# Section 6: The Deadweight Loss of Monopoly

As mentioned in the previous sections, except for administrative monopoly, normally monopoly (price-searching) is actually good for the society, because the cause of it is entry threshold which is established by innovation of new technologies, and cannot eliminate competition.

In MES, monopoly is believed to be evil based on some seemingly plausible analysis which think monopoly will cause so-called “deadweight loss”, an efficiency loss shown in Fig.16-1. The demand curve in it is sloping downwards, reflecting that the market structure is price-searching (monopoly), and a monopolist can increase the price along the demand curve by decreasing the output.

If a monopolist sets a single price for all products sold, his average revenue (AR) curve will coincide with the demand curve, as has been explained in Lecture 15. His marginal revenue (MR) curve will no longer coincide with the demand curve, but is located below it, because if he increases output which is the increase in market supply, there will be a decrease in price (not only the price of the increased output, but also that of all output). Thus the increase in revenue (i.e. MR) by producing one more unit output is lower than the price (i.e. AR).

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![figure16-1](image/figure16-1.jpg)

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Figure 16-1

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The marginal cost (MC) curve is sloping upwards in Fig.16-1, which is also the supply curve of the monopolist. Suppose there is only one producer in the market, so the supply curve of him is also that of the whole market.

According to what has been introduced in Lecture 15, the optimum for any producer in any market (no matter the market structure is price-taking or price-searching) is MR＝MC, which is the point H in Fig.16-1. It determines the optimal output is Q<sub>m</sub>. With the output (supply) of Q<sub>m</sub>, the optimal price determined by the demand curve is P<sub>m</sub> that is corresponding to the point F vertically above H.

In MSE, monopoly is believe to be evil because the optimum of it (Q<sub>m</sub>,P<sub>m</sub>) is compared with that of price-taking (Q<sub>c</sub>,P<sub>c</sub>) that is the intersection point (E) of the demand curve and the supply curve (coincident with the MC curve). The equilibrium point of monopoly or price-searching is lower in output and higher in price than that of price-taking, which is unfavorable to consumers.

However, the analysis of MSE is much more comprehensive with the consumer surplus and producer surplus as analysis tool introduced in Lecture 15. Monopoly is unfavorable for consumers but favorable for producers, while the whole society is made up of both consumers and producers, so it is not possible to draw an intuitive conclusion on whether monopoly is favorable or not for the whole society. Only by considering the changes in the benefits of both parties can an objective conclusion be drawn. Consumer surplus can be used to measure the benefit or welfare for consumers in a transaction, while producer surplus for producers. By comparing the magnitude of them, we can analyze the welfare effect of monopoly on the whole of society.

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Under the market structure of price-taking, the equilibrium price is P<sub>c</sub>, and the consumer surplus is AP<sub>c</sub>E. By contrast, under the market structure of monopoly or price-searching, the equilibrium price is Pm, and the consumer surplus is AP<sub>m</sub>F. Obviously, the consumer surplus has reduced by the trapezoidal area of P<sub>m</sub>FP<sub>c</sub>E.

Under the market structure of price-taking, the equilibrium price is P<sub>c</sub>, and the producer surplus is P<sub>c</sub>EB. By contrast, under the market structure of monopoly or price-searching, the equilibrium price is Pm, and the producer surplus is P<sub>m</sub>FHB, which has one more rectangular of P<sub>m</sub>FGP<sub>c</sub> but one less curved triangle of GEH. Therefore, whether the producer surplus increases or decreases depends on whether the area of the rectangle larger or smaller than the curved triangle. There is no geometric theory to ensure that the rectangle must be larger than the triangle, which proves mathematically that the only producer in the market is not necessarily a monopolist. If the rectangle is smaller than the triangle, the only producer in the market would better take the price of P<sub>c</sub> instead of the monopolistic price of Pm. However, in MSE, this possibility is completely ignored because it implies the definition of monopoly is wrong, and it is supposed that the rectangle must be larger than the triangle to ensure that producers will only choose the monopolistic price.

Based on the above analysis of consumer surplus and producer surplus, it is clear that the rectangular of P<sub>m</sub>FHB comes from part of the trapezoidal P<sub>m</sub>FP<sub>c</sub>E. In other words, that part of the decrease in consumer surplus does not lose, but is transferred to producer surplus, because the rise in price increases the producers’ revenue. Although this transfer is unfavorable to consumers, it is favorable to producers. From the perspective of the whole society, it is only income redistribution and does not cause any loss.

However, there is still a triangle of FGE that is not transferred to producer surplus. What is more, although the increase in producer surplus is transferred from consumers, the decrease in producer surplus (the curved triangle of GEH) is not transferred to anyone else. Thus, the curved triangle of FEH summed up by these two triangles is called the “Deadweight Loss”, which is precisely the reason for MSE to criticize monopoly, because from the perspective of the whole society, it is a net loss.

The same conclusion can be made from another perspective. Any equilibrium in economics must be in line with the equal marginal principle.

For example, in the equilibrium of consumer, the marginal substitution rate of different goods is equal to their relative price that is actually the marginal cost of goods for consumer. In other words, the equilibrium should be the intersection point of demand curve (reflecting the marginal use value or MV of the good for consumer) and the price (reflecting the marginal cost of the good for consumer). Another example is that in the equilibrium of producer, marginal revenue is equal to marginal cost (MR=MC).

The above two examples are respectively from the perspective of consumer or producer. From the perspective of the whole society, the equilibrium of consumer and that of producer should be the same, which means in the equilibrium of optimum of the whole society, the MV of consumer is equal to the MC of producer. The economic implication is that for the whole society, when a good is produced and then consumed, the value (revenue) is consumption enjoyment (use value for consumer), and the cost is production cost, and they must be equal on the margin in equilibrium or optimum.

Under the market structure of price-taking, the intersection point of the demand curve and the supply curve is the equilibrium, and the MV represented by the demand curve is naturally equal to the MC represented by the supply curve, so the society is in optimum. However, under the market structure of monopoly or price-searching, in equilibrium, MV is at the point F, while MC is at the point H, so the former is located higher than the latter, and the society is not in optimum. The reason is that the consumption or the output is too low. By increasing consumption or output, according to the law of diminishing marginal use value, MV will decrease; while according to the law of increasing marginal cost, MC will increase, which will make them be equal in the end (the point E in Fig.16-1), and the society is in optimum.

It is the critique on monopoly in MSE: the consumer optimum and the producer optimum are not the same equilibrium, which causes the society to be not in optimum, resulting in the deadweight loss of the curved triangle (FEH).