Modelling consumer choice

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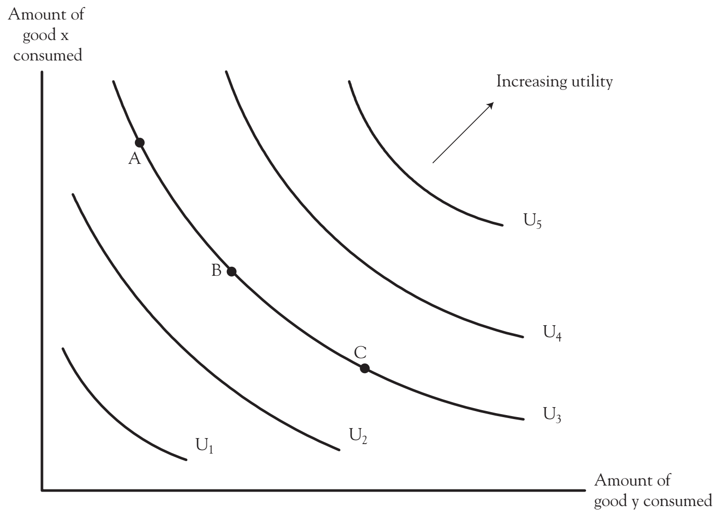
Consumer preferences are often assumed to be:

- ***Complete:*** consumers can compare any two collections (or bundles) of goods and decide whether they prefer one bundle to the other or are indifferent between them. Thus a ranking choice between two bundles is always possible.
- ***Consistent:*** pairwise comparisons of bundles are consistent. If a collection of goods A is ranked ahead of collection B and B is ranked ahead of C, then A must be ranked ahead of C.
- ***Non-satiated:*** consumers prefer more to less of any good. The marginal utility consumers derive from consuming more of any good is positive.
- ***Convex:*** consumers like to 'mix up' their consumption bundles. They prefer mixed collections of goods to specialised collections that involve spending all of their money on specific goods.

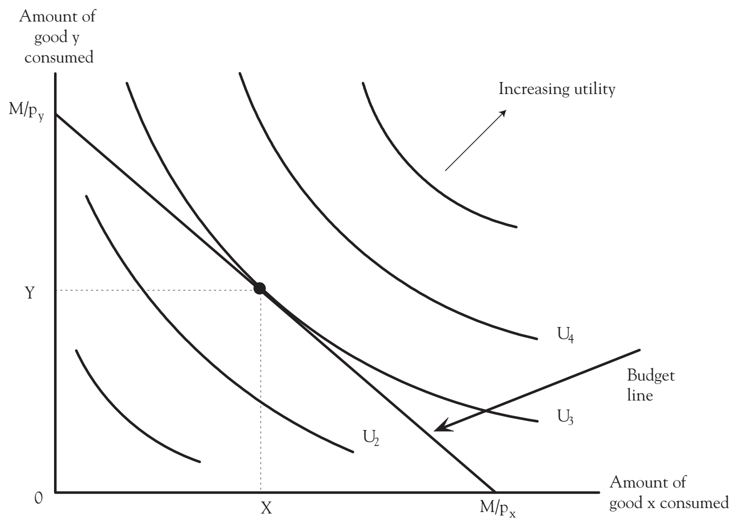
Given these properties, preferences between two goods can be represented by an **indifference map** as in Figure 1. Each of the curves in this figure is an indifference curve, indicating a certain fixed level of utility. For example, the combinations of goods x and y indicated by the points A, B and C all yield utility U_3. Since preferences are complete, an indifference curve passes through every point in the plane. That they are consistent means the indifference curves don't intersect. As they are non-satiated, moving in a north-east direction in the figure moves the consumer to higher utility; so U_4 is larger than U_3. Finally, since indifference curves are convex, they are bowed toward the origin, a balance between different types of consumption is preferred to specialised consumption patterns. Indifference curves 'shy away' from the axes since, at an axis, consumption becomes specialised in one of the goods.

Figure 1 *An indifference map*



Ideas of affordability and desirability are now put together to explain how consumers make decisions. The basic theory is that 'consumers try to maximise their utility given their budgets'. Again, think of a simplified situation where there are only two goods. Consider the consumer indifference map in Figure 2.

Figure 2 *Budget-constrained utility maximisation*



What combination of the two goods will this consumer choose if she maximises her utility? She must operate in her budget set, inside the triangle 0ab formed by the axes and the **budget line**: the line that shows how much she will consume if she spends all of her income on the two goods. The budget set defines the affordable bundles she can buy. If she spends all her budget M on good x, she can buy M/p_x, if she spends all her budget on good y, she can buy M/p_y units of good y. From these affordable bundles, which should be chosen? Clearly this consumer should try to attain the highest possible indifference curve within her budget set. This occurs at the point on her budget line where

slope of the budget line = slope of the indifference curve.

In the figure this tangency occurs when X units of good x and Y units of good y are consumed, so this is the best choice: the choice maximising utility subject to budget. How can we characterise this point? As in many economic situations, we can imagine the consumer here operating using the marginal principle. She will buy units of each good until her budget is just exhausted and she equates marginal utility per dollar spent on the different commodities, so

$$MU_x/p_x = MU_y/p_y.$$

This is the opportunity cost idea applied to consumer economics. Since we also know that she will operate on the budget line (this is so because her preferences are non-satiated), we know her total expenditure on the two goods p_xX+p_yY just equals her income. Thus we know

$$p_xX+p_yY = M.$$

Together, the slope condition involving marginal utilities and the budget condition comprise a simple economic model, a model of consumer demand. The variables explained by this model, the endogenous variables, are the demands for the two goods, x and y. The exogenous variables, the variables whose values are taken as given, are all the prices, consumer's income M and tastes T of the consumer. We can write the demand for the goods as

$$X = D_x(p_x, p_y, M, T) \text{ and } Y = D_y(p_x, p_y, M, T),$$

where X and Y are the constrained-utility-maximising quantities of good x and good y; D_x and D_y are the demands for good x and good y which depend on p_x, p_y the respective prices of the goods, the consumer's income M, and T, some index of tastes. In words, the amount purchased by an individual consumer depends on all prices, income and tastes.