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Financial Management Pillar

Strategic Level Paper

**P9 – Management Accounting
Financial Strategy**

24 May 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 12.

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

Question One

Scenario

PM Industries plc

Background

PM Industries plc (PM) is a UK-based entity with shares trading on a UK Stock Exchange. It is a long established business with widespread commercial and industrial interests worldwide. It had a modest growth and profitability record until four years ago when a new Chief Executive Officer (CEO) was appointed from the United States of America (US). This new CEO has transformed the business by divesting poor performing, or non-core, subsidiaries or business units and focusing on volume growth in the remaining units. Some of this growth has been internally generated and some has come about because of financially sound acquisitions. A particular area of strength is in non-drug pharmaceutical materials such as packaging. PM now controls the largest share of this market in the UK and Europe.

Financial objectives

PM's current financial objectives are:

- To increase EPS by 5% per annum;
- To maintain a gearing ratio (market values of long-term debt to equity) below 30%;
- To maintain a P/E ratio above the industry average.

Proposed merger

The senior management of PM is currently negotiating a merger with NQ Inc (NQ), a US-based entity with shares trading on a US Stock Exchange. NQ is an entity of similar size to PM, in terms of revenue and assets, with a similar spread of commercial and industrial interests, especially pharmaceutical materials, which is why PM originally became attracted to NQ.

NQ has had a less impressive track record of growth than PM over the last two years because of some poor performing business units. As a result, PM's market capitalisation is substantially higher than NQ's. Although this will, in reality, be an acquisition, PM's CEO refers to it as a "merger" in negotiations to avoid irritating the NQ Board, which is very sensitive to the issue.

NQ holds some software licences to products that the CEO of PM thinks are not being marketed as well as they could be. He believes he could sell these licences to a large software entity in the UK for around £100 million. He does not see the commercial logic in retaining them, as information technology is not a core business. The value of these licences is included in NQ's balance sheet at \$US125 million.

Both entities believe a merger between them makes commercial and financial sense, as long as terms can be agreed. The CEO of PM thinks his entity will have the upper hand in negotiations because of the share price performance of PM over the last 12 months and his own reputation in the City. He also believes he can boost the entity's share value if he can convince the market his entity's growth rating can be applied to NQ's earnings.

Summary of relevant financial data

Extracts from the Income Statements for the year ended 31 March 2006

	PM	NQ
	<i>£ million</i>	<i>\$ million</i>
Revenue	1,560	2,500
Operating profit	546	750
Earnings available for ordinary shareholders	273	300

Extracts from the Balance Sheets as at 31 March 2006

	PM	NQ
	<i>£ million</i>	<i>\$ million</i>
Total net assets	2,000	2,100
Total equity	850	1,550
Total long term debt	1,150	550

Other data

Number of shares in issue

Ordinary shares of 10 pence	950,000,000	
Common stock of \$1		850,000,000
Share price as at today (24 May 2006)	456 pence	450 cents
High/low share price over last 12 months	475 pence/326 pence	520 cents/280 cents
Industry average P/E ratio	14	13
Debt traded within last week at	£105	Par

Five-year revenue and earnings record

Year ended 31 March	PM (£m)		NQ (US\$m)	
	Revenue	Earnings	Revenue	Earnings
2002	1,050	225	1,850	250
2003	1,125	231	1,950	265
2004	1,250	245	2,150	280
2005	1,400	258	2,336	290
2006	1,560	273	2,500	300

The two entities' revenue and operating profits are generated in the following five geographical areas, with average figures over the past five years as follows:

Percentage of total:	PM		NQ	
	Revenue	Profits	Revenue	Profits
UK	30	28	20	17
US	22	23	75	76
Mainland Europe	20	17	5	7
Asia (mainly Japan)	18	20	0	0
Rest of World	10	12	0	0

Economic data

PM's bankers have provided forecast interest and inflation rates in the two main areas of operation for the next 12 months as follows:

	<i>Interest rates</i>	<i>Inflation rate</i>
	<i>Current forecast</i>	<i>Current forecast</i>
UK	4.5%	2.0%
US	2.5%	1.5%

Terms of the merger

PM intends to open the negotiations by suggesting terms of 1 PM share for 2 NQ stock units. The Finance Director of PM, plus the entity's professional advisors, have forecast the following data, post-merger, for PM. They believe this is a "conservative" estimate as it excludes their estimate of value of the software licences. The current spot exchange rate is \$US1.85 = £1.

Market capitalisation	£6,905 million
EPS	31.65 pence

The question continues (with its requirements) on page 5

TURN OVER

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Question One (continued)

A cash offer as an alternative to a share exchange is unlikely, although the CEO of PM has not ruled it out should the bid turn hostile. However, this would require substantial borrowing by PM, even if only 50% of NQ's shareholders opt for cash.

Except for the potential profit on the sale of the licences, no savings or synergies from the merger have as yet been identified.

Required:

Assume you are one of the financial advisors working for PM.

(a)

- (i) Explain, with supporting calculations, how the Finance Director and advisors of PM have arrived at their estimates of post-merger values.

(10 marks)
- (ii) Calculate and comment briefly on the likely impact on the share price and market capitalisation for each of PM and NQ when the bid terms are announced. Make appropriate assumptions based on the information given in the scenario.

(4 marks)
- (iii) If NQ rejects the terms offered, calculate
 - the maximum total amount and price per share to be paid for the entity; and
 - the resulting share exchange terms PM should be prepared to agree without reducing PM's shareholder wealth.

(6 marks)

(Total for part (a) = 20 marks)

(b)

Write a report to the Board of PM that evaluates and discusses the following issues:

- (i) How the merger might contribute to the achievement of PM's financial objectives, assuming the merger goes ahead on the terms you have calculated in (a) (iii). If you have not managed to calculate terms, make sensible assumptions;

(12 marks)
- (ii) External economic forces that might help and/or hinder the achievement of the merger's financial objectives. Comment also on the policies the merged entity could consider to help reduce adverse effects of such economic forces;

(8 marks)
- (iii) Potential post-merger value enhancing strategies that could increase shareholder wealth.

(10 marks)

(Total for part (b) = 30 marks)

Up to 4 marks are available for structure and presentation in Question One.

(Total for Question One = 50 marks)

End of Section A

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[Section B starts on the next page]

TURN OVER

SECTION B – 50 MARKS

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

ANSWER TWO ONLY OF THE FOUR QUESTIONS

Question Two

MNO is a private toy distributor situated in the United States of America (US) with a US customer base and local suppliers. There is a central manufacturing base and several marketing units spread across the US. The marketing units are encouraged to adapt to local market conditions, largely acting independently and free from central control. These units are responsible for all aspects of local sales, including collecting sales revenues, which are paid across to Head Office on a monthly basis. Funding is provided by Head Office as required.

Figures for last year to 31 December 2005 were as follows:

Revenue	\$10 million
Gross profit margin	40% of revenue
Accounts receivable days	minimum 20, maximum 30 days
Accounts payable days	minimum 40, maximum 50 days
Inventories	minimum 50, maximum 80 days
Non-current assets	\$8 million

Accounts receivable, accounts payable and inventories can all be assumed to be the same on both 31 December 2004 and 31 December 2005, but fluctuate between those dates.

The Financial Controller is carrying out an analysis of MNO's working capital levels, as requested by the Treasurer. He is assuming that the peak period for accounts receivable coincides with the peak period for inventories and the lowest level of accounts payable.

MNO is currently in consultation with a potentially significant new supplier in Asia, who will demand payment in its local currency.

The requirement for Question Two is on the opposite page

Required:

(a)

- (i) Calculate the minimum and maximum working capital levels based on the Financial Controller's assumption regarding the timing of peaks and troughs in working capital variables and discuss the validity of that assumption.

(6 marks)

- (ii) Using the figures calculated in (i) above, calculate and draw a chart in your answer book to show the short-term and long-term (permanent) financing requirements of MNO under each of the following working capital financing policies:

- moderate policy, where long-term financing matches permanent net current assets;
- aggressive policy, where 30% of permanent net current assets are funded by short-term financing;
- conservative policy, where only 40% of fluctuating net current assets are funded by short-term financing.

(7 marks)

- (b)** Discuss the advantages and disadvantages of an aggressive financing policy and advise whether or not such a policy would be appropriate for MNO.

(6 marks)

- (c)** Advise MNO whether a profit or cost centre structure would be more appropriate for its treasury department.

(6 marks)

(Total for Question Two = 25 marks)

TURN OVER

Question Three

EFG is a South American entity specialising in providing information systems solutions to large corporates. It is going through a period of rapid expansion and requires additional funds to finance the long-term working capital needs of the business.

EFG has issued one million \$1 ordinary shares, which are listed on the local stock market at a current market price of \$15, with typical increases of 10% per annum expected in the next five year period. Dividend payout is kept constant at a level of 10% of post-tax profits. EFG also has \$10 million of bank borrowings.

It is estimated that a further \$3 million is required to satisfy the funding requirements of the business for the next five-year period beginning 1 July 2006. Two major institutional shareholders have indicated that they are not prepared to invest further in EFG at the present time and so a rights issue is unlikely to succeed. The directors are therefore considering various forms of debt finance. Three alternative structures are under discussion as shown below:

- Five-year unsecured bank loan at a fixed interest rate of 7% per annum;
- Five-year unsecured bond with a coupon of 5% per annum, redeemable at par and issued at a 6% discount to par;
- A convertible bond, issued at par, with an annual coupon of 4.5% and a conversion option in five years' time of five shares for each \$100 nominal of debt.

There have been lengthy boardroom discussions on the relative merits of each instrument and you, as Finance Director, have been asked to address the following queries:

Sr. A: "The bank loan would seem to be more expensive than the unsecured bond. Is this actually the case?"

Sr. B: "Surely the convertible bond would be the cheapest form of borrowing with such a low interest rate?"

Sr. C: "If we want to increase our equity base, why use a convertible bond, rather than a straight equity issue?"

Required:

(a) Write a response to Sr. A, Sr. B and Sr. C, directors of EFG, discussing the issues raised and advising on the most appropriate financing instrument for EFG. In your answer, include calculations of:

- expected conversion value of the convertible bond in five years' time;
- yield to maturity (redemption yield) of the five-year unsecured bond.

Ignore tax.

(18 marks)

(including up to 8 marks for calculations)

(b) Advise a prospective investor in the five-year unsecured bond issued by EFG on what information he should expect to be provided with and what further analysis he should undertake in order to assess the creditworthiness of the proposed investment.

(7 marks)

(Total for Question Three = 25 marks)

Question Four

GHI is a mobile phone manufacturer based in France with a wide customer base in France and Germany, with all costs and revenues based in euro (€). GHI is considering expanding into the UK market and has begun investigating how to break into this market and is designing a new phone specifically for it. A small project committee has been formed to plan and control the project.

After careful investigation, the following project cash flows have been identified:

Year	£million
0	(10)
1	5
2	5
3	4
4	3
5	3

The project is to be funded by a loan of €16 million at an annual interest rate of 5% and repayable at the end of five years. Loan issue costs amount to 2% and are tax deductible.

GHI has a debt : equity ratio of 40 : 60 based on market values, a pre-tax cost of debt of 5.0% and a cost of equity of 10.7%.

Tax on entity profits in France can be assumed to be at a rate of 35%, payable in the year in which it arises. UK tax at 25% is deductible in full against French tax in the same time period under the terms of the double tax treaty between the UK and France. The initial investment of £10 million will not qualify for any tax relief.

Assume the current spot rate is £1 = €1.60 and sterling (£) is expected to weaken against the euro by 3% per annum (so that in year 1 it is worth only 97% of its value in euro (€) in year 0).

Required:

- (a) Advise GHI on whether or not to proceed with the project based on a calculation of its adjusted present value (APV) and describe the limitations of an APV approach in this context. (15 marks)
- (b) Explain the function of the project committee of GHI in the following stages of the project:
- (i) determining customer requirements and an appropriate product design for the UK market; and (5 marks)
 - (ii) controlling the implementation stage of the project. (5 marks)

(Total for Question Four = 25 marks)

TURN OVER

Question Five

RST is a publicly-owned and funded health organisation based in the Far East. It is reviewing a number of interesting possibilities for new development projects in the area and has narrowed down the choice to the five projects detailed below. RST is aware that government budget restrictions may be tighter in a year's time and so does not want to commit to a capital budget of more than \$30 million in year 1. In addition, any project cash inflows in year 1 may be used to fund capital expenditure in that year. There is sufficient capital budget remaining in year 0 to enable all projects to be undertaken. Under government funding rules, any unused capital in year 0 cannot be carried over to year 1 and no interest may be earned on unused capital. No borrowings are permitted.

RST assesses capital projects at a hurdle rate of 15% based on the equity beta of health-based companies in the private sector.

Project	Cash outflows		Cash inflows	
	Year 0 \$ million	Year 1 \$ million		
A	9	16	4	from year 1 in perpetuity
B	10	10	4	from year 2 in perpetuity
C	10	12	5	in years 1 to 10
D	8	5	6	in years 3 to 7
E	9	8	{ 2	in years 1 to 5
			{ 5	in years 6 to 15

Notes:

- the projects are not divisible
- each project can only be undertaken once
- ignore tax

Required:

(a) Advise RST on the best combination of projects based on an evaluation of each project on the basis of both:

- NPV of cashflows;
- a profitability index for use in this capital rationing analysis.

(15 marks)

(b) Discuss

- whether or not capital rationing techniques based on NPV analysis are appropriate for a publicly-owned entity such as RST.

(5 marks)

- as a publicly-owned entity, what other factors RST should consider and what other analysis it should undertake before making a final decision on which project(s) to accept.

(5 marks)

(Total for Question Five = 25 marks)

End of Question Paper

Maths Tables & Formulae are on pages 15-19

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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:

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

- (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