EQUATION SHEET
Principles of Finance
Exam 1

FINANCIAL STATEMENT ANALYSIS

Net cash flow = Net income + Depreciation and amortization

Net working capital = NWC = Current assets – Current liabilities

$$\begin{matrix}\text{Net operating}\\ \text{working}\end{matrix} = \text{NOWC} = \begin{pmatrix}\text{Current assets}\\ \text{required for operations}\end{pmatrix} - \begin{pmatrix}\text{Non – interest – bearing}\\ \text{current liabilities}\end{pmatrix}$$

Operating cash flow = NOI(1 – Tax rate) + Depreciation and amortization

Free cash flow = FCF = Operating cash flow – Investments
= Operating cash flow – (Δ in fixed assets + Δ NOWC)

Economic value added = EVA = NOI(1- Tax rate) – [(Invested capital) x (After-tax cost of capital)]

$$\text{DuPont equation - - ROA} = \text{Net profit margin} \times \text{Total assets turnover}$$
$$= \frac{\text{Net income}}{\text{Sales}} \times \frac{\text{Sales}}{\text{Total assets}}$$

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:

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

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

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

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

Perpetuities:

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

Uneven cash flow streams:

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

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

Interest rates (yields):

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

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

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

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

COST OF MONEY

Dollar return = (Dollar income) + (Capital gains)
= (Dollar income) + (Ending value – Beginning value)

$$\text{Yield} = \frac{\text{Dollar return}}{\text{Beginning value}} = \frac{\text{Dollar income} + \text{Capital gains}}{\text{Beginning value}}$$
$$= \frac{\text{Dollar income} + (\text{Ending value} - \text{Beginning value})}{\text{Beginning value}}$$

Rate of return = r = Risk-free rate + Risk premium

Rate of return = $r = r_{RF} + RP = r_{RF} + [DRP + LP + MRP]$
$= [r^* + IP] + [DRP + LP + MRP]$

$r_{Treasury} = r_{RF} + MRP = [r^* + IP] + MRP$

$$\text{Yield on a 2 - year bond} = \frac{\begin{pmatrix}\text{Interest rate}\\ \text{in Year 1}\end{pmatrix} + \begin{pmatrix}\text{Interest rate}\\ \text{in Year 2}\end{pmatrix}}{2} = \frac{R_1 + R_2}{2}$$