

## Financial Management

Thursday 4 June 2009

## 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.


## ALL FOUR questions are compulsory and MUST be attempted

1 KFP Co, a company listed on a major stock market, is looking at its cost of capital as it prepares to make a bid to buy a rival unlisted company, NGN. Both companies are in the same business sector. Financial information on KFP Co and NGN is as follows:


Other relevant financial information:
Risk-free rate of return $4.0 \%$

Average return on the market $10.5 \%$
Taxation rate 30\%
NGN has a cost of equity of $12 \%$ per year and has maintained a dividend payout ratio of $45 \%$ for several years. The current earnings per share of the company is 80 c per share and its earnings have grown at an average rate of $4.5 \%$ per year in recent years.

The ex div share price of KFP Co is $\$ 4 \cdot 20$ per share and it has an equity beta of $1 \cdot 2$. The $7 \%$ bonds of the company are trading on an ex interest basis at $\$ 94.74$ per $\$ 100$ bond. The price/earnings ratio of KFP Co is eight times.

The directors of KFP Co believe a cash offer for the shares of NGN would have the best chance of success. It has been suggested that a cash offer could be financed by debt.

## Required:

(a) Calculate the weighted average cost of capital of KFP Co on a market value weighted basis. (10 marks)
(b) Calculate the total value of the target company, NGN, using the following valuation methods:
(i) Price/earnings ratio method, using the price/earnings ratio of KFP Co; and
(ii) Dividend growth model.
(c) Discuss the relationship between capital structure and weighted average cost of capital, and comment on the suggestion that debt could be used to finance a cash offer for NGN.
(9 marks)
(25 marks)

2 PV Co is evaluating an investment proposal to manufacture Product W33, which has performed well in test marketing trials conducted recently by the company's research and development division. The following information relating to this investment proposal has now been prepared.

Initial investment $\$ 2$ million
Selling price (current price terms)
Expected selling price inflation
Variable operating costs (current price terms)
Fixed operating costs (current price terms)
Expected operating cost inflation
\$20 per unit
$3 \%$ per year
\$8 per unit
\$170,000 per year
4\% per year

The research and development division has prepared the following demand forecast as a result of its test marketing trials. The forecast reflects expected technological change and its effect on the anticipated life-cycle of Product W33.

| Year | 1 | 2 | 3 | 4 |
| :--- | :---: | :---: | :---: | :---: |
| Demand (units) | 60,000 | 70,000 | 120,000 | 45,000 |

It is expected that all units of Product W33 produced will be sold, in line with the company's policy of keeping no inventory of finished goods. No terminal value or machinery scrap value is expected at the end of four years, when production of Product W33 is planned to end. For investment appraisal purposes, PV Co uses a nominal (money) discount rate of $10 \%$ per year and a target return on capital employed of $30 \%$ per year. Ignore taxation.

## Required:

(a) Identify and explain the key stages in the capital investment decision-making process, and the role of investment appraisal in this process.
(7 marks)
(b) Calculate the following values for the investment proposal:
(i) net present value;
(ii) internal rate of return;
(iii) return on capital employed (accounting rate of return) based on average investment; and
(iv) discounted payback period.
(13 marks)
(c) Discuss your findings in each section of (b) above and advise whether the investment proposal is financially acceptable.

3 The following financial information relates to HGR Co:
Statement of financial position at the current date (extracts)

|  | $\$ 000$ | $\$ 000$ | $\$ 000$ |
| :--- | :---: | :---: | :---: |
| Non-current assets |  | 48,965 |  |
| Current assets |  |  |  |
| Inventory | 8,160 |  |  |
| Accounts receivable | $\mathbf{8 , 7 7 5}$ |  |  |
|  | 16,935 |  |  |

Current liabilities
Overdraft 3,800

Accounts payable 10,200
14,000

| Net current assets | $\underline{2,935}$ |
| :--- | ---: |
| Total assets less current liabilities | $\underline{51,900}$ |

Cash flow forecasts from the current date are as follows:

|  | Month 1 | Month 2 | Month 3 |
| :--- | :---: | :---: | :---: |
| Cash operating receipts (\$000) | 4,220 | 4,350 | 3,808 |
| Cash operating payments $(\$ 000)$ | 3,950 | 4,100 | 3,750 |
| Six-monthly interest on traded bonds (\$000) |  | 200 |  |
| Capital investment $(\$ 000)$ |  | 2,000 |  |

The finance director has completed a review of accounts receivable management and has proposed staff training and operating procedure improvements, which he believes will reduce accounts receivable days to the average sector value of 53 days. This reduction would take six months to achieve from the current date, with an equal reduction in each month. He has also proposed changes to inventory management methods, which he hopes will reduce inventory days by two days per month each month over a three-month period from the current date. He does not expect any change in the current level of accounts payable.

HGR Co has an overdraft limit of $\$ 4,000,000$. Overdraft interest is payable at an annual rate of $6 \cdot 17 \%$ per year, with payments being made each month based on the opening balance at the start of that month. Credit sales for the year to the current date were $\$ 49,275,000$ and cost of sales was $\$ 37,230,000$. These levels of credit sales and cost of sales are expected to be maintained in the coming year. Assume that there are 365 working days in each year.

## Required:

(a) Discuss the working capital financing strategy of HGR Co.
(b) For HGR Co, calculate:
(i) the bank balance in three months' time if no action is taken; and
(ii) the bank balance in three months' time if the finance director's proposals are implemented.

Comment on the forecast cash flow position of HGR Co and recommend a suitable course of action.
(10 marks)
(c) Discuss how risks arising from granting credit to foreign customers can be managed and reduced.
(8 marks)
(25 marks)

4 JJG Co is planning to raise $\$ 15$ million of new finance for a major expansion of existing business and is considering a rights issue, a placing or an issue of bonds. The corporate objectives of JJG Co, as stated in its Annual Report, are to maximise the wealth of its shareholders and to achieve continuous growth in earnings per share. Recent financial information on JJG Co is as follows:

|  | 2008 | 2007 | 2006 | 2005 |
| :---: | :---: | :---: | :---: | :---: |
| Turnover (\$m) | $28 \cdot 0$ | 24.0 | 19•1 | $16 \cdot 8$ |
| Profit before interest and tax (\$m) | $9 \cdot 8$ | $8 \cdot 5$ | $7 \cdot 5$ | $6 \cdot 8$ |
| Earnings (\$m) | $5 \cdot 5$ | $4 \cdot 7$ | $4 \cdot 1$ | $3 \cdot 6$ |
| Dividends (\$m) | $2 \cdot 2$ | 1.9 | $1 \cdot 6$ | $1 \cdot 6$ |
| Ordinary shares (\$m) | $5 \cdot 5$ | $5 \cdot 5$ | $5 \cdot 5$ | $5 \cdot 5$ |
| Reserves (\$m) | $13 \cdot 7$ | $10 \cdot 4$ | $7 \cdot 6$ | $5 \cdot 1$ |
| 8\% Bonds, redeemable 2015 (\$m) | 20 | 20 | 20 | 20 |
| Share price (\$) | $8 \cdot 64$ | $5 \cdot 74$ | $3 \cdot 35$ | $2 \cdot 67$ |

The par value of the shares of JJG Co is $\$ 1.00$ per share. The general level of inflation has averaged $4 \%$ per year in the period under consideration. The bonds of JJG Co are currently trading at their par value of $\$ 100$. The following values for the business sector of JJG Co are available:

| Average return on capital employed | $25 \%$ |
| :--- | :--- |
| Average return on shareholders' funds | $20 \%$ |
| Average interest coverage ratio | 20 times |
| Average debt/equity ratio (market value basis) | $50 \%$ |
| Return predicted by the capital asset pricing model | $14 \%$ |

## Required:

(a) Evaluate the financial performance of JJG Co, and analyse and discuss the extent to which the company has achieved its stated corporate objectives of:
(i) maximising the wealth of its shareholders;
(ii) achieving continuous growth in earnings per share.

Note: up to 7 marks are available for financial analysis.
(b) If the new finance is raised via a rights issue at $\$ 7 \cdot 50$ per share and the major expansion of business has not yet begun, calculate and comment on the effect of the rights issue on:
(i) the share price of JJG Co;
(ii) the earnings per share of the company; and
(iii) the debt/equity ratio.
(6 marks)
(c) Analyse and discuss the relative merits of a rights issue, a placing and an issue of bonds as ways of raising the finance for the expansion.

## Formulae Sheet

Economic order quantity

$$
=\sqrt{\frac{2 C_{0} D}{C_{H}}}
$$

## Miller-Orr Model

$$
\begin{aligned}
& \text { Return point }=\text { Lower limit }+\left(\frac{1}{3} \times \text { spread }\right) \\
& \text { Spread }=3\left[\frac{\frac{3}{4} \times \text { transaction cost } \times \text { variance of cash flows }}{\text { interest rate }}\right]^{\frac{1}{3}}
\end{aligned}
$$

## The Capital Asset Pricing Model

$$
E\left(r_{i}\right)=R_{f}+\beta_{i}\left(E\left(r_{m}\right)-R_{f}\right)
$$

The asset beta formula

$$
\beta_{\mathrm{a}}=\left[\frac{\mathrm{V}_{\mathrm{e}}}{\left(\mathrm{~V}_{\mathrm{e}}+\mathrm{V}_{\mathrm{d}}(1-\mathrm{T})\right)} \beta_{\mathrm{e}}\right]+\left[\frac{\mathrm{V}_{\mathrm{d}}(1-\mathrm{T})}{\left(\mathrm{V}_{\mathrm{e}}+\mathrm{V}_{\mathrm{d}}(1-\mathrm{T})\right)} \beta_{\mathrm{d}}\right]
$$

## The Growth Model

$$
P_{o}=\frac{D_{0}(1+g)}{\left(r_{e}-g\right)}
$$

## Gordon's growth approximation

$$
\mathrm{g}=\mathrm{br} \mathrm{r}_{\mathrm{e}}
$$

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

$$
S_{1}=S_{0} \times \frac{\left(1+h_{c}\right)}{\left(1+h_{b}\right)} \quad F_{0}=S_{0} \times \frac{\left(1+i_{c}\right)}{\left(1+i_{b}\right)}
$$

## Present Value Table

Present value of 1 i.e. $(1+r)^{-n}$
Where $r=$ discount rate
$\mathrm{n}=$ number of periods until payment
Discount rate (r)
Periods

| $(\mathrm{n})$ | $1 \%$ | $2 \%$ | $3 \%$ | $4 \%$ | $5 \%$ | $6 \%$ | $7 \%$ | $8 \%$ | $9 \%$ | $10 \%$ |  |
| ---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: | :---: |
| 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 | 0.941 | 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 | 0.305 | 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. $\frac{1-(1+r)^{-n}}{r}$

$$
\begin{array}{ll}
\text { Where } & r=\text { discount rate } \\
& n=\text { number of periods }
\end{array}
$$

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 |  |
| 2 | 1.970 | 1.942 | 1.913 | $1 \cdot 886$ | 1.859 | 1.833 | 1.808 | $1 \cdot 783$ | 1.759 | 1.736 | 2 |
| 3 | 2.941 | $2 \cdot 884$ | 2.829 | 2.775 | $2 \cdot 723$ | $2 \cdot 673$ | $2 \cdot 624$ | 2.577 | 2.531 | $2 \cdot 487$ | 3 |
| 4 | 3.902 | 3.808 | 3.717 | 3.630 | 3.546 | $3 \cdot 465$ | 3.387 | $3 \cdot 312$ | 3.240 | $3 \cdot 170$ | 4 |
| 5 | 4.853 | $4 \cdot 713$ | 4.580 | $4 \cdot 452$ | 4.329 | $4 \cdot 212$ | $4 \cdot 100$ | 3.993 | 3.890 | 3.791 | 5 |
| 6 | 5.795 | 5.601 | $5 \cdot 417$ | 5.242 | 5.076 | 4.917 | 4.767 | $4 \cdot 623$ | 4.486 | 4.355 | 6 |
| 7 | 6.728 | 6.472 | 6.230 | 6.002 | 5.786 | $5 \cdot 582$ | $5 \cdot 389$ | $5 \cdot 206$ | 5.033 | 4.868 | 7 |
| 8 | 7.652 | $7 \cdot 325$ | 7.020 | 6.733 | 6.463 | $6 \cdot 210$ | $5 \cdot 971$ | $5 \cdot 747$ | 5.535 | 5.335 | 8 |
| 9 | 8.566 | $8 \cdot 162$ | 7.786 | 7.435 | $7 \cdot 108$ | 6.802 | 6.515 | 6.247 | 5.995 | 5.759 | 9 |
| 10 | 9.471 | 8.983 | 8.530 | 8.111 | $7 \cdot 722$ | $7 \cdot 360$ | 7.024 | $6 \cdot 710$ | $6 \cdot 418$ | 6.145 | 10 |
| 11 | 10.37 | 9.787 | 9. 253 | 8.760 | $8 \cdot 306$ | 7.887 | 7.499 | $7 \cdot 139$ | 6.805 | 6.495 | 11 |
| 12 | 11.26 | 10.58 | 9.954 | 9.385 | 8.863 | 8.384 | 7.943 | $7 \cdot 536$ | $7 \cdot 161$ | 6.814 | 12 |
| 13 | $12 \cdot 13$ | 11.35 | $10 \cdot 63$ | 9.986 | $9 \cdot 394$ | 8.853 | 8.358 | 7.904 | $7 \cdot 487$ | $7 \cdot 103$ | 13 |
| 14 | 13.00 | $12 \cdot 11$ | 11.30 | 10.56 | 9.899 | 9.295 | 8.745 | 8.244 | $7 \cdot 786$ | 7.367 | 14 |
| 15 | 13.87 | 12.85 | 11.94 | $11 \cdot 12$ | $10 \cdot 38$ | $9 \cdot 712$ | 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 |  |
| 2 | 1.713 | 1.690 | $1 \cdot 668$ | $1 \cdot 647$ | 1.626 | 1.605 | 1.585 | 1.566 | 1.547 | 1.528 | 2 |
| 3 | $2 \cdot 444$ | $2 \cdot 402$ | 2.361 | $2 \cdot 322$ | $2 \cdot 283$ | $2 \cdot 246$ | $2 \cdot 210$ | $2 \cdot 174$ | $2 \cdot 140$ | $2 \cdot 106$ | 3 |
| 4 | $3 \cdot 102$ | 3.037 | $2 \cdot 974$ | 2.914 | 2.855 | 2.798 | $2 \cdot 743$ | $2 \cdot 690$ | $2 \cdot 639$ | 2.589 | 4 |
| 5 | 3.696 | 3.605 | 3.517 | 3.433 | 3.352 | 3.274 | 3.199 | $3 \cdot 127$ | 3.058 | 2.991 | 5 |
| 6 | 4.231 | $4 \cdot 111$ | 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 | $4 \cdot 160$ | 4.039 | 3.922 | 3.812 | 3.706 | 3.605 | 7 |
| 8 | $5 \cdot 146$ | 4.968 | 4.799 | 4.639 | $4 \cdot 487$ | 4.344 | $4 \cdot 207$ | 4.078 | 3.954 | 3.837 | 8 |
| 9 | 5.537 | $5 \cdot 328$ | $5 \cdot 132$ | 4.946 | 4.772 | 4.607 | $4 \cdot 451$ | $4 \cdot 303$ | $4 \cdot 163$ | 4.031 | 9 |
| 10 | 5.889 | $5 \cdot 650$ | $5 \cdot 426$ | $5 \cdot 216$ | 5.019 | 4.833 | 4.659 | $4 \cdot 494$ | 4.339 | $4 \cdot 192$ | 10 |
| 11 | 6.207 | 5.938 | 5.687 | $5 \cdot 453$ | 5.234 | 5.029 | 4.836 | 4.656 | $4 \cdot 486$ | 4.327 | 11 |
| 12 | 6.492 | 6.194 | 5.918 | 5.660 | $5 \cdot 421$ | $5 \cdot 197$ | 4.988 | 4.793 | 4.611 | 4.439 | 12 |
| 13 | 6.750 | $6 \cdot 424$ | $6 \cdot 122$ | 5.842 | 5.583 | $5 \cdot 342$ | $5 \cdot 118$ | 4.910 | 4.715 | 4.533 | 13 |
| 14 | 6.982 | 6.628 | $6 \cdot 302$ | 6.002 | $5 \cdot 724$ | $5 \cdot 468$ | 5.229 | 5.008 | 4.802 | 4.611 | 14 |
| 15 | $7 \cdot 191$ | 6.811 | $6 \cdot 462$ | 6. 142 | 5.847 | $5 \cdot 575$ | $5 \cdot 324$ | $5 \cdot 092$ | 4.876 | 4.675 | 15 |

## End of Question Paper

