

# CHAPTER 6

## Optimization without Constraints: One Independent Variable Case

Topics:

- ➔ Maximize profits
  - Competitive market case
  - Monopoly case
- ➔ Effects of taxes
  - Lump-sum tax
  - Profit tax
  - Excise tax
- ➔ Maximization of tax revenue

Our attention will be turned to the study of goal equilibrium, in which the equilibrium state is defined as the optimum position for a given economic unit(e.g. a household, a business firm) and in which the said economic unit will be deliberately striving for attainment of that equilibrium.

We will use the optimization to study how consumers, producers, or public policy makers choose their best alternatives given their limited resources, as the essence of the optimization problem is to choose the BEST alternative available.

Utility Maximization:

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Profit Maximization

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Cost Minimization

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Total Revenue Maximization

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Tax Revenue Maximization

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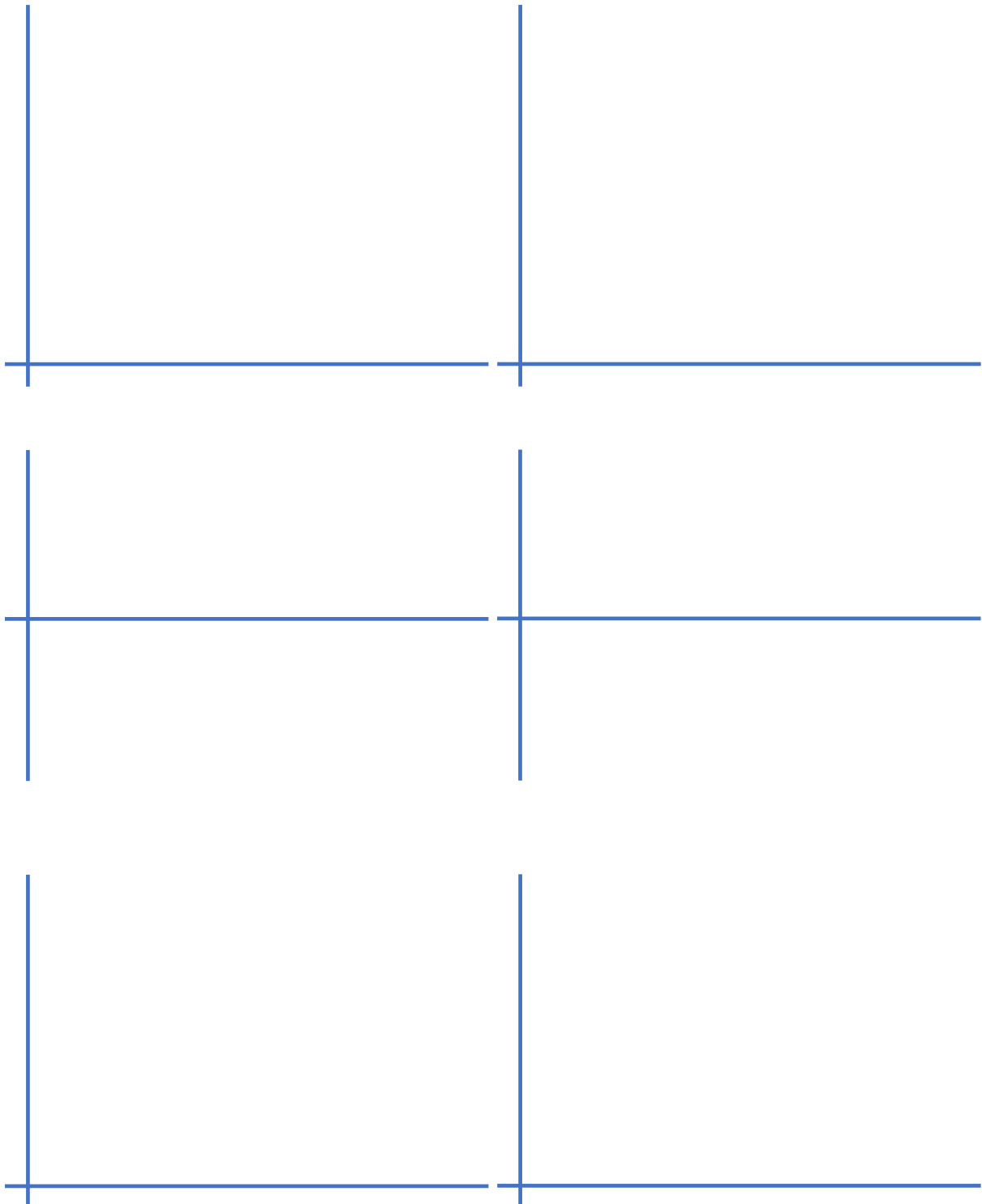
Social Welfare Maximization

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**TR, TC,  $\pi$ , MC, and MR**



➔ **Producers in Competitive Market**

<b>Recap: Characteristics of competitive market</b>
1. Many Buyers, many sellers
2. Homogeneous product
3. Perfect information among buyers and Sellers
4. Free entry and perfect mobility

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Firm's Profit Maximization:

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Example: Suppose Peter decides to open a company selling shirts in a competitive market. He has total cost  $C = 100 + Q^2$ , where  $Q$  is his level production. If market price for this shirt is 60 baht per shirt, how many shirt should he produce?

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If  $Q = 2L$ , how many employee should Peter hire so that he can maximize his profit?

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➔ **A monopolist**

<b>Recap: Characteristics of monopoly market</b>
1. One producer
2. Inelastic market demand
3. Economy of scale in production
4. Barrier to entry

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Let market demand be  $Q = a - bP$ .

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Total Revenue:TR

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Total Cost: TC

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Objective:

$\pi =$

Find Q that maximizes profit

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**FONC:**

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**SOSC:**

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**Rule of Thumb for Pricing:**

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**Measuring Monopoly Power**

Lerner’s Degree of Monopoly Power

$$L = \frac{(P - MC)}{P} = -\frac{1}{E_p}$$

The Lerner Index is between 0 and 1 since the range of demand that a monopolist chooses to produce has  $1 < |E_p| < \infty$

For producers in a competitive market, Lerner Index is 0, since  $P=MC$ .

The higher the Lerner index is, the higher the monopoly power is.



**The effect of tax on profit maximization**

Before tax:

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After tax:

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Three types of tax:

Lumsum tax

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Profit tax:

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**From FONC, at the level of output at maximizing profit**

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**The profit-maximizing price is**

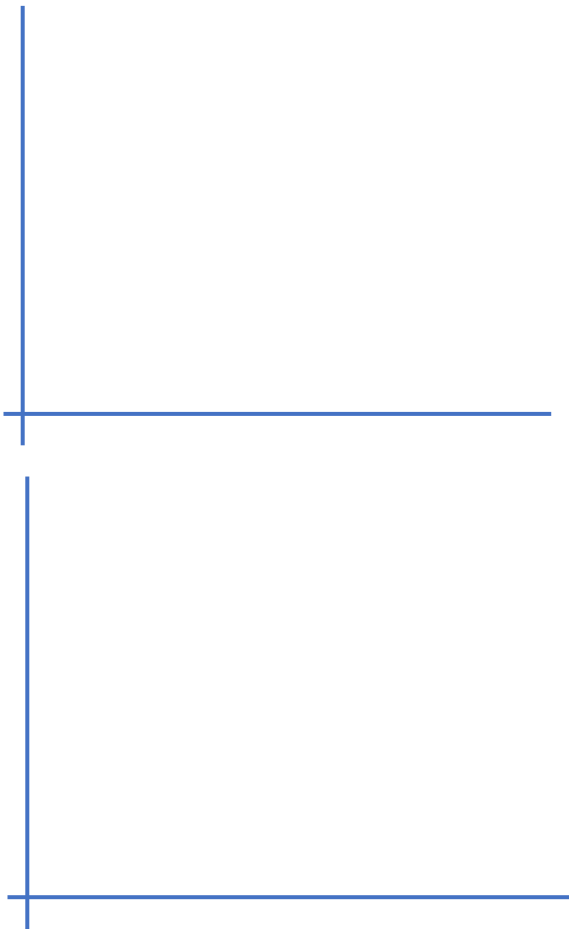
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**Profit after tax is**

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Therefore, if lumpsum tax is collected, the optimal quantity and price will be as same as before tax, but the level of profit will be reduced by the tax amount..... Profit tax can be called neutral tax.





**From FONC, at the level of output at maximizing profit**

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**The profit-maximizing price is**

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**Profit after tax is**

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If unit tax is collected, producer will reduce production and increase price. The level of profit will be reduced. Unit tax is distortion tax.

