Valuation: Formula sheet

Corporate Finance

t: Time period. Cflow firm: Expected cash flow to the firm. Cflow equity$_t$: Expected cash flow to equity. r_E: cost of capital for equity. r_D: cost of capital for debt. τ: Tax rate

No tax case

$$r^* = r_D \frac{D}{D+E} + r_E \frac{E}{D+E}$$

$$\beta^* = \beta_D \frac{D}{D+E} + \beta_E \frac{E}{D+E}$$

$$r_E = r^* + (r^* - r_D)\frac{D}{E}$$

WACC

$$WACC = \frac{D}{D+E} r_D (1-\tau) + \frac{E}{D+E} r_E$$

$$\text{Value of firm} = \sum_{t=1}^{\infty} \frac{\text{Cflow firm}}{(1+r_{WACC})^t}$$

Flow-to-equity

$$\text{Value of equity} = \sum_{t=1}^{\infty} \frac{\text{Cflow equity}}{(1+k_e)^t}$$

Adjusted Present Value (APV)

$$\begin{aligned}\text{Firm Value} \quad = \quad & \text{All-equity financed firm} \\ & +PV(\text{tax benefits}) \\ & -PV(\text{exp. bankruptcy costs})\end{aligned}$$

	Sales (revenues)
Less	Costs of goods sold
	Gross Profit
Less	Operating expenses (including depreciation)
	Earnings before Interest and Taxes
Less	Taxes
	Net Operating Profit after taxes (NOPAT)
Plus	Depreciation
Less	Capital Expenditure (CAPEX) (Investments)
Less	Increase in Working Capital (ΔNWC)
	Free Cash Flow (FCF)

Computing FCF (direct method)

	Sales (revenues)
−	Costs
+	Amortizations
=	*Earnings before interest, taxes, and amortization (EBITA)*
−	Taxes paid on EBITA
+	Increase in deferred taxes and taxes payable
=	*NOPLAT (Operating profit)*
+	Depreciation
−	Increase in operating working capital
−	Increase in other operating assets (net of operating liabilities)
−	Investments in property, plant, and equipment (capex)
−	Investment in goodwill
=	*Free Cash Flow (FCF)*

Reconciliating FCF to Net Income (indirect method)

	Net Income (Profits After Taxes)
$+$	Change in Taxes payable
$+$	After-tax financial expenses (e.g. interest)
$-$	After-tax financial income (e.g. interest)
$=$	*NOPLAT (Operating profit)*
$+$	Depreciation and other non-cash expenses
$-$	Increase in operating working capital
$-$	Increase in other operating assets (net of operating liabilities)
$-$	Investments in property, plant, and equipment (capex)
$-$	Investment in goodwill
$=$	*Free Cash Flow (FCF)*

Free Cash Flow to Equity (FCFE)

	Sales (revenues)
$-$	Costs (excluding depreciation)
$-$	Change in working capital
$-$	Interest
$-$	Provision for income taxes (from income statement)
$=$	*Cash Flow from Operations*
$-$	Investments in property, plant, and equipment (capital expenditures)
$+$	Proceeds from new debt and preferred equity issues
$-$	Preferred dividends
$-$	Debt repayments
$=$	*Free Cash Flow to Equity (FCFE)*