAS plc's share price on each of the bases listed below and discuss the relevance of each result in determining a fair market price for the entity's shares:
- the theoretical ex-rights price *before* adjusting for the project cashflows;
 - the theoretical ex-rights price *after* adjusting for the project cashflows;
 - directors' dividend forecast issued in January 2005.
- (14 marks)*
- (iii) Advise on how and to what extent directors are able to influence their entity's share price. *(5 marks)*

(Total for requirement (c) = 25 marks)

Within the overall mark allocation, up to 4 marks are available for structure and presentation.

(Total for Question One = 50 marks)

(Total for Section A = 50 marks)

End of Section A

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SECTION B – 50 MARKS

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

ANSWER TWO ONLY OF THE FOUR QUESTIONS

Question Two

HG is a privately-owned toy manufacturer based in a country in the European Union, but which is not in the European Common Currency Area (ECCA). It trades internationally both as a supplier and a customer. Although HG is privately owned, it has revenue and assets equivalent in amount to some public listed companies. It has a large number of shareholders, but has no intention of seeking a listing at the present time. In fact, the major shareholders have often expressed a wish to buy out some of the smaller investors.

The entity has a long history of sound, if unspectacular, profitability. The directors and shareholders are reasonably happy with this situation and are averse to adopting strategies that they think might involve a substantial increase in risk, for example, acquisition or setting up manufacturing capability overseas, as some of HG's European competitors have done. As a consequence, HG accepts its growth rate will be relatively low, compared with some of its competitors.

The entity is financed 70% equity and 30% debt (based on book values). The debt is a mixture of secured and unsecured bonds carrying interest rates of between 7% and 8.5% and repayable in 5 to 10 years' time. Inflation in HG's country is near zero and interest rates are low and possibly falling. The Company Treasurer is investigating the opportunities for, and consequences of, refinancing.

HG's main financial objective is simply to increase dividends each year. It has one non-financial objective, which is to treat all stakeholders in the organisation with "fairness and equality". The Board has decided to review these objectives. The new Finance Director believes maximisation of shareholder wealth should be the sole objective, but the other directors do not agree and think a range of objectives should be considered, for example profits after tax and return on investment and performance improvement across a number of operational areas.

Required:

- (a) Evaluate the appropriateness of HG's current objectives and the Finance Director's suggestion, and discuss the issues that the HG Board should consider when determining the new corporate objectives. Conclude with a recommendation.
- (15 marks)*
- (b) Discuss the factors that the treasury department should consider when determining financing, or re-financing strategies in the context of the economic environment described in the scenario and explain how these might impact on the determination of corporate objectives.

(10 marks)

(Total for Question Two = 25 marks)

TURN OVER

Question Three

FS provides industrial and commercial cleaning services to organisations throughout a country in the European Union. Its shares have been listed for 15 years and, until two years ago, the entity followed a policy of aggressive growth, mainly by acquisition.

However, in the last two years, there have been few suitable takeover opportunities and, as a consequence, growth has slowed. The market has downgraded FS's shares and they are currently trading at €3.57, the lowest price for five years. The market as a whole has declined in value, but not to the same extent as FS's shares.

FS's bank has recently informed FS's directors of a possible takeover opportunity of another of its clients, MT. This is a large private entity in the same industry as FS. MT's directors have indicated to the bank that if the price is right they may be prepared to sell the entity. MT's directors have made their financial forecasts and other strategic documentation available to the bank on a strictly confidential basis, requesting that this information only be released to a serious potential bidder. After much discussion between the bank and the two companies, MT agrees that FS should have the information.

MT's results for the past three years and the directors' estimates for the current year are as follows:

<i>Year to 30 June</i>	<i>Revenue €million</i>	<i>Earnings €million</i>
2003	925	55.5
2004	1,020	62.7
2005	1,150	71.5
2006 (forecast)	1,350	88.9

For 2007 onwards, growth in earnings and dividends is likely to fall to 4% per annum, according to MT's directors. MT has paid a dividend of 50% of its earnings for the past 10 years.

Summary balance sheets as at 30 June 2005 for both FS and MT are as follows:

	<i>FS €million</i>	<i>MT €million</i>
TOTAL ASSETS		
Non-current assets	1,944	1,040
Current assets *	<u>796</u>	<u>375</u>
	<u>2,740</u>	<u>1,415</u>
EQUITY AND LIABILITIES		
Equity		
Share capital (Shares of €1)	420	
(Shares of 50 cents)		220
Retained earnings	<u>1,080</u>	<u>680</u>
	<u>1,500</u>	<u>900</u>
Non-current liabilities		
(Secured bonds, 6% 2015)	750	
(Unsecured bonds, 7% 2010)		300
Current liabilities	<u>490</u>	<u>215</u>
	<u>1,240</u>	<u>515</u>
	<u>2,740</u>	<u>1,415</u>
* Includes cash of	250	65

FS's revenues and earnings for the year ended 30 June 2005 were €2,250 million and €128.5 million respectively.

After thoroughly examining the information on MT, financial managers in FS have identified a number of savings and potential synergies that would arise if the takeover were to go ahead. These synergies are estimated to have a net present value of €200 million. However, the FS directors believe MT's forecast earnings are over-optimistic and think earnings growth for 2006 onwards is likely to be in the range 2% to 4%. The bank advisers disagree, but they are in a delicate situation trying to balance the interests of two clients.

FS's cost of equity is 8.5%. MT has not provided information on its cost of capital, but the two entity's asset betas are likely to be the same. FS's equity beta is quoted as 1.1. The expected risk free rate of return is 3% and the expected return on the market is 8%. Assume that the debt beta for both companies is 0.2 and that FS's debt is trading at par.

Ignore tax in your calculations.

Required:

Assume you are a Financial Manager with FS. Advise the directors of FS on

- (i) the appropriate cost of capital to be used when valuing MT. Accompany your comments with a calculation of the cost of equity for MT. *(6 Marks)*
- (ii) a bidding strategy; that is the initial price to be offered and the maximum FS should be prepared to offer for the shares in MT. Use whatever methods of valuation you think appropriate and accompany each with brief comments on their suitability in the circumstances here. In calculations of value that require a discount rate, use the cost of equity you have calculated in (i) above. Your answer should consider the interests of both groups of shareholders. *(13 marks)*
- (iii) the most appropriate form of consideration to use in the circumstances. Assume the choice is either a share exchange or cash. Your answer should consider the interests of both groups of shareholders. *(6 marks)*

(Total for Question Three = 25 marks)

TURN OVER

Question Four

WZ is a manufacturer of specialist components for the motor trade. It is based in Zafran, a country in the Far East. The entity's capital structure is as follows:

- 5 million ordinary shares of Z\$1 each, currently quoted at Z\$12.5 per share.
- 10 million preference shares of Z\$1 each, currently quoted at Z\$0.80 per share, paying a dividend of 7% per annum.
- Z\$20 million, 8% undated debt, secured on the entity's non-current assets. This debt is currently trading at Z\$90 per Z\$100 nominal.

To finance expansion, the directors of WZ want to raise Z\$5 million for additional working capital. Cash flow from trading, before interest and tax is currently Z\$15 million per annum. If the expansion goes ahead, this is expected to rise to Z\$17 million. The current rate of tax, which is expected to continue for the foreseeable future, is 30%.

Assume for the purposes of simplicity:

- That profit after interest and tax equals cash flow;
- The required rate of return on equity will remain at the current rate of 12% per annum irrespective of type of finance raised;
- There are no transaction costs.

The directors of WZ are considering three forms of finance:

- 1 Equity via a rights issue at 15% discount to current market price;
- 2 9% bonds repayable in 2015 secured as a floating charge on the entity's current assets.
- 3 Factoring the entity's trade receivables. This is likely to provide a one-off release of funds of approximately Z\$5 million.

Required:

- (a) Calculate for the current situation and financing alternatives 1 and 2 the expected
- (i) earnings per share;
 - (ii) market value of equity, using the capitalisation of earnings at the cost of equity;
 - (iii) market value of the entity;
 - (iv) gearing ratios (debt to total value of the entity), using market values;
 - (v) weighted average cost of capital.

State whatever assumptions you consider necessary.

(12 marks)

- (b) Assume you are a Financial Manager with WZ. Advise directors of WZ of the issues to be considered before deciding on which form of finance to choose, including factoring, and make your own recommendation.

(13 marks)

(Total for Question Four = 25 marks)

Section B continues on the next page

TURN OVER

Question Five

RJ plc is a supplier of surgical instruments and medical supplies (excluding drugs). Its shares are listed on the UK's Alternative Investment Market and are currently quoted at 458 pence per £1 share. The majority of its customers are public sector organisations in the UK. RJ plc is doing well and now needs additional capital to expand operations.

The forecast financial statements are given below.

Extracts from the Income Statement for the year ended 31 December 2005

	<i>£000</i>
Revenue	30,120
Costs and expenses	<u>22,500</u>
Operating profit	7,620
Finance costs	<u>2,650</u>
Profit before tax	4,970
Tax	1,491

Note: Dividends declared for 2005 are £1,392,000

Balance Sheet as at 31 December 2005

	<i>£000</i>	<i>£000</i>
TOTAL ASSETS		
Non-current assets		14,425
Current assets		
Inventories	4,510	
Trade receivables	3,700	
Cash	<u>198</u>	
		<u>8,408</u>
		<u>22,833</u>
EQUITY AND LIABILITIES		
Equity		
Share capital	8,350	
Retained earnings	<u>4,750</u>	13,100
Non-current liabilities		
(Secured bonds, 6% 2008)		4,000
Current liabilities		
Trade payables	2,850	
Other payables (tax and dividends)	<u>2,883</u>	
		<u>5,733</u>
		<u>22,833</u>

You have obtained the following additional information:

- 1 Revenue is expected to increase by 10% per annum in each of the financial years ending 31 December 2006 and 2007. Costs and expenses, excluding depreciation, are expected to increase by an average of 5% per annum. Finance costs are expected to remain unchanged.
- 2 RJ plc expects to continue to be liable for tax at the marginal rate of 30%. Assume tax is paid or refunded the year following that in which the liability or repayment arises.

- 3 The ratios of *trade receivables to revenue* and *trade payables to costs and expenses* will remain the same for the next two years. The value of inventories is likely to remain at 2005 levels.
- 4 The non-current assets are land and buildings, which are not depreciated in RJ plc's books. Capital (tax) allowances on the buildings may be ignored. All other assets used by the entity (machinery, cars and so on) are either rented or leased on operating leases.
- 5 Dividends will be increased by 5% each year.
- 6 RJ plc intends to purchase for cash new machinery to the value of £6,000,000 during 2006, although an investment appraisal exercise has not been carried out. It will be depreciated straight line over 10 years. RJ plc intends to charge a full year's depreciation in the first year of purchase of its assets. Capital (tax) allowances are available at 25% reducing balance on this expenditure.

RJ plc's main financial objectives for the years 2006-2007 are to earn a pre-tax return on the closing book value of equity of 35% per annum and a year-on-year increase in earnings of 10%.

Required:

Assume you are a consultant working for RJ plc. Evaluate the implications of the financial information you have obtained. You should:

- (i) Provide forecast income statements, dividends and retentions for the two years ending 31 December 2006 and 2007. (6 marks)
- (ii) Provide cash flow forecasts for the years 2006 and 2007. Comment briefly on how RJ plc might finance any cash deficit. (8 marks)

Note: This is **not** an investment appraisal exercise; you may ignore the timing of cash flows **within** each year and you should not discount the cash flows. You should also ignore interest payable on any cash deficit.

- (iii) Discuss the key aspects and implications of the financial information you have obtained in your answer to parts (i) and (ii) of the question, in particular whether RJ plc is likely to meet its stated objectives. Provide whatever calculations you think are appropriate to support your discussion. Up to 4 marks are available for calculations in this section of the question. (11 marks)

(Total for Question Five = 25 marks)

(Total for Section B = 50 marks)

End of Question Paper

Maths Tables and Formulae are on pages 15 to 19

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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 (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	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	0.705	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 (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	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 $\left[\frac{1-(1+r)^{-n}}{r} \right]$

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	4.988	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

FORMULAE

Valuation models

- (i) Irredeemable preference share, 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) share, 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) share, 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 (undated) debt, 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:

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

- (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:

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

FORMULAE CONTINUE ON THE NEXT PAGE

Cost of capital

- (i) Cost of irredeemable preference capital, 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 debt capital, 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) 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) share capital, 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) share capital, using the CAPM:

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

- (vi) Cost of ordinary (equity) share capital in a geared firm (no tax):

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

- (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, β_u is used for an ungeared β and β_g is used for a geared β :

- (x) β_u from β_g , taking β_d as zero (no tax):

$$\beta_u = \beta_g \left[\frac{V_E}{V_E + V_D} \right]$$

- (xi) If β_d is not zero:

$$\beta_u = \beta_g \left[\frac{V_E}{V_E + V_D} \right] + \beta_d \left[\frac{V_D}{V_D + V_E} \right]$$

- (xii) β_u from β_g , taking β_d as zero (with tax):

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

- (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:

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

- (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.

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Financial Management Pillar

Strategic Level Paper

*P9 – Management Accounting
Financial Strategy*

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Wednesday Morning Session