

Applying NPV Analysis to Project Feasibility

<http://bit.ly/2JC3VQa>

PROF. DR. ARNAT LEEMAKDEJ

THAMMASAT BUSINESS SCHOOL

Cashflow Statement

Cash Flow from Operations			
Net Income	-		480,000
+ Depreciation	-		500,000
- Δ Reserved	-		(750,000)
+ Δ A/P	-		500,000
- Δ A/R	-		(1,000,000)
- Δ inventories	-		(250,000)
Net Cash From Operations	-		(520,000)
Cash Flow from Investing			
- Fixed Asset Investment	(5,000,000)		-
Cash Flow from Financing			
+ Δ Short-Term Loans	-		-
+ Δ Long-Term Loans	5,000,000		(1,000,000)
+ Δ Capital	2,000,000		-
Net Chang in Cash	2,000,000		(1,520,000)
Beginning Cash Balance	-		2,000,000

FCFF & Cash Flow Statement

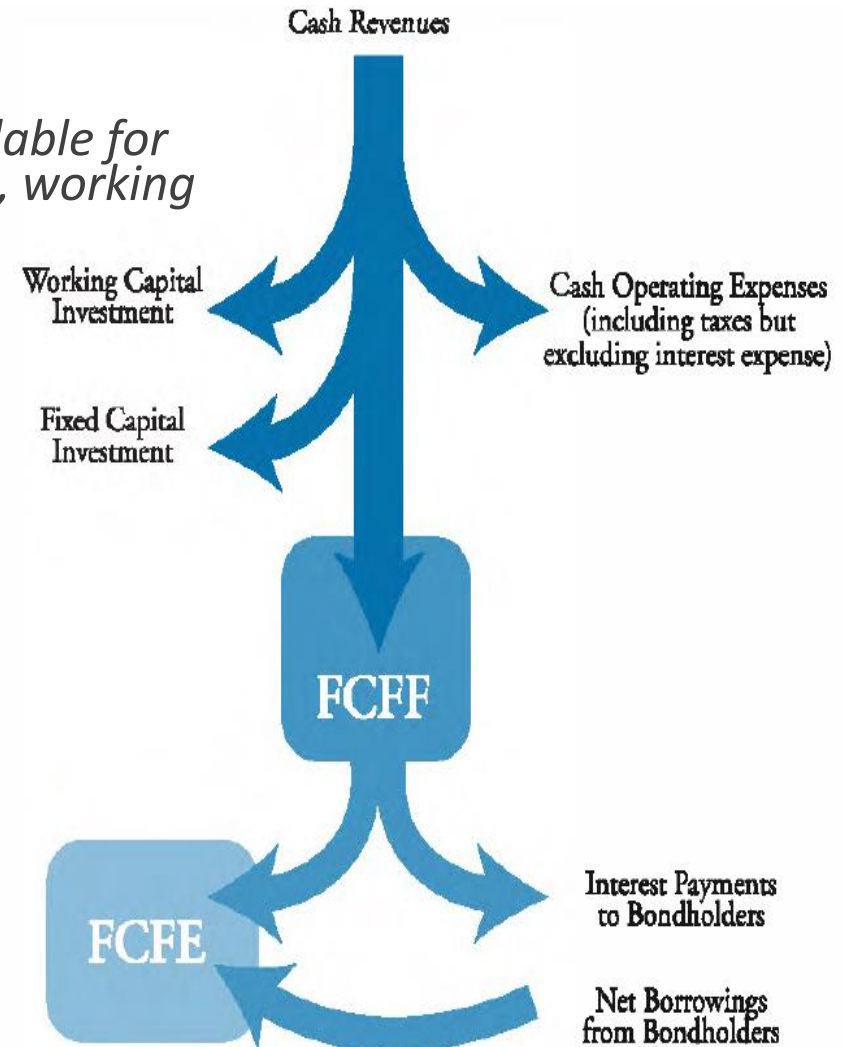
FCFF : Free Cash Flow to Firm

the amount of cash flow from operations available for distribution after depreciation expenses, taxes, working capital, and investments are paid

$$\begin{aligned}\text{FCFF} = & \text{Operating Cash Flow} \\ & + \text{Interest Paid} * (1 - \text{Tax Rate}) \\ & + \text{Investing Cash Flow}\end{aligned}$$

Free Cash Flow to Equity

$$\begin{aligned}\text{FCFE} = & \text{FCFF} \\ & - \text{Interest Paid} * (1 - \text{Tax Rate}) \\ & + \text{Net Borrowing}\end{aligned}$$



A/R, A/P, Inventory, Reserved

❑ A/R: Account Receivable

❑ If the company sets the credit term to customers for 60 days

❑ If it has 1 MB sales each month => Annual Sales = 12 MB

❑ On 31th Dec: A/R = November Sales + December Sales

❑ $A/R = \text{Sales} / (360/60) = \text{Sales} / 6$

A/R Turnover

❑ A/P: Account Payable

❑ If the company gets the credit term for 30 days from suppliers

❑ $A/P = \text{COGS} / (360/30) = \text{COGS} / 12$

A/P Turnover

A/R, A/P, Inventory, Reserved

- ❑ Inventory is unsold products
 - ❑ If it takes 120 days to produce and sell
 - ❑ $\text{Inventory} = \text{COGS} / (360/120) = \text{COGS} / 3$
- ❑ $\text{Reserved} = \text{A/R} + \text{Inventory} - \text{A/P}$

Inventory Turnover

Base Case Scenario

- ❑ Establish a new Chili Sauce Factory.
- ❑ Expect to get 10% share of market size of 40 MB.
- ❑ Factory construction cost = 5 MB. (10-Year Utilization)
- ❑ Initial fund raised = 2 MB.
- ❑ Long term loan = 5 MB (Interest rate = 10%) Principal is repaid 20% per year. Excess amount is used for working capital.
- ❑ Cost of Goods Sold = 50% of Sales
- ❑ Other Expenses = 10% of Sales
- ❑ Given $K_e = 14\%$
- ❑ Days Sales Outstanding: DSO = 90 days
- ❑ Days Payable Outstanding: DPO = 90 days
- ❑ Days Inventory Outstanding: DIO = 45 days

Assumptions

Bank's Assumptions

- Growth Rate = 0%
- Additional Funds Needed (AFN) must not exceed 0.

Financial Ratio on repayment ability.

- **Interest Coverage Ratio (ICR)** = $\text{EBIT} / \text{Interest}$
- **Debt Service Coverage Ratio (DSCR)** = $\text{EBITDA} / (\text{Principal Repayment} + \text{Interest})$

Questions

- If the company offers credit term of 120 days, shall the Bank approve?
- If the company gets credit from creditors only 45 days, shall the Bank approve?
- How can the Bank adjust the conditions to keep this business running?

Questions: Bank's Perspective

1.1 Does the company have enough fund to run the business?

1.2 Shall the Bank approve the loan?

Scenario 2

2.1 If the company needs to extend AR to 120 days, what will happen?

2.2 If the company's credit is shorten to only 45 days, what will happen?

2.3 For 2.1 and 2.2 How to negotiate with the Bank to keep business running?

Owner's Perspective

- **AFN: the amount of money a company must raise from external sources to finance the increase in assets required to support increased level of sales**
- Additional Funds Needed (AFN) must not exceed 0.
- NPV of project
 - Must greater than 0
 - $K_d, K_e \Rightarrow WACC$

NPV Case 1

Liquidation Value

- This chili sauce factory can be used for 10 years
- Project's cash flow for the last year (10th)
= FCFF + market value of the sold or liquidated assets

7	8	9	10
380,000	1,380,000	1,380,000	1,380,000
			10,100,000

3.1 Calculate NPV of this project given $K_s = 14\%$

NPV Case 2

On-Going Value

- Owner wants to run this factory forever
- Project's cash flow for the last year (10th)
 - = constant growth model
 - = $FCFF_{10} + FCFF_{10}(1 + g) / (wacc - g)$

3.2 Calculate NPV of this project given $K_e = 14\%$

3.3 Does it make sense if owner wants to keep this project running forever but its factory last only 10 year?

NPV Case 2

3.4 Using a constant ratio of **Sales/PPE** implies that PPE (factory in this case) always stays in good shape.

Non-Current Assets				
PPE	5,000,000	5,000,000	125%	5,000,000
Total Non-Current Assets	7,000,000	7,000,000		7,000,000

Compare the result with 3.2

Company Valuation

Value of a Project

$$NPV = \sum_{i=0}^T PV(C_i) = \sum_{i=0}^T \frac{C_i}{(1+r)^i}$$

; NPV	Net Present Value
PV	Present Value
C _i	Cash Flow
C ₀	Initial Investments
r	Discount Rate
T	Project's Life

Company Valuation

Value of a Company

$$\text{Value of firm} = \sum_{i=0}^T \text{PV}(\text{FCFF}_i) = \sum_{i=0}^T \frac{\text{FCFF}_i}{(1 + \text{wacc})^i}$$

; wacc weighted average cost of capital

$$\text{wacc} = \text{wd} * \text{kd} * (1 - \text{Tax Rate}) + \text{we} * \text{ke}$$

wd Weight of Debt

we Weight of Equity

kd * (1 – Tax Rate) Cost of Debt

ke Cost of Equity

FCFE & Stock Price

$$\text{Value of Equity} = \sum_{i=0}^T \text{PV}(\text{FCFE}_i) = \sum_{i=0}^T \frac{\text{FCFE}_i}{(1 + k_e)^i}$$

- ❑ Initial fund raised = 2 MB (2M unit @ 1B).
- ❑ Value of Equity = 4.14 MB.
- ❑ Stock Price increase => $4.14/2 \Rightarrow 2.07X$