

Fundamentals Level – Skills Module

# Financial Management

Friday 7 December 2012



**Time allowed**

Reading and planning: 15 minutes

Writing: 3 hours

ALL FOUR questions are compulsory and MUST be attempted.

**Formulae Sheet, Present Value and Annuity Tables are on pages 6, 7 and 8.**

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

**During reading and planning time only the question paper may be annotated. You must NOT write in your answer booklet until instructed by the supervisor.**

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

The Association of Chartered Certified Accountants

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**ACCA**

**ALL FOUR questions are compulsory and MUST be attempted**

1 BQK Co, a house-building company, plans to build 100 houses on a development site over the next four years. The purchase cost of the development site is \$4,000,000, payable at the start of the first year of construction. Two types of house will be built, with annual sales of each house expected to be as follows:

Year	1	2	3	4
Number of small houses sold:	15	20	15	5
Number of large houses sold:	7	8	15	15

Houses are built in the year of sale. Each customer finances the purchase of a home by taking out a long-term personal loan from their bank. Financial information relating to each type of house is as follows:

	Small house	Large house
Selling price:	\$200,000	\$350,000
Variable cost of construction:	\$100,000	\$200,000

Selling prices and variable cost of construction are in current price terms, before allowing for selling price inflation of 3% per year and variable cost of construction inflation of 4.5% per year.

Fixed infrastructure costs of \$1,500,000 per year in current price terms would be incurred. These would not relate to any specific house, but would be for the provision of new roads, gardens, drainage and utilities. Infrastructure cost inflation is expected to be 2% per year.

BQK Co pays profit tax one year in arrears at an annual rate of 30%. The company can claim capital allowances on the purchase cost of the development site on a straight-line basis over the four years of construction.

BQK Co has a real after-tax cost of capital of 9% per year and a nominal after-tax cost of capital of 12% per year. New investments are required by the company to have a before-tax return on capital employed (accounting rate of return) on an average investment basis of 20% per year.

**Required:**

- (a) Calculate the net present value of the proposed investment and comment on its financial acceptability. Work to the nearest \$1,000. (13 marks)
- (b) Calculate the before-tax return on capital employed (accounting rate of return) of the proposed investment on an average investment basis and discuss briefly its financial acceptability. (5 marks)
- (c) Discuss the effect of a substantial rise in interest rates on the financing cost of BQK Co and its customers, and on the capital investment appraisal decision-making process of BQK Co. (7 marks)

**(25 marks)**

- 2 KXP Co is an e-business which trades solely over the internet. In the last year the company had sales of \$15 million. All sales were on 30 days' credit to commercial customers.

Extracts from the company's most recent statement of financial position relating to working capital are as follows:

	<b>\$000</b>
Trade receivables	2,466
Trade payables	2,220
Overdraft	3,000

In order to encourage customers to pay on time, KXP Co proposes introducing an early settlement discount of 1% for payment within 30 days, while increasing its normal credit period to 45 days. It is expected that, on average, 50% of customers will take the discount and pay within 30 days, 30% of customers will pay after 45 days, and 20% of customers will not change their current paying behaviour.

KXP Co currently orders 15,000 units per month of Product Z, demand for which is constant. There is only one supplier of Product Z and the cost of Product Z purchases over the last year was \$540,000. The supplier has offered a 2% discount for orders of Product Z of 30,000 units or more. Each order costs KXP Co \$150 to place and the holding cost is 24 cents per unit per year.

KXP Co has an overdraft facility charging interest of 6% per year.

**Required:**

- (a) Calculate the net benefit or cost of the proposed changes in trade receivables policy and comment on your findings. (6 marks)
- (b) Calculate whether the bulk purchase discount offered by the supplier is financially acceptable and comment on the assumptions made by your calculation. (6 marks)
- (c) Identify and discuss the factors to be considered in determining the optimum level of cash to be held by a company. (5 marks)
- (d) Discuss the factors to be considered in formulating a trade receivables management policy. (8 marks)

**(25 marks)**

3 The statement of financial position of BKB Co provides the following information:

	\$m	\$m
Equity finance		
Ordinary shares (\$1 nominal value)	25	
Reserves	15	40
	<hr/>	
Non-current liabilities		
7% Convertible bonds (\$100 nominal value)	20	
5% Preference shares (\$1 nominal value)	10	30
	<hr/>	
Current liabilities		
Trade payables	10	
Overdraft	15	25
	<hr/>	<hr/>
Total liabilities		95
		<hr/>

BKB Co has an equity beta of 1.2 and the ex-dividend market value of the company's equity is \$125 million. The ex-interest market value of the convertible bonds is \$21 million and the ex-dividend market value of the preference shares is \$6.25 million.

The convertible bonds of BKB Co have a conversion ratio of 19 ordinary shares per bond. The conversion date and redemption date are both on the same date in five years' time. The current ordinary share price of BKB Co is expected to increase by 4% per year for the foreseeable future.

The overdraft has a variable interest rate which is currently 6% per year and BKB Co expects this to increase in the near future. The overdraft has not changed in size over the last financial year, although one year ago the overdraft interest rate was 4% per year. The company's bank will not allow the overdraft to increase from its current level.

The equity risk premium is 5% per year and the risk-free rate of return is 4% per year. BKB Co pays profit tax at an annual rate of 30% per year.

**Required:**

- (a) Calculate the market value after-tax weighted average cost of capital of BKB Co, explaining clearly any assumptions you make. (12 marks)
- (b) Discuss why market value weighted average cost of capital is preferred to book value weighted average cost of capital when making investment decisions. (4 marks)
- (c) Comment on the interest rate risk faced by BKB Co and discuss briefly how this risk can be managed. (5 marks)
- (d) Discuss the attractions to a company of convertible debt compared to a bank loan of a similar maturity as a source of finance. (4 marks)

**(25 marks)**

- 4 GWW Co is a listed company which is seen as a potential target for acquisition by financial analysts. The value of the company has therefore been a matter of public debate in recent weeks and the following financial information is available:

Year	2009	2010	2011	2012
Profit after tax (\$m)	8.5	8.9	9.7	10.1
Total dividends (\$m)	5.0	5.2	5.6	6.0

**Statement of financial position information for 2012**

	\$m	\$m
Non-current assets		91.0
Current assets		
Inventory	3.8	
Trade receivables	4.5	8.3
Total assets		<u>99.3</u>
Equity finance		
Ordinary shares	20.0	
Reserves	<u>47.2</u>	67.2
Non-current liabilities		
8% bonds		25.0
Current liabilities		<u>7.1</u>
Total liabilities		<u>99.3</u>

The shares of GWW Co have a nominal (par) value of 50c per share and a market value of \$4.00 per share. The cost of equity of the company is 9% per year. The business sector of GWW Co has an average price/earnings ratio of 17 times. The 8% bonds are redeemable at nominal (par) value of \$100 per bond in seven years' time and the before-tax cost of debt of GWW Co is 6% per year.

The expected net realisable values of the non-current assets and the inventory are \$86.0m and \$4.2m, respectively. In the event of liquidation, only 80% of the trade receivables are expected to be collectible.

**Required:**

**(a) Calculate the value of GWW Co using the following methods:**

- (i) market capitalisation (equity market value);
- (ii) net asset value (liquidation basis);
- (iii) price/earnings ratio method using the business sector average price/earnings ratio;
- (iv) dividend growth model using:
  - (1) the average historic dividend growth rate;
  - (2) Gordon's growth model (the  $br_e$  model).

The total marks will be split equally between each part.

(10 marks)

**(b) Discuss the relative merits of the valuation methods in part (a) above in determining a purchase price for GWW Co.**

(8 marks)

**(c) Calculate the following values for GWW Co:**

- (i) the before-tax market value of the bonds of GWW Co;
- (ii) debt/equity ratio (book value basis);
- (iii) debt/equity ratio (market value basis).

**Discuss the usefulness of the debt/equity ratio in assessing the financial risk of GWW Co.**

The total marks will be split equally between each part.

(7 marks)

**(25 marks)**

## Formulae Sheet

### Economic order quantity

$$= \sqrt{\frac{2C_0D}{C_h}}$$

### Miller–Orr Model

$$\text{Return point} = \text{Lower limit} + \left(\frac{1}{3} \times \text{spread}\right)$$

$$\text{Spread} = 3 \left[ \frac{\frac{3}{4} \times \text{transaction cost} \times \text{variance of cash flows}}{\text{interest rate}} \right]^{\frac{1}{3}}$$

### 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

$$P_0 = \frac{D_0(1 + g)}{(r_e - g)}$$

### Gordon's growth approximation

$$g = br_e$$

### The weighted average cost of capital

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

### The Fisher formula

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

### Purchasing power parity and interest rate parity

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

### Present Value Table

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

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

<i>Discount rate (r)</i>											
<i>Periods</i>											
(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

Periods (n)	Discount rate (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	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

End of Question Paper



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# Answers

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**1 (a) NPV calculation**

Year	1	2	3	4	5
	<b>\$000</b>	<b>\$000</b>	<b>\$000</b>	<b>\$000</b>	<b>\$000</b>
Sales revenue	5,614	7,214	9,015	7,034	
Variable costs	(3,031)	(3,931)	(5,135)	(4,174)	
Contribution	2,583	3,283	3,880	2,860	
Fixed costs	(1,530)	(1,561)	(1,592)	(1,624)	
Before-tax cash flow	1,053	1,722	2,288	1,236	
Tax liability		(316)	(517)	(686)	(371)
CA tax benefits		300	300	300	300
After-tax cash flow	1,053	1,706	2,071	850	(71)
Discount at 12%	0.893	0.797	0.712	0.636	0.567
Present values	940	1,360	1,475	541	(40)
	<b>\$000</b>				
PV of future cash flows	4,276				
Initial investment	(4,000)				
	276				

**Comment**

Since the proposed investment has a positive net present value of \$276,000, it is financially acceptable.

**Workings**

**Sales revenue**

Year	1	2	3	4
Sales of small houses (houses/yr)	15	20	15	5
Sales of large houses (houses/yr)	7	8	15	15
Small house selling price (\$000/house)	200	200	200	200
Large house selling price (\$000/house)	350	350	350	350
Sales revenue (small houses) (\$000/yr)	3,000	4,000	3,000	1,000
Sales revenue (large houses) (\$000/yr)	2,450	2,800	5,250	5,250
Total sales revenue (\$/yr)	5,450	6,800	8,250	6,250
Inflated sales revenue (\$/yr)	5,614	7,214	9,015	7,034

**Variable costs of construction**

Year	1	2	3	4
Sales of small houses (houses/yr)	15	20	15	5
Sales of large houses (houses/yr)	7	8	15	15
Small house variable cost (\$000/house)	100	100	100	100
Large house variable cost (\$000/house)	200	200	200	200
Variable cost (small houses) (\$000/yr)	1,500	2,000	1,500	500
Variable cost (large houses) (\$000/yr)	1,400	1,600	3,000	3,000
Total variable cost (\$/yr)	2,900	3,600	4,500	3,500
Inflated total variable cost (\$/yr)	3,031	3,931	5,135	4,174

**Fixed infrastructure costs**

Year	1	2	3	4
Fixed costs (\$000/yr)	1,500	1,500	1,500	1,500
Inflated fixed costs (\$000/yr)	1,530	1,561	1,592	1,624

### Alternative NPV calculation

Year	1	2	3	4	5
	\$000	\$000	\$000	\$000	\$000
Before-tax cash flow	1,053	1,722	2,288	1,236	
Capital allowances	(1,000)	(1,000)	(1,000)	(1,000)	
Taxable profit	53	722	1,288	236	
Taxation		(16)	(217)	(386)	(71)
Profit after tax	53	706	1,071	(150)	(71)
Add back allowances	1,000	1,000	1,000	1,000	
After-tax cash flow	1,053	1,706	2,071	850	(71)
Discount at 12%	0.893	0.797	0.712	0.636	0.567
Present values	940	1,360	1,475	541	(40)
	\$000				
PV of future cash flows	4,276				
Initial investment	(4,000)				
	276				

### (b) Calculation of return on capital employed (ROCE)

Total before-tax cash flow	\$6,299,000
Total depreciation	\$4,000,000
Total accounting profit	\$2,299,000

Average annual profit (\$000/year) =  $2,299,000/4 = \$574,750$

Average investment (\$000) =  $4,000,000/2 = \$2,000,000$

ROCE (ARR) =  $100 \times 574,750/2,000,000 = 28.7\%$

### Discussion

The ROCE is greater than the 20% target ROCE of the investing company and so the proposed investment is financially acceptable. However, the investment decision should be made on the basis of information provided by a discounted cash flow (DCF) method, such as net present value or internal rate of return.

- (c) A substantial increase in interest rates will increase the financing costs of BQK Co and its customers. These will affect the discount rate used in the investment appraisal decision-making process and the value of project variables.

### Customer financing costs

Each customer finances their house purchase through a long-term personal loan from their bank. A substantial rise in interest rates will increase the borrowing costs of existing and potential customers of BQK Co, and will therefore increase the amount of cash they pay to buy one of the houses.

### Company financing costs

The cost of debt of BQK Co will change with interest rates in the economy. A substantial rise in interest rates will therefore lead to a substantial increase in the cost of debt of the company. This will lead to an increase in the weighted average cost of capital (WACC) of BQK Co, the actual increase depending on the relative proportion of debt compared to equity in the company's capital structure.

The cost of equity will also increase as interest rates rise, contributing to the increase in the WACC. Since most companies have a greater proportion of equity finance as compared to debt finance, the increase in the cost of equity is likely to have a more significant effect on the WACC than the increase in the cost of debt.

### Effect on the capital investment appraisal process

Since the business of the company is building houses, the WACC of the company is likely to be the discount rate it uses in evaluating investment decisions such as the one under consideration. An increase in WACC will therefore lead to a decrease in the NPV of investment projects and some projects may no longer be attractive.

In order to make the investment project more attractive, the prices of the houses offered for sale might have to increase. This could make the houses more difficult to sell and lead to increased costs due to slower sales.

Houses could also be more difficult to sell as customers would be more reluctant to commit themselves to long-term personal loans when interest rates are historically high.

Construction and infrastructure costs might increase as suppliers seek to pass on their higher borrowing costs.

Overall, income per year could decrease and the time period for the investment might need to be extended to accommodate the slower sales process.

## 2 (a) Calculation of net cost/benefit

Current receivables = \$2,466,000

Receivables paying within 30 days =  $15\text{m} \times 0.5 \times 30/365 = \$616,438$

Receivables paying within 45 days =  $15\text{m} \times 0.3 \times 45/365 = \$554,795$

Receivables paying within 60 days =  $15\text{m} \times 0.2 \times 60/365 = \$493,151$

Revised receivables =  $616,438 + 554,795 + 493,151 = \$1,664,384$

Reduction in receivables =  $2,466,000 - 1,664,384 = \$801,616$

Reduction in financing cost =  $801,616 \times 0.06 = \$48,097$

Cost of discount =  $15\text{m} \times 0.5 \times 0.01 = \$75,000$

Net cost of proposed changes in receivables policy =  $75,000 - 48,097 = \$26,903$

### Alternative approach to calculation of net cost/benefit

Current receivables days =  $(2,466/15,000) \times 365 = 60$  days

Revised receivables days =  $(30 \times 0.5) + (45 \times 0.3) + (60 \times 0.2) = 40.5$  days

Decrease in receivables days =  $60 - 40.5 = 19.5$  days

Decrease in receivables =  $15\text{m} \times 19.5/365 = \$801,370$

(The slight difference compared to the earlier answer is due to rounding)

Decrease in financing cost =  $801,370 \times 0.06 = \$48,082$

Net cost of proposed changes in receivables policy =  $75,000 - 48,082 = \$26,918$

### Comment

The proposed changes in trade receivables policy are not financially acceptable. However, if the trade terms offered are comparable with those of its competitors, KXP Co needs to investigate the reasons for the (on average) late payment of current customers. This analysis also assumes constant sales and no bad debts, which is unlikely to be the case in reality.

## (b) Cost of current inventory policy

Cost of materials = \$540,000 per year

Annual ordering cost =  $12 \times 150 = \$1,800$  per year

Annual holding cost =  $0.24 \times (15,000/2) = \$1,800$  per year

Total cost of current inventory policy =  $540,000 + 1,800 + 1,800 = \$543,600$  per year

### Cost of inventory policy after bulk purchase discount

Cost of materials after bulk purchase discount =  $540,000 \times 0.98 = \$529,200$  per year

Annual demand =  $12 \times 15,000 = 180,000$  units per year

KXP Co will need to increase its order size to 30,000 units to gain the bulk discount

Revised number of orders =  $180,000/30,000 = 6$  orders per year

Revised ordering cost =  $6 \times 150 = \$900$  per year

Revised holding cost =  $0.24 \times (30,000/2) = \$3,600$  per year

Revised total cost of inventory policy =  $529,200 + 900 + 3,600 = \$533,700$  per year

### Evaluation of offer of bulk purchase discount

Net benefit of taking bulk purchase discount =  $543,600 - 533,700 = \$9,900$  per year

The bulk purchase discount looks to be financially acceptable. However, this evaluation is based on a number of unrealistic assumptions. For example, the ordering cost and the holding cost are assumed to be constant, which is unlikely to be true in reality. Annual demand is assumed to be constant, whereas in practice seasonal and other changes in demand are likely.

- (c) The following factors should be considered in determining the optimum level of cash to be held by a company, for example, at the start of a month or other accounting control period.

### The transactions need for cash

The amount of cash needed for the next period can be forecast using a cash budget, which will net off expected receipts against expected payments. This will determine the transactions need for cash, which is one of the three reasons for holding cash.

### The precautionary need for cash

Although a cash budget will provide an estimate of the transactions need for cash, it will be based on assumptions about the future and will therefore be subject to uncertainty. The actual need for cash may be greater than the forecast need for cash. In order to provide for any unexpected need for cash, a company can include some spare cash (a cash buffer) in its cash balance. This is the precautionary need for cash. In determining the optimal level of cash to be held, a company will estimate the size of this cash buffer, for example from past experience, because it will be keen to minimise the opportunity cost of maintaining funds in cash form.

### The speculative need for cash

There is always the possibility of an unexpected opportunity occurring in the business world and a company may wish to be prepared to take advantage of such a business opportunity if it arises. It may therefore wish to have some cash available for this purpose. This is the speculative need for cash. Building 'a war chest' for possible company acquisitions reflects this reason for holding cash.

### The availability of finance

A company may choose to hold higher levels of cash if it has difficulty gaining access to cash when it needs it. For example, if a company's bank makes it difficult to access overdraft finance, or if a company is refused an overdraft facility, its precautionary need for cash will increase and its optimum cash level will therefore also increase.

- (d) The factors to be considered in formulating a trade receivables policy relate to credit analysis, credit control and receivables collection.

#### Credit analysis

In offering credit, a company must consider that it will be exposed to the risk of late payment and the risk of bad debts. To reduce these risks, the company will assess the creditworthiness of its potential customers. In order to do this, the company needs information, which can come from a variety of sources, such as trade references, bank references, credit reference agencies, published accounts and so on. As a result of assessing the creditworthiness of customers, a company can decide on the amount of credit to offer, the credit terms to offer, or whether to offer credit at all.

#### Credit control

Having extended credit to customers, a company needs to consider ways to ensure that the terms under which credit was granted are followed. It is important that customers settle outstanding accounts on time and keep to agreed credit limits. Factors to consider here are, therefore, the number of overdue accounts and the amount of outstanding cash. This information can be provided by an aged receivables analysis.

Another factor to consider is that customers need to be made aware of the amounts outstanding on their accounts and reminded when payment is due. This can be done by providing regular statements of account and by sending reminder letters when payment is due.

#### Receivables collection

Cash received needs to be banked quickly if payment is not made electronically by credit transfer. Overdue accounts must be followed up in order to assess the likelihood of payment and to determine what further action is needed. In the worst cases, legal steps may need to be taken in order to recover outstanding amounts.

A key factor to consider here is that the benefit gained from chasing overdue amounts must not exceed the costs incurred.

### 3 (a) Calculation of cost of equity

The cost of equity can be calculated using the capital asset pricing model

$$K_e = 4 + (1.2 \times 5) = 10\%$$

#### Calculation of cost of debt of convertible bonds

Market value of bond =  $100 \times 21\text{m}/20\text{m} = \$105$  per bond

Ordinary share price =  $125\text{m}/25\text{m} = \$5.00$  per share

Share price in five years' time =  $5.00 \times 1.04^5 = \$6.08$  per share

Conversion value =  $6.08 \times 19 = \$115.52$

It is assumed that conversion is likely to occur, as the conversion value is greater than the alternative \$100 redemption value.

After-tax interest payment =  $0.07 \times 100 \times (1 - 0.3) = \$4.90$  per bond

Using linear interpolation:

Year	Cash flow	\$	Discount at 7%	PV (\$)
0	Market price	(105.00)	1.000	(105.00)
1-5	Interest	4.90	4.100	20.09
5	Conversion value	115.52	0.713	82.37
				<u>(2.54)</u>
Year	Cash flow	\$	Discount at 6%	PV (\$)
0	Market price	(105.00)	1.000	(105.00)
1-5	Interest	4.90	4.212	20.64
5	Conversion value	115.52	0.747	86.29
				<u>1.93</u>

$$\text{After-tax } K_d = 6 + ((7 - 6) \times 1.93)/(1.93 + 2.54) = 6 + 0.43 = 6.43\%$$

### Calculation of cost of preference shares

$$K_p = 100 \times (0.05 \times 10\text{m}/6.25\text{m}) = 8\%$$

Alternatively, the preference dividend per share can be compared with the preference share price to find the cost of preference shares

### Calculation of weighted average after-tax cost of capital

Total value of company = 125m + 6.25m + 21m = \$152.25 million

$$\text{After-tax WACC} = ((10\% \times 125\text{m}) + (8\% \times 6.25\text{m}) + (6.43\% \times 21\text{m}))/152.25\text{m} = 9.4\%$$

It is assumed that the overdraft can be ignored in calculating the WACC, even though it persists from year to year and is a significant source of finance for BKB Co.

- (b) Market values of different sources of finance are preferred to their book values when calculating weighted average cost of capital (WACC) because market values reflect the current conditions in the capital market. The relative proportions of the different sources of finance in the capital structure reflect more appropriately their relative importance to a company if market values are used as weights. For example, the market value of equity is usually much greater than its book value, so using book values for weights would seriously underestimate the relative importance of the cost of equity in the weighted average cost of capital.

If book values are used as weights, the WACC will be lower than if market values were used, due to the understatement of the contribution of the cost of equity, which is higher than the cost of capital of other sources of finance. This can be seen in the case of BKB Co, where the market value after-tax WACC was found to be 9.4% and the book value after-tax WACC is 8.7% ( $10\% \times 40 + 8\% \times 10 + 6.43\% \times 20/70$ ).

If book value WACC were used as the discount rate in investment appraisal, investment projects would be accepted that would be rejected if market value WACC were used. Using book value WACC as the discount rate will therefore lead to sub-optimal investment decisions.

As far as the cost of debt is concerned, using book values rather than market values for weights may make little difference to the WACC, since bonds often trade on the capital market at or close to their nominal (par) value. In addition, the cost of debt is lower than the cost of equity and will therefore make a smaller contribution to the WACC. It is still possible, however, that using book values as weights may under- or over-estimate the contribution of the cost of debt to the WACC.

- (c) BKB Co expects the variable interest rate on its overdraft to increase in the near future and therefore faces the risk of higher interest payments. The expected increase in the overdraft interest rate may be due to the particular position of BKB Co, which is at its overdraft limit as its bank will not allow any further increase in this borrowing facility. Alternatively, the expected increase in the overdraft interest rate may be due to a general increase in short-term interest rates, for example, as a result of government action to reduce inflationary pressures in the economy.

BKB Co is protected against interest rate increases to the extent that it has fixed-rate debt. The proportion of fixed-rate debt to total debt is 57% ( $100 \times 20/35$ ), while the proportion of fixed-rate interest to total interest is 61% ( $100 \times 1.4/2.3$ ). An increase of 1% in the overdraft interest rate will increase the annual interest payments on the overdraft of BKB Co by \$150,000 or 6.5%.

There are several ways that BKB can manage its interest rate risk. One way is to reduce the exposure of the company to the identified risk, in this case an interest rate increase. The company could therefore look to reduce the size of its overdraft, an action which would be welcomed by its bank. This could be achieved, for example, by using cash income to reduce the overdraft or by replacing part of the overdraft with fixed interest debt, such as a bank loan or an issue of traded bonds. An issue of longer-term debt, however, could potentially lead to a bigger increase in interest payments than expected from the increase in short-term interest rates. Furthermore, maintaining a balance between fixed-rate and floating-rate debt is itself a hedging method (smoothing) and BKB Co may already have chosen this internal hedging method over external hedging methods due to its lower relative cost.

Forward rate agreements would not help BKB Co manage its interest rate risk as these relate to future borrowing rather than to current debt. Interest rate futures would allow BKB Co to protect itself against an interest rate increase by locking into current interest rates. Interest rate swaps would be more suitable for hedging a long-term interest rate exposure, rather than the short-term interest rate exposure represented by an increase in the overdraft interest rate.

### Workings

$$\text{Total debt} = 20\text{m} + 15\text{m} = \$35 \text{ million}$$

$$\text{Fixed rate interest} = 20\text{m} \times 7\% = \$1.4 \text{ million per year}$$

$$\text{Variable rate interest} = 15\text{m} \times 6\% = \$0.9 \text{ million per year}$$

$$\text{Total interest} = 1.4\text{m} + 0.9\text{m} = \$2.3 \text{ million}$$

- (d) Convertible debt is debt that, at the option of the holder, can be converted into ordinary shares. If not converted, it will be redeemed like ordinary or straight debt on maturity. Convertible debt has a number of attractions compared with a bank loan of similar maturity, as follows:

### Self-liquidating

Provided that the conversion terms are pitched correctly and expected share price growth occurs, conversion will be an attractive choice for bond holders as it offers more wealth than redemption. This occurs when the conversion value is greater than the redemption value (if conversion and redemption are on the same date), or when the conversion value is greater than the floor value on the conversion date (if conversion is at an earlier date than the redemption date). If the debt is converted into ordinary shares, it will not need to be redeemed, i.e. self-liquidation has occurred. A bank loan of a similar maturity will need to have all of the capital repaid.

### Lower interest rate

The interest rate on convertible debt will be lower than the interest rate on ordinary debt such as a bank loan because of the value of the option to convert. The returns on fixed-interest debt will not increase with corporate profitability, so debt providers will have a limited share of the benefits from the investment of the funds they have provided. When debt has been converted, however, bond holders become shareholders and will potentially have unlimited returns, or at least returns that are higher than the returns on debt finance.

### Increase in debt capacity on conversion

Gearing will increase with a bank loan for the time that the debt is outstanding, and gearing will then return to its previous level when the bank loan has been paid off. Gearing also increases when convertible debt is issued, but if conversion occurs, the gearing will fall not only because the debt has been removed, but will fall even further because equity has replaced the debt. The capacity of the company to service debt (debt capacity) will therefore be enhanced by conversion, compared to redemption of a bank loan of a similar maturity.

### More attractive than ordinary debt

It may be possible to issue convertible debt even when ordinary debt such as a bank loan is not attractive to lenders, since the option to convert offers a little extra that ordinary debt does not. This is the option to convert in the future, which can be attractive to optimists, even when the short- and medium-term economic outlook may be poor.

#### 4 (a) (i) Market capitalisation of GWW Co

Value of ordinary shares in statement of financial position = \$20.0 million

Nominal (par) value of ordinary shares = 50 cents

Number of ordinary shares of company =  $20\text{m}/0.5 = 40$  million shares

Ordinary share price = \$4.00 per share

Market capitalisation =  $40\text{m} \times 4 = \$160$  million

#### (ii) Net asset value (liquidation basis)

Current net asset value (NAV) =  $91.0\text{m} + 8.3\text{m} - 7.1\text{m} - 25.0\text{m} = \$67.2$  million

Decrease in value of non-current assets on liquidation =  $86.0\text{m} - 91.0\text{m} = \$5$  million

Increase in value of inventory on liquidation =  $4.2\text{m} - 3.8\text{m} = \$0.4$  million

Decrease in value of trade receivables =  $4.5\text{m} \times 0.2 = \$0.9$  million

NAV (liquidation basis) =  $67.2\text{m} - 5\text{m} + 0.4\text{m} - 0.9\text{m} = \$61.7$  million

#### (iii) Price/earnings ratio value

Historic earnings of GWW Co = \$10.1 million

Average price/earnings ratio of GWW Co business sector = 17 times

Price/earnings ratio value of GWW Co =  $17 \times 10.1\text{m} = \$171.7$  million

*(Tutorial note: Price/earnings ratio calculation using forecast earnings would receive full credit)*

#### (iv) (1) Dividend growth model value (using historic dividend growth rate)

Historic dividend growth rate =  $[(6.0\text{m}/5.0\text{m})^{1/3} - 1] \times 100 = 6.27\%$

An assumption is made that future dividend growth is similar to historic dividend growth.

Value of GWW Co =  $(6\text{m} \times 1.0627)/(0.09 - 0.0627) = \$234$  million

#### (2) Dividend growth model value (using Gordon's growth model)

Gordon's growth model estimates the dividend growth rate using  $g = br_e$

Historic retention ratio (b) =  $100 \times (3.5 + 3.7 + 4.1 + 4.1)/(8.5 + 8.9 + 9.7 + 10.1) = 41\%$

Current return on shareholders' funds ( $r_e$ ) =  $100 \times 10.1/67.2 = 15\%$

Dividend growth rate =  $41 \times 0.15 = 6.15\%$

Value of GWW Co =  $(6\text{m} \times 1.0615)/(0.09 - 0.0615) = \$224$  million

- (b) Net asset value is an asset-based valuation method, while the price/earnings ratio method and the dividend growth model are both income-based methods. Market capitalisation can be seen as an objective measure of company value provided by the capital markets.

### Market capitalisation

While market capitalisation is often seen as an objective measure of company value, it must be recognised that market capitalisation is not fixed, but constantly changing as share prices change with the random arrival of new information on the capital market. In terms of determining a purchase price for GWW Co, market capitalisation represents a minimum value that existing shareholders can currently obtain on the capital market. Shareholders will therefore expect to be offered more than the current market price of their shares if they are to be persuaded to sell their shares to a bidding company.

Compared with other valuation methods, however, market capitalisation offers a value that is immediately verifiable for a listed company and existing shareholders will use it as a benchmark against which to measure any offer that is made to them.

### Net asset value (liquidation basis)

In terms of determining a purchase price for GWW Co, liquidation NAV is arguably more useful than book value NAV or replacement cost NAV, provided that information needed to calculate it can be reliably established, since it values a course of action open to the shareholders that is a real alternative to accepting an offer from a bidder. That said, it is usually found to be a value much lower than any possible purchase price because it does not value a company as a going concern, and few companies are purchased with the sole objective of liquidation.

### Price/earnings ratio method

This is a widely-used valuation method and provided that appropriate information is used, it can be useful in helping to determine a purchase price.

Appropriate information will include expected future earnings rather than historical earnings, since it is future income from a company that is purchased, not past income. In the case of GWW Co, the earnings one year forward could be forecast to be \$10.7m ( $10.1m \times 1.059$ ), using the historical earnings growth rate of 5.9%. With these earnings rather than the most recent earnings of \$10.1m, the price/earnings ratio value becomes \$181.9m ( $17 \times 10.7$ ), an increase of \$10.2m on the previously calculated value of \$171.2m. This increase would need to be considered in determining a purchase price for GWW Co, provided that earnings growth was expected to continue in the future.

Appropriate information will also include the price/earnings ratio used in the valuation, and the origin and meaning of the applied price/earnings ratio must be carefully considered if the calculated company value is to have any significance. Using a sector average price/earnings ratio implies that GWW Co is an average company, and this may be an inappropriate assumption to make.

### Dividend growth model

This valuation method provides a deprival value for target company shareholders, i.e. it values what they give up (the right to receive future dividends) if they accept an offer for their shares. Like market capitalisation, it represents a minimum value when considering the purchase price of a company, in this case a minimum value for shareholders who do not control dividend policy. While the dividend growth model has many weaknesses, the value it provides is useful in determining a purchase price, providing its limitations are kept in mind.

#### (c) (i) Calculation of market value of bond

The market value of the bond is the present value of the future cash flows from the bond, discounted at the before-tax cost of debt.

$$\text{Market value of bond} = (8 \times 5.582) + (100 \times 0.665) = 44.66 + 66.50 = \$111.16$$

#### (ii) Debt/equity ratio (book value basis)

$$D/E = 100 \times 25.0/67.2 = 37.2\%$$

#### (iii) Debt/equity ratio (market value basis)

$$\text{Market value of debt} = 25.0 \times 111.16/100 = \$27.8 \text{ million}$$

$$\text{Market value of equity} = 4.00 \times 20.0/0.5 = \$160.0 \text{ million}$$

$$D/E = 100 \times 27.8/160.0 = 17.4\%$$

### Debt/equity ratio and assessing financial risk

Financial risk relates to the variability in shareholder returns (profit after tax or earnings) that is caused by the use of debt in a company's capital structure. The debt/equity ratio is therefore useful in assessing financial risk as it measures the relative proportion of debt to equity. Financial risk will increase as the debt/equity ratio increases, whether the ratio uses a book value basis or a market value basis.

In assessing financial risk, however, the debt/equity ratio, like other accounting ratios, needs a basis for comparison. It is often said that a ratio in isolation has no meaning. In assessing financial risk, therefore, the trend over time in a company's debt/equity ratio can be considered, a rising trend indicating increasing financial risk. A comparison can also be made with the debt/equity ratios of similar companies, or with sector average debt/equity ratio, in order to assess relative financial risk.

Since financial risk relates to the variability in shareholder returns in the income statement, another commonly used way of assessing financial risk is the interest coverage ratio, sometimes calculated as interest gearing. This can be a more sensitive measure of financial risk than the debt/equity ratio, in that it can indicate when a company is experiencing increasing difficulty in meeting its interest payments. It should be noted that difficulty in meeting interest payments can be a problem even when the debt/equity ratio is low.



**Fundamentals Level – Skills Module, Paper F9  
Financial Management**

**December 2012 Marking Scheme**

	<i>Marks</i>	<i>Marks</i>
<b>1 (a)</b> Sales income without inflation	1	
Inflation of sales income	1	
Variable costs without inflation	1	
Inflation of variable costs	1	
Inflated fixed costs	1	
Calculation of capital allowances	1	
Correct use of capital allowances	1	
Calculation of tax liabilities	1	
Correct timing of tax liabilities	1	
Selection of correct discount rate	1	
Selection of discount factors	1	
Calculation of net present value	1	
Comment on financial acceptability	<u>1</u>	
		13
<b>(b)</b> Calculation of average annual accounting profit	1	
Correct use of depreciation	1	
Calculation of average investment	1	
Calculation of before-tax ROCE (ARR)	1	
Discussion on financial acceptability	<u>1–2</u>	
	Maximum	5
<b>(c)</b> Customer financing costs	2–3	
Company financing costs	2–3	
Effect on investment appraisal process	<u>2–3</u>	
	Maximum	<u>7</u>
		<u><b>25</b></u>

	<i>Marks</i>	<i>Marks</i>
<b>2 (a)</b> Revised trade receivables	1	
Reduction in trade receivables	1	
Reduction in financing cost	1	
Cost of early settlement discount	1	
Net cost of change in receivables policy	1	
Comment on findings	<u>1</u>	
		6
<b>(b)</b> Current annual ordering cost	0·5	
Current holding cost	0·5	
Total cost of current inventory policy	1	
Revised cost of materials	0·5	
Revised number of orders	0·5	
Revised ordering cost	0·5	
Revised holding cost	0·5	
Net benefit of bulk purchase discount	1	
Comment on assumptions	<u>1</u>	
		6
<b>(c)</b> Transactions need for cash	1–2	
Precautionary need for cash	1–2	
Speculative need for cash	1–2	
Other relevant discussion	<u>1–2</u>	
	Maximum	5
<b>(d)</b> Credit analysis	2–3	
Credit control	2–3	
Receivables collection	2–3	
Cost and benefits of trade receivables policy	<u>1–2</u>	
	Maximum	<u>8</u>
		<b><u>25</u></b>

	<i>Marks</i>	<i>Marks</i>
<b>3 (a)</b> Calculation of cost of equity using CAPM	2	
Calculation of bond market price	0-5	
Calculation of current share price	0-5	
Calculation of future share price	1	
Calculation of conversion value	1	
After-tax interest payment	1	
Setting up interpolation calculation	1	
Calculation of after-tax cost of debt	1	
Calculation of cost of preference shares	1	
Calculation of after-tax WACC	2	
Explanation of any assumptions made	<u>1</u>	
		12
<b>(b)</b> Market values reflect current market conditions	1-2	
Market values and optimal investment decisions	1-2	
Other relevant discussion or illustration	<u>1-2</u>	
	Maximum	4
<b>(c)</b> Comment on interest rate risk faced by company	1-2	
Reducing interest rate risk	1-2	
Other relevant discussion	<u>2-3</u>	
	Maximum	5
<b>(d)</b> Self-liquidating	1	
Lower interest rate	1	
Increase in debt capacity on conversion	1	
Other relevant advantages of convertible debt	<u>1-3</u>	
	Maximum	<u>4</u>
		<b><u>25</u></b>
<b>4 (a)</b> Market capitalisation	1	
Calculation of NAV (liquidation basis)	2	
Calculation of price/earnings ratio value	2	
Calculation of historic dividend growth rate	1	
Dividend growth model value using this growth rate	1	
Calculation of Gordon model dividend growth rate	2	
Dividend growth model value using this growth rate	<u>1</u>	
		10
<b>(b)</b> Discussion of market capitalisation	1-2	
Discussion of net asset value	1-2	
Discussion of price/earnings ratio method	1-2	
Discussion of dividend growth model	1-2	
Other relevant discussion	<u>1-2</u>	
	Maximum	8
<b>(c)</b> Calculation of before-tax market value of bond	2	
Calculation of book value debt/equity ratio	1	
Calculation of market value debt/equity ratio	1	
Discussion of debt/equity ratio and financial risk	<u>3-4</u>	
	Maximum	<u>7</u>
		<b><u>25</u></b>