EQUATION SHEET
Principles of Finance
Exam 1

FINANCIAL STATEMENT ANALYSIS

Net cash flow = Net income + Depreciation and amortization

DuPont Equation: Return on Assets (ROA)

\[ ROA = \frac{\text{Net profit margin}}{\text{Total assets turnover}} \times \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total assets}} = \frac{\text{Net income}}{\text{Total assets}} \]

DuPont Equation: Return on Equity (ROE)

\[ ROE = \frac{\text{Net income}}{\text{Total assets}} \times \frac{\text{Total assets}}{\text{Common equity}} \times \text{Equity multiplier} \]

THERE FINANCIAL ENVIRONMENT

Net proceeds from issue = Amount of issue – Flotation costs

\[ = (\text{Amount of issue}) \times (1 - \text{Flotation costs stated as a %}) - (\text{Other costs stated in $}) \]

\[ = (\text{Amount of issue}) \times (1 - F) - \text{Other costs} \]

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:**

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

\[
FV(\text{DUE})_A = \text{PMT} \left[ \left( \sum_{t=0}^{n-1} (1+r)^t \right) \times (1+r) \right] = \text{PMT} \left[ \frac{(1+r)^n - 1}{r} \times (1+r) \right]
\]

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

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

**Perpetuities:**

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

**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):**

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

Number of interest periods = \(n_{\text{PER}} = (\text{Number of years}) \times (\text{Number of interest payments per year}) = n_{\text{YRS}} \times m\)

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

Annual percentage rate = \(APR = r_{\text{PER}} \times m\)

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