

# Preferences and utility

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Predicting what the individual will do

A consumer's demand functions are determined by her budget constraint and her preferences

We devoted a whole lecture to budget constraints.

Up to now we have said that economists assume that an individual has preferences: can rank consumption bundles.

Consumer theory simply says that of all the consumption bundles the individual can afford (in their budget set) they will consume the one that they rank the highest (most prefer).

An individual's demand for a product is the amount of the product in their chosen bundle.

Everytime an individual's budget constraint changes, the demands for products change.

We typically measure preference with something we call *utility*, utility is simply a number we attach to a bundle such that more preferred bundles get higher number.

That is

if you prefer bundle  $i$  to bundle  $j$ ,  $\mathbf{x}^i \succ \mathbf{x}^j$ , you get more utility (a higher number of utils) from bundle  $i$ :  $u^i > u^j$

if you prefer bundle  $j$  to bundle  $i$ ,  $\mathbf{x}^j \succ \mathbf{x}^i$ , you get more utility from bundle  $j$ :  $u^j > u^i$

if you are indifferent between two bundles,  $\mathbf{x}^i \sim \mathbf{x}^j$ , the same utility number is attached to each bundle:  $u^i = u^j$

For simplicity, assume the world consists of only two goods:  $x_1$  and  $x_2$ , so a consumption bundles consists of some amount of good  $x_1$  and some amount of good  $x_2$  - the world has little variety.

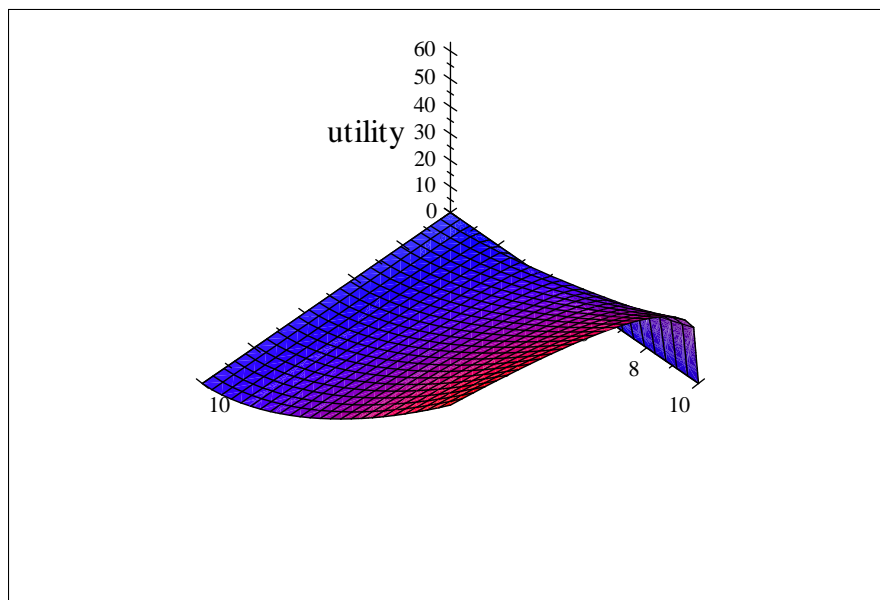
A bundle is, simply, an amount of  $x_1$  and an amount of  $x_2$

You get utility from the bundle you consume

$$u = u(x_1, x_2)$$

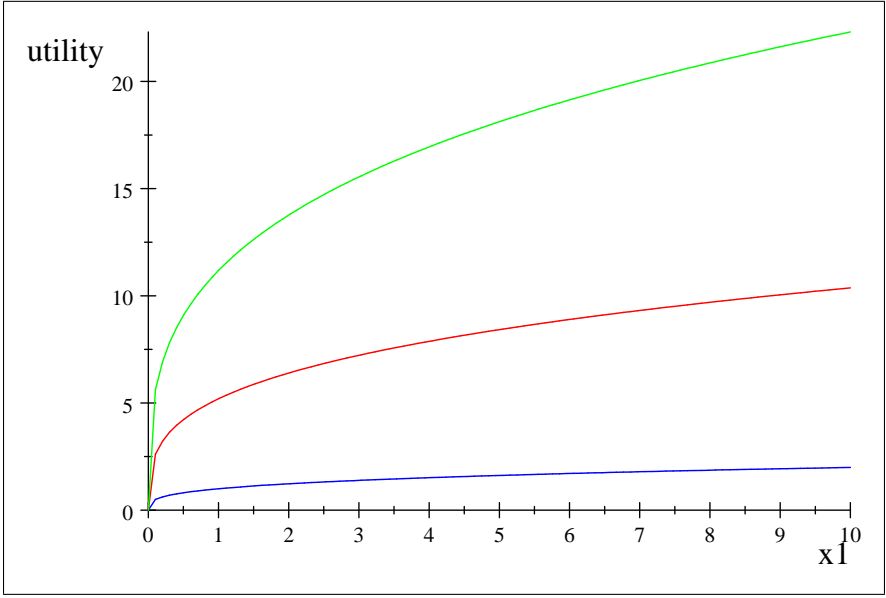
where  $x_1$  is the amount of  $x_1$  you consume and  $x_2$  is the amount of  $x_2$  you consume.  $u(x_1, x_2)$  is a function with the name  $u$ .

The function might look the the following



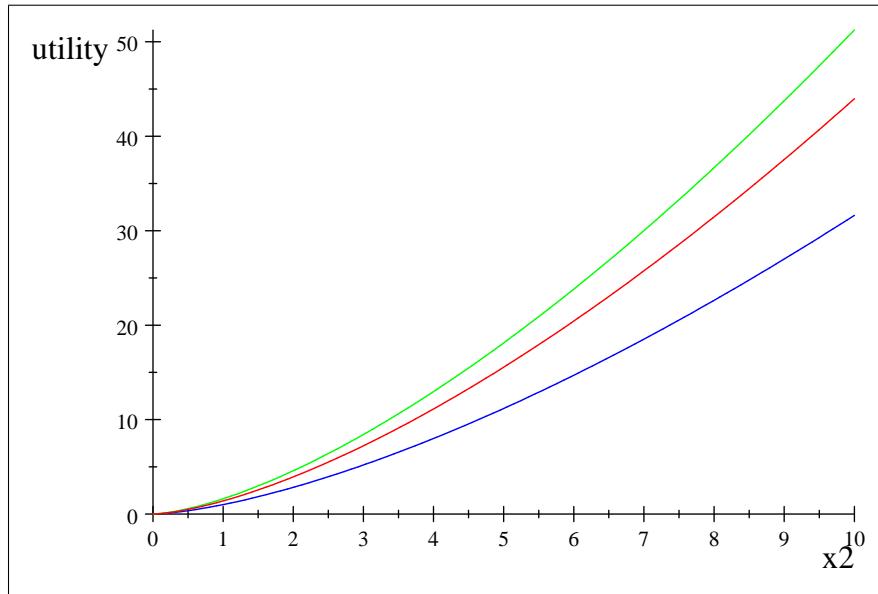
utility as a function of the amount of  $x_1$  and  $x_2$  consumed

Let me graph it only as a function of  $x_1$  holding  $x_2 = 1$  (blue),  $x_2 = 3$  (red) and  $x_2 = 5$  (green)



I am taking slices from the  $x_1$  direction, holding  $x_2$  constant. (Picture it in a room.)

Now I will graph it only as a function of  $x_2$  holding  $x_1 = 1$  (blue),  $x_1 = 3$  (red) and  $x_1 = 5$  (green)

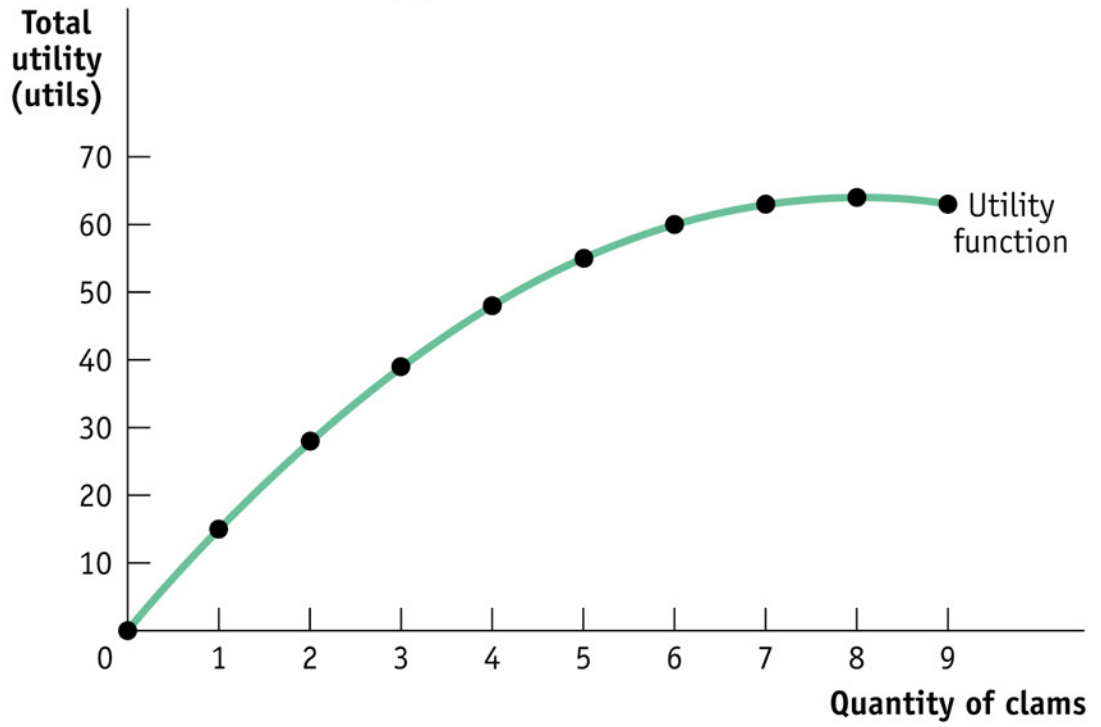


Slices in the  $x_2$  direction.

These are the equivalent to the following graph in KW.

KW are graphing utility as a function of clams holding constant the consumption of the other good

(a) Cassie's Utility Function



Quantity of clams
0
1
2
3
4
5
6
7
8
9

Draw a utility function of a commodity that is a bad, rather than a good.

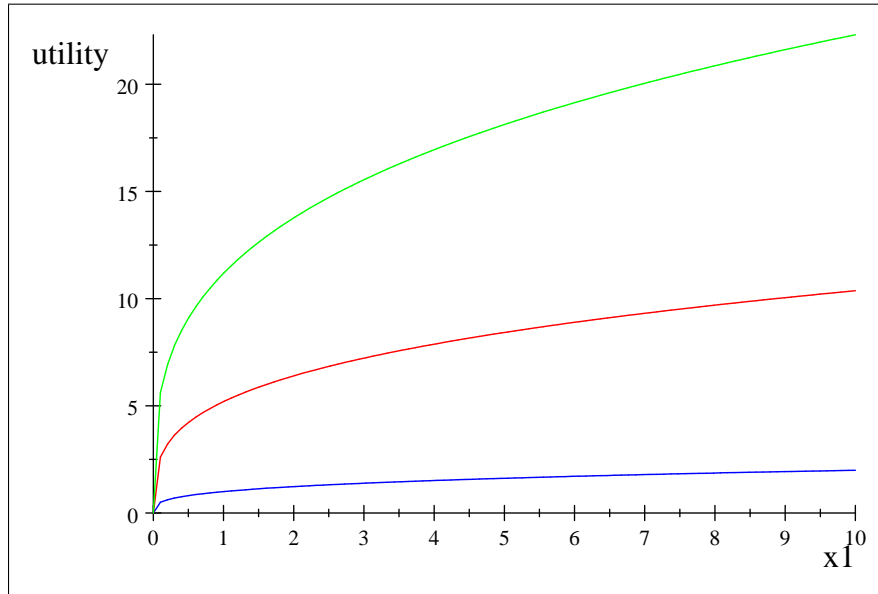
An example?

Draw a utility function of a commodity that starts off as a good but quickly turns into a bad

An example?

Draw a utility function for a medicine that is only effective in the dose of 6 drops.

Look again at the graphs of utility from  $x_1$  with  $x_2 = 1$  (blue),  $x_2 = 3$  (red) and  $x_2 = 5$  (green)



What happens to the slopes of each of these lines as  $x_1$  increases?

They get less steep. What does this mean?

As the consumption of  $x_1$  increases, holding constant the consumption of  $x_2$  the utility from each additional unit of  $x_1$  declines.

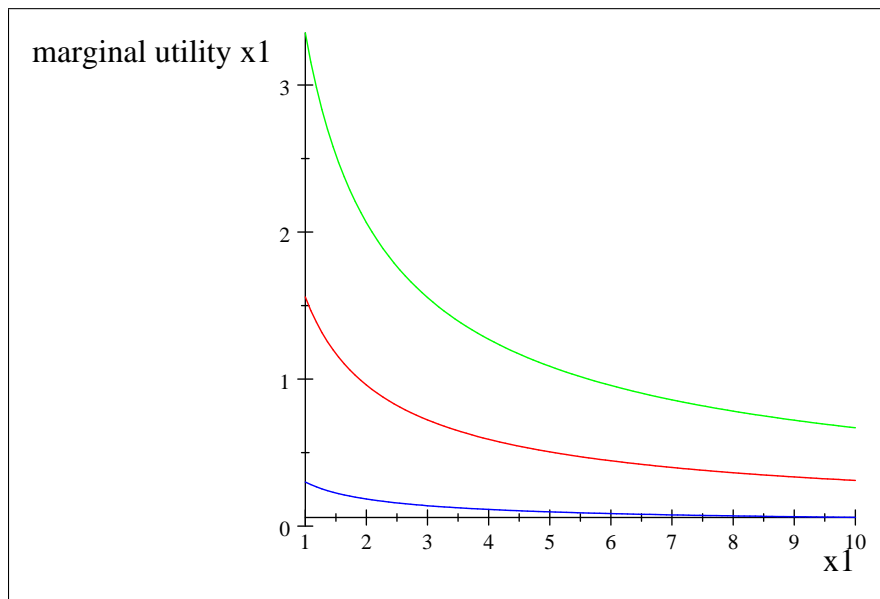
How much utility increases when  $x_1$  consumption is increased by one unit, holding the consumption of  $x_2$  constant, is called the marginal utility of  $x_1$ ?

In my graphs, and in the KW graphs, marginal utility is decreasing: while more  $x_1$  is preferred to less  $x_1$ , each additional unit of  $x_1$  consumption adds less and less to total utility.

This is called diminishing marginal utility in the consumption of  $x_1$ :  $\frac{\Delta u}{\Delta x_1}$  declines as  $x_1$  increases.

Let's graph the marginal utility of  $x_1$  curves that correspond to the utility curves drawn above.

The basic idea behind the **principle of diminishing marginal utility** is that the additional satisfaction a consumer gets from one more unit of a good declines as the amount of that good or service consumed rises. Or, to put it differently, the more of a good or service you consume, the closer you get to being satiated—reaching a point at which an additional unit of the good adds very little to your satisfaction. For someone who almost never gets to eat a banana, the first banana is a marvelous treat (as it was in Eastern Europe before the fall of Communism, when bananas were very hard to find). For someone who eats them every day, a banana is just, well, a banana.



These graphs demonstrate the *principle of diminishing marginal utility*.

In the words of KW,

Note the principle is not a universal truth. That is, it does not necessarily hold for all goods.

The principle of diminishing marginal utility is why most of how do not consume just one good - we get "filled up" on the good before we run out of income.

Consuming BMW convertibles: the first one adds greatly to utility, the second one a bunch, but not as much as the first (you can only drive one at a time), and the third less than the second. There are many more people who own one BMW convertible than people who own two.

Can you think of a good where the marginal utility of consuming the good is always a positive constant?

People will consume different bundles of goods for two reasons:

Preferences vary across individuals

Budget constraints vary across individuals