Strategic Professional – Options

Advanced Financial Management (AFM)

Friday 7 December 2018

AFM ACCA

AFM

Time allowed: 3 hours 15 minutes

This question paper is divided into two sections:

Section A – This ONE question is compulsory and MUST be attempted

Section B – BOTH questions are compulsory and MUST be attempted

Formulae and tables are on pages 6–10.

Do NOT open this question paper until instructed by the supervisor.

This question paper must not be removed from the examination hall.

Think Ahead ACCA

The Association of Chartered Certified Accountants

Section A – This ONE question is compulsory and MUST be attempted

1 Around seven years ago, Opao Co, a private conglomerate company involved in many different businesses, decided to obtain a listing on a recognised stock exchange by offering a small proportion of its equity shares to the public. Before the listing, the company was owned by around 100 shareholders, who were all closely linked to Opao Co and had their entire shareholding wealth invested in the company. However, soon after the listing these individuals started selling their shares in Opao Co, and over a two-year period after the listing, its ownership structure changed to one of many diverse individual and institutional shareholders.

As a consequence of this change in ownership structure, Opao Co's board of directors (BoD) commenced an aggressive period of business reorganisation through portfolio and organisational restructuring. This resulted in Opao Co changing from a conglomerate company to a company focusing on just two business sectors: financial services and food manufacturing. The financial press reported that Opao Co had been forced to take this action because of the change in the type of its shareholders. The equity markets seem to support this action, and Opao Co's share price has grown strongly during this period of restructuring, after growing very slowly initially.

Opao Co recently sold a subsidiary company, Burgut Co, through a management buy-in (MBI), although it also had the option to dispose of Burgut Co through a management buy-out (MBO). In a statement, Opao Co's BoD justified this by stating that Burgut Co would be better off being controlled by the MBI team.

Opao Co is now considering acquiring Tai Co and details of the proposed acquisition are as follows:

Proposed acquisition of Tai Co

Tai Co is an unlisted company involved in food manufacturing. Opao Co's BoD is of the opinion that the range of products produced by Tai Co will fit very well with its own product portfolio, leading to cross-selling opportunities, new innovations, and a larger market share. The BoD also thinks that there is a possibility for economies of scale and scope, such as shared logistic and storage facilities, giving cost saving opportunities. This, the BoD believes, will lead to significant synergy benefits and therefore it is of the opinion that Opao Co should make a bid to acquire Tai Co.

Financial information related to Opao Co, Tai Co and the combined company

Opao Co
Opao Co has 2,000 million shares in issue and are currently trading at $2·50 each.

Tai Co
Tai Co has 263 million shares in issue and the current market value of its debt is $400 million. Its most recent profit before interest and tax was $132·0 million, after deducting tax allowable depreciation and non-cash expenses of $27·4 million. Tai Co makes an annual cash investment of $24·3 million in non-current assets and working capital. It is estimated that its cash flows will grow by 3% annually for the foreseeable future. Tai Co's current cost of capital is estimated to be 11%.

Combined company
If Opao Co acquires Tai Co, it is expected that the combined company's sales revenue will be $7,351 million in the first year and its annual pre-tax profit margin on sales will be 15·4% for the foreseeable future. After the first year, sales revenue will grow by 5·02% every year for the next three years. It can be assumed that the combined company's annual depreciation will be equivalent to the investment required to maintain the company at current operational levels. However, in order to increase the sales revenue levels each year, the combined company will require an additional investment of $109 million in the first year and $0·31 for every $1 increase in sales revenue for each of the next three years.

After the first four years, it is expected that the combined company's free cash flows will grow by 2·4% annually for the foreseeable future. The combined company's cost of capital is estimated to be 10%. It expected that the combined company's debt to equity level will be maintained at 40:60, in market value terms, after the acquisition has taken place.

Both Opao Co and Tai Co pay corporation tax on profits at an annual rate of 20% and it is expected that this rate will not change if Opao Co acquires Tai Co. It can be assumed that corporation tax is payable in the same year as the profits it is charged on.

Possible acquisition price offers

Opao Co's BoD is proposing that Tai Co's acquisition be made through one of the following payment methods:

(i) A cash payment offer of $4·40 for each Tai Co share, or

(ii) Through a share-for-share exchange, where a number of Tai Co shares are exchanged for a number of Opao Co shares, such that 55·5% of the additional value created from the acquisition is allocated to Tai Co's shareholders and the remaining 44·5% of the additional value is allocated to Opao Co's shareholders, or

(iii) Through a mixed offer of a cash payment of $2·09 per share and one Opao Co share for each Tai Co share. It is estimated that Opao Co's share price will become $2·60 per share when such a mixed offer is made.

Similar acquisitions in the food manufacturing industry have normally attracted a share price premium of between 15% and 40% previously.

Required:

(a) Distinguish between a management buy-out (MBO) and a management buy-in (MBI), and discuss why Opao Co's board of directors (BoD) might have sold Burgut Co through an MBI. (4 marks)

(b) Explain what portfolio restructuring and organisational restructuring involve, and discuss possible reason(s) why the change in the type of shareholders may have made Opao Co change from being a conglomerate to one focusing on just two business sectors. (5 marks)

(c) Prepare a report for the board of directors of Opao Co which:

(i) Estimates the value of equity of Opao Co and of Tai Co before the acquisition, and of the combined company after the acquisition; (10 marks)

(ii) Estimates the percentage gain in value for each Opao Co share and Tai Co share, under each of the cash, the share-for-share, and the mixed offers; (12 marks)

(iii) Evaluates the likely reaction of Opao Co's and Tai Co's shareholders to the acquisition offers. (7 marks)

Professional marks will be awarded in part (c) for the format, structure and presentation of the report. (4 marks)

(d) Following the MBI, the BoD of Burgut Co announced that its intention was to list the company on a recognised stock exchange within seven years. The BoD is discussing whether to obtain the listing through an initial public offering (IPO) or through a reverse takeover, but it does not currently have a strong preference for either option.

Required:

Distinguish between an IPO and a reverse takeover, and discuss whether an IPO or a reverse takeover would be an appropriate method for Burgut Co to obtain a listing. (8 marks)

(50 marks)

Section B – BOTH questions are compulsory and MUST be attempted

2 Nutourne Co is a company based in the USA, supplying medical equipment to the USA and Europe.

It is 30 November 20X8. Nutourne Co's treasury department is currently dealing with a sale to a Swiss customer of CHF12·3 million which has just been agreed, where the customer will pay for the equipment on 31 May 20X9. The treasury department intends to hedge the foreign exchange risk on this transaction using traded futures or options as far as possible. Any amount not hedged by a futures or option contract will be hedged on the forward market.

Exchange rates (quoted as US$/CHF 1)

Spot	1·0292–1·0309
Three months forward	1·0327–1·0347
Six months forward	1·0358–1·0380

Currency futures (contract size CHF125,000, futures price quoted as US$ per CHF1)

	Futures price
December	1·0318
March	1·0345
June	1·0369

Currency options (contract size CHF125,000, exercise price quotation US$ per CHF1, premium: US cents per CHF1)

		Calls			Puts	
Exercise price	December	March	June	December	March	June
1·0375	0·47	0·50	0·53	0·74	0·79	0·86

Futures and options contracts mature at the month end.

Non-executive director's comments

A new non-executive director has recently been briefed about the work of the treasury department and has a number of questions about hedging activities. He wants to understand the significance of basis risk in relation to futures. He also wants to know the significant features of over-the-counter forward contracts and options, and why Nutourne Co prefers to use exchange-traded derivatives for hedging.

The non-executive director has also heard about the mark-to-market process and wants to understand the terminology involved, and how the process works, using the transaction with the Swiss customer as an example. The treasury department has supplied relevant information to answer his query. The contract specification for the CHF futures contract states that an initial margin of US$1,450 per contract will be required and a maintenance margin of US$1,360 per contract will also be required. The tick size on the contract is US$0·0001 and the tick value is US$12·50. You can assume that on the first day when Nutourne Co holds the futures contracts, the loss per contract is US$0·0011.

Required:

(a) **Evaluate which of the exchange-traded derivatives would give Nutourne Co the higher receipt, considering scenarios when the options are and are not exercised.** (12 marks)

(b) **Discuss the benefits and drawbacks for Nutourne Co in using forward contracts compared with using over-the-counter currency options, and explain why Nutourne Co may prefer to use exchange-traded derivatives rather than over-the-counter derivatives to hedge foreign currency risk.** (7 marks)

(c) **Explain to the non-executive director how the mark-to-market process would work for the CHF futures, including the significance of the data supplied by the treasury department. Illustrate your explanation with calculations showing what would happen on the first day, using the data supplied by the treasury department.** (6 marks)

(25 marks)

3 Amberle Co is a listed company with divisions which manufacture cars, motorbikes and cycles. Over the last few years, Amberle Co has used a mixture of equity and debt finance for its investments. However, it is about to make a new investment of $150 million in facilities to produce electric cars, which it proposes to finance solely by debt finance.

Project information

Amberle Co's finance director has prepared estimates of the post-tax cash flows for the project, using a four-year time horizon, together with the realisable value at the end of four years:

Year	1	2	3	4
	$m	$m	$m	$m
Post-tax operating cash flows	28·50	36·70	44·40	50·90
Realisable value				45·00

Working capital of $6 million, not included in the estimates above and funded from retained earnings, will also be required immediately for the project, rising by the predicted rate of inflation for each year. Any remaining working capital will be released in full at the end of the project.

Predicted rates of inflation are as follows:

Year	1	2	3	4
	8%	6%	5%	4%

The finance director has proposed the following finance package for the new investment:

	$m
Bank loan, repayable in equal annual instalments over the project's life, interest payable at 8% per year	70
Subsidised loan from a government loan scheme over the project's life on which interest is payable at 3·1% per year	80
	150

Issue costs of 3% of gross proceeds will be payable on the subsidised loan. No issue costs will be payable on the bank loan. Issue costs are not allowable for tax.

Financial information

Amberle Co pays tax at an annual rate of 30% on profits in the same year in which profits arise.

Amberle Co's asset beta is currently estimated at 1·14. The current return on the market is estimated at 11%. The current risk-free rate is 4% per year.

Amberle Co's chairman has noted that all of the company's debt, including the new debt, will be repayable within three to five years. He is wondering whether Amberle Co needs to develop a longer term financing policy in broad terms and how flexible this policy should be.

Required:

(a) Calculate the adjusted present value (APV) for the project and conclude whether the project should be accepted or not. (15 marks)

(b) Discuss the factors which may determine the long-term finance policy which Amberle Co's board may adopt and the factors which may cause the policy to change. (10 marks)

(25 marks)

Formulae

Modigliani and Miller Proposition 2 (with tax)

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

The Capital Asset Pricing Model

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

The asset beta formula

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

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

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

Modified Internal Rate of Return

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

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

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

Present Value Table

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

Where r = discount rate
n = number of periods until payment

Discount rate (r)

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	1
2	0·980	0·961	0·943	0·925	0·907	0·890	0·873	0·857	0·842	0·826	2
3	0·971	0·942	0·915	0·889	0·864	0·840	0·816	0·794	0·772	0·751	3
4	0·961	0·924	0·888	0·855	0·823	0·792	0·763	0·735	0·708	0·683	4
5	0·951	0·906	0·863	0·822	0·784	0·747	0·713	0·681	0·650	0·621	5
6	0·942	0·888	0·837	0·790	0·746	0·705	0·666	0·630	0·596	0·564	6
7	0·933	0·871	0·813	0·760	0·711	0·665	0·623	0·583	0·547	0·513	7
8	0·923	0·853	0·789	0·731	0·677	0·627	0·582	0·540	0·502	0·467	8
9	0·914	0·837	0·766	0·703	0·645	0·592	0·544	0·500	0·460	0·424	9
10	0·905	0·820	0·744	0·676	0·614	0·558	0·508	0·463	0·422	0·386	10
11	0·896	0·804	0·722	0·650	0·585	0·527	0·475	0·429	0·388	0·350	11
12	0·887	0·788	0·701	0·625	0·557	0·497	0·444	0·397	0·356	0·319	12
13	0·879	0·773	0·681	0·601	0·530	0·469	0·415	0·368	0·326	0·290	13
14	0·870	0·758	0·661	0·577	0·505	0·442	0·388	0·340	0·299	0·263	14
15	0·861	0·743	0·642	0·555	0·481	0·417	0·362	0·315	0·275	0·239	15

(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	1
2	0·812	0·797	0·783	0·769	0·756	0·743	0·731	0·718	0·706	0·694	2
3	0·731	0·712	0·693	0·675	0·658	0·641	0·624	0·609	0·593	0·579	3
4	0·659	0·636	0·613	0·592	0·572	0·552	0·534	0·516	0·499	0·482	4
5	0·593	0·567	0·543	0·519	0·497	0·476	0·456	0·437	0·419	0·402	5
6	0·535	0·507	0·480	0·456	0·432	0·410	0·390	0·370	0·352	0·335	6
7	0·482	0·452	0·425	0·400	0·376	0·354	0·333	0·314	0·296	0·279	7
8	0·434	0·404	0·376	0·351	0·327	0·305	0·285	0·266	0·249	0·233	8
9	0·391	0·361	0·333	0·308	0·284	0·263	0·243	0·225	0·209	0·194	9
10	0·352	0·322	0·295	0·270	0·247	0·227	0·208	0·191	0·176	0·162	10
11	0·317	0·287	0·261	0·237	0·215	0·195	0·178	0·162	0·148	0·135	11
12	0·286	0·257	0·231	0·208	0·187	0·168	0·152	0·137	0·124	0·112	12
13	0·258	0·229	0·204	0·182	0·163	0·145	0·130	0·116	0·104	0·093	13
14	0·232	0·205	0·181	0·160	0·141	0·125	0·111	0·099	0·088	0·078	14
15	0·209	0·183	0·160	0·140	0·123	0·108	0·095	0·084	0·074	0·065	15

Annuity Table

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

Where r = discount rate
n = number of periods

Discount rate (r)

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	1
2	1·970	1·942	1·913	1·886	1·859	1·833	1·808	1·783	1·759	1·736	2
3	2·941	2·884	2·829	2·775	2·723	2·673	2·624	2·577	2·531	2·487	3
4	3·902	3·808	3·717	3·630	3·546	3·465	3·387	3·312	3·240	3·170	4
5	4·853	4·713	4·580	4·452	4·329	4·212	4·100	3·993	3·890	3·791	5
6	5·795	5·601	5·417	5·242	5·076	4·917	4·767	4·623	4·486	4·355	6
7	6·728	6·472	6·230	6·002	5·786	5·582	5·389	5·206	5·033	4·868	7
8	7·652	7·325	7·020	6·733	6·463	6·210	5·971	5·747	5·535	5·335	8
9	8·566	8·162	7·786	7·435	7·108	6·802	6·515	6·247	5·995	5·759	9
10	9·471	8·983	8·530	8·111	7·722	7·360	7·024	6·710	6·418	6·145	10
11	10·368	9·787	9·253	8·760	8·306	7·887	7·499	7·139	6·805	6·495	11
12	11·255	10·575	9·954	9·385	8·863	8·384	7·943	7·536	7·161	6·814	12
13	12·134	11·348	10·635	9·986	9·394	8·853	8·358	7·904	7·487	7·103	13
14	13·004	12·106	11·296	10·563	9·899	9·295	8·745	8·244	7·786	7·367	14
15	13·865	12·849	11·938	11·118	10·380	9·712	9·108	8·559	8·061	7·606	15

(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	1
2	1·713	1·690	1·668	1·647	1·626	1·605	1·585	1·566	1·547	1·528	2
3	2·444	2·402	2·361	2·322	2·283	2·246	2·210	2·174	2·140	2·106	3
4	3·102	3·037	2·974	2·914	2·855	2·798	2·743	2·690	2·639	2·589	4
5	3·696	3·605	3·517	3·433	3·352	3·274	3·199	3·127	3·058	2·991	5
6	4·231	4·111	3·998	3·889	3·784	3·685	3·589	3·498	3·410	3·326	6
7	4·712	4·564	4·423	4·288	4·160	4·039	3·922	3·812	3·706	3·605	7
8	5·146	4·968	4·799	4·639	4·487	4·344	4·207	4·078	3·954	3·837	8
9	5·537	5·328	5·132	4·946	4·772	4·607	4·451	4·303	4·163	4·031	9
10	5·889	5·650	5·426	5·216	5·019	4·833	4·659	4·494	4·339	4·192	10
11	6·207	5·938	5·687	5·453	5·234	5·029	4·836	4·656	4·486	4·327	11
12	6·492	6·194	5·918	5·660	5·421	5·197	4·988	4·793	4·611	4·439	12
13	6·750	6·424	6·122	5·842	5·583	5·342	5·118	4·910	4·715	4·533	13
14	6·982	6·628	6·302	6·002	5·724	5·468	5·229	5·008	4·802	4·611	14
15	7·191	6·811	6·462	6·142	5·847	5·575	5·324	5·092	4·876	4·675	15

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	0·0000	0·0040	0·0080	0·0120	0·0160	0·0199	0·0239	0·0279	0·0319	0·0359
0·1	0·0398	0·0438	0·0478	0·0517	0·0557	0·0596	0·0636	0·0675	0·0714	0·0753
0·2	0·0793	0·0832	0·0871	0·0910	0·0948	0·0987	0·1026	0·1064	0·1103	0·1141
0·3	0·1179	0·1217	0·1255	0·1293	0·1331	0·1368	0·1406	0·1443	0·1480	0·1517
0·4	0·1554	0·1591	0·1628	0·1664	0·1700	0·1736	0·1772	0·1808	0·1844	0·1879
0·5	0·1915	0·1950	0·1985	0·2019	0·2054	0·2088	0·2123	0·2157	0·2190	0·2224
0·6	0·2257	0·2291	0·2324	0·2357	0·2389	0·2422	0·2454	0·2486	0·2517	0·2549
0·7	0·2580	0·2611	0·2642	0·2673	0·2704	0·2734	0·2764	0·2794	0·2823	0·2852
0·8	0·2881	0·2910	0·2939	0·2967	0·2995	0·3023	0·3051	0·3078	0·3106	0·3133
0·9	0·3159	0·3186	0·3212	0·3238	0·3264	0·3289	0·3315	0·3340	0·3365	0·3389
1·0	0·3413	0·3438	0·3461	0·3485	0·3508	0·3531	0·3554	0·3577	0·3599	0·3621
1·1	0·3643	0·3665	0·3686	0·3708	0·3729	0·3749	0·3770	0·3790	0·3810	0·3830
1·2	0·3849	0·3869	0·3888	0·3907	0·3925	0·3944	0·3962	0·3980	0·3997	0·4015
1·3	0·4032	0·4049	0·4066	0·4082	0·4099	0·4115	0·4131	0·4147	0·4162	0·4177
1·4	0·4192	0·4207	0·4222	0·4236	0·4251	0·4265	0·4279	0·4292	0·4306	0·4319
1·5	0·4332	0·4345	0·4357	0·4370	0·4382	0·4394	0·4406	0·4418	0·4429	0·4441
1·6	0·4452	0·4463	0·4474	0·4484	0·4495	0·4505	0·4515	0·4525	0·4535	0·4545
1·7	0·4554	0·4564	0·4573	0·4582	0·4591	0·4599	0·4608	0·4616	0·4625	0·4633
1·8	0·4641	0·4649	0·4656	0·4664	0·4671	0·4678	0·4686	0·4693	0·4699	0·4706
1·9	0·4713	0·4719	0·4726	0·4732	0·4738	0·4744	0·4750	0·4756	0·4761	0·4767
2·0	0·4772	0·4778	0·4783	0·4788	0·4793	0·4798	0·4803	0·4808	0·4812	0·4817
2·1	0·4821	0·4826	0·4830	0·4834	0·4838	0·4842	0·4846	0·4850	0·4854	0·4857
2·2	0·4861	0·4864	0·4868	0·4871	0·4875	0·4878	0·4881	0·4884	0·4887	0·4890
2·3	0·4893	0·4896	0·4898	0·4901	0·4904	0·4906	0·4909	0·4911	0·4913	0·4916
2·4	0·4918	0·4920	0·4922	0·4925	0·4927	0·4929	0·4931	0·4932	0·4934	0·4936
2·5	0·4938	0·4940	0·4941	0·4943	0·4945	0·4946	0·4948	0·4949	0·4951	0·4952
2·6	0·4953	0·4955	0·4956	0·4957	0·4959	0·4960	0·4961	0·4962	0·4963	0·4964
2·7	0·4965	0·4966	0·4967	0·4968	0·4969	0·4970	0·4971	0·4972	0·4973	0·4974
2·8	0·4974	0·4975	0·4976	0·4977	0·4977	0·4978	0·4979	0·4979	0·4980	0·4981
2·9	0·4981	0·4982	0·4982	0·4983	0·4984	0·4984	0·4985	0·4985	0·4986	0·4986
3·0	0·4987	0·4987	0·4987	0·4988	0·4988	0·4989	0·4989	0·4989	0·4990	0·4990

This table can be used to calculate $N(d)$, the cumulative normal distribution functions needed for the Black-Scholes model of option pricing. If $d_i > 0$, add 0·5 to the relevant number above. If $d_i < 0$, subtract the relevant number above from 0·5.

End of Question Paper