

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.

a) For indifference curve, we can solve for slope by

$$2MU_x = MU_y$$

$$\frac{MU_x}{MU_y} = \frac{1}{2} = 0.5 \#$$

Because  $MRS_{xy}$  is a constant which means traveling to Thailand and traveling to Maldives is perfectly substitute. That make indifference curve is a straight line.

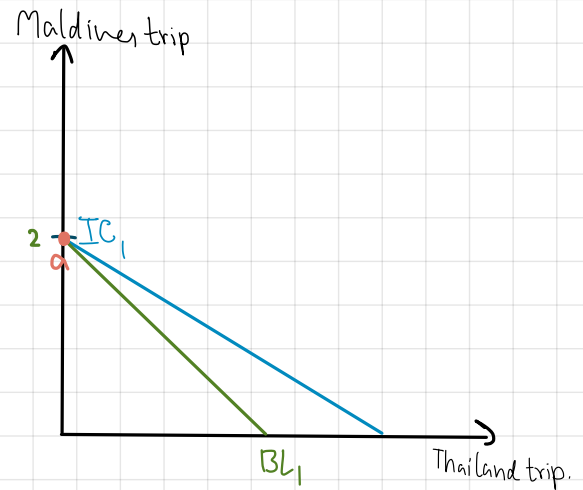
For budget line, we can solve for slope by

$$I = P_x \cdot x + P_y \cdot y$$

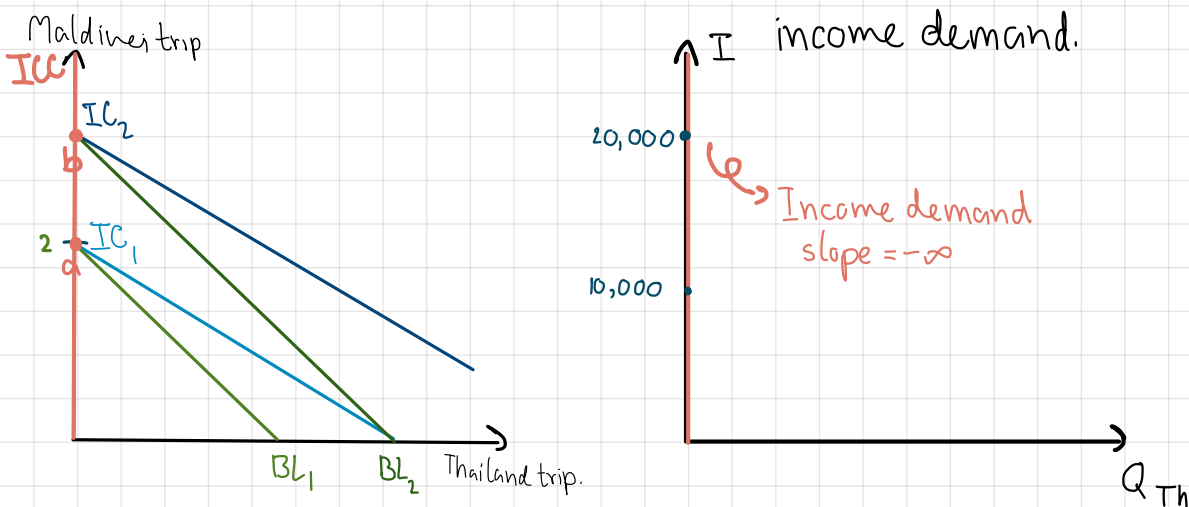
$$10000 = 3000x + 5000y$$

$$\text{slope BL} = \frac{3}{5} = 0.6 \#$$

So, the point that IC tangent to the budget line is at point a which equal to 2 Maldives trips that is the point that he spent all the money.



- 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.



If his budget increase to 20,000 baht, the point that he gain the most utility with all spent budget is point B. Because at  $BL_2$  the IC that give Neo the most utility is  $IC_2$  that tangent to  $BL_2$

ICC can be derive from draw a line through consumer equilibria. So, ICC of Neo will be straight vertical line because to maximize his utility he have to go to maldives only.

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?

$$a) \text{MRTS}_{LK} = \frac{\Delta K}{\Delta L} = \frac{MP_L}{MP_K}$$

$$\text{MRTS}_{LK} = \frac{6}{8} = 0.75 \neq$$

cost minimization

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

$$0.75 = \frac{3}{r}$$

$$\therefore r = 4$$

$\therefore$  The market rate of technical substitution is 0.75 and the interest rate at the equilibrium is 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.

b) the wage change causes the isocost to change

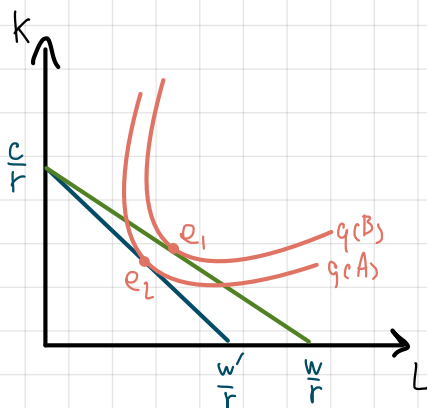
$$\text{MRMS}_{LK} = \frac{w}{r}$$

$$\frac{MP_L}{w} = \frac{6}{4} = 1.5$$

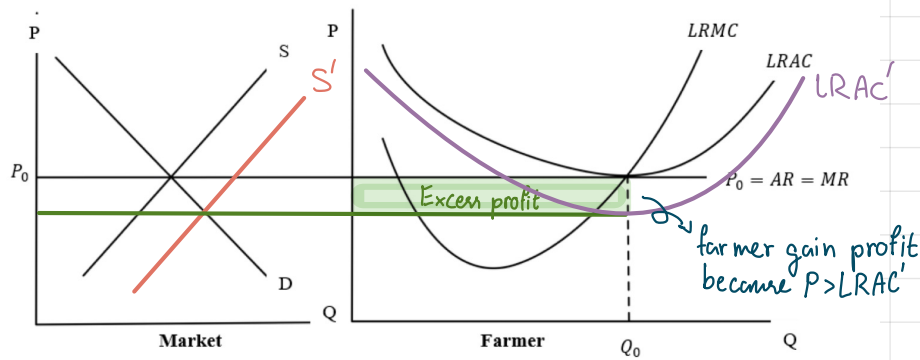
$$\text{MRMS} = \frac{4}{4} = 1 \neq$$

$$\frac{MP_K}{r} = \frac{8}{4} = 2 \neq$$

$\therefore$  the firm will decrease the number of labor from  $\frac{w}{r}$  to  $\frac{w'}{r}$  and the output will decrease from  $q(B)$  to  $q(A)$



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 lump sum subsidy will decrease the LRAC due to the lower fixed cost. But for LRMC, the subsidy is just one time aid from government so it doesn't affect variable factor so LRMC doesn't 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.

: No, the quantity that maximize the profit is at  $MR = LRMC$  and the lump sum subsidy doesn't affect either  $MR$  or  $LRMC$

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

Since there's no barrier to enter the market, new competitors will enter the market due to excess profit which will cause the supply increases. As a result, the market price will decrease to the point that the farmer only gains normal profit and the quantity will increase.

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.

$$MC = MR$$

$$20 = 100 - 10Q$$

$$10Q = 80$$

$$Q^* = 8$$

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

$$P = 60$$

∴ This product will be produced 8 units in order to maximize monopolist's profit in short-run. The marginal cost equals the marginal revenue (price) at 8 units. This product cost \$60

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

MC is constant;  $MC = AC$

$$TVC = AC \cdot Q$$

$$= 20 \cdot 8$$

$$= 160$$

∴ When the monopolist's profit is maximized, Total variable cost equals 160 \$

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

$$TR = P \cdot Q$$

$$= 60 \cdot 8$$

$$= 320$$

$$TC = TFC + TVC$$

$$= 160 + 160$$

$$= 320$$

$$\pi = TR - TC$$

$$= 320 - 320$$

$$= 0$$

∴ The monopolist's profit is 0 \$

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.

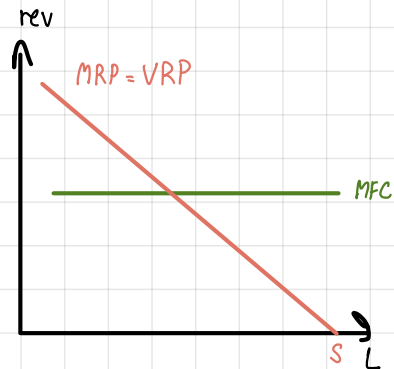
profit is maximized when  $MRP = MRC$

$$MR \cdot MP = W$$

$$12 \cdot MP = 48$$

$$MP = 4$$

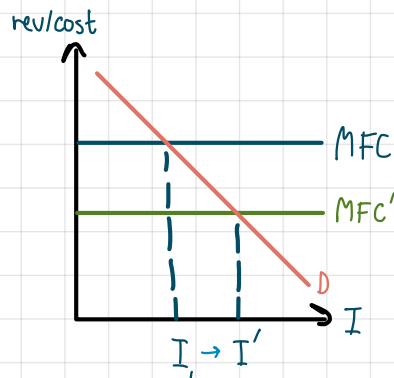
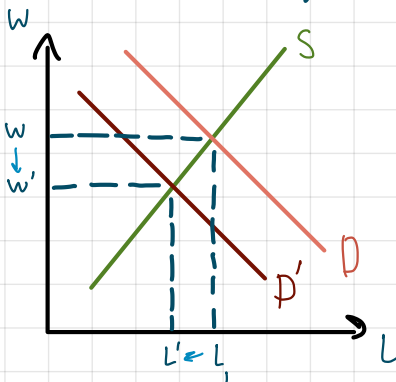
$$W = 48$$



$\therefore$  Firm should choose 5 units of labor in order to maximize profit.

- 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.

The economic recession makes every firm demand less labor from  $I_1$  to  $I_1'$ . Also affects total demand in the market to decrease from  $D$ , to  $D'$ . Declining demand for labor causes wage decrease from  $w$ , to  $w'$ , leading to a decrease in  $MFC$  from  $MFC_1$  to  $MFC_1'$ .



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

**Choices:**

1. Not a market failure (a) : The price is rely on price machanism of market.
2. Market power (e) : When starbuck can set their coffee price higher than other competitor meaning that starbuck have some market power.
3. Externalities (b) : negative externalities from a third party (next room).
4. Public goods (d) : The earthquake alarming is non-excludable and non-rivalous.
5. Moral hazard (c) : It affects the behavior of trinity and the company bears the cost of the risk.
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.