EE211 Assignment #3 KEY

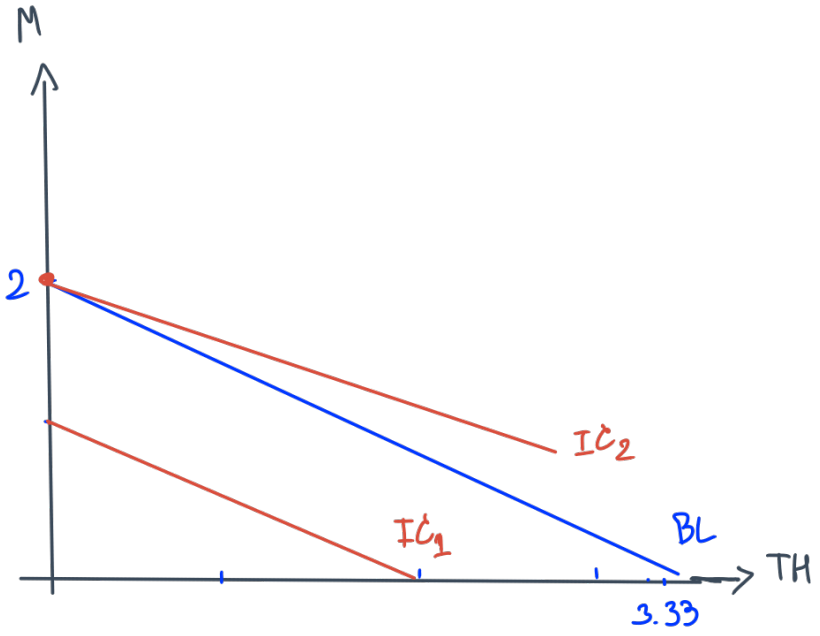
1. Neo loves traveling. Supposed he has two choices of destination, Thailand and Maldives which costs him 3,000 baht and 5,000 baht respectively. His utility received from traveling to Maldives is twice compared to traveling to Thailand. Answer the following questions.

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.

- First, his IC is a straight line since his utility received from travelling to Maldives is twice compared to Thailand, meaning that he prefers 2 times travelling to Thailand as much as travelling to Maldives once.

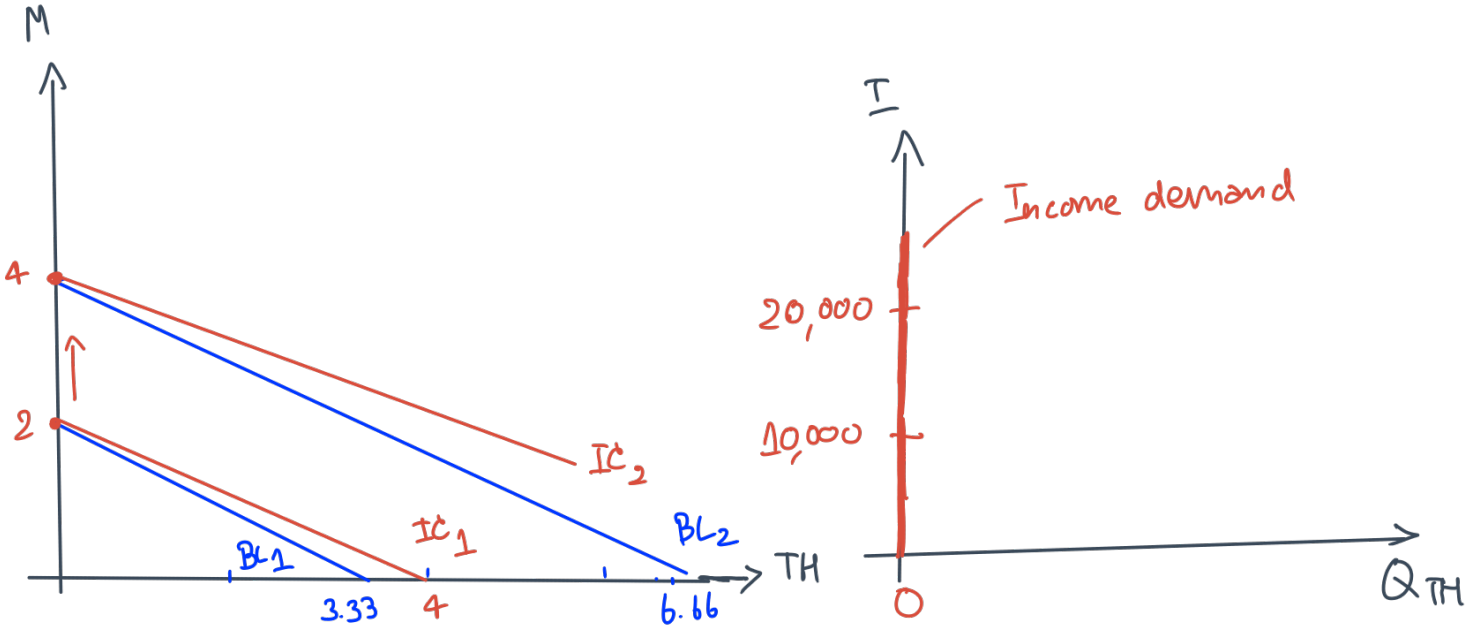
- Second, his budget line is also a straight line. The intercept on Maldives axis is 10,000/5,000 = 2 while the intercept on Thailand axis is 10,000/3,000 = 3.33 (due to the indefinitely separable assumption).

- He will try to move his IC as high as possible. His IC and BL have different slopes. When his preference is always twice as much for Maldives, but the price of Maldives is not more than twice, he will always choose to maximize his utility by choosing solely to travel to Maldives as displayed in the graph below.



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.

- Assumed that his preference does not change, he can push his IC upwards by choosing to travel to Maldives as usual. His income demand of traveling in Thailand will be a flat line since he will never choose to go there, no matter how much money he has.



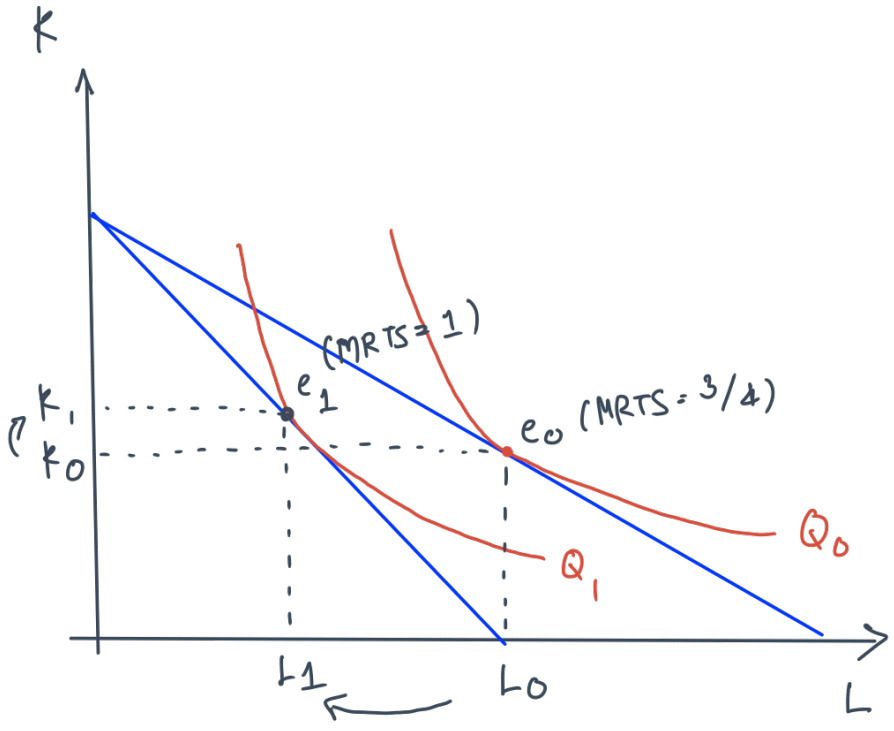
2. Consider a long-run production in which there are only two inputs labor and capital, and the input prices for labor and capital are wage (w) and interest rate (r), respectively. Suppose that at the equilibrium levels of labor and capital (L*, K*), the marginal product of labor (MP_L) and marginal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

a) 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?

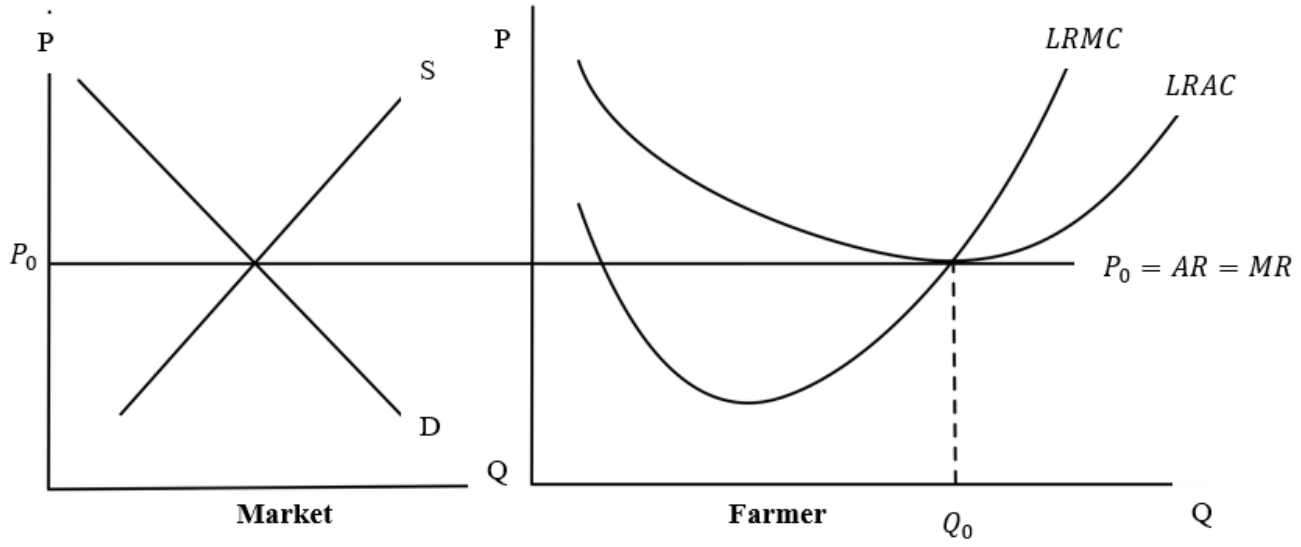
- Cost minimization condition is $\frac{MP_L}{MP_k} = \frac{w}{r}$. Therefore, plug the numbers in, we get, $\frac{6}{8} = \frac{3}{r}$ and now we can solve for r which is 4.

b) 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 w rises to 4, the $\frac{w}{r} = 1$. To minimize cost, the marginal rate of technical substitution (MRTS) must also be $\frac{MP_L}{MP_k} = 1$. Producer has to shift their production from Q_0 to Q_1, reducing the total output, *ceteris paribus*, as illustrated below. Notice that the slope on the new equilibrium must be higher, in absolute term compared between ¾ and 1, which means that the producer reduces the number of labor due to higher cost of labor and substitute with higher amount of capital.



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.

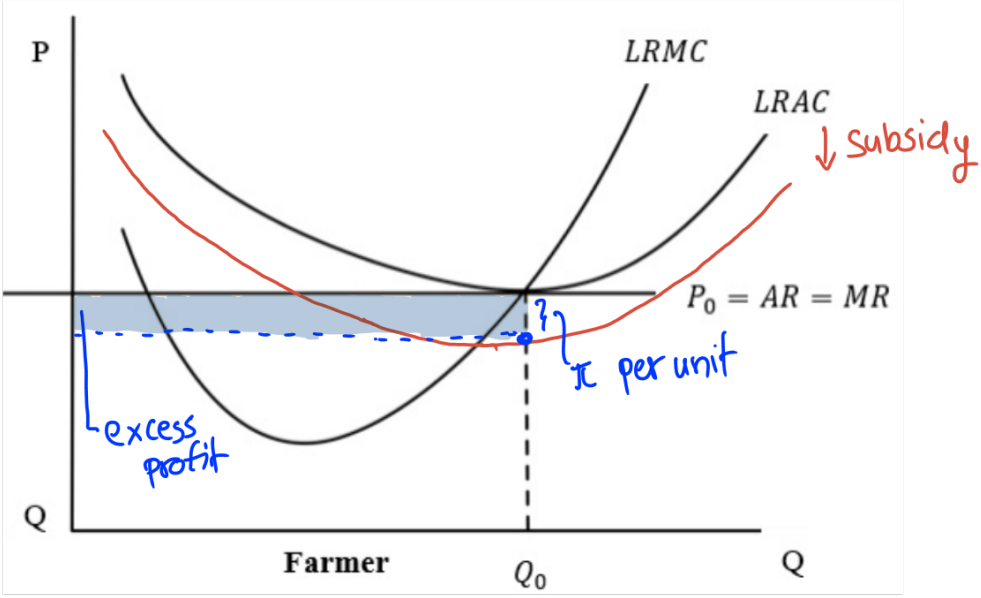


a) The government grants a lump sum subsidy to every farmer. How will this change the LRAC? Explain why LRMC does not change.

- The subsidy will lower the average cost since it is a lump sum subsidy, lowering the LRAC down. The reason why LRMC does not shift is because the subsidy has no effect on variable cost. (see the illustration below)

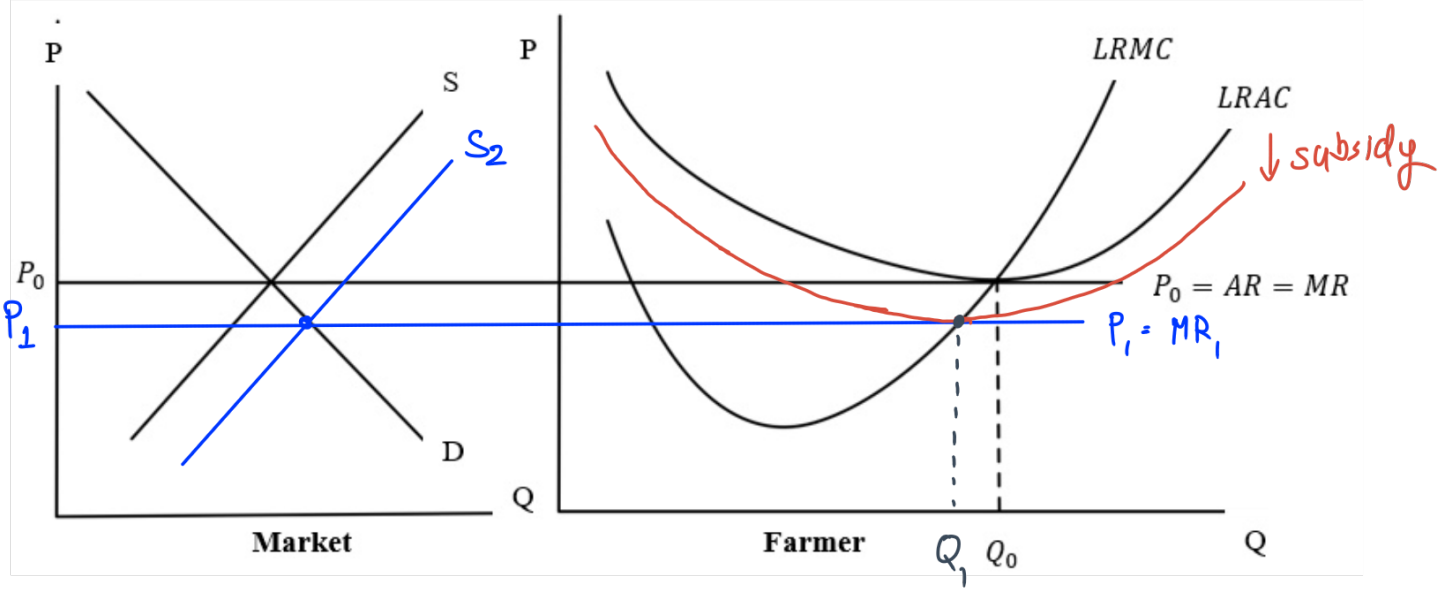
b) Will the lump sum subsidy change the quantity the farmer wants to produce to maximize his profit? Show in the graph that the farmer now earns an Excess Profit. Explain.

- No. The optimal quantity does not change since LRMC and MR remain the same. Excess profit is shown in the graph below.



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

- Due to the excess profit, it will attract new entries into this market, leading to higher supply. Eventually, price will drop due to supply shift (to the right). Each firm produces less output due to new entries spreading the output. All firms receive normal profit.



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.

- The profit maximization condition is MR = MC, then we need to find MR from demand.

- Since P = 100 – 5Q ; TR = P x Q then, TR = 100(Q)-5Q(Q) = 100Q-5Q^2.

- MR = dTR/dQ = 100-10Q

- MC = 20, then plug MR = MC, solve for Q*, 100-10Q = 20, then **Q* = 8**.

- Price will be set at **P = 100 – 5(8) = 60**.

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

- Variable cost = Sum of marginal cost, then producing eight units, variable cost is 8 x 20 = **160.** (Note that the marginal cost is constant here.)

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

- Total cost (TC) = TFC + TVC. If TVC is 160 and TFC is 160, TC = 160 + 160 = 320.

- Total revenue (TR) = P x Q. If P is 60 and Q* = 8 then TR = 60 x 8 = 480.

- Profit is TR – TC = 480 - 320 = **160**.

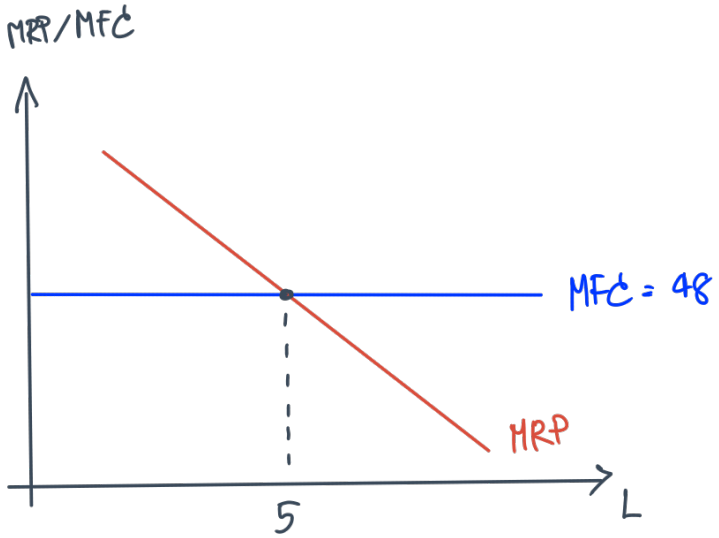
5. Assumed both a product market and a labor market are perfectly competitive, a table of marginal product is given below.

Unit of labor	Marginal product of labor
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.

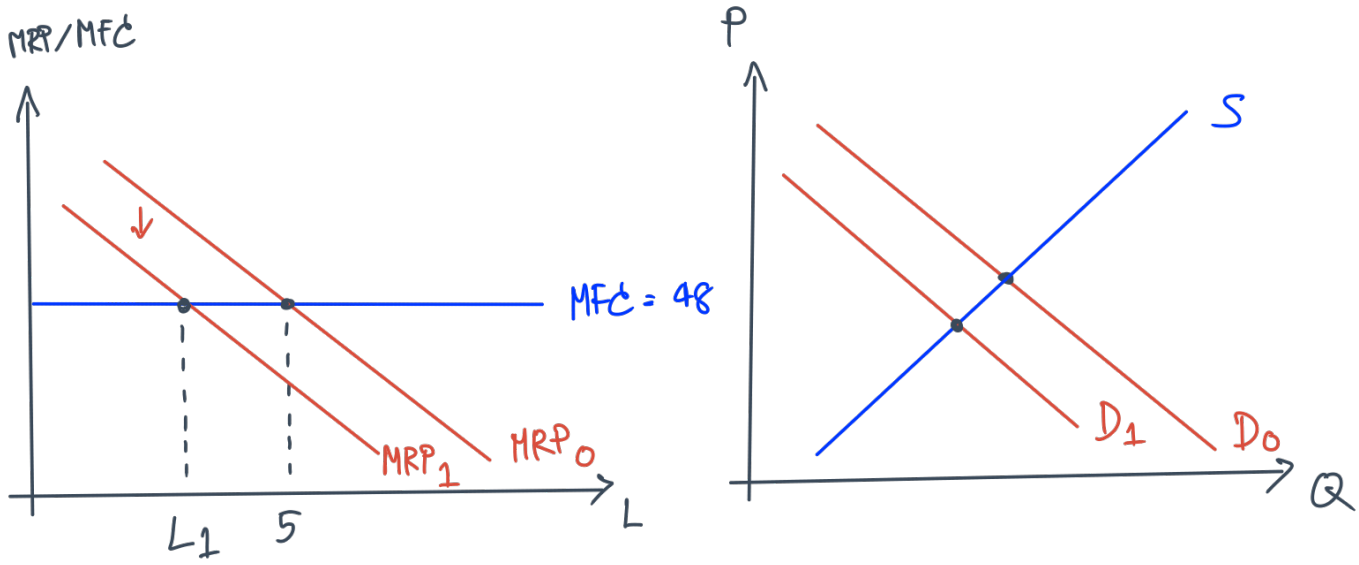
a) Figure out how many units of labor this firm will choose as input for its production to maximize profit. Illustrate a graph to support your answer and explain.

- The demand for labor is set when MRP = MFC. If both markets are perfectly competitive, then MFC = w or $48 in this case. Meanwhile, MRP = MR x MP, then MR is constant at $12 and 48/12 = 4. When the MP is 4, total units of labor is 5. Therefore, 5 units of labor is employed at this firm.



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 product market demand is driven downward, causing equilibrium price and quantity to decrease, firms will also reduce their units of labor due to the shift of MRP_0 to MRP_1, due to the decrease in MR.



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.

- Not a market failure since there is no indication of market power. People's feeling is not a measure of any market failure.

b) Morpheus always hears a loud fight coming from a room next to his.

- Negative externalities. The loud fight bothers Morpheus which is irrelevant to the activities performed by others.

c) Trinity does not receive her full-benefit until her first 3-month of her work position.

- Moral hazard. This measure is for the employer to monitor Trinity's performance during the first 3 months probational period.

d) In Chiang Mai, there is no earthquake alarming system.

- Public goods. Alarming system is a public good if it is not excludable and rivalrous. It seems that we cannot exclude people benefiting the alarm and there is no marginal cost from utilizing the alarm.

e) Starbucks coffee is more expensive than Amazon coffee.

- Market power. If and only if we assume that these two brands sell the same quality coffee, when Starbucks can charge more, it is due to their market power to manipulate price.

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