

Onset of production. In the real life firms begin their activity even at a loss. In anticipation of profit in the future. However the firm can plan their production better. If they know the level of production where cost and revenue are in equilibrium i.e. profitable and non-profitable range of production. Break even analysis or what is also known as profit Contribution analysis is an important analytical technique used to study the relationship b/w the total cost, total revenue and total profit. The Break even analysis is a technique of having a preview of profit prospects and a tool of profit planning. It integrates the cost and revenue estimates to ascertain the profit and losses associated with different level of output. The relationship b/w cost and output and price ^{b/w} and output may be linear and non-linear in nature.

Linear Cost and Revenue function

The Break-even analysis under linear cost and revenue function conditions. Let us assume linear cost and linear

Revenue function are given.

fig (1) T.C. = T.V.C + T.F.C

$$TC = 100 + 10Q$$

And revenue function = $15Q$ — eq. (ii)

The cost function given in eq. (i) implies that the firm's total fixed cost is given at £100 and its variable cost varies at a constant rate of £10 per unit in response to increase in output. The revenue function given in eq. (ii) implies that the price for the firm's product is given in the market at £15 per unit of the sale. The

The process of Break-even analysis is graphically expressed in above figure. The line TFC shows the total fixed cost at £100 for a certain level of output and the TVC shows the total variable cost rising with a slope: $\frac{\Delta TVC}{\Delta Q} = \frac{10}{1}$

The line TC has been obtained by plotting the TC function. It can also be obtained by summation summation of TFC and TVC at various level of output.

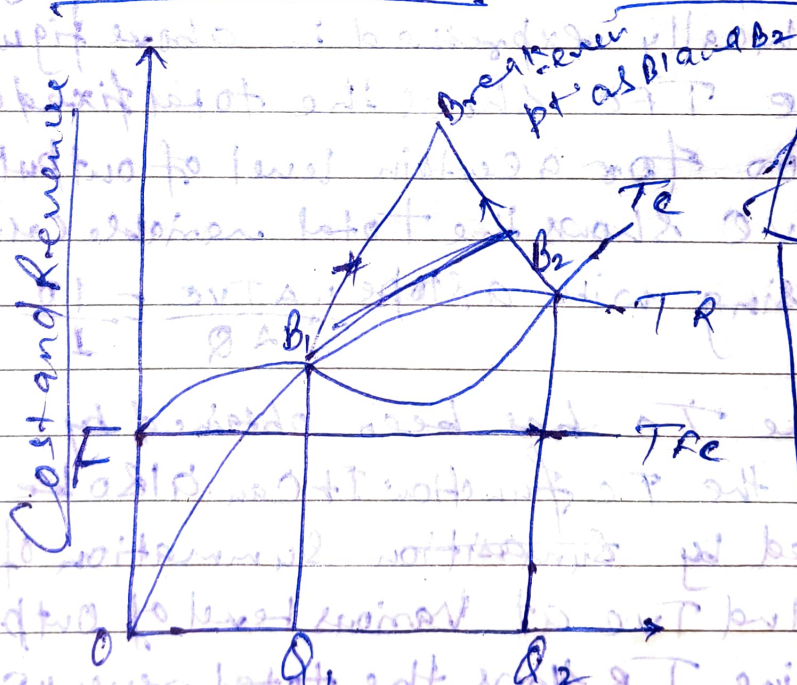
The line TR shows the total revenue obtained as quantity into price. The TR and TC lines intersect at pt. B, where,

Output is equal to 20 units. The pt. B shows that $Q = 20$. The firm's total Cost (TC) is equal to its total revenue (TR). Here ~~at~~ At $Q = 20$ TC breaks even with TR at pt. B. Therefore pt. B is the Break even pt. and $Q = 20$ is the Break even output.

The difference between TC and TR or TC is greater than TR is known as operating loss where TR is greater than TC it is termed as profit or the difference b/w TR and TC is termed as operating profit.

Break Analysis

Non-linear Cost and Revenue function



This curve has two Break even point

Output per time unit

~~Let us~~ Let us consider the Break-even analysis under non-linear Cost and revenue functions. We show in above figure (2). TFC line shows the fixed cost at OF and the vertical distance b/w ~~Tc~~ Tc and TFC measure the Total variable cost. The curve TR shows the total sale proceeds ~~or~~ of the TR at different level of output and price. The vertical distance b/w the TR and TC measure the profit and loss for various level of output. As in figure (2) TR and TC curve intersects at two pts. ~~P~~ i.e. B_1 and B_2 where TR is equal to TC. There are lower and upper Break-even pts. for the whole range of output b/w OQ_1 and OQ_2 . TR is greater than TC ~~or~~ its implies that a firm producing an output more than OQ_1 and less than OQ_2 will make profit. In other words the profitability range of output ~~lies~~ lies b/w OQ_1 and OQ_2 units of output.