FORMULAE – PART 2

(following Berk, DeMarzo and Harford's "Fundamentals of Corporate Finance" sequence)

GESTÃO FINANCEIRA I / CORPORATE FINANCE I / GESTÃO FINANCEIRA / CORPORATE FINANCE

$$NPV = FCF_0 + \frac{FCF_1}{1+r} + \cdots + \frac{FCF_N}{(1+r)^N} = VAL$$

$$IRR: \quad FCF_0 + \frac{FCF_1}{1+irr} + \cdots + \frac{FCF_N}{(1+irr)^N} = 0$$

$$Profitability\ Index = \frac{Value\ Created}{Resource\ Consumed} = \frac{NPV}{Resource\ Consumed} = \frac{VAL}{Recurso\ Consumido} = Índice\ de\ Rendibilidade$$

$$Net\ Working\ Capital = Cash + Inventory + Receivables - Payables = NWC$$

$$Free\ Cash\ Flow = EBIT(1 - Tax\ Rate) + Depreciation - Capital\ Expenditures - \Delta\ NWC$$

OR

$$Free\ Cash\ Flow = Net\ Income + InterestExpense \times (1 - Tax\ Rate) + Depreciation - Capital\ Expenditures - \Delta NWC$$

$$PV(FCF_t) = \frac{FCF_t}{(1+r)^t} = Valor\ atual\ do\ FCFt$$

$$Capital\ Gain = Sale\ Price - Book\ Value = Valor\ de\ Venda - Valor\ Contabilístico = Mais\ Valia$$

$$Book\ Value = Purchase\ Price - Accumulated\ Depreciation = Valor\ de\ Aquisição - Depreciações\ Acumuladas$$
$$= Valor\ Contabilístico$$

$$After-Tax\ Cash\ Flow\ from\ Asset\ Sale = Sale\ Price - TaxRate \times CapitalGain$$
$$= Cash\ Flow\ líquido\ de\ imposto\ de\ Venda\ de\ Ativo$$

$$Enterprise\ Value = Market\ Value\ of\ Equity + Debt - Cash$$

$$Discounted\ Free\ Cash\ Flow\ Model: V_0 = PV(Future\ Free\ Cash\ Flow\ of\ Firm)$$

$$P_0 = \frac{V_0 + Cash_0 - Debt_0}{Shares\ Outstanding_0}$$

$$V_0 = \frac{FCF_1}{1+r_{wacc}} + \frac{FCF_2}{(1+r_{wacc})^2} + \cdots + \frac{FCF_N}{(1+r_{wacc})^N} + \frac{V_N}{(1+r_{wacc})^N}$$

$$V_N = \frac{FCF_{N+1}}{r_{wacc} - g_{FCF}} = \frac{FCF_N \times (1 + g_{FCF})}{r_{wacc} - g_{FCF}}$$

$$Degree\ of\ Operating\ Leverage = DOL = \frac{Q(P-V)}{Q(P-V) - F} = GAO = Grau\ de\ Alavanca\ Operacional$$

$$Degree\ of\ Financial\ Leverage = DFL = \frac{Q(P-V) - F}{Q(P-V) - F - FinCost} = GAF = Grau\ de\ Alavanca\ Financeira$$

$$Degree\ of\ Total\ Leverage = DTL = \frac{Q(P-V)}{Q(P-V) - F - FinCost} = GAT = Grau\ de\ Alavanca\ Total$$

$$\bar{R} = \frac{1}{T}(R_1 + R_2 + \cdots + R_T) = \frac{1}{T}\sum_{t=1}^{T} R_t$$

$$Var(R) = \frac{1}{T-1}\sum_{t=1}^{T}(R_t - \bar{R})^2$$

$$SD(R) = \sqrt{Var(R)}$$

$$w_i = \frac{value\ of\ investment\ i}{total\ value\ of\ portfolio}$$

$$R_p = w_1 R_1 + w_2 R_2 + \cdots w_N R_N$$

$$E(R_p) = w_1 E(R_1) + w_2 E(R_2) + \cdots + w_N E(R_N)$$

$$cov(R_i, R_j) = E\left[\left(R_i - E(R_i)\right)\left(R_j - E(R_j)\right)\right]$$

$$cov(R_i, R_j) = \frac{1}{T-1}\sum_t (R_{i,t} - \bar{R}_i)(R_{j,t} - \bar{R}_j)$$

$$corr(R_i, R_j) = \frac{cov(R_i, R_j)}{SD(R_i)SD(R_j)}$$

$$Var(R_p) = w_1^2 Var(R_1) + w_2^2 Var(R_2) + 2w_1 w_2 cov(R_1, R_2) =$$

$$= w_1^2 Var(R_1) + w_2^2 Var(R_2) + 2w_1 w_2 corr(R_1, R_2)SD(R_1)SD(R_2)$$

$$\beta_i = \frac{SD(R_i)corr(R_i, R_{Mkt})}{SD(R_{Mkt})} = \frac{cov(R_i, R_{Mkt})}{Var(R_{Mkt})}$$

$$Capital\ Asset\ Pricing\ Model: E(R_i) = r_f + \beta_i \times \left(E[R_{Mkt}] - r_f\right)$$

$$\beta_p = \frac{cov(R_p, R_{Mkt})}{Var(R_{Mkt})} = w_1 \beta_1 + w_2 \beta_2 + \cdots + w_N \beta_N$$

$$Cost\ of\ Preferred\ Stock\ Capital = r_P = \frac{Preferred\ Dividend}{Preferred\ Stock\ Price} = \frac{Div_{pfd}}{P_{pfd}}$$

$$CAPM\ Cost\ of\ Equity = r_E = r_f + \beta_E \times \left(E[R_{Mkt}] - r_f\right)$$

$$Constant\ Dividend\ Growth\ Model\ Cost\ of\ Equity = r_E = \frac{Div_1}{P_E} + g$$

$$Weighted\ Average\ Cost\ of\ Capital = r_{WACC} = \frac{E}{E+P+D}r_E + \frac{P}{E+P+D}r_P + \frac{D}{E+P+D}r_D(1-T_C)$$

$$Net\ New\ Financing = ProForma\ Assets - ProForma\ Liabilities\ and\ Equity$$