ECONOMICS for ENGINEERS

(HMTS-3101)

For HITK students
by S.K.Sen

Economics for Engineers

Syllabus for HMTS3101

Module 1 :

a. Market: Meaning of Market, Types of Market, Perfect Competition, Monopoly, Monopolistic and Oligopoly market.

b. The basic concept of economics – Needs, Wants, Utility.

c. National Income-GDP, GNP. Demand & Supply, Law of demand, Role of demand and supply in price determination, Price Elasticity.

d. Inflation: meaning, reasons, etc. (6L)

Module 2 :

a. Business: Types of business, Proprietorship, Partnership, Joint-stock company, and cooperative society – their characteristics.

b. Banking: role of commercial banks; credit and its importance in industrial functioning.

c. Role of central bank: Reserve Bank of India.

d. International Business or Trade Environment. (4L)

Module 3 :

a. Financial Accounting-Journals. Ledgers, Trial Balance, Profit & Loss Account, Balance Sheet.

b. Financial Statement Analysis (Ratio and Cash Flow analysis). (8L)

c. Cost Accounting- Terminology, Fixed, Variable and Semi-variable costs, Break Even Analysis.

d. Cost Sheet, Budgeting and Variance Analysis.

e. Marginal Cost based decisions. (6L)

Module 4 :

a. Time Value of Money: Present and Future Value, Annuity, Perpetuity.

b. Equity and Debt, Cost of Capital.

c. Capital Budgeting: Methods of project appraisal - average rate of return - payback period - discounted cash flow method: net present value, benefit cost ratio, internal rate of return.

d. Depreciation and its types, Replacement Analysis, Sensitivity Analysis.

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Suggested Readings :

1. R. Narayanswami, Financial Accounting- A Managerial Perspective. Prentice-Hall of India Private Limited. New Delhi

2. Horne, James C Van, Fundamentals of Financial Management. Prentice-Hall of India Private Limited, New Delhi

3. H. L. Ahuja., Modern Economic Theory. S. Chand. New Delhi.

4. Newman, Donald G., Eschenbach, Ted G., and Lavelle, Jerome P. Engineering Economic Analysis. New York: Oxford University Press. 2012.

MARKET

Meaning of Market, Types of Market,
Perfect Competition, Monopoly,
Monopolistic and Oligopoly Market.

A market is defined as the sum total of all the buyers and sellers in the area or region under consideration. The area may be the earth, or countries, regions, states, or cities.

A set up where two or more parties engage in exchange of goods, services and information is called a market. Ideally a market is a place where two or more parties are involved in buying and selling.
The two parties involved in a transaction are called ***Seller*** and ***Buyer***.
The seller sells goods and services to the buyer in exchange of money. There has to be more than one buyer and seller for the market to be competitive.

The value, cost and price of items traded are as per forces of supply and demand in a market. The market may be a physical entity, or may be virtual. It may be local or global, perfect and imperfect.

***Different types of markets* :** A market can be called the 'Available Market' - that of all the people in the area. Within the available market, there is the 'Market Minimum'- or the market size, which will buy goods without any marketing effort. This is the lowest sale that a company could get without any action on its part. In today's world, this level is sinking ever lower.

There is also the 'Market Potential', which is the maximum market size that will buy goods when subjected to the greatest marketing action that a company can do. Beyond this market potential, the costs outweigh the gains. The market potential is therefore, the upper limit for a marketplace and sales.

TYPES of MARKETS

- **Physical**
  - Auction Market
  - Market for Intermediate Goods
  - Black Market
  - Knowledge Market
- **Non-Physical**
  - Through internet eg. – Flipkart, Amazon, eBay etc.
- **Financial**
  - Stock Market
  - Bond Market
  - Foreign Exchange Market
- **Predictive**

Physical Markets - Physical market is a set up where buyers can physically meet the sellers and purchase the desired merchandise from them in exchange of money. Shopping malls, department stores, retail stores are examples of physical markets.

Non Physical Markets/Virtual markets - In Virtual Markets, buyer and seller do not meet or interact physically, instead the transaction is done via intermediates and electronic information. In such markets, buyers purchase goods and services through internet. Examples – Flipkart, Amazon, Rediff shopping, eBay etc.

Auction Market - In an auction market the seller sells his goods to one who is the highest bidder.

Market for Intermediate Goods - Such markets sell raw materials (goods) required for the final production of other goods.

***B**lack Market* - A black market is a setup where illegal goods like drugs and weapons are sold.

***K**nowledge Market* - Knowledge market is a set up which deals in the exchange of information and knowledge based products.

***F**inancial Market* - Market dealing with the exchange of liquid assets (money) is called a financial market.

Financial markets are of following types **:**
***S**tock Market* - A form of market where sellers and buyers exchange shares is called a stock market.

***B**ond Market* - A market place where buyers and sellers are engaged in the exchange of debt securities, usually in the form of bonds is called a bond market. A bond is a contract signed by both the parties where one party promises to return money with interest at fixed intervals.

Foreign Exchange Market - In such type of market, parties are involved in trading of currency. In a foreign exchange market (also called currency market), one party exchanges one country's currency with equivalent quantity of another currency.

Predictive Markets - Predictive market is a set up where exchange of good or service takes place for future. The buyer benefits when the market goes up and is at a loss when the market crashes.

Types of Market System / Structure

Monopoly **:** Monopoly is a condition where there is a single seller and many buyers at the market place. In such a condition, the seller has a monopoly with no competition from others and has complete control over the products and services. A monopoly market contains a single firm that produces goods with no close substitute, with significant barriers to entry of other firms.

In a monopoly, the seller charges high prices for the goods because there is no competition. Barriers to entry in a monopoly market are high due to technology, high capital requirement, government regulation, patents and high distribution overheads.

A monopoly draws power from the fact that it is the only viable seller of the product in the industry.

Monopsony **-** A market form where there are many sellers but a single buyer is called monopsony. In such a set up, since there is a single buyer against many sellers; the buyer can exert his control on the sellers. The buyer in such a form has an upper edge over the sellers.

Oligopsony **:** An oligopsony (from Ancient Greek (oligoi) "few" + (opsōnia) "purchase") is a market form in which the number of buyers is small while the number of sellers in theory could be large. This typically happens in a market for inputs where numerous suppliers are competing to sell their product to a small number of (often large and powerful) buyers. It contrasts with an oligopoly, where there are many buyers but few sellers. An oligopsony is a form of imperfect competition.

The terms monopoly (one seller), monopsony (one buyer), and bilateral monopoly have a similar relationship.

Oligopoly **:** A situation where there are only a few sellers in a particular economy who control a particular commodity. They can, therefore, influence prices and affect the competition. In India, an example of this would be mobile telephony - There are only a few operators, examples of which are: Airtel, Idea, BSNL, Reliance

Perfect Competition **:** This is an economic situation that really doesn't exist, in which a bunch of conditions are met, not the least of which are free entry and exit from a market, tons of sellers selling the exact same product, and tons of buyers for that product who have perfect knowledge of what it does and how it works. An Indian fish market might be an example of something close to this (though real "perfect competition" doesn't really exist.) At the fist market, lots of sellers gather together to try to sell the same wares, and lots of customers try to buy them with a good knowledge of what they are buying. There is little to prevent someone from joining in on the selling or quitting the market altogether.

Duopoly **:** A market in which two giant brands control most of the product being sold and therefore have a great amount of influence over the factors involved in the selling. Some examples would be Visa & Mastercard and Reuters & Associated Press and International news agencies.

Monopolistic Competition **:** Here, there are lots of sellers selling similar products that don't differ a whole lot in terms of characteristics or price. Think breakfast cereals. In India, an example of this is the banking system. After financial sector reforms in 1992, the banking system in

India has become much more competitive with lots more banks offering similar products at similar prices.

Perfect competition is a concept used to explain some economic concepts, but it does not exist in real life anywhere. What does exist is a near perfect competition. Monopoly is, in a way, the opposite of perfect condition, in which a single firm or supplier has complete control over market prices and supplies. Oligiopoly is some thing in between perfect competition, where a few suppliers have some control over the market prices and supplies. However, this control is not complete control as enjoyed by monopolies.

Examples of each of these types of market structures are - Situations like perfect market exists for markets for most of unbranded staple goods such as food grain and vegetables. However it should be noted that there is a trend of branding more & more of such goods also, and in this ways making their markets become more and more like oligopolistic markets.

Oligopolistic markets are most common form of markets we get to see today. One of the most fierce oligopolistic competition exists in the automobile industry across the world.

Duopolistic market with exactly two suppliers is not very common. However, there are number of products that have two dominant suppliers plus a few smaller ones. For example, in aerated soft drinks market, Coca Cola and Pepsi represent two dominant suppliers in many countries.

True Monopoly generally exist only in government controlled markets. For example provision of civic services such as sewage disposal is generally monopoly of local self government bodies such as municipal corporations. Railways is a government monopoly in India.

Monopoly in private business are rather rare, and even then they only approach monopolistic power but are not perfect monopolies. As a matter of fact governments in many countries have special provisions to control monopolistic operation. For example, Microsoft which is considered a monopoly for operating system and some other software for personal computers is facing many litigation on the charge of following monopolistic practices.

Some times very small businesses are also able to enjoy monopolistic power because of their location and reputation. A hair stylist or fashion designer may enjoy such high reputation that many rich and the famous insist on using his or her services. Also, a retail store with no other store in vicinity may enjoy a monopolistic advantage in that locality.

A monopoly is a market structure in which there is only one producer/seller for a product. In other words, the single business is the industry. Entry into such a market is restricted due to high costs or other impediments, which may be economic, social or political. For instance, a government can create a monopoly over an industry that it wants to control, such as electricity. Another reason for the barriers against entry into a monopolistic industry is that oftentimes, one entity has the exclusive rights to a natural resource. For example, in Saudi Arabia the government has sole control over the oil industry. A monopoly may also form when a company has a copyright or patent that prevents others from entering the market. Pfizer, for instance, had a patent on Viagra.

In an oligopoly, there are only a few firms that make up an industry. This select group of firms has control over the price and, like a monopoly, an oligopoly has high barriers to entry. The products that the oligopolistic firms produce are often nearly identical and, therefore, the companies, which are competing for market share, are interdependent as a result of market forces. Assume, for example, that an economy needs only 100 widgets. Company X produces 50 widgets and its competitor, Company Y, produces the other 50. The prices of the two brands will be interdependent and, therefore, similar. So, if Company X starts selling the widgets at a lower price, it will get a greater market share, thereby forcing Company Y to lower its prices as well.

There are two extreme forms of market structure: monopoly and, its opposite, perfect competition.

Perfect competition is characterized by many buyers and sellers, many products that are similar in nature and, as a result, many substitutes. Perfect competition means there are few, if any, barriers to entry for new companies, and prices are determined by supply and demand. Thus, producers in a perfectly competitive market are subject to the prices determined by the market and do not have any leverage. For example, in a perfectly competitive market, should a single firm decide to increase its selling price of a good, the consumers can just turn to the nearest competitor for a better price, causing any firm that increases its prices to lose market share and profits.

Major differences between a Monopoly and an Oligopoly : A monopoly and an oligopoly are economic market structures where there is imperfect competition in the market. A monopoly market contains a single firm that produces goods with no close substitute, with significant barriers to entry of other firms. An oligopoly market has a small number of relatively large firms that produce similar but slightly different products. Again, there are significant barriers to entry for other enterprises.

In a monopoly, the seller charges high prices for the goods because there is no competition. In an oligopoly, the prices are moderate due to the presence of competition. However, they are higher than they would be in perfect competition. Barriers to entry in a monopoly market are high due to technology, high capital requirement, government regulation, patents and high distribution overheads. In an oligopoly market, the barriers to entry are high due to the economies of scale.

A monopoly draws power from the fact that it is the only viable seller of the product in the industry. However, in an oligopoly, firms can influence the market by setting their prices, marketing strategies and customer service.
In oligopoly, firms may collude rather than compete. The cooperation makes them operate as though they were one firm. This changes the market structure from being an oligopoly to a monopoly. There must be some measure of competition in an oligopoly market structure.

The geographical size of the market also determines whether it is an oligopoly or a monopoly. A firm may dominate an industry in a particular area where there are no alternative choices of the same product but have two or three similar companies operating nationwide. Thus, the firm may be a monopoly in a region but operate in an oligopoly market in a larger geographical area.

In economics and general equilibrium theory, a ***Perfect*** *Market* is defined by several conditions, collectively called perfect competition. These conditions are **:**

(i) A large number of buyers and sellers - A large number of consumers with the willingness and ability to buy the product at a certain price, and a large number of producers with the willingness and ability to supply the product at a certain price.

(ii) Perfect information - All consumers and producers know all prices of products and utilities each person would get from owning each product.

(iii) Homogeneous products - The products are perfect substitutes for each other, (i.e., the qualities and characteristics of a market good or service do not vary between different suppliers).

(iv) Well defined Property rights - These determine what may be sold, as well as what rights are conferred on the buyer.

(v) No barriers to entry or exit

(vi) Every participant is a price taker - No participant with market power to set prices

(vii) Perfect factor mobility - In the long run factors of production are perfectly mobile, allowing free long term adjustments to changing market conditions.

(viii) Profit maximization of sellers - Firms sell where the most profit is generated, where marginal costs meet marginal revenue.

(ix) Rational buyers: Buyers make all trades that increase their economic utility and make no trades that do not increase their utility.

(x) No externalities - Costs or benefits of an activity do not affect third parties. This criteria also excludes any government intervention.

(xi) Zero transaction costs - Buyers and sellers do not incur costs in making an exchange of goods in a perfectly competitive market.

(xii) Non-increasing returns to scale and no network effects - The lack of economies of scale or network effects ensures that there will always be a sufficient number of firms in the industry.

ADDITIONAL / OPTIONAL

When conditions of perfect competition hold, it has been proven that a market will reach an equilibrium in which the quantity supplied for every product or service, including labour, equals the quantity demanded at the current price. This equilibrium will be a Pareto optimum, meaning that nobody can be made better off by exchange without making someone else worse off.

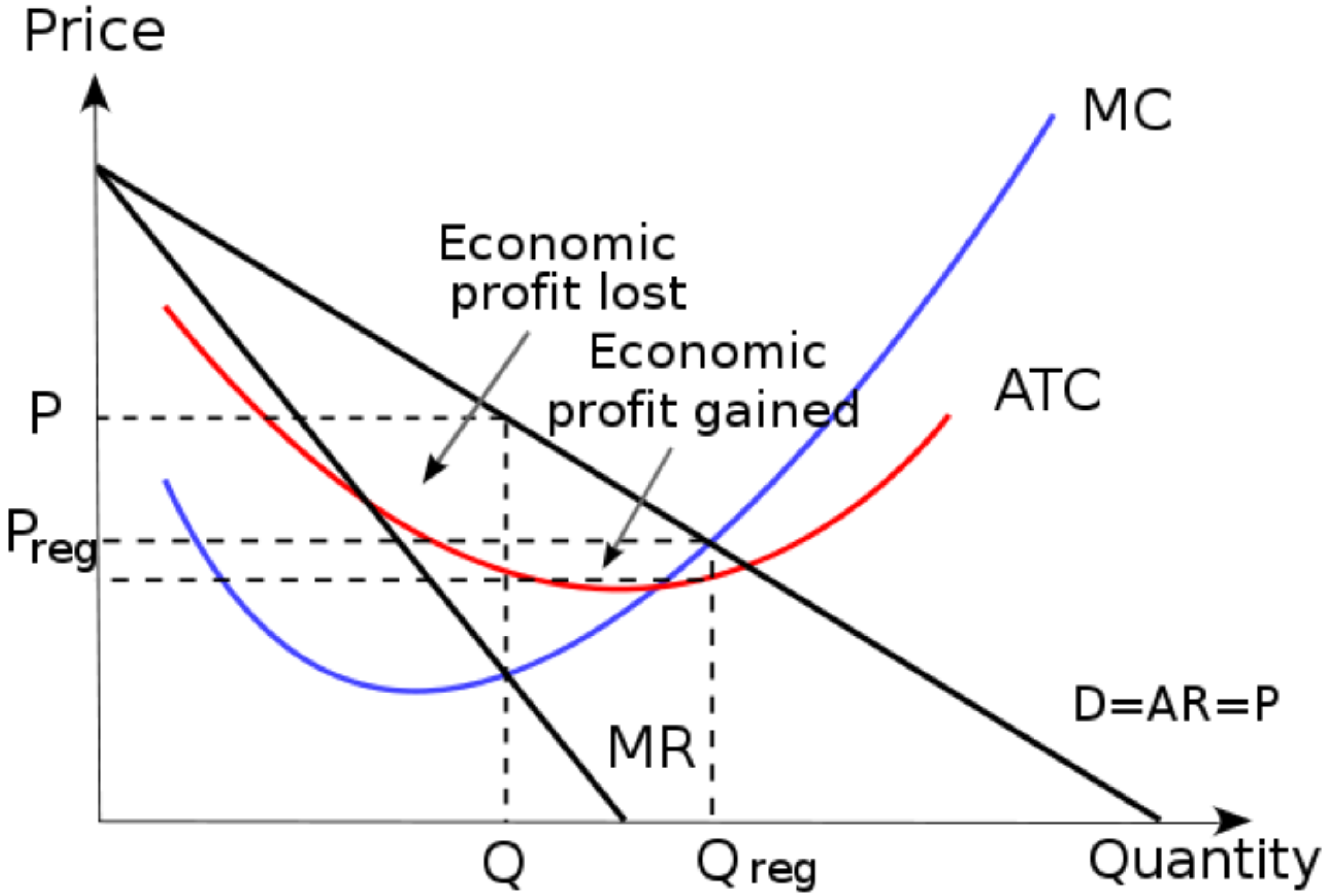
Such markets are allocatively efficient, as output will always occur where marginal cost is equal to marginal revenue (MC = MR). But perfectly competitive markets are not necessarily productively efficient as output will not always occur where marginal cost is equal to average cost (MC = AC).

In perfect competition, any profit-maximizing producer faces a market price equal to its marginal cost (P = MC). This implies that a factor's price equals the factor's marginal revenue product. It allows for derivation of the supply curve on which the neoclassical approach is based. This is also the reason why "a monopoly does not have a supply curve". The abandonment of price taking creates considerable difficulties for the demonstration of a general equilibrium except under other, very specific conditions such as that of monopolistic competition.

Real markets are never perfect, but range from close-to-perfect to very imperfect. Share and foreign exchange markets are commonly said to be the most similar to the perfect market. The real estate market is an example of a very imperfect market.

In a regulated industry, the government examines firms' marginal cost structure and allows them to charge a price that is no greater than this marginal cost. This does not necessarily ensure zero Economic profit for the firm, but eliminates a "Pure Monopoly" Profit.

Diagram showing a firm in imperfect competition (e.g. a monopoly) - when price regulation forced it to decrease its price from P to Preg. The profit maximising firm therefore chooses to expand output from Q to Qreg. Its economic profit is reduced, but not removed entirely; for the government's point of view, allocative efficiency is achieved. The diagram has been slightly simplified. Technically, the regulation would cause the MR curve to be malformed, but to no particular consequence other than the common sense one of reduced prices. The costs at Q and Qreg are shown as equal merely out of convenience.



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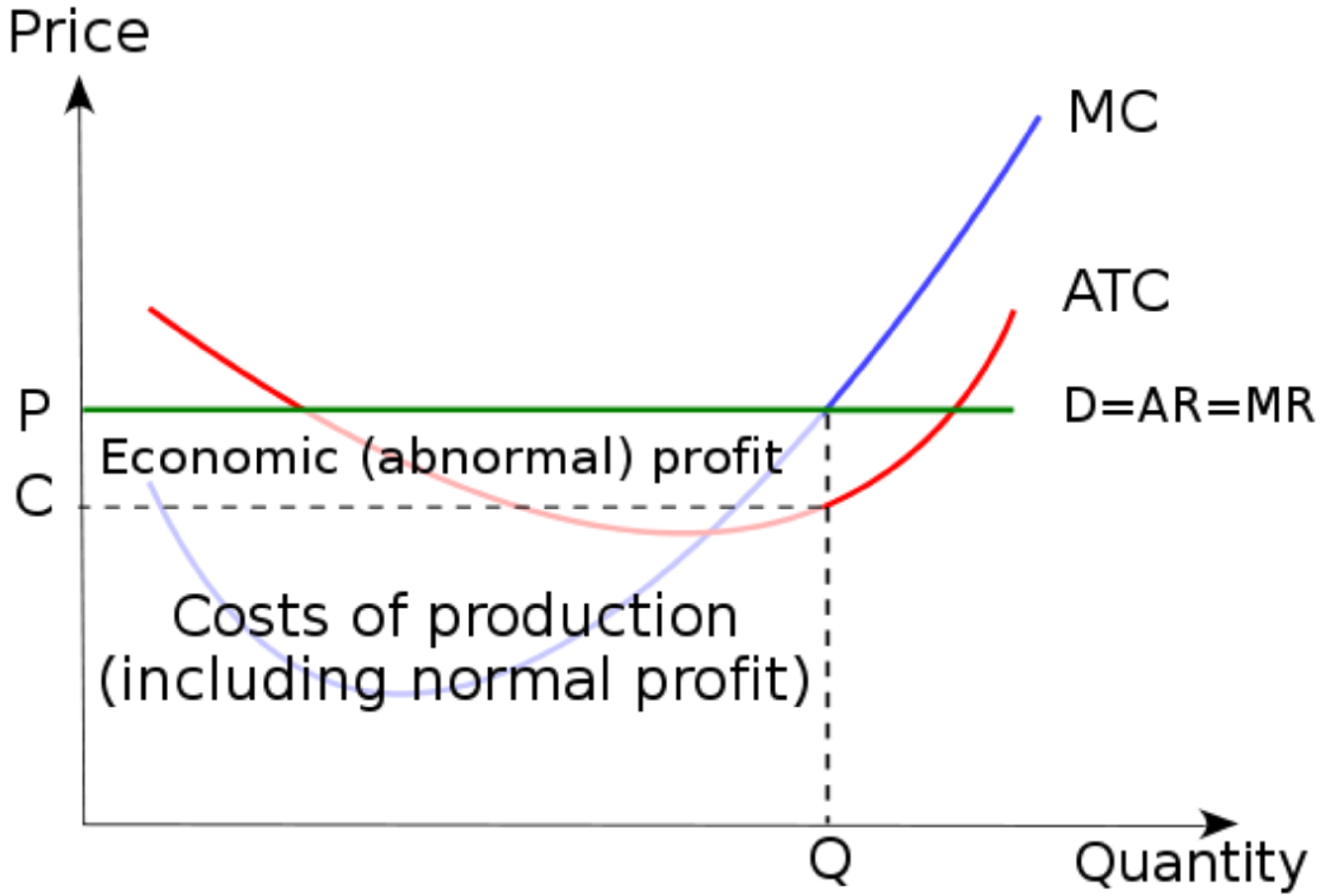

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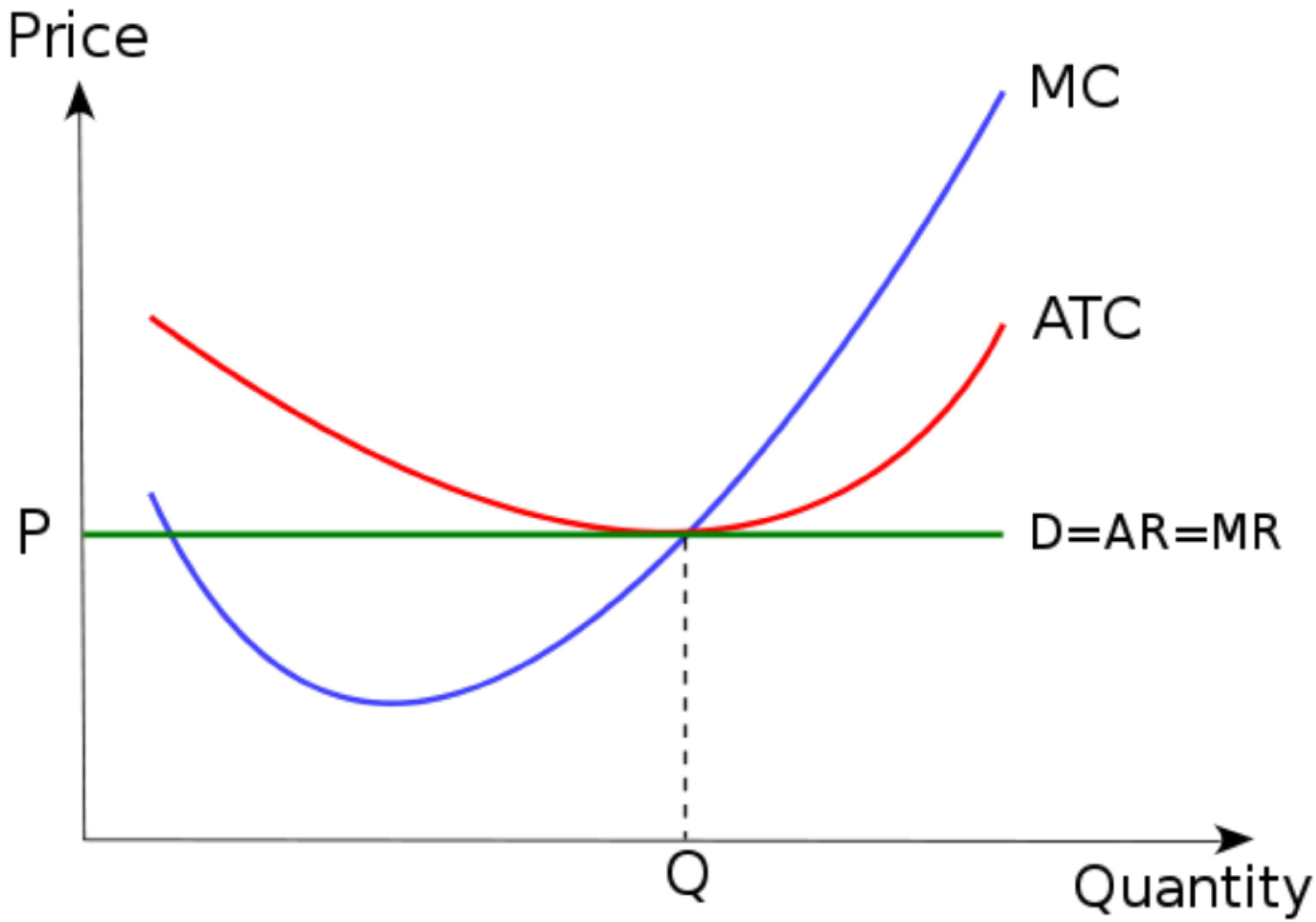
In the short run, it is possible for an individual firm to make an economic profit. This situation is shown in this diagram, as the price or average revenue, denoted by P, is above the average cost denoted by C .

Diagram showing that it is possible that a firm in perfect competition makes an abnormal profit, if P > min(ATC). In the long run, however, only normal profits will be made, since P will equal min(ATC) exactly.



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However, in the long run, economic profit cannot be sustained. The arrival of new firms or expansion of existing firms (if returns to scale are constant) in the market causes the (horizontal) demand curve of each individual firm to shift downward, bringing down at the same time the price, the average revenue and marginal revenue curve. The final outcome is that, in the long run, the firm will make only normal profit (zero economic profit). Its horizontal demand curve will touch its average total cost curve at its lowest point. (See cost curve.)

Cost curves for a perfectly competitive market in its long run equilibrium.

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