Forecasting Analysis

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How to forecast financial statements ?

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1. Why do we need to forecast financial statements?

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Prospective analysis is the process of forecasting the future performance of a company.

Managers use prospective analysis to:

- Evaluate the impact of strategies, financing, and investment decisions on the company's future performance.
- By doing so, they can foresee how investors and creditors will react to these decisions.

Investors and creditors forecast financial statements because it allows them to:

- Estimate the future cash flows of the company.
- Estimate the future value of the company.

The forecast starts when the historical financial statements have been appropriately adjusted:

- Eliminating transitory items in the income statement.
- Capitalizing (expensing) items that have been expensed (capitalized) by management.
- Capitalizing operating leases.
- Other forms of off-balance sheet financing.
- And so on ...

2. Step 1: Projected Income Statement

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The projected income statement is the starting point of the prospective analysis. Step 1.1: we need an estimation of the company's expected sales growth rate:

- Easy approach: use the historical trend in sales growth rate.
- More sophisticated approaches:
  - expected level of macroeconomic activity: using econometrics to link sales growth to GDP growth. If the economy is in a cyclical upturn, sales growth is expected to be higher than the historical average.
  - Product market competition: if the company is in a highly competitive industry, the company has no price-setting power, and sales growth can quickly decline.
  - Multiproduct/multiservice companies.

Step 1.2, we need to estimate the company's expected gross profit margin:

- Easy and most common approach: use the historical trend in gross profit margin
- As a subproduct, we can calculate the company's expected *cost of sales* (COGS) as a *sales* - *gross profit* (step 1.3)

Let's jump to the example in MS Excel.

Step 1.4, we need to estimate the company's expected *selling, general, and administrative expenses* (SG&A):

- it is reasonable to argue that a relevant portion of SG&A varies with the company's sales.
  - Advertising and marketing expenses.
  - Sales commissions.
  - Salaries of salespeople.
- It is also reasonable to argue that a relevant portion of SG&A is fixed.
  - Salaries of top management.
  - Depreciation and insurance of the company's headquarters.
  - Rent and insurance.
  - And so on ...

Problem: how to estimate the variable and fixed portions of SG&A?

- Managers: easy, cost accounting and budgeting (later on this course)
- Investors and creditors: Impossible.
    - Therefore, they use historical trends in SG&A as a percentage of sales (so, consider that all SG&A is variable).

Let's jump to the example in MS Excel.

Step 1.5, we need to estimate the company's expected *depreciation and amortization* (D&A):

- we know that this fixed cost is a function of the company's gross PP&E at the beginning of the period.
    - so, it is reasonable to predict future D&A is a fraction of gross PP&E.
- the underlying assumption is that the company will keep the same PP&E structure.
- however, if companies have announced investments that still need to be incorporated, it is easy to get a decent estimate of the expected D&A using the depreciation information from footnotes.

Let's jump to the example in MS Excel.

Step 1.6, we need to estimate the company's expected *interest expenses*:

- This is also a fixed cost, so the prediction is relatively easy if we assume no changes in debt structure.
- We know that this fixed cost is a function of the company's debt at the beginning of the period.
- Of course, if the company announces new debt, we can incorporate this information into the forecast relatively easily.

Step 1.7 we can calculate the company's expected *Income before tax* as a *sales* - *COGS* - *SG&A* - *D&A* - *interest expenses*

Step 1.8, we need to estimate the company's expected *tax_expenses*:

- we know that this cost is a function of the company's income before tax.
- If we know the country's tax system well, we can estimate the company's expected TDA and TDL, and then calculate the company's expected tax expenses.
- However, in practice, most analysts just use the effective tax rate (ETR) as a percentage of income before tax.

$$\text{Effective Tax Rate (ETR)} = \frac{\text{tax expenses}}{\text{income before tax}}$$

Step 1.9, we focus on extraordinary items and discontinued operations:

- By their very nature, these items are not expected to occur in the future
- So, it is not sensitive to use past values as forecasted values
- Therefore, we assume that these items will be zero in the future
    - There are, of course, exceptions to this rule, but we will not discuss them here

Step 1.10, we can calculate the company's expected *net income* as a *income before tax* - *tax expenses* - *extraordinary items* - *discontinued operations*

3. Step 2: Projected Balance Sheet

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Step 2.1, estimate the company's expected *accounts receivable*:

$$\text{Accounts receivable turnover rate} = \frac{\text{Sales}}{\text{Accounts receivable balance}}$$

The forecast:

$$\text{Forcasted accounts receivable} = \frac{\text{Forecasted Sales}}{\text{Accounts receivable turnover rate}}$$

Step 2.2, estimate the company's expected *inventories*:

$$\text{Inventory turnover rate} = \frac{\text{COGS}}{\text{Ending inventory}}$$

The forecast:

$$\text{Forcasted ending inventory} = \frac{\text{Forecasted COGS}}{\text{Inventory turnover rate}}$$

We can add more sophistication to the forecast when the firm discloses more information:

- inventory turnover rates by product line or category are especially important for diversified companies.
- launching new products or stores: estimate the inventory should be added to the forecast.

Step 2.4, estimate the company's expected *PPE*:

- *PPE* is estimated as the prior year’s gross PP&E balance + historical capital expenditures as a percentage of sales.
- Historical capital expenditures are obtained from the statement of cash flows.
- It is very common to subsequently adjust forecasted PPE to examine the financial implications of higher (lower) levels of capital expenditures (sensitivity analyses).

Step 2.5, estimate expected accumulated depreciation:

Accumulated depreciation is estimated as the prior year’s accumulated depreciation balance + forecasted depreciation (step 1.5).

Step 2.6, estimate the company's expected *net PP&E*:

Now we move to the liabilities and equity side of the balance sheet.

Step 2.8, estimate the company's expected *accounts payable*:

$$\text{Accounts payable turnover rate} = \frac{\text{COGS}}{\text{Accounts payable balance}}$$

The forecast:

$$\text{Forcasted accounts payable} = \frac{\text{Forecasted COGS}}{\text{Accounts payable turnover rate}}$$

Step 2.9, update the *current portion of long-term debt* using the latest financial statements (footnotes).

Step 2.10, estimate expected *accrued expenses*:

- Accrued expenses are usually estimated as a percentage of sales.
- Very basic intuition: if sales increase, the company will need to pay more salaries and recognize more operating expenses later to match their revenues.

Step 2.11, estimate expected *tax payable*:

- What fraction of the tax expenses will be paid next year?
- We can estimate this fraction by looking at the historical trend in tax payable as a percentage of tax expenses.

Step 2.13, estimate expected *other long-term liabilities*:

- if there is no reason to expect changes in the company's debt structure, we can assume that other long-term liabilities will be the same as the prior year's balance minus the expected current portion of long-term debt (step 2.9).

Step 2.16, estimate expected *retained earnings*:

$$\text{Forecasted retained earnings} = \text{Prior year's retained earnings} + \text{Projected net income} - \text{Proyected dividends}$$

Step 2.17, estimated expected *cash*:

- Amount needed to balance total liability and equity with total assets
- Crucial step: is further financing needed? can the company invest more in PP&E? Can the company pay more dividends?

4. Sensitivity Analysis

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- We are assuming that many dimensions of the financialsstatements will change.
- Our approach is a good starting point:
    i. to test the sheet and formula: there should not be drastic changes in the company's financial structure
    ii. to foresee how the company's financial structure will look if no significant changes happen in the future
        a. valid for mature companies,
        b. less for young or highly disruptive/distressed companies.

4.1 Univariate optimization

How much does the company need to increase sales to meet EPS target?

- is it feasible? If not, what else can be done?

Find the solution: MS Excel: Data>What-if-Analysis>Goal Seeker.

Let's jump to the example in MS Excel.

4.2 Multivariate optimization

How much must the company adjust its assumptions to meet the net income (or EPS) target?

- sales growth rate
- gross profit margin
- SG&A, D&A
- debt structure, and so on

Find the solution: MS Excel: File>Options>Add-in> Solver.

4.3 Sensitivity analysis

Is the net income (or EPS) very sensitive to minor variations in the assumptions?

Find the solution: MS Excel: Data>What-if-Analysis>Data Table.

4.4 Scenario analysis

Now we bunch assumptions together to create specific scenarios and ask:

- What if the company's assumptions are too optimistic or too pessimistic?
- What if next year the economy is in a recession as in 2008?
- What if we have a pandemic as in 2020? Or if we lose a major client?

We must tailor an MS sheet and assemble assumptions to create each scenario.

Based on:

- Subramanyam, K. R. (2014). Financial statement analysis. McGraw-Hill Education. Chapter 9.
- Fridson, M. S., & Alvarez, F. (2022). Financial statement analysis: a practitioner's guide. John Wiley & Sons. Chapter 12.

Questions ❓

Check my website for an updated version of this presentation:

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Thanks 👏