Important Capital Budgeting Formulas PDF

Formulas
Examples
with Units

List of 18
Important Capital Budgeting Formulas

1) Accounting Rate of Return Formula

Evaluate Formula

Formula

$$ARR = \left(\frac{AP}{\text{Initial Invt}}\right) \cdot 100$$

Example

$$35 = \left(\frac{700}{2000}\right) \cdot 100$$

2) After-Tax Cost of Debt Formula

Evaluate Formula

Formula

$$ATCD = \left(R_f + CS_P\right) \cdot \left(1 - T_r\right)$$

Example

$$0.0315 = \left(0.015 + 0.03\right) \cdot \left(1 - 0.30\right)$$

3) Beginning Inventory Formula

Evaluate Formula

Formula

$$BI = COGS - P + EI$$

Example

$$33000 = 40000 - 25000 + 18000$$

4) Capital Asset Pricing Model Formula

Evaluate Formula

Formula

$$ER_i = R_f + \beta_i \cdot \left(ER_m - R_f\right)$$

Example

$$159.715 = 0.015 + 20 \cdot \left(8 - 0.015\right)$$

5) Certainty Equivalent Cashflow Formula

Evaluate Formula

Formula

$$CECF = \frac{C}{1 + R_p}$$

Example

$$487.8049 = \frac{20000}{1 + 40}$$

6) Cost of Debt Formula

Evaluate Formula

Formula

$$R_d = Int.E \cdot \left(1 - T_r\right)$$

Example

$$94.5 = 135 \cdot \left(1 - 0.30\right)$$

7) Cost of Retained Earnings Formula

Evaluate Formula

Formula

$$C_{RE} = \left(\frac{D}{P_c}\right) + g$$

Example

$$0.7 = \left(\frac{25}{50}\right) + 0.20$$

8) Discounted Payback Period Formula

Evaluate Formula

Formula

$$DPP = \frac{\ln\left(\frac{1}{1 - \left(\frac{\text{Initial Invt} \cdot DR}{PCF}\right)}\right)}{\ln\left(1 + DR\right)}$$

Example

$$0.0593 = \frac{\ln\left(\frac{1}{1 - \left(\frac{2000 \cdot 12}{170000}\right)}\right)}{\ln\left(1 + 12\right)}$$

9) Double Declining Balance Method Formula

Evaluate Formula

Formula

$$DE = \left(\left(\frac{PC - SV}{ULA}\right) \cdot 2\right) \cdot BBV$$

Example

$$462222.2222 = \left(\left(\frac{340000 - 180000}{9}\right) \cdot 2\right) \cdot 13$$

10) Expected Monetary Value Formula

Evaluate Formula

Formula

$$EMV = \mu < i\left(Po, Imp\right)$$

Example

$$78000 = \mu < i\left(0.6, 130000\right)$$

11) Inventory Carrying Cost Formula

Evaluate Formula

Formula

$$ICC = \left(\frac{TCC}{TIV}\right) \cdot 100$$

Example

$$153.8462 = \left(\frac{300000}{195000}\right) \cdot 100$$

12) Modified Internal Rate of Return Formula

Evaluate Formula

Formula

$$MIRR = 3 \cdot \left(\left(\frac{PV}{PV_O}\right)^{\frac{1}{t}} \cdot \left(1 + I\right) - 1\right)$$

Example

$$3.3715 = 3 \cdot \left(\left(\frac{15}{975}\right)^{\frac{1}{3.5}} \cdot \left(1 + 6\right) - 1\right)$$

13) Net Present Value (NPV) for even cash flow Formula

Evaluate Formula

Formula

$$NPV = C \cdot \left(\frac{1 - \left(1 + RoR\right)^{-n}}{RoR} \right) - \text{Initial Invt}$$

Example

$$1981.4815 = 20000 \cdot \left(\frac{1 - \left(1 + 5\right)^{-3}}{5} \right) - 2000$$

14) Overall Cost of Capital Formula

Evaluate Formula

Formula

$$OCC = \frac{E}{E + MV} \cdot RR + \frac{MV}{E + MV} \cdot R_d \cdot \left(1 - T_r\right)$$

Example

$$53.7288 = \frac{500}{500 + 2100} \cdot 0.09 + \frac{2100}{500 + 2100} \cdot 95 \cdot \left(1 - 0.30\right)$$

15) Payback Period Formula

Evaluate Formula

Formula

$$PBP = \frac{\text{Initial Invt}}{C_f}$$

Example

$$1.3333 = \frac{2000}{1500}$$

16) Terminal Value using Exit Multiple Method Formula

Evaluate Formula

Formula

$$TV = EBITDA_{n+1} \cdot EM$$

Example

$$10150 = 1015 \cdot 10$$

17) Terminal Value using Perpetuity Method Formula

Evaluate Formula

Formula

$$TV = \frac{FCF}{DR - g}$$

Example

$$10169.4915 = \frac{120000}{12 - 0.20}$$

18) Trade Discount Formula

Evaluate Formula

Formula

$$TD = \mu < i\left(LP, TDR\right)$$

Example

$$150 = \mu < i\left(1000, 0.15\right)$$

Variables used in list of Capital Budgeting Formulas above

- **AP** Average Annual Profit
- **ARR** Accounting Rate of Return
- **ATCD** After Tax Cost of Debt
- **BBV** Beginning PP&E Book Value
- **BI** Beginning Inventory
- **C** Expected Cash Flow
- C_f Cashflow per Period
- C_{RE} Cost of Retained Earnings
- **CECF** Certainty Equivalent Cashflow
- **COGS** Cost of Goods Sold
- CS_P Credit Spread
- **D** Dividend
- **DE** Depreciation Expense
- **DPP** Discounted Payback Period
- **DR** Discount Rate
- **E** Market Value of the Firm's Equity
- $EBITDA_{n+1}$ EBITDA at Last Period
- **EI** Ending Inventory
- **EM** Exit Multiple
- **EMV** Expected Monetary Value
- ER_i Expected Return on Investment
- ER_m Expected Return on Market Portfolio
- **FCF** Free Cash Flow
- **g** Growth Rate
- **I** Interest
- **ICC** Inventory Carrying Cost
- **Imp** Impact
- **Initial Invt** Initial Investment
- **Int.E** Interest Expense
- **LP** List Price
- **MIRR** Modified Internal Rate of Return
- **MV** Market Value of the Firm's Debt
- **n** Number of Periods
- **NPV** Net Present Value (NPV)
- **OCC** Overall Cost of Capital

Constants, Functions, Measurements used in list of Capital Budgeting Formulas above

- Functions: **ln**, ln(Number)
  The natural logarithm, also known as the logarithm to the base e, is the inverse function of the natural exponential function.
- Functions: **multi**, multi(a1, …, an)
  Multiplication is the process of calculating the product of two or more numbers.

- **P** Purchases
- **P_c** Current Stock Price
- **PBP** Payback Period
- **PC** Purchase Cost
- **PCF** Periodic Cash Flow
- **Po** Probability
- **PV** Present Value
- **PV_O** Cash Outlay
- **R_d** Cost of Debt
- **R_f** Risk Free Rate
- **R_p** Risk Premium
- **RoR** Rate of Return
- **RR** Required Rate of Return
- **SV** Salvage Value
- **t** Number of Years
- **T_r** Tax Rate
- **TCC** Total Carrying Cost
- **TD** Trade Discount
- **TDR** Trade Discount Rate
- **TIV** Total Inventory Value
- **TV** Terminal Value
- **ULA** Useful Life Assumption
- **β_i** Beta on Investment

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