**EQUATIONS FOR CAPITAL BUDGET PROCESS:**

1. Break Even Point: , where FC = fixed costs, VC = variable costs per unit, and P = Price per unit
2. Cost of Capital Component Parts:
   1. (After Tax) Cost of Debt: rd (1-T), where rd = rate of return required by the holders of the debt instrument, and T = combined tax rate for the subsidiary or firm. This equation only works in a domestic capacity or if debt is denominated in the home country’s currency.
   2. Cost of Foreign-Currency-Denominated Debt: rd (1-T)(1 +ΔFXe) + ΔFXe, where rd (1-T) is the after tax cost of debt, and,

ΔFXe = , where FX1 is the price of the foreign exchange at time1, and FX0 is the price of the foreign exchange at time0.

* 1. Cost of Preferred Stock: rps= , where Dps= preferred dividend, and Pn= net issuing price after deducting all costs associated with “floating” the stock (that is, going to an investment bank and having them sell the stock. Hence the term “floating.”)
  2. Cost of Common Equity (Bond or Stock): rs
     1. Company-bond-yield plus risk-premium approach:

rs= Original Bond Yield + Risk Premium

* + 1. Capital Asset Pricing Model (CAPM):

rs= rRF + (RPM)bi, where rRF = the risk-free rate, bi= firm’s beta coefficient, and RPM = market risk premium

* + 1. Global CAPM:

rs= rRF + (RPW)biW, where rRF = the risk-free rate, biW= firm’s beta coefficient calculated against the world index, and RPW = world risk premium, usually taken from one of the world indices created by the larger investment banks, like Morgan Stanley’s Capital Market International (MSCI) value-weighted world index

1. Weighted Average Cost of Capital (WACC):

|  |  |  |  |
| --- | --- | --- | --- |
| **Capital Component** | **Target Weight:**  **Column A** | **After-Tax Component Cost:**  **Column B** | **After-Tax Weighted Cost**  **Column C= Column AB (delimited in %)** |
| Debt | 30% | rd (1-T) | (0.30) rd (1-T) |
| Preferred | 10% | rps= | (0.10) rps= |
| Common | 60% | rs= rRF + (RPW)biW | (0.60) rs= rRF + (RPW)biW |
|  |  | **WACC** | Σ Column C |

The values in Column A: Target Weight is an arbitrary number, agreed upon by the senior management of the subsidiary or parent organization. While the 30%/10%/60% is a “common” valuation in large manufacturing or project-oriented firms, it is my no means the “only” mix appropriate to your venture. No matter the values used for Column A, you will **still have to support your assumptions** on the appropriate mix for your transnational business.

1. Net Present Value, Internal Rate of Return, and the Payback Period:
   1. Net Present Value, NPV:

NPV = , where:

* + 1. CFt is the total cash flows for the project/new venture/subsidiary over a period, n
    2. WACC is the Weighted Average Cost of Capital, and is described above
    3. *n* is the period over which the project/ new subsidiary is said to be in the start-up period, and is agreed upon by senior management before start of project
    4. CFt, WACC, & n are all estimates
  1. Internal Rate of Return, IRR:

NPV = 0 = , where:

1. CFt is the total cash flows for the project/new venture/subsidiary over a period, n
2. *n* is the period over which the project/ new subsidiary is said to be in the start-up period, and is agreed upon by senior management before start of project
3. We solve for the IRR value when the net present value of the entire project is 0 because, in essence, this is the “break-even” internal rate or “hurdle rate” that the firm requires in order for the project just to “break-even.” If a project/ new venture doesn’t pass this hurdle rate in time *n*, then the project/new venture doesn’t get a “go.”
   1. Payback Period, PB:

PB = Last Year/Month/Period with a Negative Cash Flow (NCF) + 

* 1. Estimating Cash Flows: Comes in two parts, the actual equation, and an estimate of what is called net operating working capital.
     1. Required Change in Net Operating Working Capital (NOWCrc):

NOWCrc = Increases in Inventory + Increases in A/R – Increases in A/P and Current Liabilities

* + 1. Free Cash Flow (FCF):

FCF = Net Operating Profits (after taxes) – Net Fixed Assets (expenditures) - NOWCrc

* + 1. Salvage Value (Sn) for a project, or its “going concern” value beyond project time, *n*:

Sn = [NOCFn(1+g)] / (WACC-g), where:

NOCFn = Net Operating Cash Flow in time *n*,

WACC = Weighted Average of the Cost of Capital

g = average growth rate in the NOCF over the length of the project

The Salvage Value of a project comes in two types: as a liquidating value concept, and as a “going concern concept.” In the first place, senior management has decided that the project is at an end, and should be “liquidated.” This is the final cash flow, and should be subtracted from the capital budget, as the project does not extend outward past time *n*.

In the second place, the project/subsidiary/new venture is considered to be a “permanent” part of the parent company, and its cash flows extend past time *n*. Therefore, such an endeavor adds to the overall cash flow of the firm, and should be added to the capital budget figures.