

Notes on Microeconomics for IBA (I)

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1 Introduction

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6. Policy: Before every tutorial, I will ask for your common questions, which is the only part to discuss in public. For personal questions, I will give you tips in person in the Q&A session. You could leave anytime you want, but don't disturb others.

2 Tips for Problem Set 1

Q2.1

1. Demand curve shifts outwards, please refer to cross-price elasticity.
2. Demand curve moves inwards, the cost for consumption increases.
3. Supply curve shifts upwards, the quantity decreases.
4. Supply curve shifts upwards, the cost rises.

Q2.2

1. Demand curve shifts inwards, the price and quantity decreases in equilibrium.
2. Supply curves shifts upwards (cost), and demand curve moves outwards (substitutes), the change of price and quantity depends on which effect dominates

Q3.1

1. $U(1, 0) = U(0, 2)$, so one unit of butter offers $2a$ unity of utility, while a piece of jelly provides a unit of utility. Therefore the utility function $U(pb, j) = a \times [2pb + j]$.
2. $U(pb, j) = a \times pb$, the quantity of jelly has nothing to do with the utility.
3. $U(pb, j) = a \times pb - b \times j$.
4. $U(pb, j) = a \times \min(pb, 2j)$, a little complicated. Assume the utility of a piece of peanut butter with half piece of jelly (a bundle) is a , and we have pb pieces of peanut butter, if the quantity of jelly is just half of pb , that is, $pb = 2j$, the utility is $a \times pb$ or $a \times 2j$. Even if the quantity of jelly is more than $\frac{pb}{2}$ ($j > \frac{pb}{2}$), the utility won't change. If $j < \frac{pb}{2}$, the utility depends on the quantity of jelly, since half of the jelly with one piece of peanut butter contribute a , the utility in this case is $2a \times j$. That is leontief utility function.
5. Key to get the utility function: think about the utility contribution of each goods, assuming a and $2a$, then calculate the total utility with the quantity of each goods pb and j .
6. Key to get the indifferent curve: impose a number to the utility function, in order to see the relationship between the amount of each goods directly¹.

Q3.2

1. Impose number on the utility function, have a try.or maybe you can directly analyze the property of indifferent curve
2. Key: if $x_1 + y_1 > x_2 + y_2$, then $(x_1 + y_1)^2 > (x_2 + y_2)^2$

Q3.3

1. Yes, more is better, since $MU_x = y + 1$, and $MU_y = x$.

¹Or maybe you can directly analyze the property of indifferent curve, for the first question, if $(1, 0)$ and $(0, 2)$ are the same in utility, the segment between thus must offer the same utility; for the second one, the jelly contribute nothing, so the indifferent curve is vertical along with the jelly axis; the curve closer to jelly axis stands for smaller utility for the third question; for the last one, once a pair of butter and jelly is set, the extended part is determined.

2. To see the property of marginal utility function, we have to see the second order derivatives of the utility function. Since $MU_x = y + 1$, and $MU_y = x$, both MU_{xx} and MU_{yy} are zero. So they are both marginal utilities are constant.
3. Refer to above.
4. For the more complicated utility function, we have to take different approach to guess the shape of the curve. First, impose a number to the utility, in order to see the property on the axis. For example, $xy + x = a$, when $x = 0$, the equation cannot hold unless $a = 0$. Therefore, as long as the utility is more than 0, the curve won't touch the y-axis. When $y = 0$, $x = a$, so we can roughly locate the curve. Then we have to explore the property of MRS . The $MRS_{x,y} = \frac{y+1}{x}$, that is, how many units of y can be replaced by one unit of x^2 . While x increasing, the amount of y can be replaced is diminishing. Therefore, the indifferent curve is convex, otherwise, the curve is concave³.

Q3.4

1. $MU_x = \alpha Ax^{\alpha-1}y\beta$, $MU_y = \beta Ax^\alpha y^{\beta-1}$, if A , α and β are all positive, "more is better" applies here.
2. Think about the MU_{xx} and MU_{yy} , so we have to compare α , β and unity.
3. Refer to above.
4. $MRS_{x,y} = \frac{\alpha Ax^{\alpha-1}y\beta}{\beta Ax^\alpha y^{\beta-1}} = \frac{\alpha y}{\beta x}$, the approach illustrated in last question could apply here.

3 Tips for Understanding

3.1 Demand Curve and Supply Curve

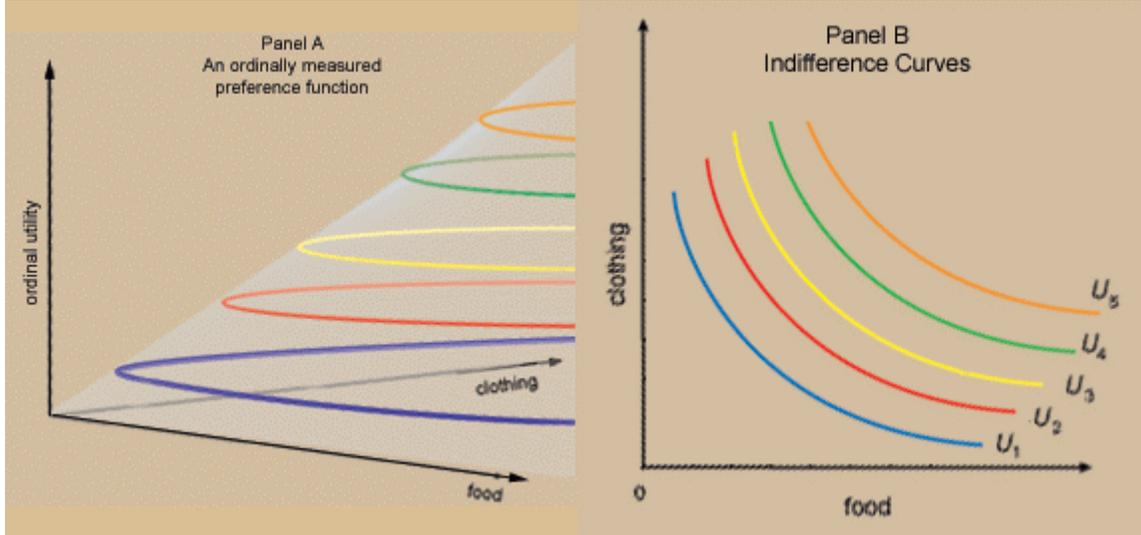
1. Demand Curve and Supply Curve from the perspective of a person: the more the better
2. Demand Curve and Supply Curve from the perspective of a market: there is the threshold ($MU = MC$) for each consumer and for each producer ($MR = MC$). While the price falling, more consumers are afford to the goods; while it rising, more producers are willing to join the market.
3. The independent variable is price, which is on the vertical axis; the dependent variable is quantity on horizontal axis. That is different from most cases in mathematics, and unique in economics.

² $MRS_{x,y} = -\frac{dy}{dx} = -\left(-\frac{MU_x}{MU_y}\right) = \frac{y+1}{x}$, based on Implicit Function Theorem

³Think about the change in slope.

3.2 Utility Function and Indifferent Curve

The utility function is actually on the third dimension, and the indifferent curve is the projector (shadow) of utility function.



3.3 Classification of Elasticity (Based on Wang (2006))

1. normal good: $\frac{\partial x}{\partial I} \geq 0$; inferior good: $\frac{\partial x}{\partial I} < 0$
2. luxury good: $\frac{I}{x} \cdot \frac{\partial x}{\partial I} \geq 1$; necessary good: $0 \leq \frac{I}{x} \cdot \frac{\partial x}{\partial I} < 1$
3. gross substitutes: $\frac{\partial x_i}{\partial p_j} > 0$; gross complements: $\frac{\partial x_i}{\partial p_j} < 0$
4. Giffen good⁴: $\frac{\partial x_i}{\partial p_i} > 0$; usual good: $\frac{\partial x_i}{\partial p_i} \leq 0$
5. elastic: $-\frac{p_i}{x_i} \frac{\partial x_i}{\partial p_i} > 1$; inelastic: $0 \leq -\frac{p_i}{x_i} \frac{\partial x_i}{\partial p_i} < 1$;

References

JENSEN, R. T., AND N. H. MILLER (2008): "Giffen Behavior and Subsistence Consumption," *American Economic Review*, 98(4), 1553–77.

WANG, S. (2006): *Microeconomic Theory*. China Renmin University Press.

⁴please refer to Jensen and Miller (2008)