AG215 Summary:

Business Finance

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AG215 Course Summary

Company Valuation

1: Capital Asset Pricing Model

$$r = r_f + \beta(r_m - r_f)$$

2: Earnings Per Share

Ungeared Company

$$EPS_{UG} = \frac{EBIT(1 - T_C)}{N_{UG}}$$

T_C = Corporate Tax

Geared Company

$$EPS_G = \frac{(EBIT - r_B(B_G))(1 - T_C)}{N_G}$$

3: Earnings Yield

$$EY = \frac{EPS}{P_t}$$

4: Rate on Equity

Ungeared Equity Company

$$r_{S_{UG}} = \frac{EBIT(1 - T_C)}{V_{UG}}$$

Geared Equity Company

$$r_{S_G} = \frac{(EBIT - r_B(B_G))(1 - T_C)}{S_G}$$

Equity Company

$$r_S = \frac{D_1(1+g)}{P_0} + g$$

5: Rate on Debt

$$r_{B_G} = \frac{\left(EBIT - r_B(B_G)\right)(1 - T_C)}{V_G}$$

6: Value of A Company

Geared Company

$$V_G = S_G + B_G$$

Ungeared Company

$$V_{UG} = P_0(N_{UG})$$

$$\therefore V_G = V_{UG} + B_G(T_C)$$

7: Rate on Weighted Average Cost of Capital

$$r_{WACC} = r_S\left(\frac{S_G}{B_G}\right) + \left(r_B\left(\frac{B_G}{V_G}\right)(1 - T_C)\right)$$

Working Capital

1: Annual Holding Cost

$$AHC = \frac{1}{2}QC_H$$

C_H = Unit Cost to Hold
Q = Order Quantity

2: Annual Order Cost

$$AOC = \frac{D}{Q}C_0$$

D = Demand
C_0 = Unit Cost to Order

$$\therefore TAC = \left(\frac{1}{2}QC_H\right) + \left(\frac{D}{Q}C_0\right)$$

3: Optimal Holding Quantity

$$Q^* = \sqrt{\frac{2DC_0}{C_H}}$$

4: Optimal Holding Period

$$Optimal\ Period = \frac{Q^*}{\left(\frac{D}{365}\right)}$$

5: Optimal Cash

$$C^* = \sqrt{\frac{2(ACR)(TC)}{r}}$$

ACR = Annual Cash Required
TC = Transaction Costs

6: Optimal Cash Period

$$Optimal\ Period = \frac{C^*}{\left(\frac{ACR}{365}\right)}$$

7: Optimal Target Cash Balance (All Daily)

$$Z^* = \sqrt{\frac{3(TC)(\sigma^2)}{4r}} + L$$

$$U^* = \text{Optimal Upper Cash Balance} = 3Z^* - 2L$$
$$U = \text{Upper Cash Limit}$$
$$L = \text{Lower Limit Cash Balance}$$
$$\sigma^2 = \text{Variance of CFs}$$
$$r = \left(\sqrt[365]{EAR + 1}\right) - 1$$

$$\therefore Average\ Cash = \frac{4Z - L}{3}$$

Capital Budgeting & Leasing

1: Steps of a Capital Budget

- Initial Costs
- Maintenance Costs
- Tax Savings on Maintenance Costs
- Scrap Value
- Tax Savings on Scrap Value

Tax Saving

$$Tax\ Saving = Tax\ Depreciation * T_C$$

Straight Line Depreciation

$$Straight\ Line\ Tax\ Depreciation = \frac{Initial\ Cost - Scrap\ Value}{t}$$

Equivalent Annual Cost

$$EAC = \frac{NPV}{PVAF_{r,n}}$$

Rate of Depreciation

$$r = r_B(1 - T_C)$$

2: Leases

Net Advantage to Leasing

$$NAL = PV(Cost\ to\ Lease) - PV(Cost\ to\ Buy)$$

Raising Equity

1: Taking Up Rights

Step 1

$$P_s = P_0(1 - d)$$

d = Discount (Not Rate)
P_s = New Offer Share Price
P_0 = Current Share Price
P_x = Share Price Day After Offer

Step 2

$$N^* = \frac{F}{P_S}$$

F = Funds to Be Raised
N^* = Number of New Shares Issued
N = Number of Current Shares

Step 3

$$\frac{N^*}{N} = \textbf{Ratio Offered}$$

To Lowest Denominator
"Offered N^* (New) for Every N (Old)"

Step 4

$$P_{x(Pre\ Issue)} = \frac{(P_0)(N) + F}{(N + N^*)}$$

$$P_x = \frac{(P_0)(N) + (P_S)(N^*)}{(N + N^*)}$$

Step 5

$$Rights\ Value = P_x - P_S$$

If $P_x > P_S$: Capital Gain
If $P_x < P_S$: Capital Loss

2: Selling Rights

Step 1

- Find Original Shares Owned: $(P_0N) = x$
- Find Price to Sell New: $(P_x - P_S) =$ Rights Value
- Find Proportion Entitled To: $\frac{N^*}{N}$
- Find Value of New: $(P_x - P_S)N^*$
- $Cost = ((P_0N) - ((P_x - P_S)N^*))$
    - Should be (=) $(P_0N) + (P_SN^*)$

Step 2

- Find Day-After Value of Only Current Shares: (P_xN)
- Hence, Answers Should Be (=)
    - *"Value after selling new rights (=) value to buy current amount of shares owned, the day after"*

3: Sell & Take Up (Tail Swallowing)

$$Y = \frac{(P_SN^*)}{P_x}$$

$Y =$ Optimal Amount of Rights to Sell
Sell Newly Entitled Rights Proportion Y to P_S
To Get Money for $(N - Y)$ New Shares At P_x

Step 1 (Cost)

- Own N @ P_0
- Sell Y @ $(P_x - P_S)$
- Purchase $(N^* - Y)$ @ P_S

$$Cost = (P_0N) + ((P_x - P_S)Y) - (P_S(N^* - Y))$$

$(P_0N) =$ Original; $(P_x - P_S)Y =$ Sold Rights; $P_S(N^* - Y) =$ Taken Rights
$(P_x - P_S)Y$ Should (=) $P_S(N^* - Y)$

Step 2 (Value)

$$\text{Own } (N + N^* - Y) \text{ @ } P_x$$
$$Value = P_x(N + N^* - Y)$$