



B.E. International Program

Faculty of Economics, Thammasat University



EE 211 Principle of Microeconomics

Exercise 5 -Answers

(Applications of Demand and Supply, and Government Policies)

1. Explain how a price floor policy can be implemented. Use the demand and supply diagram to illustrate the change in the market equilibrium, and how this policy can create a welfare loss to the society. Do the same analysis for a price ceiling policy.

See lecture notes.

2. Suppose that the demand and supply of pencils are given by $Q^D = 30 - P$ and $Q^S = P$.
 - a. Determine the equilibrium price and quantity.

$P^*=15, Q^*=15$

- b. Suppose a price floor is fixed at $P = \$20$. Show the change in the market equilibrium. Is there any excess demand or excess supply, and by how much? Calculate the amount of deadweight loss to the society.

Excess supply is 10 units.

DWL = \$25.

- c. Do the same analysis as in question b. when a price ceiling is set at $P = \$10$.

[Note: The explanation to these questions can be found in Exercise 4 Question 4.]

3. Use the same demand and supply functions as in question 2. Suppose now that a specific tax of \$6 per unit is imposed on the producer.
 - a. Show how the demand or supply curves would change.

The supply curve shifts upward by \$6.
[Draw the graph yourself!]
 - b. Determine the new equilibrium levels (i.e. price paid by buyers, price received by sellers, and quantity).

$$P_B = 18, P_S = 12, Q_T = 12$$

- c. Calculate the per-unit tax burden for consumers and producers, and total tax burden for both parties. Who bears more tax burden?

$$\text{Per-unit tax burden for consumers} = \$18 - \$15 = \$3.$$

$$\text{Total tax burden for consumers} = 12 \times \$3 = \$36.$$

$$\text{Per-unit tax burden for producers} = \$15 - \$12 = \$3.$$

$$\text{Total tax burden for producers} = 12 \times \$3 = \$36.$$

They bear tax burden equally.

- d. Recall the price elasticities you obtained in Exercise 3. How do these price elasticities relate to the tax incidence you find in question c.?

In this case, both demand and supply are unitary elastic. So, both parties share the same amount of tax burden.

- e. Suppose now the demand curve is changed to $Q^D = 30 - 2P$, and the same \$6 per unit tax is imposed on the producer. Redo questions a., b., and c. above. Discuss your answers.

$$\text{Before tax: } P^* = 10, Q^* = 10. (\epsilon_d = 2, \epsilon_s = 1)$$

$$\text{After tax: } P_B = 12, P_S = 6, Q_T = 6.$$

$$\text{Per-unit tax burden for consumers} = \$12 - \$10 = \$2.$$

$$\text{Total tax burden for consumers} = 6 \times \$2 = \$12.$$

$$\text{Per-unit tax burden for producers} = \$10 - \$6 = \$4.$$

$$\text{Total tax burden for producers} = 6 \times \$4 = \$24.$$

Producers bear more tax burden because supply is more inelastic.

4. Use the same demand and supply functions as in question 2. Suppose now that a \$6 subsidy is given to the producer.

- a. Show how the demand or supply curves would change.

Supply curve shifts down by \$6.

- b. Determine the new equilibrium levels (i.e. price paid by buyers, price received by sellers, and quantity).

$$\text{After Subsidy: } P_B = 12, P_S = 18, Q_{\text{subsidy}} = 18.$$

- c. Calculate the changes in consumer surplus, producer surplus, and net social welfare.

$$\text{New CS} = \frac{1}{2} * (30 - 12) * 18 = \$162 \rightarrow \Delta \text{CS} = 162 - 112.5 = 49.5$$

$$\text{New PS} = \frac{1}{2} * 18 * 18 = \$162 \rightarrow \Delta \text{PS} = 162 - 112.5 = 49.5$$

$$\text{Subsidy costs} = 18 * \$6 = 108.$$

$$\text{Net social welfare} = 49.5 + 49.5 - 108 = -9$$

5. Suppose that the government increases the minimum wage rate from 300 baht per day to 700 baht per day. Discuss the consequence of this change in the minimum wage rate. Is the society as a whole better off or worse off, and why? Use a diagram to support your answer. You can make assumption(s) as needed.

We discussed this in class.