

# The law of diminishing marginal productivity



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The law of diminishing marginal productivity states that if there is marginal increase in the total output it reduces with increase in with variable input after a certain point. Basically the efficiency reduces after certain stage as in ratio wise because the input increases gradually with certain considerable factor but the output expected in comparison to the increase in output . This is applicable in all the production from home to offices throughout.

DMP holds for any production house or where items being produced , the continuous addition of more units of a variable input to fixed input increases the total marginal output initially, but after the addition of a certain number of units, the rate of marginal increase becomes constant, and at an even later stage, the rate of marginal increase in output starts to decline with the additional of more inputs

For example farmer wants to increase the fertility of the soil which he is using to sow seeds, he adds fertilizers which improves the production of crop in farms but at certain point, adding more and more fertilizer does not improves the yield per unit of fertilizer, and excessive quantity of fertilizer can also reduce the yield. A common sort of example is adding more workers to a job, such as assembling a car on a factory floor. At some point, adding more workers causes problems such as getting in each other's way, or workers frequently find themselves waiting for access to a part. In all of these processes, producing one more unit of output per unit of time will eventually cost increasingly more, due to inputs being used less and less effectively.

Return to scale

On the other hand the marginal returns differs from diminishing marginal productivity because marginal returns applies to cases where if only one of the many inputs increases (for example, the quantity of seed increases, for the same amount of land)., or if all the inputs are increased in an equal proportion , the result may be constant or with increased output . It may even result with better efficiency ratio wise.

Marginal returns does not assure the return on investment is maximum in this application . It might even has problems . for example the manager of a company tries to add those improvements, or factors of production, which ultimately leads to greater returns. As a thought experiment, it is really difficult to imagine that why only one factor of production (e. g. hammers) would be added in the making of a specific product, without considering the importance of the other factors which plays very important role for the increase in the productivity. (e. g. labor to use the extra hammers). The “ law of diminishing returns” can be treated as benchmark in todays world but it has very few examples in practice. As has been understood from the time of Smith and Mill, and further explained by more recent economists such as Paul Romer “ increasing returns” is more likely to occur when companies invest on a factor of production, as they do not hold everything else constant. This is how companies such as Wal-Mart and Microsoft can become more profitable as they grow in size.

## **2. Explain how profit maximizing output is determined in a**

### **a. Perfect Competitive market**

Perfect Competitive market :

Perfectly competitive market has two characteristics

Market is made up of number of sellers and buyers

Various sellers offer generally the same goods.

The firm maximizes profit by producing the quantity at which marginal cost (MC) equals Marginal Revenue (MR), Profit Maximising Quantity ( $Q_{pm}$ ), Quantity (Q), Average Total Cost (ATC), Average Variable Cost, Market Price (P),

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Refer above graph :

Take an example of a firm producing quantity  $Q_1$ , at  $Q_1$  marginal revenue is more than the marginal cost if the firm raises its production level and sales increases by 1 unit, the total revenue will exceed. Profit which is equal to the total revenue minus total cost would increase, hence if MR is greater than MC, the firm can increase profit by increasing production.

If quantity is increased by the firm to ( $Q_2$ ) then the MC is greater than MR, so if the firm reduces its production by 1 unit the cost saved  $MC_2$  would exceed revenue lost, therefore if Marginal Revenue is less than Marginal cost here firm increases profit by reducing production.

Therefore to have maximum profit irrespective of high production by increasing the quantity or low production by reducing ultimately they have to adjust until the quantity reaches a point

(Qpm) where  $Mr$  is equal to  $P$ , this analysis shows a general rule for profit maximization: At the profit maximizing level of output, marginal revenue and marginal cost are exactly equal.

## **b. Monopoly**

A firm is monopoly when it is the sole producer of the product, it has got no competition and even if competition exists it is very negligible. Generally the price is set by the sole producer which is treated as the benchmark figure in market and it sets the standard for the same. In other words the product is exactly the same as the Marginal cost of producing the product because the monopoly firm does not have to worry about losing customers to competitors. Monopoly firms can set a price of the product which is higher than the price that is higher than Marginal (Economic) cost. They generate an economic profit over and above the normal profit that is typically in a perfectly competitive industry. Profit obtained by a monopoly firm is referred to as monopoly profit.

Firms are said to be price takers in a perfectly competitive market, since the customers can buy the required product from one firm or the other firm depending upon the various options available to them. But in monopoly, there is no competition in market which creates a downward sloping demand curve for a monopolist, although they lose business by increasing the prices above equilibrium price, they don't lose it all, rather in some cases they make more profit. The biggest advantage to monopoly firm is that, they can set their own price and accept a level of output from the market, or they can set their output quantity and accept the price determined by the market. The price and output are co-determined by consumer demand and the firm's

production capacity Firm with monopoly powers tries to set prices for their maximum profit maximizing level..

### c. Monopolistic market

Monopolistic competition is a type of imperfect competition such that one or two producers sell products that are differentiated from one another as goods but not perfect substitutes (such as from branding, quality, or location). In monopolistic competition, a firm takes the prices charged by its rivals as given and ignores the impact of its own prices on the prices of other firms.

In a monopolistically competitive market, firms can behave like monopolies in the short run, including by using market power to generate profit. In the long run, however, other firms enter the market and the benefits of differentiation decrease with competition; the market becomes more like a perfectly competitive one where firms cannot gain economic profit. In practice, however, if consumer rationality/innovativeness is low and heuristics are preferred, monopolistic competition can fall into natural monopoly, even in the complete absence of government intervention. In the presence of coercive government, monopolistic competition will fall into government-granted monopoly. Unlike perfect competition, the firm maintains spare capacity. Models of monopolistic competition are often used to model industries. Textbook examples of industries with market structures similar to monopolistic competition include restaurants, cereal, clothing, shoes, and service industries in large cities. Monopolistically competitive markets have the following characteristics:

There are many producers and many consumers in the market, and no business has total control over the market price.

Consumers perceive that there are non-price differences among the competitors' products.

There are few barriers to entry and exit

Producers have a degree of control over price.

The long-run characteristics of a monopolistically competitive market are almost the same as a perfectly competitive market. Two differences between the two are that monopolistic competition produces heterogeneous products and that monopolistic competition involves a great deal of non-price competition, which is based on subtle product differentiation. A firm making profits in the short run will nonetheless only break even in the long run because demand will decrease and average total cost will increase. This means in the long run, a monopolistically competitive firm will make zero economic profit. This illustrates the amount of influence the firm has over the market; because of brand loyalty, it can raise its prices without losing all of its customers. This means that an individual firm's demand curve is downward sloping, in contrast to perfect competition, which has a perfectly elastic demand schedule