

ELEMENTAL ECONOMICS

1. MICRO

THREE PAGE SYMBOLIC MICRO

Economics, among other things, is about choice. More specifically microeconomics is about the constrained maximization of consumer happiness and firm profit in a marketplace where goods & services can be bought and sold, in other words, where Supply meets Demand.

On the one hand, the consumer strives to maximize happiness through the consumption of goods & services subject to a budget constraint. In symbolic logic, and restricted to a two-commodity economy, this is expressed as the consumer maximizing:

$U = f(X, Y)$ where:

‘U’ stands for consumer happiness defined as utility measured as the sum total of all units of pleasure or ‘utiles’ acquired;

‘f’ stands for some function reflecting the taste of the consumer; and,

‘X’ & ‘Y’ stand for goods and services

The consumer, however, is subject to a **budget constraint**, expressed as:

$I = P_X X + P_Y Y$ where:

‘I’ stands for income earned through work which is considered ‘disutility’ or pain;

‘P’ stands for price; and,

‘I’ must be exhausted on some combination of X & Y, *i.e.*, happiness is obtained only through the consumption of goods & services that have associated prices – explicit market prices (plus or minus associated social or ‘non-market’ costs and benefits).

Assuming that the **price of only one commodity changes** while all other variables remain fixed – price of other goods, consumer income and taste – or, *ceteris paribus*, we can derive the **consumer demand curve** for that product. The demand curve shows how much a consumer is willing to pay for a given quantity in order to maximize happiness subject to the budget constraint. It will usually be downward sloping reflecting the Law of Demand: the lower the price, the greater the Demand; the higher the price, the lower the Demand. By horizontally summing up how much each consumer is willing to buy at each price we generate the market demand curve.

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On the other hand, the producer or the firm wants to maximize output. In symbolic logic, restricted again to a two-commodity economy, this is called 'the production function' of a firm maximizing:

$$Q = g(K, L, N) \text{ where:}$$

'Q' stands for output;

'g' stands for some function reflecting the technology or 'know-how' available to combine factors of production (K, L, N) in a technically efficient manner to produce a given 'Q';

'K' stands for capital as physical plant and equipment, the value of which can be expressed in financial terms;

'L' stands for labour including productive (shop floor), managerial and entrepreneurial talent; and,

'N' stands for natural resources enframed and enabled to serve human purpose.

If the firm cannot increase Q without increasing inputs, *i.e.*, K, L and/or N, it is 'technically efficient'. The producer, however, is subject to a cost constraint which, assuming a two-factor economy, can be expressed as:

$$C = P_K K + P_L L \text{ where:}$$

'C' stands for cost;

'P' stands for price;

'K' stands for a given quantity of capital; and,

'L' stands for a given quantity of labour.

Thus for a given 'Q' there is an associated 'C' determined by the sum of the quantity times the price of factors employed. How much Q will actually be produced is dependent, however, on market price, *i.e.*, how much consumers are willing to pay. So long as that price maximizes profit (or minimizes losses at or above the firm's 'shutdown' point) it will provide a corresponding Q. From the resulting cost function we can determine the supply curve of the firm, *i.e.*, how much it is willing to produce at each price. It will (in the short-run) be upward sloping reflecting the Law of Supply: the higher the price, the greater the supply; the lower the price the smaller the supply. By horizontally summing up how much each firm is willing to provide at each price we generate the market supply curve.

With market demand and supply curves we generate an 'X'-shaped graph with demand increasing as price goes down and supply increasing as price goes up. There will be a point where the two intersect. That point is called market

equilibrium, the point at which the willingness to buy and the willingness to sell (in order to maximize consumer happiness and firm profit, respectively), are equal. *Ceteris paribus*, this will be a stable equilibrium, *i.e.*, if all variables remain fixed, *e.g.*, technology, factor prices, consumer taste and income as well as the price of all other goods & services, the price-quantity equilibrium will be maintained.

Under such fixed conditions if the price rises, for whatever reason, above this equilibrium point firms will be willing to provide more than consumer are willing to buy and a surplus is created. To eliminate the surplus firms must lower price returning, eventually, to the equilibrium point. Similarly, if price drops below the equilibrium point consumer demand exceeds supply and a shortage results. Consumers will then bid up the price until it returns to the equilibrium point. These are called ‘market forces’.

Choice in microeconomics, however, takes place ‘at the margin’. In the case of the consumer, consumption of good X will increase until, dollar for dollar, the additional satisfaction (marginal utility or MU) from the last unit consumed equals the satisfaction, dollar for dollar, of the next unit of good Y. In symbolic logic this is expressed as:

$$MU_X/P_X = MU_Y/P_Y$$

where:

‘MU’ stands for the additional or marginal utility to the consumer from the next unit consumed; and,

‘P’ stands for the price.

Similarly, the firm will increase output until the additional cost (marginal cost or ‘MC’) of the last unit equals the additional revenue (marginal revenue or ‘MR’) earned from its sale. For all previous units cost is less than revenue and profit is maximized when, in symbolic logic:

$$MC = MR$$

The actual market equilibrium – price/quantity – will depend on the nature of the market - both demand and supply. If there are many, many sellers of identical goods and many, many buyers there is ‘[perfect competition](#)’ and ‘X’ marks the spot. If there is only one seller there is ‘[monopoly](#)’. If only one seller of a differentiated product there is ‘monopolistic competition’; if there are a few large sellers that dominate the market there is ‘[oligopoly](#)’. The same can occur on the demand-side of the market with, for example: ‘monopsony’ or only one buyer and oligopsony or a only few big buyers.