EQUATION SHEET
Principles of Finance
Exam 1

FINANCIAL STATEMENT ANALYSIS

Net cash flow = Net income + Depreciation and amortization

DuPont Equation: Return on Assets (ROA)

$$\text{ROA} = \text{Net profit margin} \times \text{Total assets turnover}$$

$$= \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total assets}} = \frac{\text{Net income}}{\text{Total assets}}$$

DuPont Equation: Return on Equity (ROE)

$$\text{ROE} = \text{ROA} \times \text{Equity multiplier}$$

$$= \frac{\text{Net income}}{\text{Total assets}} \times \frac{\text{Total assets}}{\text{Common equity}}$$

$$= \left[\begin{array}{c}\text{Profit} \\ \text{margin}\end{array} \times \begin{array}{c}\text{Total assets} \\ \text{turnover}\end{array}\right] \times \begin{array}{c}\text{Equity} \\ \text{multiplier}\end{array}$$

$$= \left[\frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total assets}}\right] \times \frac{\text{Total assets}}{\text{Common equity}} = \frac{\text{Net income}}{\text{Common equity}}$$

THE FINANCIAL ENVIRONMENT

Net proceeds from issue = Amount of issue – Flotation costs
= (Amount of issue) x (1 – Flotation costs stated as a %) – (Other costs stated in $)
= (Amount of issue) x (1 – F) – Other costs

$$\text{Amount of issue} = \frac{(\text{Net proceeds}) + (\text{Other costs})}{(1-F)} = \frac{(\text{Amount needed}) + (\text{Other costs})}{(1-F)}$$

TIME VALUE OF MONEY

Lump-sum (single) payments:

$$FV_n = PV(1+r)^n$$

$$PV = \frac{FV_n}{(1+r)^n} = FV_n\left[\frac{1}{(1+r)^n}\right]$$

Annuity payments:

$$FVA_n = PMT\left[\sum_{t=0}^{n-1}(1+r)^t\right] = PMT\left[\frac{(1+r)^n - 1}{r}\right]$$

$$FVA(DUE)_n = PMT\left\{\left[\sum_{t=0}^{n-1}(1+r)^t\right]\times(1+r)\right\} = PMT\left[\left\{\frac{(1+r)^n - 1}{r}\right\}\times(1+r)\right]$$

$$PVA_n = PMT\left[\sum_{t=1}^{n}\frac{1}{(1+r)^t}\right] = PMT\left[\frac{1 - \frac{1}{(1+r)^n}}{r}\right]$$

$$PVA(DUE)_n = PMT\left\{\sum_{t=1}^{n}\left[\frac{1}{(1+r)^t}\right]\times(1+r)\right\} = PMT\left[\left\{\frac{1 - \frac{1}{(1+r)^n}}{r}\right\}\times(1+r)\right]$$

Perpetuities:

$$\text{Present value of a perpetuity} = PVP = \frac{\text{Payment}}{\text{Interest rate}} = \frac{PMT}{r}$$

Uneven cash flow streams:

$$FV\,CF_n = CF_1(1+r)^{n-1} + \ldots + CF_n(1+r)^0 = \sum_{t=0}^{n-1} CF_t(1+r)^t$$

$$PV\,CF_n = CF_1\left[\frac{1}{(1+r)^1}\right] + \ldots + CF_n\left[\frac{1}{(1+r)^n}\right] = \sum_{t=1}^{n} CF_t\left[\frac{1}{(1+r)^t}\right]$$

Interest rates (yields):

$$\text{Periodic rate} = r_{PER} = \frac{\text{Stated annual interest rate}}{\text{Number of interest payments per year}} = \frac{r_{SIMPLE}}{m}$$

$$\begin{matrix}\text{Number of}\\ \text{interest periods}\end{matrix} = n_{PER} = \begin{pmatrix}\text{Number}\\ \text{of years}\end{pmatrix}\times\begin{pmatrix}\text{Number of interest}\\ \text{payments per year}\end{pmatrix} = n_{YRS}\times m$$

$$\begin{matrix}\text{Effective}\\ \text{annual rate}\end{matrix} = EAR = r_{EAR} = \left(1 + \frac{r_{SIMPLE}}{m}\right)^m - 1.0 = (1 + r_{PER})^m - 1.0$$

Annual percentage rate = APR = r_{PER} x m

$$\text{Value of an asset} = \frac{\hat{CF}_1}{(1+r)^1} + \frac{\hat{CF}_2}{(1+r)^2} + \cdots + \frac{\hat{CF}_n}{(1+r)^n} = \sum_{t=1}^{n}\frac{\hat{CF}_t}{(1+r)^t}$$