

Discounted Cash Flow: Free Cash Flow

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Last Time

Discounted Cash Flow (DCF)

- Decision making
 - NPV rule
 - IRR
 - Payback
- Practical approach

This Time Discounted Cash Flow (DCF)

- Free Cash Flow

Free Cash Flow

Recall: Two components to NPV

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1. Free Cash Flows

Recall: Two components to NPV

1. Free Cash Flows
2. Discount Rate

Recall: Two components to NPV

1. Free Cash Flows
2. Discount Rate

$$\text{FCF} = (\text{Revenue}$$

$$\text{FCF} = (\text{Revenue} - \text{Costs})$$


$$\text{FCF} = (\text{Revenue} - \text{Costs} - \text{Depreciation})$$

$$\text{FCF} = (\text{Revenue} - \text{Costs} - \text{Depreciation}) \times (1 - t_c)$$

Unlevered Net Income

Net Operating Profit After Taxes (NOPAT)

Earnings Before Interest After Taxes (EBIAT)


$$\text{FCF} = (\text{Revenue} - \text{Costs} - \text{Depreciation}) \times (1 - t_c)$$

$$\text{FCF} = (\text{Revenue} - \text{Costs} - \text{Depreciation}) \times (1 - t_c) + \text{Depreciation}$$

$$\text{FCF} = (\text{Revenue} - \text{Costs} - \text{Depreciation}) \times (1 - t_c) + \text{Depreciation} - \text{Capital Expenditures}$$

$$\begin{aligned} \text{FCF} = & (\text{Revenue} - \text{Costs} - \text{Depreciation}) \times (1 - t_c) \\ & + \text{Depreciation} - \text{Capital Expenditures} \\ & - \text{Change in Net Working Capital} \end{aligned}$$

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Lesson: FCF is the residual cash flow left over after **all** of the project's requirements have been satisfied and implications accounted for.

$$\begin{aligned} \text{FCF} = & (\text{Revenue} - \text{Costs} - \text{Depreciation}) \times (1 - t_c) \\ & + \text{Depreciation} - \text{Capital Expenditures} \\ & - \text{Change in Net Working Capital} \end{aligned}$$

Lesson: FCF is the cash flow that can be distributed to the financial claimants (e.g., debt and equity) of the project or company

$$\begin{aligned} \text{FCF} = & (\text{Revenue} - \text{Costs} - \text{Depreciation}) \times (1 - t_c) \\ & + \text{Depreciation} - \text{Capital Expenditures} \\ & - \text{Change in Net Working Capital} \end{aligned}$$

Lesson: FCF is **not** the same as accounting cash flow from the **statement of cash flows** (SCF) but we can derive FCF from the SCF.

$$\begin{aligned} \text{FCF} = & (\text{Revenue} - \text{Costs} - \text{Depreciation}) \times (1 - t_c) \\ & + \text{Depreciation} - \text{Capital Expenditures} \\ & - \text{Change in Net Working Capital} \end{aligned}$$

Lesson: FCF is more precisely unlevered free cash flow to distinguish it from free cash flow to equity (FCFE) or levered free cash flow.

$$\begin{aligned}\text{FCFE} = & (\text{Revenue} - \text{Costs} - \text{Depreciation}) \times (1 - t_c) \\ & + \text{Depreciation} - \text{Capital Expenditures} \\ & - \text{Change in Net Working Capital} \\ & - \text{Interest} \times (1 - t_c) \\ & + \text{Net Borrowing}\end{aligned}$$

$$\text{FCFE} = \text{FCF} - \text{Interest} \times (1 - t_c) + \text{Net Borrowing}$$

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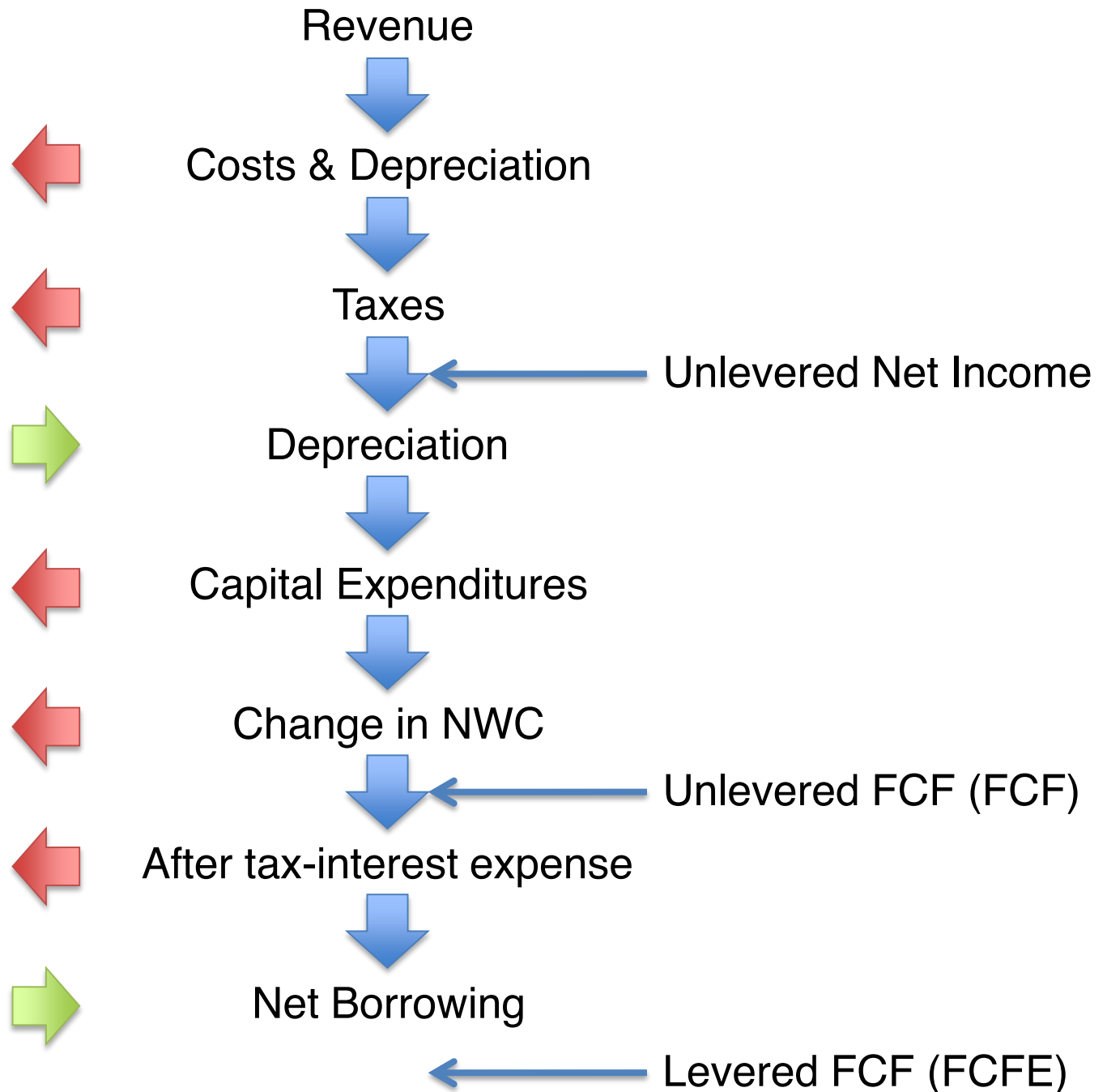
Lesson: FCFE is residual cash flow left over after **all** of the project's requirements have been satisfied, implications accounted for, *and* all debt financing has been satisfied

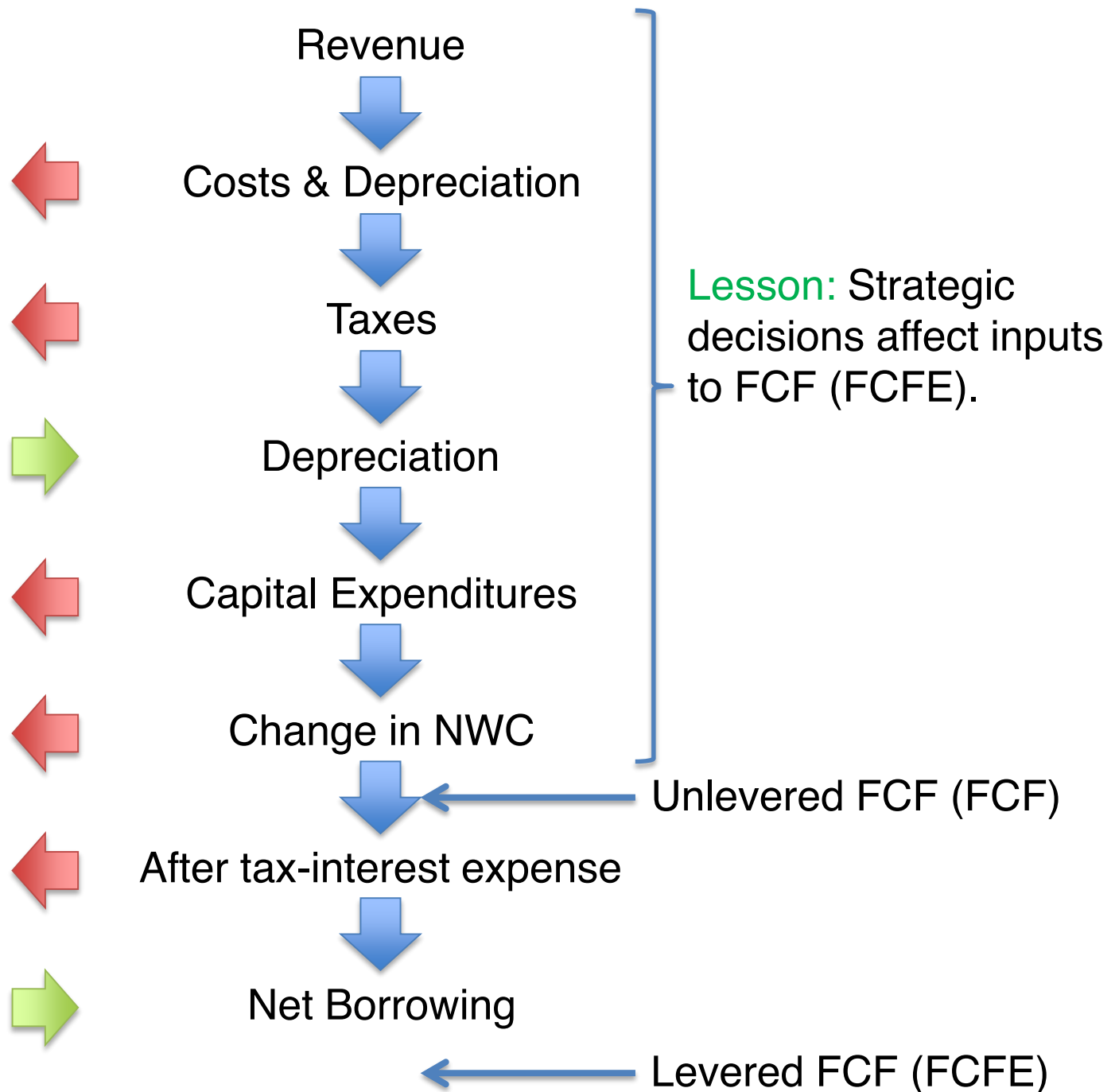
$$\text{FCFE} = \text{FCF} - \text{Interest} \times (1 - t_c) + \text{Net Borrowing}$$

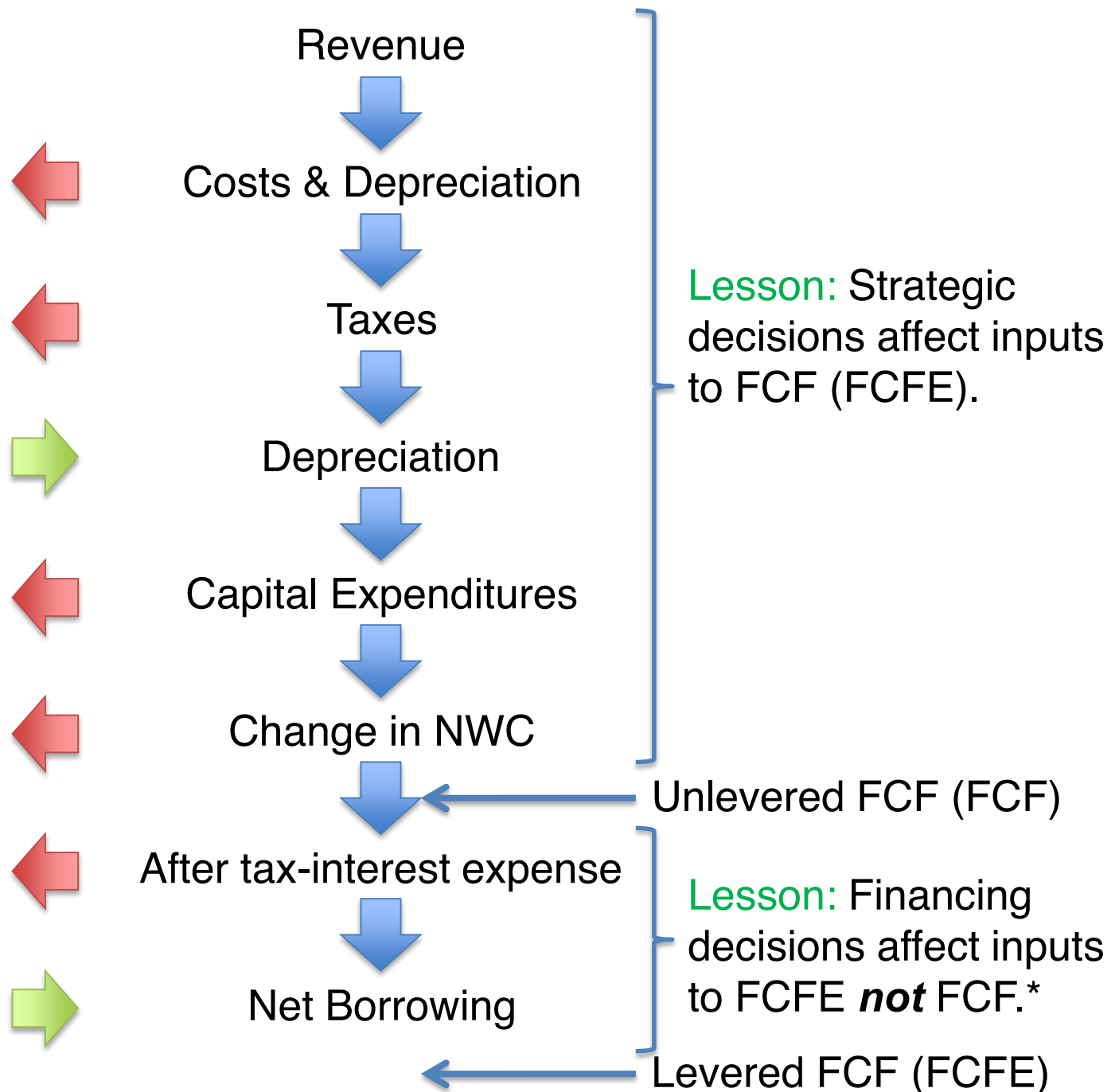
Lesson: FCFE is the cash flow that can be distributed to the shareholders (i.e., equity) of the project or company

$$\text{FCFE} = \text{FCF} - \text{Interest} \times (1 - t_c) + \text{Net Borrowing}$$

Lesson: FCF is more precisely levered free cash flow because it is affected by the choice of leverage (i.e., debt)







Summary

Lessons

- NPV is a decision rule that quantifies the value implications of decisions
 - Positive NPV implies value increasing
 - Negative NPV implies value decreasing

Coming up next

- Discounted Cash Flow (DCF)
 - Forecast Drivers