Microeconomics (literally, *very small economics*) is the study of the economic behaviour of individual consumers, firms, and industries and the distribution of production and income among them. It considers individuals both as suppliers of labour and capital and as the ultimate consumers of the final product. It analyzes firms both as suppliers of products and as consumers of labour and capital.

Microeconomics seeks to analyze the market form or other types of mechanisms that establish relative prices amongst goods and services and/or allocates society's resources amongst their many alternative uses.

Assumptions and definitions

The theory of supply and demand usually assumes that markets are perfectly competitive. This implies that there are many buyers and sellers in the market and none of them have the capacity to influence the price of the good. In many real-life transactions, the assumption fails because some individual buyers or sellers or groups of buyers or sellers do have enough ability to influence prices. Quite often a sophisticated analysis is required to understand the demand-supply equation of a good. However, the theory works well in simple situations.

Mainstream economics does not assume a priori that markets are preferable to other forms of social organization. In fact, much analysis is devoted to cases where so-called market failures lead to resource allocation that is suboptimal by some standard. In such cases, economists may attempt to find policies that will avoid waste; directly by government control, indirectly by regulation that induces market participants to act in a manner consistent with optimal welfare, or by creating "missing" markets to enable efficient trading where none had previously existed. This is studied in the field of collective action.

Demand

Demand is that quantity of a good that consumers are not only willing to buy but also have the capacity to buy at the given price. For example, a consumer may be willing to purchase 2 lb of potatoes if the price is $0.75 per lb. However, the same consumer may be willing to purchase only 1 lb if the price is $1.00 per lb. A demand schedule can be constructed that shows the quantity demanded at each given price. It can be represented on a graph as a line or curve by plotting the quantity demanded at each price. It can also be described mathematically by a demand equation. The main determinants of the quantity one is willing to purchase will typically be the price of the good, one's level of income, personal tastes, the price of substitute goods, and the price of complementary goods.

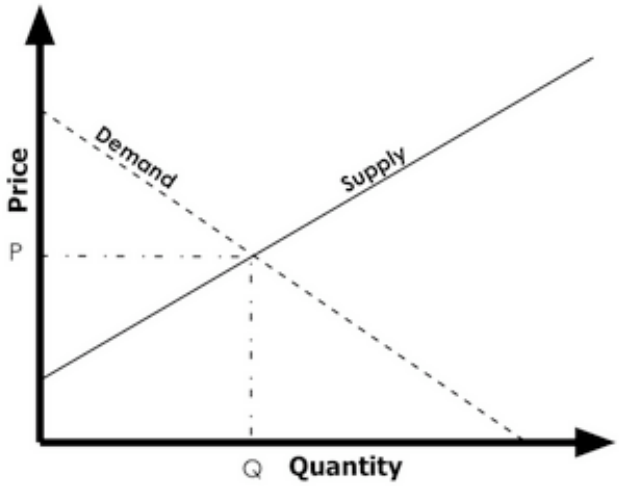
Supply

Supply is the quantity that producers are willing to produce at a given market price. For example, the potato grower may be willing to sell 1 million lb of potatoes if the price is $0.75

per lb and substantially more if the market price is $0.90 per lb. The main determinants of supply will be the market price of the good and the cost of producing it. In fact, supply curves are constructed from the firm's long-run cost schedule.

Simple supply and demand curves

Mainstream economic theory centers on creating a series of supply and demand relationships, describing them as equations, and then adjusting for factors which produce "stickiness" between supply and demand. Analysis is then done to see what "trade offs" are made in the "market", which is the negotiation between sellers and buyers. Analysis is done as to what point the ability of sellers to sell becomes less useful than other opportunities. This is related to "marginal" costs, or the price to produce the last unit that can be sold profitably, versus the chance of using the same effort to engage in some other activity.



Graph of simple supply and demand curves

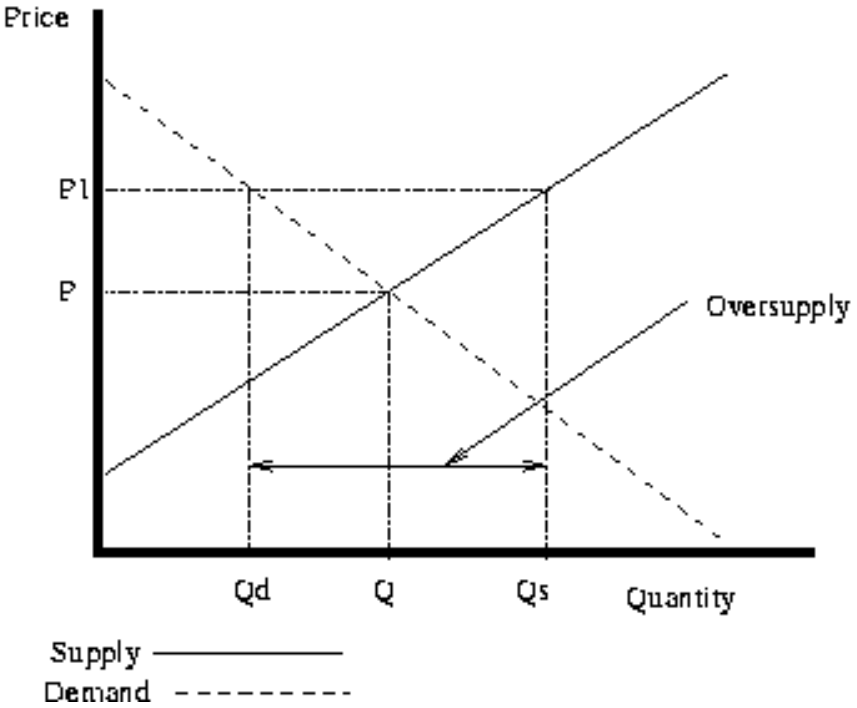
The slope of the demand curve (downward to the right) indicates that a greater quantity will be demanded when the price is lower. On the other hand, the slope of the supply curve (upward to the right) tells us that as the price goes up, producers are willing to produce more goods. The point where these curves intersect is the **equilibrium point**. At a price of P producers will be willing to supply Q units per period of time and buyers will demand the same quantity. P in this example, is the equilibrating price that equates supply with demand.

In the figures, straight lines are drawn instead of the more general curves. This is typical in analysis looking at the simplified relationships between supply and demand because the shape of the curve does not change the general relationships and lessons of the supply and demand

theory. The shape of the curves far away from the equilibrium point are less likely to be important because they do not affect the market clearing price and will not affect it unless large shifts in the supply or demand occur. So straight lines for supply and demand with the proper slope will convey most of the information the model can offer. In any case, the exact shape of the curve is not easy to determine for a given market. The general shape of the curve, especially its slope near the equilibrium point, does however have an impact on how a market will adjust to changes in demand or supply. (See the below section on elasticity.)

It should be noted that on supply and demand curves both are drawn as a function of price. Neither is represented as a function of the other. Rather the two functions interact in a manner that is representative of market outcomes. The curves also imply a somewhat neutral means of measuring price. In practice any currency or commodity used to measure price is also the subject of supply and demand.

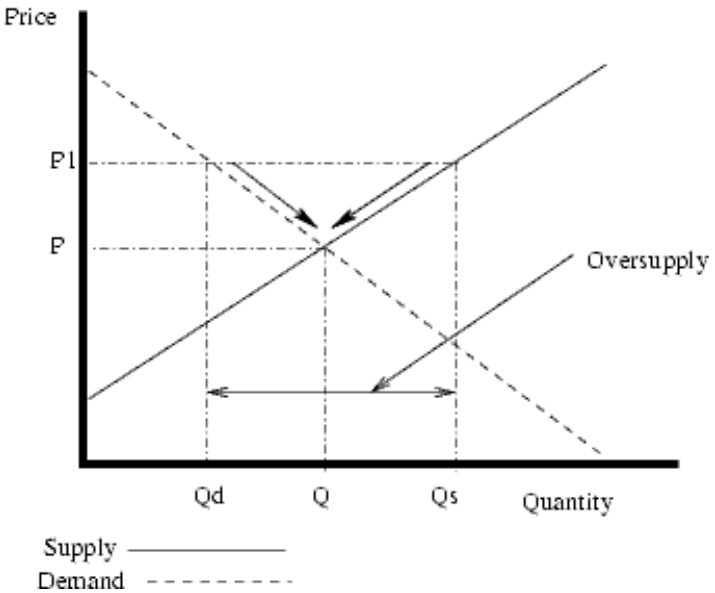
Effects of being away from the equilibrium point



Consider how prices and quantities not at the equilibrium point tend to move towards the equilibrium. Assume that some organization (say government or industry cartel) has the ability to set prices. If the price is set too high, such as at `P1` in the diagram to the right, then the quantity produced will be `Qs`. The quantity demanded will be `Qd`. Since the quantity demanded is less than the quantity supplied there will be an oversupply (also called surplus or excess supply). On the other hand, if the price is set too low, then too little will be produced to meet demand at that price. This will cause an undersupply problem (also called a shortage).

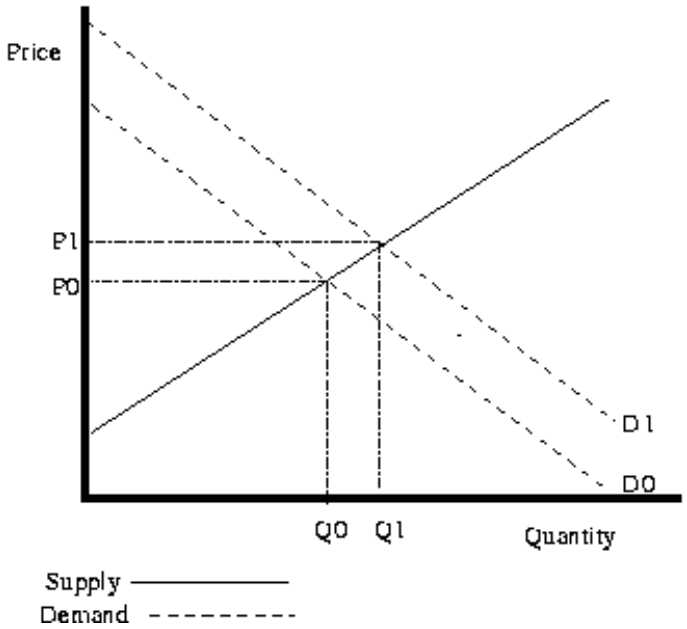
Now assume that individual firms have the ability to alter the quantities supplied and the price

they are willing to accept, and consumers have the ability to alter the quantities that they demand and the amount they are willing to pay. Businesses and consumers will respond by adjusting their price (and quantity) levels and this will eventually restore the quantity and the price to the equilibrium.



In the case of too high a price and oversupply (seen in the diagram at the left), the profit-maximizing businesses will soon have too much excess inventory, so they will lower prices (from P1 to P) to reduce this. Quantity supplied will be reduced from Qs to Q and the oversupply will be eliminated. In the case of too low a price and undersupply, consumers will likely compete to obtain the good at the low price, but since more consumers would like to buy the good at the price that is too low, the profit-maximizing firm would raise the price to the highest they can, which is the equilibrium point. In each case, the actions of independent market participants cause the quantity and price to move towards the equilibrium point.

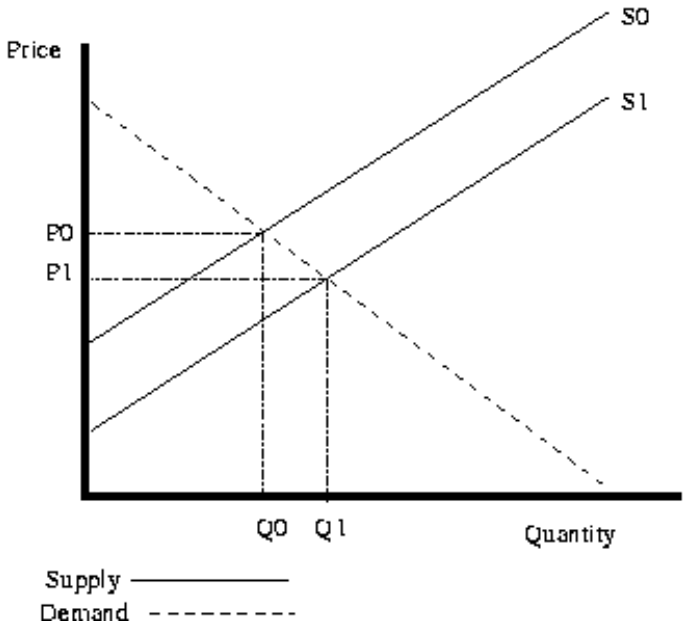
Demand curve shifts



When more people want something, the quantity demanded at all prices will tend to increase. This can be referred to as an *increase in demand*. The increase in demand could also come from changing tastes, where the same consumers desire more of the same good than they previously did. Increased demand can be represented on the graph as the curve being shifted right, because at each price point, a greater quantity is demanded. An example of this would be more people suddenly wanting more coffee. This will cause the demand curve to shift from the initial curve `D0` to the new curve `D1`. This raises the equilibrium price from `P0` to the higher `P1`. This raises the equilibrium quantity from `Q0` to the higher `Q1`. In this situation, we say that there has been an *increase* in demand which has caused an *extension* in supply.

Conversely, if the demand decreases, the opposite happens. If the demand starts at `D1` and then *decreases* to `D0`, the price will decrease and the quantity supplied will decreaseâ€"a *contraction* in supply. Notice that this is purely an effect of demand changing. The quantity supplied at each price is the same as before the demand shift (at both Q0 and Q1). The reason that the equilibrium quantity and price are different is the demand is different.

Supply curve shifts



When the suppliers' costs change the supply curve will shift. For example, assume that someone invents a better way of growing wheat so that the amount of wheat that can be grown for a given cost will increase. Producers will be willing to supply more wheat at every price and this shifts the supply curve S0 to the right, to S1â€"an *increase in supply*. This causes the equilibrium price to decrease from P0 to P1. The equilibrium quantity increases from Q0 to Q1 as the quantity demanded increases at the new lower prices. Notice that in the case of a supply curve shift, the price and the quantity move in opposite directions.

Conversely, if the quantity supplied *decreases*, the opposite happens. If the supply curve starts at S1 and then shifts to S0, the equilibrium price will increase and the quantity will decrease. Notice that this is purely an effect of supply changing. The quantity demanded at each price is the same as before the supply shift (at both Q0 and Q1). The reason that the equilibrium quantity and price are different is the *supply* is different.

See also: Induced demand

Market 'clearance'

The market "clears" at the point where all the supply and demand at a given price balance. That is, the amount of a commodity available at a given price equals the amount that buyers are willing to purchase at that price. It is assumed that there is a process that will result in the market reaching this point, but exactly what the process is in a real situation is an ongoing subject of research. Markets which do not clear will react in some way, either by a change in price, or in the amount produced, or in the amount demanded. Graphically the situation can be represented by two curves: one showing the price-quantity combinations buyers will pay for, or the demand curve; and one showing the combinations sellers will sell for, or the supply curve.

The market clears where the two are in equilibrium, that is, where the curves intersect. In a general equilibrium model, all markets in all goods clear simultaneously and the "price" can be described entirely in terms of tradeoffs with other goods. For a century most economists believed in Say's Law, which states that markets, as a whole, would always clear and thus be in balance.

Elasticity

Main article: Elasticity (economics)

An important concept in understanding supply and demand theory is **elasticity**. In this context, it refers to how supply and demand change in response to various stimuli. One way of defining elasticity is the percentage change in one variable divided by the percentage change in another variable (known as *arch elasticity* because it calculates the elasticity over a range of values, in contrast with *point elasticity* that uses differential calculus to determine the elasticity at a specific point). Thus it is a measure of *relative* changes.

Often, it is useful to know how the quantity supplied or demanded will change when the price changes. This is known as the **price elasticity of demand** and the **price elasticity of supply**. If a monopolist decides to increase the price of their product, how will this affect their sales revenue? Will the increased unit price offset the likely decrease in sales volume? If a government imposes a tax on a good, thereby increasing the effective price, how will this affect the quantity demanded?

If you do not wish to calculate elasticity, a simpler technique is to look at the slope of the curve. Unfortunately, this has units of measurement of quantity over monetary unit (for example, liters per euro, or battleships per million yen), which is not a convenient measure to use for most purposes. So, for example, if you wanted to compare the effect of a price change of gasoline in Europe versus the United States, there is a complicated conversion between gallons per dollar and liters per euro. This is one of the reasons why economists often use relative changes in percentages, or elasticity. Another reason is that elasticity is more than just the slope of the function: It is the slope of a function in a coordinate space, that is, a line with a constant slope will have different elasticity at various points.

Let's do an example calculation. We have said that one way of calculating elasticity is the percentage change in quantity over the percentage change in price. So, if the price moves from $1.00 to $1.05, and the quantity supplied goes from 100 pens to 102 pens, the slope is 2/0.05 or 40 pens per dollar. Since the elasticity depends on the percentages, the quantity of pens increased by 2%, and the price increased by 5%, so the elasticity is 2/5 or 0.4.

Since the changes are in percentages, changing the unit of measurement or the currency will not affect the elasticity. If the quantity demanded or supplied changes a lot when the price changes a little, it is said to be elastic. If the quantity changes little when the prices changes a lot, it is said to be inelastic. An example of perfectly inelastic supply, or zero elasticity, is

represented as a vertical supply curve. (See that section below)

Elasticity in relation to variables other than price can also be considered. One of the most common to consider is income. How would the demand for a good change if income increased or decreased? This is known as the **income elasticity of demand**. For example, how much would the demand for a luxury car increase if average income increased by 10%? If it is positive, this increase in demand would be represented on a graph by a positive shift in the demand curve, because at all price levels, a greater quantity of luxury cars would be demanded.

Another elasticity that is sometimes considered is the **cross elasticity of demand**, which measures the responsiveness of the quantity demanded of a good to a change in the price of another good. This is often considered when looking at the relative changes in demand when studying **complement** and **substitute goods**. Complement goods are goods that are typically utilized together, where if one is consumed, usually the other is also. Substitute goods are those where one can be substituted for the other, and if the price of one good rises, one may purchase less of it and instead purchase its substitute.

Cross elasticity of demand is measured as the percentage change in demand for the first good that occurs in response to a percentage change in price of the second good. For an example with a complement good, if, in response to a 10% increase in the price of fuel, the quantity of new cars demanded decreased by 20%, the cross elasticity of demand would be âˆ’20%/10% or, âˆ’2.

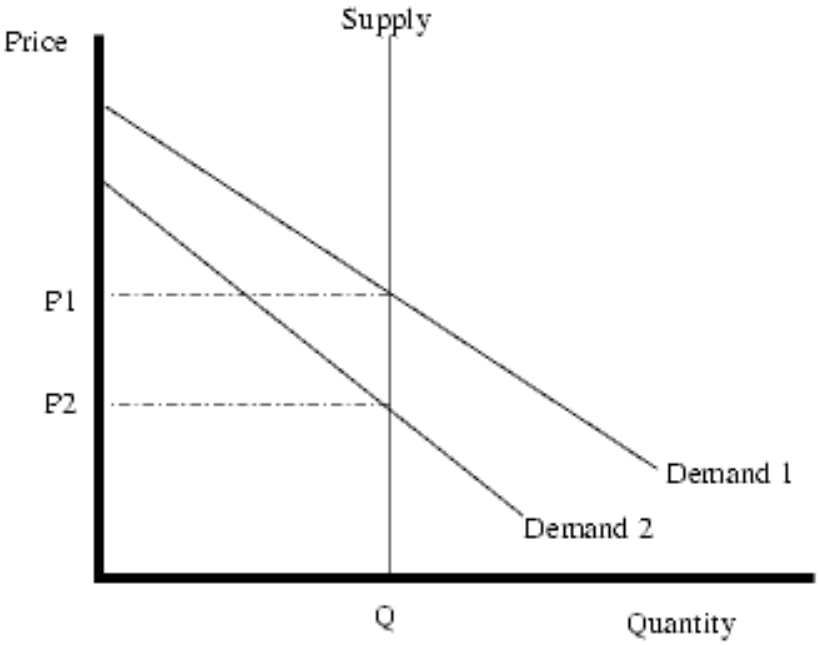
Vertical supply curve

It is sometimes the case that the supply curve is vertical: that is the quantity supplied is fixed, no matter what the market price. For example, the amount of land in the world can be considered fixed. In this case, no matter how much someone would be willing to pay for a piece of land, the extra cannot be created. Also, even if no one wanted all the land, it still would exist. These conditions create a vertical supply curve, giving it zero elasticity (i.e., no matter how large the change in price, the quantity supplied will not change).

In the short run near vertical supply curves are even more common. For example, if the Super Bowl is next week, increasing the number of seats in the stadium is almost impossible. The supply of tickets for the game can be considered vertical in this case. If the organizers of this event underestimated demand, then it may very well be the case that the price that they set is below the equilibrium price. In this case there will likely be people who paid the lower price who only value the ticket at that price, and people who could not get tickets, even though they would be willing to pay more. If some of the people who value the tickets less sell them to people who are willing to pay more (i.e., scalp the tickets), then the effective price will rise to the equilibrium price.

The graph below illustrates a vertical supply curve. When the `demand 1` is in effect, the price will be `p1`. When `demand 2` is occurring, the price will be `p2`. Notice that at both values the

quantity is Q. Since the supply is fixed, any shifts in demand will only affect price.



Other market forms

In a situation in which there are many buyers but a single **monopoly** supplier that can adjust the supply or price of a good at will, the monopolist will adjust the price so that his profit is maximized given the amount that is demanded at that price. This price will be higher than in a competitive market. A similar analysis using supply and demand can be applied when a good has a single buyer, a **monopsony**, but many sellers.

Where there are both few buyers or few sellers, the theory of supply and demand cannot be applied because both decisions of the buyers and sellers are interdependentâ€"changes in supply can affect demand and vice versa. **Game theory** can be used to analyze this kind of situation. (See also **oligopoly**.)

The supply curve does not have to be linear. However, if the supply is from a profit-maximizing firm, it can be proven that supply curves are not downward sloping (i.e., if the price increases, the quantity supplied will not decrease). Supply curves from profit-maximizing firms can be vertical, horizontal or upward sloping. While it is possible for industry supply curves to be downward sloping, supply curves for individual firms are never downward sloping.

Standard microeconomic assumptions cannot be used to prove that the demand curve is downward sloping. However, despite years of searching, no generally agreed upon example of a good that has an upward-sloping demand curve has been found (also known as a **giffen good**). Non-economists sometimes think that certain goods would have such a curve. For

example, some people will buy a luxury car because it is expensive. In this case the good demanded is actually prestige, and not a car, so when the price of the luxury car decreases, it is actually changing the amount of prestige so the demand is not decreasing since it is a different good (see **Veblen good**). Even with downward-sloping demand curves, it is possible that an increase in income may lead to a decrease in demand for a particular good, probably due to the existence of more attractive alternatives which become affordable: a good with this property is known as an **inferior good**.

An example: Supply and demand in a 6-person economy

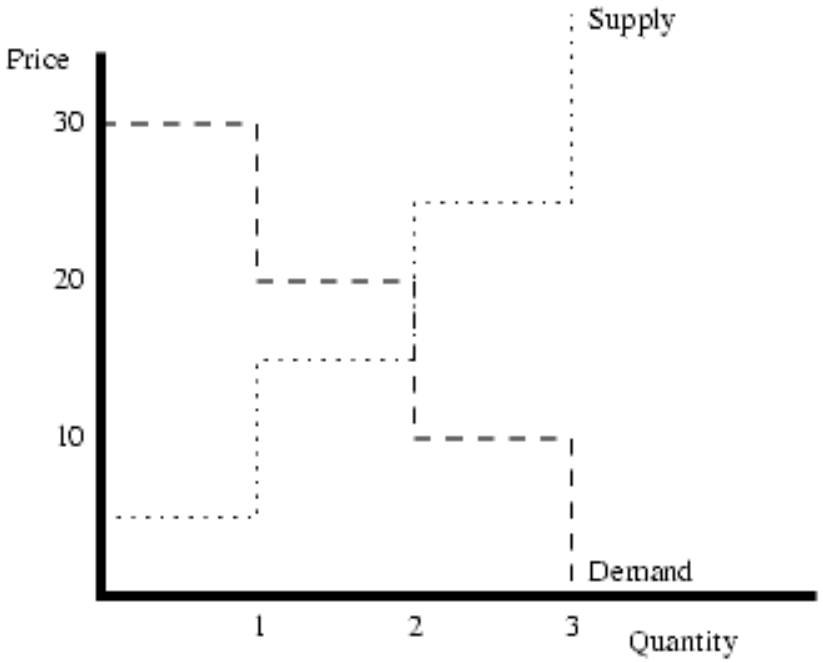
Supply and demand can be thought of in terms of individual people interacting at a market. Suppose the following six people participate in this simplified economy:

- Alice is willing to pay $10 for a sack of potatoes.
- Bob is willing to pay $20 for a sack of potatoes.
- Cathy is willing to pay $30 for a sack of potatoes.
- Dan is willing to sell a sack of potatoes for $5.
- Emily is willing to sell a sack of potatoes for $15.
- Fred is willing to sell a sack of potatoes for $25.

There are many possible trades that would be mutually agreeable to both people, but not all of them will happen. For example, Cathy and Fred would be interested in trading with each other for any price between $25 and $30. If the price is above $30, Cathy is not interested, since the price is too high. If the price is below $25, Fred is not interested, since the price is too low. However, at the market Cathy will discover that there are other sellers willing to sell at well below $25, so she will not trade with Fred at all. In an efficient market, each seller will get as high a price as possible, and each buyer will get as low a price as possible.

Imagine that Cathy and Fred are bartering over the price. Fred offers $25 for a sack of potatoes. Before Cathy can agree, Emily offers a sack of potatoes for $24. Fred is not willing to sell at $24, so he drops out. At this point, Dan offers to sell for $12. Emily won't sell for that amount so it looks like the deal might go through. At this point Bob steps in and offers $14. Now we have two people willing to pay $14 for a sack of potatoes (Cathy and Bob), but only one person (Dan) willing to sell for $14. Cathy notices this and doesn't want to lose a good deal, so she offers Dan $16 for his potatoes. Now Emily also offers to sell for $16, so there are two buyers and two sellers at that price (note that they could have settled on any price between $15 and $20), and the bartering can stop. But what about Fred and Alice? Well, Fred and Alice are not willing to trade with each other, since Alice is only willing to pay $10 and Fred will not sell for any amount under $25. Alice can't outbid Cathy or Bob to purchase from Dan, so Alice

will not be able to get a trade with them. Fred can't underbid Dan or Emily, so he will not be able to get a trade with Cathy. In other words, a stable equilibrium has been reached.



A supply and demand graph could also be drawn from this. The demand would be:

- 1 person is willing to pay $30 (Cathy).
- 2 people are willing to pay $20 (Cathy and Bob).
- 3 people are willing to pay $10 (Cathy, Bob, and Alice).

The supply would be:

- 1 person is willing to sell for $5 (Dan).
- 2 people are willing to sell for $15 (Dan and Emily).
- 3 people are willing to sell for $25 (Dan, Emily, and Fred).

Supply and demand match when the quantity traded is two sacks and the price is between $15 and $20. Whether Dan sells to Cathy, and Emily to Bob, or the other way round, and what precisely is the price agreed cannot be determined. This is the only limitation of this simple model. When considering the full assumptions of perfect competition the price would be fully determined, since there would be enough participants to determine the price. For example, if the "last trade" was between someone willing to sell at $15.50 and someone willing to pay $15.51, then the price could be determined to the penny. As more participants enter, the more

likely there will be a close bracketing of the equilibrium price.

It is important to note that this example violates the assumption of perfect competition in that there are a limited number of market participants. However, this simplification shows how the equilibrium price and quantity can be determined in an easily understood situation. The results are similar when unlimited market participants and the other assumptions of perfect competition are considered.

Decision making

Much of economics assumes that individuals seek to maximize their happiness or utility; however, whether they rationally attempt to optimize their well-being given available information is a source of much debate. In this view, which underpins much of economic writing, individuals make choices between alternatives based on their estimation of which will yield the best results. Many important economic ideas, such as the "efficient market hypothesis", rest on this view of decision making.

However, this framework, once called "homo economicus", has for decades been the focus of unease even by those who apply it. Milton Friedman once defended the idea by saying that inaccurate assumptions could produce accurate results. Alfred Marshall was careful to differentiate the tendency to maximize happiness with maximizing economic well-being. The limits of rationality have been the subject of intense study, for example, Herbert Simon's model for "bounded rationality", which was awarded a Nobel Prize in 1978. More recently, irrational behavior and imperfect information have increasingly been the subject of formal modeling, often referred to as behavioral economics, for which Daniel Kahneman won a Nobel Prize in 2002. An example is the growing field of behavioral finance, which combines previous theory with cognitive psychology.

The new model of information and decision making focuses on asymmetrical information, when some participants have key facts that others do not, and on decision making based not on the economic pressures but on the decisions of other economic actors. Asymmetrical information and behavioral dynamics lead to different conclusions: in a world of asymmetrical information, markets are generally not efficient, and inefficiencies grow up as means of hedging against information. While not yet universally accepted, it is increasingly influential in policy, for example, the writing of Joseph Stiglitz and financial modeling.

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Special Cases of a Supply Curve

As described above, the general form of a supply curve is that it is upward sloping. There are a few rare cases in which the supply curve may be backward bending. A well known example is for the supply curve for labor: backward bending supply curve of labour. As a person's wage

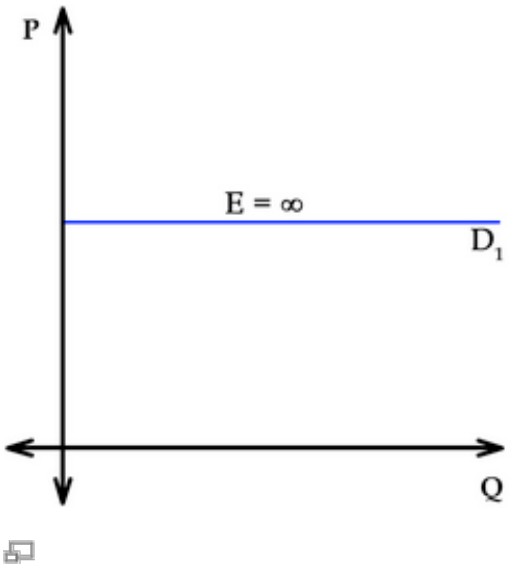
increases, they are willing to supply a greater number of hours working, but when the wage reaches an extremely high amount (say a wage of $1,000,000 per hour), the amount of labor supplied actually decreases.

In economics, **elasticity** is the ratio of the incremental percentage change in one variable with respect to an incremental percentage change in another variable. Elasticity is usually expressed as a positive number (i.e., an absolute value) when the sign is already clear from context.

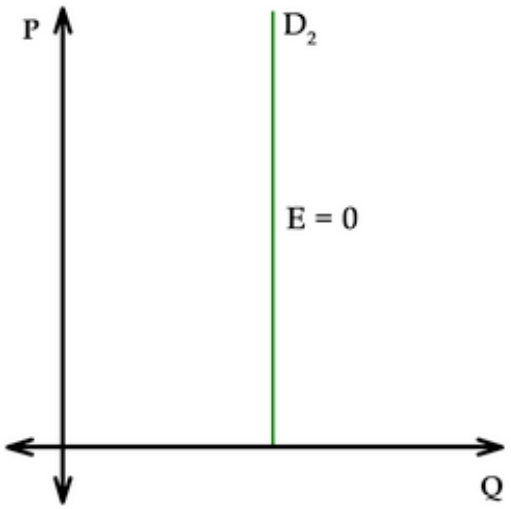
Generalised cases

Keeping in mind the example of price elasticity of demand, these figures show x=Q horizontal and y=P vertical.

Figure 1: Illustrations of Perfect Elasticity and Perfect Inelasticity.



In this example the demand curve (D1) is perfectly elastic.



In this example the demand curve (D2) is perfectly inelastic.

Generalised cases of elasticity are frequently used in discussions that characterise circumstances for which detailed information is not available and/or irrelevant to the discussion. There are five such cases of elasticity.

- E = 0 Perfectly inelastic. This special case of elasticity is represented in the figure to the right above. Any change in P will have no effect on Q.
- E < 1 Inelastic. The proportional change in Q is less than the proportional change in P.
- E = 1 Unit elasticity. The proportional change in one variable is equal to the proportional change in another variable.
- E > 1 Elastic. The proportional change in Q is greater than the proportional change in P.
- E = infinity Perfectly elastic. This special case of elasticity is represented in the figure to the left above. Change in P is zero, so elasticity is infinite.

Importance

Elasticity is an important concept in understanding the incidence of indirect taxation, marginal concepts as they relate to the theory of the firm, distribution of wealth and different types of goods as they relate to the theory of consumer choice and the Lagrange Multiplier. Elasticity is also crucially important in any discussion of welfare distribution: in particular consumer surplus, producer surplus, or government surplus.

The concept of Elasticity was also an important component of the Singer-Prebisch Thesis

which is a central argument in Dependency Theory as it relates to development economics.

This page deals with the various forms of economic surplus, including producer, consumer, government, and social/total surplus. For information about a budget surplus, see budget deficit.

The term **surplus** is used in economics for several related quantities. The **consumer surplus** is the amount that consumers benefit by being able to purchase a product for a price that is less than they would be willing to pay. The **producer surplus** is the amount that producers benefit by selling at a market price that is higher than they would be willing to sell for.

If the government intervenes, using, for example, a tax or a subsidy, then the graph of supply and demand becomes more complicated and will also include an area that represents **government surplus.**

Combined, the consumer surplus, the producer surplus, and the government surplus (if present) make up the **social surplus** or the **total surplus**. Total surplus is the primary measure used in Welfare Economics to evaluate the efficiency of a proposed policy.

A basic technique of bargaining for both parties is to pretend that their surplus is less than it really is: sellers may argue that the price they asks hardly leaves them any profit, while customers may play down how eager they are to have the article.

In national accounts, operating surplus is roughly equal to distributed and undistributed pre-tax profit income, net of depreciation.

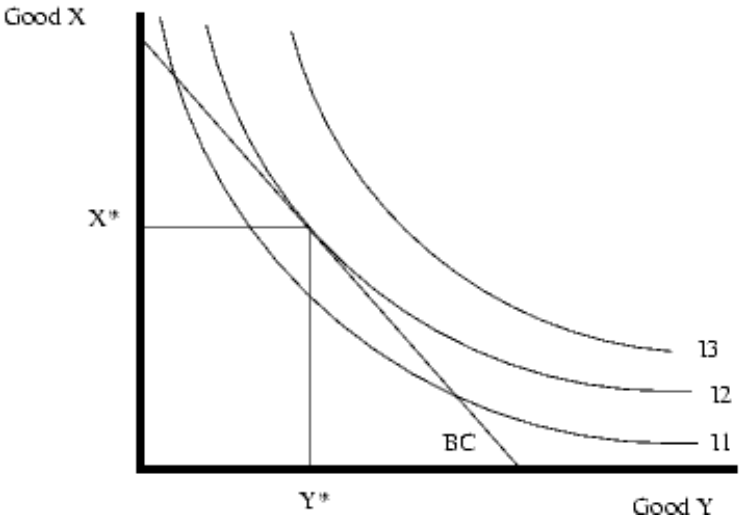
In heterodox economics, the economic surplus denotes the total income which the ruling class derives from its ownership of society's (productive) assets, which is either reinvested or spent on consumption.

In Marxian economics, the term *surplus* may also refer to surplus value and surplus labour.

Consumer theory relates preferences, indifference curves and **budget constraints** to consumer demand curves.

Indifference curves and budget constraints

Using indifference curves and an assumption of constant prices and a fixed income in a two good world will give the following diagram. The consumer can choose any point on or below the budget constraint line BC. This line is diagonal since it comes from the equation $X \times px + Y \times py \leq Income$. In other words, the amount spent on both goods together is less than or equal to the income of the consumer. The consumer will choose the indifference curve with the highest utility that is within the budget constraint. I3 has all the points outside of their budget constraint so the best that they can do is I2. This will result in them purchasing X* of good X and Y* of good Y.

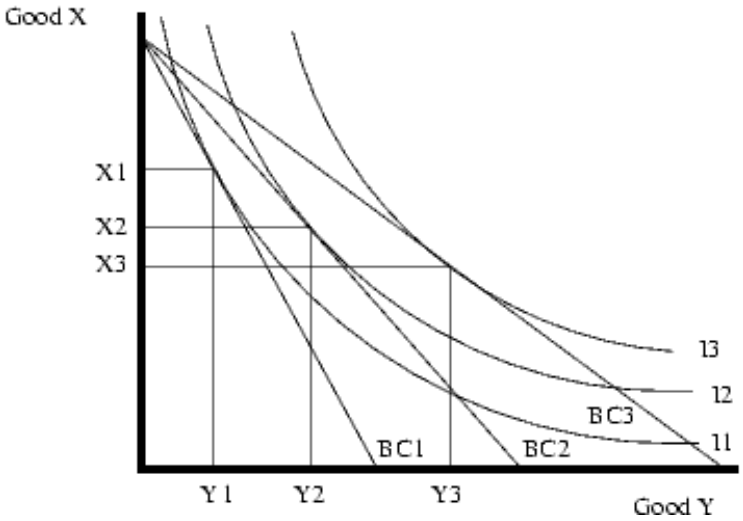


Income effect and Price effect deal with how the change in price of the commodity changes the consumption of the Good

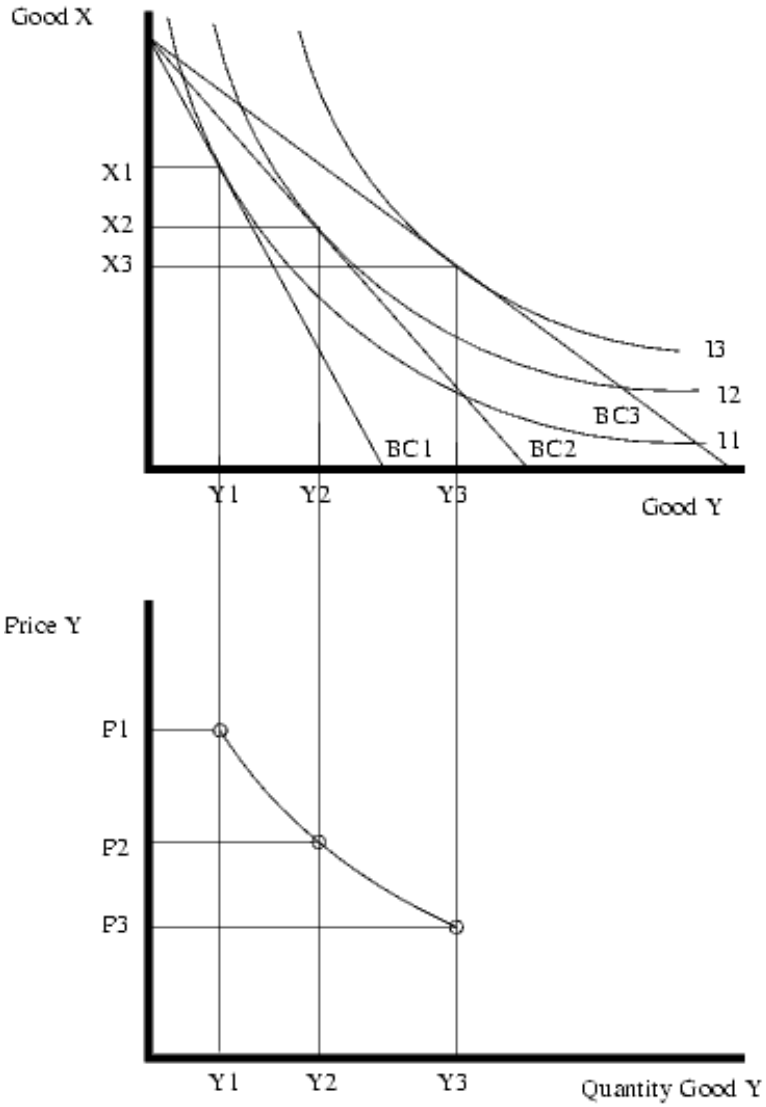
Price effects

More usefully, this can now be used to predict the effect of various shifts in the constraint. The below graphic shows the effect of a price shift for good y. If the price of Y increases from where it is at BC2, the budget constraint will shift to BC1. Notice that since the price of X does not change, the consumer can still buy the same amount of X if they only choose to buy good X. On the other hand, if they choose to buy only good Y, they will be able to buy less of good Y since its price has increased.

To maximize the utility with the reduce budget constraint, BC1, the consumer will re-allocate consumption to reach the highest available indifference curve which BC1 can touch. As shown on the diagram below, that curve is I1, and therefore the amount of good Y bought will shift from Y2 to Y1, and the amount of good X bought to shift from X2 to X1. The opposite effect will occur if the price of Y decreases causing the shift from BC2 to BC3, and I2 to I3.

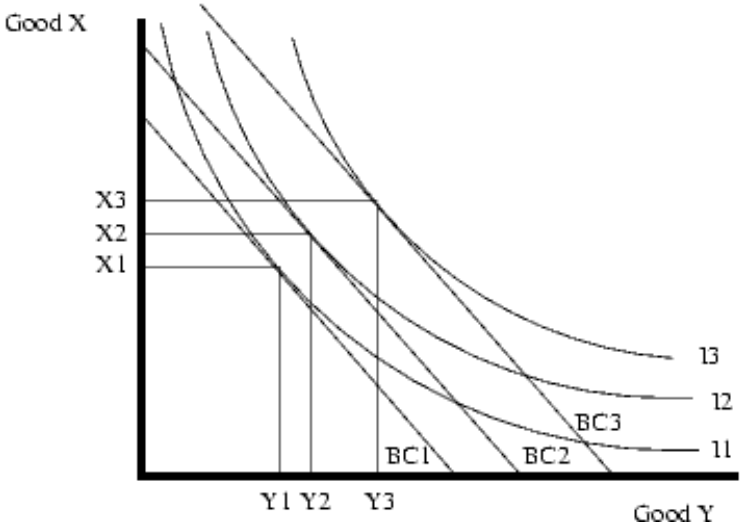


If this shifts are repeated with many different prices for good Y, a demand curve for good Y can be constructed. If the price for good Y is fixed and the price for good X is varied, a demand curve for good X can be constructed. The below diagram explains this for good y.

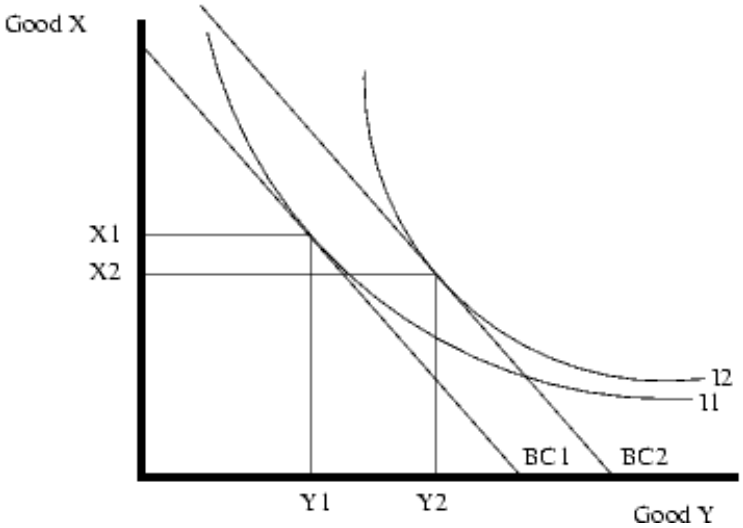


Income effect

Another important item that can change is the income of the consumer. As long as the prices remain constant, changing the income will create a parallel shift of the budget constraint. Increasing the income will shift the budget constraint right since more of both can be bought, and decreasing income will shift it left.



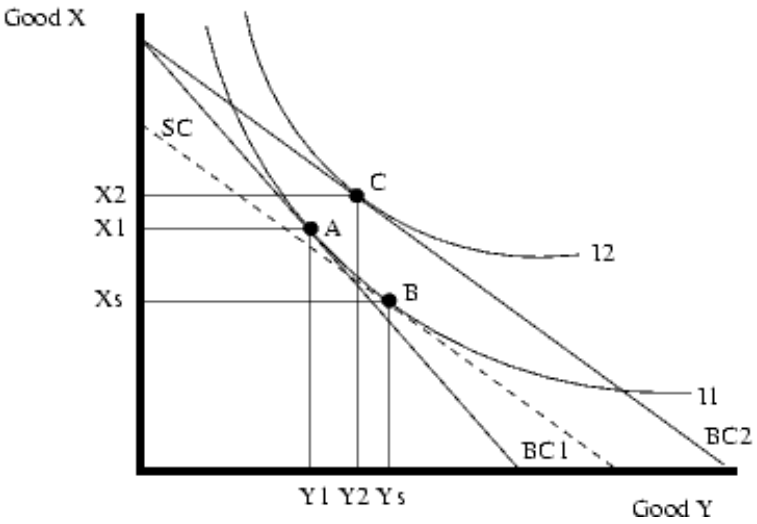
Depending on the indifference curves the amount of a good bought can either increase, decrease or stay the same when income increases. In the diagram below, good Y is a normal good since the amount purchased increased as the budget constraint shifted from BC1 to the higher income BC2. Good X is an inferior good since the amount bought decreased as the income increases.



Substitution effect

Every price change can be converted into an income effect and a substitution effect. The substitution effect is basically a price change that changes the slope of the budget constraint, but leaves the consumer on the same indifference curve. This effect will always cause the consumer to substitute away from the good that is becoming comparatively more expensive. If the good in question is a normal good, then the income effect will re-enforce the substitution effect. If the good is inferior, then the income effect will lessen the substitution effect. If the

income effect is opposite and stronger than the substitution effect, the consumer will buy more of the good when it becomes more expensive. There is a generally agreed upon example of this happening, known as a Giffen good.



To download a free software to make your own experiments with consumer choice, substitution and income effects you may go to:
The demand for various commodities by individuals is generally thought of as the outcome of a utility-maximizing process. The interpretation of this relationship between price and quantity demanded of a given good is that, given all the other goods and constraints, this set of choices is that one which makes the consumer happiest.

Aggregate, or market, demand curves represent the sum of these individual demand curves. An important question is whether market demand curves can also be thought of as being generated by a utility-maximization process. Does the aggregated demand curve show how to optimise the total utility (happiness) of society? Does it show how to optimise something else? The answer to these questions is no; market demand curves generally have no utility interpretation.

Moreover, even if market demand curves could mathematically be rationalized by a utility function; they still cannot be economically rationalized as generating an overall welfare index. There are several reasons for this

1. Each person's individual total utility gleaned from purchases depends on the size of his or her budget, but the distribution of wealth (and thus her budget) is a separate (free) variable in the aggregation. In other words, changing the distribution of wealth (such as giving needy people more resources) will produce a different total for society's utility.

2. Each person's demand curve is a function of his or her budget, so that if the distribution of wealth changes (by changing the distribution of prices and thus salaries, and so on), all of the individual demand curves change. The aggregate effect of such a change is not simple unless all the consumers have wealth-independent consumption patterns --- that is,

unless the pauper and the billionaire spend the same fraction of their budgets on each item.

Markets cannot be claimed to select an optimum in the sense of the greatest total utility of society; indeed, there is not even general agreement on how total utility should be defined. However, under strictly competitive conditions, market outcomes do represent a Pareto optimum.

It has been known since at least 1953 (Gorman, W.M., *Community Preference Fields, Econometrica, 21: 63-80*) and 1982 (Shafer, W. and Sonnenschein, H., *Market demand and excess demand functions*, in K. J. Arrow and M. D. Intriligator (eds), *Handbook of Mathematical Economics (Vol. II)*, North-Holland, Amsterdam) that no reasonable assumptions can circumvent these problems.

This article is about "utility" in economics and in game theory. For utility companies and similar concepts, see public utility. For utilities in computers, see computer software. See also Utility (patent)

In economics, **utility** is a measure of the happiness or satisfaction gained from a good or service.

The concept is applied by economists in such topics as the indifference curve, which measures the combination of a basket of commodities that an individual or a community requests at a given level(s) of satisfaction. The concept is also used in utility functions, social welfare functions, Pareto maximization, Edgeworth boxes and contract curves. It is a central concept of welfare economics.

The doctrine of utilitarianism saw the maximisation of utility as a moral criterion for the organisation of society. According to utilitarians, such as Jeremy Bentham (1748-1832) and John Stuart Mill (1806-1876), society should aim to maximise the total utility of individuals, aiming for 'the greatest happiness for the greatest number'.

Utility theory assumes that humankind is rational. That is, people maximize their utility wherever possible. For instance, one would request more of a good if it is available and if one has the ability to acquire that amount, if this is the rational thing to do in the circumstances.

Cardinal and ordinal utility

There are mainly two kinds of measurement of utility implemented by economists: cardinal utility and ordinal utility.

Utility was originally viewed as a measurable quantity, so that it would be possible to measure the utility of each individual in the society with respect to each good available in the society, and to add these together to yield the total utility of all people with respect to all goods in the society. Society could then aim to maximise the total utility of all people in society, or equivalently the average utility per person. This conception of utility as a measurable quantity that could be aggregated across individuals is called **cardinal utility**.

Cardinal utility quantitatively measures the preference of an individual towards a certain commodity. Numbers assigned to different goods or services can be compared. A utility of 100 units towards a cup of vodka is twice as desirable as a cup of coffee with a utility level of 50 units.

The concept of cardinal utility suffers from the absence of an objective measure of utility when comparing the utility gained from consumption of a particular good by one individual as opposed to another individual.

For this reason, neoclassical economics abandoned utility as a foundation for the analysis of economic behaviour, in favour of an analysis based upon preferences. This led to the development of tools such as indifference curves to explain economic behaviour.

In this analysis, an individual is observed to prefer one choice to another. Preferences can be ordered from most satisfying to least satisfying. Only the ordering is important: the magnitude of the numerical values are not important except in as much as they establish the order. A utility of 100 towards an ice-cream is not twice as desirable as a utility of 50 towards candy. All that can be said is that ice-cream is preferred to candy. There is no attempt to explain why one choice is preferred to another; hence no need for a quantitative concept of utility.

It is nonetheless possible, given a set of preferences which satisfy certain criteria of reasonableness, to find a **utility function** that will explain these preferences. Such a utility function takes on higher values for choices that the individual prefers. Utility functions are a useful and widely used tool in modern economics.

A utility function to describe an individual's set of preferences clearly is not unique. If the value of the utility function were to be, e.g., doubled, squared, or subjected to any other strictly monotonically increasing function, it would still describe the same preferences. With this approach to utility, known as **ordinal utility** it is not possible to compare utility between individuals, or find the total utility for society as the Utilitarians hoped to do.

Utility functions

While preferences are the conventional foundation of **microeconomics**, it is convenient to represent preferences with a utility function and reason indirectly about preferences with utility functions. Let X be the **consumption set**, the set of all packages the consumer could conceivably consume. The consumer's **utility function** $u : X \to \mathbf{R}$ assigns a happiness

score to each package in the consumption set. If u(x) > u(y), then the consumer strictly prefers x to y.

Diamond-water Paradox

The **diamond-water paradox** is the observation that even though water is essential to human life, the price of water is relatively low. Diamonds are frivolous and unimportant for human existence, yet the price of diamonds is substantially higher. Adam Smith, the esteemed and perhaps most famous economist, described the paradox in his seminal work The Wealth of Nations.

Cost of Production

Adam Smith and David Ricardo both theorized that value is a result of the cost-of-production. Smith concluded that the economic value of a good is dependent on the amount of labor required to attain it. It followed that diamonds are expensive because it requires a lot of labor to find and mine them (labor theory of value). In long-run equilibrium, prices reflect costs per unit produced and a rate of profit that is equalized between sectors. Some economists, particularly many classical economists still believe this. However, this does not explain why emeralds, which are harder to find and more expensive to extract than diamonds, are not valued as highly, nor why large, easily extracted and easily found diamonds are worth much more than small, hard to extract ones.

The origins of marginalism come from Ricardo's theory of land-rent, in which the price of land depends on the productivity of the least productive land in cultivationâ€"the marginal land. Thus, all else equal, as the demand for agricultural crops increases, the price of land rises as farmers move to less productive land.

Marginal Utility

Marginal utility, or marginal benefit, is the additional utility (satisfaction or benefit) that a consumer derives from an additional unit of a commodity or service. The concept grew out of attempts by 19th-century economists to explain the fundamental economic reality of price. Austrian economist Friedrich von Wieser coined the term.

The Austrian economist Eugen von BÃ¶hm-Bawerk gave probably the most memorable description of the marginal theory of value, one often used by economics textbooks. Loosely translated it is:

> A pioneer farmer had five sacks of grain, with no way of selling them or buying more. He had five possible uses: as basic feed for himself, food to build strength, food for his chickens for dietary variation, an ingredient for making whisky and feed for his parrots to amuse him. Then the farmer lost one sack of grain. Instead of reducing every activity

by a fifth, the farmer simply starved the parrots as they were of less utility than the other four uses, in other words they were on the margin. And it is on the margin, and not with a view to the big picture, that we make economic decisions.

Diminishing marginal utility refers to the marginal utility of each additional unit of a good having less value than the previous unit. For example, the marginal utility of an additional slice of bread to a person with few slices will be great. But the marginal utility of an extra slice of bread to a person with many slices will be small.

Diminishing marginal utility is a very common assumption in economics, but it is not universally assumed. It corresponds to convexity of the indifference curves.

Basic Definitions

Any costs incurred by a firm may be classed into two groups: fixed cost and variable cost. Fixed costs are incurred by the business at any level of output, including none. These may include equipment maintenance, rent, wages, and general upkeep. Variable costs change with the level of output, increasing as more product is generated. Materials consumed during production often have the largest impact on this category. Fixed cost and variable cost, combined, equal total cost.

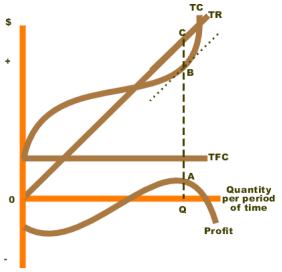
Revenue is the total amount of money that flows into the firm. This can be from any source, including product sales, government subsidies, venture capital and personal funds.

Average cost and revenue are defined as the total cost or revenue divided by the amount of units output. For instance, if a firm produced 400 units at a cost of 20000 USD, the average cost would be 50 USD.

Marginal cost and revenue, depending on whether the calculus approach is taken or not, are defined as either the change in cost or revenue as each additional unit is produced, or the derivative of cost or revenue with respect to quantity output. For instance, taking the first definition, if it costs a firm 400 USD to produce 5 units and 480 USD to produce 6, the marginal cost of the sixth unit is approximately 80 dollars, although this is more accurately stated as the marginal cost of the 5.5th unit due to linear interpolation. Calculus is capable of providing more accurate answers if regression equations can be provided.

Total Cost-Total Revenue Method

To obtain the profit maximizing output quantity, we start by recognizing that profit is equal to total revenue minus total cost. Given a table of costs and revenues at each quantity, we can either compute equations or plot the data directly on a graph. Finding the profit-maximizing output is as simple as finding the output at which profit reaches its maximum. That is represented by output Q in the diagram.



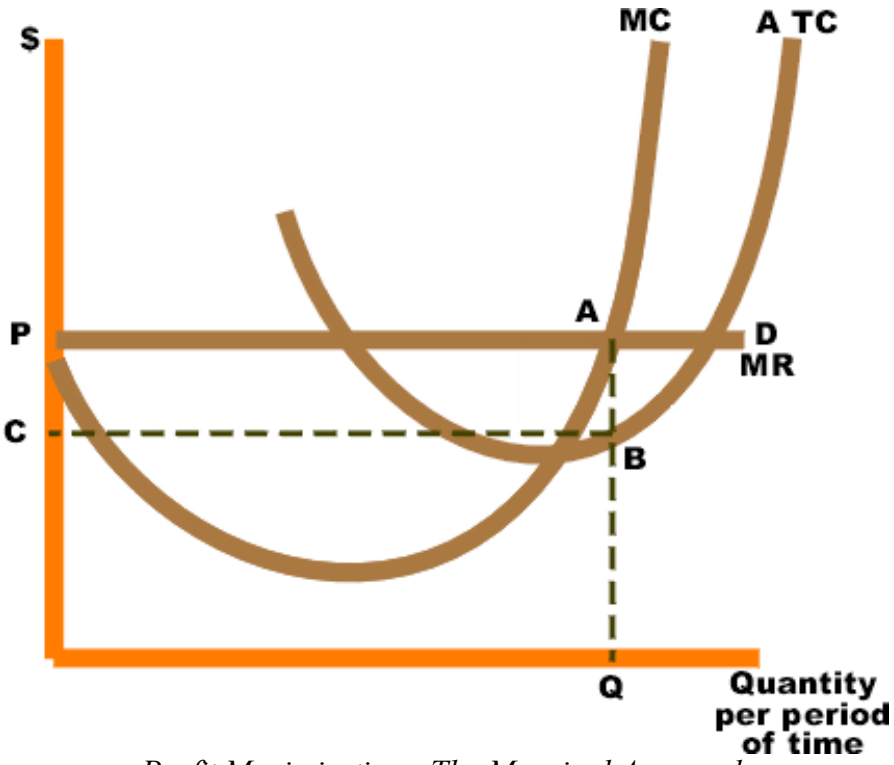
Profit Maximization - The Totals Approach

There are two graphical ways of determining that Q is optimal. Firstly, we see that the profit curve is at its maximum at this point (A). Secondly, we see that at the point (B) that the tangent on the total cost curve (TC) is parallel to the total revenue curve (TR), the surplus of revenue net of costs (B,C) is the greatest. Because total revenue minus total costs is equal to profit, the line segment C,B is equal in length to the line segment A,Q.

Computing the price at which to sell the product requires knowledge of the firm's demand curve. The price at which quantity demanded equals profit-maximizing output is the optimum price to sell the product.

Marginal Cost-Marginal Revenue Method

If total revenue and total cost figures are difficult to procure, this method may also be used. For each unit sold, marginal profit equals marginal revenue minus marginal cost. Then, if marginal revenue is greater than marginal cost, marginal profit is positive, and if marginal revenue is less than marginal cost, marginal profit is negative. When marginal revenue equals marginal cost, marginal profit is zero. Since total profit increases when marginal profit is positive and total profit decreases when marginal profit is negative, it must reach a maximum where marginal profit is zero - or where marginal cost equals marginal revenue. This intersection of marginal revenue (MR) with marginal costs (MC) is shown in the next diagram as point A. If the industry is competitive (as is assumed in the diagram), the firm faces a demand curve (D) that is identical to its Marginal revenue curve (MR), and this is a horizontal line at a price determined by industry supply and demand. Average total costs are reprsented by curve ATC. Total economic profits are represented by area P,A,B,C. The optimum quantity (Q) is the same as the optimum quantity (Q) in the first diagram.



Profit Maximization - The Marginal Approach

If the firm is operating in a non-competitive market, minor changes would have to be made to the diagrams.

Modes of Operation

It is assumed that all firms are following rational decision-making, and will produce at the profit-maximizing output. Given this assumption, there are four categories in which a firm's profit may be considered.

A firm is said to be making an economic profit when its average total cost is less than the price of the product at the profit-maximizing output. The economic profit is equal to the quantity output multiplied by the difference between the average total cost and the price.

A firm is said to be making a normal profit when its economic profit equals zero. This occurs where average total cost equals price at the profit-maximizing output.

If the price is between average total cost and average variable cost at the profit-maximizing output, then the firm is said to be in a loss-minimizing condition. The firm should still continue to produce, however, since its loss would be larger if it was to stop producing. By continuing production, the firm can offset its variable cost and at least part of its fixed cost, but by stopping completely it would lose equivalent of its entire fixed cost.

If the price is below average variable cost at the profit-maximizing output, the firm is said to be in shutdown. Losses are minimized by not producing at all, since any production would not generate returns significant enough to offset any fixed cost and part of the variable cost. By not producing, the firm loses only its fixed cost.

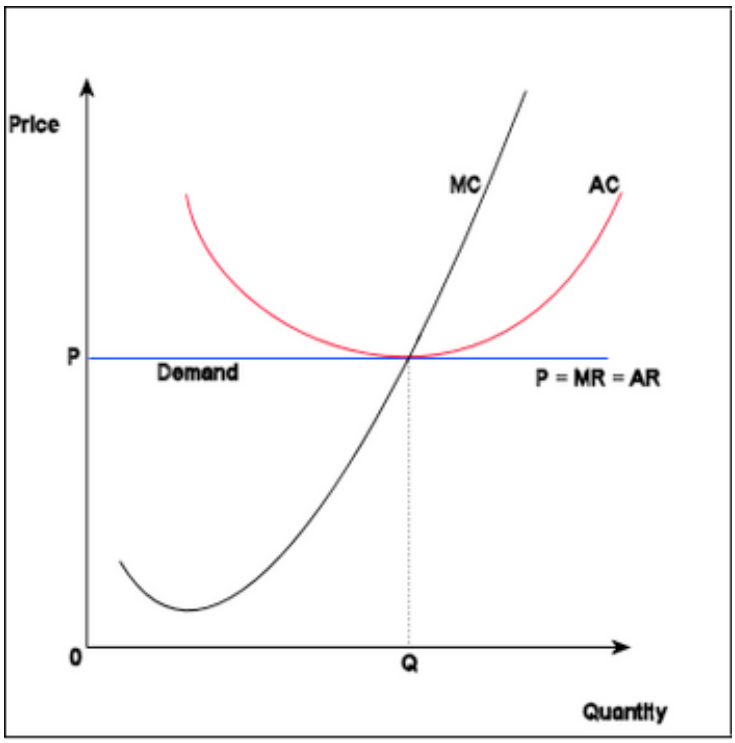
Perfect competition is a model in economic theory. It describes a hypothetical market form in which no producer or consumer has the market power to influence prices in the market. This would lead to an outcome which is efficient, according to the standard definition in economics (Pareto efficiency). The analysis of perfectly competitive markets provides the foundation of the theory of supply and demand.

Assumptions of perfect competition

Perfect competition requires five parameters to be fulfilled:

1. **Atomicity** -- there are a large number of small producers and consumers on a given market, each so small that its actions have no significant impact on others, firms are *price takers*.
2. **Homogeneity** -- that goods and services are perfect substitutes.
3. **Perfect and complete information** -- all firms and consumers know the prices set by all firms.
4. **Equal access** -- all firms have access to production technologies, and resources (including information) are perfectly mobile.
5. **Free entry** -- any firm may enter or exit the market as it wishes *(see Barriers to entry)*.

In such a market, the price would move instantaneously to equilibrium.



Perfect competition

Results of a Perfectly Competitive Market

This model is in most cases only a distant approximation of real markets, with the possible exception of certain large street markets. In general, few, if any of the conditions listed above will apply in real markets. For example, firms will never have perfect information about each other, and there will always be some transaction costs. In a perfectly competitive market, there will be both allocative and productive efficiency. Productive efficiency occurs when the firm produces at the lowest point on the average total cost curve, implying it cannot produce the goods for any cheaper. This is shown on the diagram - the horizontal demand curve touches the ATC (average total cost) curve at the lowest point. This would be achieved in perfect competition, as if any firm was not doing this another firm would be able to undercut it by selling products at a lower price. Allocative efficiency occurs when price is equal to marginal cost, as the good is available to the consumer at the lowest possible price. This is also achieved in perfect competition.

In contrast to a monopoly or oligopoly, it is impossible for a firm in perfect competition to earn abnormal profit in the long run, that is to say that a firm cannot make any more money than is necessary to cover its losses. If a firm is earning abnormal profit in the short term, this will act as a trigger for other firms to enter the market. They will compete with the first firm, driving the market price down until all firms are earning normal profit.

Examples of Perfect Competition

Some say that agriculture, with a large amount of suppliers, relatively inelastic demand, and almost perfectly substitutable product is an approximation to the perfect competition model. This may be/have been true in some places and times, but in modern economies it is not. For example, in the global agriculture market, agricultural subsidies are provided to US and European (via the CAP) farmers whose products are exported (dumped) at prices below the cost of production. Any form of government intervention such as subsidies warps the market, meaning that perfect competition does not occur. Buying a farm (of even renting one, together with equipment) is a rather substantial barrier to entry!

Perhaps the closest thing to a perfectly competitive market would be a street market with many small stalls selling identical smallholding-sourced food produce. As perfect competition is a theoretical absolute, there are no examples of a perfectly competitive market.

This article is about the state of a player in economics. For the Parker Brothers board game, see Monopoly (game).

In economics, a **monopoly** (from the Greek *monos*, one + *polein*, to sell) is defined as a persistent market situation where there is only one provider of a kind of product or service. Monopolies are characterized by a lack of economic competition for the good or service that they provide and a lack of viable substitute goods.

Monopoly should be distinguished from monopsony, in which there is only one *buyer* of the product or service; it should also, strictly, be distinguished from the (similar) phenomenon of a cartel. In a monopoly a *single* firm is the *sole* provider of a product or service; in a cartel a centralized institution is set up to partially coordinate the actions of *several independent* providers (which is a form of oligopoly).

Forms of monopoly

Monopolies are often distinguished based on the circumstances under which they arise; the main distinctions are between a monopoly that is the result of law (government-granted monopoly and government monopoly) alone; one that arises from the cost structure of the industry (natural monopoly); and one that arise by other means (eg one firm simply outcompeting all other firms; illegal behaviour; etc). Advocates of economic liberalism assert that a more fundamental way of classifying monopolies is to distinguish those that arise and exist due to violation of the principles of a *free market* (coercive monopoly) from those that arise and are maintained by consistently outcompeting all other firms.

Legal monopoly

A monopoly based on laws explicitly preventing competition is a legal monopoly or de jure monopoly. When such a monopoly is granted to a private party, it is a government-granted monopoly; when it is operated by government itself, it is a government monopoly or state monopoly. A government monopoly may exist at different levels of government (eg just for one region or locality); a state monopoly is specifically operated by a national government.

An example of a "de jure" monopoly is AT&T, which was granted monopoly power by the US government, only to be broken up in 1982 following a Sherman Antitrust suit.

Natural monopoly

Main article: Natural monopoly

A natural monopoly is a monopoly that arises in industries where economies of scale are so large that a single firm can supply the entire market without exhausting them. In these industries competition will tend to be eliminated as the largest (often the first) firm develops a monopoly through its cost advantage. In these industries monopoly may be more economically efficient than competition, although because of potential dynamic efficiencies this is not necessarily clear-cut.

Natural monopoly arises when there are large capital costs relative to variable costs, which arises typically in network industries such as electricity and water. It should be distinguished from network effects, which operate on the demand side and do not affect costs. Counter-intuitively, the case of a monopolization of a key source of a natural resource is not considered a natural monopoly, because it is based on the running down of natural capital rather than the amortization of an investment in physical or human capital.

Whether an industry is a natural monopoly may change over time through the introduction of new technologies. A natural monopoly industry can also be artificially broken up by government, although (eg electricity liberalization, eg Railtrack) the results are at best mixed. Advocates of free markets, such as libertarians, assert that a natural monopoly is a practical impossibility, and, given that a monopoly is a persistent rather than a transient situation, that there is no historical precedent of one ever existing. They say that the idea of "natural monopoly" is mere theoretical abstraction to justify expanding the scope of government, and that it in the case of nationalization or deprivatization it is the government intervention itself that creates a monopoly where one did not actually exist.

Local monopoly

A local monopoly is a monopoly of a market in a particular area, usually a town or even a smaller locality: the term is used to differentiate a monopoly that is geographically limited within a country, as the default assumption is that a monopoly covers the entire industry in a

given country. This may include the ability to charge (to some extent) monopoly pricing, for example in the case of the only gas station on an expressway rest stop, which will serve a certain number of motorists who lack fuel to reach the next station and must pay whatever is charged.

Monopolistic competition

Main article: Monopolistic competition

Industries which are dominated by a single firm may allow the firm to act as a near-monopoly or "de facto monopoly", a practice known in economics as monopolistic competition. Common historical examples arguably include corporations such as Microsoft and Standard Oil (Standard's market share of refining was 64% in competition with over 100 other refiners at the time of the trial that resulted in the government-forced breakup). Practices which these entities may be accused of include dumping products below cost to harm competitors, creating tying arrangements between their products, and other practices regulated under antitrust law.

Large corporations often attempt to monopolize markets through horizontal integration, in which a parent company consolidates control over several small, seemingly diverse companies (sometimes even using different branding to create the illusion of marketplace competition). Such a monopoly is known as a horizontal monopoly. A magazine publishing firm, for example, might publish many different magazines on many different subjects, but it would still be considered to engage in monopolistic practices if the intent of doing this was to control the entire magazine-reader market, and prevent the emergence of competitors.

A monopoly arrived at through vertical integration is called a vertical monopoly. A common example is vertical integration of electricity distribution with electricity generation, which is common because it reduces or eliminates certain costly risks.

Coercive monopoly

Main article: coercive monopoly

A coercive monopoly is one that arises and whose existence is maintained as the result of any sort of activity that violates the principle of a free market and is therefore insulated from competitive forces that would otherwise be a potential threat to its superior status. The term is typically used by those who favor laissez-faire capitalism.

Economic analysis

Primary characteristics of a monopoly

- Single Seller

A *pure* monopoly is an industry in which a single firm is the sole producer of a good or the sole provider of a service. This is usually caused by a blocked entry.

- No Close Substitutes

  The product or service is unique in ways which go beyond brand identity, and cannot be easily replaced (a monopoly on water from a certain spring, sold under a certain brand name, is not a true monopoly; neither is Coca-Cola, even though it is differentiated from its competition in flavor).

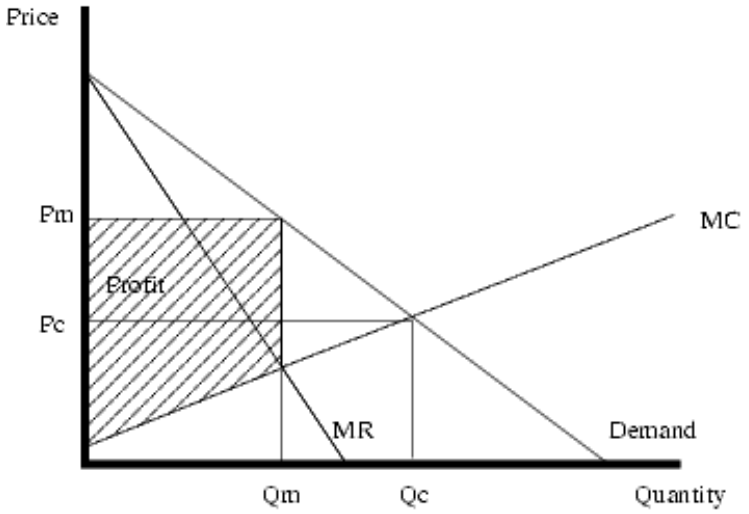
- Price Maker

  In a pure monopoly a single firm controls the total supply of the whole industry and is able to exhert a significant degree of control over the price, by changing the quantity supplied. In subtotal monopolies (for example diamonds or petroleum at present) a single organization controls enough of the supply that even if it limits the quantity, or raises prices, the other suppliers will be unable to make up the difference and take significant amounts of market share.

- Blocked Entry

  The reason a *pure* monopolist has no competitors is that certain barriers keep would be competitors from entering the market. Depending upon the form of the monopoly these barriers can be economic, technological, legal (basic patents on certain drugs), or of some other type of barrier that completely prevents other firms from entering the market.

Monopolistic pricing



In economics a company is said to have **monopoly power** if it faces a downward sloping

demand curve (see supply and demand). This is in contrast to a **price taker** that faces a horizontal demand curve. A price taker cannot choose the price that they sell at, since if they set it above the equilibrium price, they will sell none, and if they set it below the equilibrium price, they will have an infinite number of buyers (and be making less money than they could if they sold at the equilibrium price). In contrast, a business with monopoly power can choose the price they want to sell at. If they set it higher, they sell less. If they set it lower, they sell more.

If a monopoly can only set one price it will set it where marginal cost (MC) equals marginal revenue (MR) as seen on the diagram on the right. This can be seen on a supply and demand diagram for the firm. This will be at the quantity Qm and at the price Pm. This is above the competitive price of Pc and with a smaller quantity that the competitive quantity of Qc. The profit the monopoly gains is the shaded in area labeled profit.

As long as the price elasticity of demand (in absolute value) for most customers is less than one, it is very advantageous to increase the price: the seller gets more money for less goods. With an increase of the price the price elasticity tends to rise, and in the optimum mentioned above it will for most customers be above one. A formula gives the relation between price, marginal cost of production and demand elasticity which maximizes a monopoly profit:

$\frac{P}{MC} = \frac{1}{1+1/e}$ (known as Lerner Index).

The economy as a whole loses out when monopoly power is used in this way, since the extra profit earned by the firm will be smaller than the loss in consumer surplus. This difference is known as a deadweight loss.

Monopoly and efficiency

In standard economic theory (see analysis above), a monopoly will sell a lower quantity of goods at a higher price than firms would in a purely competitive market. In this way the monopoly will secure monopoly profits by appropriating some or all of the consumer surplus, as although the higher price deters some consumers from purchasing, most are willing to pay the higher price. Assuming that costs stay the same, this does not lead to an outcome which is inefficient in the sense of Pareto efficiency; no-one could be made better off by shifting resources without making someone else worse off. However, total social welfare declines compared with perfect competition, because some consumers must choose second-best products.

It is also often argued that monopolies tend to become less efficient and innovative over time, becoming "complacent giants", because they don't have to be efficient or innovative to compete in the marketplace. Sometimes this very loss of efficiency can raise the potential value of a competitor enough to overcome market entry barriers, or provide incentive for research and investment into new alternatives. The theory of contestable markets argues that in some circumstances (private) monopolies are forced to behave *as if* there were competition, because

of the risk of losing that monopoly to new entrants, or because of the availability in the longer-term of substitutes in other markets. For example, a canal monopoly in the late eighteenth century United Kingdom was worth a lot more than in the late nineteenth century, because of the introduction of railways as a substitute.

Some argue that it can be good to allow a firm to attempt to monopolize a market, since practices such as dumping can benefit consumers in the short term; and once the firm grows too big, it can then be dealt with via regulation. (This is a rather optimistic view of how effectively regulation can substitute for competition.) When monopolies are not broken through the open market, often a government will step in to either regulate the monopoly, turn it into a publicly-owned monopoly, or forcibly break it up (see Antitrust law). Public utilities, often being natural monopolies and less susceptible to efficient breakup, are often strongly regulated or publicly-owned. AT&T and Standard Oil are debatable examples of the breakup of a private monopoly. When AT&T was broken up into the "Baby Bell" components, MCI, Sprint, and other companies were able to compete effectively in the long-distance phone market and started to take phone traffic from the less efficient AT&T.

Historical examples

Salt

Until common salt (sodium chloride) was mined in quantity in comparatively recent times, its availability was subject to the vagaries of climate and environment. A combination of strong sunshine and low humidity or an extension of peat marshes was necessary for winning salt from the sea â€” the most plentiful source â€” by solar evaporation or boiling. Mines and inland salt springs being scarce and often located in hostile areas like the Dead Sea or the salt mines in the Sahara desert, they required well-organised security for transport, storage and highly monopolised distribution. Changing sea levels flooded many of these sources during certain periods and caused salt "famines" and communities were left to the mercy of those who monopolised these few inland sources. The "Gabelle", a notoriously high tax levied upon salt, resulted in the French Revolution and is possibly the most cruel example in recent history. Anyone was allowed to purchase salt; however, strict legal controls were in place over who was allowed to sell and distribute salt. Advocates of laissez-faire capitalism, such as the Austrian school, maintain that a salt monopoly would never develop without such government intervention.

In economics, a **market failure** is a situation in which markets do not efficiently organize production or allocate goods and services to consumers (for example, a failure to allocate goods in a way some see as socially or morally preferable). To economists, the term would normally be applied to situations where the inefficiency is particularly dramatic, or when it is suggested that non-market institutions would provide a more desirable result. On the other hand, to many, market failures are situations where market forces do not serve the perceived "public interest". Here, the focus is on the economists' theories of market failure.

Economists use model-like theorems to explain or understand such cases. The two main reasons that markets fail are:

- the inadequate expression of costs or benefits in prices and thus into microeconomic decision-making in markets.
- sub-optimal market structures

In economics, **information asymmetry** occurs when one party to a transaction has more or better information than the other party. (It has also been called **asymmetrical information** and **markets with asymmetrical information**). Typically it is the seller that knows more about the product than the buyer, however, it is possible for the reverse to be true: for the buyer to know more than the seller.

Examples of situations where the seller usually has better information than the buyer are numerous but include used-car salespeople, stockbrokers, real estate agents, and life insurance transactions.

Examples of situations where the buyer usually has better information than the seller include estate sales as specified in a last will and testament.

This situation was first described by Kenneth J. Arrow in a seminal article on health care in 1963 entitled "Uncertainty and the Welfare Economics of Medical Care," in the *American Economic Review*.

George Akerlof later used the term asymmetric information in his 1970 work *The Market for Lemons*. He also noticed that, in such a market, the average value of the commodity tends to go down, even for those of perfectly good quality. It is even possible for the market to decay to the point of nonexistence.

Because of information asymmetry, unscrupulous sellers can "spoof" items (like software or computer games) and defraud the buyer. As a result, many people not willing to risk getting ripped off will avoid certain types of purchases, or will not spend as much for a given item.

An **externality** occurs in economics when a decision (for example, to pollute the atmosphere) causes costs or benefits to stakeholders other than the person making the decision. In other words, the decision-maker does not bear all of the costs or reap all of the gains from his action. As a result, in a competitive market too much or too little of the good will be consumed from the point of view of society. If the world around the person making the decision benefits more than he does (education, safety), then the good will be underconsumed by individual decision makers; if the costs to the world exceed the costs to the individual making the choice (pollution, crime) then the good will be overconsumed from society's point of view.

Implications