Erasmus School of Economics

Formula Sheet

Corporate Valuation	Formula	Note
Releverd Beta (β_l)	$\beta_u \times \left(1 + (1 - \tau_c) \times \frac{D}{E}\right)$	We use the Hamada formula to calculate the releverd beta. this formula assumes a beta of debt equal to zero. This means that it is assumed that debt is independent of firm value.
Releverd Beta (β_l) #2	$\beta_l = \beta_u + \left(1 - \tau_c\right) \times \frac{D}{E}(\beta_u - \beta_{debt})$	This formula takes into account the beta of debt. This means that debt is related to firm value.
Cost of Debt (R_e)	$r_f + Credit\ Spread$	The cost of debt can be calculated by adding the credit spread of debt to the risk free rate. This formula assumes that the beta of debt is equal to zero.
Cost of Debt (R_e) #2	$r_f + \beta_{debt} MRP + DRP$	This formula takes into account the beta of debt. MRP and DRP stand for the market risk premium and default risk premium respectively.
Cost of Equity (R_e)	$r_f + \beta_l \times MRP + FSRP$	The cost of equity is calculated by adding to the risk-free rate the relevered beta times the market risk premium and adding firm specific risk premiums (e.g. small firm premium).
WACC	$R_d \times (1 - \tau_c) \times \frac{D}{V} + R_e \times \frac{E}{V}$	Weigthed Average Cost of Capital. V is equal to $E + D$.
Key value driver	$\frac{NOPAT_T \times (1+g) \times \left(1 - \frac{g}{ROCB}\right)}{WACC - g}$	The key value driver formula can be used to calculate the terminal value. It assumes that returns on new investments are higher than the WACC.
Aggresive (Gordon) Growth model	$\frac{NOPAT_T \times (1+g)}{WACC - g}$	The key value driver formula can be used to calculate the terminal value. It assumes that returns on new investments (without investing) approach infinity.
Convergence Model	$\frac{NOPAT_T \times (1+g)}{WACC}$	The key value driver formula can be used to calculate the terminal value. It assumes that returns on new investments equal the WACC.

Free Cash Flows	**Note**
EBIT(A) - Operating Taxes **NOPAT** - Change in NWC + Change in operating provisions + Depreciation - Capex TFA **FREE CASH FLOWS** × Discount factor **PV FCF**	
Net working Capital (NWC)	To calculate the change in NWC, we need to calculate the NWC for each year. The NWC equals the current assets minus the current liabilities of a company.
Capital Expenditures (CAPEX) TFA	The CAPEX TFA of a company equal the change in tangible fixed assets plus the depreciation.
Discount rate	In the WACC method, the appropriate discount factor is the WACC, taking the time value of money into account: $\left(\frac{1}{WACC^t}\right)$

Corporate Strategy	Formula	Note
PVGO	$Market\,Value - Value\,of\,assets\,in\,place$	
Economic Value Added	$EVA = (ROCB - WACC) \times Operating\,Capital$	
ROCB	$\left(\frac{NOPLAT}{Operating\,Capital}\right)$	
Operating Capital	$Invested\,capital - financial fixed assets and cash and cash equivalents$	

Real Options	Formula	Note
Up factor (u)	$e^{\sigma\sqrt{\Delta t}}$	
Down factor (d)	$e^{-\sigma\sqrt{\Delta t}} = \frac{1}{u}$	
Risk-neutral probability (p)	$\frac{1+rf-d}{u-d}$	
End-node payoffs	$\max[V - I,\ 0]$ $\max[eV - E,\ 0]$ $\max[C - cV,\ 0]$ $\max[V - A,\ 0]$	Option to invest Option to expand Option to contract Option to abandon
$\underset{Prev.Period}{F}$	$\frac{p*F_{up}+(1-p)*F_{down}}{1+r_f}$	