

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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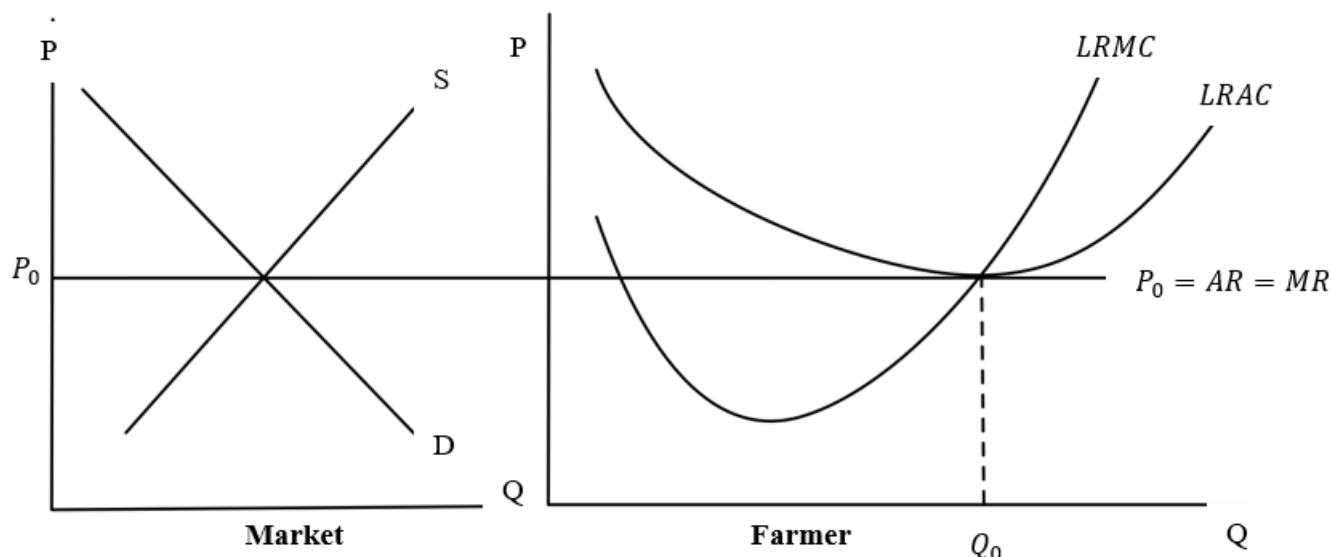
1. Neo loves traveling. Supposed he has two choices of destination, Thailand and Maldives which costs him 3,000 baht and 5,000 baht respectively. His utility received from traveling to Maldives is twice compared to traveling to Thailand. Answer the following questions.

- a) If Neo has 10,000 baht of budget, how many times of each destination he will choose to travel and why? Draw his indifferent 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.

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?

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
2	12
3	8
4	6
5	4
6	2

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:

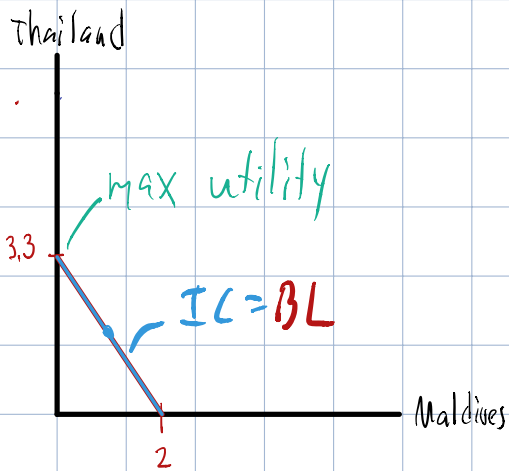
- Not a market failure
- Market power
- Externalities
- Public goods
- Moral hazard
- Adverse selection

- 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.

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.

M = No. of times to Maldives
T = No. of times to Thailand



Maldives	TH
0	3
1	1
2	0

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

$$\frac{MU_T}{3000} = \frac{MU_M}{5000}$$

$$\frac{1}{3000} < \frac{2}{5000}$$

∴ Must travel to Maldives more than TH and the option that travel to Maldives more than Thailand is Maldives 2 times 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.

At budget = 20,000 baht, Neo options are:

Maldives	Thailand
0	6
1	5
2	3
3	1
4	0

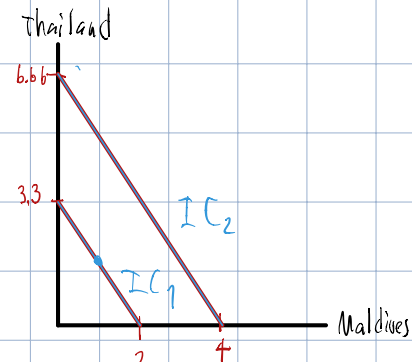
there are now 2 options that no. of time to M > T



M=4, T=0 is the only option that utilised budget=20,000 and also yields more utility.

slope of IC = undefined

MRS =



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?

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

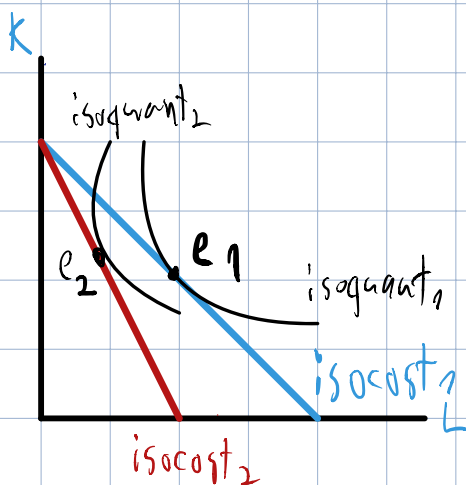
At the equilibrium $\rightarrow$ slope of isoquant = slope of isocost

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

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

$$r = 4$$

- 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.

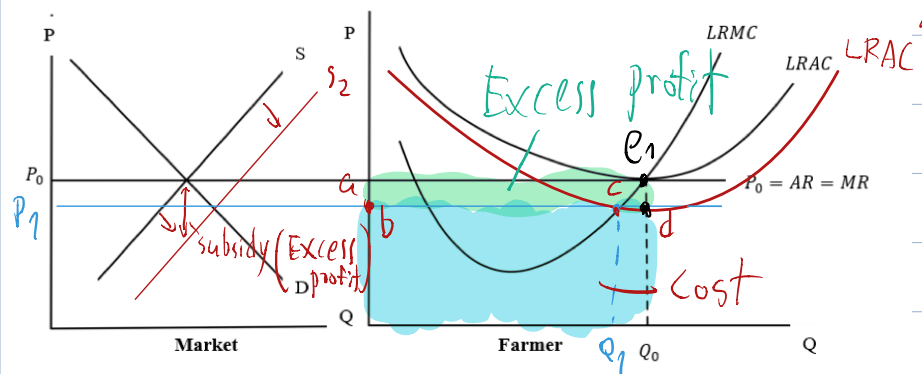


So firm will consume less labor since it has become relatively more expensive.

Then firm will consume more capital instead because it become cheaper.

So the isocost is shift down and equilibrium is move from e_1 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.



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

$$AC = \frac{TC}{q} \text{ If } TC \downarrow \text{ then } AC \downarrow \text{ too}$$

TC - lump-sum tax $\rightarrow$ LRAC $\downarrow$ but $\nrightarrow$ LRMC

(a) Even the government grants a lump sum subsidy it will affect supply curve to shift to the right. Price will fall down but it will affect LRAC to shift down but slope still the same since it is only amount of money not affect to per unit cost. LRMC does not change due to lump sum subsidy doesn't affect cost of production per unit (MC).

- 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, firm produce same quantity but the lump sum subsidy will lower the LAC and cost become less so firm earn excess profit.

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

In long run, Excess Profit will seduce people to entry to the market then quantity rise up and price fall down until reach the normal profit then it will no one entry market anymore since no any benefit.

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.

- 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.

Maximum monopolist's profit is

$$MC = MR$$

$$TC = 8 \times 20 = \$160$$

$$20 = 100 - 10Q$$

$$P = 100 - 5Q$$

$$-80 = -10Q$$

$$TR = P \cdot Q = 100Q - 5Q^2$$

$$Q = 8$$

$$MR = \frac{dTR}{dQ} = 100 - 10Q$$

$$P = 100 - 5(8) = 60$$

$\therefore$ The quantity of product that maximizes profit in short-run is $Q = 8$ and it cost \$20 per unit.

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

assume constant marginal cost = $AC = 20$

$$TC = AC \cdot Q^* = 20 \cdot 8 = 160$$

$$TVC = TC - TF \quad TVC = 160 - 100 = \$60$$

$\therefore TVC = \$60$ when profit is maximized

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

$$P = 60 \times 8 = 480$$

Find TC

Find profit

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

$$\text{profit} = TR - TC$$

$$= 480 - 320$$

$$= 160$$

$$TC = \int 20 dQ \quad \text{fixed cost}$$

$$= 20Q + C$$

$$TC = 20(8) + 160 = 320$$

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
2	12
3	8
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5	4
6	2

24
24
24
20
12

P

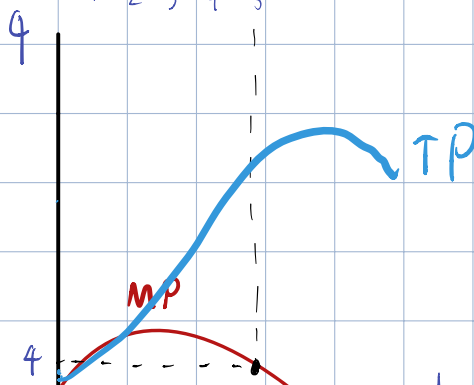
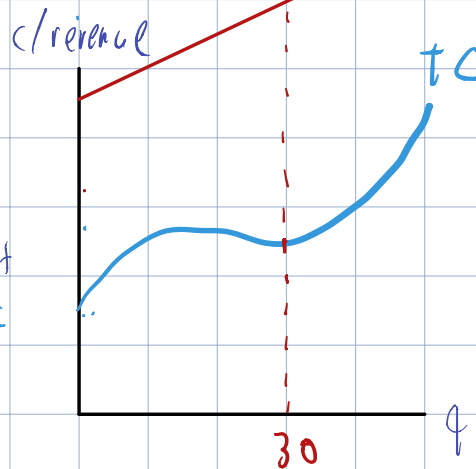
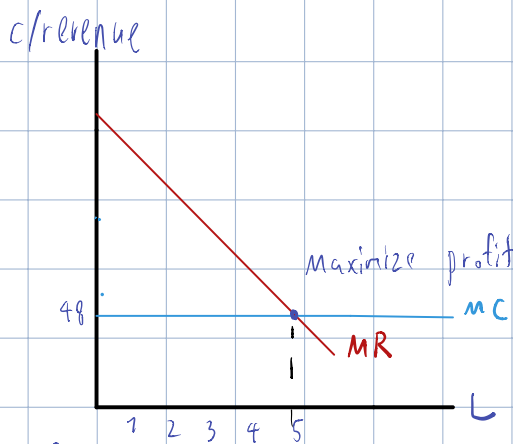
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This product can be sold in the market for \$12 each while labor wage is \$48, answer the following questions clearly.

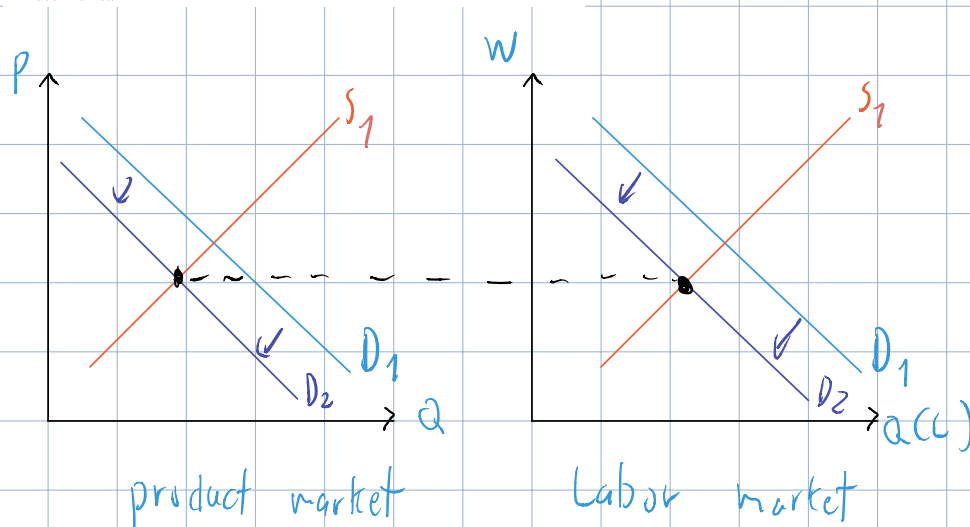
- a) Figure out how many units of labor this firm will choose as input for its production to maximize profit. Illustrate a graph to support your answer and explain.

	TR	MR	TC	MC	TP	profit
2	144	144	$2 \times 48 = 96$	$96 - 48 = 48$	12	48
3	240	96	144	48	20	46
4	312	72	192	48	26	120
5	360	48	240	48	30	120
6	384	24	288	48	32	96

∴ The firm will maximize profit at $MR = MC$ which is $48 = 48$ at 5 unit of labor.



- 1 2 3 4 5 6
- b) Suppose 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.



Fristly, when consumers' purchasing power down it will lead demand in the product market to shift down too. Then demand curve in the Labor market will shift down since people 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

- a) People feel that price level is hiking.
- b) Morpheus always hears a loud fight coming from a room next to his.
- c) Trinity does not receive her full-benefit until her first 3-month of her work position.
- d) In Chiang Mai, there is no earthquake alarming system.
- e) Starbucks coffee is more expensive than Amazon coffee.

(a) Not a market failure because people only "feel" not actual market that change.

(b) Externality since a loud fight is compared with external factor that affect the market.

(c) Moral hazard due to right of human Trinity should receive her benefit fully.

(d) Public goods because earthquake alarming system is public utility.

(e) Market power because more expensive price require market power to sell such as market barrier or monopoly.