Financial Accounting I

BUSI 721: Data-Driven Finance I

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Statements

- Income statement
    - Revenues
    - Costs
    - Net income = revenues - costs
- Balance sheet
    - Assets
    - Liabilities
    - Equity = assets - liabilities
- Statement of Cash Flows

Example: Property, Plant & Equipment (PP&E)

- Investment in PP&E is not an immediate cost in calculating income
- It goes on the balance sheet as an asset.
- It is gradually depreciated over time.
- The depreciation is a cost in calculating income.
- The balance sheet amount is written down by the amount of the depreciation.

Depreciation

- Depreciation is straight-line for financial reporting (same amount each year = investment/num of years).
- Depreciation is accelerated for tax purposes: double declining balance with a switch to straight line when that is optimal and a half-year in the first and last years.
- Congress passed accelerated depreciation to encourage investment. Accelerating depreciation improves near-term cash flows (more later).
- Tax schedule is called MACRS (Modified Accelerated Cost Recovery System).

Example

- Invest $100 in five-year equipment
- Straight-line is 20% per year.
- Double-declining balance is 40% of the remaining balance each year.
- But first year of service is only a half year, so 20%.
- Switching to straight-line means computing balance / (num years left) and switching to that when higher.

- $20 - >$80 balance
- $32 - >$48 balance (SL would be 80/4.5 = 17.78)
- $19.20 - >$28.80 balance (SL would be 48/3.5 = 13.71)
- $11.52 - >$17.28 balance (SL would be 28.80/2.5 = 11.52)
- $11.52 - >$5.76 balance (DDB would be 0.4 x 17.38 = 6.95)
- $5.76 - >$0.00 balance

Balance Sheet in Example

Year	0	1	2	3	4	5
Gross PP&E	100	100	100	100	100	100
Accum Depr	20	52	71.20	82.72	94.24	100
Net PP&E	80	48	28.80	17.28	5.76	0

Income Statement in Example

- Assume revenue $50 per year beginning in year 1 and there are no costs other than depreciation.
- Assume the tax rate is 30%.

Year	0	1	2	3	4	5
Revenue	0	50	50	50	50	50
Less Depreciation	-20	-32	-19.20	-11.52	-11.52	-5.76
Pre-Tax Income	- 20	18	30.80	38.48	38.48	44.24
Less Taxes	6	- 5.40	- 9.24	- 11.54	- 11.54	- 13.27
Net Income	- 14	12.60	21.56	26.94	26.94	30.97

Income is Not Cash

- Depreciation is not an actual cash expense.
- Cash inflow in this example, excluding the initial $100 outlay for equipment, is revenue - taxes.
- We can also calculate cash inflow as net income + depreciation (depreciation add back).
    - Net income = 0.7 x (revenue - depreciation)
    - Net income + depreciation = 0.7 x revenue + 0.3 x depreciation
    - 0.3 x depreciation = depreciation tax shield

Statement of Cash Flows

- The statement of cash flows starts with net income and makes adjustments to get to cash flow (cash flow = cash inflow).
- Like adding back depreciation
- The cash inflow goes on the company's balance sheet as an increase in the cash account (or a decrease if the cash flow is negative).

Statement of Cash Flows in Example

Year	0	1	2	3	4	5
Net Income	- 14	12.60	21.56	26.94	26.94	30.97
Less Cap Ex	- 100	0	0	0	0	0
Plus Depr Add-Back	20	32	19.20	11.52	11.52	5.76
Cash Flow	- 94	44.60	40.76	38.46	38.46	36.73

Accelerated Depreciation and Cash Flows

- The effect of depreciation is to increase cash flow by the depreciation tax shield = 0.3 x depreciation.
- If we increase depreciation in early years (and therefore reduce it in later years) then we move some of the depreciation tax shields from late years to early years.
- Accelerating depreciation accelerates cash flows.
- How would cash flows change if the cap ex could be fully depreciated in year 0? And how would the balance sheet change?
    - This would be called expensing as opposed to capitalizing.

Why are there Assets and Liabilities?

- Revenues $\neq$ cash inflows
- Costs $\neq$ cash outflows
- Difference between revenue/cost and cash inflow/outflow is always manifested in a change in a balance sheet item.
- To calculate cash inflow/outflow from revenue/cost, the adjustment we make is to always add/subtract the change in a balance sheet item.
- Cash flow = net income - Δ (assets-liabilities)

Balance Sheet Changes in the Example

Year	0	1	2	3	4	5
Net PP&E	80	48	28.80	17.28	5.76	0
Δ Net PP&E	80	-32	-19.20	- 11.52	- 11.52	- 5.76

- Cash Flow = Net Income - Cap Ex + Depreciation
- Cash Flow = Net Income - Δ Net PP&E

Another Example

- Invest $500,000 in five-year MACRS equipment
- Revenues =
    - 0 in year 0
    - $100,000 in year 1
    - $200,000 in year 2
    - $200,000 in year 3
    - $100,000 in year 4
    - $50,000 in year 5
- No costs other than depreciation. Calculate cash flows.

Working Capital

- Short-term assets minus short-term liabilities
- Main categories:
    - Assets = inventory + accounts receivable
    - Liabilities = accounts payable

Matching Principle

- Record costs and revenues at time of sale
- If cash outflows/inflows occur at other times,
    - cash outflow before recording $\mapsto$ asset (inventory)
    - cash outflow after recording $\mapsto$ liability (accounts payable)
    - cash inflow before recording $\mapsto$ liability (pre-paid sales)
    - cash inflow after recording $\mapsto$ asset (accounts receivable)

Example

Year	0	1	2	3	4	5
Inventory	5	10	10	10	10	0
Receivables	0	8	8	8	8	0
Payables	3	6	6	6	6	0
Net Working Capital	2	12	12	12	12	0
Δ NWC	2	10	0	0	0	- 12

Invested Capital (using previous example for net pp&e)

Year	0	1	2	3	4	5
Net PP&E	80	48	28.80	17.28	5.76	0
Net Working Capital	2	12	12	12	12	0
Invested Capital	82	60	40.80	29.28	17.76	0
Δ IC	82	- 22	- 19.20	- 11.52	- 11.52	- 17.76

Cash Flow = Net Income - ΔIC

COGS and SG&A

- Direct costs of production (materials + labor) are costs of goods sold or costs of revenue
    - COGS or COR
- Other costs are selling, general, and administrative
    - SG&A

Previous Example

- Invest $500,000 in five-year MACRS equipment
- Revenues =
    - 0 in year 0
    - $100,000 in year 1
    - $200,000 in year 2
    - $200,000 in year 3
    - $100,000 in year 4
    - $50,000 in year 5
- No costs other than depreciation. Calculate cash flows.

- Assume COGS = 40% of revenue
- Assume SG&A = $50,000 each year
- Assume inventory = 10% of subsequent year sales (0 at end)
- Assume receivables = 8% of prior year sales (0 at end)
- Assume payables = 50% of inventory (0 at end)
- Calculate Net Income, Invested Capital, and Cash Flows.