

FORMULAE * Project Evaluation
English Class M01 2013/2014

<p>Working Capital</p> <ul style="list-style-type: none"> Working Capital = Raw materials in stock + Finished goods in stock + Monies owed by customers + Monies owed to suppliers¹ or Working Capital = Current Assets – Current Liabilities² or Working Capital = Accounts receivable + Inventory + Accounts payable³ Working Capital Investment = Working Capital_t – Working Capital_{t-1}
<p>Cash Flows for a Project</p> <p>CFG_t = Global or Total Cash Flow in t</p> <p>CFE_t = Operational Cash Flow or Cash Flow from Operating Activities</p>
<ul style="list-style-type: none"> CFG_t = Inflows_t – Outflows_t CFG_t = [-CI_t + VR_t - ΔNFM_t] + CFE_t <p>CFG Global Cash Flow CI Cost of Investment VR Residual Value NFM Working Capital ΔNFM Investment in Working Capital</p>
<ul style="list-style-type: none"> CFE_t = RL_t + A_t + Aj_t + EFFin_t <p>CFE Operational Cash Flow RL operating net return (net profit) A Depreciation Aj Adjustments EFFin_t value of Interests paid (Interests)</p>
<ul style="list-style-type: none"> FCF_t = RAIEF_t × (1-T) + A_t + Aj_t – Investment_t Free Cash Flow = Net Results before Taxes and Interest <p>T = taxes (tax rate; e.g. 25%)</p>
<ul style="list-style-type: none"> WACC definitions:
<p>(Flow Global CF/Fluxo = CFG) WACC_t = w_d K_d + (1 – w_d) K_s</p>
<p>(Flow Free CF/Fluxo = FCF) WACC_t = w_d K_d (1 – T) + (1 – w_d) K_s</p> <ul style="list-style-type: none"> Cash Flow of Stockholders (=CFG_A): CFG_A = CFG_t + Received from funders(external capital)_t – Paid to funders (external capital)_t
<p>Financing Projects</p>
<ul style="list-style-type: none"> WACC = w_s k_s + w_d k_d APV = NPV of the project if financed 100% by own capital + discounted value of fiscal saving from interest payment k_s = R_F + risk premium Risk Premium_i = (R_M – R_F) β_i

¹ Crundwell (2008, p.7)

² Crundwell (2008, p.113)

³ Crundwell (2008, p.113)

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- $\beta_i = \frac{Cov(R_i, RM)}{\sigma_M^2}$

- **NPV of a project (assuming a constant k):**

$$NPV = \sum_{t=0}^n \frac{CFG_t}{(1+k)^t}$$

- **IRR**

$$\sum_{t=1}^n \frac{CFE_t}{(1+TIR)^t} = CI_0$$

<ul style="list-style-type: none"> • IRR Modified or Modified Internal Rate of Return (MIRR)⁴ $\frac{\sum_{t=1}^n CFE_t (1 + R_2)^{n-t}}{(1 + TIRM)^n} = CI_0$	
<ul style="list-style-type: none"> • Profitability Index $IR = \left[\frac{\sum_{t=1}^n \frac{CFE_t}{(1 + k)^t}}{CI_0} \right]$	
<ul style="list-style-type: none"> • Adjusted Present Value, APV $APV = \sum_{t=0}^n \frac{FCF_t}{(1 + k_{S_U})^t} + \sum_{t=1}^n \frac{kdD_t T}{(1 + kd)^t}$	
Decisions under uncertainty	
<ul style="list-style-type: none"> • NPV (using certainty equivalent method) $NPV = \sum_{t=0}^n \frac{\alpha_t CFG_t}{(1 + R_f)^t}$	

⁴ Crundwell (2008), p.180.