FIN401 Tip Sheet

Capital Budgeting Problem:

Decision rules: If NPV>0, accept (pick higher NPV)

Accept if IRR is > than required rate of return or WACC

For Purchasing problems:

NPV=PV(OCF)+PV(Net Capital Spending)+PVCCATS+PV(NWC)

PV(OCF)=(N=years, r=required return or WACC, pmt=CF/year)

Remember if PMT=OCF is before tax, multiply by(1-Tc)

PV(Net Capital Spending)= - Initial Cost+PV (Salvage)

PV(S_N)=Salvage÷(1+required return)^N

$$PVCCATS = \frac{IdT_c}{d+r} \, x \, \frac{1+0.5r}{1+r} - \frac{S_n dT_c}{d+r} \, x \, \frac{1}{(1+r)^n}$$

I= Total Capital Investment; d=CCA tax rate; r=discount rate; Tc = Corporate tax rate; n= # of years or payments in the project;

Sn= Salvage value in year n;

PV(NWC)= - Investment in NWC+ Recovery÷(1+required rate)^N

Leasing

For Leasee, NAL=I_0 – PV(ATLP) – PVCCAT - PVS_N

1. PV(ATLP) ALWAYS #1:

After tax cost of debt: R_D*= R_D(1-Tax)

ATLP= BTLP(1-Tax)

2. PVCCATS – formula (if no salvage value, second half = 0).

Use Rd* in place of r since it is after tax cost of debt

3. PV(Salvage) = Salvage/(1+R_D*)^n

NAL of Lessor (if same tax rate) = Negative NAL of Lessee

  = - I_0 + PV(ATLP) + PVCCATS + PVS_N

The cash flows to the lessee are exactly the opposite of cash flows to lessor. If 0 tax rate, use before tax cost of debt.

If NAL>0, They should lease; if NAL<0 they should buy

Firms in lower (zero) tax bracket benefit MORE from leasing because they lose less (zero) CCA tax shield.

No Tax NAL=I_0-PV(BTLP)-PV(S_N) Use before tax cost of debt

Indifference Lease Payment or Breakeven --->NAL=0, solve for BTLP, where BTLP=ATLP/(1-Tax)

The Cost of Capital

WACC=$W_E R_E$+$W_D R_D$(1-Tax)+$W_P D_P$ (if there is preferred stocks)

1. Find Weights (We, Wd, Wp)

Market Value of Equity = (# of shares o/s) x (stock price)

Market Value of Debt= (# of bonds o/s) x (current bond price)

Market Value of Preferred Shares = (# of shares o/s) x (preferred stock price)

Firm Value (Asset) = Common Shares + Debt + Preferred Shares

W_E= Equity / Firm Value -->% financed with equity

W_D= Debt / Firm Value -->=1-W_E -->% financed with debt

W_P= Preferred Shares/Firm Value

2. Find Costs of Capital (R_E, R_D, R_P)

Cost of Equity, Debt, and Preferred Shares

Dividend Growth Model: D_1 = D_0 x (1 + g)

CAPM: R_E = R_f + β x (R_{rm}-R_f)

R_D = YTM = I% x 2 (if semi-annual)

For the company, Bond is debt, stock is equity.

Lease payment are usually made at the **BGN**, change the calculator setting.

 If made at the END, change the set back.

YTM (for the bond holder)= cost of debt (for the company)=R_D

Return on the stock (stock holder) = [D_0 x (1+g) ÷ P_0] + g

= cost of equity (for the company) = R_E = (D_1÷P_0) + g

Chapter 16 Capital Structure

Earnings per Shares (EPS)=net income÷# shares o/s

Return on Equity (ROE)=net income÷equity value OR (EPS÷ Share price)

Break even EBIT: EPS doesn't change= EBIT ÷ old # of share s= (EBIT-Interest)÷new # shares o/s; interest = Debt x cost of debt

Degree of Financial Leverage (DFL)=%Δ in EPS÷%Δ in EBIT

Financial Leverage = debt to equity ratio = Debt ÷ Equity

Unlevered firm-<u>All equity</u>; Levered firm-<u>Equity and debt</u>

D/E Ratio-Debt/(Equity-Debt)to find cost of equity

	Prop 1 (Firm Value)	Prop 2 (WACC)
Case 1 No Taxes	$V_L=V_U$	WACC Constant $R_E=R_U+(R_U-R_D)(D/E)$ $WACC=W_E R_E+W_D R_D$
Case 2 Corp. Taxes	$V_L=V_U+DTc$	WACC decrease as debt increase $R_E=R_U+(R_U-R_D)(D/E)(1-Tc)$ $WACC=W_E R_E+W_D R_D(1-Tc)$

Vu (value of unlevered firm)

No Taxes: Vu=EBIT÷Ru (unlevered cost of capital)

With Taxes: Vu=EBIT x (1-Tc) ÷ Ru

$V_E=V_L-D$

W_E = E÷ (E+D); W_D= D÷ (E+D)

If WACC < than R_u then Debt is more efficient

If a company issues debt, subtract interest (debt x interest rate) when calculating EPS for 3 economic scenarios

None of the above.

In a world of no taxes, the WACC of the firm does not change with changes in capital structure. Old WACC =New WACC

Share Price at the end of Year 1: $P_1 = P_2 ÷ (1+r)$

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