

Price and Output Determination Under Monopoly/Equilibrium of the Firm/Industry Under Monopoly

Monopoly is that market form in which a single producer controls the whole supply of a single commodity that has no close substitute. Producing firm itself is an industry and its main duties are to determine the equilibrium level of output and to determine the appropriate price. The equilibrium of monopolists in the short run and the long run can be explained below.

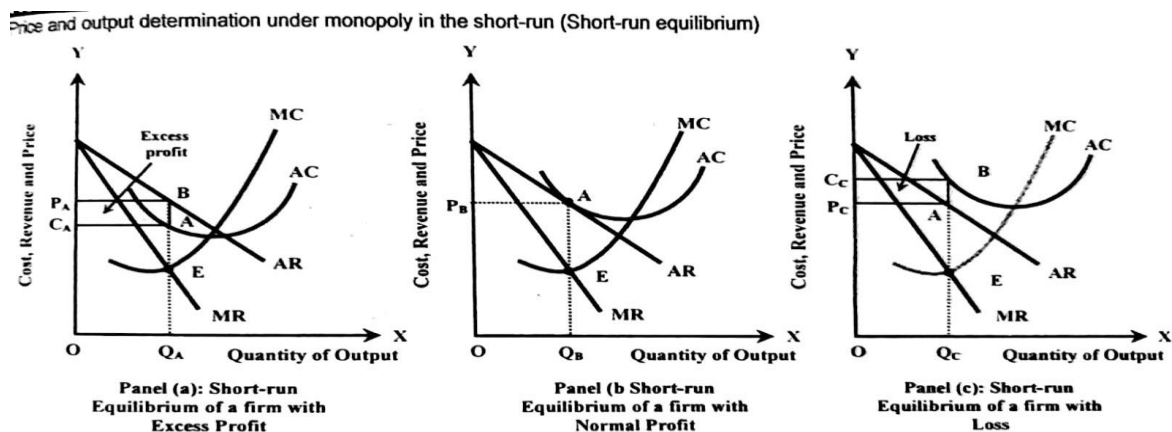
Short-run Equilibrium Under Monopoly

Short-run is the period in which monopolist has no sufficient time to expand its plant size or production capacity. It means the seller cannot adjust its output as per the market demand. A firm under a monopoly faces a downward-sloping demand curve or average revenue curve. Further, in monopoly, since average revenue falls as more units of output are sold, the marginal revenue is less than the average revenue. In other words, under monopoly, the MR curve lies below the AR curve. The Equilibrium level in monopoly is that level of output in which marginal revenue equals marginal cost. The producer will continue to produce if marginal revenue exceeds the marginal cost. At the point where MR is equal to MC, the profit will be maximum and beyond this point, the producer will stop producing. Thus, the monopolist maximizes profit or attains equilibrium by selling the output at the point where $MR=MC$ and MC are rising or the slope of MC is greater than the slope of MR or MC curve must intersect MR curve from below.

At the point of equilibrium, the monopolist may earn an excess profit, normal profit, or incur a loss as well. It depends on *its cost revenue conditions, the threat of potential competition or presence of remote substitutes, and government policy in respect of monopoly*. So the monopolist realizes three conditions for profit maximization as given below.

- If $AR > AC$, the firm obtains excess profit
- If $AR = AC$, the firm obtains normal profit
- If $AR < AC$, the firm bears the loss.

These all possible three situations in the short run are explained with the help of the following diagram.



Three cases of short-run equilibrium under monopoly are explained below.

Excess Profit ($AR > AC$)

Panel 'a' of the figure shows the case of excess profit by producing OQ_A units of output, selling at OP_A price/average revenue and the per-unit cost is OC_A . Firm A's excess profit is $P_A B A C_A$.

Normal Profit ($AR = AC$)

Panel 'b' of the above diagram shows the normal profit case of a monopolistic firm with OQ_B output, selling at OP_B , and per-unit cost of output is also OP_B . So here average revenue and per-unit cost or average cost are equal, so the firm is earning normal profit only.

Loss ($AR < AC$)

Monopolistic firm 'c' is suffering loss by producing OQ_C units of output at OC_C per unit cost and selling at OP_C per unit price or average revenue. The average cost is higher than the average revenue, so the firm is suffering a loss equal to $ABC_C P_C$.

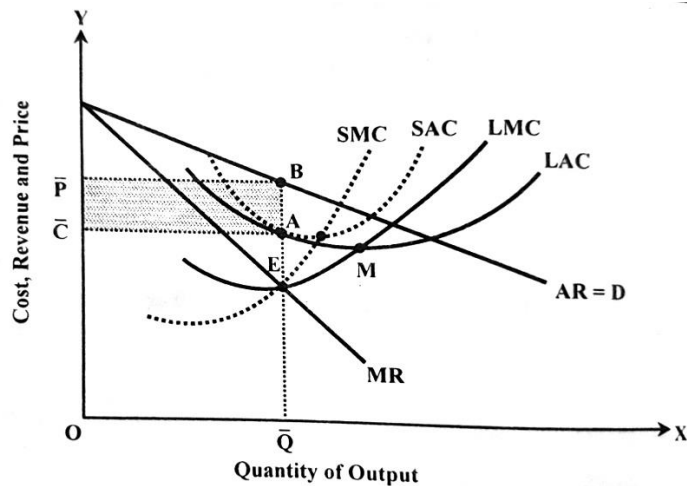
Therefore, at the point of equilibrium, the monopolist does earn a profit only and may suffer losses as well in the short-run. Monopolist seller hence does not always earn profit in the short run.

Long-run Equilibrium Under Monopoly

The long-run is the time in which a monopolist can adjust its plant and productive capacity according to the market. Thus, in the long run, the monopolist would adjust the size of his plant. The long-run average cost curve and its corresponding long-run marginal cost curve portray the alternative plants, i.e., various plant sizes from which the firm must choose for operation in the long-run.

The monopolist would choose the plant size which is most appropriate for a particular level of demand. In the short run, the monopolist adjusts the level of output while working with a given existing plant. His profit-maximizing output in the short run will be where only the short-run marginal cost curve (i.e., marginal cost curve with the existing plant) is equal to marginal revenue. But in the long run, he can further increase his profits by adjusting the size of the plant. So, in the long run, he will be in equilibrium at the level of output where the given long marginal revenue curve cuts the long-run marginal cost curve.

Under the monopoly, there is the barrier of entry to a new firm and there are no close substitutes of the product, the firm thus earns excess profit only in the long-run. The firm to be in equilibrium in the long-run requires the execution of the conditions; $MR = LMC$ and LCM cut MR from below. The following diagram presents the long-run equilibrium of a monopolistic firm.



The above figure shows that monopolist is earning excess profit in the long-run. 'E' is the equilibrium point executing all the required conditions and showing output \bar{Q} , the price per unit or long-run average revenue per unit is \bar{P} and long-run per unit cost is \bar{C} . Price or average revenue is greater than average cost ($\bar{P} > \bar{C}$), the monopolist is earning excess profit in the long-run and is represented by $\bar{P}\bar{C}AB$.

In the long-run, a monopolist may operate on the falling part of LAC or at the minimum point of LAC and rising part of LAC. Operation on the falling part of LAC shows underutilization of plant, the minimum point of LAC shows efficient or optimal utilization and rising part of LAC shows overutilization of plan. The operation decision of monopolists in the long-run depends on the nature of the demand or AR curve. The above monopolistic firm is operating at falling part of LAC shown by SAC and that ensures that the firm is using its plan in sub-optimal size. The efficient or socially desirable output is always produced at the minimum point of LAC (at point M on the diagram) but the monopolist is producing at less than optimal or socially desirable output and charges higher prices. Thus, AM part of the LAC is the unused capacity of the plan in the long-run.

Economic Effects of Monopoly

Monopolies are criticized because of their potential negative effects on the consumer. However, some economists think that monopoly power is essential for innovation. Here is a brief discussion of the positive as well as the negative effect of monopoly market structure.

Negative Effects of Monopoly

Allocative Inefficiency

Allocative efficiency is achieved when the price is equal to marginal cost ($P=MC$). Under perfect competition market $P=AC$ minimum= MC . So, a perfect competition market ensures allocative efficiency. In monopoly, there is allocative inefficiency because monopolist operates at falling part of AC rather than its minimum points like perfect competition market and price is greater than marginal cost at equilibrium. Therefore, the monopolist does not achieve allocative efficiency. In the case of perfect competition, price is lower and that allows the greatest number of consumers to enjoy the product and maximizes consumer surplus but in the case of monopoly due to higher price people who will buy do not enjoy much consumer surplus.

Productive Inefficiency

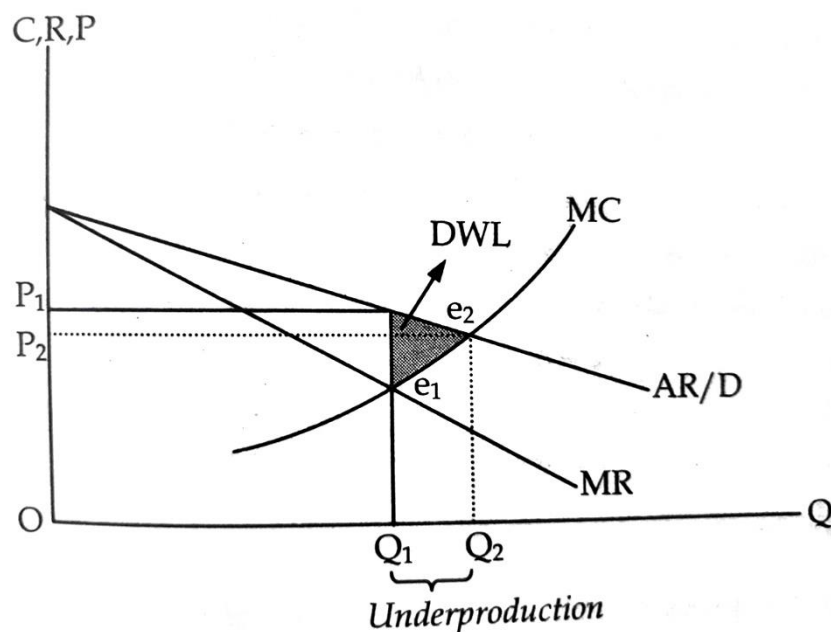
Productive efficiency is achieved when the firm operates at $P = \text{Minimum AC}$. Because the product is produced at minimum ATC, a perfect competition market achieves productive efficiency. However, a monopolist does not set the price equal to its minimum ATC when $MR = MC$. Thus, a monopolist does not achieve productive efficiency.

So, the effect of monopoly can be seen in the form of higher prices, less output in the market, reduction of consumer surplus, and decrease consumers surplus and economic welfare.

Dead Weight Loss/ Loss of Social Welfare

A monopoly causes loss of social welfare and falsifications in resource allocation. The loss of social welfare is caused by sub-optimal use of resources and by dead-weight loss under monopoly. The dead-weight loss is the potential gains that did not go to the producer or the consumer. As a result of the deadweight loss, the combined surplus of the monopoly and the consumers is less than that obtained by consumers in a competitive market. A monopoly is less efficient in total gains from trade than a competitive market.

The price is higher, and output is less in the case of a monopoly than in a competitive market. So, the loss of social welfare can be reflected in terms of loss of consumers and producers surplus due to monopoly. This can be shown in the following graph.



Point e_1 of the figure shows the equilibrium under monopoly market with the price is higher than marginal cost and sales quantity is Q_1 . If the market would have perfectly competitive then the firm would provide Q_2 output at P_1 price which is equal to MC as shown by equilibrium point e_2 . The level of output Q_2 defined by e_2 under perfect competition is socially desirable output. The existence of monopoly creates underemployment denoted by the Q_1Q_2 level of output. Less than socially desirable or optimal output is produced by monopoly shows the dead-weight loss in the economy. Thus, the dead-weight loss is a decline in total surplus due to market distortions like the existence of monopoly and regulation of government in the market.

Therefore, under monopoly price is higher than marginal cost, lowest point of AC and creates a loss.

Contributes Income Inequality

Consumers under a monopoly market pay a higher price for the products than they would have paid under a competitive market and thus there is the transition of income from consumers to the owners of the monopoly. So, this causes transfer of income from low-income people (buyers are generally having lower income than monopoly owner) to high-income people (monopoly owner), creates high-income inequality in the society. The higher the degree of monopoly in the economy higher will be the inequality. The situation that may be preferable for reduction of inequality due to monopoly when buyers are wealthier than monopoly seller. It is because the excess wealth of buyers transfers to the monopoly owner and that helps to reduce income inequality. However, in general, monopoly owners are wealthier than buyers of monopoly products.

Reduce Innovations

Since there are no close substitutes in the market, a monopolist often does not tend to improve its products more than it is needed or it must. Therefore, monopoly may reduce innovation in the economy.

Cost Inefficiencies

The monopolist in general operates its plant at the falling part of ATC as it has no incentive to operate at the minimum point of ATC. But in the case of a perfect competition market, a firm must operate at a minimum point of ATC, otherwise, they are driven out of business. Monopoly has no such concerns. This is known as X-inefficiency. X-inefficiency happens when a lack of effective competition in an industry means that average costs are higher than they would be if the market were perfectly competitive. So there exist cost inefficiencies in the case of a monopoly market.

Positive Effects of Monopoly

Economies of scale

In an industry with high fixed costs, a single firm can gain lower long-run average costs through exploiting economies of scale. This is particularly important for firms operating in a natural monopoly (e.g. rail infrastructure, gas network). For example, it would make no sense to have many small companies providing tap water because these small firms would be duplicating investment and infrastructure. The large-scale infrastructure makes it more efficient to just have one firm – a monopoly.

Innovation

Without patents and monopoly power, drug companies would be unwilling to invest so much in drug research. The monopoly power of patent provides an incentive for firms to develop new technology and knowledge, that can benefit society. Also, monopolies make supernormal profit, and this supernormal profit can be used to fund investment which leads to improved technology and dynamic efficiency. For example, large tech monopolies, such as Google and Apple have invested significantly in new technological developments.

However, this can also have downsides with drug companies able to charge excessively high prices for life-saving drugs. It also gives drug companies an incentive to push pharmaceutical treatments rather than much cheaper solutions to promoting good health and avoiding poor health in the first place.

Firms with Monopoly Power May be the Most Efficient and Dynamic

Firms may gain monopoly power by being better than their rivals. For example, Google has monopoly power on search engines – but can we say Google is an inefficient firm who do not seek to innovate?

References and Suggested Readings

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