

Marginal Utility Theory of Household Behavior

1 The Marginal Utility Approach to Household Demand

When the theory of consumer behavior was first developed an approach different from the indifference curve analysis was utilized. Economists measured the satisfaction that a person received from a unit of a commodity as the "utility" (or amount of psychological pleasure) that commodity provided the consumer. Say you consume 10 units of a commodity per month, the total utility you receive is simply the sum of the utilities (the total psychic pleasure) received for each unit. Say, however, that you've been consuming 10 units of something and you decide to consume one unit more ... the addition to total utility brought about by consuming one more unit, is the marginal utility of the commodity.

DO NOT CONFUSE TOTAL AND MARGINAL UTILITY:

<< If you had to choose between giving up totally one of the following, which would you choose, water or the movies? >> The movies, naturally since your total utility from water is infinitely higher than that from movies.

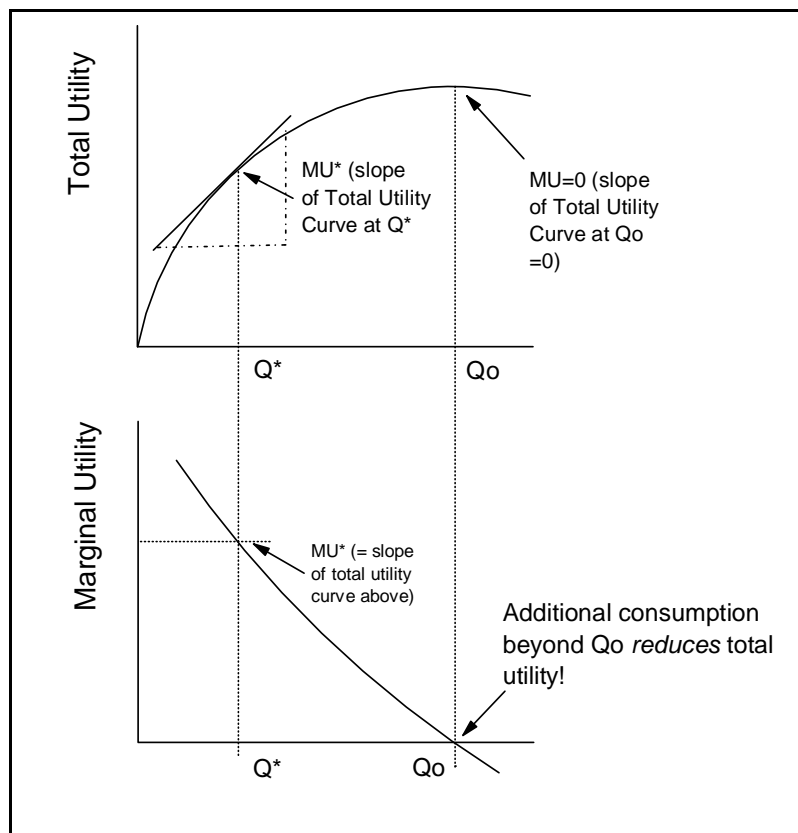
<< However, what if you had the choice of taking one extra bath per month or attending one extra movie per month, which would you choose? >> Probably the movie since the *addition* to total utility would likely be larger in the case of an extra movie even

though the total utility of water is very high. HERE WE'RE COMPARING MARGINAL UTILITIES.

Basic hypothesis of utility theory: *the utility that any household derives from successive units of a particular commodity will diminish as its total consumption of the commodity increases, the consumption of all other commodities being held constant.*

<< How might we picture this? >> Quantity on one axis, total utility on the other.

<<The total utility curve is upward sloping, is it straight, or does it bend?>> Bends, downward.



<<How might we find marginal utility of an extra unit?>> Pick a point on the

graph and determine how much of an increase in total utility there is

if we increase consumption by one. Can plot another graph with

quantity and **marginal utility** on the axis. Note that when the total utility curve becomes flat, the marginal utility curve hits zero. Each point on the marginal utility curve represents the slope of a corresponding point on the total utility curve.

<<Would you expect that if the hypothesis of diminishing marginal utility holds, that the consumer will pay less for each additional unit consumed?>> Yes.

Now we assume that the household wants to maximize utility (total utility) ... how might they go about this?

1. Consumption of any **free good** will be pushed to the point at which its *marginal utility is zero*.
2. For goods which are not free, the household maximizing its utility will so allocate its expenditure between commodities that the utility of the last dollar spent on each is equal.

In our two commodity world this implies:

$$\frac{MU_f}{P_f} = \frac{MU_c}{P_c}.$$

Or, the household consumes enough of each commodity so that the *marginal utility per dollar of the last unit consumed is equal for all goods consumed*.

<<What would happen if the two ratios were not equal?>> The household could increase its welfare by reallocating consumption away from the low ratio to the high ratio.

Now, by cross multiplying we can rewrite our equality conditions as:

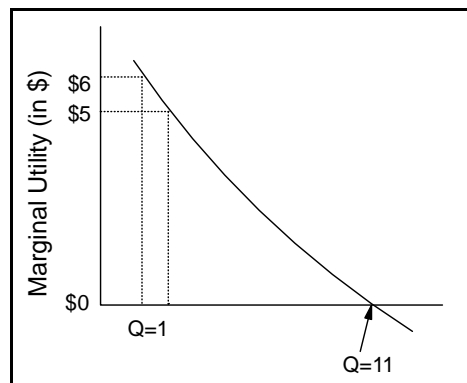
$$\frac{P_f}{P_c} = \frac{MU_f}{MU_c}.$$

<<Does this look familiar?>> Yes, looks like our equilibrium condition in indifference curve analysis. *So, indifference curve theory and marginal utility theory propose **exactly** the same conditions for utility maximization*

Digression: Baumol and Blinder don't like the concept of measuring the consumer's pleasure in terms of **utils** or some other measure of psychic bliss, so they convert **marginal utility** units to money terms by asking the following question:

“Suppose Joe is deciding whether or not to buy a piece of pizza; what is the maximum price he's willing to pay for that first piece?” Let's say that he's willing to pay \$6.00. The value to Joe of this marginal piece of pizza is \$6.00.

Now, suppose that he's only willing to pay \$5 for the second piece, and \$4 for the third piece and he's not willing to pay anything for the 11th piece. Then, we could draw Joe's marginal utility curve in dollar terms as:



Then, Joe's total utility in dollar terms would simply be the area under his marginal utility curve. With this way of looking at things Joe will consume pizza until his marginal utility (in dollars) equals zero. That is equivalent to saying as we have done above, that he consumes pizza until

$$\frac{MU_{pizza}}{P_{pizza}} = \frac{MU_{otherGood}}{P_{otherGood}}.$$

2 Derivation of the Consumer's Demand Curve:

Assume that F is an index of all other goods and we want to determine what the demand curve for clothing will look like if the price of clothing changes. Assume that the consumer is in equilibrium and that P_c falls. The equilibrium condition no longer holds:

$$\frac{P_f}{P_c} > \frac{MU_f}{MU_c}.$$

<<How can we bring the consumer back into equilibrium?>> To restore equilibrium the consumer must buy more clothing so that (because of diminishing MU) MU_c falls. If the price of clothing is cut in half, consumption of clothing must rise (and possibly consumption of other commodities must fall) until the ratio of marginal utilities is again equated to the price ratio ... this leads to the basic prediction of demand theory:

THE LAW OF DEMAND: *A rise in the price of one commodity (with income and the prices of all other commodities constant) will lead to a decrease in the quantity of the commodity demanded by each household.*

<<Does the slope of the demand curve depend upon total utility?>> No, it depends upon the marginal utility over the relevant range of consumption ... this we would expect from our indifference curve analysis where total utilities are never mentioned.

3 Diamond-Water Paradox:

<<Why should water the total utility of which is so high have a lower price than diamonds which have practically no "use value?">> Because the *exchange value* of something is determined by the intersection of supply and demand curves ... *water is relatively plentiful*, so that although *total utility* from consumption is high, the *marginal utility* of the last unit is low.

If supply of water is tight enough, price might get very high. I remember a science fiction story about the man who had the air concession on Mars!

<<How do diamond producers keep the price up!?!>> ... <<Are diamonds a good investment?>>

