

# DECISION MAKING AND SCENARIOS

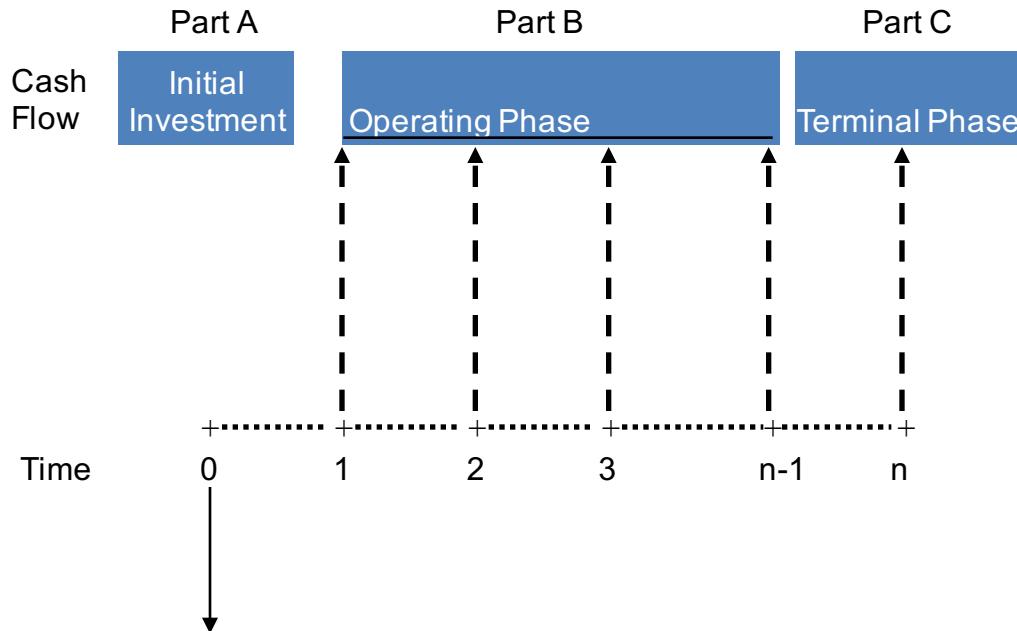
## MODULE 2.2 – Evaluating Projects

Analyzing the Incremental After-Tax Cash Flows  
– Operating Phase

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# Incremental After-Tax Cash Flows – Operating Phase



## Cash Flows during the operating phase

- Want to measure how the relevant cash flows of the organization change because of the project.
- To do that, we measure  $\Delta \text{Cash Flow} = \Delta \text{CR} - \Delta \text{CE} - \Delta \text{T}$ 
  - Where CR is cash receipts, CE is cash expenditures and T is taxes and  $\Delta$  is the change in the company's CR, CE and T because of the project
  - Suppose the project increases the company's sales by \$1,400 and the company collects all of that money this period. What is the change in cash receipts because of the project? \$1,400
  - Suppose the cost of the products that the company sold above for \$1,400 was \$500 and they made only what they sold. What are cash expenditures for production? \$500

## Cash Flows during the operating phase

- Note that the cash flows with the project so far would be  $\$900 = \$1400 - \$500$ . But at this point we haven't figured out the taxes?
- What would the taxes be assuming that we had \$300 of depreciation expense associated with the project and a tax rate of 40%?
- The taxable income would be equal to Revenues – Cost of Goods Sold – Depreciation =  $\$1,400 - \$500 - \$300 = \$600$  and taxes would be 40% of \$600 or \$240. Assume we pay taxes at year end.
- The cash flow for the year would be the cash receipts – cash expenditures – taxes associated with the project =  $\$1400 - \$500 - \$240 = \$660$

## Cash Flows during the operating phase

- Must include any additional working capital investment required such as receivables and inventories, net of increases in accounts payables
- The ongoing working capital investments would typically affect CR and CE.
- Let's augment our prior example to see that

## Cash Flows during the operating phase

- As indicated, we measure how the relevant cash flows of the organization changed because of the project.
- To do that, we measure  $\Delta \text{Cash Flow} = \Delta \text{CR} - \Delta \text{CE} - \Delta \text{T}$
- Let's add some working capital to the prior problem.
  - Suppose the project increases the company's sales by \$1,400, but accounts receivable associated with those sales (amounts owed by customers) increase by \$200. What is the change in cash receipts because of the project?  $\$1,200 = \$1,400 - \$200$
  - Suppose the cost of the products that the company sold above was \$500. In addition, suppose the company felt that it needed to increase its inventory level \$200 during the period to accommodate future sales. What are cash expenditures?  
 $\$700 = \$500 + \$200$

## Cash flows during the operating phase

- Note that the cash flows with the project so far would be  $\$500 = \$1200 - \$700$ . But at this point we haven't figured out the taxes?
- What would the taxes be assuming that we had \$300 of depreciation expense associated with the project and a tax rate of 40%? Taxes are based on measure of income, not cash flows.
- The taxable income would be equal to Revenues – Cost of Goods Sold – Depreciation =  $\$1,400 - \$500 - \$300 = \$600$  and taxes would be 40% of \$600 or \$240. This is the same as before!!!
- The operating cash flow for the year would be the cash receipts – cash expenditures – taxes associated with the project =  $\$1200 - \$700 - \$240 = \$260$

# Cash Flows during the operating phase - Note on Depreciation

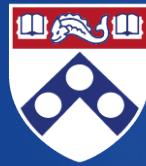
- Depreciation is not a cash flow in the years it is taken, but it does affect a company's cash flows indirectly by reducing the amount of taxes that the company pays because it reduces the company's net income.
- In many countries, corporations can use an accelerated form of depreciation (faster write-off of the asset) for tax purposes than they do for their non-tax records
- The relevant depreciation for this calculation is whatever method is used for tax purposes, not the depreciation used for financial reporting purposes (which can be different).

## Cash Flows during the operating phase - Note on Depreciation

- The simplest form of depreciation is straight-line which calculates annual depreciation as  
Annual depreciation =  $(\text{cost} - \text{estimated salvage}) / \text{life}$
- So a machine costing \$1000 with an estimated salvage value of \$250 and a 5 year life would have \$150 of depreciation per year ( $\$150 = (\$1,000 - \$250) / 5$ )
- Accelerated forms of depreciation would write the asset off over the same time frame, but the depreciation would be higher in the early years and lower in the later years than straight-line depreciation
  - Corporations often use accelerated depreciation because it typically reduces the PV of the taxes paid

## Cash Flows during the operating phase

- Make sure to include any additional investments in property, plant and equipment required in future years associated with the project.
- For example, if you had to add say another production line for a product in the third year, you would reduce the cash flows for that capital investment in that year.



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