Managerial Finance
FRL 3000
Formula Sheet
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(August 2018)

Average Tax Rate = \frac{\text{Tax Liability}}{\text{Taxable Income}}

Cash Flow from Assets = \text{Cash Flow to Creditors} + \text{Cash Flow to Stockholders}

Operating Cash Flow
- Δ\text{Net Working Capital}
- \text{Net Capital Spending}
\text{Cash Flow from Assets}

Interest Paid
- Net New Borrowing
- Net New Equity
Cash Flow to Creditors
Cash Flow to Stockholders

EBIT
+ \text{Depreciation}
- \text{Taxes}
\text{Operating Cash Flow}

Ending Net Fixed Assets
- Beginning Net Fixed Assets
+ \text{Depreciation}
\text{Net Capital Spending}

Ending Net Working Capital (CA – CL)
- Beginning Net Working Capital (CA-CL)

Change in Net Working Capital

Ending L.T. Debt
- Beginning L.T. Debt
\text{Net New Borrowing}
\text{Ending Equity}
- Beginning Equity
- \text{Addition to Retained Earnings}
\text{Net New Equity}
Internal Growth Rate = \frac{\text{ROA} \times b}{1 - (\text{ROA} \times b)}

Sustainable Growth Rate = \frac{\text{ROE} \times b}{1 - (\text{ROE} \times b)}

Earnings Retention Ratio = b = 1 – Dividend Payout Ratio

\[ FV = PV(1 + r)^t = PV \times FVIF_{r,t} \]

\[ PV = \frac{FV}{(1 + r)^t} = FV \times PVIF_{r,t} \]

\[ FV = PV(1 + \frac{r}{m})^{m \times t} = PV \times FVIF_{r}^{m 	imes t} \]

\[ PV = \frac{FV}{(1 + \frac{r}{m})^{m \times t}} = FV \times PVIF_{r}^{m 	imes t} \]

\[ PV = FV \times e^{-r \times t} \]

\[ EAR = \left(1 + \frac{\text{APR}}{m}\right)^m - 1 \]

\[ FV = PV \times e^{r \times t} \]

\[ \text{PVA} = C \left[\frac{1}{r} - \frac{1}{r \times (1 + r)^t}\right] = C \times PVIFA_{r,t} \]

\[ \text{FVA} = C \left[\frac{(1 + r)^t - 1}{r}\right] = C \times FVIFA_{r,t} \]
\[ FVA = C_{due} \left[ \frac{(1+r)^t - 1}{r} \right] \ast (1 + r) = C_{due} \ast FVIFA_{r,t} \ast (1 + r) \]

\[ PVA = C_{due} \left[ \frac{1}{r} - \frac{1}{r \ast (1 + r)^t} \right] \ast (1 + r) = C_{due} \ast PVIFA_{r,t} \ast (1 + r) \]

**Reminder:** In the case of frequent compounding or discounting, divide the nominal rate (APR) by “m” and multiply period by “m”. “m” is number of times interest is compounded/discounted in one period. Also, annuity interval must match the frequency (m) of compounding or discounting.

\[
P_0 = \frac{D}{r} \\
P_0 = \frac{D_1}{r - g} \\
r = \frac{D_1}{P_0} \\
D_n = D_0 \ast (1 + g)^n \\
(1 + R) = (1 + r) \ast (1 + h) \\
Bond\ Value = C * \left[ \frac{1}{r} - \frac{1}{r \ast (1 + r)^t} \right] + \frac{FV}{(1 + r)^t} \\
P_0 = \frac{D_1}{(1 + r)^1} + \frac{D_2}{(1 + r)^2} + \frac{D_3}{(1 + r)^3} + \ldots \ldots \\
P_0 = \frac{D_1}{(1 + r)^1} + \frac{D_2}{(1 + r)^2} + \frac{D_3}{(1 + r)^t} + \ldots + \frac{D_n}{(1 + r)^n} + \left[ \frac{D_{n+1} \ast 1}{r - g_c \ast (1 + r)^n} \right] \]
**Coupon Rate** = \( \frac{\text{Coupon}}{FV} \)

**Current Yield** = \( \frac{\text{Coupon}}{V_B} \)

\[
V_B = C \left[ \frac{1}{YTM} - \frac{1}{YTM \times (1 + YTM)^t} \right] + \frac{FV}{(1 + YTM)^t}
\]

\[
NPV = \sum_{t=1}^{n} \frac{CF_t}{(1 + r)^t} + (CF_0)
\]

\[
\sum_{t=1}^{n} \frac{CF_t}{(1 + IRR)^t} + (CF_0) = 0
\]

\[
P_l = \sum_{t=1}^{n} \frac{CF_t}{(1 + r)^t} \quad |CF_0|
\]

\[
PBP = t + \frac{|\text{Cum} CF_t|}{CF_{t+1}}
\]

\[
\sum_{t=0}^{n} \frac{COF_t}{(1 + r_F)^t} = \sum_{t=1}^{n} \frac{CIF_t \times (1 + r)^n - t}{(1 + MIRR)^n}
\]

\[
PV_{\text{Perpetuity}} = \frac{C}{r}
\]

\[
ARR = \frac{\sum_{t=1}^{n} \text{Net Income}_t}{\text{Beginning Value Investment} + \text{Ending Value Investment}}
\]
Operating Cash Flow = (Sales–Variable Cost–Fixed Cost–Depreciation)(1-T) + Depreciation

Operating Cash Flow = EBIT + Depreciation – Taxes

Operating Cash Flow = (Sales – OC – Depreciation)*(1-T) + Depreciation

Operating Cash Flow = Net Income + Depreciation

Operating Cash Flow = (Sales – OC)*(1 – T) + T*Depreciation

Book Value of Asset = Original Cost – Accumulated Depreciation

Straight–Line Depreciation = \( \frac{Original\ Cost - Salvage\ Value}{n} \)

Return on Capital = \( \frac{Net\ Income + Interest + Preferred\ Dividend}{Debt + Common\ Equity + Preferred\ Stock} \)

Internal Growth Rate = \( \frac{ROA * b}{1 - (ROA * b)} \)

Sustainable Growth Rate = \( \frac{ROE * b}{1 - (ROE * b)} \)

Earnings Retention Ratio = b = 1 – Dividend Payout Ratio

Dividend Yield = \( \frac{D_{t+1}}{P_t} \)

\[ R = \frac{D_t + P_t - P_{t-1}}{P_{t-1}} \]

\[ (1 + R) = (1 + r) \times (1 + h) \]
\[ R = r + h \]

\[
R(T) = \frac{T-1}{N-1} \times Geometric \ Average + \frac{N-T}{N-1} \times Arithmetic \ Average
\]

\[
E(R) = \sum_{s=1}^{n} Pr.s \times R_s
\]

\[
\sigma^2 = \sum_{s=1}^{n} Pr.s \times [R_s - E(R)]^2
\]

\[
\sigma = \sqrt{\sigma^2} = \sqrt{\sum_{s=1}^{n} Pr.s \times [R_s - E(R)]^2}
\]

\[
E(R_p) = W_A \times E(R_A) + W_B \times E(R_B)
\]

\[ R = E(R) + U \]

\[
\beta_p = \sum_{j=1}^{n} W_j \times \beta_j
\]

\[ W_A + W_B + ... + W_N = 1 \]

\[
E(R_A) = R_f + [E(R_M) - R_f] \times \beta_A
\]

\[
Slope = \frac{E(R_j) - R_f}{\beta_j}
\]

\[
P_t = C \left[ \frac{1}{R_D} - \frac{1}{R_D (1 + R_D)^t} \right] + \frac{FV}{(1 + R_D)^t}
\]
\[ R_E = \frac{D_1}{P_0} + g = \frac{D_0 \cdot (1 + g)}{P_0} + g \]
\[ R_f = R_f + \beta_{e} \cdot (R_M - R_f) \]
\[ R_p = \frac{D}{P_0} \]
\[ WACC = \left( \frac{E}{V} \right) \cdot R_E + \left( \frac{P}{V} \right) \cdot R_P + \left( \frac{D}{V} \right) \cdot R_D \cdot (1 - t_c) \]
\[ V = E + P + D \]
\[ WACC = W_E \cdot R_E + W_P \cdot R_P + W_D \cdot R_D \cdot (1 - t_c) \]
\[ W_E + W_P + W_D = 1 \]
\[ YTM_{approximate} = R_p = \frac{\text{Coupon} + \frac{FV - P_0}{n}}{FV + 2P_0} \]
\[ f_A = \frac{E}{V} \cdot f_e + \frac{D}{V} \cdot f_p \]

\[ FC_1 : FC_2 = \frac{FC_1}{S} \times \frac{S}{FC_2} \]
\[ S = FC : $ \]
\[ P_F = S \times \frac{P_{US}}{S} \]
\[ \left[ \frac{E(S_1) - S_0}{S_0} \right] = h_{FC} - h_{US} \]
\[ E(S_1) = S_0 \times [1 + (h_{FC} - h_{US})] \]
\[ \frac{F_1 - S_0}{S_0} = R_{FC} - R_{US} \]
\[ F_1 = S_0 \times [1 + (R_{FC} - R_{US})] \]
\[ F_t = S_0 \times [1 + (R_{FC} - R_{US})]^t \]
\[ E(S_t) = S_0 \times [1 + (R_{FC} - R_{US})]^t \]
\[ R_{US} - h_{US} = R_{FC} - h_{FC} \]
Modified Accelerated Cost Recovery System

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