

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.

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.

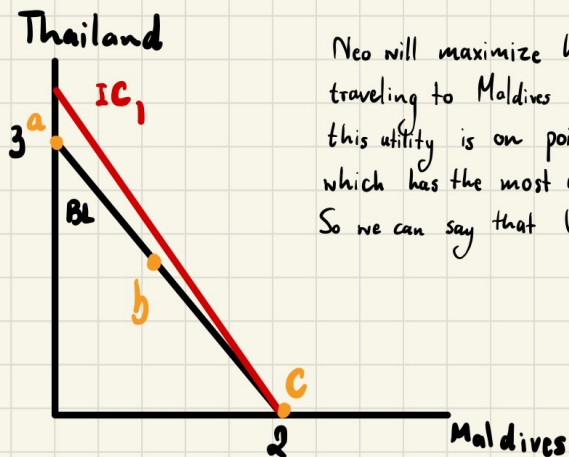
- If Neo has 10,000 baht of budget, how many times of each destination he will choose to travel and why? Draw his indifference curve and budget line to analyze his decision and indicate details on the graph.
- If his budget increases to 20,000 baht, draw his income-consumption curve. Also plot his income 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.

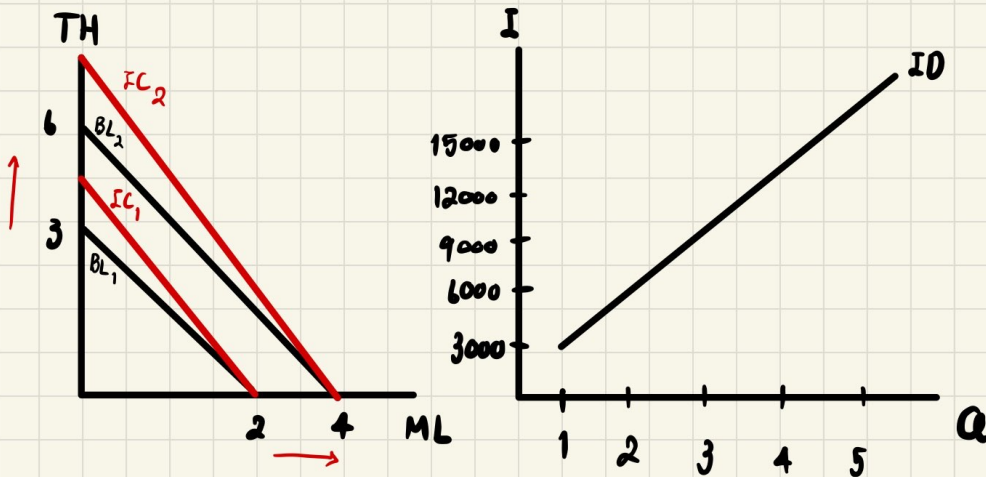
- (5 points) Calculate the marginal rate of technical substitution (MRTS) and state the cost-minimization conditions of this firm, given that the required output is fixed at Q_0 . If the market wage rate (w) is \$3, what is the interest rate at the equilibrium?
- (5 points) Suppose now that the wage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

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.



When Neo's budget is increased to 20,000, he will definitely choose to travel to Maldives for 4 times to maximize his utility. And due to he has no interest in traveling in Thailand, so the slope will be 0.

2.

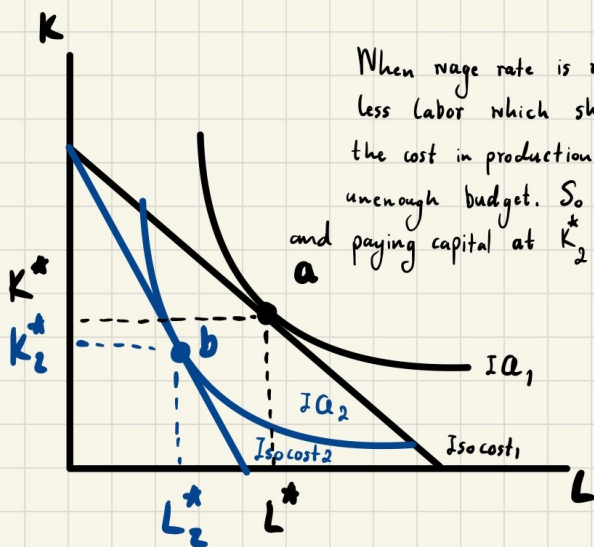
?

- 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?

$$\begin{aligned} \text{MRTS}_{LK} &= \frac{MP_L}{MP_K} = \frac{6}{8} \\ \text{MRMS}_{LK} &= \frac{w}{r} = \frac{3}{r} \end{aligned} \quad \left. \vphantom{\begin{aligned} \text{MRTS}_{LK} &= \frac{6}{8} \\ \text{MRMS}_{LK} &= \frac{3}{r} \end{aligned}} \right\} \begin{aligned} \text{MRTS}_{LK} &= \text{MRMS}_{LK} \\ \frac{6}{8} &= \frac{3}{r} \\ 6r &= 24 \\ \therefore r &= 4 \end{aligned}$$

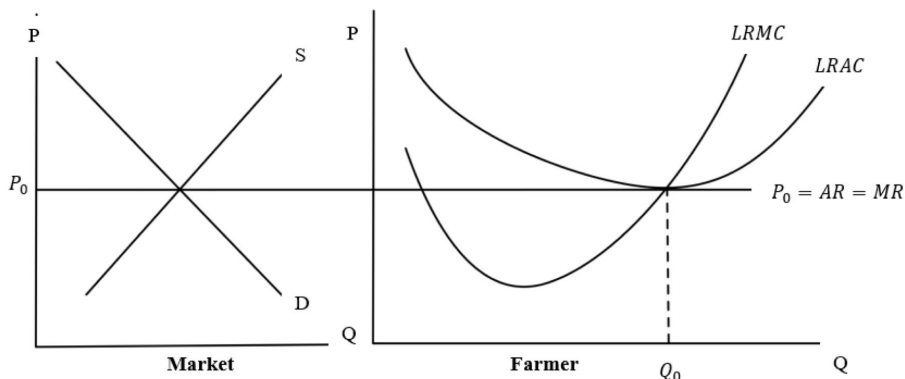
Since the maximized cost is when $\text{MRMS} = \text{MRTS}$, so $\frac{MP_L}{MP_K} = \frac{w}{r}$.

- 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.



When wage rate is raised to \$4. Firms have to hire less labor which shifts Isocost to $Isocost_2$ and use the cost in production at point B instead of point A due to unenough budget. So they can only produce by hiring labor at L_2^* and paying capital at K_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.

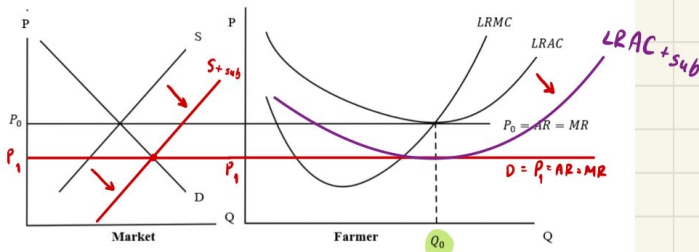
4. An inverse demand function in a monopoly market is given by

$$P = 100 - 5Q$$

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?

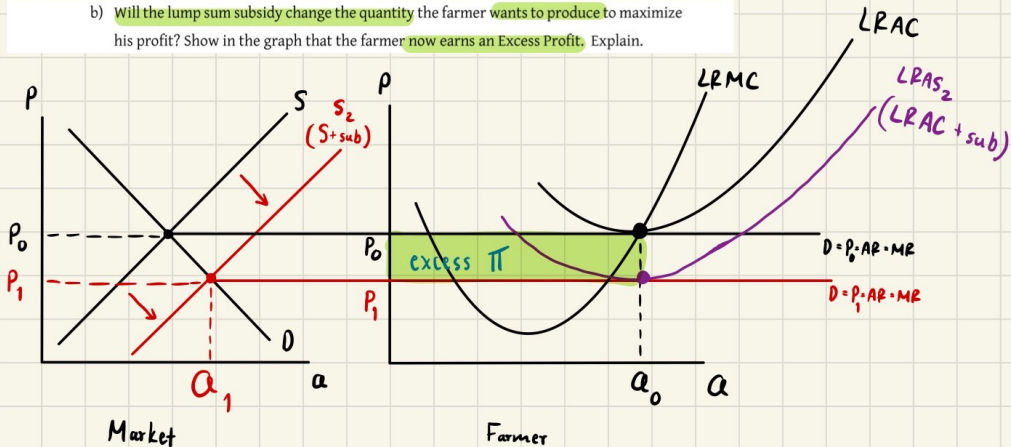
3. A Thai rice farmer is in a long run equilibrium in a perfect competition and produces at the quantity Q_0 as shown in the graph below.



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

Lump-sum subsidy the government provided to every farmers will lighten the load of fixed cost which affects LRAC to be decreased, the profit is also gained more at the same time. As we can see LRM is not affected because the subsidy provided is a single-time provided money that can only cover up in the fixed cost. Then this subsidy does not affect variable cost that is why LRM does not change.

- 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.



The lump-sum subsidy will not change the quantity that farmer wants to produce because the subsidy help decreasing fixed production cost only

, so the farmer will have more cost to produce more quantity of product to maximize his profit.

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

After the government provided them the lump-sum subsidy, it increase their excess profit. This will attract new players to enter the market, so the supply curve of this market will increase from S to S_2 in the right. Which makes the quantity of supply is higher while the demand for the product is still unchanged, so the price decreases from P_0 to P_1 . Due to the diminishing of price, producers will gain less benefit, AR and MR will also decrease. Lastly, producers will not make any benefit in Long-run due to perfectly competitive market.

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

$$P = 100 - 5Q$$

$$MC = 20$$

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

$$Q = ?$$

- 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.

$$\begin{aligned} P &= TFC \\ P &= 100 - 5Q \\ TR &= P \cdot Q \\ &= (100 - 5Q)Q \\ &= 100Q - 5Q^2 \\ \frac{dTR}{dQ} &= 100 - 10Q \\ MR &= 100 - 10Q \end{aligned}$$

$$\begin{aligned} MR &= MC \\ 100 - 10Q &= 20 \\ -10Q &= -80 \\ \therefore Q &= 8 \end{aligned}$$

$$\begin{aligned} \text{Product cost} &= AC \cdot Q \\ &= (20)(8) \\ &= 160 \end{aligned}$$

$$TVC = ?$$

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

$$\begin{aligned} TC &= TFC + TVC \\ TC - TFC &= TVC \\ TVC &= 160 - 100 \\ &= 60 \end{aligned}$$

$$FC = 160$$

$$\pi = ?$$

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

$$\text{Profit} (\pi) = TR - TC$$

$$\begin{aligned} P &= 100 - 5(8) \\ &= 60 \end{aligned}$$

$$\begin{aligned} TR &= 60 \cdot 8 \\ &= 480 \end{aligned}$$

$$\begin{aligned} TC &= TFC + TVC \\ &= 100 + 60 \\ &= 160 \end{aligned}$$

$$\begin{aligned} \therefore \pi &= 480 - 160 \\ &= 320 \end{aligned}$$

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.

- 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.
- 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.

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.

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

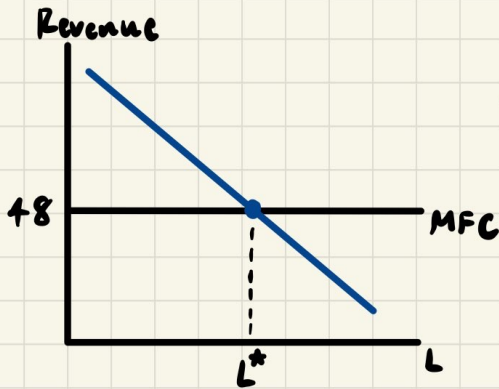
L	MP _L	n
Unit of labor	Marginal product of labor	
2	12	144
3	8	240
4	6	312
5	4	360
6	2	384

n

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.



$$MRP = MP \cdot MR$$

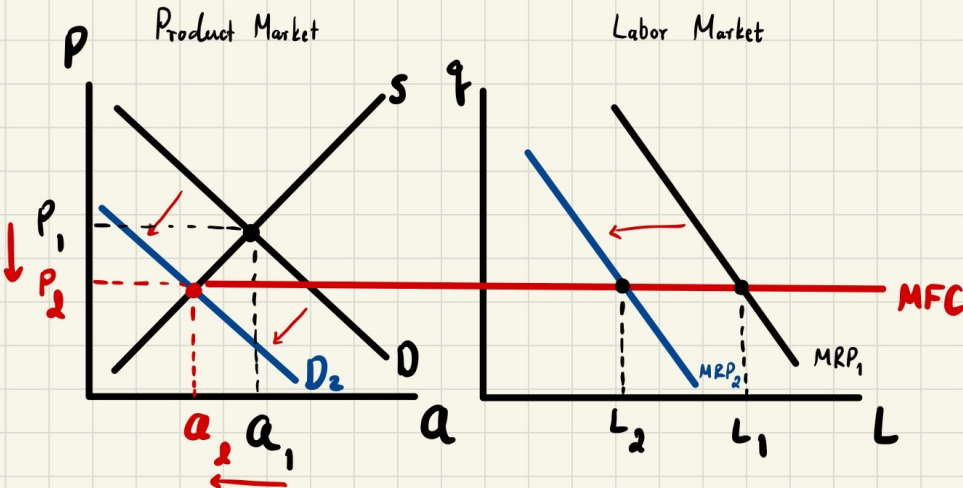
To maximize profit ; $MFC = MRP$ and $n = MFC$

$$48 = MP \cdot 12$$

$$\therefore MP_L = 4$$

At $MP_L = 4$, the firms will hire the labor for 5 units.

- 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 the consumer's purchasing power decreases, the consumer will have less demand of product so it shifts D_1 to D_2 . It also affects price to be lower, when the price is low, it affects MR to be decreased. And due to $MRP = MR \cdot MP$, it also leads MRP to be decreased. So in the labor market MRP_1 shifts to MRP_2 to hiring less unit of labor at L_2 .

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.
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 - d) In Chiang Mai, there is no earthquake alarming system.
 - e) Starbucks coffee is more expensive than Amazon coffee.

1. Not a market failure ; C → If she continue her business, there will be a chance to receive benefit.
2. Market power ; E → Starbucks has more power in the market, so they have more power to set their price to be higher.
3. Externalities ; B → He has negative externalities due to the disturbance from his neighbor.
4. Public goods ; D → Earthquake alarming system is a public good which causes benefit to everyone.
5. Moral hazard ; A → It is normal thing to have inflation in the market, but people will be afraid that their power of purchasing will fall due to higher price.