

EE211 Assignment #3 (Section 2 Semester 2/2020)

Instructions:

- Assigned date is Thursday the 13th, May 2021. **Due date is Friday the 21th, May 2021 before 11.59 PM.**
 - Submission is only received through BE Moodle platform as PDF file.
 - Name your file as StudentID_nickname, such as 1234567489_Bo.
 - There is no need to rewrite the question into your answer sheets. Indicating clearly question and item number is sufficient.
 - Write your nickname and student ID on top-right corner of the first page.
 - For those who do not have a digital device to write on, you can write your answers in sheets of paper, take pictures, convert them into a single PDF then submit in on Moodle.
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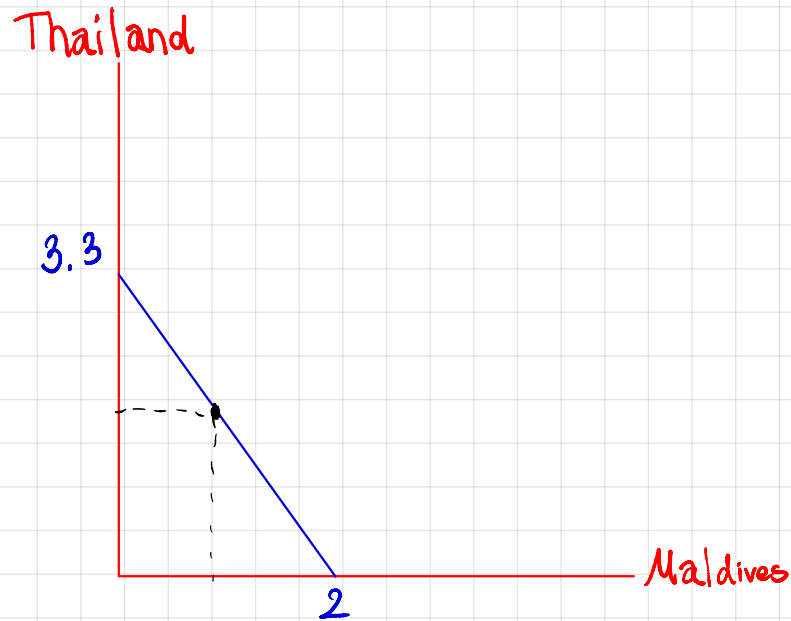
1. Neo loves traveling. Supposed he has two choices of destination, Thailand and Maldives which costs him 3,000 baht and 5,000 baht respectively. His utility received from traveling to Maldives is twice compared to traveling to Thailand. Answer the following questions.

- a) If Neo has 10,000 baht of budget, how many times of each destination he will choose to travel and why? Draw his indifference curve and budget line to analyze his decision and indicate details on the graph.
- b) If his budget increases to 20,000 baht, draw his income-consumption curve. Also plot his income demand of traveling in Thailand, find its slope and explain.

2. Consider a long-run production in which there are only two inputs labor and capital, and the input prices for labor and capital are wage (w) and interest rate (r), respectively. Suppose that at the equilibrium levels of labor and capital (L^* , K^*), the marginal product of labor (MP_L) and marginal product of capital (MP_K) are 6 and 8, respectively.

- a) (5 points) Calculate the marginal rate of technical substitution (MRTS) and state the cost-minimization conditions of this firm, given that the required output is fixed at Q_0 . If the market wage rate (w) is \$3, what is the interest rate at the equilibrium?
- b) (5 points) Suppose now that the wage rate (w) increases to \$4, ceteris paribus. Draw a diagram to illustrate the changes in the cost-minimizing combination of inputs.

- a) (5 points) Calculate the marginal rate of technical substitution (MRTS) and state the cost-minimization conditions of this firm, given that the required output is fixed at Q_0 . If the market wage rate (w) is \$3, what is the interest rate at the equilibrium?



Maldives	TH
0	3
1	1
2	0

$$\frac{MU_T}{P_T} = \frac{MU_M}{P_M}$$

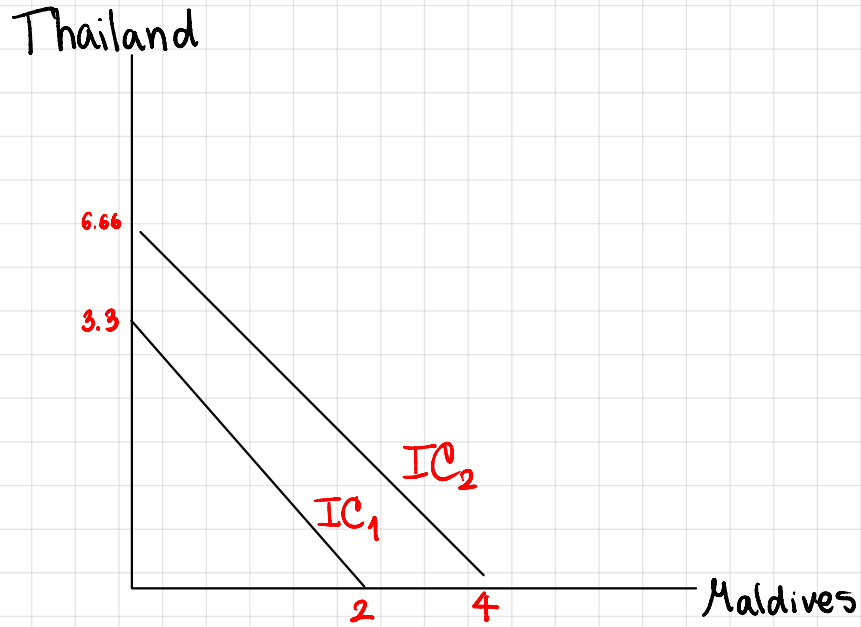
$$\frac{MU_T}{3,000} = \frac{MU_M}{5,000}$$

$$\frac{1}{3,000} < \frac{2}{5,000}$$

Must travel to Maldives more than TH and the option that travel to maldives more than thailand is Maldives 2 time and Thailand 0 times

b) If his budget increases to 20,000 baht, draw his income-consumption curve. Also plot his income demand of traveling in Thailand, find its slope and explain.

There are now 2 options that



Maldives
0
1
2
3
4

Thailand
6
5
3
1
0

} time to $M > TH$

$M=4, T=0$ is the only option that utilised budget 20,000 gain more utility

2. Consider a long-run production in which there are only two inputs labor and capital, and the input prices for labor and capital are wage (w) and interest rate (r), respectively. Suppose that at the equilibrium levels of labor and capital (L^* , K^*), the marginal product of labor (MP_L) and marginal product of capital (MP_K) are 6 and 8, respectively.

- a) (5 points) Calculate the marginal rate of technical substitution (MRTS) and state the cost-minimization conditions of this firm, given that the required output is fixed at Q_0 . If the market wage rate (w) is \$3, what is the interest rate at the equilibrium?

$$MRTS = \frac{MP_L}{MP_K} = \frac{6}{8} = \frac{3}{4}$$

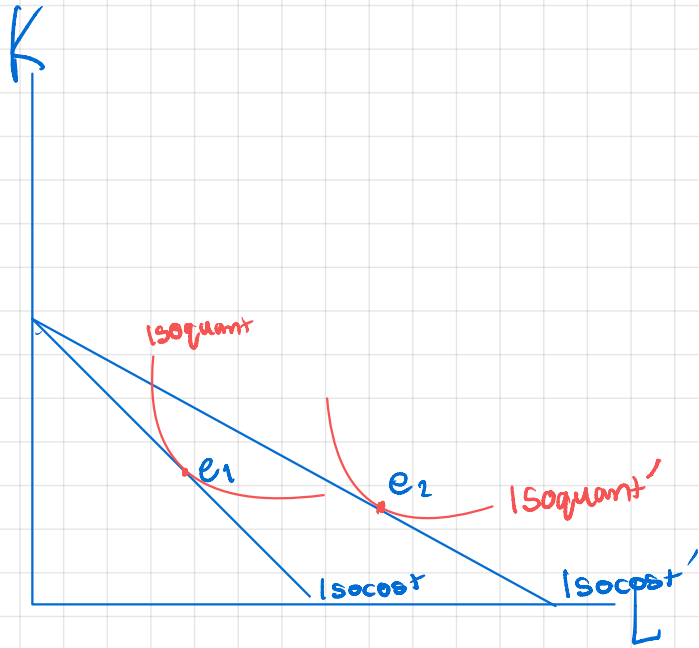
Equilibrium \Rightarrow Slope isocost = slope isoquant

$$\frac{MP_L}{MP_K} = \frac{w}{r}$$

$$\frac{3}{4} = \frac{3}{r}$$

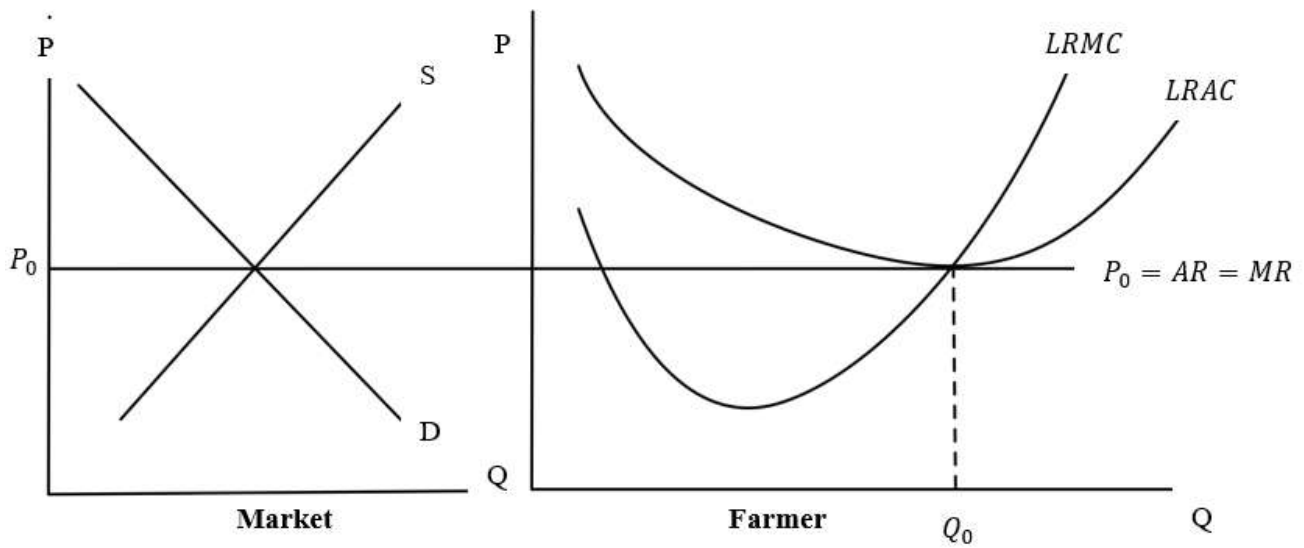
$$r = 4$$

- b) (5 points) Suppose now that the wage rate (w) increases to \$4, ceteris paribus. Draw a diagram to illustrate the changes in the cost-minimizing combination of inputs.



Because of the increasing in wage so in make isoquant shift this will make firm to hire less labor and buy more capital so e_1 shift to e_2

3. A Thai rice farmer is in a long run equilibrium in a perfect competition and produces at the quantity Q_0 as shown in the graph below.



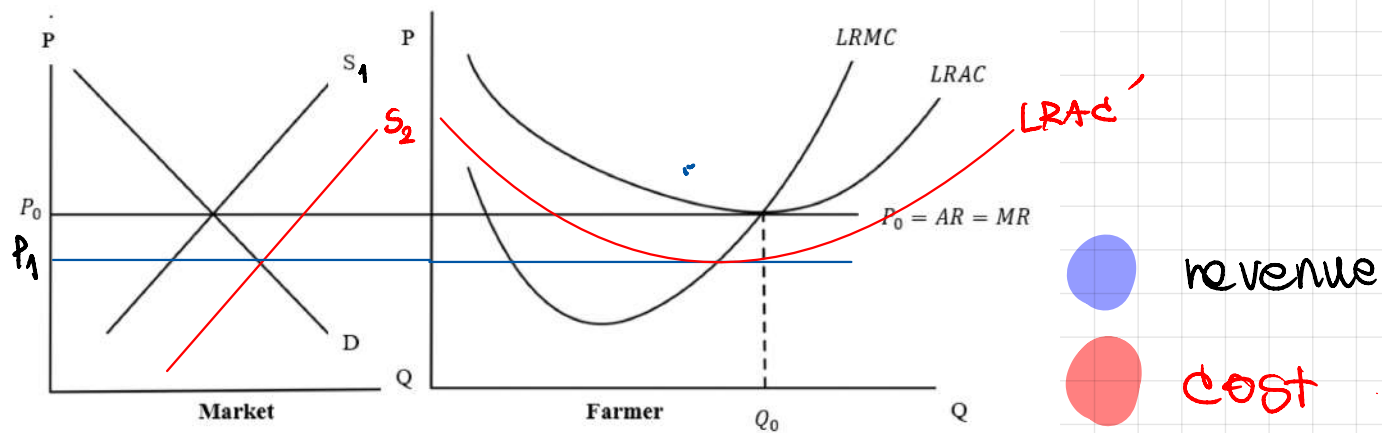
- The government grants a lump sum subsidy to every farmer. How will this change the LRAC? Explain why LRMC does not change.
- Will the lump sum subsidy change the quantity the farmer wants to produce to maximize his profit? Show in the graph that the farmer now earns an Excess Profit. Explain.
- Demonstrate how this Excess Profit will affect the market price in the Long Run that allows new entry to the market.

4. An inverse demand function in a monopoly market is given by

$$P = 100 - 5Q$$

Supposed that the monopolist is very efficient, which gives a constant marginal cost of \$20, answer the following questions.

- How many units of this product will be produced that maximizes monopolist's profit in the short-run? Also, how much does this product cost? Show your argument clearly.
- How much is the total variable cost when the monopolist's profit is maximized?
- If this monopolist has a fixed cost of \$160, how much is the monopolist's profit?

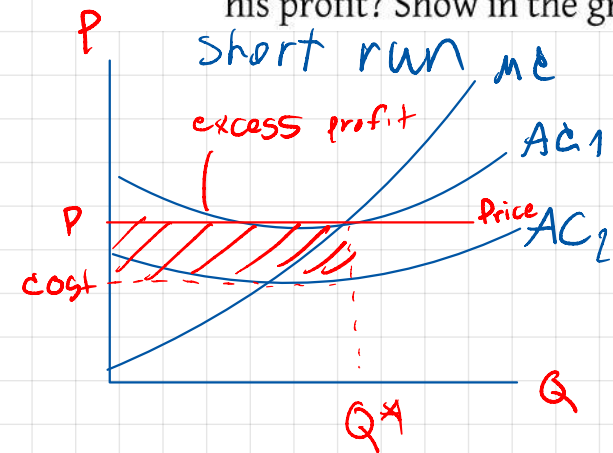


a) The government grants a lump sum subsidy to every farmer. How will this change the LRAC? Explain why LRMC does not change.

when government grant a lump sum subsidy a firm can reduce the fix cost that make LRAC shift down

The reason that LRMC does not change because MC is derive from derivative of variable cost or slope of it, the subsidy didn't reduce amount of variable cost or we can say that we still pay the wage same amount so VC didn't change so MC still the same

- b) Will the lump sum subsidy change the quantity the farmer wants to produce to maximize his profit? Show in the graph that the farmer now earns an Excess Profit. Explain.



In short run there will be the excess profit due to lump sum subsidy so the firm doesn't have to produce more but long run the new competitor and that makes price go down until normal profit.

- c) Demonstrate how this Excess Profit will affect the market price in the Long Run that allows new entry to the market.

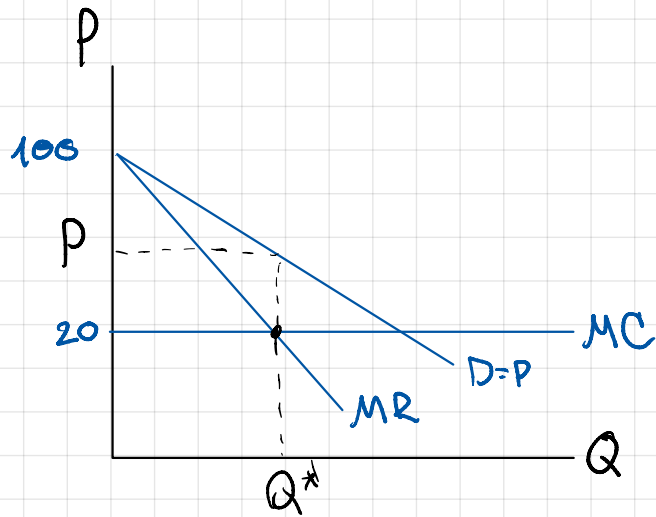
In the long run the new competitor will enter the market because there is the excess profit so supply in market will increase ($S_1 \rightarrow S_2$) after the new competitor enters the market the price will go down and down until $P = LRAC = MR$ (normal profit)

(use the graph in (a))

$$P = 100 - 5Q$$

Supposed that the monopolist is very efficient, which gives a constant marginal cost of \$20, answer the following questions.

- a) How many units of this product will be produced that maximizes monopolist's profit in the short-run? Also, how much does this product cost? Show your argument clearly.



$$\Pi = \text{Total revenue} - \text{Total cost}$$

$$\Pi = P \cdot Q - \text{Total cost}$$

$$= (100 - 5Q)Q - 20Q$$

$$\Pi = 100Q - 5Q^2 - 20Q$$

$$\frac{d\Pi}{dQ} = 100 - 10Q$$

$$MR = MC$$

$$20 = 100 - 10Q$$

$$80 = 10Q$$

$$Q = 8 \quad \text{X}$$

$$P = 100 - 5(8)$$

$$= 60$$

b) How much is the total variable cost when the monopolist's profit is maximized?

$$MC = \frac{dTC}{dQ}$$

$$TC = \int MC$$
$$= 20Q + C \quad \text{fix cost}$$

variable cost

firm maximized profit at $Q=8$

$$\therefore = 20 \cdot 8 = 160$$

c) If this monopolist has a fixed cost of \$160, how much is the monopolist's profit?

$$MC = \frac{dTC}{dq} =$$

$$\therefore \text{Total cost} = \int 20 dq$$
$$= 20q + C \quad \text{fixed cost}$$

$$\text{Total} = 20(8) + 160$$
$$= 320$$

$$\Pi = TR - TC$$

$$= PQ - 320$$

$$= 60(8) - 320$$

$$= 480 - 320$$

$$= 160$$

5. Assumed both a product market and a labor market are perfectly competitive, a table of marginal product is given below.

Unit of labor	Marginal product of labor	TC	TR
2	12	96	
3	8	144	
4	6	192	
5	4	240	
6	2	288	

This product can be sold in the market for \$12 each while labor wage is \$48, answer the following questions clearly.

- Figure out how many units of labor this firm will choose as input for its production to maximize profit. Illustrate a graph to support your answer and explain.
- Supposed that there is a sudden economic recession driving consumers' purchasing power downward, what would happen to the units of labor hired by this firm? Support your answer with illustrations that also show a connection between product market and labor market.

6. Consider these statements and indicate which one of the choices fits with each statement and roughly explain why.

Choices:

- Not a market failure
 - Market power
 - Externalities
 - Public goods
 - Moral hazard
 - Adverse selection
- People feel that price level is hiking.
 - Morpheus always hears a loud fight coming from a room next to his.
 - Trinity does not receive her full-benefit until her first 3-month of her work position.
 - In Chiang Mai, there is no earthquake alarming system.
 - Starbucks coffee is more expensive than Amazon coffee.

below.

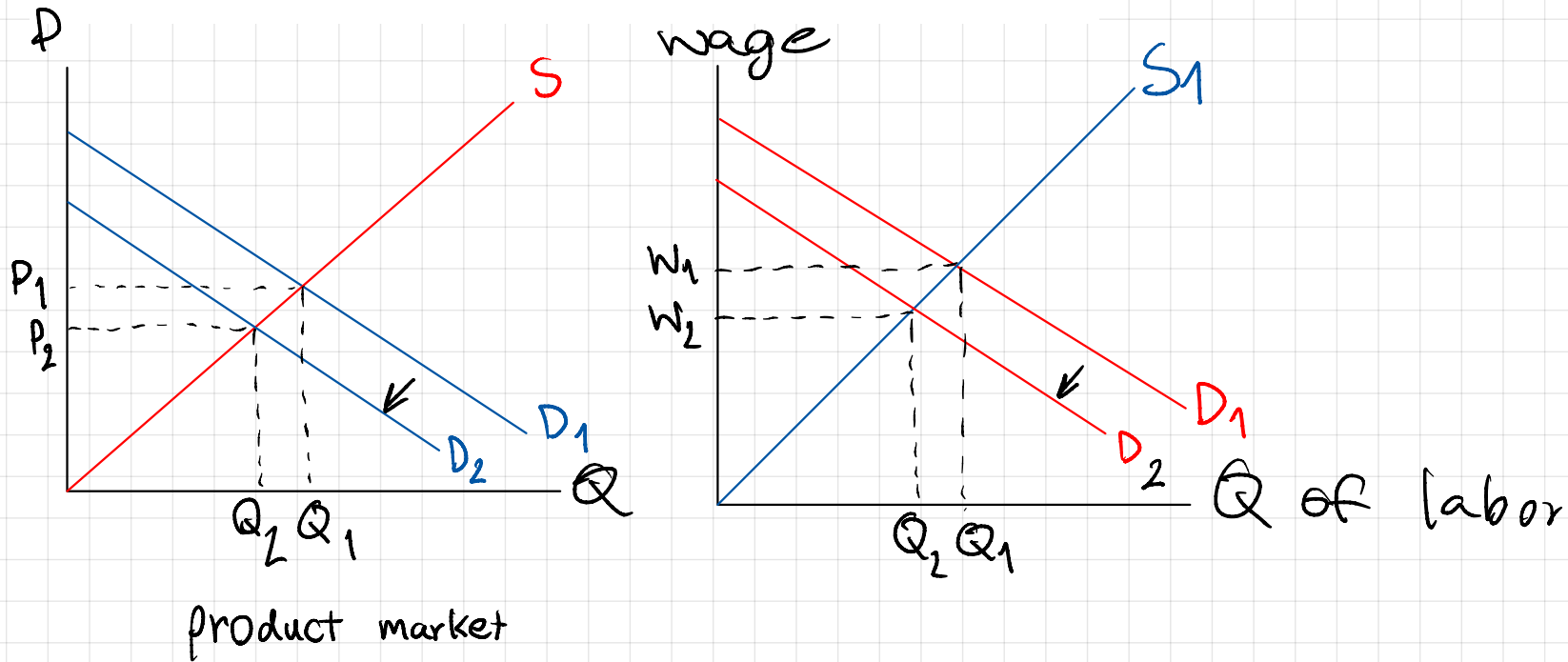
Unit of labor	Marginal product of labor	TP	TC	TR	Profit	MC	MR
2	12	12	96	144	48	96	144
3	8	20	144	240	96	48	96
4	6	26	192	312	120	48	72
5	4	30	240	360	120	48	48
6	2	32	288	384	96	48	48

This product can be sold in the market for \$12 each while labor wage is \$48, answer the following questions clearly.

- a) Figure out how many units of labor this firm will choose as input for its production to maximize profit. Illustrate a graph to support your answer and explain.

From table above a firm will maximize quantity to produce at $MC = MR$ which is 5 labor so the firm hire 5 labor

- b) Supposed that there is a sudden economic recession driving consumers' purchasing power downward, what would happen to the units of labor hired by this firm? Support your answer with illustrations that also show a connection between product market and labor market.



When pp of consumer go down demand in product market will shift down too. Then demand curve in the labor will also shift down because consumer consume less

6. Consider these statements and indicate which one of the choices fits with each statement and roughly explain why.

Choices:

1. Not a market failure
2. Market power
3. Externalities
4. Public goods
5. Moral hazard
6. Adverse selection

- 1 a) People feel that price level is hiking. *failure because people only feel not actual to market change*
- 3 b) Morpheus always hears a loud fight coming from a room next to his. *external factor affect the market*
- 5 c) Trinity does not receive her full-benefit until her first 3-month of her work position. *receive benefit fully*
- 4 d) In Chiang Mai, there is no earthquake alarming system. *It alarm system is public utility*
- 2 e) Starbucks coffee is more expensive than Amazon coffee. *More expensive price require market power to sell market barrier or monopoly*