Capital Budgeting

MGMT 675: AI-Assisted Financial Analysis

Outline

- Building a model
- Creating a slide deck
- Creating a Julius workflow

Building a Model

Model Elements

- Balance sheet
  - Gross PP&E
  - Accumulated depreciation
  - Net PP&E
  - Inventory
  - Accounts receivable
  - Accounts payable
- Income statement
  - Revenue
  - Cost of goods sold
  - SG&A expenses
  - Sales of PP&E less book value
  - Taxes
  - Net income

More Model Elements

- Statement of cash flows
  - Net income
  - Add back depreciation
  - Add back book value of PP&E sold
  - Subtract capital expenditures
  - Subtract change in net working capital
- Valuation
  - Cash flows
  - Discount rate

General Points

- Let's use 0, 1, 2, . . . as the years
- Cap ex occurs at date 0 but can also occur at other dates
- All balance sheet items should be zero at the end of the project
  - Use up inventory, collect recivables, pay payables
  - Dispose of or sell PP&E
  - Let's don't add an extra year at the end for this. Instead, assume it occurs at the end of the last year of sales.
- Add inflation in cash flows and use nominal discount rate
- Do everything on incremental basis
  - For example, if a new product will cannibalize existing sales, use incremental revenue, COGS, SG&A, inventory, receivables, and payables.
- Use tax depreciation schedule (MACRS in U.S. starting in year 1)

Tables

- Julius will want to put variables in columns and years in rows
- This is not best for presentations, but just transpose at the end
- Create separate table (dataframe) for each element (balance sheet, income statement, statement of cash flows, valuation)
- We need to tell Julius to set up the tables, specifying the column names in the order we want to see them in tables and specifying the years as rows (called index).
- We need to tell Julius the formulas for how variables depend on each other.
- We need to tell Julius what inputs to ask the user for. The user may specify additional formulas (e.g., COGS is 40% of sales).

Balance Sheet Columns

- Capital expenditures
- Gross PP&E
- Depreciation
- Accumulated depreciation
- Net PP&E
- Inventory
- Accounts receivable
- Accounts payable
- Net working capital

Income Statement Columns

- Sales
- COGS
- SG&A
- EBITDA
- Depreciation
- EBIT
- Taxes
- Net income

Statement of Cash Flows Columns

- Net income
- Add back depreciation
- Add back book value of PP&E sold
- Subtract capital expenditures
- Subtract change in net working capital
- Cash flow

Valuation Columns

- Cash flow
- PV factor
- PV of cash flow
- NPV

Creating a Julius Workflow

Inputs, income statement, and balance sheet

- User prompt: cap ex, depreciation schedules
- Julius prompt: create and display transposed PP&E table: cap ex, gross PP&E, depreciation, accumulated depreciation, net PP&E
- User prompt: sales, COGS, SG&A, tax rate
- Julius prompt: create and display transposed income statement
- User prompt: inventory, receivables, inventory
- Julius prompt: create and display transpose net working capital table: sales, COGS, SG&A, EBITDA, depreciation, EBIT, taxes, net income
- Notes: users should be able to specify $ amounts or as percents of other items.

Cash flows and valuation

- User prompt:Are the income statement and balance sheet correct? If not, what changes need to be made?
- Julius prompt: If user approves income statement and balance sheet, create and display transposed statement of cash flows.
- User prompt: input the cost of capital
- Julius prompt: create and display valuation table

PowerPoint (Optional)

- You can tell Julius to transpose each table and export it to a slide in a Powerpoint deck.
- You can tell Julius to display each table in a pretty format: numbers centered under column headers, alternating row shades, different background shades for headers and row names, etc.
- You can also edit the table styles in PowerPoint after Julius finishes.