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ACCA – Paper P4
Advanced Financial Management
September and December 2015
Final Assessment

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Marking Report

Notice to Markers

1 When commenting about the script performance, please ensure on individual questions and on overall assessment your comments cover areas of examination technique including:

• Time management	• Handwriting	• Presentation and layout	• Use of English
• Points clearly and concisely made	• Relevance of answers to question	• Coverage and depth of answer	• Accuracy of calculations
• Calculations cross-referenced to workings	• All parts of the requirement attempted	• Length of answers equates to marks available	• Read the question carefully

2 For each question, please provide suitable constructive comments

Question Number	General Comments	Exam Technique Comments

ACCA FINAL ASSESSMENT

Advanced Financial Management

September and December 2015

Paper P4

Time allowed

Reading time: **15 minutes**

Writing time: **3 hours**

This paper is divided into two sections

Section A One compulsory question

Section B TWO questions ONLY to be attempted

Formulae Sheet and Mathematical Tables are on pages 8-12

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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SECTION A

One compulsory question

1 Blencathra is a company located in Wales which specialises in the production of digital clocks. A slump in demand during the last two years has meant that the company has moved into a loss-making situation. Prospects for the future are poor, unless the company can find new markets. Blencathra's managing director is unwilling to expose the company to the increased credit risk that would result from exporting, so she has been to South America where she has been discussing a possible joint venture in the country of Marantinta. A company in Marantinta would like to use the technical expertise and patent rights of Blencathra, and set up a manufacturing operation in Marantinta, which would sell clocks to the South American market, an area in which Blencathra has never traded. Due to differences in labour costs the Marantintan Company expects to manufacture the clocks for 40% less than it costs to manufacture in Wales. The Marantintan Company has agreed that it would not export to Europe within the next four years.

Blencathra would be required to:

(i) Provide 30% of the total capital of 45 million pesos required to establish production in Marantinta. 5 million pesos of the total capital would be for working capital, the remainder for depreciable non-current assets.

(ii) Grant full patent rights to produce the clocks in Marantinta. The patent has six years until it expires.

(iii) Provide technical expertise to assist in setting up the joint venture.

(iv) Provide ongoing technical aid.

The joint venture agreement would be for a period of four years, after which time a new agreement would be negotiated, or the Marantintan company would guarantee to buy Blencathra's share of the venture, including future patent rights to produce the clocks, for a sum of 30 million pesos, after any tax liabilities. The joint venture agreement would provide for equal shares of profits or losses from the venture.

The clocks are expected to sell in South America for a price in year 1 of 480 pesos per unit. Price will then increase by the expected rate of inflation in Marantinta. 40,000 units are expected to be sold in South America in the first year, rising by 10% per year for the next three years. The joint venture would also sell an expected 10,000 units per year to the USA at a constant price of $30 per unit. Blencathra currently exports similar clocks to the USA, providing a pre-tax contribution of £80,000 per year. Because of the cheaper price of clocks manufactured in Marantinta it is expected that 40% of these exports would be lost.

Provision of initial technical assistance would cost Blencathra £105,000, and ongoing aid would cost £50,000 per year in salaries, at current prices. Neither would be tax allowable expenses in Marantinta, although the salaries would be tax allowable in the UK. Use of the patent would have no cash cost, but would mean that the patent could not be sold to another South American company which was willing to pay a constant £40,000 per year for the patent.

Costs in year 1 in Marantinta are expected to be:

Direct costs 200 pesos per unit,

Fixed costs 4 million pesos per annum

Both are expected to increase by the inflation rate in Marantinta. Tax allowable depreciation in Marantinta is available at 50% per year on a reducing balance basis. The corporate tax rate in Marantinta is 20% and in the UK 30%. A bilateral tax agreement exists between Marantinta and the UK. Tax is payable one year in arrears.

Expected inflation rates (%)

	UK	*Marantinta*	*USA*
Year 1	3	20	5
Year 2	3	20	5
Year 3	3	15	5
Year 4	3	15	5
Year 5	3	15	5

Spot Exchange rates:

Marantintan pesos 32.78/£

Marantintan pesos 18.32/US$

Blencathra's current after tax cost of capital is 14%. Because of the risk of operating in South America Blencathra's finance director is proposing to use 18% as the cost of capital for the joint venture. Blencathra would finance its capital needs for the new venture with a 9% convertible bond.

Required:

(a) Explain why credit risks are more significant on export sales, and discuss methods of reducing these credit risks. (10 marks)

(b) Discuss the advantages and disadvantages of establishing international operations by means of joint ventures. (8 marks)

(c) Prepare a report for the management of Blencathra which evaluates whether or not Blencathra should participate in the joint venture in Marantinta.

As part of your evaluation:

(i) calculate the net present value of the project from the point of view of Blencathra

(ii) discuss any other factors that you consider to be relevant to the decision, including the proposed financial contributions of Blencathra and the Marantintan company to the joint venture.

State clearly any assumptions that you make.

Relevant calculations should be included as part of your evaluation.

Approximately 20 marks are available for calculations, and 8 marks for discussion. **(28 marks)**

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

(Total: 50 marks)

SECTION B

TWO questions ONLY to be attempted

2 Medeiros Co is a large company which is listed on a major Asian Stock Exchange. It was founded 45 years ago as a manufacturer of car engine parts, but in recent years it has diversified into the aviation sector and now approximately one quarter of the company's revenue and profits are generated by the aircraft engine parts manufacturing business.

The company has been quite successful in recent years. Despite the global recession which has had a major impact on the car industry, Medeiros Co has seen its profits grow slightly year by year. Over the last 12 months, the company's share price has stayed fairly constant at approximately $3.29 per share. The company has 40 million $0.50 nominal value shares in issue.

Medeiros Co also has $50 million corporate bonds (at nominal value) in issue, which were issued 3 years ago and are redeemable in 5 years' time. The bonds are trading at $131.60 per $100 nominal value. Medeiros is an AA rated company according to the main Asian credit rating agency. The agency is currently displaying the following summary of credit spreads on its website:

Credit spreads in basis points:

	1 Year	*3 years*	*5 years*	*8 years*
AA rating	22	39	63	89

The risk free rate of interest in Asia is currently 3.75% per annum.

The company is considering its future options. The directors are keen to expand the business further by investing in new projects, so they want to compute a cost of capital to be used in the investment appraisal process. In a recent newspaper article, a market analyst commented that the equity beta for Medeiros Co is approximately 1.56. However, the directors of Medeiros Co want to independently verify this figure using their own calculations based on proxy companies.

Therefore, two suitable proxy companies have been identified: Car Sure Co, a manufacturer of car engine parts, and Craft Bits Co, a manufacturer of aircraft engine parts. Key financial information for these two companies is as follows:

	Car Sure Co	**Craft Bits Co**
Gearing (debt to equity at market value)	20:80	50:50
Equity beta	1.60	Not available
Cost of equity	Not available	9.48%
Pre tax cost of debt	Not available	4.38%

The debt beta for both proxy companies, and for Medeiros Co, is 0.10. The market risk premium on the stock market was 6.25% last year, and the corporation tax rate is 30%.

Required:

(a) Using the given proxy company information, estimate the current equity beta of Medeiros Co. (10 marks)

(b) Calculate the current weighted average cost of capital (WACC) for Medeiros Co. (3 marks)

(c) Explain the circumstances in which the WACC calculated in (c) above would be appropriate to use in the investment appraisal process. (4 marks)

(d) In order to enable it to expand, Medeiros Co would have to raise more finance. Explain, without presenting any further calculations, the likely impact on the WACC if Medeiros Co were to raise more finance. (8 marks)

(Total: 25 marks)

3 (a) Briefly discuss the meaning and importance of the term 'delta' in option pricing.

(3 marks)

(b) 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. **(16 marks)**

(c) Bioplasm has estimated an annual standard deviation of $1 million on one of its other projects, based on a normal distribution of returns. The average annual return on this project is $5 million.

Required:

Estimate the project's Value at Risk (VAR) at a 95% confidence level for one year and over the project's life of six years. Explain what is meant by the answers obtained. **(6 marks)**

(Total: 25 marks)

4 Coyle Developments (CD) is a UK based ceramics manufacturing company. It's most recent accounts show a turnover of £270.15m and an operating profit of £35.82m.

CD imports raw materials, such as metallic ores, in bulk from many foreign countries as the starting point of the ceramics manufacturing process. These purchases are usually denominated in the currency of the supplier's country, or in US$.

The company's Procurement Director has just secured a supply contract with a Chinese mining company to supply 500 tonnes of bismuthinite (the ore of the element bismuth, which is increasingly being used as a replacement for lead in ceramics manufacturing). The current price of bismuthinite is US$ 36 per kg (US$ 36,000 per tonne).

You are the finance director of CD, and you are concerned about the implications for currency risk of the bismuthinite contract.

The terms of the contract are:

- the bismuthinite will be delivered in two equal batches, in 6 months and in 1 year.
- payment will be required in two equal amounts, in US $, on the delivery dates.

The board of directors have asked you to research the various hedging options available for the bismuthinite contract.

Current market data:

Spot rate (US$/£1):	1.4985 – 1.5037
1 year forward discount:	3.50 – 3.85 cents

US$ LIBOR (rates quoted per annum)

6 month	4.75%
1 year	4.88%

Sterling (£) LIBOR (rates quoted per annum)

6 month	2.46%
1 year	2.52%

Required:

(a) Prepare a briefing note for the board of directors, which outlines:

(i) the different types of foreign currency exchange risk that CD faces, both on the bismuthinite contract and in general terms.

(ii) the various hedging options available for the bismuthinite contract. (10 marks)

(b) Calculate the value of the two transactions (in £) if the amounts are hedged using:

(i) forward contracts

(ii) money market hedges

and recommend which method should be used by CD in this case. (10 marks)

(c) Discuss the extent to which currency hedging can reduce a firm's cost of capital. (5 marks)

(Total: 25 marks)

FORMULAE SHEET

Modigliani and Miller proposition 2 (with tax)

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

The capital asset pricing model

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

The asset beta formula

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

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

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

Modified Internal Rate of Return

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

The Black-Scholes option pricing model

$$c = P_aN(d_1) - P_eN(d_2)e^{-rt}$$

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), the cumulative normal distribution function needed for the Black-Scholes model of option pricing. If d > 0, add 0.5 to the relevant number above. If d < 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. $\frac{1-(1+r)^{-n}}{r}$

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