

The background of the slide is a collage of various financial charts and graphs, including bar charts, line graphs, and area charts, all rendered in a blue and white color scheme. The charts are overlaid on a dark blue background with a grid pattern.

Forecasting Analysis

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How to forecast financial statements ?

1. Why do we need to forecast financial statements?
2. Step 1: Projected Income Statement
3. Step 2: Projected Balance Sheet
4. Sensitivity Analysis

1. Why do we need to forecast financial statements?

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

Managers use prospective analysis to:

- Evaluate the impact of different 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 properly 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 easily decline

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 goods sold* (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 is 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: kind of impossible
 - therefore, they use historical trend 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 not significantly change its PP&E structure
 - for now, let's keep this assumption to understand the mechanics of forecasting

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

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

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 well the tax system of the country, we can estimate the company's expected TDA and TDL, and then calculate the company's expected tax expenses
- however, in practice, most of the analyst 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 just 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:

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

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

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

The forecast:

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

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

- inventory turnover rates by product or category, specially important for diversified companies.
- launching of 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 plus 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 plus forecasted depreciation (step 1.5).

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

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

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

The forecast:

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

Step 2.9, identify the *current portion of long-term debt* from the footnotes of the financial statements.

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 on to match their revenues.

Step 2.11, estimate expected *tax payable*:

- what fraction of the tax expenses will be paid in the 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*:

Forecasted retained earnings = Prior year's retained earnings + Projected net income – Projected 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 financials statements will change.
- Our approach is a good starting point to
 - i. test the sheet and formula: there should not be drastic changes in the company's financial structure
 - ii. foresee how the company's financial structure will look if no significant changes happen in the future
 - a. valid for mature companies,
 - b. not so much for young or highly disruptive/distressed companies.

4.1 Univariate optimization

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

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

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

Let's jump to the example in MS Excel.

4.2 Multivariate optimization

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

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

Find the solution to the question: 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 to the question: 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 need to tailor our MS sheet and bunch assumptions together 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 🙌