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Capital Budgeting Formulas

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List of 18 Capital Budgeting Formulas

Capital Budgeting

1) Accounting Rate of Return

Open Calculator

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

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

2) After-Tax Cost of Debt

Open Calculator

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

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

3) Beginning Inventory

Open Calculator

fx $$BI = COGS - P + EI$$

ex $$33000 = 40000 - 25000 + 18000$$

4) Capital Asset Pricing Model

Open Calculator

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

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

5) Certainty Equivalent Cashflow

Open Calculator

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

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

6) Cost of Debt

Open Calculator

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

ex $$94.5 = 135 \cdot (1 - 0.30)$$

7) Cost of Retained Earnings

Open Calculator

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

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

8) Discounted Payback Period

Open Calculator

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

ex $$0.059335 = \frac{\ln\left(\frac{1}{1-\left(\frac{2000 \cdot 12}{170000}\right)}\right)}{\ln(1 + 12)}$$

9) Double Declining Balance Method

Open Calculator

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

ex $$462222.2 = \left(\left(\frac{340000 - 180000}{9}\right) \cdot 2\right) \cdot 13$$

10) Expected Monetary Value

Open Calculator

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

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

11) Inventory Carrying Cost

Open Calculator

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

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

12) Modified Internal Rate of Return

Open Calculator

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

ex $$3.371535 = 3 \cdot \left(\left(\frac{15}{975}\right)^{\frac{1}{3.5}} \cdot (1 + 6) - 1\right)$$

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

Open Calculator

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

ex $$1981.481 = 20000 \cdot \left(\frac{1 - (1 + 5)^{-3}}{5} \right) - 2000$$

14) Overall Cost of Capital

Open Calculator

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

ex $$53.72885 = \frac{500}{500 + 2100} \cdot 0.09 + \frac{2100}{500 + 2100} \cdot 95 \cdot (1 - 0.30)$$

15) Payback Period

Open Calculator

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

ex $$1.333333 = \frac{2000}{1500}$$

16) Terminal Value using Exit Multiple Method

Open Calculator

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

ex $$10150 = 1015 \cdot 10$$

17) Terminal Value using Perpetuity Method

Open Calculator

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

ex $$10169.49 = \frac{120000}{12 - 0.20}$$

18) Trade Discount

Open Calculator

fx $$\mathrm{TD} = \mu < i(\mathrm{LP}, \mathrm{TDR})$$

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

Variables Used

- **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
- **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

Constants, Functions, Measurements used

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

Check other formula lists

- **Capital Budgeting Formulas**

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