Capital Structure (Chapter 16) Tip Sheet

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M&M Case I

Assumption 1: No Corporate Taxes
Assumption 2: No Bankruptcy Costs
Assumption 3: No Financial Distress

Proposition I

Step 1 (Value of Unlevered Firm): $V_U = \frac{EBIT}{R_U}$ **OR** $\frac{FCF}{(1+R_U)}$

$\boldsymbol{V_U}$ **=** Value of Unlevered Firm
$\boldsymbol{R_U}$ = Cost of Unlevered Equity
FCF = Free Cash Flow

Step 2.1 (Value of Levered Firm): $V_L = V_U$

$\boldsymbol{V_U}$ **=** Value of Unlevered Firm
$\boldsymbol{V_L}$ **=** Value of Levered Firm

Step 2.2 (Equity Value): E = V_L - D

$\boldsymbol{V_L}$ **=** Value of Levered Firm
E = Equity
D = Permanent Debt

Proposition II

Step 3 (Cost of Equity): $R_E = R_U + \frac{D}{E} \times (R_U - R_D)$

$\boldsymbol{R_E}$ **=** Cost of Equity
$\boldsymbol{R_U}$ = Cost of Unlevered Equity
$\boldsymbol{R_D}$ = Cost of Debt
D = Debt
E = Equity

Step 4 (WACC): WACC = [$(W_E) \times (R_E)$] + [$(W_D) \times (R_D)$]
$\boldsymbol{W_E}$ **=** Weight of Equity (E / E + D)
$\boldsymbol{W_D}$ **=** Weight of Debt (D / E + D)
$\boldsymbol{R_E}$ **=** Cost of Equity
$\boldsymbol{R_D}$ = Cost of Debt

M&M Case II

Assumption 1: Corporate Taxes Included
Assumption 2: No Bankruptcy Costs
Assumption 3: No Financial Distress

Proposition I

Step 1 (Value of Unlevered Firm): $V_U = \frac{FCF \times (1 - T_C)}{(1+R_U)}$

$\boldsymbol{V_U}$ = Value of Unlevered Firm
$\boldsymbol{R_U}$ = Cost of Unlevered Equity
$\boldsymbol{T_C}$ = Corporate Tax Rate

Step 2.1 (Value of Levered Firm): $V_L = V_U$ + (D)(T_C)

$\boldsymbol{V_U}$ **=** Value of Unlevered Firm
$\boldsymbol{V_L}$ **=** Value of Levered Firm
D = Permanent Debt
$\boldsymbol{T_C}$ = Corporate Tax Rate

Step 2.2 (Equity Value): E = V_L - D

$\boldsymbol{V_L}$ **=** Value of Levered Firm
E = Equity
D = Permanent Debt

Proposition II

Step 3 (Cost of Equity): $R_E = R_U + (R_U - R_D) \times \frac{D}{E} \times (1 - T_C)$

$\boldsymbol{R_E}$ **=** Cost of Equity
$\boldsymbol{R_U}$ = Cost of Unlevered Equity
$\boldsymbol{R_D}$ = Cost of Debt
$\boldsymbol{T_C}$ = Corporate Tax Rate
D = Debt
E = Equity

Step 4 (WACC): WACC = [$(W_E)\times(R_E)$] + [$(W_D)\times(R_D)$] × (1 - T_C)
$\boldsymbol{W_E}$ **=** Weight of Equity (E / E + D)
$\boldsymbol{W_D}$ **=** Weight of Debt (D / E + D)
$\boldsymbol{R_E}$ **=** Cost of Equity
$\boldsymbol{R_D}$ = Cost of Debt
$\boldsymbol{T_C}$ = Corporate Tax Rate

M&M Case III

Assumption 1: Corporate Taxes Included
Assumption 2: Bankruptcy Costs Included
Assumption 3: Financial Distress Included

Proposition I

Step 1 (Value of Levered Firm): $V_L = V_U$ + (D)(T_C) - PV (Financial Distress)

$\boldsymbol{V_U}$ **=** Value of Unlevered Firm
$\boldsymbol{V_L}$ **=** Value of Levered Firm
D = Permanent Debt
$\boldsymbol{T_C}$ = Corporate Tax Rate