

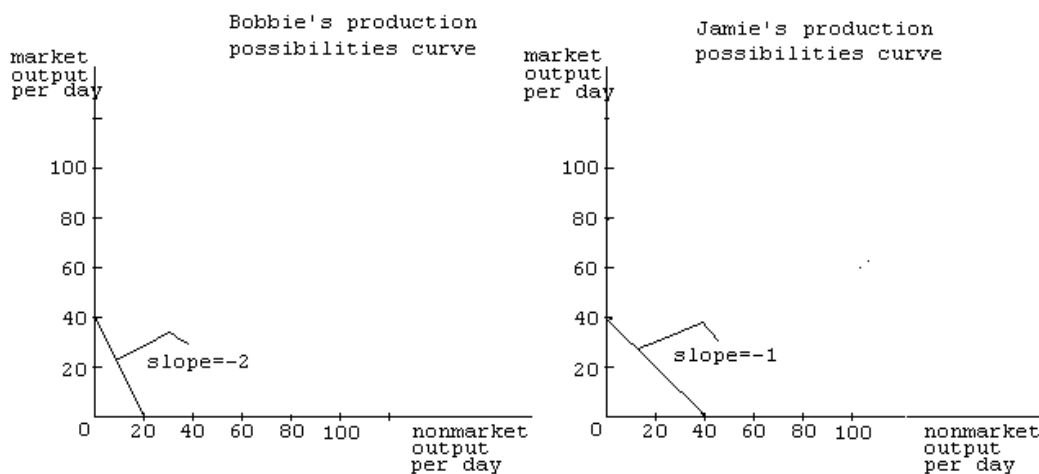
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Individual and Household Production Possibilities Curves
Comparative Advantage

Household Production Possibilities Curve; Comparative Advantage

We illustrate by means of an example how to derive individual and household production possibilities curves; we also illustrate the idea of comparative advantage.

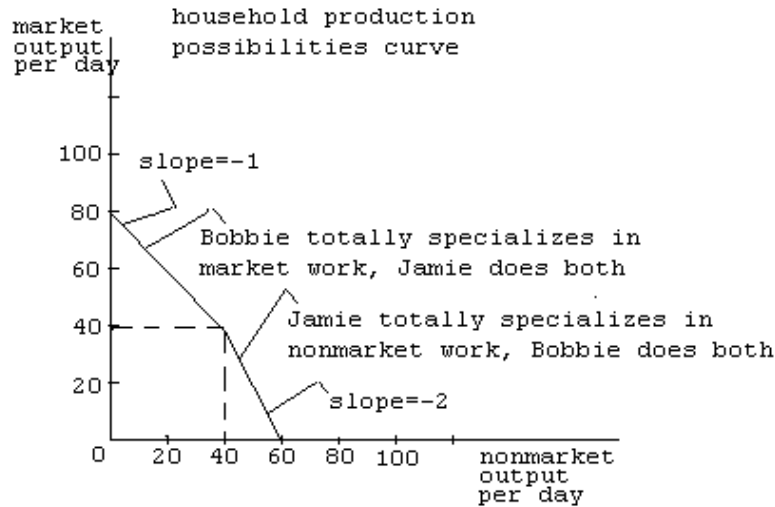
Assume that the two individuals, Bobbie and Jamie, can work 20 hrs./day maximum and that the price of the market output is \$1. Assume that Bobbie earns \$2 per hr. in market work and can produce 1 unit nonmarket output per hr.; Jamie earns \$2 per hr. in market work and can produce 2 units nonmarket output per hr. We graph each individual's production possibilities curve and determine who has the comparative advantage (if either) in what.

Since Bobbie earns \$2 per hour and he/she can work up to 20 hrs. per day, he/she can obtain $2 \cdot 20 = 40$ units of market output per day, given that market output is \$1; it follows that the vertical intercept of his/her production possibilities curve is 40. His/her horizontal intercept is $1 \cdot 20 = 20$. Since Jamie earns \$2 per hour and he/she can work up to 20 hrs. per day, he/she can obtain $2 \cdot 20 = 40$ units of market output per day, given that market output is \$1; it follows that the vertical intercept of his/her production possibilities curve is 40. His/her horizontal intercept is $2 \cdot 20 = 40$. See the following diagrams; the curves are straight lines since the trade off of market output for nonmarket output is constant for each individual.



Notice that in order to get 1 more unit of nonmarket output, Bobbie will lose 2 units of market output. On the other hand, in order to get 1 more unit of nonmarket output, Jamie will lose only 1 unit of market output. Therefore, Bobbie has a comparative advantage over Jamie in market work (which automatically means that Jamie has a comparative advantage over Bobbie in nonmarket work).

Now we derive the household production possibilities curve. If both people spend all their time in market work, the household can obtain $80(= 40 + 40)$ units of market output; if both people spend all their time in nonmarket work, the household can obtain $60(= 20 + 40)$ units of nonmarket output. These calculations give us the intercepts of the curve. In order to get the first unit of nonmarket output and get the maximum market output, Jamie will produce the first unit of nonmarket output since he/she has a comparative advantage in that; at the same time, Bobbie would do market work only, obtaining 40 units. We would make similar arguments up to the point where all possible nonmarket output has been obtained from Jamie, 40 units. At that point any additional increases in nonmarket output have to be obtained from Bobbie, requiring a sacrifice of 2 units of market output for every additional unit of nonmarket output.



Origins of Comparative Advantage

1. If an individual's wage is high enough relative to a second individual's, then the first individual will have a comparative advantage in market work.
2. If an individual is productive enough in nonmarket work relative to a second individual, then the first individual will have a comparative advantage in nonmarket work.
3. Wage differences that arise from wage discrimination, for example, can lead to the individual discriminated against having a comparative advantage in nonmarket work.
4. Some economists, like Gary Becker, tie comparative advantage of women in nonmarket work to their sex, to biology, as illustrated by the following quotes (from his *Treatise on the Family*, 1991, pp. 37-39, on reading list):

[T]he sharp sexual division of labor [between market and nonmarket work] ... is ... partly due to intrinsic differences between the sexes.

From biological differences emerges the not-very-startling conclusion that the sex of household members is an important distinguishing characteristic in the production and care of children, and perhaps also in other household commodities and in the market sector.

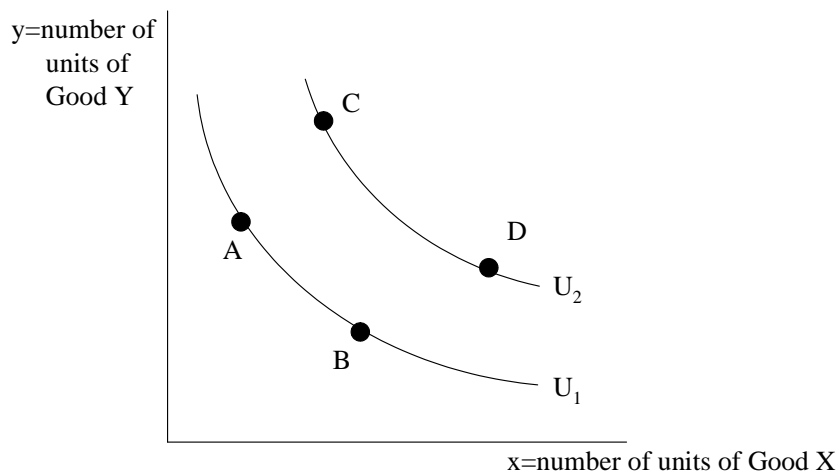
Consequently, biological differences in comparative advantage between the sexes explain not only why households typically have both sexes, but also why women have usually spent their time bearing and rearing children and engaging in other household activities.

Choice of the Household

Preferences

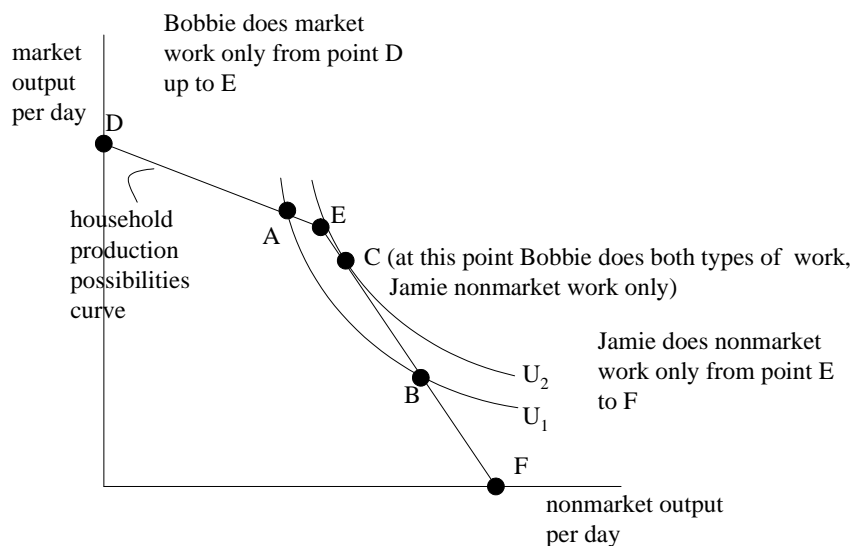
In the following diagram, the curves labeled U_1 and U_2 are indifference curves (an indifference curve is a collection of points such that the individual (in this case, household) is indifferent between any two on the same curve). Any two points along any given indifference curve are indifferent (from the individual's point of view); for example, A is indifferent to B , C is indifferent to D . Points along "higher" indifference curves are preferred to points along "lower" indifference curves; for example, C is preferred to both A and B (C has a higher utility level than A or B , or the individual's level of satisfaction is higher at C than it is at A or B), D is preferred to both A and B . There is exactly one indifference curve which goes through any point in the diagram. No two indifference curves can intersect. They are assumed to be downward sloping (this

means that if the individual receives an increase of one good, he/she must receive a decrease in the other good to remain indifferent). They are assumed to have the shape indicated.



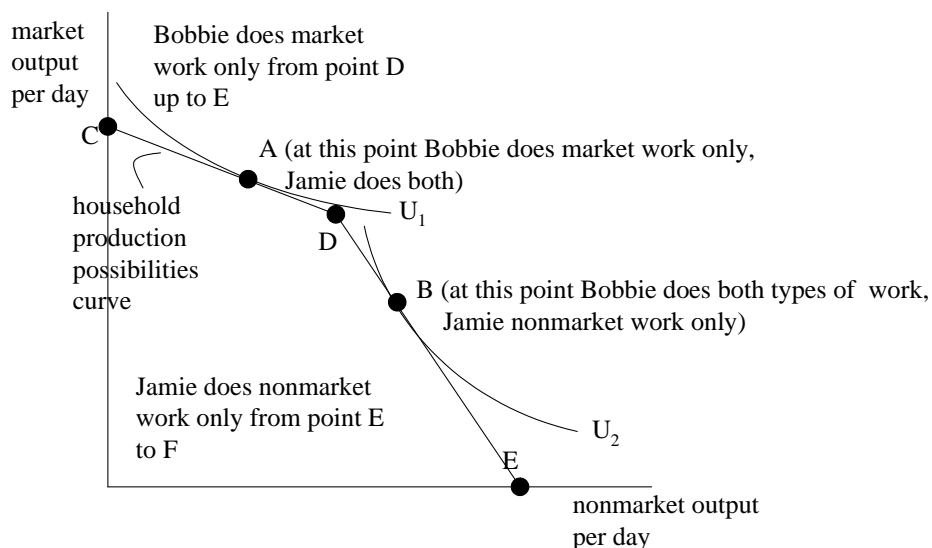
Household's Choice Given Its Constraint, the Household Production Possibility's Curve

In the following diagram, neither point *A* nor point *B* would be the choice of the household, given its constraint. Point *C* is the choice given the constraint since any better point would be in the region above the indifference curve through *C* would be impossible for the household. Given the representation of the indifference curves, this household chooses a point on the production possibilities curve where Bobbie does both kinds of work, Jamie does nonmarket work only.



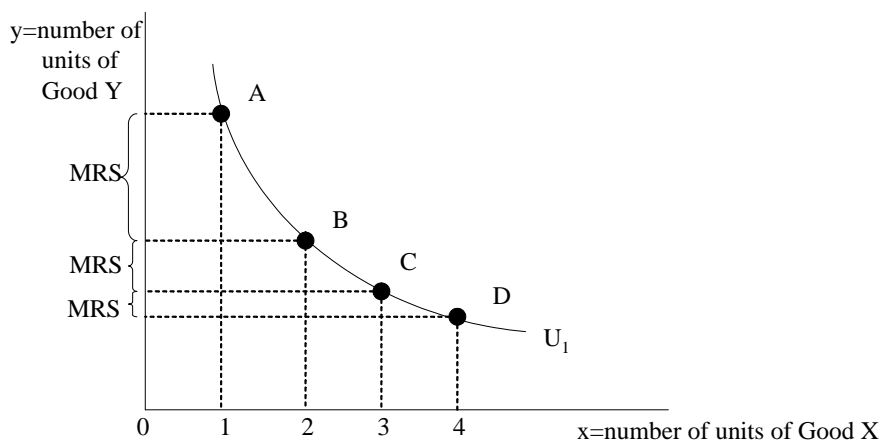
Different Households May Make Different Choices

In the following diagram, two households' choices are indicated (at points *A* and *B*).



Why would different households make different choices? Their preferences are different, but more precisely, they have different levels of willingness to trade market output in favor of nonmarket output. In economic terms, the first household has a smaller marginal rate of substitution than does the second household.

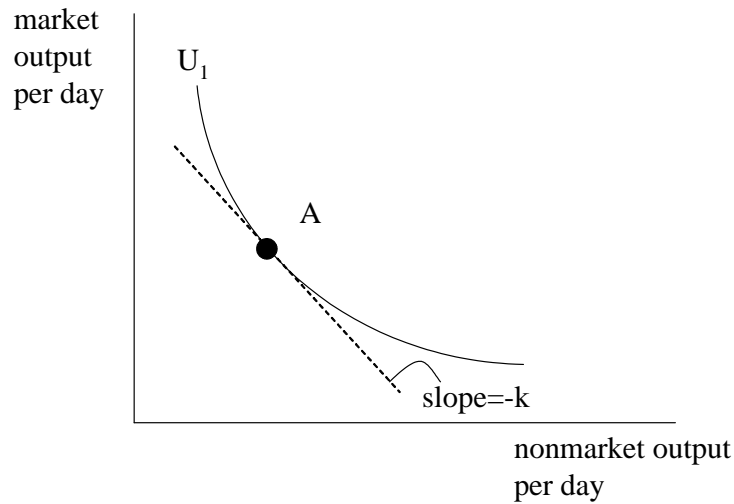
Marginal Rate of Substitution (MRS)



In each move, the *MRS* indicates the maximum amount of good *Y* that the individual is willing to give up for one more unit of good *X*. Notice that the *MRS* decreases as the individual receives more of Good *X*, i.e., the individual's willingness to forego *Y* in favor of *X* decreases. Generally, in economics, we define

$$MRS = -\frac{\Delta y}{\Delta x},$$

and allow Δx to get very small. This allows us to geometrically measure the *MRS* by $-1 \times$ slope of the indifference curve. In the following diagram, the *MRS* at *A* = *k*.



Back to Different Households Making Different Choices

Returning to the situation where different households make different types of choices, note that in the following diagram similar indifference curves are represented. In the following diagram, at point A , the slope along the first indifference curve is $-m$ and the slope along the second indifference curve is $-n$. It follows that

$$MRS \text{ at } A \text{ along } U_1 = n < MRS \text{ at } A \text{ along } U_2 = m;$$

this means that the second household is more willing to give up market output in favor of nonmarket output than is the first household.

