FORMULAE Part I FÓRMULAS Parte I

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

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

$$PV(growing\ perpetuity) = \frac{C}{r-g} = VA(renda\ perpétua) \qquad (4.7)$$

$$PV(annuity\ of\ C\ for\ N\ periods\ with\ interest\ rate\ r, growing\ at\ rate\ g) = C \times \frac{1}{r-g}\left(1-\left(\frac{1+g}{1+r}\right)^N\right) =$$

$$= VA(renda\ termo\ inicial\ C, crescente\ a\ taxa\ g, durante\ N\ períodos, atualizada\ a\ taxa\ r) \qquad (4.8)$$

$$1 + EAR = \left(1+\frac{APR}{k}\right)^k \qquad ; \qquad 1 + TAE = \left(1+\frac{TAN}{k}\right)^k \quad (5.3)$$

$$YTM_n = \left(\frac{Face\ Value}{P}\right)^{\frac{1}{n}} - 1 \qquad (6.2)$$

$$P = CPN \times \frac{1}{y}\left(1-\frac{1}{(1+y)^n}\right) + \frac{FV}{(1+y)^n} \qquad (6.3)$$

$$P = PV(Bond/Obrigação\ cash\ Flows) = \frac{CPN}{1+YTM_1} + \frac{CPN}{(1+YTM_2)^2} + \cdots + \frac{CPN+FV}{(1+YTM_N)^N} \qquad (6.4)$$

$$r_E = \frac{Div_1}{P_0} + \frac{P_1 - P_0}{P_0} \qquad (7.2)$$

$$P_0 = \frac{Div_1}{1+r_E} + \frac{Div_2}{(1+r_E)^2} + \cdots + \frac{Div_N}{(1+r_E)^N} + \frac{P_N}{(1+r_E)^N} \qquad (7.4)$$

$$P_0 = \frac{Div_1}{r_E - g} \qquad (7.6)$$

$$Div_t = EPS_t \times Dividend\ Payout\ Rate_t \qquad (7.8)$$

$$g = Retention\ rate\ \times Return\ on\ New\ Investment \qquad (7.11)$$

$$P_0 = \frac{PV(Future\ Total\ Dividends\ and\ Repurchases)}{Shares\ Outstanding_0} \qquad (7.15)$$

RATIOS RÁCIOS

$$Gross\ Profit\ Margin = \frac{Gross\ Profit}{Sales} = \frac{Margem\ Bruta}{Vendas} = Margem\ Bruta\ das\ Vendas$$

$$EBIT\ Margin = \frac{EBIT}{Sales} = \frac{EBIT}{Vendas} = Margem\ do\ EBIT$$

$$Net\ Profit\ Margin = \frac{Net\ Income}{Sales} = \frac{Resultado\ Líquido}{Vendas} = Rendibilidade\ Líquida\ das\ Vendas$$

$$Current\ Ratio = \frac{Current\ Assets}{Current\ Liabilities} = \frac{Ativo\ Corrente}{Passivo\ Corrente} = Liquidez\ Geral$$

$$Quick\ Ratio = \frac{Current\ Assets - Inventory}{Current\ Liabilities} = \frac{Ativo\ Corrente - Inventários}{Passivo\ Corrente} = Liquidez\ Reduzida$$

$$Cash\ Ratio = \frac{Cash\ or\ Cash\&Equivalents}{Current\ Liabilities} = \frac{Caixa\ ou\ Caixa\&Equivalentes}{Passivo\ Corrente} = Liquidez\ Imediata$$

$$AccountsReceivableDays = \frac{Accounts\ Receivable}{Average\ Daily\ Sales} = \frac{Contas\ a\ Receber}{Vendas\ Diárias\ (média)} = PrazoMédioRecebimentos$$

$$Accounts\ Payable\ Days = \frac{Accounts\ Payable}{Average\ Daily\ Cost\ of\ Sales} = \frac{Contas\ a\ Pagar}{CMVMC\ Diário\ (médio)} = PrazoMédioPagamentos$$

$$InventoryDays = \frac{Inventory}{Average\ Daily\ Cost\ of\ Sales} = \frac{Inventários}{CMVMC\ Diário\ (médio)} = PrazoMédioPermanênciaInventários$$

$$Inventory\ Turnover = \frac{Annual\ Cost\ of\ Sales}{Inventory} = \frac{CMVMC\ Anual}{Inventários} = Rotação\ de\ Inventários$$

$$Interest\ Coverage\ Ratio = \frac{EBIT\ or\ EBITDA}{Interest\ Expense} = \frac{EBIT\ ou\ EBITDA}{Encargos\ Financeiros\ com\ a\ dívida} = CoberturaEncargosFinanceirosDívida$$

$$Debt/Equity\ Ratio = \frac{Total\ Debt}{Total\ Equity} = \frac{Dívida\ Total}{Capital\ Próprio} = Rácio\ Dívida/CapitalPróprio$$

$$Debt - to - Capital\ Ratio = \frac{Total\ Debt}{Total\ Equity + Total\ Debt} = \frac{Dívida\ Total}{Capital\ Próprio + Dívida\ Total} = Grau\ de\ Endividamento\ Total$$

$$Equity\ Multiplier\ (at\ book\ values) = \frac{Total\ Assets}{Equity} = \frac{Total\ do\ Ativo}{Capital\ Próprio} = Multiplicador\ do\ CapitalPróprio\ (a\ valores\ contabilísticos)$$

$$Market - to - Book\ Ratio = \frac{Market\ Value\ of\ Equity}{Book\ Value\ of\ Equity} = \frac{Valor\ de\ Mercado\ do\ Capital\ Próprio}{Valor\ Contabilístico\ do\ Capital\ Próprio}$$

$$Price - Earnings\ Ratio = \frac{Share\ Price}{Earnings\ per\ Share} = \frac{Cotação\ da\ Ação}{Resultado\ por\ Ação} = PER$$

$$Asset\ Turnover = \frac{Sales}{Total\ Assets} = \frac{Vendas}{Total\ do\ Ativo} = Rotação\ do\ Ativo$$

$$ROE = \frac{Net\ Income}{Book\ Value\ of\ Equity} = \frac{Resultado\ Líquido}{Valor\ Contabilístico\ Capital\ Próprio}$$

$$ROA = \frac{Net\ Income + Interest\ Expense}{Book\ Value\ of\ Assets} = \frac{Resultado\ Líquido + Encargos\ Financeiros\ com\ Dívida}{Valor\ Contabilístico\ do\ Ativo}$$

$$ROIC = \frac{EBIT(1 - Tax\ Rate)}{Book\ Value\ of\ Equity + Net\ Debt} = \frac{EBIT(1 - Taxa\ de\ Imposto)}{Valor\ Contabilístico\ Capital\ Próprio + Net\ Debt}$$

FORMULAE Part II FÓRMULAS Parte II

(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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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