Intermediate Microeconomics Exercise Class 6

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Content

Homework 2

Satisfaction from consumption is maximized when

- marginal cost equals zero.
- marginal benefit equals zero.
- **marginal benefit equals marginal cost.**
- marginal benefit is maximum.

Homework 2

Dr. J gives 4 homework assignments for the Intermediate Microeconomics course. Suppose he drops each student's two lower scores and uses the average score of the other two assignments to determine the final homework score. Naughty Brown is taking this class and gets a 60 and a 70 in the first two assignments. Let x be his score on the third assignment and y be his score on the fourth assignment. If we draw his indifference curves for the scores on the third and fourth assignment with x on the horizontal axis and y on the vertical axis, then his indifference curve that crosses the point of $(x, y) = (50, 70)$ is

- a line segment between $(0, 120)$ and $(120, 0)$.
- **two line segments with one being vertical and the other one being horizontal.**
- three line segments with one being vertical, one being horizontal, and the other one that links $(70, 50)$ and $(50, 70)$.
- three line segments with one being vertical, one being horizontal, and the other one that links $(70, 60)$ and $(60, 70)$.

Homework 2

Pencils sell for 10 cents and pens sell for 50 cents. Suppose Fiori, whose preferences satisfy all the basic assumptions, buys 5 pens and one pencil each semester. With this consumption bundle, $|MRS_{Pencil\,Pen}| = 3$. Which of the following is true?

- Fiori could optimize his utility by buying more pens and fewer pencils.
- **Fiori could optimize his utility by buying more pencils and fewer pens.**
- Fiori could optimize his utility by buying more pencils and more pens.
- Fiori could optimize his utility by buying fewer pencils and fewer pens.

Homework 2

If $P_X = P_Y$, then when the consumer maximizes utility,

- X must equal Y.
- **$\boldsymbol{MU_X}$ must equal $\boldsymbol{MU_Y}$.**
- $MRS_{XY} = 0$.
- X and Y must be substitutes.

Homework 2

Fiori derives utility from consuming iced tea and lemonade. For the bundle he currently consumes, the marginal utility he receives from iced tea is 16, and the marginal utility he receives from lemonade is 8. Instead of consuming this bundle, Fiori should

- buy more iced tea and less lemonade.
- buy more lemonade and less iced tea.
- buy more iced tea and lemonade.
- buy less iced tea and lemonade.
- **None of the above is necessarily correct.**

Homework 2

Fiori is a candy-loving kid. X units of candy provides him a utility of $u(X) = 4\log(1 + X)$ units, while holding \$1 gives him 1 unit of utility. X does not have to be an integer.

- If Fiori has \$10 and the unit price of candy is \$2, how many units of candy will Fiori purchase to maximize his utility? What is the maximized utility?
- How about if Fiori has \$1 and the unit price of candy is \$2?
- Derive Fiori's demand for candy when he has \$3.

Homework 2

Fiori is a utility-maximizing consumer. He has an income $m > 0$ to allocate between two goods (1 and 2). For each good, Fiori faces a constant price of p_1 and p_2. For each of the following utility function, derive Fiori's optimal demand $x_1(p_1, p_2, m)$ and $x_2(p_1, p_2, m)$.

- $u(x_1, x_2) = \sqrt{x_1} + 2\sqrt{x_2}$
- $u(x_1, x_2) = \int_0^{x_1^a x_2^b} f(x)\, dx$, where a, $b > 0$ and $f(x)$ is positive
- $u(x_1\, x_2) = \min\{x_1 + 2x_2, 2x_1 + x_2\}$

Homework 2

Naughty Brown spends his monthly TA income m on food (x_1), clothing (x_2) and KTV (x_3). The price of food is constant at $p_1 = 0.5$, and the price of clothing is constant at $p_2 = 2$, while the KTV currently offers a deal: every month, $p_3 = 1$ per hour for the first four hours and $p_4 = 4$ per hour for the following hours. Naughty Brown's utility function is given by $u(x_1, x_2, x_3) = \sqrt{x_1 x_2} x_3$.

- Assume that Naughty Brown buys the same amount of food and clothing this month. Derive his budget constraint and plot it with $x_1 (= x_2)$ on the horizontal axis and x_3 on the vertical axis. Label everything clearly.
- Derive Naughty Brown's demand function of $x_1(m)$, $x_2(m)$ and $x_3(m)$.

Cost

- Cost Category
  - Accounting Cost
  - Economic Cost=Accounting Cost + The Value of Opportunity Cost
- Total Cost (TC)
- Average Cost (AC) or Average Total Cost (ATC)
- Fixed Cost (FC)
- Quasi-Fixed Cost
- Average Fixed Cost (AFC)
- Variable Cost (VC)
- Average Variable Cost (AVC)
- Marginal Cost (MC)

Cost Cont'd

- Sunk Cost: Expenditure that has been made and cannot be recovered.
- It should always be ignored when making future economic decisions.

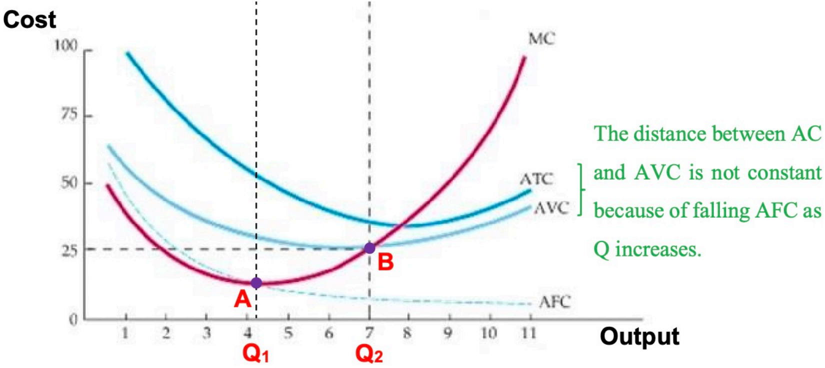
Cost Cont'd

- Cost Function
- $\min_{x_1, x_2} w_1 x_1 + w_2 x_2$ such that $f(x_1, x_2) = y$

Cost Cont'd

- Cost in the Short-Run
- $MC = \frac{W}{MP_L}$
- MC curve is the reverse of MP curve
- Diminishing marginal returns: MC will increase

- The Shape of Cost Curves in the Short-Run



Cost Cont'd

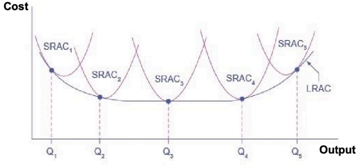
- Cost in the Long-Run
- Isocost Line: $K = \frac{c}{r} - \frac{w}{r}L$
- Optimal Production: Produce at minimal cost
- $\frac{w}{r} = \frac{MP_L}{MP_K}$
- Conditional Factor Demand Function: e.g. $x_1(w_1, w_2, y)$

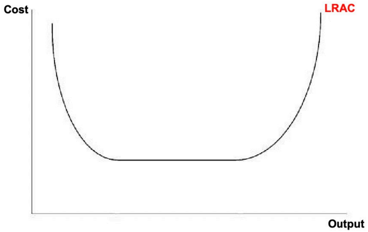
Cost Cont'd

- Perfect Complements: $f(x_1, x_2) = \min\{x_1, x_2\}$
- Perfect Substitutes: $f(x_1, x_2) = x_1 + x_2$
- Cobb-Douglas: $f(x_1, x_2) = x_1^a x_2^b$

Cost Cont'd

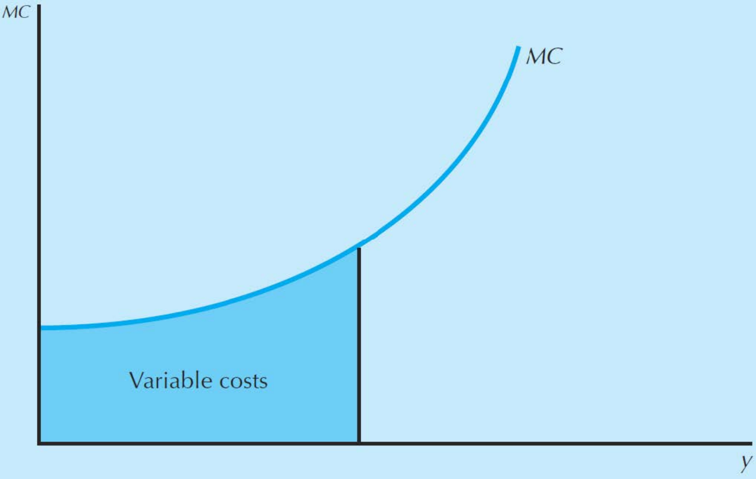
- Applications of Cost Function





Cost Cont'd

- The Relationship between MC and VC
- $MC(y) = \frac{dVC(y)}{dy}$
- $\int_0^y MC(x)dx = VC(y)$



Cost Cont'd

- Economies of Scale: Increasing returns to scale
- Diseconomies of Scale: Decreasing returns to scale

Cost Cont'd

- Reasons for Economies of Scale
  - Larger scale allows workers to specialize
  - Scale can provide flexibility by varying the combination of inputs, so that managers can organize more effectively
  - Firms can acquire inputs at lower cost because buying them in large quantities and therefore negotiate better prices

Cost Cont'd

- Reasons for Diseconomies of Scale
  - Limited factory space and machinery reduce efficiency
  - Managing a larger firm becomes more complex and inefficient as the number of tasks increases
  - The advantages of buying in bulk will disappear at some point because of limited supply

Cost Cont'd

- Economies of Scope
  - Produce more overall: Lower unit cost
  - Common factors of production
- $C(Q_1, Q_2) < C(Q_1, \emptyset) + C(\emptyset, Q_2)$

Thanks!