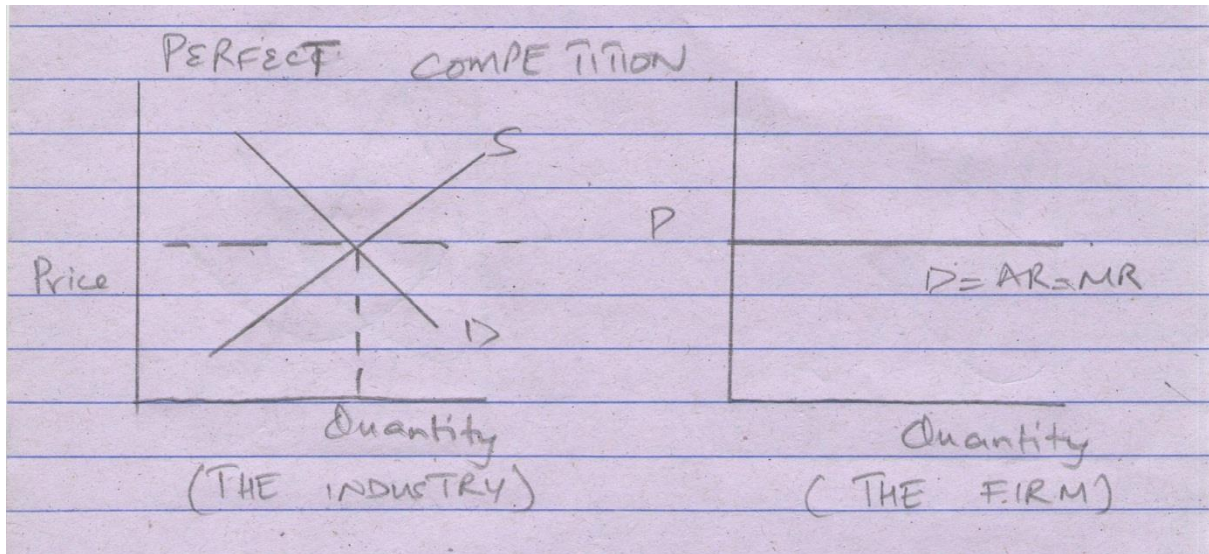


Social scientists, especially economists, define four market models that define how an economy works and functions. These are the set of conditions in which consumers and producers, or buyers and sellers interact in order to exchange goods and services.

Perfect Competition

The key characteristics of perfect competition are based on a number of factors. Firstly, the industry in perfect competition consists of a large number of firms. Each firm is so small that its input and individuality has no effect on the price of the product sold. The firms are price takers and sell at the price where demand and supply equals. Moreover, the product sold is also homogenous and similar in nature. There are no barriers to entry and exit and each firm is free to enter or leave the industry at any point in time (Blink & Dorton 2010). All the producers and consumers in the industry have perfect knowledge about the market, prices and other factors. There are no imperfections and individual firms have to sell at the price which is set by the demand and supply of the industry in general. Although perfect competition exists in theory, very few industries are perfectly competitive in reality. The most famous example of a perfect competition is an agricultural market.

For example, the growing of wheat in the whole of European Union can be considered as a perfect competition. Even though there are large producers, they all seem very small in front of the whole wheat market. Each individual farm's supply would be very small as compared to the total wheat production in EU (Blink & Dorton 2010). A single farm does not have the ability to shift the supply curve and hence each has to sell at the market price (where the demand and supply interact). Sellers and buyers also have almost 'perfect knowledge' and the wheat market is presumed to be in perfect competition. The graphs further elaborate the concept, showing that each firm cannot affect the price of the entire industry.



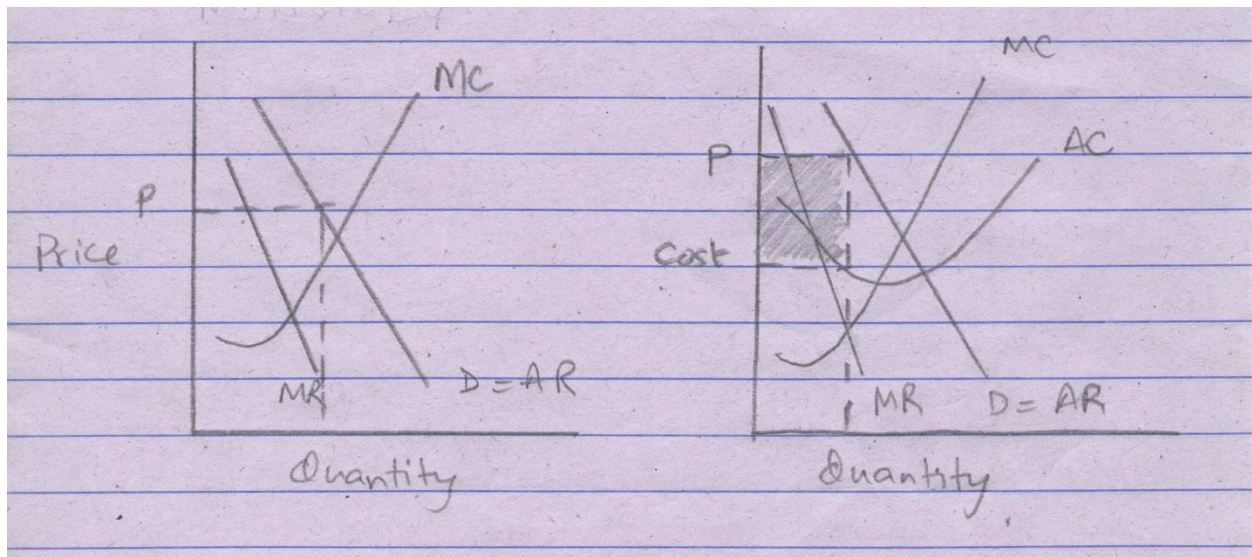
Monopoly

Monopoly is a market condition where there is only one firm producing a particular product or service. Therefore, the firm itself is the entire industry. There are barriers to entry that can stop new firms from entering the industry and maintains the monopoly of the existing firm. The monopolist firm has the ability to make abnormal profits in the long run, due to the barriers to entry (Mussa & Rosen 1978).

For example, specialized and highly recognized doctors have a monopoly over other doctors in the market. They have such high credibility, educational attainment and degrees as well as reputation, that they present barriers for other doctors to enter the same market. They can also charge the highest price and make large profits from patients (Mussa & Rosen 1978). The situation of monopoly depends upon the narrowness of the market as well. Microsoft might have a monopoly over a particular kind of software, but it will not have a monopoly over the entire software industry. The wider the market, the lesser are the chances of a single firm monopolizing all the power.

There are various other characteristics of a monopoly market. Economies of scale create a possible barrier to entry. Specialization, division of labour, and financial economies create a situation for other firms to stay away from entering the industry. Then there are monopolies known as natural monopoly, condition in which the economies of scale in the market are just

enough to support a single firm (Mussa & Rosen 1978). Examples of there are supply utilities industries such as water, electricity and gas etc. Sometimes, legal barriers also prevent other firms to enter, for example patents, copyrights, trademarks, as well as intellectual property rights. A monopolist can also adopt anti-competitive behavior, such as lowering the price and restrictive practices, to prevent other eligible firms from entering. Such are some of the other characteristics of a monopoly market. The graph shows marginal and average costs in the economy, and the abnormal profits made in a condition of monopoly (Mussa & Rosen 1978).



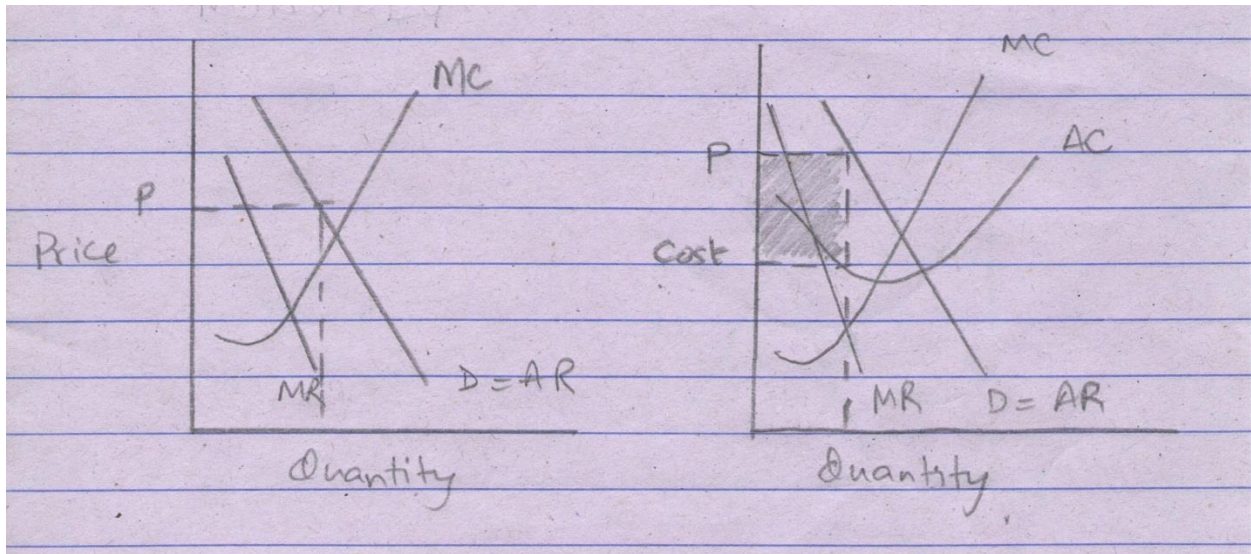
Monopolistic competition

Monopolistic competition is a mixture of perfect competition and monopoly, where there are many firms competing in the market and each has a little bit of market power in the industry. They do have some ability to adjust and set their own market prices. Some of the characteristics of this kind of market are that there are a fairly large number of firms in the industry (Krugman 1979). Since the number is large, firms act independently and do not have a great effect on other firms. The product or service sold is not homogenous but differentiated. There are different ways by which the product sold might be considered different. It can be different in terms of its design, quality, marketing, packaging as well the type of customer service used. Moreover, there are no barriers to entry and exit (Krugman 1979).

An example of monopolistic competition could be the Chinese restaurants in India. There are a large number of Chinese restaurants in the country. Each restaurant is also very small as compared to the entire food market. Goods and services are also differentiated, in terms of the food quality, menu, service, ambience, location etc (Blink & Dorton 2010). The barriers to entry and exit are also very low; there is low capital cost and no such large economies of scale present. When the existing restaurants will be seen making profits, more and more Chinese restaurants will be set up in the long run. The graph below shows the demand curve, $MC < AC$ and short run profits of a firm under monopolistic competition. (Refer to the same diagram as the Monopoly).

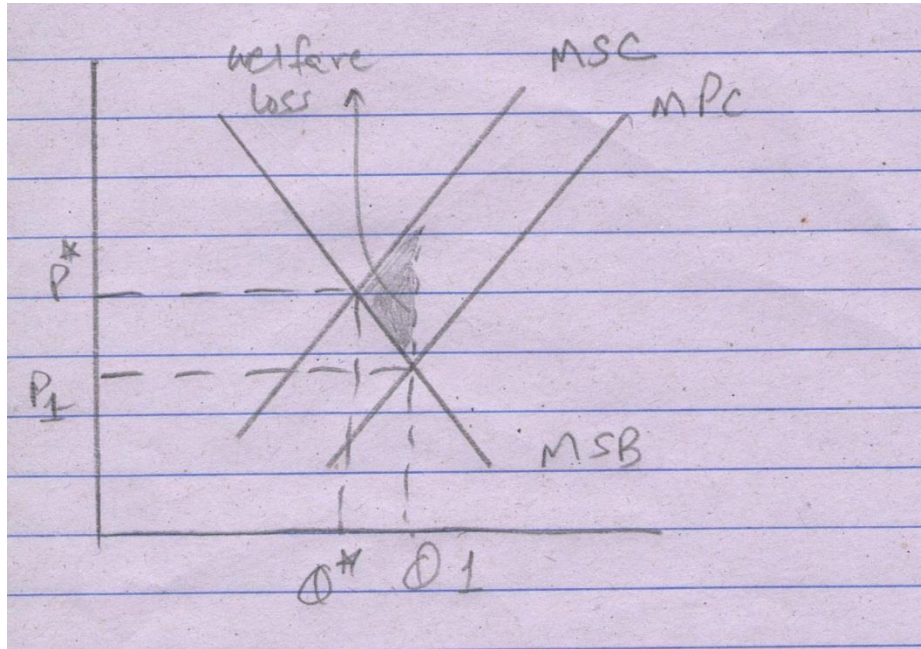
Oligopoly

In oligopoly, a few firms rule and lead an industry. There are usually a small number of firms dominating the industry and a large proportion of the industry's output is shared by them. The smaller the number of firms in an industry, the larger oligopolistic power each would have. Some oligopolistic industries produce similar products and some produce differentiated ones. There are barriers to entry in most cases due to the economies of scale present, as well as strong branding of the products. The most important characteristic of these firms are that there is high interdependence on each other. Since there are just a few firms, they have to take notice and be aware of each other's actions. They can either collude or compete with each other (Blink & Dorton 2010). For example, Coca Cola, Pepsi and Mountain Dew might be the oligopolistic powers in the beverage industry. They have economies of scale and brand loyalties as well. They need to be careful of each other's prices and act accordingly. If Pepsi reduces its prices, Coca Cola also has to adopt a similar strategy. Each also has to notice closely the marketing strategies of the other oligopolistic firms.



An externality occurs when either the production or consumption of a product or service has an effect on the third party. Third party users are those who are not involved in the selling or buying of that commodity. If the effect is harmful or negative, then the externality is referred to as negative externality. There is an external cost involved that must be added to the private cost of the producer as well as the consumer in order to truly reflect the total cost to the society. On the other hand, beneficial externality is known as positive externality in economics (Weder 2000).

A negative externality can occur in the production side, such as a factory emitting harmful fumes to the environment, affecting the residential areas nearby. In this case, the marginal social cost is greater than the marginal private cost to the producer. The marginal social cost is equal to the marginal private cost plus the external cost. This is depicted in the graph of figure 2.1 (Blink & Dorton 2010). The firm is producing Q_1 and not Q^* , therefore there is a market failure. The allocation of resources is not efficient and too much is produced at a lower cost. The welfare loss to the society is shown by the shaded area.



In the free market, this situation of polluting the environment would continue since the firms would be making a lot of profit by producing too much. The government can intervene and solve this situation by taking a number of steps.

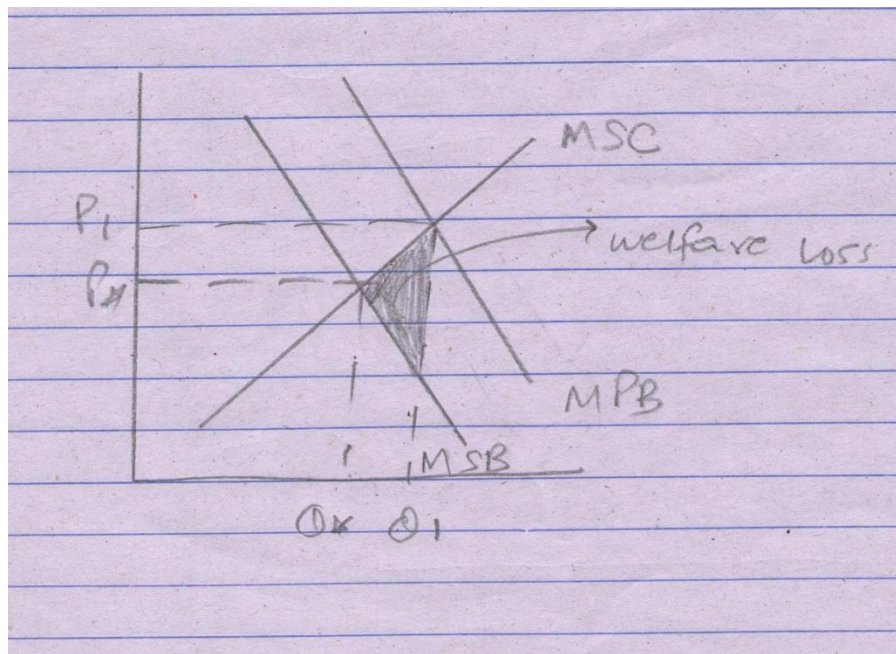
Placing a tax of the firm polluting in order to increase its private cost and shifting the marginal private cost curve to the upwards. The tax should be equal to the external cost in order to fully eliminate the welfare loss. If the tax is less than the external cost introduced, the welfare loss will be less than that of the free market. There are some problems with introducing taxes by the government. Firstly, it is very difficult to measure the amount of pollution created by the factory and then equate it with the taxes charged. Pollution or a lot of negative externalities in general, cannot be quantified. Secondly, it is very difficult for the government to identify which firms are specifically polluting the environment. Each firm will not take responsibility of pollution itself and government will have a hard time figuring out the extent to which each firm is responsible for pollution.

Government can also ban the polluting firms altogether or restrict their output to a certain level, preferably to Q^* . Laws relating to the particular environmental standards can also be set so that this will increase the private costs of the firms. But the cost of setting up such standards and policies maybe greater than the cost of the negative externality (pollution in this case) itself.

Also, banning or cutting gout production might lead to job losses or less sales of that product, leading to a fall in the overall economy (Blink & Dorton 2010).

Government could also introduce tradable emission permits that authorize each firm to buy the license to create pollution. Each firm has a quota to pollute and this is how the increase their private costs. This will not completely solve the problem as firms can simply pay for the cost of polluting and pollute more and more they wish. Also, it is difficult to assign a cost for pollution, as well as keep an acceptable amount of pollution as the minimum quota. A real life example of this is the Kyoto Protocol in 1997, with the objective to cut the emission of greenhouse gases. Developing countries are in no obligation to reduce these gases and are given tradable permits. Developed countries, on the other hand, are allowed to meet their greenhouse gas targets by procuring them from the developing nations (Blink & Dorton 2010).

Many goods and services consumed by the consumer also affect the third party individuals. The most common example here is that of cigarettes and car pollution. The marginal social benefits are less than the marginal private benefit, therefore creating a welfare loss. This is shown in the graph of figure 2.2.



Government can also take a number of steps here to reduce the effect of the negative externality by the consumer. One step could be that they can completely ban cigarettes and make

it illegal for anyone to smoke. Cigarettes have inelastic price, so the government can also tax them, in order to increase its price and make it more expensive for the consumers to purchase them (Blink & Dorton 2010). But on the other hand, a government also needs a good reputation in front of the citizens for votes, and a government that bans cigarettes would unlikely get any votes. Indirect taxes will reduce quantity demanded and will raise government revenue (Azariadis & Drazen 1990). But in either case, quantity demanded will never fall to the socially optimal level Q^* , so this step by the government will not eliminate the welfare loss. If the price of cigarettes is increased to a significantly higher level, people will look towards other sources of supply such as smuggling etc. This will not solve the externality problem, since the good is inelastic. Government can also educate and create awareness about smoking, its harmful effects as well as passive smoking. The costs of such programs might be very high for the government, and shifting the MPB curve to the left will be very difficult and time consuming (Azariadis & Drazen 1990).

The issue of the negative externality of pollution is very common in the Indian Economy. Till the end of the year 2013, air pollution has become more and more serious in India. As India is a developing country with a lot of production and manufacturing, air pollution is also increasing as a consequence. Pollution has taken many forms, example the fumes from the chemical industry, emission of fumes from cars, and also the sulphur content releasing from the coal. The nitrogen area has also almost increased by more than double as compared to 2012. According to the Economist, other dangerous particles in the environment have also doubled in the last two years (A.R 2012). This also causes a lot of problems for the nearby population. The smoke can cause heart or asthma attacks, grumpiness and gloominess, headaches as well as deformed children. An estimate in the Economist also showed that pollution from smoke kills around 10500 people in a year due to heart and asthma attacks, as well as cancer (A.R 2012).

Negative externalities, in the form of the above examples in India, can lead to market failure. In this situation, the market of India cannot allocate goods and services efficiently, and the price cannot also be determined in an effective manner. There can be many reasons for market failure of course, such as public and merit goods, but negative externality is a major cause for that in this country. In this situation, the citizens pay for the external cost of the good, in the form of more visits to the doctor or less time at work. The citizens are not directly

involved in the buying and selling of the good produced, therefore they are the third party. Hence, the price of the product is less than its value in the market. A distribution problem will be caused as a result and there will be a deadweight loss. Unless the government does not take any actions to solve this issue, it will be a major problem for the Indian market. Figure 2.1 shows the negative externality graph of production of air pollution in India and how the marginal social cost is greater than marginal private cost. It also shades the area of deadweight loss or welfare loss and shows that how government can take certain efforts to decrease the quantity of such products to the socially optimal level (A.R 2012).

The Indian Government has taken many steps to tackle this issue. There is a constant pollution checking by the transport department on roads for prosecuting the vehicles polluting beyond a specific amount and not having PUC Certificates. Public Awareness and social campaigns are also introduced by the government to educate the motorists about the health issues involved of air pollution, controlling the measures, and even about statutory provisions. Also since 1995, all petrol driven 4 wheeler vehicles have been fitted with Catalytic Converters (Transport 2014). A mass and effective transport system has been put in place, along with proper bus and train (rail) systems. These are not only efficient but also affordable for the entire population. The transport department of India is rigorously working on this pollution issue to combat it and also the government is issuing loans to help them purchase new vehicles. Vehicles replaced on a frequent basis would be less prone to pollution (Ramesh 2013). The quality of the fuel in Dehli, India has also been significantly improved since 2010. Leaded petrol has been totally phased out. Moreover, low sulphur diesel has been introduced, where the content of sulphur is even less than 0.035%. Ministry of Road Transport and Highways, Government of India has constricted the CO emission level and announced the extent of HC emissions in petrol vehicles. Also, in agreement with the Gazette notification, all the pollution checking centres have been asked to get their equipment upgraded with the new 4-gas analyzer. Their authorization has been cancelled and held void if they have failed to do so. Government of India has also taken efforts to introduce the metro system in India, especially Dehli, which has become very efficient. Metro has decreased the usage of private cars, which allows for overall less air and noise pollution. Buses exhale less harmful gases and also give way to less traffic. Moreover, government can also easily update and replace the engines of public buses in order to make sure

than air pollution is reduced to its minimum in the country (Ramesh 2013). The government of India has also started using permits and licensing in order to limit the amount of air pollution. This step was taken when air and other forms of pollution in India reached its limit. Permit over here is the same as discussed in the last question. If the industry goes over the limit and pollutes, it will be penalized and fined. If consistent limits are crossed, the industry would be warned and closed down. In this manner, air pollution will be controlled. But the government needs very stringent and costly ways to supervise this rule in India, as many industries will try to fake their pollution ranges and will not take any responsibilities. Bribery and other unofficial means of getting away with this have also been seen. Hence the government needs to carefully monitor the implementation of this plan (Transport 2014).

In short, pollution of all types is highly prevalent in India and needs to be tackled in an effective manner by the government. Pollution is a negative externality that exists in almost all economies of the world. Whether it is a perfect competition market, monopoly or oligopoly, externalities exists in all markets.

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