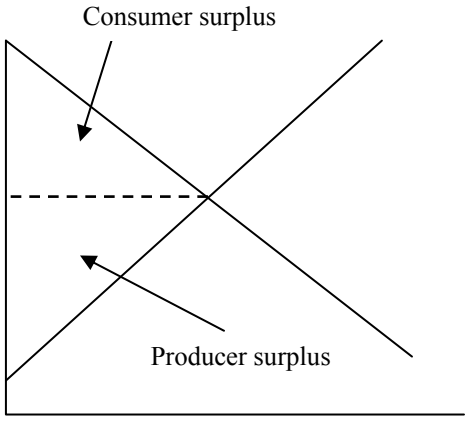
Math Recitation #6– October 27, 2009

I. Consumer and producer surplus
II. Concepts of marginal revenue
III. Profit maximization in a monopoly

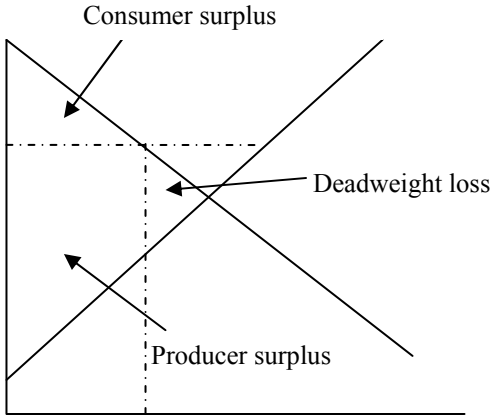
I. Consumer and producer surplus



Consumer surplus: The surplus that occurs due to the fact that the market price is the valuation of the last unit purchased, which always has the lowest value of all purchased units because of diminishing marginal utility. On every unit before the last unit, the consumer is paying less than what they value the good for.

Producer surplus: The surplus that occurs due to the fact that the producer is receiving the market price that is equal to the marginal cost of their last unit. The marginal cost on the last unit is always higher than the cost of all the other units. On every unit before the last unit, the producer is receiving more money per unit than it cost to make that unit.

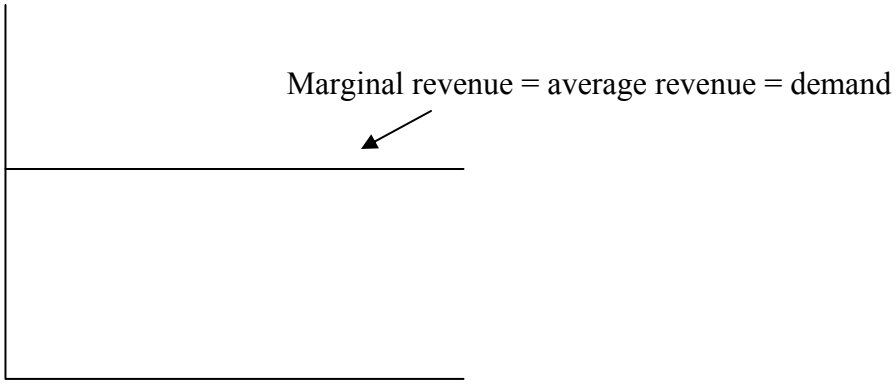
Price floor:



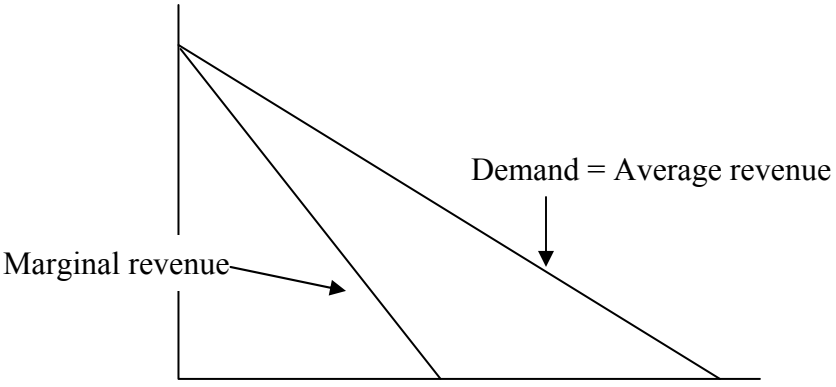
Some of consumer surplus is transferred to producers and there is now deadweight loss, which is a loss in surplus that neither party receives due to the inefficient pricing. Transactions that could be mutually beneficial to consumers and producers in the market are prevented from happening.

II. Concepts of marginal revenue

In a perfectly competitive market, individual firms do not have market power, the ability to change market outcomes if they alter their pricing and/or quantity produced. Because of this, the marginal revenue curve a firm in a competitive market faces is a horizontal line. The marginal revenue is constant over all quantities.



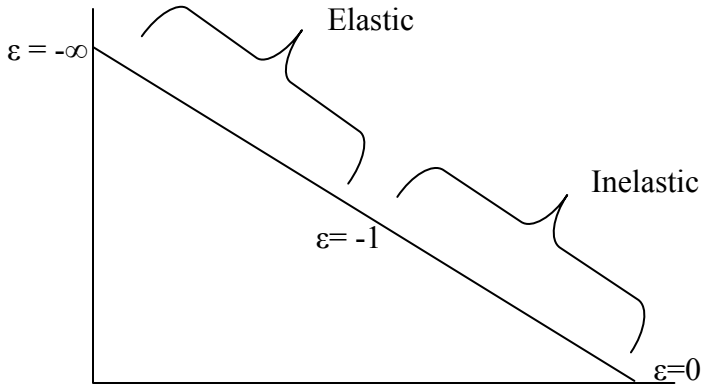
In a non-perfectly competitive market firms have market power, the quantity they choose to produce affects market price and in turn their marginal revenue. Therefore, the marginal revenue curve firms face is a function of quantity.



Marginal revenue = dRevenue/dQ = dP(Q)*Q/dQ = derivative of demand * quantity + demand
Marginal revenue is always less than price for any given quantity → by producing another unit, the firm is driving the price down because they are increasing supply. The downward sloping demand curve shows that price goes down when quantity goes up.

Marginal revenue is closely related to the demand curve and therefore elasticity.

$$\text{Marginal revenue} = P\left[1 + 1/\varepsilon\right]$$



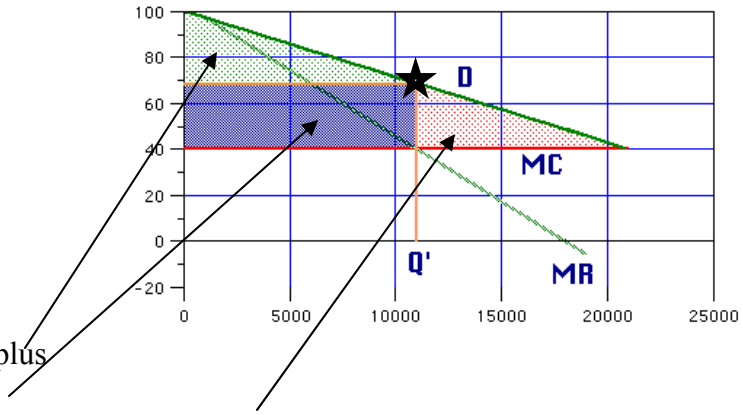
Where the demand curve is inelastic, marginal revenue will be less → loss in revenue
Change in quantity is greater than change in price where curve is elastic → if firm increases output the price drop will be smaller than the quantity change, which is good for the firm profits.
Change in quantity is smaller than change in price where curve is inelastic → if firm increases output, the price drop will be greater than the quantity change, which is bad for the firm profits.

Two effects firm considers when producing more or lowering the price:

1) Additional revenue from selling more units (+)
2) Reduction in price per unit due to more market quantity (-)

III. Profit maximization in a monopolistic market

A monopoly firm will produce at the point where MR=MC and charge the corresponding price to that quantity on the demand curve.



Consumer surplus
Profits to firm
Loss in consumer surplus in monopoly as compared to a competitive market

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11.203 Microeconomics
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