UNIT–5: BUSINESS ARITHMETIC

"Take risks in your life. If you win, you can lead. If you lose, you can guide."

- Swami Vivekanand

Learning objectives:

The learner will be able to:

- Understand the concept of unit price
- Calculate Break even point for Multiple products
- Understand the meaning of inventory control and Economic Order Quantity
- Enumerate the meaning of cash flow projection
- Explain the concept of working capital
- Understand the terminologies- financial management and budgets
- Calculate Return on Investment
- Explain the concept of Return on Equity

Content

- **Unit of sale, Unit cost, Unit price for multiple products**
- **Break even analysis for multiple products or services**
- **Importance and use of cash flow projections**
- **Budgeting and managing of finances**
- **Computation of working capital**
- **Inventory control and EOQ**
- **Return on Investment (ROI) and Return on equity (ROE)**

Unit of sale, unit price and unit cost (multiple products or services)

Unit of sale, we learnt last year, is required to understand the economics of the business in an easy and standardized manner and for tracking progress, comparing past with the future and to be able to take corrective action. In short, it is a management tool.

We also learnt that when the shop or a business sells only one item – say milk (in packets) or mangoes or oranges, it is easy to determine the unit of sale and use it in variety of ways for proper management action. The unit of sale in these examples could be "quantity – for example, one or a dozen" or "weight – say kilograms" and the entrepreneur will use it for pricing, determining the cost per unit, gross profit per unit, establishing the sales trend, fixing sales target etc.

Real world is not so simple. While some businesses may deal in only one item, the majority of them deal in many or large number of items. Let us review some examples.

A grocery shop has hundreds of items on its shelves and if it is a super market, it has thousands of items. A restaurant will have the menu card that runs to a few pages and each page may have 10 to 20 items. Thus, has a few hundred of items. A beauty parlor offers many treatments for the customers.

In spite of such large number of items, the business person needs some quick and easy way of checking the progress of the business or plan corrective actions. How does one do it?

Defining the unit of sale, unit price and unit cost & resultant gross profit in a meaningful way is the answer. Let us see how!

In the examples used above, we all know that a customer does not buy all the items from the grocer at a given time, nor does he/she order all the items on the menu when visiting a restaurant. A customer coming to the beauty parlor does not avail of all the offered services. Neither do all customers buy or order or avail of same items or services. If this be the case, and it is, how does the business owner figure out what is going on in his/her business?

This is when "averages" come in to play and help the business owner.

Let us take the example of a grocery store. Observe the process, as it will be applicable to many similar situations. Each customer coming in to buy things will have different requirements. This, then results in the "billed amount" (or invoiced amount) being different for different people. For example, at the end of the day, the shop keeper found out the following.

Number of customers	Per customer billed amount (₹)	Total billed amount (₹)
5	500	2,500
10	700	7,000
15	1,000	15,000
10	1,450	14,500
25	2,000	50,000
5	2,500	12,500
10	3,100	31,000
15	3,500	52,500
5	5,000	25,000
Total	***Weighted Average***	***Total***
100	2,100	2,10,000

In other words, 100 customers bought items worth ₹ 2,10,000/- , thus giving an average of ₹ 2,100/- per customer. You would notice that no one bought items worth "exactly" ₹ 2,100. However, the collective purchase by all of them yielded this average we arrived at. It is conceivable that on another day the average could be different. In a month, the average (derived on a daily basis) at the beginning of the month could be higher than towards the end. If the average is arrived for all the customers in a month then that could give a more realistic picture as the sample (total customers) would be larger.

In this particular case, "Customer" is the "unit of sale" and the average purchase made by one customer (not the actual bill but total billed amount divided by total number of customers) is the "Unit Price". Taking the same example, the Unit Price per Customer (or per Unit of Sale) would be ₹ 2,100/-.

In the case of a restaurant, the "unit of sale" would be a "Diner". This is different from the person who pays the bill. A group my consist of 10 people or 5 or 2. At times it may even be one. In each case, the number of persons paying the bill would most likely be one. So it is more accurate to go by the number of "Diners". The "Diner" is the "Unit of Sale" and the average amount billed per "Diner" would be the "Unit Price". In the case of a restaurant that provides only Buffet Lunch or Dinner, life is simple. It is like a single product business.

You can now visualize how a beauty parlor or saloon can also use the same concept. The "Customer" is the "Unit of Sale" and average billing per customer is "Unit Price".

So we have understood Unit of Sale and Unit Price in multi product environment. What about Unit Cost.

As you would recollect from your earlier study, unit cost refers to variable cost (also referred to as cost of goods sold). How do we calculate the unit cost in the case of multi product or service situations? If we understood the way we calculated the unit price, it should give us a clue. Let us take the grocery store again.

Grocery store is a Trading Business. One buys and sells. So, the cost at which the items are purchased is known (just as its MRP at which you are selling). Therefore, at the end of the day, it is possible to know the purchase price of all the items and quantities that were sold. Let us suppose that it works out to ₹ 1,70,000/-. There were 100 units of Sale. So the unit cost is ₹ 1,700/-.

In some cases, there could be another way. For every item, if the purchase price is 80% of selling price, then in that particular case, the Unit Cost would be ₹ 1,680/- (= 80% of ₹ 2,100/-).

Gross Profit would then be ₹ 400/- per unit of sale (₹ 2,100 - ₹ 1,700) in the first case and ₹ 420/- per Unit of sale (₹ 2,100- ₹ 1,680) in the second case. This will depend on the industry specifics.

Many industries have their unique thumb rules for the relationship between Unit Price and Unit Cost. In Fast Moving Consumer Goods Industry it could be 80 or 85% (cost as percentage age of selling price). In food industry, it could be 30 to 35% (COG as percentage age of selling price). Electronic items may have a different thumb rule. Where none exists, you may be able to develop your own. However, the more accurate way is to actually compute the costs as explained.

An exercise

A stationery store sold in one day the following items at the prices indicated.

Products	Price per unit (₹)	Quantity sold
Student note book	40	35
Reynolds pens	40	40
Erasers	5	5

Scale (12" plastic)	15	10
Flip chart	10	5
Sketch pens (one DOZEN)	25	3

The shopkeeper also found out, based on the number of bills issued by him, that there were 50 customers. If customer is the unit of sale, what is the "Unit Price" in this case? If the cost of each stationery item is 75% of its selling price, calculate the "Unit Cost" and the "Gross Margin" per unit of sale.

Exercises for practice

Illustration 1: Beauty parlor

A Beauty parlor had varying number of customers during 5 weeks. This information and the total weekly billing are in the following table. What are the "Unit of sale" and the "Unit Price" in this case? If the cost of goods sold or variable cost is 60% of the sale price, calculate the "Unit Cost" and the "Gross Margin" per Unit of Sale.

Week #	No. of customers	Total amount billed (₹)	Average amount billed (₹) per customer
Week 1	10	1,000	100
Week 2	17	1,445	85
Week 3	13	923	71
Week 4	22	5,082	231
Week 5	18	3,150	175
Total	**80**	**11,600**	

Illustration 2: Restaurant

Number of people who took their meals and the total billing for each of the 5 weeks is in the following table. What are the "Unit of sale" and the "Unit Price" in this case? If the variable cost is 50% of the sale price, calculate the "Unit Cost" and the "Gross Margin" per Unit of Sale.

Weeks	No. of people taking meals	Total amount billed (₹)	Average amount billed (₹)
Week 1	120	18,000	150
Week 2	60	12,300	205
Week 3	70	10,220	146
Week 4	80	17,680	221
Week 5	90	21,600	240
Total	**420**	**79,800**	

Some formulas:

1. Unit Price per customer = $\frac{\text{Total Billed Amount}}{\text{Number of Customers}}$

2. Unit Cost perproduct = $\frac{\text{Total Sale}}{\text{Number of Unit Sold}}$

3. Gross Profit = Selling price per unit-cost price per unit

Break even analysis

(Multiple products or services)

We have understood the meaning and importance of & method of determining breakeven Point in our earlier lesson (Std XI). That related to single product or service business.

Just to recap, breakeven point is the level of sales (or revenue generated) that equals all the expenses required for generating that revenue. It is not more than the expenses (i.e. no profit) nor is it less than the expenses (i.e. no loss). In other words there is neither loss nor profit.

At the breakeven level

Total revenue = Total expenses

(Qty x Unit Price) = (Qty x Unit Cost) + Fixed Exp

Qty x (Unit Price – Unit Cost) = Fixed Exp

Qty x Gross Margin (*or Profit*) per Unit = Fixed Exp

B.E. Qty for a single product =

Fixed expenses

Selling price per unit – variable cost per unit

B.E. quantity for multiple products

Fixed expenses

Weighted average selling price per unit – Weighted Average variable cost per unit

Please note: Gross margin and gross profit are one and the same.

Usefulness of break–even analysis continues to be the same whether you are operating a single product or multiple product business. It helps in setting profit goal and sales target. In a manufacturing environment, it helps in determining the products that are not contributing to meet the fixed expenses and thus brings up the item for discussion in management meetings about its continuity.

Sales mix break-even point calculation

Sales mix is the proportion in which two or more products are sold. For the calculation of break-even point for sales mix, **following assumptions** are made:

1. The proportion of sales mix must be predetermined.
2. The sales mix must not change within the relevant time period.

3. All cost can be categorized as variable or fixed.
4. Sales price per unit, variable cost per unit and total fixed cost are constant.
5. All units produced are sold.

The calculation method for the break-even point of sales mix is based on the contribution approach method. Since we have multiple products in sales mix therefore it is most likely that we will be dealing with products with different contribution margin per unit and contribution margin ratios. This problem is overcome by calculating weighted average contribution margin per unit and contribution margin ratio. These are then used to calculate the break-even point for sales mix.

The calculation procedure and the formulas are discussed via following example:

Example: Formulas and calculation procedure

Following information is related to sales mix of product A, B and C.

Product	A	B	C
Sales price per unit	₹15/–	₹21/–	₹36/–
Variable cost per unit	₹9/–	₹14/–	₹19/–
Sales mix percentage	20%	20%	60%
Total fixed cost	₹40,000/–		

Calculate the break-even point in units and in rupees.

Calculation:

Step 1: Calculate the contribution margin per unit for each product:

Product	A	B	C
Sales price per unit	₹15/–	₹21/–	₹36/–
– Variable cost per unit	₹9/–	₹14/–	₹19/–
Contribution margin per unit	₹6/–	₹7/–	₹17/–

Step 2: Calculate the weighted-average contribution margin per unit for the sales mix using the following formula:

Product A CM (contribution mix) per Unit × Product a sales mix percentage
+ Product B CM per unit × Product B sales mix percentage
+ Product C CM per unit × Product C sales mix percentage
= Weighted average unit contribution margin

Product	A	B	C
Sales price per unit	₹15/–	₹21/–	₹36/–
− Variable cost per unit	₹9/–	₹14/–	₹19/–
Contribution margin per unit	₹6/–	₹7/–	₹17/–
× Sales mix percentage	20%	20%	60%
	₹1.2/–	₹1.4/–	₹10.2/–
Sum: Weighted average CM per unit	₹12.80/–		

Step 3: Calculate total units of sales mix required to break-even using the formula:

Break-even point in units of sales mix = Total fixed cost ÷ Weighted average CM per unit

Total fixed cost	₹40,000/–
÷ Weighted average CM per unit	₹12.80/–
Break-even point in units of sales mix	₹3,125/–

Step 4: Calculate number units of product A, B and C at break-even point:

Product	A	B	C
Sales mix ratio	20%	20%	60%
× Total break-even units	3,125	3,125	3,125
Product units at break-even point	625	625	1,875

Step 5: Calculate break-even point in rupees as follows:

Product	A	B	C
Product units at break-even point	625	625	1,875
× Price per unit	₹15/–	₹21/–	₹36/–
Product sales in rupees	₹9,375/–	₹13,125/–	₹67,500/–
Sum: Break-even point in rupees	₹90,000/–		

BE analysis helps in such decision making. Please note that such decisions are product related and not business related. So it is clear from the above calculations as to how we can calculate weighted average sales price per unit and weighted average variable cost so that we can arrive at breakeven point.

Below is another sum for more clarification:

Multiple-product break even analysis

Toy craft produces toy alligators and toy dolphins. Fixed costs are ₹12,90,000 per year. Sales revenue and variable costs per unit are as follow:

	Alligators	Dolphins
Sales Price	₹20/–	₹25/–
Variable Costs	₹8/–	₹10/–

Questions:

A. Suppose the company currently sells 140,000 alligators per year and 60,000 dolphins per year (Sales Mix Percentage 14:6). Assuming the sales mix stays constant how many alligators and Dolphins must the company sell to break even?

B. Suppose the company currently sells 60,000 alligators per year and 140,000 dolphins per year (Sales mix percentage 6:14). Assuming the sales mix stays constant, how many alligators and dolphins must the company sell to break even per year?

C. Explain why the total number of toys needed to break even in (a) is the same as or different from the number in (b).

Solution:

A.

Units	140000	60000	200000
Sales price per unit	₹20/–	₹25/–	
Variable Cost per unit	₹8/–	₹10/–	
	Alligators	**Dolphins**	**TOTAL**
Sales(A)	₹28,00,000/–	₹15,00,000/–	₹43,00,000/–
Variable cost(B)	₹11,20,000/–	₹6,00,000/–	₹17,20,000/–
Contribution Margin (A-B)	₹16,80,000/–	₹9,00,000/–	₹25,80,000/–
Less :Fixed cost			₹12,90,000/–
Net income			₹12,90,000/–

Weighted Average Contribution margin: Total Contribution/Total units

= ₹2580000/200000

= ₹12.90/–

Breakeven Point = Fixed Cost/Weighted Average Contribution

= ₹1,290,000/₹12.90

= 100000 units

Allocating TOTAL UNITS to each product based on EXPECTED UNITS PROPORTION= 14:6

Alligators to be produced for Breakeven $= 100000 \times \frac{14}{20}$

= 70000 units

Dolphins to be produced for Breakeven $= 100000 \times \frac{6}{20}$

= 30000 units

So, Toy Crafts has to produce 70000 toy alligators and 30000 toy dolphins for breakeven.

B.

Units	60000	140000	200000
Sales price per unit	₹20/–	₹25/–	
Variable Cost per unit	₹8/–	₹10/–	
	Alligators	**Dolphins**	**TOTAL**
Sales(A)	₹12,00,000/–	₹35,00,000/–	₹47,00,000/–
Variable cost(B)	₹4,80,000/–	₹14,00,000/–	₹18,80,000/–
Contribution Margin(A-B)	₹7,20,000/–	₹21,00,000/–	₹28,20,000/–
Less :Fixed cost			₹12,90,000/–
Net income			**₹15,30,000**/–

Weighted Average Contribution margin: Total Contribution/Total units

= ₹2820000/200000

= ₹14.10/–

Breakeven Point = Fixed Cost/Weighted Average Contribution

= ₹1,290,000/₹14.10

= 91489 units

Allocating TOTAL UNITS to each product based on EXPECTED UNITS PROPORTION = 6:14

Alligators to be produced for Breakeven $= 91489 \times \frac{6}{20}$

= 27446 units

Dolphins to be produced for Breakeven $= 91489 \times \frac{14}{20}$

$= 64042$ units

So, Toy Crafts has to produce 27446 toy alligators and 64042 toy dolphins for breakeven.

C. The total number of toys needed to break even in (a) is different from the number in (b) and lower also. This is due to the reason as weighted contribution per unit has increased; fixed cost spreads over greater number of rupees letting the breakeven to be achieved early. Perhaps (b) sales mix is more efficient and gives the firm a hint to produce toy dolphins more as contribution per unit of a toy dolphin is also higher.

Table 1:

Total Revenue = Total Expenses

(Qty x Unit Price) = (Qty x Unit Cost) + Fixed Exp

Qty x (Unit Price- Unit Cost) = Fixed Exp

Qty x Gross Margin (*or Profit*) per Unit = Fixed Exp

$$\text{B.E. Qty} = \frac{Fixed Expenses}{Gross\ Margin\ Per\ Unit}$$

Table 1.1:

Here are some more examples for practice

Let us look at a manufacturing plant that produces four different types of machine tools and their cost, price and BE Qty. The fixed costs are allocated – taking in to consideration the utilization of common resources for different products.

Here is the basic data:

Products: A, B, C and D

Selling Price: ₹100,000; ₹50,000; ₹70,000 and ₹200,000 respectively

Variable Cost: ₹30,000; ₹25,000; ₹30,000 and ₹100,000 respectively

Allocated Fixed Expenses per month: ₹350,000; ₹250,000; ₹1,000,000 and ₹1,500,000 respectively

Computation of Break Even Level would show the following.

	A	B	C	D
Unit Selling Price	₹100,000	₹50,000	₹70,000	₹200,000
Unit Variable Cost	₹30,000	₹25,000	₹30,000	₹100,000
Gross Profit per Unit	₹70,000	₹25,000	₹40,000	₹100,000
Fixed Exp Per Month	₹350,000	₹250,000	₹1,000,000	₹1,500,000
BE Qty per Month	**5**	**10**	**25**	**15**

Each product has it's BE level. If a particular product consistently fails to move beyond the BE level, then it is a candidate for some management discussion – how to increase sales or reduce costs (variable as well as fixed) etc. If all else fails, then dropping the product is the preferred management action.

BE analysis helps in such decision making. Please note that such decisions are product related and not business related.

Exercise for practice

Illustration 1: Textile shop - please calculate breakeven point.

Garments sold are silk saris, cotton saris, suit materials, kids wear.

Selling prices (in ₹) are:

Silk saris: ₹3,500/sari

Cotton saris: ₹900/sari

Suit materials: ₹1,800/suit

Kids wear: ₹450/wear

Variable cost:

Silk saris: 1,050 pieces

Cotton saris: 270 pieces

Suit materials: 540 pieces

Kids wear: 135 pieces

Allocated fixed expenses:

Silk saris: ₹2, 45,000/-

Cotton saris: ₹15, 7500/-

Suit material: ₹63,000/-

Kids wear: ₹70,875/-

Importance and use of cash flow projections

Cash (or money, which means both currency and checks) is the lifeblood of every business. It is the most important asset for the operations of a business. **Cash Flow** refers to the **movement of money** in and out of a business during a specific period of time. It is a record of a company's inflows and outflows. **Cash inflow** is defined as the movement of money into a business and cash outflow is defined as the movement of money out of a business. As you have seen in earlier lessons, there are various ways in which money comes in to and goes out of business.

Cash Flow Projection shows how cash is **expected to flow in and out of your business**. For you, it's an important tool for cash management, letting you know when your outflows are too high or when you might want to arrange short term investment to deal with a cash surplus. As part of your business plan, a Cash Flow Projection will give you a much better idea of how much capital investment your business idea needs.

Please do not confuse a **Cash Flow Projection** with a **Cash Flow Statement**. The Cash Flow Statement shows how cash has flowed in and out of your business. In other words, it describes the cash flow that has **occurred in the past**. The Cash Flow Projection shows the cash that is **anticipated to be generated or expended** over a chosen period of time in the future.

Cash Flow Statement, like Balance Sheet and Income Statement, deals with the past. It does not help in managing the current, day to day requirement. Cash Flow Projection, on the other hand, is a very critical management tool for the successful operation of the business.

Why cash flow projection?

Every business must want to manage its affairs in a very efficient manner. Which means it must pay its suppliers as per agreed terms, pay the employees their wages on stipulated dates, pay government levies etc as per rules, procure services and pay for the same, pay utility bills & rent etc on time. The list is endless. Similarly it must collect what is due to it also in a timely manner. It should strive to sell more so it can collect more.

Very often, when business is expanding, your outflows can be more than in your inflows. This is so because there is always a lag between your spending (on raw materials, labor etc) and your receiving the sales revenue. Receipt of sales revenue may be delayed because you might have given credit or you have produced ahead of the sales (to cater to the high demand during festive season) and are temporarily holding finished goods stock. In such situations, you should be equipped with sufficient information to be able to arrange for needed funds.(More on this in *Working Capital* lesson).

Very nature of any business is uncertainty. You base your calculations on certain (hopefully realistic) assumptions. You plan the funds required using these assumptions. However, your actual performance, say of sales, could be higher or lower than your plan. It will rarely be exactly per plan. Or your collection from credit customers has lagged and you are running short of funds. There could be many other reasons as to why your well laid out funding plan has gone for a toss.

To avoid such situations and be on top of things, reviewing your projections periodically and **recasting the future based the current status** (and not assumptions of the past) and what is likely to happen in the near future is very crucial. Cash Flow Projections is not a static document. It must be used as a dynamic tool.

An important question that arises is about the frequency and period (unit of time) of preparing Cash flow projections. The answer depends on the **purpose for which the projection will be used**.

- If it is for a **Business Plan** (to attract investors and lenders), it will be prepared at the initial stage – monthly for the first year, quarterly for the next two years and annual thereafter. These projections are not of much use for day to day cash management but meant for demonstrating the fluctuating need of the short term funds (working capital or overdraft facility). In fact, it almost takes the form of Cash Flow Statement and because it is for the future, it is also referred to as Pro-Forma Cash Flow Statement. (Pro Forma, a Latin word, means potential or expected in relation to a planned act).

- If it is for **running the day to day operations**, then the projections would cover a much shorter period of say 3 to 6 months (13 to 26 weeks). The unit of time could be a month or even a week. The length of the period is closely related to the volatility of the business and one's ability to forecast accurately.
- Once you have decided on the frequency of preparing a Cash Flow Projection, say weekly (period) to cover 13 weeks (horizon), or monthly to cover 6 months or even daily to cover a month, develop a format that suits your business. While there are generic formats, it will be helpful to develop one appropriate for your business, keeping the generic ones in mind.
- As you would be preparing this projection on periodic basis, please make sure that when one "period" is over, it is dropped and a new period is added, keeping the length of the horizon intact.
- How accurate a *Cash Flow Projection* is depends on the period and horizon involved. A forecast covering the next 30 days could be taken as extremely reliable as the payments due to be made and received during that time may already be known. This means that the forecast will be extremely accurate unless there are unforeseen issues such as a customer going out of business before paying their bills. A forecast for the next 12 months may be less reliable as it will include estimates of future sales. This does not make the forecast worthless: even if overall sales are unpredictable, a business owner may still have a very good idea of seasonal variations.

How to develop a cash flow projection?

- Based on your business charateristics, decide on the frequency & period (day, week or month) as well as horizon (month, 13 weeks or 6 months).
- Develop the format, with items appropriate for your business, which will be used for developing the projection. You may take help from the formats attached here as sample.
- A *projected* cash flow begins with the existing cash balance for the business. It then lists the sources of inflow and the anticipated payment dates. For example, if you supply goods on credit, you will know at the start of February that you will receive a certain amount during the month covering sales from January – based on credit terms. You may have other inflows – interest on your deposits, sale of scrap,rent from space sub-let etc. In this manner, you add up all your inflows.
- The statement then looks at forthcoming expenditure. Some of this will be a fixed, regular sum such as staff costs. Other expenses will be known but only payable at certain times, such as taxes. There will also be variable costs such as buying stock or materials.
- Where payment dates are variable, it is usually safest to work on the basis that you will pay suppliers as soon as possible but not receive payment from customers until the last possible date. In short, be conservative in your assumptions.
- Adding all outflows then enables you arrive at the surplus or deficit for the period. This, when combined with the opening balance, leads to deriving the closing balance – which becomes opening balance for the next period.

Budgeting & managing the finances

What is financial management?

Financial Management means planning, organizing, directing and controlling the financial activities such as procurement and utilization of funds of the enterprise. It means applying general management principles to financial resources of the enterprise.

Objectives of financial management

The financial management is generally concerned with procurement, allocation and control of financial resources of a concern. The objectives can be-

Main objective of Wealth maximization of shareholder's wealth.

1. To ensure regular and adequate supply of funds to the concern.
2. To ensure adequate returns to the shareholders.
3. To ensure optimum funds utilization. Once the funds are procured, they should be utilized in maximum possible way at least cost.

To plan a sound capital structure-There should be sound and fair composition of capital so that a balance is maintained between debt and equity capital as well as long term and short term uses and sources.

Process of financial management

There are three key elements to the process of financial management:

1) Financial planning

Management need to ensure that enough funding is available at the right time to meet the needs of the business. In the short term, funding may be needed to invest in equipment and stocks, pay employees and fund sales made on credit.

In the medium and long term, funding may be required for significant additions to the productive capacity of the business or to make acquisitions.

2) Financial control

Financial control is a critically important activity to help the business ensure that the business is meeting its objectives. Financial control addresses questions such as:

- Are assets being used efficiently?
- Are the businesses assets secure?
- Does management act in the best interest of shareholders and in accordance with business rules?

3) Financial decision-making

The key aspects of financial decision-making relate to investment, financing and dividends:

- Investments must be financed in some way – however there are always financing alternatives that can be considered. For example it is possible to raise finance from selling new shares, borrowing from banks or taking credit from suppliers
- A key financing decision is whether profits earned by the business should be retained rather than distributed to shareholders via dividends.
- If dividends are too high, the business may be starved of funding to reinvest in growing revenues and profits further.

  Focus of our discussion in the remaining paragraphs would be on planning and control aspects.

Budgeting

One of the important tools for good financial management (i.e. planning and controlling) is the budgeting process.

The word "Budget" is used in common parlance to mean "allocation of resources". A housewife allocates the money for different items like grocery, rent, Easy monthly installments for housing loan, school fees, entertainment etc. The idea is to make sure you monitor your expenses and stay within the available resources. School administration allocates periods for different subjects and various activities, within the overall time available for contact purposes. Students should allocate (read budget) time for studying different subjects, based on the need. So we all understand what budget or budgeting means.

French word ***bougette***, meaning purse (so obviously referring to money), is the origin of the word budget. Though it might have started with only money, today we use it in context of many resources as seen above.

For any business, a **budget** is a quantitative expression of a **plan** for a defined period of **time**. It may include planned sales volumes and revenues, resource quantities, costs and expenses etc.

Essentials of budget include:

- To control resources
- To communicate plans to various responsibility center managers.
- To motivate managers to strive to achieve budget goals.
- To evaluate the performance of managers
- For accountability

Types of budgets include

- **Sales budget –** an estimate of future sales, often broken down into both units and currency. It is used to create company sales goals.
- **Production budget –** an estimate of the number of units that must be manufactured to meet the sales goals. The production budget also estimates the various costs involved with manufacturing those units, including labor and material.

- **Capital budget -** used to determine whether an organization's long term investments such as new machinery, replacement machinery, new plants, new products, and research development projects are worth pursuing.
- **Cash flow/cash budget –** a prediction of future cash receipts and expenditures for a particular time period. It usually covers a period in the short term future. The cash flow budget helps the business determine when income will be sufficient to cover expenses and when the company will need to seek outside financing.
- **Marketing budget –** an estimate of the funds needed for promotion, advertising, and public relations in order to market the product or service.
- **Project budget –** a prediction of the costs associated with a particular company project. These costs include labour, materials, and other related expenses. The project budget is often broken down into specific tasks, with task budgets assigned to each. A cost estimate is used to establish a project budget.

While budget is the final product, the process of arriving at a budget is the budgeting process.

Is there only one way to prepare a budget or are there different ways and what are their pros and cons?

Let us review what ***Inc. Magazine*** has to say on this

Budgets and budgeting

In the broadest sense, a budget is an allocation of money for some purpose. Modern formal budgets not only limit expenditures; they also predict income, profits, and returns on investment a year ahead. They have evolved into tools of control and are also used as a means of determining such rewards as profit-sharing and bonuses. Unless the budgetary process is managed with extreme skill and care, the very virtues of budgeting can turn into negatives

Budgeting as a process

In large corporations, budgeting is a collective process in which operating units prepare their plans in conformity with corporate goals published by top management. Each unit plan is intended to contribute to the achievement of the corporate goals. Unit managers prepare projections of sales, operating costs, overhead costs, and capital requirements. They calculate operating profits and returns on the investment they intend to use.

The budget itself is the projection of these values for the next calendar or fiscal year. As part of this process, each unit presents its plans and budget to a reviewing upper management panel and may, thereafter, make whatever changes result from instructions from or negotiations with the higher level.

Texts presenting, documenting, and defending the rationales underlying the numbers are usually part of the planning document. Approved budgets then become the road-map for operations in the coming year. Ideally monthly or quarterly budget reviews track performance against the budget. As part of such reviews, changes to the budget may be approved. At year-end managers are judged by their performance against the budget.

Benefits of budgeting

For startup entrepreneurs, a budget is like a roadmap that can help them set goals and assess the validity of their business concept.

For established small businesses, a budget can be used to take the pulse of the business, determining how the business is performing through the years, and helping identify possible future investments.

By regularly consulting a budget, business leaders can compare actual figures and catch potential business shortfalls or other problems early. Budgets can also be instrumental in winning over investors, convincing banks your business is a good loan risk, or bringing on new partners or customers.

The single-most potential benefit of formal budgeting lies in ensuring that responsible managers take time each year (and then at fixed intervals throughout the year) in thinking about their operation by looking at all of its aspects. Budgeting creates a comprehensive picture of the future and makes both opportunities and barriers conscious. This foreknowledge then helps guide day-to-day activities.

Cost of budgeting

The chief cost of the budget process is time. In some corporations the process takes on a life of its own and becomes a convoluted exercise of excessive complexity which, moreover, prevents unit managers from doing any thinking: their time is consumed in efforts to comply with a vast array of requirements dictated from above.

Much of the negative attitude that has developed concerning this activity has its roots in unnecessary bureaucratic impositions on the one hand and unreliability because of rapid change a few months out.

Forms budgeting process

The two dominant forms of budgeting processes are traditional and zero-based. Business planning is usually a combination of the two. ***Traditional*** **budgeting** is based on a review of historical performance and then the projection of such findings to the future with modifications. If inflation is high, for instance, cost trends of the last several years are projected forward but with adjustments both for inflation and for projected growth or decline in business activity. Historical sales patterns, using established trends in sales growth, are projected; new sales from planned new product introductions are then added. ***Zero-based*** **budgeting** is the creation of a completely new budget from the ground up—as if no history existed. When using this method, the operation must justify and document every item of expenditure and income anew.

Table 2:

For the small business, different types of budgets can be drafted to monitor various financial aspects of the business.

- **Operational budget** - An operational budget is the most common type of budget used. It forecasts and tries to pretty closely predict yearly revenue and expenses for a business.

This budget can be updated with actual figures on a monthly basis and then you can revise your figures for the year, if needed.

- **Cash flow budget** - A cash flow budget details the amount of cash you collect and pay out. This is generally tallied on a monthly basis, but some businesses tabulate this weekly. In this budget, you track your sales and other receivables from income sources and contrast those against how much you pay to suppliers and in expenses. A positive cash flow is essential to grow your business. (Also see chapter on importance and use of Cash Flow Projections).
- **Capital budget** - The capital budget helps you figure out how much money you need to put in place new equipment or procedures to launch new products or increase production or services. This budget estimates the value of capital purchases you need for your business to grow and increase revenues.

Budgeting is an important and integral part of running a business. Various future strategies planned in the business must be translated in to numbers – sales qty and revenue, costs, resources required, fixed expenses and many other. The common denominator is money and the vehicle is budget, which is the result of budgeting process.

Budget and budgeting help one manage the business by numbers and not the seat of pants. One of the reasons businesses fail is due to lack of discipline – in terms of strict budgetary process.

Working capital

While one needs a good idea and a well laid out implementation plan, for the business to run successfully it needs adequate capital (among other things).

Need for capital

a) For procuring or investing in longer term assets – land, building, machinery, equipment etc. These are typically known as Fixed Assets. Once pressed in to service, they last over a reasonably longer period. These are placed in service for carrying out the main activity of the business – production and sales or service etc – and are not traded or sold to receive money (except when they have outlived their life). In other words, money invested on these items does not result in direct cash inflow for the business.

b) For buying raw materials, packing materials, paying rent, insurance premium, utility bills, wages and salaries and for many other services and/or materials used in the production or service. In other words this is the money needed for the day-to-day operations of the business.

Money needed to fund the normal, day to day operations of a business is known as the **Working Capital**. It ensures you have enough cash to pay your debts and expenses as they fall due, particularly during start-up period as very few new businesses are profitable as soon as they open their doors. It takes time to reach breakeven point and start making a profit.

Our discussion here is limited to Working Capital – how to compute, where to source it and such other related issues.

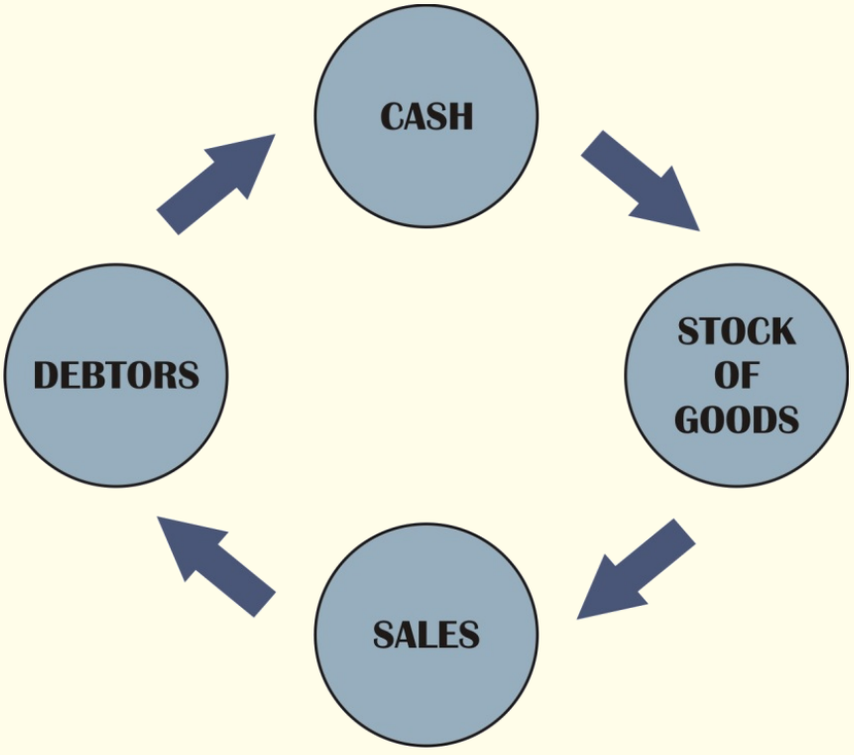
First let us understand why there is **need for working capital**.

If one is involved in manufacturing activity, one starts with buying raw materials and packing materials etc. These materials are then "converted" in to the end product. During the time required to convert raw material to end product, various expenses like wages, rent, salary, utility bill, insurance etc are to be paid. Once the end product is ready, it has to be sold and money received from the customer. If it is a cash sale, the money is received immediately and for credit sale, it is received after the credit period. The duration between buying the raw material and receiving the cash from the customer is known as the "**Operating Cycle**". It is also referred to as the **Cash Conversion Cycle.**

The cash conversion cycle (CCC or **Operating Cycle**) is the length of time between a firm's purchase of inventory and the receipt of cash from accounts receivable. It is the time required for a business to turn purchases into cash receipts from customers. CCC represents the number of days a firm's cash remains tied up within the operations of the business.

Different products will have different operating cycles. If the conversion takes longer then the cycle will be longer. For trading, where there is no manufacturing (or conversion), the operating cycle will be shorter. Longer the operating cycle, working capital quantum is more; shorter the cycle, less working capital is needed.

Following two diagrams show the composition of operating cycles for trading operation and manufacturing operations respectively. These are simplified versions; in real life there can be more stages and sub-flows like operating expenses, bad debt, pilferage of material, manufacturing defects etc. But the simplified version is good enough for understanding the concept.



Operating cycle or cash conversion cycle for trading business

Operating cycle or cash conversion cycle for manufacturing business

Gross and net working capital

Let us understand the terms **gross working capital**

For starters, first is the "financial concept".

Gross working capital (also known as current capital or circulating capital) is the sum total of all current assets of the business. These include cash, inventory (raw materials, work in process, finished goods, spares etc) and accounts receivable (or trade debtors). Current assets comprise items that would get converted in to cash in the short-run, say, within the normal operating cycle (or cash conversion cycle) of the business.

Current liabilities represent short-term source of funds and are expected to fall due or mature for payment in a short period, generally within a year. These typically consist of payables to vendors and service providers, employees, other short term borrowings and provisions.

A list of current assets and current liabilities for your reference:	
Current assets:	Current liabilities:
Stock	Trade creditors
Debtors	Short term loans
Cash	Outstanding expenses
Short term investment	

Inventory control and economic order quantity

Inventory

The word inventory conjures up the image of collection of things and a list of those items in our mind. In fact, the dictionary meaning of inventory is: "Detailed list of articles, goods, property etc". Which means we can have an inventory of vehicles we own (Assets), or list of our friends, list of movies seen etc. While that is the general meaning of the term inventory, in the present context we will be talking of raw materials, semi-finished goods, consumables, spare parts, finished goods etc. In other words, **inventory** are required directly or indirectly to make a sale (of the end product) and may also represent different stages in the process of getting the final product.

Inventory, in this context, deals with tangible items. One could have inventory of intangible items like quality or traits one possesses, or happy memories of childhood etc. Those are not the subject matter of our discussion. Similarly, our discussion would be limited to two types of businesses – manufacturing and trading (wholesale or retail) and not service. In certain service industries there may be use of tangible material – like spare parts in repair shop. But then, these are two distinct businesses – trading of spares and repair (which is a service). Various consumables like rags, solvents, lubricants etc are required and they will get similar treatment as other items being discussed here later.

In the accounting jargon, inventory refers to the value of all the items in the inventory list that is owned by the business. Ownership is the determining factor. Location may be your premises or vendor premises; that makes no difference. Similarly you may have other people's material on your premises. That is not part of your inventory (in terms of value), but you have responsibility for that material.

There are different valuation methods for accounting purposes. We will not be dealing with those issues here.

Control

When we use the word "things are under control", we are trying to convey that they are as per our expectations. What the expectations are or "what kind of behavior or event we expect" will be specific to the situation or class. Any system that helps in achieving "expected behavior" is a control system. So an inventory control system is expected to help achieve "desirable behavior" of the inventory items. Higher the conformance with the "desirable behavior" using a system, that system can be labeled as a better system.

What is the desirable behavior of any inventory item? Intuitively, we can say that there should never be any stock out. In other words, moment the need (demand) arises we should be able to supply the item – without losing any time. If this was the only expectation, then it would be very simple – hold in stock "huge quantity" for any and all eventuality! But there is another expectation – it should be at the lowest possible cost! Now that could be a challenge.

A well conceived and thought through system can help in achieving the control of inventory. Let us keep in mind that there are different aspects of control – physical and fiscal (or monetary). We will discuss both in subsequent paragraphs.

Items that make up the inventory

For a good inventory control system, we need to take care of both physical and fiscal aspects. But before we deal with those two, let us understand the nature of items that make up the inventory.

- **Stock keeping unit (SKU) code**

  Each and every "item" in the inventory is to be identified with a **unique code** which signifies certain aspects of the item. It can be color, size, weight or any other characteristic that is of importance in its use. The SKU code can be a combination of alpha and numeric.

  SKU is the very basic unit for data collection and further manipulation for deriving meaningful statistics and decision making. Bar Codes and RFID (Radio Frequency Identification) tags are used in tracking etc using SKU.

- **Motley crowd**

  While we refer to inventory in one monetary value in the accounting statement, behind it are myriad numbers of SKUs – that can be classified as Raw Materials, Packing Materials, Spare Parts, Semi Finished Goods (or WIP – Work In Progress), Finished Goods, Consumables etc. The SKU code should definitely help us identify which class the item belongs but not much else. The treatment for each class will have to be different, keeping in mind some of the factors identified here.

- **Space**

  Space requirement for all items will not be identical; neither will it have proportionate relationship with the cost of the item. There can be many bulky items with low value (For example, straw for use in paper mill) as well as high value items with low volume (For example, Diamonds). Good Inventory Control system will have to take due note of this.

- **Value**

  Not all SKUs have same value. See more about the value distribution under Pareto Principle later.

- **Lead time**

  Lead time to manufacture or procure an item depends on many factors. Combined effect of these factors - like standard or special raw material, processing time, scheduling of machines, distance between source and user point etc - makes up the lead time for an item. Also, it is not always the same for a given item; variability in different factors contributing to the total lead time can make the lead time vary.

- **Standard vs made to order**

  Some of the items in the inventory could be commodity items – no significant differentiation and hence easy to substitute, or many suppliers produce to same specifications and hence easy to choose from. Others may be specifically made to order and hence possibly limited sources to order from.

- **Seasonality of supply**

  If the item is an agricultural product (grains, vegetables, fruits etc.), the supply would be seasonal. This can play a role in designing the inventory control system.

- **Demand not uniform or not predictable**

  Demand for an item could be seasonal – weather, festival seasons, events, school opening etc can play a significant part in this. In some cases it is easy to forecast – raw material for items produced to order; but in others not so easy – requirement of a spare part.

- **Shelf life**

  Items like vegetables, fruits, flowers and fish are perishable in nature. This calls for special storage conditions and equipments – cold storage, freezers etc. These have financial implications. Similarly some of the manufactured food or medicinal products have expiry dates – beyond which they are not fit for consumption. This imposes certain constraints on inventory management.

- **Safety aspects**

  Some of the items are hazardous in nature and special precautions have to be taken in their storage. Examples are – gasoline, other combustible items, some hazardous chemicals etc. In a factory manufacturing safety matches, phosphorous and potassium chlorate are not stored in the same or even adjoining areas, for fear of accidental mix up. In fact, even their path of delivery to the respective end use points do not cross.

- **Obsolescence**

  Due to advancement in technology, certain items may not be used and their demand drops off.

  These are the various characteristics of SKUs that have to be kept in mind while designing inventory control systems – one size will not fit all. Systems (rules and guidelines) will have to be different for raw materials, consumables, spare parts, packing materials etc. We will discuss some more about these later. But let us now look at one common thread that can run through systems for these different classes or categories.

Pareto's Principle and ABC analysis for control

Whether or not you're familiar with the economic principle known as **Pareto's Principle**, you may have observed its effects. This principle holds that in a given system, a relative handful of "causes" will produce the majority of "effects." For example, one may find that 20 percent of customers are responsible for 80 percent of sales, or that 30 percent of the product lines result in 70 percent of returns.

The principle is named for Vilfredo Pareto, an Italian economist who studied land ownership in Italy in the early 1900's and found that roughly 20 percent of the population held title to about 80 percent of the land. Legend has it that he further developed the theory upon observing that 20 percent of the pea pods in his garden produced 80 percent of the peas. For this reason, Pareto's Principle is often referred to as the "80/20" rule. There's nothing "magic" about the 80 percent figure, though. Many business systems do in fact show an 80/20 relationship; others

don't. But the overall point still stands: **A relatively handful of things will generate the bulk of the results or in any group will have "vital few and trivial many".**

Pareto's law has applications throughout science as well as business, including inventory control, where it forms the basis for a technique called ABC analysis.

The value of the Pareto Principle in management is in reminding us to stay focused on the "20 percent that matters".

Examining inventory

Businesses that maintain an inventory of goods to sell to customers or for use in manufacturing commonly observe a Pareto distribution in the value of that inventory. For example, a company might determine that 20 percent of the products in its inventory account for 80 percent of the total value of inventory. Managing inventory is time-consuming and expensive. By understanding that a few items represent the vast majority of inventory value, a company can get the most bang for its buck by focusing its inventory control efforts on those particular items.

ABC analysis

The inventory control technique known as ABC analysis builds on Pareto's Principle. In ABC analysis, a company reviews its inventory and sorts all SKUs into three categories, called "A" , "B" and "C" items. The typical breakdown might look like this: "A" inventory: 20 percent of SKUs, 80 percent of value. "B" inventory: 30 percent of SKUs, 15 percent of value. "C" inventory: 50 percent of SKUs, 5 percent of value. Again, a particular company's numbers may be different, but we should be able to discern a similar kind of pattern.

Once a company has conducted its ABC analysis, it can devise an inventory-control strategy that focuses effort where it will have the greatest effect. Items in "A" inventory are tightly controlled, meaning the company keeps close tabs on how much it has in stock; pays close attention to current demand and forecasts for future demand; and carefully plans its ordering so that it neither runs out nor winds up with too much excess inventory that can become obsolete. Items in "B" inventory are also watched closely, but the company reviews its ordering strategy less often. Since items in "C" inventory are the least expensive, the company can order them in b**ulk and exercise minimal controls; all that really matters is that the company doesn't run out.**

A - outstandingly important; B - of average importance; C - relatively unimportant as a basis for a control scheme. Each category can and sometimes should be handled in a different way, with more attention being devoted to category A, less to B, and still less to C.

Thus, applied in the context of inventory, it's a determination of the relative ratios between the number of items and the currency value of the items purchased/consumed on a repetitive basis:

- 10-20% of the items (**'A' class**) account for 70-80% of the consumption.
- The next, 15-25% (**'B' class**) account for 10-20% of the consumption and.
- The balance, 65-75% (**'C' class**) account for 5-10% of the consumption.

'A' class items are closely monitored because of the value involved (70-80%!).

Suggested policy guidelines for A, B & C classes of items

(A) items (High Consumption Value)	(B) items (Moderate Consumption Value)	(C) item (Low Consumption Value)
Very strict consumption control	Moderate control	Loose control
No/very low safety stock	Low safety stock	High safety stock
Phased delivery (Weekly)	Once in three months	Once in 6 months
Weekly control report	Monthly control report	Quarterly report
Maximum follow up	Periodic follow up	Exceptional
As many sources as possible	Two or more reliable	Two reliable
Accurate forecasts	Estimates on past data	Rough estimate
Central purchasing /storage	Combination purchasing	Decentralised
Max. efforts to control LT	Moderate	Min. clerical efforts
To be handled by Sr. officers	Middle level	Can be delegated

ABC (Always **B**etter **C**ontrol) analysis can help you control your inventory better.

Economic order quantity

Keeping aside various other aspects (like security, safety etc) and considering only the monetary or financial implications, how does one design an effective Inventory Control System?

One of the objectives of such a system would be to ensure that there is no stock-out situation. If that were the only criteria, then it is easy to order "large qty" and be very safe. However, there is cost associated with ordering and holding inventory.

Assuming that the future demand is known, one needs to determine **when** to place an order (Reorder Point) and **how much** to order (Order Quantity). Reorder point takes due note of the lead time and demand during lead time. For example, if procurement or manufacturing lead time is 2 months, and demand during this period is expected to be 300 units per month, then an order is to be placed when the stock or inventory level reaches 600 pieces. This is the reorder point or level.

Reorder formula = Average daily usage rate × Lead time in days

Under utopian situation, the new quantity will arrive, just as the stock reaches zero. Real life is not that simple or straightforward. There is variability in the rate of demand (or consumption) as well as in the supply or manufacturing lead time etc. Therefore, it may reach a zero stock status, before the supply arrives. To cater to such variability, the concept of **safety stock** is used. In this particular case, 150 may be added as safety stock. The reorder level then would be 750 pieces i.e. place new order when the stock level reaches 750.

For every item, a level of safety stock is determined – keeping the possible variation in lead time and variation in demand during lead time in mind. As we will see later, the Safety Stock has no impact on the Economic Order Quantity. However, both are essential for good inventory control system.

Costs

There are two costs involved: **One for Ordering** (which includes paperwork for placing order, receiving, inspection, warehouse handling etc) and another for holding the inventory or **Inventory Carrying Cost** (which includes cost of money tied up i.e. interest, space cost, insurance etc).

Let us try to figure out the way to determine EOQ (Economic Order Qty).

The following model assumes:

1. Future demand is known and is uniform throughout the period.
2. Unit price of item does not vary with qty ordered. (In real life, the price varies. We will then have to use a different model. That is not discussed here.)

Let us use following symbols:

D: Annual demand for the item (SKU)

P: Cost of placing and receiving one order (does not include purchase price)

C: Inventory carrying cost per unit. This may be derived by multiplying the unit price of the item by the carrying cost expressed as %age of the unit price.

S: Safety Stock level for the item.

Q*: Economic order quantity

- Total number of orders being placed during the year will be = $\frac{D}{Q}$
- Total ordering cost = $\frac{P\,D}{Q}$
- Average inventory = $S + \frac{Q}{2}$
- Inventory carrying cost = $C \times (S + \frac{Q}{2})$

Total annual cost = $\frac{P\,D}{Q} + [C \times (S + \frac{Q}{2})]$

As you would recollect, the safety stock S is not dependent on Q. Irrespective of the value of Q, value of S depends on variability of lead time and demand rate. So it can be removed from the equation and get a modified total cost as follows:

Modified annual cost = $\frac{P\,D}{Q} + [C \times \frac{Q}{2}]$

Table 4:

The ordering cost $\left(\frac{PD}{Q}\right)$ and inventory carrying cost $\left(C \times \frac{Q}{2}\right)$ equal each other when the total cost is the lowest.

$$\frac{PD}{Q} = C \times \frac{Q}{2}$$

or

$2PD = CQ^2$

or

$$Q = \sqrt{\frac{2PD}{C}}$$

Therefore,

Those who have background of calculus can easily see that, the EOQ is the value when derivative of modified annual cost is zero. Therefore, differentiating the equation, with respect to Q,

$$O = -\frac{PD}{Q^2} + \frac{C}{2}$$

or

$$\frac{PD}{Q^2} = \frac{C}{2}$$

or

$$\frac{2PD}{C} = Q^2$$

or

$$Q = \sqrt{\frac{2PD}{C}}$$

Formula for calculating EOQ =

D: Annual Demand for the item (SKU)

P: Cost of placing and receiving one Order (does not include purchase price)

C: Inventory carrying cost per unit. This may be derived by multiplying the unit price of the item by the carrying cost expressed as %age of the unit price.

S: Safety Stock level for the item.

Q: Economic Order Quantity

$$Q = \sqrt{\frac{2PD}{C}}$$

Couple of numerical examples may further clarify the formula

Example 1:

Annual qty of jeans sold by a shop is 1,200 at the rate of ₹ 100/- per month. Cost of placing an order and receiving goods is ₹ 500/- per order. Inventory holding cost is ₹ 30/- per annum. What is the economic order Qty for the shop keeper?

Here, D = 1,200; P = 500 and C = 30.

So 2 x P x D = 12,00,000

This divided by 30 = 40,000.

Square root of which is = 200

So the EOQ is 200 jeans.

Example 2:

A book shop sells pens – 30,000 qty per year. Demand is uniform. Purchase cost is ₹ 6/- per pen. Holding cost per annum is 20% of purchase cost. Ordering cost is ₹ 500/- per order. What should be the EOQ for the shop keeper?

Here, D = 30,000; P = 500 and C = 1.2 (20% of 6)

So 2 x P x D = 3,00,00,000

This divided by 1.2 = 2,50,00,000

Square root of which is = 5,000

So the EOQ is 5,000 pens.

Final note on inventory control and EOQ

Inventory control, as explained earlier, has many facets – monetary, physical, safety and many others. It is crucial to understand these aspects in designing an inventory control system. ABC system is one such. There are other different system, including Just-in- time (JIT), perpetual inventory etc. These have not been elaborated here.

Economic ordering quantity is a key factor (but not the only one) in managing any inventory. However, the formula we have arrived at in the earlier pages is a simplified one. There are more advanced formulae available – that take care of seasonality of demand, fluctuations in lead time as well as price breaks based on quantity ordered etc. Those are beyond the scope of current discussion.

Return on investment and return on equity

Measure of profitability

The purpose of any economic activity is earning profit. At its very basic level, profitable business means earning more than what one spends. Of course, there are nuances to the words "earning" and "spending" to make it meaningful.

While profit is the motive, question arises as to how to measure or compare profit from one activity or project with profit from many others. Suppose we spend ₹ 1,000/- and earn a profit

of ₹ 400/- in one case and in another case spend ₹ 100,000/- and earn profit of ₹ 10,000/- which makes **more profit**? The answer obviously is- the later one. However, if we ask which is more profitable then the answer is - the first one. That is because; relationship between profit and spending is being compared. And we have not even figured the timing issues which may exist – one may be in six months and another in 2 years!

So the need arises for some common understanding and yardstick or measurement technique.

Return on Investment (ROI) and Return on Equity (ROE) are two such critical profitability ratios. These measures are applicable to individual projects, such as the purchase and subsequent sale of an apartment, a small grocery business or a multinational conglomerate. Therefore, it pays to understand ROE and ROI.

Return on investment

Return on investment equals the net income from a business or a project divided by the total money invested in the venture multiplied by 100.

$$\text{ROI} = \frac{\text{Net Profit}}{\text{Total Capital Invested}} \times 100$$

If, for example, you spend ₹ 100,000/- to open a grocery shop and make a net profit of ₹ 20,000/- in one year, your annual ROI equals (20,000/100,000) x 100 = 20 percent. When calculating ROI, the investment will include not only what the investor spent out of his/her pocket, but also all borrowed funds. In the example, the owner might have invested ₹ 40, 000/- of his own money (equity) and secured a loan for ₹ 60, 000/-.

Return on equity

You can calculate ROE by dividing the net income by the equity of the investor and multiplying the result by 100. In the example, the grocery owner has an equity stake of ₹ 40,000/- in the business. He has borrowed ₹ 60,000/-. This will attract an interest of ₹ 6,000/- @ of 10% per annum. The net profit, then would be ₹ 14,000/- (= 20,000 – 6,000). So, ROE is (14,000 / 40,000) x 100 = 35 percent. This means that for every Rupee of own money the owner put into the business, he made 35 paisa. The ROI of 20 percent, on the other hand, means that for every Rupee of combined assets and loans invested, the business yielded a 20 paisa average profit per Rupee invested (equity plus loan).

$$\text{ROE} = \frac{\text{Net Income x100}}{\text{Equity}}$$

Which one to use? ROI or ROE:

Before discussing this, let us review an example.

Let us take the case of two people, A & B starting identical business and performing identically in terms of sales, variable cost, fixed costs etc. The only difference is A did not borrow any money and B did. Interest rate is 10% per annum. Here are some numbers for both A & B.

Table 5:

	A (₹)	B (₹)
Total investment = x	10,00,000	10,00,000
Source of funds		
Equity = y	10,00,000	4,00,000
Loan = z	–	6,00,000
Total	10,00,000	10,00,000
Interest rate per annum		10%
Income statement for 1 Yr		
Sales revenue (a)	7,00,000	7,00,000
Less cost of goods sold (b)	(3,00,000)	(3,00,000)
Gross margin c= (a-b)	4,00,000	4,00,000
Fixed expenses		
Salary etc	2,00,000	2,00,000
Rent, utility etc	50,000	50,000
Interest	–	60,000
Depreciation & amortization	10,000	10,000
Total fixed expense= (d)	2,60,000	3,20,000
Profit before tax = (c-d)	1,40,000	80,000
Tax @ 20% =e	28,000	16,000
Profit after tax = f= (c-d-e)	1,12,000	64,000
Some Ratios		
ROI =(f/x)	11.2%	6.4%
ROE = (f/y)	11.2%	16%
EBITDA= (PBT + Int + Dep & Amrt)	1,50,000	1,50,000
EBITDA/investment	15%	15%
EBITDA/equity	15%	37.5%
EBITDA – stands for Earnings Before interest, Tax, Depreciation and Amortization. This is arrived at by adding interest, depreciation and amortization to PBT. See the section below on EBITDA		

In this example, we can see that B makes less profit (whether before or after tax) than A. This is reflected in lower ROI for B. However, B has invested lesser amount than A and as a result, when we compare profit in relation to "own funds" or "equity", B comes out ahead of A – 16% Vs 11.2%.

For a true measure of how "own money" is being used, ROE is a good indicator.

ROI, on the other hand, gives an indication of how the "total money" is being used.

EBITDA

The acronym EBITDA stands for earnings before interest, taxes, depreciation and amortization. Why calculate EBITDA and what its utility is.

When financial statements are prepared, the results are a combination of different factors: some are managerial decisions, others entrepreneurial and some others are government policies. To measure or compare true effectiveness of one operation and the managerial decisions with another one, the extraneous factors must be normalized. Let us review these.

Interest

If one business is started with all equity and another one with some loan, the second one will have an interest element in its cost. This interest is strictly not because of the operational efficiency or otherwise, but due to the "funding decision". Adding back the interest to PBT, takes away the effect of this funding decision.

Taxes

Taxes are levied by the government. If you are comparing profits of one period to another, the rates might have changed. There may be other reasons why the "tax treatment" is different for two companies – state taxes, special levies etc. The business owner or manger has no control over these. To avoid distortion in the profit, tax component is added back to the profit.

Depreciation & amortization

There are different options available to depreciate (tangible asset) or amortize (intangible asset). One company may use a particular method and another one a totally different one. One may write off slowly and another one fast – both being allowed by the authorities. So to avoid distortion due to differing practices being followed, Depreciation & Amortization is added back.

When one wants to assess the efficiency of operations – either for acquisition or comparison with benchmarked operations or over different time periods, ability to generate cash by business is crucial. EBITDA is one such measurement. It is one of the most widely used measures for evaluating a business for acquisition etc.

Price for a business is often quoted in terms of a multiple of its EBITDA – **say (*M) x (EBITDA).*** M has numerical value that varies from industry to industry.

Note:

Valuation of business for buying or selling uses EBITDA as one of the criteria. Basic philosophy in this thought process is when someone buys a business, he or she buys the "future Cash Flows" from that

business. Hence they are willing to pay a "multiple" of the EBITDA. However, there are timing issues and people use concepts like DCF (Discounted Cash Flow) or IRR (Internal Rate of Return) etc. These are beyond the scope of the current topics.

Illustration 1: Please calculate return on investment and return on equity.

You have newly started a beauty parlor business, you spend ₹1,50,000/- to open the parlor of which you invested ₹70,000/- of your own money and borrowed a loan for ₹80,000/-. Interest rate per annum is 7%. Sales revenue per month is ₹80,000/-. Cost of goods sold is ₹30,000/- per month. Fixed expenses is ₹30,000/- (salary ₹20,000/-, rent and utility ₹10,000/-), depreciation ₹3,000/- and tax @ 14%.

Illustration 2: Please calculate return on investment and return on equity.

You have newly started a restaurant business, you spend ₹10,00,000/- to open the restaurant. You have invested ₹4,00,000/- of your own money and borrowed a loan for ₹6,00,000/-. Interest rate per annum is 10%. Monthly sales revenue is ₹6,00,000/- and cost of goods sold is ₹3,00,000/-. Fixed expenses per month ₹2,00,000/- (salary ₹1,50,000/-, rent and utility ₹50,000/-), depreciation ₹10,000/- and tax @ 20%.

SUMMARY

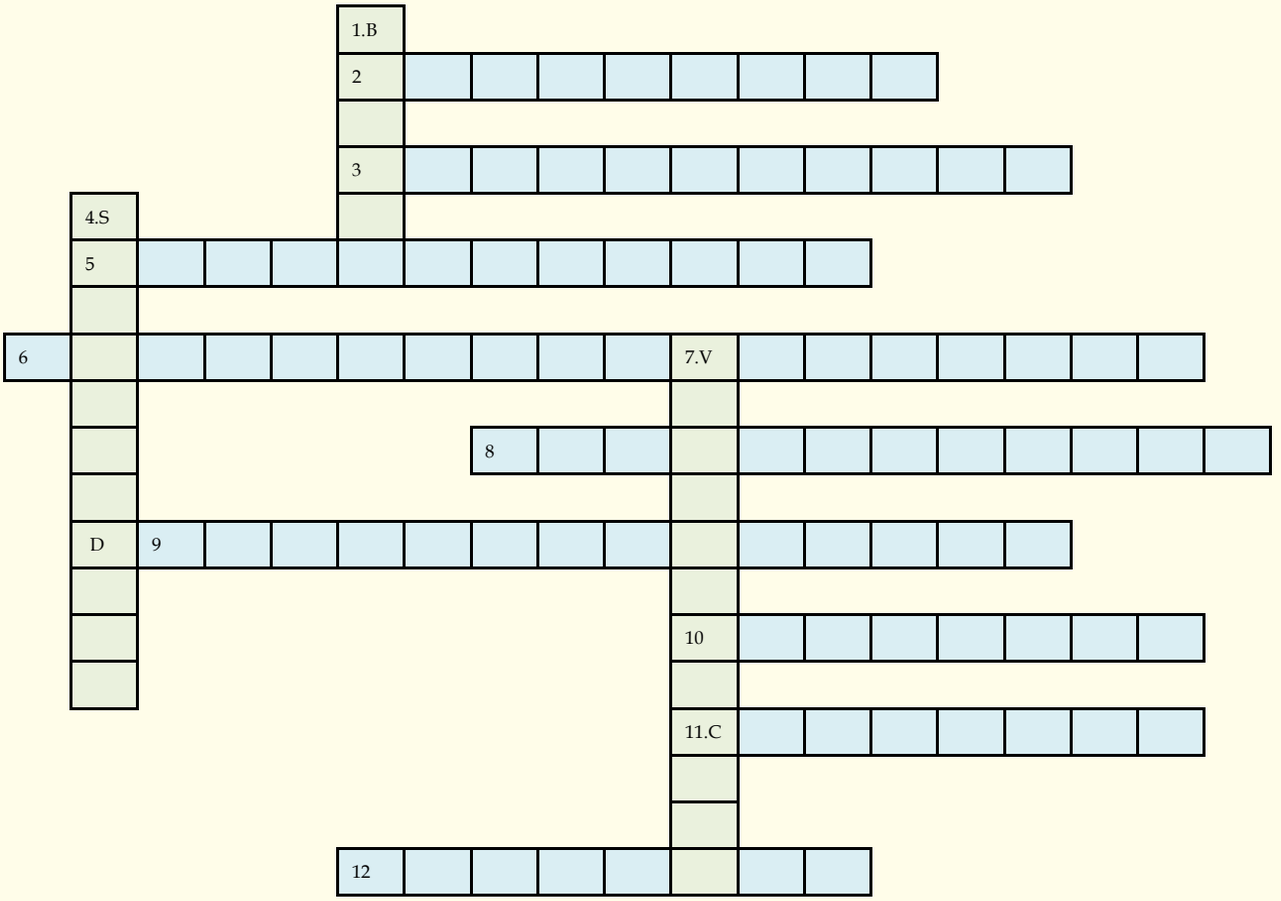
- *Cash flow refers to the movement of money in and out of business*
- *Cash flow projections show how cash is expected to flow in and out of business*
- *Financial management means planning, organizing, directing & controlling the financial activities such as procurement and utilization of fields of the enterprise.*
- *Budgeting means allocation of resources*
- *Traditional budgeting is based on review of historic performance and the projection of such finding to the future with modification.*
- *Zero based budgeting is the creation of a completion new budget from the ground up as is no history existed*
- *Funds needed for day to day operation of business know as working capital*
- *The decision between buying the raw material and receiving the cash from the customer (in form of sales) is known as the 'operating cycle'*
- *Operating cycle is also reference to as the cash consumer cycle*
- *The requirement of working capital depends up length of operating cycle, sales policy, credit policies, tax liabilities and nature of business*
- *Inventory control system is designed to bring about expected control over the inventory and its utilization*
- *Pareto principle: The pareto principle (also known as the 80–20 rule, the law of the vital few, and the principle of factor sparsity) states that, for many events, roughly 80% of the effects come from 20% of the causes.*

- *ABC analysis: The ABC approach states that, when reviewing inventory, a company should rate items from A to C, basing its ratings on the following rules:*
- *A-items are goods which annual consumption value is the highest. The top 70-80% of the annual consumption value of the company typically accounts for only 10-20% of total inventory items.*
- *C-items are, on the contrary, items with the lowest consumption value. The lower 5% of the annual consumption value typically accounts for 50% of total inventory items.*
- *B-items are the interclass items, with a medium consumption value. Those 15-25% of annual consumption value typically accounts for 30% of total inventory items.*
- ***A**lways **b**etter **c**ontrol can help you control you inventory better.*
- *Economic order quantity: Economic order quantity (EOQ) is the order quantity of inventory that minimizes the total cost of inventory management.*
- *Recorder point: The reorder point ("ROP") is the level of inventory when an order should be made with suppliers to bring the inventory up by the Economic order quantity ("EOQ").*
- *Carrying cost: In marketing, carrying cost refers to the total cost of holding inventory. This includes warehousing costs such as rent, utilities and salaries, financial costs such as opportunity cost, and inventory costs related to perishability, pilferage, shrinkage and insurance.*

"To win without risk is to triumph without glory."

- Corneille

REVIEW CROSSWORD PUZZLE



Across:

2. Collective process in which operating units prepare their plans in conformity with corporate goals published by top management.
3. Selling price per unit - cost price per unit
5. It takes place on intangible assets
6. Gain generated on an investment relative to the amount of money invested.
8. The concept by which monetary value of an asset decreases over time due to use, wear and tear or obsolescence
9. The money needed to fund the normal, day to day operations of your business
10. Time between the initiation of a process and its completion
11. The movement of money in and out of a business during a specific period of time.
12. A party to whom money is owed

Down:

1. A plan that shows how much one can spend against what they earn over a given time
4. An estimate of future sales, often broken down into both units and currency.
7. Costs that vary depending on a company's production volume

LET'S REVISE

A. Answers to these questions should not exceed 15 words:

1. Explain the following terms with proper example:
   - SKU
   - Cash flow
   - Cash inflow
   - Cash outflow
   - Re-order point
   - Cash flow projection
   - Cash conversion cycle
2. Pareto's Law formed the basis for a technique. Name it.

B. Answers to these questions should not exceed 30 words:

1. What is ABC analysis?
2. What is Pareto's Principle?
3. Differentiate between cash flow project & cash flow statement?
4. What is financial management? What is the main objective of financial management?

C. Answers to these questions should not exceed 75 words:

1. There are three key elements in the process of financial management. Explain them.
2. What are the key aspects of financial decision making?
3. What is a budget? What are the essentials of a budget?
4. Explain Inventory Control and state its objectives.

D. Answers to these questions should not exceed 250 words:

1. What is a budgeting process?
2. There is a Budget to suit every business and its need .Elucidate.
3. Explain the two dominant forms of budgeting process.
4. What is working capital? What is the need for a working capital?

E. HOTS (High Order Thinking Skills)

1. Calculate working capital Raja & Co. has the following items in its Balance sheet Stock -50,000: Trade creditors – 32,000; debtors – 75000; cash – 1,00000 Dividend payable – 50,000; Tax – 44,000; Short term loan – 61,000; Short term investments – 76,000 Calculate gross and net working capital.
2. Ramu is buying and selling ice-cream. Explain his working capital requirement.