**CHAPTER SIX**

**6. LONG- TERM FINANCING**

**6.1. LEVERAGES**

Leverage is the use of fixed costs in an attempt to increase (or lever up) profitability.

**6.1.1. Types of Leverage**

Leverage can be classified into three major headings according to the nature of the finance mix of the company.

1. Operating leverage
2. Financial leverage
3. Combined leverage

**6.1.2. Operating leverage**

Operating leverage may be defined as the company’s ability to use fixed operating costs to magnify the effects of changes in sales on its earnings before interest and taxes. Operating leverage consists of two important costs viz., fixed cost and variable cost.

* **Operating leverage can be determined with the help of a break even analysis.**

Breakeven analysis is one means to study the relationship between total operating costs. The intersection of the total costs line with the total revenues line determines the break-even point. The break-even point is the sales volume required for total revenues to equal total operating costs or for operating profit to equal zero.

**EBIT = P (Q) − V (Q) − FC = Q (P − V) − FC**

**Where**

**EBIT** = earnings before interest and taxes

**P** = price per unit

**V** = variable costs per unit

**(P − V)** = unit contribution margin

**Q** = quantity (units) produced and sold

**FC** = fixed costs

**At the break-even point (QBE), EBIT is zero. Therefore**,

0 = QBE (P − V) − FC

**Rearranging the above equation the break-even point is**

QBE = FC/ (P − V)

***Example:*** *consider a firm that produces a high-quality child’s bicycle helmet that sells for $50 a unit. The company has annual fixed operating costs of $100,000, and variable operating costs are $25 a unit regardless of the volume sold.* **Based on the information given determine break-even point.**

**Given:**

P=$50 per unit

VC=$25 per unit

FC= $100, 0000

**Solution**

QBE = FC/ (P − V) therefore,

QBE = $100,000/ ($50 − $25) = 4,000 units

* **Recognizing that at the break-even (sales) point the firm is just able to cover its fixed and variable operating costs.**

***S*BE** = *FC* + *VC*BE,

Where **SBE** = break-even sales revenues

**FC** = fixed costs

**VCBE** = total variable costs at the break-even point

SBE=100,000+25\*4000=200,000

Or SBE=P\*Q**BE** therefore

SBE=50\*4000=200,000

The following figure shows break Break-even chart with the break-even point expressed in units and sales dollars.



**6.1.2.1. Degree of Operating Leverage (DOL)**

A quantitative measure of this sensitivity of a firm’s operating profit to a change in the firm’s sales is called the degree of operating leverage (DOL).

Degree of operating leverage (DOL) at Q units of output (or sales) =%change in EBIT

 %change in sales

It is often difficult to work directly with the above Equation to solve for the DOL at a particular level of sales. There is a simple alternative formula to calculate DOL.

**DOL at a given level of units= Q (P-V) = Q**

 **Q (P-V)-FC (Q-QBE)**

* *Turn back to the previous example and suppose that we wish to determine the degree of operating leverage at 5,000 units of output and sales for our hypothetical example firm.*

Degree of operating leverage (DOL) =5000 =5

 5000-4000

**Interpretation:**

* When sales increase by 1% earnings before interest and tax will increase by 5%.
* When sales increase by 5%percent earnings before interest and tax will increase by 50%.
* One interesting potential effect caused by the presence of fixed operating costs (operating leverage) is that a change in the volume of sales results in a *more than proportional* change in operating profit (or loss).

**6.1.2. Financial Leverage**

Financial leverage involves the use of fixed cost financing. Interestingly, financial leverage is acquired by choice.

* Financial leverage is always a choice item.
* No firm is required (must) to have any long-term debt or preferred stock financing. Firms can, finance operations and capital expenditures from internal sources and the issuance of common stock. Nevertheless, it is a rare firm that has no financial leverage.
* Financial leverage is employed in the hope of increasing the return to common shareholders.
* Favorable may be favorable or unfavorable.

6.2.1.1. **Degree of Financial Leverage (DFL)**

A quantitative measure of the sensitivity of a firm’s earnings per share to a change in the firm’s operating profit is called the **degree of financial leverage (DFL)**. The degree of financial leverage at a particular level of operating profit is simply the percentage change in earnings per share over the percentage change in operating profit that causes the change in earnings per share. Thus, Degree of financial leverage (DFL) at EBIT of X dollars=%change in EPS

 %change in EBITT

* ***Earnings per share can be calculated by using the following formula***



**Where:**

**I** = annual interest paid

**PD** = annual preferred dividend paid

**t** = corporate tax rate

**NS** = number of shares of common stock outstanding

**Whereas the above formula is useful for *defining DFL*, a simple alternative formula to calculate *Degree of financial leverages (DFL)* values:**

**DFLEBIT X dollars=EBIT**

 **EBIT-I-[PD/ (1-t)]**

**Where**

**EBIT:** Earnings before interest and taxes

**I**: interest

**PD**: preferred stock dividend

**T**: Tax

* ***Note that interest on debt is deducted before taxes, whereas preferred stock dividends are deducted after taxes.***

Example: suppose that XYZ Tire Company with long-term financing of $10 million, consisting entirely of common stock equity, wishes to raise another $5 million for expansion through one of three possible financing plans. The company may gain additional financing with a new issue of (1) all common stock, (2) all debt at 12 percent interest, or (3) all preferred stock with an 11 percent dividend. Present annual earnings before interest and taxes (EBIT) are $1.5 million but with expansion are expected to rise to $2.7 million. The income tax rate is 40 percent, and 200,000 shares of common stock are now outstanding. Common stock can be sold at $50 per share under the first financing option, which translates into 100,000 additional shares of stock. Based on the information given ***determine degree of financial leverage.***

**Solution:**



* ***For our example firm, using the debt-financing alternative at $2.7 million in EBIT, we have***

DFL **EBIT** of$2.7 million=$2,700,000 = 1.29

 $2,700,000-$600,000

**Interpretation:** When earnings before interest and tax increase by 1% earnings per share will increase by 1.29%.

* For the preferred stock financing alternative, the degree of financial leverage

DFL **EBIT** of$2.7 million==$2,700,000 =1.51

 2,700,000-[550,000/ (0.6)]

**Interpretation:** When earnings before interest and tax increase by 1% earnings per share will increase by 1.51%.

**6.1.3. Total leverage**

Total (or combined) leverage the use of both fixed operating and financing costs by the firm. When financial leverage is combined with operating leverage, the result is referred to as **total** (or **combined**) **leverage**. Degree of total leverage (DTL) The percentage change in a firm’s earnings per share (EPS) resulting from a 1 percent change in output (sales). This is also equal to a firm’s degree of operating leverage (DOL) times its degree of financial leverage (DFL) at a particular level of output (sales).

6.1.3.1. **Degree of Total Leverage (DTL)**

The degree of total leverage of a firm at a particular level of output (or sales) is equal to the percentage change in earnings per share over the percentage change in output (or sales) that causes the change in earnings per share. Thus,



Computationally, we can make use of the fact that the degree of total leverage is simply the product of the degree of operating leverage and the degree of financial leverage as follows:

**DTL Q units (or S dollars**=DOL**Q** units (or S dollars\*DFL **EBIT** of X dollars in addition, multiplying alternative DOLs, Equations by DFL, Equation gives us;

**DTLQ unites** =Q (P-V)

 Q (P-V)-FC-I-[PD/ (1-t)]

DTL**S dollar of sales=**EBIT+FC

 EBIT- I-[PD/ (1-t)]

**Example:** Suppose that our bicycle-helmet manufacturing firm used to illustrate operating leverage has $200,000 in debt at 8 percent interest. Recall that the selling price is $50 a unit, variable operating costs are $25 a unit, and annual fixed operating costs are $100,000. Assume that the tax rate is 40 percent, and that we wish to determine the degree of total leverage at 8,000 units of production and sales. Therefore, using equation:

 Q (P-V)

 Q (P-V)-FC-I-[PD/ (1-t)

DTL **8000units=** 8000($50-$25=2.38

 8000($50-$25)-$100,000-16,000

**Interpretation:** For every 1 percent change in sales, its EPS would change by 2.38 percent.

**6.2. Sources of long term finance**

As you are aware finance is the life blood of business. Funds required for a business may be classified as long term and short term. Long term finance is required for purchasing fixed assets like land and building, machinery etc. The amount of long term capital depends upon the scale of business and nature of business.

**6.2.1. Long Term Finance: Its meaning and purpose**

A business requires funds to purchase fixed assets like land and building, plant and machinery, furniture etc. These assets may be regarded as the foundation of a business. The capital required for these assets is called fixed capital. A part of the working capital is also of a permanent nature and funds required for this part of the working capital and for fixed capital are called long term finance.

**6.2.1. 1. Purpose of long term finance**Long term finance is required for the following purposes:

* To Finance fixed assets
* To finance the permanent part of working capital
* To finance growth and expansion of business

**6.2.2. Factors determining long-term financial requirements**
the amount required to meet the long term capital needs of a company depend upon many factors. These are:

* Nature of Business
* Nature of goods produced
* Technology used

**6.2.3. Sources of long term finance**
the main sources of long term finance are as follows:
**1. Shares:** These are issued to the general public. These may be of two types: (i) Equity and (ii) Preference. The holders of shares are the owners of the business.
**2. Debentures:** These are also issued to the general public. The holders of debentures are the creditors of the company.

**3. Public Deposits:** General public also like to deposit their savings with a popular and well established company which can pay interest periodically and pay-back the deposit when due.
**4. Retained earnings:** The Company may not distribute the whole of its profits among its shareholders. It may retain a part of the profits and utilize it as capital.
**5. Term loans from banks:** Many industrial development banks, cooperative banks and commercial banks grant medium term loans for a period of three to five years.
6. Loan from financial institutions: There are many specialized financial institutions established by the Central and State governments which give long term loans at reasonable rate of interest.

**Thank you very much!**

**I wish good luck for all 2nd year management students!**