

ECONOMICS FOR HEALTH POLICY

INTRODUCTION TO MICROECONOMICS

FROM CONSUMER UTILITY TO MARKET DEMAND CURVES

THE DIAMOND-WATER PARADOX

Adam Smith, the father of modern economics, posed his students this question when he was lecturing to his students at the University of Glasgow in the 1760s:

“Common sense suggests that the price of a commodity should be related to its utility to consumers. But we observe that water, although essential to life, costs almost nothing; whereas diamonds have very limited uses but cost a great deal. Why?”

The answer to this question involves using marginal analysis, one of the fundamental tools of economics.

TOTAL UTILITY

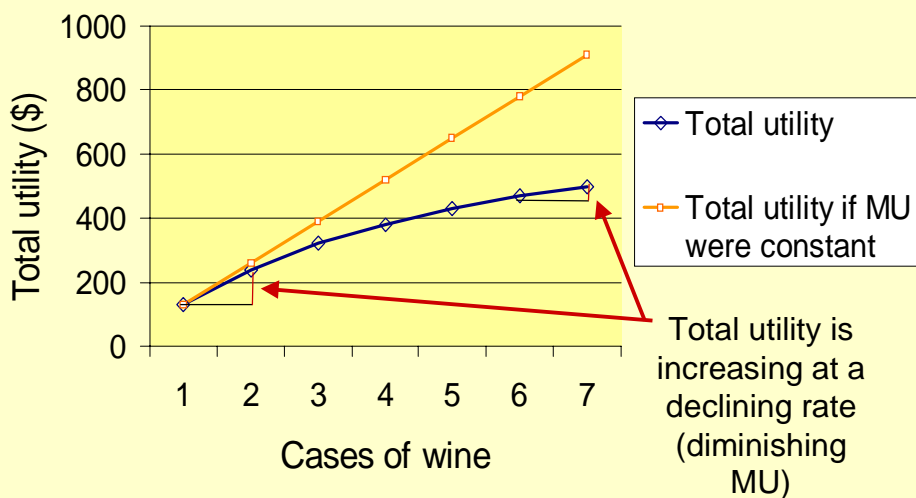
We saw last time that much of economics is concerned, at root, with situations of voluntary exchange among individuals. A voluntary exchange suggests that individuals must attach some value to that which they are giving up, and some value to that which they are receiving in exchange. The traditional word economists use to refer to value, in this sense, is **utility**.

The total utility of a quantity of goods to a consumer, in monetary terms, is the amount he or she would be willing to accept in exchange for it.

TOTAL VS. MARGINAL UTILITY

Number of cases of wine	Total utility (in dollars)	Marginal utility (in dollars)
1	130	130
2	240	110
3	320	80
4	380	60
5	430	50
6	470	40
7	500	30

TOTAL AND MARGINAL UTILITY ILLUSTRATED



THE OPTIMAL PRICE RULE

All other factors equal, it is clearly optimal for a consumer to purchase cases of wine to the point where:

Price of a case of wine = Marginal utility of an additional case of wine

The consumer who purchases a good to the point where the optimal price rule is satisfied maximizes his/her utility; and economists postulate (assume) that individuals maximize their utility.

THE DIAMOND-WATER PARADOX SOLVED

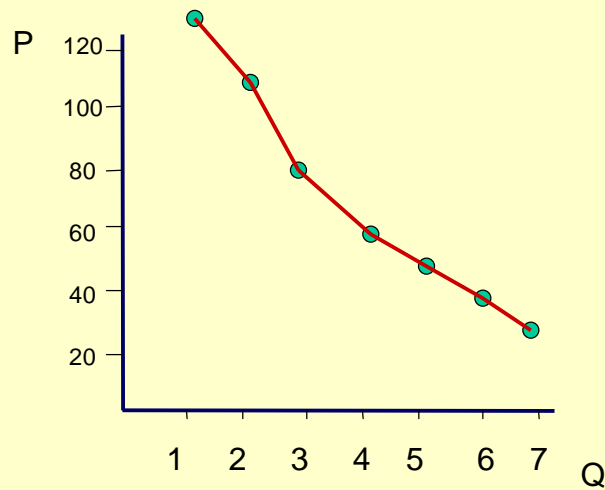
The assumption that individuals maximize their own utility then gives us a solution to the diamond-water paradox: **the total utility of water is very great, but** there is (in most places) lots of water, so **its marginal utility, hence its price, is low**. The total utility of diamonds is much lower than the total utility of water, but diamonds being scarce, their marginal utility, hence their price, is high.

RELATING QUANTITY AND PRICE

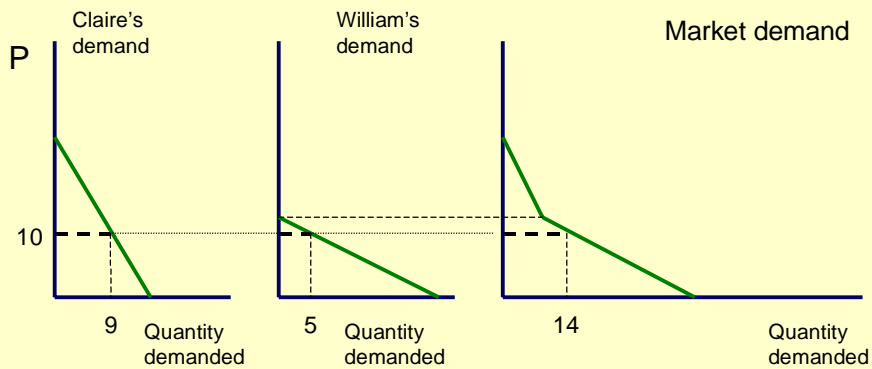
Number of cases of wine	Marginal utility (in dollars)	(Optimal) Price (in dollars)
1	130	130
2	110	110
3	80	80
4	60	60
5	50	50
6	40	40
7	30	30

CONSTRUCTING AN INDIVIDUAL DEMAND CURVE

Quantity	Price
1	130
2	110
3	80
4	60
5	50
6	40
7	30



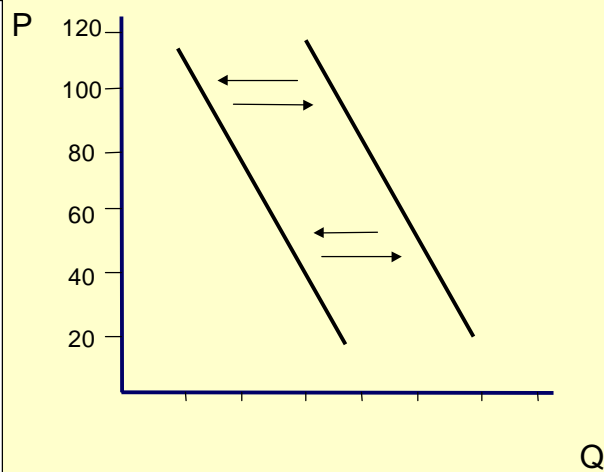
FROM INDIVIDUAL DEMAND CURVES TO A MARKET DEMAND CURVE



The market demand curve is obtained by summing consumers' individual quantities demanded at each price

FACTORS CAUSING SHIFTS IN MARKET DEMAND CURVE

- Income (distinguish between normal and inferior goods)
- Tastes (influenced by advertising)
- Prices of other goods (substitutes or complements)



PRICE ELASTICITY OF DEMAND

The *price elasticity of demand* is a very important concept in microeconomics. It measures the extent to which the quantity demanded changes in response to a price change. In order to make it unitless, it is defined as:

$$\text{Price elasticity of demand} = \frac{\% \text{ change in quantity}}{\% \text{ change in price}}$$

INCOME ELASTICITY OF DEMAND

The *income elasticity of demand* measures the extent to which the quantity demanded changes in response to a change in INCOME. It is defined as:

$$\text{Income elasticity of demand} = \frac{\% \text{ change in quantity}}{\% \text{ change in income}}$$

CROSS-PRICE ELASTICITY OF DEMAND

The *cross-price elasticity of demand* measures the extent to which the quantity demanded changes in response to a change in THE PRICE OF ANOTHER GOOD. It is defined as:

$$\text{Income elasticity of demand} = \frac{\% \text{ change in quantity}}{\% \text{ change in price of another good}}$$

INCOME EFFECTS AND SUBSTITUTION EFFECTS -1

A change in the price of a good affects the quantity demanded through two mechanisms: the INCOME EFFECT and the SUBSTITUTION EFFECT.

The income effect comes from the fact that, say, an increase in the price of a good, all other factors equal, reduces available income. This makes me (usually) want to buy less of a good (unless the good is an inferior good).

The substitution effect comes from the fact that the same increase in the price of the good makes other goods relatively cheaper. For this reason also I am inclined to buy less of the good.

INCOME EFFECTS AND SUBSTITUTION EFFECTS -2

Usually the substitution effect is the more important, and an increase in price causes a reduction in quantity demanded, even for an inferior good.

In unusual cases, however, the income effect is opposite to the substitution effect, and is more important: an increase in price then results in an increase in quantity demanded.

Under what conditions do you think this might happen?

FROM COSTS OF PRODUCTION TO MARKET SUPPLY CURVES

THE SIMPLEST CASE: ONLY ONE VARIABLE INPUT INTO PRODUCTION

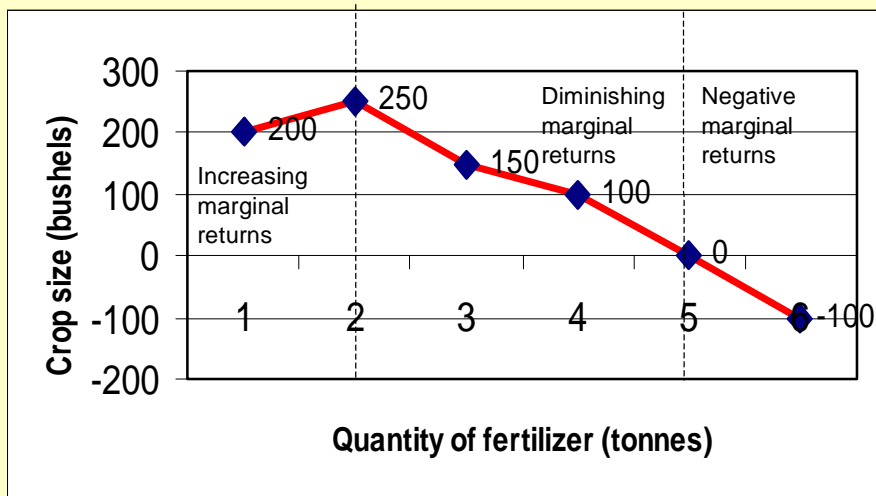
A FARMER'S TOTAL, AVERAGE, AND MARGINAL PHYSICAL PRODUCT SCHEDULES

Number of cases of wine	Marginal utility (in dollars)	(Optimal) Price (in dollars)
1	130	130
2	110	110
3	80	80
4	60	60
5	50	50
6	40	40
7	30	30

A FARMER'S TOTAL, AVERAGE, AND MARGINAL PHYSICAL PRODUCT SCHEDULES

Fertilizer input (tonnes)	Total physical product (bushels of wheat)	Marginal physical product (bushels)	Average physical product (bushels)
0	1000	--	--
1	1200	200	1200
2	1450	250	725
3	1600	150	533.33
4	1700	100	425
5	1700	0	340
6	1600	-100	266.67

MARGINAL PHYSICAL PRODUCT



THE “LAW” OF DIMINISHING MARGINAL RETURNS

The “law” of diminishing marginal returns states that, as we increase the amount of one input, *holding the quantities of all the others fixed*, the marginal returns of the expanding input begin to diminish.

This is only an empirical regularity (something that is virtually always observed in practice), not an axiom or a logically derived proposition.

RELATING OUTPUT TO COSTS

In this simplified world where there is only one input (fertilizer), the total cost of producing a given amount of wheat is simply equal to the cost of the fertilizer needed to produce that quantity.

We can then derive the total cost, average cost, and marginal cost.

These cost curves, however, can be equally well defined whether there is one input or several.

TOTAL, AVERAGE, AND MARGINAL COSTS

HYPOTHETICAL TOTAL, AVERAGE, AND MARGINAL COSTS OF AN ORTHOPAEDIC SURGEON SPECIALIZED IN HIP REPLACEMENTS

Surgeries per month	Total cost (dollars)	Marginal cost (dollars)	Average cost (dollars)
0	5000	--	--
4	7000	2000	1750
8	9000	2000	1125
12	11000	2000	916.67
16	13000	2000	812.50
20	16000	3000	800
24	20000	4000	833.33

TOTAL, AVERAGE AND MARGINAL COSTS - GRAPHICALLY

