25

The Monopolistic Firm

Monopoly, that is, exclusion of customers, has certainly no tendency to produce increase of the number of traders.

—Jeremy Bentham, *Emancipate Your Colonies*

25.1 Basic Model

In this chapter we model the same firm as we saw in the problem of the previous chapter but with new management. The firm is now a monopoly, meaning that it can adjust its output and selling price to maximize its profit. This situation means that the profits will be higher than was the case with the competitive firm in this market and the output will be lower.

The only difference here from the model in the previous chapter is that price is now a function of the quantity consumed. The relationship between price and the quantity consumed is given by a demand curve. A linear demand curve is shown in the Figure 25.1.

Each unit of a good gives utility. If consumption increases, utility increases at a decreasing rate. Therefore, the demand curve is downward sloping, expressing the fact that consumers are willing to pay less the more of the good can be consumed. In our model, the demand curve was concocted to include the \( P = MC \) point of the model in the previous chapter. Additionally, we arbitrarily chose a price at which the quantity demanded becomes 0. This "choke-off price" is set in the model to 10 and corresponds to the intercept of the demand curve above with the vertical axis.

![Figure 25.1](image)
How does the monopoly choose its profit-maximizing-output level and what is the corresponding price? As in the analytic solution of the previous chapter, we take first the derivative of the profit function with respect to output. We arrive at the condition that marginal revenues must equal marginal cost if the firm wants to achieve a profit maximum:

\[
\frac{\partial \text{PROFIT}}{\partial Q} = \frac{\partial R}{\partial Q} - \frac{\partial C}{\partial Q} = \text{MR} - \text{MC} = 0 \Rightarrow \text{MR} = \text{MC}
\]  

(1)

However, \( \text{MR} \neq P \) because the price depends on the demand curve. The difference between price and marginal cost is the monopoly rent rate. The solution to the monopolist’s profit maximization problem is shown in Figure 25.2 as \( Q^* \), the corresponding price is \( P^* \). The supply curve is the monopolist’s marginal cost curve.

Figure 25.2 illustrates that in the optimum, the monopolist produces less and charges a higher price than a firm in a perfectly competitive market. As a result, profits will be higher, too.

Let us model the process in which the monopolist identifies her profit-maximizing output level (Fig. 25.3). For the monopolist whose initial output level is below the profit-maximizing one, price will initially be high but drop with increased production.

The results of the model are shown in Figure 25.4. Profits increase steadily until a maximum is achieved. At that point marginal revenues equal marginal costs, and from then on price and output are held constant. Since output remains constant, the marginal cost and marginal revenue curves are no longer defined in our model, once the optimum is achieved: these curves are calculated by dividing through \( Q \) minus \( \text{DELAY}(Q, DT) \), which is...