ACCA REVISION MOCK

Advanced Financial Management

June 2012

Time allowed

Reading time: **15 minutes**

Writing time: **3 hours**

This paper is divided into two sections

Section A   TWO compulsory questions

Section B   TWO questions ONLY to be attempted

Formulae Sheet and Mathematical Tables are on pages 3, 4, 5, 6 and 7

Do not open this paper until instructed by the supervisor

This question paper must not be removed from the examination hall

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KAPLAN

PUBLISHING

FORMULAE SHEET

Modigliani and Miller proposition 2 (with tax)

$$k_e = k_e^i + (1 - T)(k_e^i - k_d)\ \frac{V_d}{V_e}$$

Two asset portfolio

$$s_p = \sqrt{w_a^2 s_a^2 + w_b^2 s_b^2 + 2w_a w_b r_{ab} s_a s_b}$$

The capital asset pricing model

$$E(r_i) = R_f + \beta_i(E(r_m) - R_f)$$

The asset beta formula

$$\beta_a = \left[\frac{V_e}{(V_e + V_d(1 \quad T))} \beta_e \right] + \left[\frac{V_d(1 \quad T)}{(V_e + V_d(1 \quad T))} \beta_d \right]$$

The growth model

$$P_o = \frac{D_o(1+g)}{(r_e - g)}$$

Gordon's growth approximation

$$g = br_e$$

The weighted average cost of capital

$$WACC = \left[\frac{V_e}{V_e + V_d} \right] k_e + \left[\frac{V_d}{V_e + V_d} \right] k_d(1 - T)$$

The Fisher formula

$$(1+i) = (1+r)(1+h)$$

Purchasing power parity and interest rate parity

$$S_1 = S_o x \frac{(1+h_c)}{(1+h_b)} \qquad\qquad F_0 = S_0 x \frac{(1+i_c)}{(1+i_b)}$$

Modified Internal Rate of Return

$$\text{MIRR} = \left[\frac{PV_R}{PV_1} \right]^{\frac{1}{n}} (1 + r_e) - 1$$

The Black-Scholes option pricing model

$$c = P_a N(d_1) - P_e N(d_2) e^{-rt}$$

Where:

$$d_1 = \frac{\ln(P_a/P_e) + (r + 0.5s^2)t}{s\sqrt{t}}$$

$$d_2 = d_1 - s\sqrt{t}$$

The put call parity relationship

$$p = c - P_a + P_e e^{-rt}$$

MATHEMATICAL TABLES

Standard normal distribution table

	0.00	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09
0.0	.0000	.0040	.0080	.0120	.0159	.0199	.0239	.0279	.0319	.0359
0.1	.0398	.0438	.0478	.0517	.0557	.0596	.0636	.0675	.0714	.0753
0.2	.0793	.0832	.0871	.0910	.0948	.0987	.1026	.1064	.1103	.1141
0.3	.1179	.1217	.1255	.1293	.1331	.1368	.1406	.1443	.1480	.1517
0.4	.1554	.1591	.1628	.1664	.1700	.1736	.1772	.1808	.1844	.1879
0.5	.1915	.1950	.1985	.2019	.2054	.2088	.2123	.2157	.2190	.2224
0.6	.2257	.2291	.2324	.2357	.2389	.2422	.2454	.2486	.2518	.2549
0.7	.2580	.2611	.2642	.2673	.2704	.2734	.2764	.2794	.2823	.2852
0.8	.2881	.2910	.2939	.2967	.2995	.3023	.3051	.3078	.3106	.3133
0.9	.3159	.3186	.3212	.3238	.3264	.3289	.3315	.3340	.3365	.3389
1.0	.3413	.3438	.3461	.3485	.3508	.3531	.3554	.3577	.3599	.3621
1.1	.3643	.3665	.3686	.3708	.3729	.3749	.3770	.3790	.3810	.3830
1.2	.3849	.3869	.3888	.3907	.3925	.3944	.3962	.3980	.3997	.4015
1.3	.4032	.4049	.4066	.4082	.4099	.4115	.4131	.4147	.4162	.4177
1.4	.4192	.4207	.4222	.4236	.4251	.4265	.4279	.4292	.4306	.4319
1.5	.4332	.4345	.4357	.4370	.4382	.4394	.4406	.4418	.4430	.4441
1.6	.4452	.4463	.4474	.4485	.4495	.4505	.4515	.4525	.4535	.4545
1.7	.4554	.4564	.4573	.4582	.4591	.4599	.4608	.4616	.4625	.4633
1.8	.4641	.4649	.4656	.4664	.4671	.4678	.4686	.4693	.4699	.4706
1.9	.4713	.4719	.4726	.4732	.4738	.4744	.4750	.4756	.4762	.4767
2.0	.4772	.4778	.4783	.4788	.4793	.4798	.4803	.4808	.4812	.4817
2.1	.4821	.4826	.4830	.4834	.4838	.4842	.4846	.4850	.4854	.4857
2.2	.4861	.4865	.4868	.4871	.4875	.4878	.4881	.4884	.4887	.4890
2.3	.4893	.4896	.4898	.4901	.4904	.4906	.4909	.4911	.4913	.4916
2.4	.4918	.4920	.4922	.4925	.4927	.4929	.4931	.4932	.4934	.4936
2.5	.4938	.4940	.4941	.4943	.4945	.4946	.4948	.4949	.4951	.4952
2.6	.4953	.4955	.4956	.4957	.4959	.4960	.4961	.4962	.4963	.4964
2.7	.4965	.4966	.4967	.4968	.4969	.4970	.4971	.4972	.4973	.4974
2.8	.4974	.4975	.4976	.4977	.4977	.4978	.4979	.4980	.4980	.4981
2.9	.4981	.4982	.4983	.4983	.4984	.4984	.4985	.4985	.4986	.4986
3.0	.4987	.4987	.4987	.4988	.4988	.4989	.4989	.4989	.4990	.4990

This table can be used to calculate $N(d_1)$, the cumulative normal distribution function needed for the Black-Scholes model of option pricing. If $d_1 > 0$, add 0.5 to the relevant number above. If $d_1 < 0$, subtract the relevant number above from 0.5.

Present value table

Present value of 1, i.e. $(1 + r)^{-n}$

where   r = discount rate

  n = number of periods until payment

Periods (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	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

Periods (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	0.206	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	0.933
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	0.074	0.065

Annuity table

Present value of an annuity of 1, i.e. $\dfrac{1-(1+r)^{-n}}{r}$

where   r = interest rate

        n = number of periods

Periods (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	.1783	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	8.893	8.530	8.111	7.722	7.360	7.024	6.710	6.418	6.145
11	10.37	9.787	9.253	8.760	8.306	7.887	7.499	7.139	6.805	6.495
12	11.26	10.58	9.954	9.385	8.863	8.384	7.943	7.536	7.161	6.814
13	12.13	11.35	10.63	9.986	9.394	8.853	8.358	7.904	7.487	7.103
14	13.00	12.11	11.30	10.56	9.899	9.295	8.745	8.244	7.786	7.367
15	13.87	12.85	11.94	11.12	10.38	9.712	9.108	8.559	8.061	7.606

Periods (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	3.496	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	4.586	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

SECTION A

TWO compulsory questions

QUESTION 1

(a) Laceto Inc, a large retail group specialising in the sale of clothing and electrical goods is currently considering a take-over bid for a competitor in the electrical goods sector, Omnigen Inc, whose share price has fallen by 205 cents during the last three months.

Summarised data for the financial year to 31 March 20X1:

	$ (million)	
	Laceto	Omnigen
Sales revenue	420	180
Profit before tax (after interest payments)	41	20
Taxation	12	6
Non-current assets (net)	110	63
Current assets	122	94
Current liabilities	86	71
Medium- and long-term liabilities	40	12
Shareholders' funds	106	74

The share price of Laceto is currently 380 cents, and of Omnigen 410 cents. Laceto has 80 million issued ordinary shares and Omnigen 30 million. Typical of Laceto's medium- and long-term liabilities is a 12% debenture with three years to maturity, a par value $100, and a current market price of $108.80.

The finance team of Laceto has produced the following forecasts of financial data for the activities of Omnigen if it is taken over.

	$ (million)			
Financial year	*20X2*	*20X3*	*20X4*	*20X5*
Net sales	230	261	281	298
Cost of goods sold (50%)	115	131	141	149
Selling and administrative expenses	32	34	36	38
Capital allowances (total)	40	42	42	42
Interest	18	16	14	12
Cash flow needed for asset replacement and forecast growth	50	52	55	58

Corporate taxation is at the rate of 30% per year, payable in the year that the taxable cash flow occurs. The risk-free rate is 6% per year and market return 14% per year. Omnigen's current equity beta is 1.2. This is expected to increase by 0.1 if the company is taken over as Laceto would increase the current level of capital gearing associated with the activities of Omnigen. Laceto's gearing post acquisition is expected to be between 18% and 23% (debt to debt plus equity by market values), depending upon the final price paid for Omnigen.

Post-take-over cash flows of Omnigen (after replacement and growth expenditure) are expected to grow at between 3% and 5% per year after 20X5.

Additional notes:

(i)   The realisable value of Omnigen's assets, net of all debt repayments, is estimated to be $82 million.

(ii)   The P/E ratios of two of Omnigen's quoted competitors in the electrical industry are 13:1 and 15:1, respectively.

Required:

Discuss and evaluate what price, or range of prices, Laceto should offer to purchase the shares of Omnigen. State clearly any assumptions that you make.   (24 marks)

Approximately 16 marks are for calculations and 8 for discussion.

Before making a bid for Omnigen the managing director of Laceto hears a rumour that a bid for Laceto might be made by Agressa.com, an internet retailer specialising in the sale of vehicles and electrical goods. Summarised financial data for Agressa.com are shown below.

Agressa.com	$ (million)
Sales revenue	190
Operating profit	12
Interest	4
Taxation	2
Non-current assets (net)	30
Current assets	80
Current liabilities	30
Medium- and long-term liabilities	40
Shareholders' funds	40

Agressa's current share price is $26.50, and the company has 15 million issued ordinary shares.

Required:

Prepare a brief report for the managing director of Laceto which:

(b)   Analyses how Laceto might defend itself from a take-over bid from Agressa (6 marks)

(c)   Discusses how the method of payment of the potential take-overs in (a) and (b) above might affect the success or failure of the bids.   (6 marks)

Professional marks will be awarded for the format, structure and presentation of the answer to question 1.   (4 marks)

(Total: 40 marks)

QUESTION 2

The selection of appropriate discount rates for capital investments has frequently been a problem for the finance director of Tovell Inc. The company has adopted a strategy of diversification into many different industries, in order to reduce risk for the company's shareholders. This has resulted in frequent changes in the company's gearing level and widely fluctuating risks of individual investments.

The current project under appraisal, an investment in the fast food industry where Tovell has no other investments, is expected to generate pre-tax operating cash flows of $420,000 in the first year, rising by 5% per year for the five-year expected life of the project. After five years the land and buildings are expected to have a realisable value of $1,250,000 (after any tax effects), the same as their original cost, but in order to continue operations major new investment in equipment would be required at that time. Other non-current assets would have negligible value after five years. The total initial outlay of the project (net of issue costs) is $2.3 million, and all but the land and buildings attracts a 25% per year capital allowance on a reducing balance basis.

The project would be financed by an $800,000 fixed-rate loan from a regional development agency at a subsidised interest rate of 6% per year, 3% less than Tovell could borrow at in the capital market. The remainder of the finance would be provided by an underwritten rights issue at a 10% discount on current market price, with total underwriting and issue costs of 5% of gross proceeds. The investment is believed to add $1 million to the company's debt capacity.

Current financial data for Tovell and the fast food industry includes:

	Tovell Inc	Fast food industry (average)
P/E ratio	12	20
Dividend yield	5%	3%
Equity beta	1.1	1.4
Debt beta	0.2	0.25
Gearing (debt/equity):		
Book values	1.1 to 1	1.6 to 1
Market values	0.4 to 1	1 to 1
Share price	470 cents	n/a
Number of ordinary shares	3.5 million	n/a

The corporate tax rate is currently 30% per year, and tax is payable one year in arrears.

Treasury bills are currently yielding 5% per year after tax, and the return required by well-diversified investors is 12.5% per year.

Required:

(a)   **Provide a reasoned explanation as to whether you would support the company's strategy of diversifying into many different industries.**   **(6 marks)**

(b)   **Explain in general terms the different methods of appraising new investments when the business risk and / or the capital structure of an entity changes as a consequence of undertaking the investment.**   **(4 marks)**

(c)   **Prepare a report for the finance director of Tovell Inc advising on the financial viability of the proposed fast food investment. Include in the report an assessment of the limitations of the method of appraisal that you have used. Supporting calculations should form an appendix to your report.**   **(20 marks)**

(Total: 30 marks)

SECTION B

TWO questions ONLY to be attempted

QUESTION 3

(a) **Briefly discuss possible reasons for an upward sloping yield curve.** **(4 marks)**

(b) Assume that 'now' is June 20X4.

The financial manager of Zamzam Co's pension fund is reviewing strategy regarding the fund. Over 60% of the fund is invested in fixed rate long-term bonds. Interest rates are expected to be quite volatile for the next few years.

Among the pension fund's current investments are two AAA rated bonds:

1   Zero coupon June 20Y9

2   12% Gilt June 20Y9 (interest is payable semi-annually)

(i.e. both bonds are redeemable in 15 years' time)

The current annual gross redemption yield (yield to maturity) on both bonds is 6%. The semi-annual yield may be assumed to be 3%. Both bonds have a par value and redemption value of $100.

Required:

(i)   Estimate the market price of each of the bonds if interest rates (yields):

- **increase by 1%**

- **decrease by 1%.**

The changes in interest rates may be assumed to be parallel shifts in the yield curve (yield changes by an equal amount at all points of the yield curve).
(6 marks)

(ii)   Comment upon and briefly explain the size of the expected price movements from the current prices, and how such changes in interest rates might affect the strategy of the financial manager with respect to investing in the two bonds.   **(3 marks)**

(iii) How might the bond investment strategy of the financial manager be affected if the yield curve was expected to steepen (the gap between short- and long-term interest rates to widen), and interest rates are expected to rise?

(2 marks)

(Total: 15 marks)

QUESTION 4

Bioplasm Inc is a pharmaceuticals company that has completed the preliminary development of a new drug to combat a major disease. Initial clinical trials of the drug have been favourable, and the drug is expected to receive approval from the regulatory authority in the near future.

Bioplasm has taken out a patent on the drug that gives it the exclusive right to commercially develop and market the drug for a period of 15 years. Although it is difficult to produce precise estimates, the company believes that to commercially develop and market the drug for worldwide use will cost approximately $400 million at current prices. The expected present value from sales of the drug during the patent period could vary between $350 million and $500 million. The current long-term government bond yield is 5%. The annual variance (standard deviation squared) of returns on similar biotech companies is estimated to be 0.185.

The finance director of Bioplasm can see from the possible NPVs that the company has a difficult decision as to whether or not to develop the drug, and wonders if real option pricing could assist the decision.

Required:

Using the Black-Scholes option pricing model for the life of the patent, estimate the call values of the option to commercially develop and market the drug. Provide a reasoned recommendation, based upon your calculations and any other relevant information, as to whether or not Bioplasm should develop the drug.

Note: Since the value of the returns from the patent will fall over the period before the drug is commercially developed, it is necessary to adjust the expected present value from sales of the drug. In all relevant parts of the Black-Scholes model, the present value from sales of the drug should be multiplied by exp (− 0.067) (15) = 0.3660 to reflect this potential reduction in value according to when the drug is developed.

(15 marks)

QUESTION 5

Kiboko Co is a very successful company developing a range of innovative energy efficient products based around fuel cell technology. Its sales revenue and profits have grown rapidly since it started trading six years ago. Kiboko Co is currently jointly owned by its five directors, who own 50% of the business, and a venture capital organisation, which owns the remaining 50%.

The directors have successfully utilised their expertise to develop the company and its product range, and the venture capital organisation has offered valuable commercial advice and finance to fund the company's rapid growth. It is now felt that the organisation is entering the next phase in its strategic development. Over the past 20 months, more competitors have been entering the world-wide market and the product range has been expanding to meet high demand, as more governments move towards increasingly ambitious environmental agendas. Kiboko Co's directors feel that they are well placed to meet the new challenges but think that they will need to maintain the quick investment decision-making frameworks that they have developed in order to maintain their competitive advantage.

Although the directors and the venture capital organisation have formed a strong working relationship, the venture capital organisation has indicated its desire to sell its 50% stake in Kiboko Co, as it feels that the company needs to develop under the directors' control.

After lengthy discussions it has been decided that Kiboko Co should either be listed on a major stock exchange, with its shares being sold to the public, or it should remain private, under the control of its directors as the owners.

If it were to remain private then the directors would buy out the venture capital organisation's shareholding by borrowing the money from a large bank and using the assets of the company as collateral. It is expected that as part of the loan agreement the bank may well put into place covenants which will restrict the directors' ability to make decisions in the future.

The directors have not yet approached a suitable bank, but they are aware that over the last year, credit conditions have deteriorated as banks have curtailed their lending following the down rating of US asset-backed securities. Many banks have recorded significant multibillion dollar losses as they have attempted to sell off 'toxic debt', leading to a further collapse in their value.

Required:

(a) **Briefly explain the restrictions that loan covenants could place on the directors' ability to make decisions.** **(3 marks)**

(b) **Given conditions in the global debt market as described, advise on the likely factors the banks will consider before offering a large loan.** **(5 marks)**

(c) **Discuss the possible advantages and disadvantages to Kiboko Co of being:**

    (i) **listed; and**

    (ii) **remaining private.** **(7 marks)**

(Total: 15 marks)