

6. Financial Planning. Break-even. Operating and Financial Leverage.

Financial planning primarily involves anticipating the impact of operating, investment and financial decisions on the firm's future financial position. Short-term financial planning refers to the planning function as it applies to one-year period, and long-term financial planning usually refers to three, four, or even five years.

1.1 Budgeting

Budgeting is an important management technique. Budgets reflects plans that are considered likely to achieve organizational goals and objectives. During the actual period budgets serve also as a management control device.

The sales budget is prepared first. This will incorporate forecast about selling prices and expected sales volume for each item of product. The budgets for marketing, sales and distribution would also be made at early stage, because estimates of spending on sales promotion and advertising will be necessary to gauge the expected volume of sales.

Having prepared a sales budget, it should be possible to estimate production requirements; however, a decision must first be taken about stocks of finished goods. A decision to increase stocks would mean that production must exceed the sales volume. On the other hand, a decision to reduce stock levels (so as to improve the company's cash position) would mean that production volume would be less than forecasted sales volume by the amount of the run-down in stocks.

The production budget is followed by the budgets of resources for production, ie:

1. materials-purchasing budget,
2. labor budget,
3. production overhead budget.

In order to prepare the purchase budget, a decision must first be taken about stock levels. Purchase requirements are the usage requirements, plus any increase in raw material stock or less any decrease in stocks. The similar considerations would be given as to change in creditors.

1.2 Financial Forecasts

Short term financial planning requires the development of three **pro forma (projected) statements**:

1. A **pro forma income statement** is simply a forecast of the expected revenues, expenses, and profits over some planning period. It provides information about future **performance**.
2. A **cash flow budget** is a detailed estimated schedule of future cash inflows (receipts) and outflows (expenditures). The cash flow budget provides information about future **liquidity**. It enables managers to predict both the magnitude and timing of cash **deficits and surpluses** in the future. This information can be used to arrange for lines of credit to cover future deficits or to plan for the investment of future cash surpluses.
3. A **pro forma balance sheet** is a direct estimate of the expected ending values for all asset, liability, and equity accounts for a future planning period.

Income Statement

An income statement reports a firm's performance by measuring the profits (losses) generated over a period of time, typically a fiscal year.

Sections of income statement:

- (1) Gross profit = net sales - cost of goods sold
- (2) Net operating income (NOI) = gross profit - operating expenses
- (3) Net profits before taxes (taxable income) (NPBT) = net operating income (NOI) - interest payments + nonoperating income
- (4) Net income after taxes (NI) = taxable income - taxes
- (5) Retained earnings (RE) = net income (NI) - dividends

Cash Flow Statement

The cash flow statement determines the firm's cash inflows and cash outflows based on operational, financial and investment decision.

The Accounting Balance Sheet

A **balance sheet** is a summary of a firm's "financial position", its assets and the claims on those assets, at a particular time, typically the last day of the year. The names of the assets and their respective values are listed in increasing (Poland) or descending (USA, Canada) order of liquidity. The claims on assets are listed on the balance sheet roughly in order on decreasing (Poland) or increasing (USA, Canada) maturity.

Liquidity refers to the speed and ease with which an asset can be converted to cash. A highly liquid asset is the one that can be quickly sold without significant loss of value. An illiquid asset is one that cannot be quickly converted to cash without a substantial price reduction. Fixed assets are, for the most part, relatively illiquid. Liquidity is valuable. The more liquid a business is, the less likely is to experience financial distress (that is, difficulty in paying debts or buying needed assets).

The balance sheet is a snapshot of the firm. It is a convenient means of organizing a summarizing what a firm owns (its assets), what a firm owes (its liabilities), and the difference between these two (the firm's equity at a given time). The left hand-side lists the assets of the firm and the right-hand side lists the liabilities and equity.

Assets are defined as probable future economic benefits obtained or controlled by a particular entity as a result of past transactions or events. **Liabilities** are defined, similarly, as probable future sacrifices of economic benefits arising from present obligations of a particular entity to transfer assets or provide services to other entities in the future as a result of past transactions or events.

Assets are normally divided into two categories: current assets and noncurrent (long-term) assets.

Fixed assets are expected to provide benefits and services over periods longer than one year. Fixed assets can either be tangible, such as a truck or a computer or intangible, such as a trademark or patent. Accountants refer to these assets as capital assets.

Current assets are those resources that will be converted to cash within one year or within the firm's normal operating cycle. A current asset has a life of less than one year.

Stockholders' equity (net worth, BV - book value) indicates stockholders' wealth in book-value terms. This implies that actual wealth of the shareholders (i.e. in market value

terms) may be higher or lower than the stockholders' equity. This feature of the balance sheet is intended to reflect the fact that, if the firm were to sell all of its assets and use the money to pay off its debts, whatever residual value remained would belong to shareholders.

The use of debt in a firm's capital structure is called **financial leverage**.

Long-term liabilities, such as bonds and mortgages, are payable in more than one year. We use the term bond and bondholders to refer to long term debt and long-term creditors.

Current liabilities are obligations that must be paid within one year or within the firm's normal operating cycle.

Net current assets (net working capital) refers to the difference between current assets and current liabilities. Net working capital is positive when current assets exceed current liabilities.

The Economic Balance Sheet

When we consider the market values of the assets and claims, rather than their accounting values, the result is a market-value balance sheet, also called an economic balance sheet.

<i>Economic balance sheet</i>			
Exchange Value of Assets:	A	Market Value of Debt:	D
Wealth created:	W	Market Value of Equity:	E

(6) Wealth created (W) = value in use - value in exchange

In a **claims definition** of firm value, the **market value of a firm**, V is the market value of the claims against the assets.

(7) $V = D + E$

where D and E are the **market values** of the claims against assets.

The wealth created by the firm is reflected in the market value of the equity. The markets, when placing a value on equity, seek to develop an estimate of the wealth-creating potential of a firm. It looks not at accounting profits but at cash flow, which is the actual funds the firm has available for productive uses. **The cash flow that the firm is expected to produce in the future determines the wealth created available to the firm's owners.** The value of the firm's stock is determined by how managerial decisions affect the magnitude, timing, and the risk of the firm's cash flow.

(8) $V = A + W$

where A the market value of the firm's productive assets and W is the wealth created by the firm.

The actual cash flow to the firm can be approximated as

(9) Cash flow = net income + depreciation

The net cash flow is greater than the net income because depreciation acts as a tax shield, which reduces taxable income and thus taxes.

Statement of Retained Earnings

The statement of retained earnings shows the addition to the book value of the shareholders' equity.

1.3 Financial Ratio Analysis

Two types of analyses can be done:

- an interfirm (industry) analysis
- an intrafirm (trend) analysis

1.3.1 Short-Term Solvency Ratios

Current Ratio

$$(10) \quad \text{Current ratio} = \frac{\text{current assets}}{\text{current liabilities}}$$

Quick (Acid Test) Ratio

$$(11) \quad \text{Quick ratio} = \frac{\text{current assets} - \text{inventories} - \text{prepaid expenses}}{\text{current liabilities}}$$

1.3.2 Long-Term Solvency Ratios

Debt Utilization Ratio

$$(12) \quad \text{Debt-equity ratio} = \frac{\text{current liabilities} + \text{long-term liabilities}}{\text{stockholders' equity}}$$

Coverage Ratio

$$(13) \quad \text{Times interest earned} = \frac{\text{net profits before taxes} + \text{interest expenses}}{\text{interest expenses}}$$

1.3.3 Asset Utilization Ratios

Accounts Receivable

$$(14) \quad \text{Average collection period} = \frac{\text{accounts receivable}}{\text{net sales per day}}$$

Inventory Turnover Ratio

$$(15) \quad \text{Inventory turnover} = \frac{\text{cost of good sold}}{\text{inventories}}$$

Fixed Assets

$$(16) \quad \text{Fixed-asset turnover ratio} = \frac{\text{net sales}}{\text{net fixed assets}}$$

1.3.4 Profitability Ratios

Operating Profit Margin

$$(17) \quad \text{Operating profit margin} = \frac{\text{net operating income}}{\text{net sales}}$$

Net Profit Margin

$$(18) \quad \text{Net profit margin} = \frac{\text{net income}}{\text{net sales}}$$

Book Return on Assets

$$(19) \quad \text{ROA} = \frac{\text{net operating income} (1 - T)}{\text{total assets}}$$

Book Return on Equity

$$(20) \quad \text{ROE} = \frac{\text{net income}}{\text{stockholders' equity}}$$

1.4 Restructuring Techniques

1.4.1 Cost Accounting

Some of the most common bases of absorption are shown below:

- (a) direct material cost percentage rate
- (b) direct labour cost percentage rate
- (c) prime cost percentage rate
- (d) unit of output rate
- (e) direct labour hour rate
- (f) machine hour rate

1.4.2 Break-even Analysis and Contribution Margin

The break-even point or break-even quantity is that level of sales at which total revenues are exactly equal to total operating costs.

Operating costs are divided into three categories: fixed, variable and semifixed or semivariable.

Fixed operating costs - such as depreciation and insurance do not vary with level of production. Fixed operating costs are those costs that do not depend on the number of units produced within a given range of production (given plant capacity).

Variable operating costs are those expenses that vary directly with the level of production and sales.

The **break-even point** is given by:

$$(21) \quad Q^* = \frac{F}{P-V}$$

where

- Q* is the break-even quantity,
- F is fixed costs
- P is price
- V is variable costs

P-V in the denominator, called the contribution margin per unit, denotes the dollar amount that each unit sold „contributes” to meeting the fixed costs.

The mix of fixed and variable costs depends on the firm's choice of technology. It is clear, that a firm that has high fixed costs should generate more revenues in order to break-even. Therefore, more capital-intensive companies must produce and sell more just to survive.

1.4.3 Leverage

Operating Leverage

Operating leverage is the extent to which a firm's fixed production costs contribute to its total operating costs at different levels of sales. In a firm that has operating leverage, a given change in sales results in a larger change in the net operating income.

The **degree of operating leverage** (DOL) measures the percentage change in NOI for a given percentage change in sales:

$$(22) \quad \text{DOL} = \frac{\text{percentage change in NOI}}{\text{percentage change in sales}}$$

This can be written as

$$(23) \quad \text{DOL} = \frac{Q(P - V)}{Q(P - V) - F}$$

DOL measures the sensitivity of NOI to changes in the firm's revenues.

Financial Leverage

Financial leverage measures the sensitivity of the firm's net income (NI) to changes in its net operating income (NOI). In contrast to operating leverage, which is determined by the firm's choice of technology (fixed and variable costs), financial leverage is determined by the firm's financing choices (the mix of debt and equity).

The degree of financial leverage (DFL) measures the percentage change in net income for a given percentage change in NOI:

$$(24) \quad \text{DFL} = \frac{\text{percentage change in NI}}{\text{percentage change in NOI}}$$

This can be written as

$$(25) \quad \text{DFL} = \frac{Q(P - V) - F}{Q(P - V) - F - I}$$

where I is the interest expenses.

Combined Leverage

Combined leverage measures the overall sensitivity of the firm's net income (NI) to a change in sales. The **degree of combined leverage** (DCL) measures the percentage change in net income for a given percentage change in sales:

$$(26) \quad \text{DCL} = \frac{\text{percentage change in NI}}{\text{percentage change in sales}}$$

This can be written as

$$(27) \quad \text{DCL} = \frac{Q(P - V)}{Q(P - V) - F - I}$$

Relationship between Book ROA and Book ROE

The return on assets (ROA) measures the accounting performance of the investment without regard to the manner in which the asset is financed. The return on equity (ROE) measures the net effects of both the investment and financing decisions.

$$(28) \quad \text{Book ROA} = \frac{\text{NOI}(1-T)}{A}$$

$$(29) \quad \text{Book ROE} = \frac{\text{NI}}{E}$$

where

A is total assets

E is stockholders' equity

The relationship between ROA and ROE is shown in equation:

$$(30) \quad \text{ROE} = \text{ROA} + \frac{D}{E} (\text{ROA} - i_{\text{at}})$$

where $i_{\text{at}} = (I/D)(1-T)$

Changes in ROA and ROE are related to DOL and DFL.

$$(31) \quad \% \Delta \text{ROA} = \text{DOL} * \% \Delta S$$

$$(32) \quad \% \Delta \text{ROE} = \text{DFL} * \% \Delta \text{ROA}$$

$$(33) \quad \% \Delta \text{ROE} = \text{DCL} * \% \Delta S$$

Break-even, Leverage and Cash Flows

The cash flow break even point is calculated as:

$$(34) \quad \text{BE}(\text{CF}) = \frac{F' - \text{Adj}}{P - V}$$

where

F' cash fixed costs are fixed costs minus depreciation

$F' = F - D$

Adj is adjustment factor to convert accounting based (profits) analysis to cash flow based analysis $\text{Adj} = \text{TD}/(1-T)$

The **degree of operating cash flow leverage**, $\text{DOL}(\text{CF})$, is the sensitivity of operating cash flows (OCF) to changes in sales. It can be calculated as:

$$(35) \quad \text{DOL}(\text{CF}) = \frac{Q(P - V)}{Q(P - V) - F' + \text{Adj}}$$

The **degree of financial cash flow leverage**, $\text{DFL}(\text{CF})$ measures the sensitivity of net cash flows (NCF) to changes in operating cash flows (OCF). It can be calculated using the following equation:

$$(36) \quad \text{DFL}(\text{CF}) = \frac{Q(P - V) - F' + \text{Adj}}{Q(P - V) - F' - I + \text{Adj}}$$

The **degree of combined cash flow leverage**, $\text{DCL}(\text{CF})$, measures the sensitivity of net cash flows to changes in sales and is calculated as

$$(37) \quad \text{DCL}(\text{CF}) = \frac{Q(P - V)}{Q(P - V) - F' - I + \text{Adj}}$$