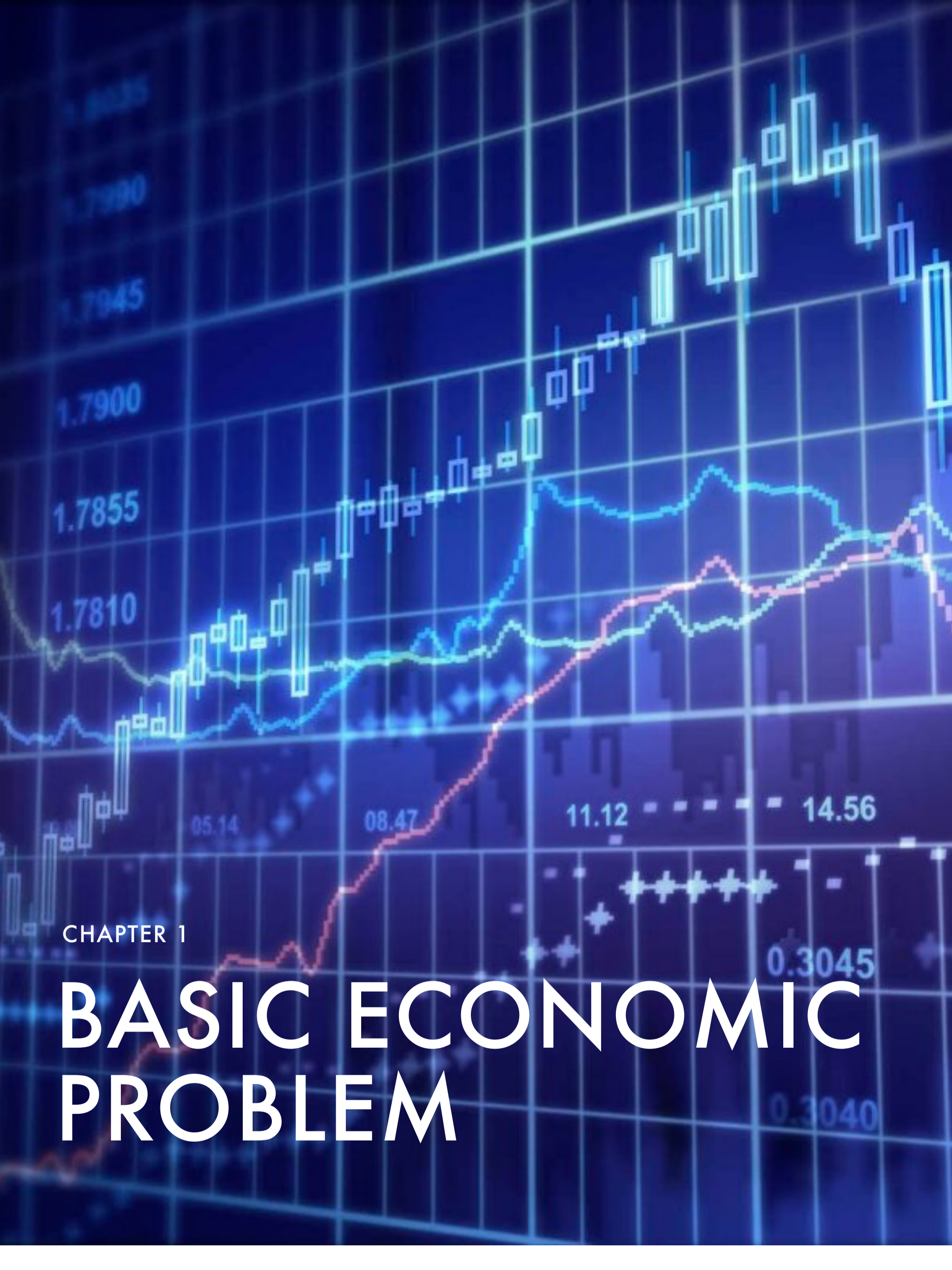# AS
MICROECONOMICS

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CHAPTER 1

BASIC ECONOMIC PROBLEM

SCARCITY AND OPPORTUNITY COST

The basic economic problem is that of scarcity. Given that human wants are unlimited and that resources are finite, choices have to be made between the various uses of resources.

This is the fundamental problem that all societies face. It refers to the excess of human wants over what can actually be produced to fulfill these wants. Human wants are unlimited. On the other hand, the means of fulfilling these human wants are limited because the resources available are limited.

The key issue that arises from the existence of scarcity is that it forces people to make choices. Each individual must choose which goods and services to consume. In other words, everyone needs to prioritize the consumption of whatever commodities they need or would like to have, as they cannot satisfy all their wants. Similarly, at the national level, governments have to make choices between alternative uses of resources.

The resources that are scarce, i.e., limited in supply, are called economic goods, while those, which are unlimited in supply, are called free goods.

Economic goods result in opportunity cost, as economic agents make choices amongst some alternatives. Opportunity cost is the forgone alternative of the choices that we ultimately make.

For example, society cannot enjoy all the books and all the tables it wants because the number of trees required to produce these two goods is limited. It somehow has to decide how many books and how many tables it wants to

produce. If more tables are produced then fewer books will be enjoyed and vice versa. We define the opportunity cost of a choice as the value of the next best alternative sacrificed. If, for example, by giving (or more correctly, 'allocating') a tree to table production, one extra table is produced but 25 books need to be sacrificed, we say that the opportunity cost of producing one more table is 25 books.

FACTORS OF PRODUCTION

Resources are also referred to as factors of production. They include all inputs used in the production of a good or service. They are typically separated into the following four categories:

1. **Land and raw materials (natural resources):** These are inputs into production that are provided by nature, for example agricultural and non-agricultural land, forests, pastures, mineral deposits, oil, natural gas, lakes and rivers. The world's land area and raw materials are limited. Some resources, such as oil and coal deposits, are non-renewable: if they are used now, they will not be available in the future. Other resources, for example forests (timber) and the stocks of fish, are renewable. The return or reward to the owner of land is rent.

2. **Labor (human resources**): Labor includes all forms of human input, both physical and mental, into current production. The labor force is, at any point in time, limited both in number and in skills. The total number of

The four factors of production are land, labour, capital and entrepreneurship.

The returns to the factors of production are rent for land, wages for labour, interest for capital and profit for entrepreneurship.

people available for work is referred to as the labor force or working population. The return or reward to the owner of labour is wages.

3. **Capital:** Physical capital includes manufactured resources; in other words, goods used to produce other goods. The world has a limited stock of capital (limited supply of factories, machines, tools and other equipment). Note that the meaning of capital in economics is different from that used in ordinary speech where people refer to money as capital. The return to owner of capital is interest that could have been earned if the money was not used in capital but given out as loan.

4. **Entrepreneurship:** Entrepreneurship refers to the willingness and ability of certain individuals to take risks and to mobilize the remaining factors of production. The reward to entrepreneurship is the profit that can be earned from a business.

ECONOMIC VS. FREE GOODS

Goods and services that require scarce resources to be sacrificed in order for them to be produced are called economic goods. In contrast to economic goods, free goods have a zero opportunity cost of production. (There are very few real-world examples, perhaps sea water and air.)

Note that goods available at a zero price are not free in an economist's sense if scarce resources have been used up to produce them.

CAPITAL VS. CONSUMER GOODS

Capital goods are used to produce consumer goods in the future, e.g. machinery and equipment which is not bought for final consumption.

Consumer goods are bought for final consumption, e.g. washing machines and videos. Consumer non-durables (e.g. food) are immediately consumed; whereas consumer durables are not consumed immediately, e.g. televisions.

MICRO VS. MACROECONOMICS

Microeconomics is concerned with the individual parts of the economy. It is concerned with the demand and supply of particular goods, services and resources. In other words, it focuses on individual markets.

Macroeconomics examines issues relating to an economy as a whole, such as unemployment, inflation, growth and

the balance of payments. This means that the focus of macroeconomics is on aggregate economic variables.

Whereas microeconomics may be interested in explaining why the price of corn is rising, macroeconomics investigates why the average price level may be rising. In microeconomics, the focus may be on how many workers a firm will employ but macroeconomics examines the total level of employment and unemployment in a country.

In other words, in macroeconomics we zoom out of individual markets and firms and look at what is going on in the country.

POSITIVE VS. NORMATIVE ECONOMICS

Normative statements are value judgments, opinions and statements that cannot be falsified or proven right or wrong; statements that cannot be tested against facts (data). Examples are: 'Inflation is rising too fast' or 'Income distribution is not fair'. Key phrases in normative statements include 'ought to be', 'should be', 'too much', 'too little', 'is fair', 'is unfair', and so on.

Positive economic statements are statements that can be falsified or proven, at least in principle, right or wrong. They can be tested against facts (data), for example: 'A minimum wage policy will increase unemployment among unskilled workers.'

Positive Statements can be tested against factual data and hence they can be falsified or proven.

Normative statements are value judgements, opinions or statements that cannot be falsified.

CETERIS PARIBUS

Ceteris paribus is a Latin phrase, literally translated as "with other things the same," or "all other things being equal or held constant." In economics, the term is used to indicate the effect of one economic variable on another, holding constant all other variables that may affect the second variable. For example, when discussing the laws of supply and demand, one could say that if demand for a given product outweighs supply, ceteris paribus, prices will rise.

PRODUCTION POSSIBILITY CURVE (PPC)

The production possibilities curve (PPC) – also referred to as the production possibilities frontier (PPF) – is the first economic model we will study. Through it, a number of important economic concepts will be illustrated and made clear. For example, the model provides us with a visual account of scarcity, attainable and unattainable choices, opportunity cost, efficiency and growth.

A PPC assumes an economy with a fixed amount of resources, characterized by a given level of technology, and producing only two goods. A PPC shows for every amount produced of good X, the maximum amount of good Y that this economy can produce if it fully utilizes its limited resources using the available technology. PPC shows different combinations of two economic goods, which an economy can produce if all the resources are fully and efficiently employed.

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FIGURE 1.1 **PPC**
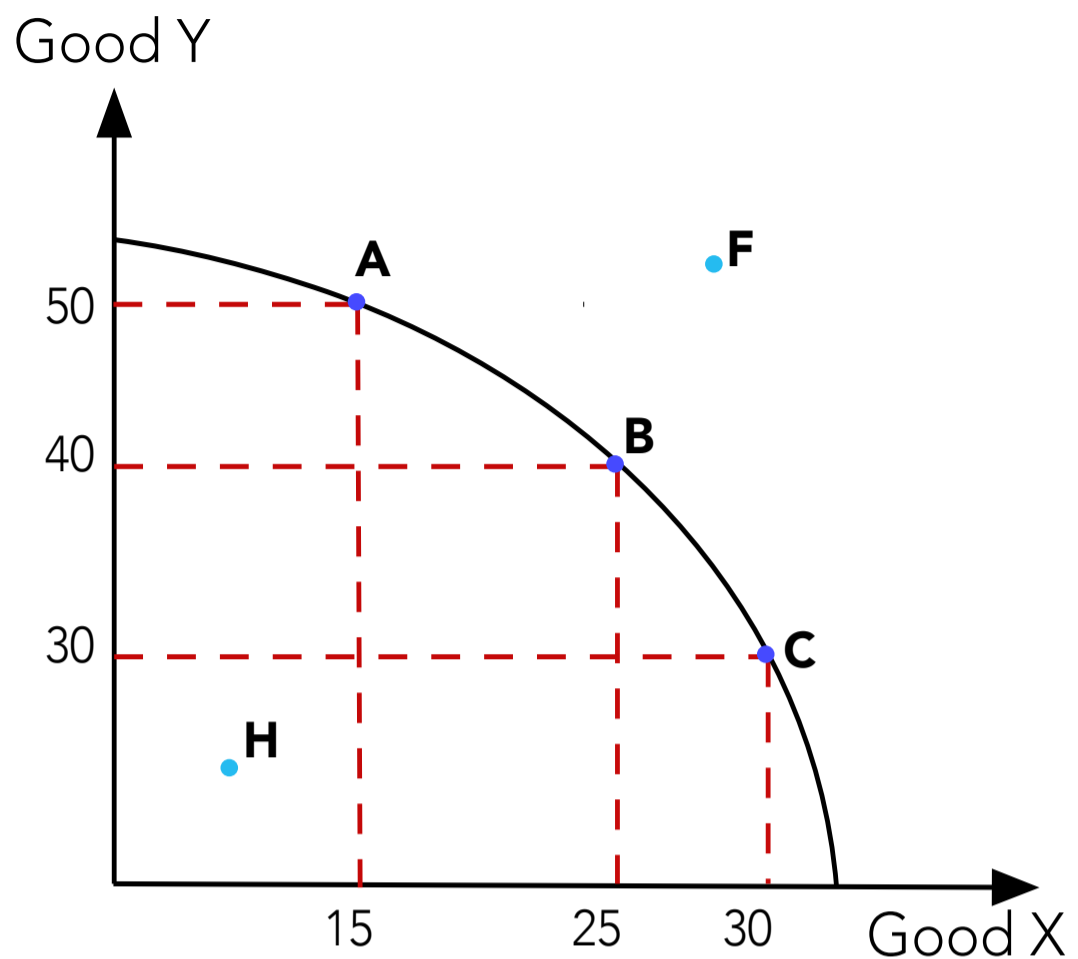
Good Y

For example, referring to Figure 1.1, if the economy decides to produce 25 units of good X then it can produce 40 units of good Y at the most, (assuming that it fully utilizes its limited resources with the available technology).

The PPC can depict many micro and macroeconomic concepts. Microeconomic concepts of scarcity, choice and opportunity cost, while macroeconomic concepts of unemployment, efficiency and economic growth can be shown through the PPC.

Microeconomic concepts

1. **Scarcity – Points beyond the PPC**
All points on the PPC are where resources are fully employed and are efficiently used, while points beyond the curve are unattainable. The economy cannot produce at any point outside its existing PPC because the PPC by definition shows the maximum production level of the economy. Hence the point F in Figure 1 shows the concept of scarcity, which is an unattainable combination beyond the boundary of the PPC.

2. **Choice – Points on the PPC**
The various combinations on the PPC, such as points A, B and C, show choice. If the economy decides to make combination B, it may not be able to choose other combinations.

3. **Opportunity Cost – Slope of the PPC**
The negative slope of the PPC reflects that, in order to produce more of one good, resources have to be diverted away from the production of the other good so that less of the other good can now be produced: there is an opportunity cost involved in producing an extra unit of a

good. This opportunity cost is the amount of the other good that has to be sacrificed. For example, the opportunity cost of producing 10 extra units of good X is equal to the 10 units of good Y that need to be sacrificed (moving from point A to B). Similarly, the opportunity cost of producing another 5 extra units of X is equal to 10 units of good Y that need to be sacrificed (moving from B to C).

Movement from the point inside the PPC to a point on the PPC entails no opportunity cost as the economy is using idle resources that were not previously used.

Macroeconomic concepts

1. **Unemployment or Inefficiency – Points inside the PPC**

Unemployment implies the existence of (labor) resources that are not utilized. The economy is producing some combination of output represented by a point located inside its PPC (point H). It follows that if unemployment or inefficiency increases then the new point will lie somewhere closer to the origin as fewer units of at least one of the two goods will be produced. Conversely, if unemployment or inefficiency decreases there is no shift in the PPC, as the factor of production labor has not increased. The economy will just move from some combination inside its PPC to another combination closer to the curve itself (that is, to any point located to the northeast of the original point).

2. Economic Growth - Shift of the PPC

Growth of an economy can be shown through an outward shift of the PPC. It implies that combinations of output that were initially unattainable can now be produced. For such an outward shift to occur, more or better resources should become available and/or technology should improve. Hence, any improvement in the quality or quantity of factors of production can result in economic growth.

An outward shift of the PPC represents Economic Growth and an increase in an economy's capacity to produce.

FIGURE 1.2 **Economic Growth**
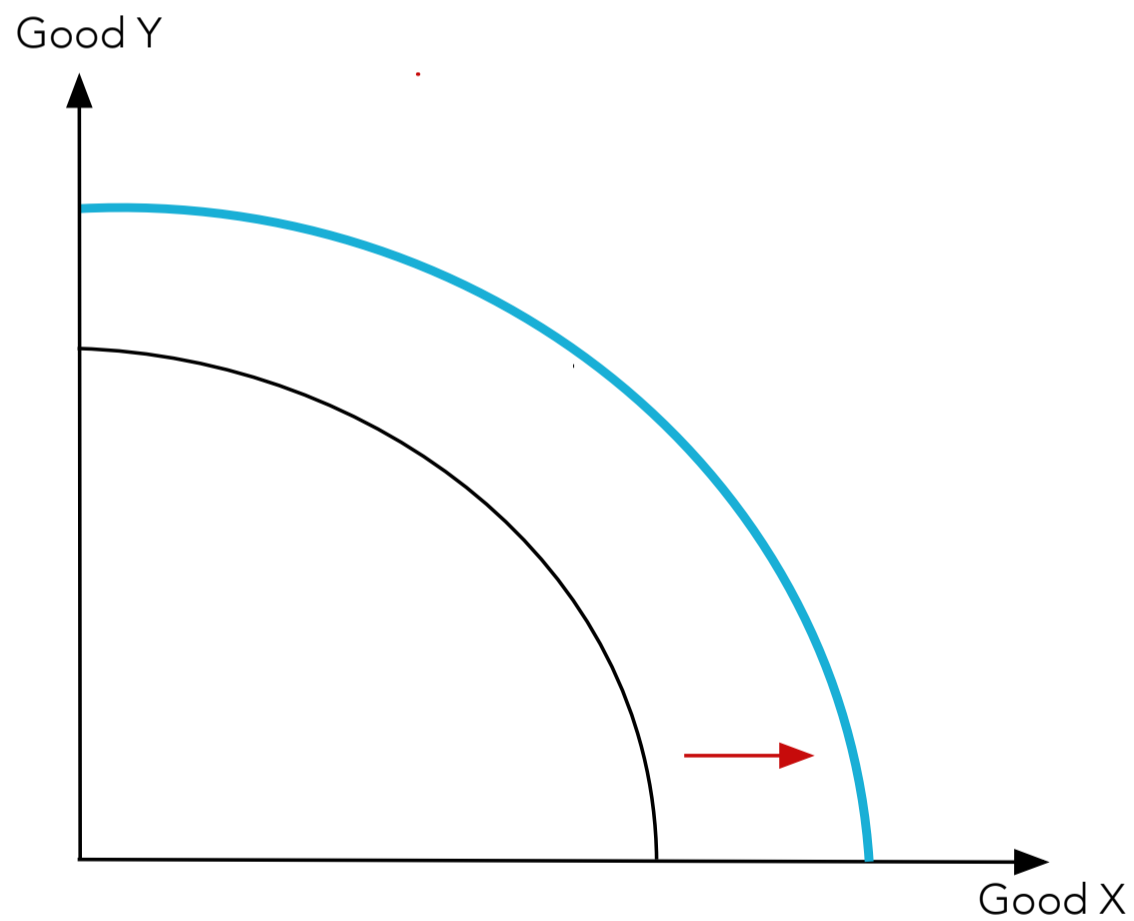
3. Pivotal Shift - Increase in FOP geared towards one good

Pivotal shift of the PPC or a change in the slope of the PPC is when there is a change in the quality or quantity of factors of production, which are specific to the production of one type of good. For example, an invention may improve production techniques used to produce good X. This will increase the potential output of good X and cause the PPC to change its slope as shown below.

FIGURE 1.3 **Increase in one factor of production**

Improvements in FOPs specific to the production of one good only.
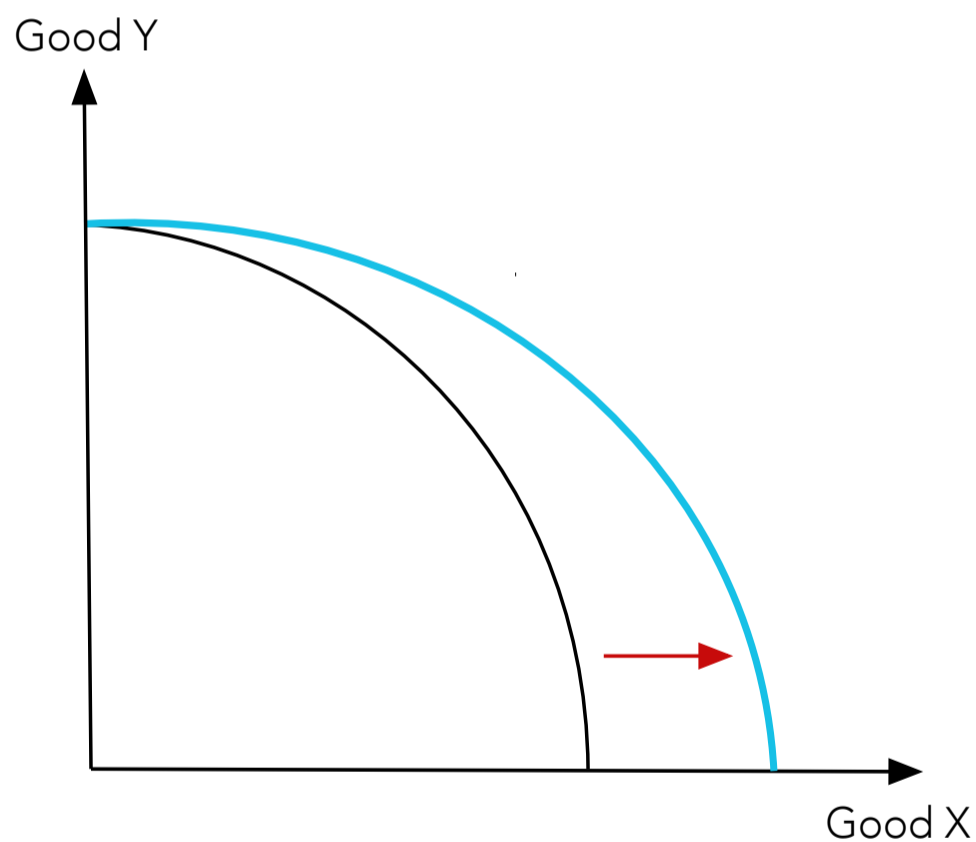
When resources are shifted to producing more of capital goods and less of consumer goods, the reallocation may require retraining the workforce in the skills required to produce capital goods.

The extent to which resources can be reallocated from one line of production to another, is known as factor mobility. And if we want resources to be swiftly allocated to the new use, we need to ensure that factors are as mobile as possible.

The shape of the PPC depicts how versatile resources are in allocation of one good as compared to another.

1. Concave to the Origin: Increasing Opportunity Cost:

As scarce resources are not equally well suited for the production of all goods (because resources tend to be specialized), the opportunity cost of producing more and more units of a good increases: ever-increasing amounts of good Y need to be sacrificed to produce more and more units of good X. This is why the PPC is bowed towards the origin. The slope (the tangent at each point, such as at points A and B) becomes steeper and steeper, reflecting that the opportunity cost of producing more of good X is increasing. Producing 1 more unit of good X is costlier (2 of Y) from Point B to C than producing 1 more units of X from Point A to B (1 of Y) because resources much better

A PPC that is concave to the origin has increasing opportunity cost which implies that the opportunity cost of producing more and more of a good are increasing.
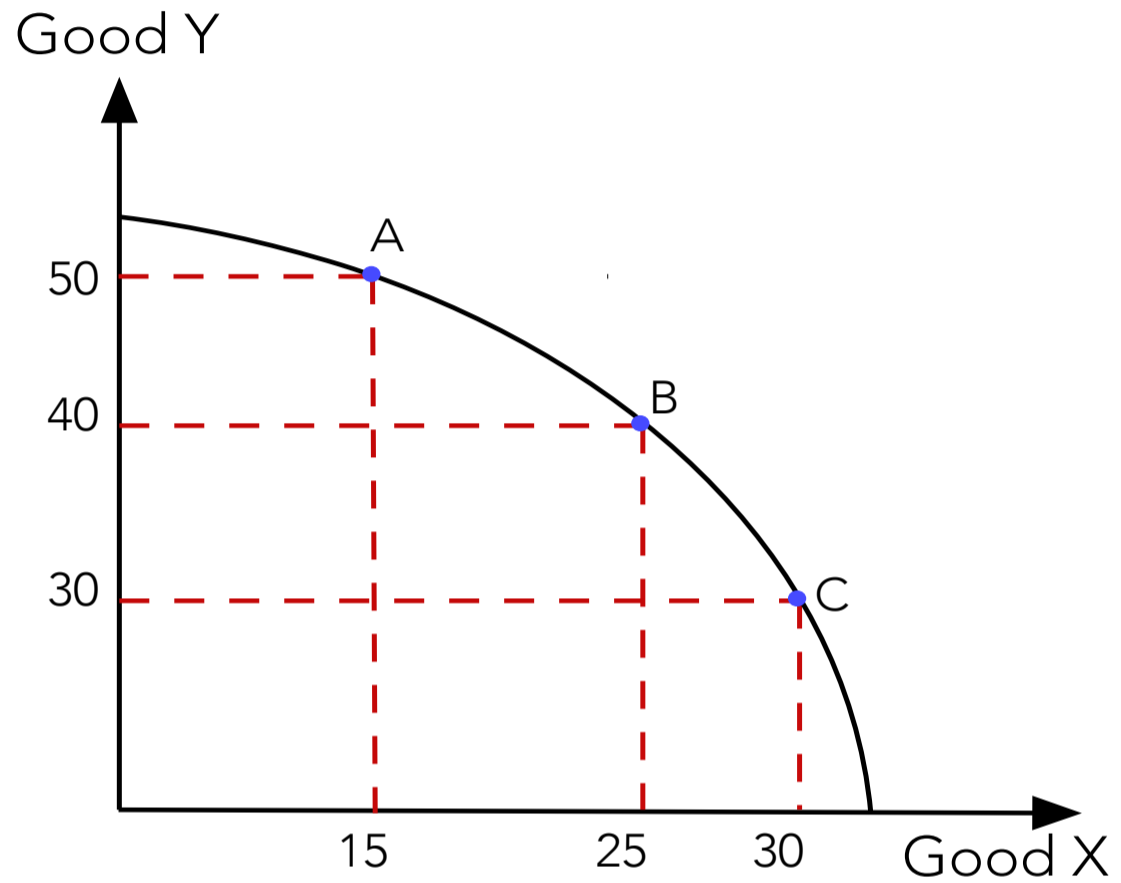
suited for the production of good Y must now be diverted to the production of good X.

FIGURE 1.4 **PPC concave to the origin**

In figure 1.4, between A and B, the opportunity cost of good X is less as compared to the opportunity cost of moving from B to C. For every 10 units of good Y lost, less of good x is gained as we move from A to C.

2. Linear PPC: Constant Opportunity Cost

A linear PPC has constant opportunity cost which implies that factors are completely mobile among competing production.

In a linear PPC, the slope remains constant as we move along the PPC. Constant opportunity cost therefore implies that factors are completely mobile in the competing production. The versatility of resources suggests that all resources are equally efficient in the production of different types of goods. This kind of PPC is not realistic as resources are not perfectly mobile in competing uses.

FIGURE 1.5 **Linear PPC**

Figure 1.5 shows a linear slope which has constant opportunity cost among competing uses. As we move from A to C, 10 units of good Y are lost for 5 units of good X.
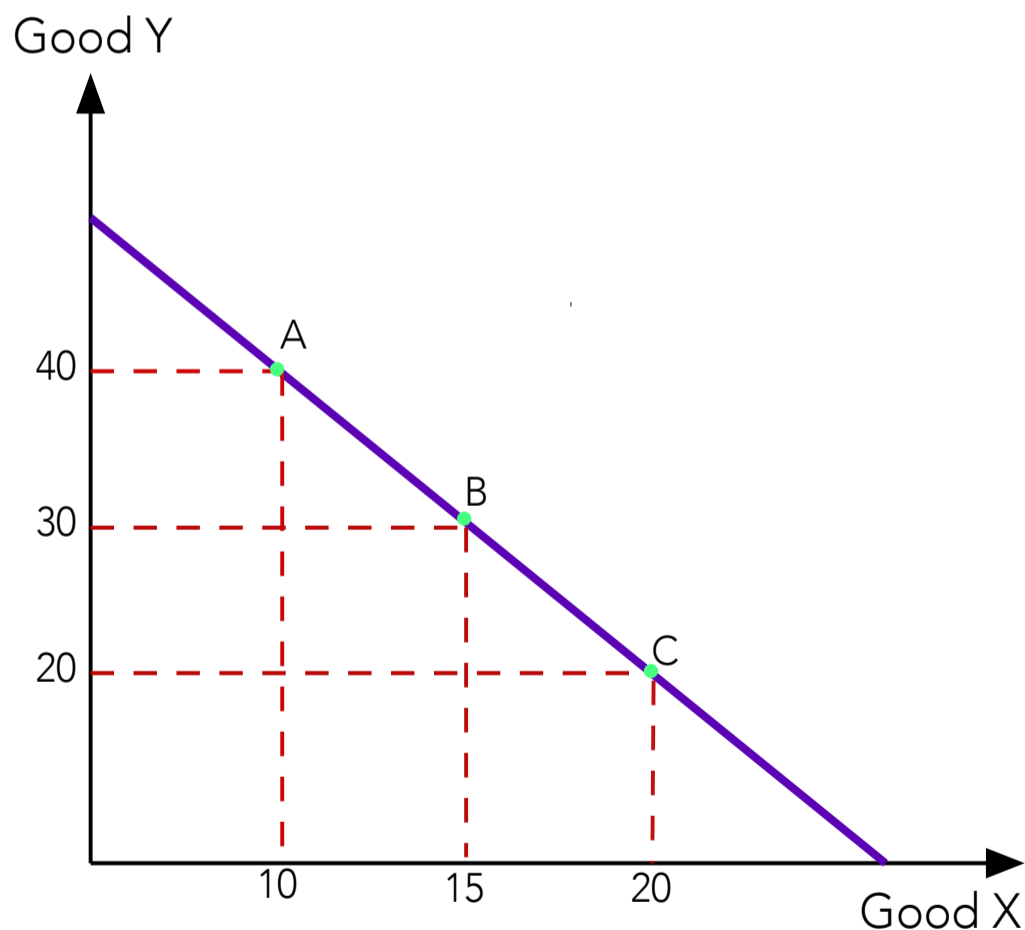
1. **Capital goods vs. Consumer goods (More jam today vs. more jam tomorrow)**

The PPC is often used to illustrate the extent to which an economy is producing for the present or for the future. Economies that focus on capital goods are investing for the

FIGURE 1.6 **Capital vs Consumer good**

Capital Goods
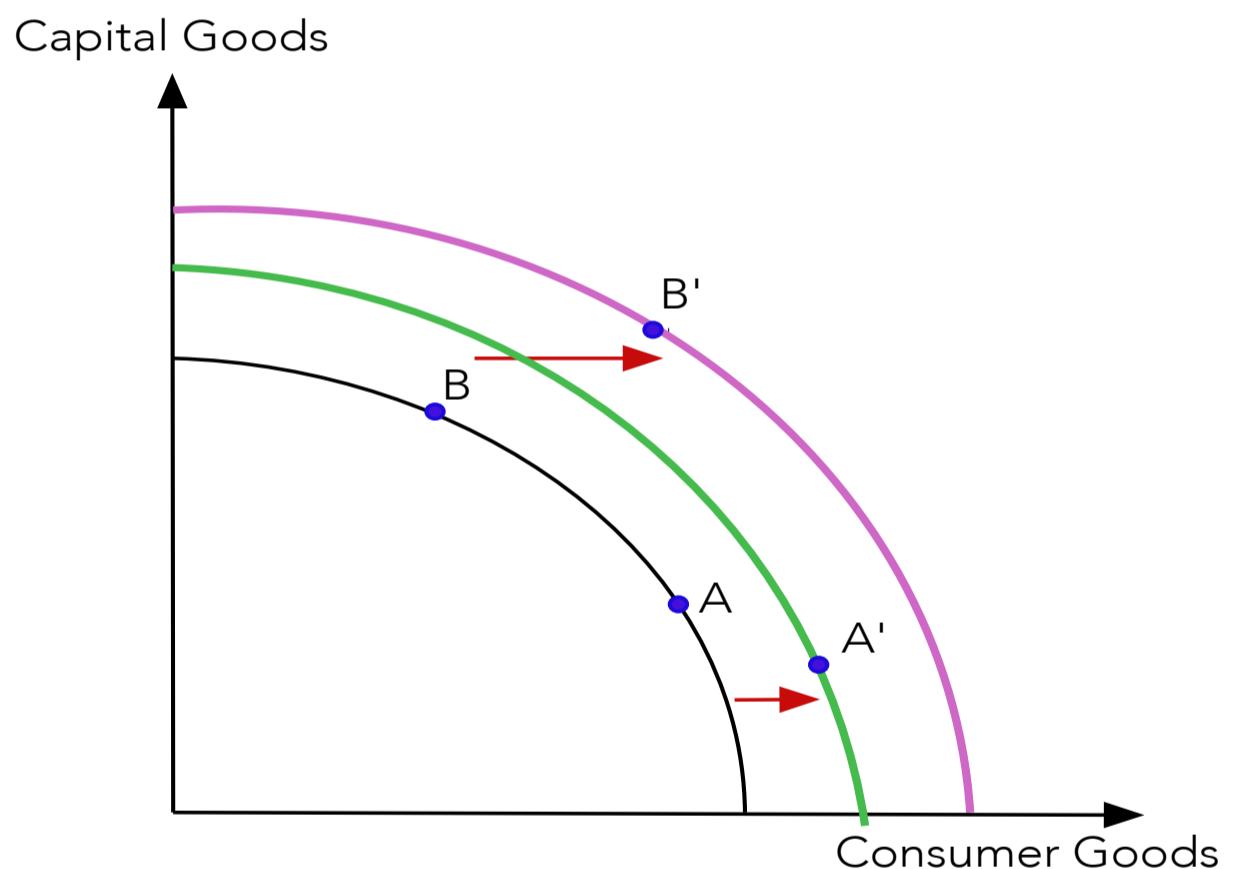
Consumer Goods

In figure 1.6, economy A focuses more on consumer good production which leads to lower growth than economy B. Economy B has a lower standard of living today but overtime it will move to a higher PPC because its production capacity will increase.

long term. They are investing in machines and equipment that will allow the economy to produce more in the future. The diagram suggests that economy A, which focuses more on consumer goods, may see lower economic growth than economy B, which sacrifices current consumption and has

lower standard of living today, but overtime it may seek economic growth and higher living standards.

2. Capital Consumption (Depreciation)

Creation of capital goods is called investment. During the production process, capital goods get utilized and need to be replaced. This is called capital consumption or depreciation. If not replaced, capital stock decreases and PPC will shift to the left. For example, an economy at point Z is investing more than its depreciation level (OA) and will have an increase in capital stock, while an economy at point

FIGURE 1.7 **Depreciation**
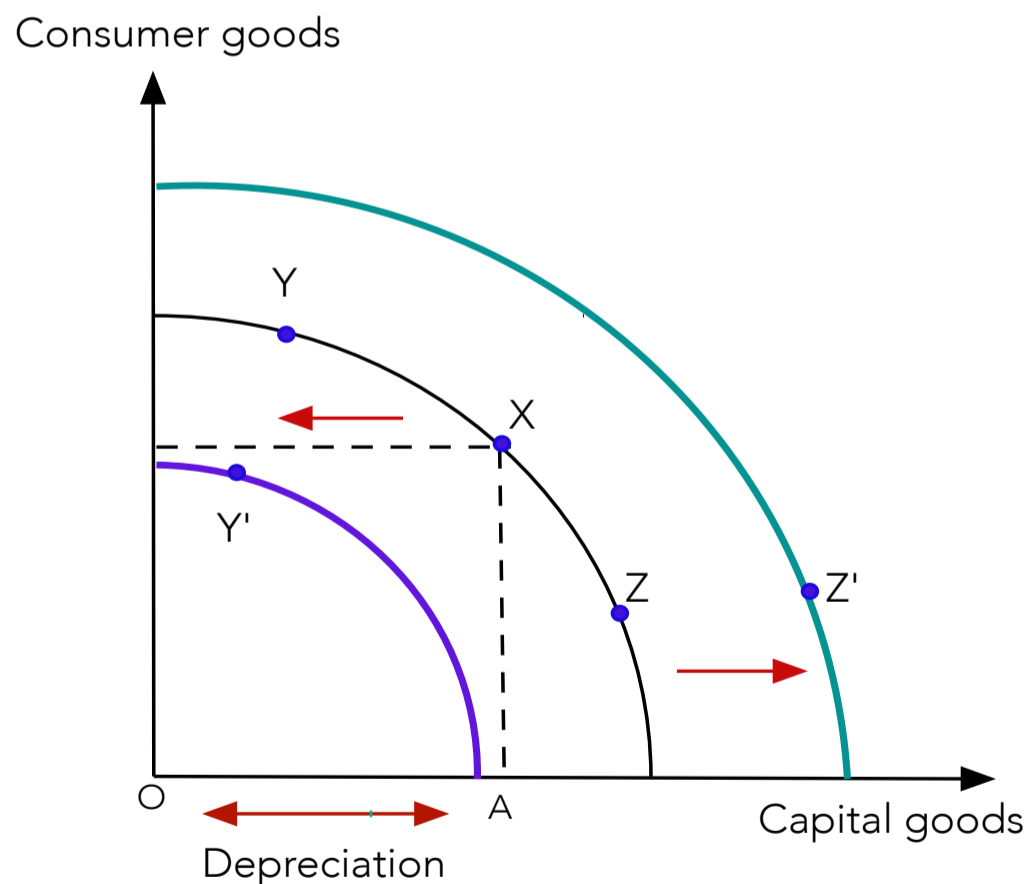
Y is investing less than its depreciation level and experiences a reduction in its productive potential, shown by a shift to the left of the PPC.

What the PPC can illustrate	
Scarcity	The existence of the PPC illustrates scarcity. If scarcity did not exist then all points in the goods space created when drawing our two axes would be attainable - this is obviously unrealistic.
Choice	Once the PPC is constructed, a society can choose any combination of output (point) on it, or, if society's preferences or priorities change, it can move from one combination to another one along the curve.
Efficiency	Efficiency is shown at all points on the PPC, as each reflects full use of available resources given the available technology without any waste.
Inefficiency	Inefficiency is shown at all points inside the PPC as given the amount produced of one of the two goods, more of the other could be produced. This implies wasted (idle or unemployed) resources and so inefficiency.
Opportunity cost	Movement from one point on the PPC to another implies that more of one of the two goods is produced but less of the other. So the extra amount produced of one good comes at a cost: this cost is the amount sacrificed of the other good. The opportunity cost of producing more units of the good on the horizontal axis is given by the slope of the PPC.
Constant opportunity cost	A linear PPC reflects constant opportunity cost: producing more and more units of one good always requires the same amount of the other good to be sacrificed.
Increasing opportunity cost	A concave (bowed in towards the origin) PPC shows increasing opportunity cost, as to produce equal extra units of one good, increasing amounts of the other good have to be sacrificed.
Growth	An outward shift of the PPC reflects growth as combinations of output previously unattainable become attainable.

Enterprise provides dynamism and innovation in an economy, especially within the sector dominated by small and medium-sized firms. The role of the entrepreneur in contemporary economies is viewed as being especially important. An effective entrepreneur is able to identify potential income-earning opportunities for businesses and is willing to assess and bear the risk involved in embarking on new projects or start-ups. The entrepreneur is also responsible for organising the other factors of production in the most efficient and effective way.

SHORT-RUN, LONG-RUN & VERY LONG-RUN

Short-run

The short-run is defined as a period of time where at least one factor of production is fixed. A fixed factor of production means that when the output rises, the quantity of input does not change. An example of a fixed input would be a school's building facilities, which is a fixed input that cannot be altered in the short-run.

Long-run

The long-run is defined as the period where all factors of production are variable, which means that in order to increase output, the firm can choose to increase or decrease any of their inputs.

Very Long-run

The very-long run is considered as the time taken to where all factors of production are variable, even those which are outside the control of a firm (external variables), such as technology, infrastructure or government policy.

What is considered the short, long or very-long run will vary from business to business and industry to industry. For instance, what is considered a long period of time to a fruit vendor will differ from that of a school.

ECONOMICS AS A SOCIAL SCIENCE

Economics sets out to tackle some complex issues concerning what is a very complex real world. This complexity is such that it is essential to simplify reality in some way; otherwise the task would be overwhelming. Economists therefore work with models. These are simplified versions of reality that are more straightforward to analyse, allowing economists to focus on some key aspects of the world.

In evaluating a model, it is always important to examine the assumptions that are made, and to ask what happens if these assumptions do not hold.

The use of models is one way in which economists try to approach their discipline in a 'scientific' manner. Much of economics is about human behaviour. This complicates matters because humans do not all act in the same way as each other – and may not even act the same on different days. This makes individual behaviour difficult to predict or explain. However, when we are dealing with large numbers of people, we can be reasonably sure about how they will behave on average. A key assumption made in mainstream economics is that economic agents act rationally. Consumers take decisions that will bring them as much satisfaction as possible, and firms take decisions that allow them to make as much profit as possible. The approach taken by economists justifies the claim that economics is a 'social science'.

THE MARGIN AND DECISION MAKING

The notion of 'the margin' is important in much of economic analysis. Decision- makers – whether they be firms or consumers – are seen to take decisions with reference to small changes in behavior. For example, a firm may decide whether to increase its output by an extra unit by checking whether the additional revenue that it would receive from selling the extra unit will compensate for the additional cost of producing it. A consumer may decide whether the extra benefit of consuming an additional can of cola is worth the price to be paid for it. This is known as the marginal principle.

DIVISION OF LABOUR AND SPECIALISATION

Specialisation can apply to an individual person, a particular firm, a specific district or region or, at the national level, a whole country. It refers to the concentration on the provision of particular goods and services rather than other products. Specialisation allows, and indeed encourages, individuals, firms, regions or whole countries to concentrate on what they are best at producing; as a result of this specialisation, the production of such products will be increased.

THE DIVISION OF LABOUR

One particular form of specialisation is the application of the principle to the work of particular individuals. Division of labour is the specialisation of economic activity by

product or process.

A famous example of this was included in the book An Inquiry into the Nature and Causes of the Wealth of Nations, by the Scottish economist Adam Smith (1723–1790) in 1776. In this book, he applied the principle of the division of labour to production in a factory.

THE ADVANTAGES AND DISADVANTAGES OF DIVISION OF LABOUR

It has already been stated that one advantage of division of labour is that it enables production or output to be increased. It does, however, have a number of potential disadvantages. Table below indicates some of the various advantages and disadvantages of the division of labour.

Advantages of the division of labour	Disadvantages of the division of labour
Saving of time: it can take a lot of time moving from one task to another in the production process. Division of labour helps to reduce this wastage of time and so can contribute to a reduction in costs.	**Dependency on others**: specialisation, through the division of labour, means that the process of production is divided into separate tasks, but there is a potential danger of one group of workers being held back by another group at a different part of the production process.
Application of technology is made easier: division of labour involves workers becoming specialists in particular tasks and this will make it easier to apply technology, such as machinery, to specific tasks.	**Dependency on technology:** although technology can be used to support workers, and enhance their skills, there is always the danger that the technology takes over and this may cause workers to become disaffected.
Increase in skill: division of labour enables workers to concentrate on particular tasks and this will enable the worker to become very skilled in these specific tasks. Repeated practice in the task will enhance efficiency and by concentrating on what they do best, workers will become highly motivated.	Frustration, boredom and alienation: by its very nature, division of labour involves workers in repetitive tasks and this may lead to a reduction in levels of motivation (some firms get round this by giving workers some degree of variety in what they do rather than getting them to do the same thing every day). If levels of motivation are reduced, this is likely to have a negative effect on the productivity of a worker.
Increased productivity: division of labour enables workers to specialise in particular tasks and, as a consequence, productivity, or the output per worker per time period, is likely to increase. If output is increased, this will lead to an improvement in the standards of living of economies.	**Over-concentration on particular skills:** division of labour is based on the idea that workers concentrate on using particular skills, but there is a danger that this focus on certain skills could be at the expense of other useful skills that are not being encouraged.
The potential to earn higher earnings: an individual worker who is highly skilled and well motivated is in a better position to try to secure higher earnings (this will, of course, depend on a number of other factors, such as the profitability of the firm).	Unemployment: specialisation, through division of labour, is useful as long as there is a demand for the particular skills of workers, but there is a danger that if the demand for such skills decreases, some workers may find themselves unemployed. This would be less of a problem if the workers soon found alternative employment (this would be frictional unemployment), but if the demand for such skills applies to a whole industry, it may be very difficult for the workers to find alternative employment (this would be structural unemployment).

ECONOMIC SYSTEMS

An economic system is a broad institutional framework within which economic activity takes place and scarce resources are allocated between competing uses.

ECONOMIC SYSTEMS

An economic system determines how scarce resources are used. That is, it addresses the problem of resource allocation. An economic system can be broadly defined as the institutional framework within which economic activity takes place. There are three main types of economic systems depending on how much government involvement there is in making decisions about the allocation of resources.

Resource allocation involves providing answers to three key questions.

To allocate resources efficiently three economic questions have to be answered.
1. What to produce?
2. How to produce?
3. For whom to produce?

THREE ECONOMIC QUESTIONS

1. What to produce:

An economy can choose the mix of goods to produce. Because we cannot produce everything, we need to decide what to produce and in what quantities. The graphical depiction of this question is where to produce on the PPC.

2. How to produce:

Because resources are scarce, we need to consider how resources are used so that the outcome arises. We may either choose to be labour intensive or capital intensive depending on the availability and cost of inputs. Economies which are efficient will produce on its PPC.

3. For whom to produce:

Because we cannot satisfy all the wants of the population, decisions have to be made concerning how much of each person's wants are to be satisfied. On a broader level, we need to decide whether everyone is going to have more or less an equal share, or whether some will have more than others. In answering this question, moral aspects of decision-making become important which depend on government policies of redistribution of wealth.

FREE MARKET ECONOMY

A market economy is one where households and firms, each acting in their own self-interest and through their interaction in markets, provide answers to the three questions.

Key features of the market economy	
Main Actors	Consumers Producers Owners of factors of production Government (limited role)
Motivation	Self Interest - actors are motivated by pure self interest and their decisions are based on private gains. **Consumers**: maximum satisfaction / individual welfare **Producers**: Maximization of profit **Owner of FOP**: Wages,Rent, Profits and Interest **Government**: Social Welfare
Ownership	Private individuals own resources where the government has a duty to uphold property rights, which is done through the legal system.
Free enterprise	Owners of FOP have the right to buy and sell what they own, through the market.
Competition	Competition exists, as economic units are free to allocate their resources as they wish. Producers compete for the spending of consumers. Workers compete for the spending of the employers and so on.
Decision making	Decentralized decision making where individual agents are free to choose how they wish to allocate resources.
Allocation of resources	Happens through the price mechanism where market forces of demand and supply determine prices and quantity.

THREE ECONOMICS QUESTIONS AND THE MARKET ECONOMY

1. **What to produce**: In a pure free market, consumers determine the allocation of resources. Consumers are sovereign. Each consumer has a certain amount of money to spend and each dollar is like a spending vote. Consumers cast their spending vote when they purchase goods and services. Firms receive these spending votes and devote factors of production to produce goods and services.

2. **How to produce**: Producers are in competition with each other. All other things equal, consumers will buy from the producers, which offer the lowest price. So producers must produce at the lowest cost if they are to survive in the market. This then determines how goods are produced, as firms will adopt the lowest cost technique of production.

3. **For whom to produce**: Those with high income and wealth are able to buy large amounts of goods and services, while those with low income and little wealth can only buy a few goods and services. The amount of money consumers spend is determined by their wealth and by their income.

Advantages of the Market Economy

1. Free market economy functions automatically – there is no need for costly and complex bureaucracies to coordinate economic decisions.

2. The economy can respond quickly to changes in demand and supply conditions through the price mechanism.

3. When markets are highly competitive, no one has great market power. Competition between firms keeps prices down and acts as an incentive for firms to become more efficient.

4. There is a strong incentive to innovate and produce high quality goods, as companies that fail to do both are likely to be driven out of business by more efficient firms.

5. Self-interest is the main motive for all economic actors, which results in minimizing the central economic problem of scarcity by encouraging the efficient use of a nation's resources in line with consumers' wishes.

Disadvantages of the Market Economy

1. Competition between firms is often limited. A few giant firms may dominate an industry. Lack of competition may result in higher prices, large profits and exploitation of consumers.

2. Lack of competition and high profits may remove the incentive for firms to be efficient.

3. Power and property may be unequally distributed. Hence, consumer sovereignty may not occur due to unequal distribution of wealth.

4. The practices of some firms may be socially undesirable. For example, chemical-producing firms may pollute the environment. This is an example of external costs or a negative externality, which arises when the production process ignores third party costs.

5. Merit goods (health, education) would be under provided by private enterprise, while demerit goods (drugs like cigarettes and alcohol) would be over-provided. Merit goods confer benefits on society in addition to the benefits they confer on private individuals.

6. Free market economy may lead to macroeconomic instability. There may be periods of recession with high unemployment and falling output, and other periods of rising prices and increasing output.

7. By rewarding self-interested behavior, the free market may encourage selfishness, greed, materialism, and the acquisition of power.

PLANNED/COMMAND ECONOMY

An economic system where resources are owned collectively by the state and allocated by the government is the planned economy.

Key Features of the Command Economy	
Ownership	All factors of production are owned and therefore allocated by the state/government.
Motivation	The government's key motivation is maximization of social welfare.
Decision making	Centralized decision making where government is the sole decision maker in terms of what, how and for whom to produce.
Price Determination	Prices are determined through the planning system.
Allocation of resources	There is no price mechanism, as government plans the distribution of resources through the planning mechanism.

THREE ECONOMIC QUESTIONS & THE COMMAND ECONOMY

1. **What to Produce**: Government plans the allocation of resources between current consumption and investment for the future. By sacrificing some present consumption and diverting resources into investment, government could achieve economic growth. The amount of resources it chooses to devote to investment will depend on its broad macroeconomic strategy, i.e., the importance it attaches to growth as opposed to current consumption.

2. **How to produce**: At a microeconomic level, the government plans the output of each industry and firm, the techniques that would be used and quantity of labor and other resources required by each industry and firm.

3. **For whom to produce**: Government plans the distribution of output between consumers. This will depend on government's aim. It may distribute goods according to the judgment of people's needs or, it may give more to those who produce more thereby providing an incentive for people to work harder.

Advantages of Command Economy

1. The government could take an overall view of the economy and direct resources in accordance with specific national goals. It could, for example, achieve high growth rates by directing large amounts into investment.

2. National income could be distributed more equally or in accordance with needs.

3. Unemployment could be avoided if the government carefully planned the allocation of resources in accordance with production requirements and labor skills.

4. The social repercussion of production and consumption can be taken into account and avoided by the government.

Disadvantages of Command Economy

1. The larger and more complex the economy, the greater the task of collecting and analyzing the information essential to planning, and the more complex the plan. Complicated plans are likely to be costly to administer and involve cumbersome bureaucracy.

2. If there is no system of prices, or if prices are set arbitrarily by the state, planning is likely to involve inefficient use of resources. Shortages will occur if

consumers decide to buy more and surpluses will occur if they decide to buy less.

3. It is difficult to devise appropriate incentives for workers and managers to be more productive without a reduction in quality.

4. Complete state control over resource allocation would involve a considerable loss of individual liberty of consumers, producers and workers.

5. Government might enforce its plans even if they were unpopular.

MIXED ECONOMY

Mixed Economy is an economic system that takes into account the advantages of both, free market and command economy. Hence there is both, private sector, where resources are owned privately, and public sector, where the government owns resources. In the private sector there is competition, while in the public sector, resources are allocated through the planning mechanism. Private sector is motivated by self-interest, while the government's goal is maximization of social welfare.

In a mixed economy a government can intervene in markets to correct market failures. It can organize resources to provide goods and services and can also introduce laws and a legal system to control harmful activities. To finance public sector activities, governments levy taxes on incomes, on wealth and on goods and services.

How markets can fail	How governments can intervene
Only goods and service that are profitable to make will be provided. For example, a market economy will not provide education or health care for people who cannot afford to pay for these services.	It can produce merit goods such as education and health care for people, regardless of their ability to pay for them, because all the economy will benefit from having a healthy and educated population.
Other services, such as street lighting, flood defenses and national parks will not be provided. Firms would be unable to charge consumers a price according to how much they use or benefit from them.	It can provide public goods, such as street lighting, sea and flood defenses and national parks that would otherwise be unprofitable for private sector firms to provide.
Resources will only be employed if it is profitable to do so. Some people who are willing and able to work may be left unemployed and without an income.	The public sector can employ people who may otherwise be unemployed and provide welfare benefits and payments to people out of work or on low incomes.
Harmful goods, such as dangerous drugs and weapons, may be produced and freely available to consumers who want to buy them.	Laws can make the production of harmful goods illegal and high taxes can be imposed on others, such as cigarettes to reduce their consumption.
Some producers may ignore the harmful effects of their production on the environment or on people's health.	Laws and regulations can protect the natural environment and people's health and safety. Firms may have to pay large fines if their activities break these laws.
Some firms may dominate the supply of a particular good or service and will charge consumers very high prices. These firms are described as monopolies.	Monopolies can be regulated to keep their prices down or be broken up into smaller firms to increase competition and choice.

PROBLEMS OF GOVERNMENT INTERVENTION

Government decisions can also introduce disadvantages to a mixed economic system:

1. High taxes on profits may reduce enterprise and high taxes on wages can reduce people's incentives to work. Consumers will also have less money after tax to spend on the goods and services they want.

2. Regulations can impose significant costs on firms and as a result they will produce less goods and services, increase their prices or lower the wages of their workers.

3. Public sector provision may be inefficient and produce poor quality goods and services because public sector organizations are not motivated to make profits.

4. Government spending may be politically motivated instead of aiming to correcting market failures and improving economic welfare.

TRANSITION FROM PLANNED TOWARDS MARKET ECONOMY

The shift from a command economy to a market economy has proven to be difficult. One transition from a command economy to a market economy that many consider successful is that of China. This 'success' was coupled with a massive disparity between rich and poor and a disturbing new level of corruption, where 90% of Chinese billionaires were related to members of the Communist Party. Gradually, the parts of the economy under the command economy decreased until the mid-1990s when resource

allocation was almost completely determined by market mechanism.

By contrast, the Soviet Union's transition was much more problematic and its successor republics faced a sharp decline in GDP during the early 1990s. One of the suggested causes is that under Soviet planning, price ceilings created major problems (shortages, queuing for bread, households hoarding money), which made the transition to an unplanned economy less easy. While the transition to a market economy proved difficult, many of the post-Soviet states have been experiencing strong, resource-based economic growth in recent years, though the levels vary substantially. However, a majority of the former Soviet Republics have not yet reached pre-collapse levels of economic development.

Features of the transitions

1. **A greater role of price mechanism:** The market forces of demand and supply would decide the key economic questions of what, how and for whom to produce. This would mean any interference of government in the form of price controls, taxes, subsidies and so on, might get abolished.

2. **Privatization of many state owned industries:** This would result in a greater role of the private sector in providing goods and services. It also means factors of

production would be in private ownership than public ownership.

3. **Deregulation of markets**: All markets – financial, factor and product – would be allowed to operate freely and on the basis of demand and supply with minimum restrictions.

4. **Opening up of the economy:** The economy would open up to foreign competition and international trade. Increased competition would encourage local firms to be more efficient and allow consumers to have more variety.

5. **Reduction of bureaucracy:** The setting up of an effective system that facilitates the smooth functioning of the market. This may entail a strong legal system, which provides property rights and justice to everyone.

6. **Rationalization process in the economy:** Where the economy transitions through structural changes and inefficient industries close down, while new industries better suited to consumer needs open up.

Problems with transitions

1. The structural changes where resources are allocated to reflect consumer choice rather than centralized direction may imply unemployment and dissatisfaction in the economy. Retraining of labor and employment of factors of production to new uses is a significant challenge and can take many years of industrial unrest.

2. Inflation is likely to occur as the forces of demand and supply are allowed to operate freely. This happens as the government removes price controls and the short run supply bottlenecks result in consumer demand to be unmet.

3. In absence of inadequate welfare systems, redistribution of income may lead to inequality between income groups and falling standards of living.

CHAPTER 3

PRICE MECHANISM

MARKET

A market can be defined as an institution, which permits interaction between buyers and sellers. It can also be considered as a mechanism that determines which goods and services will be produced in an economy and so how scarce resources will be allocated.

The interaction of consumers and producers (firms) in product markets determine the market price of each product. Changes in market conditions therefore result in changes in market prices. These set off a chain of events leading to more or less of the good being produced and so to a new allocation of scarce resources.

To analyze how markets function we need to examine the behavior of consumers and of producers.

THEORY OF DEMAND

The demand for a good summarizes the behavior of buyers in a market. It is the relationship between various possible prices and the corresponding quantities that consumers are willing and able to purchase per time period, ceteris paribus. **Ceteris paribus** means that all other factors affecting demand are assumed constant.

This relationship between price per unit and quantity demanded per period of time is inverse (negative), meaning that if the price increases then quantity demanded will decrease as consumers will be willing and able to buy less per time period.

FIGURE 3.1 **Downward sloping demand curve**

Price per unit

As price falls, quantity demanded rises.

P₁

P₂

Q₁ Q₂

D

Quantity demanded per period
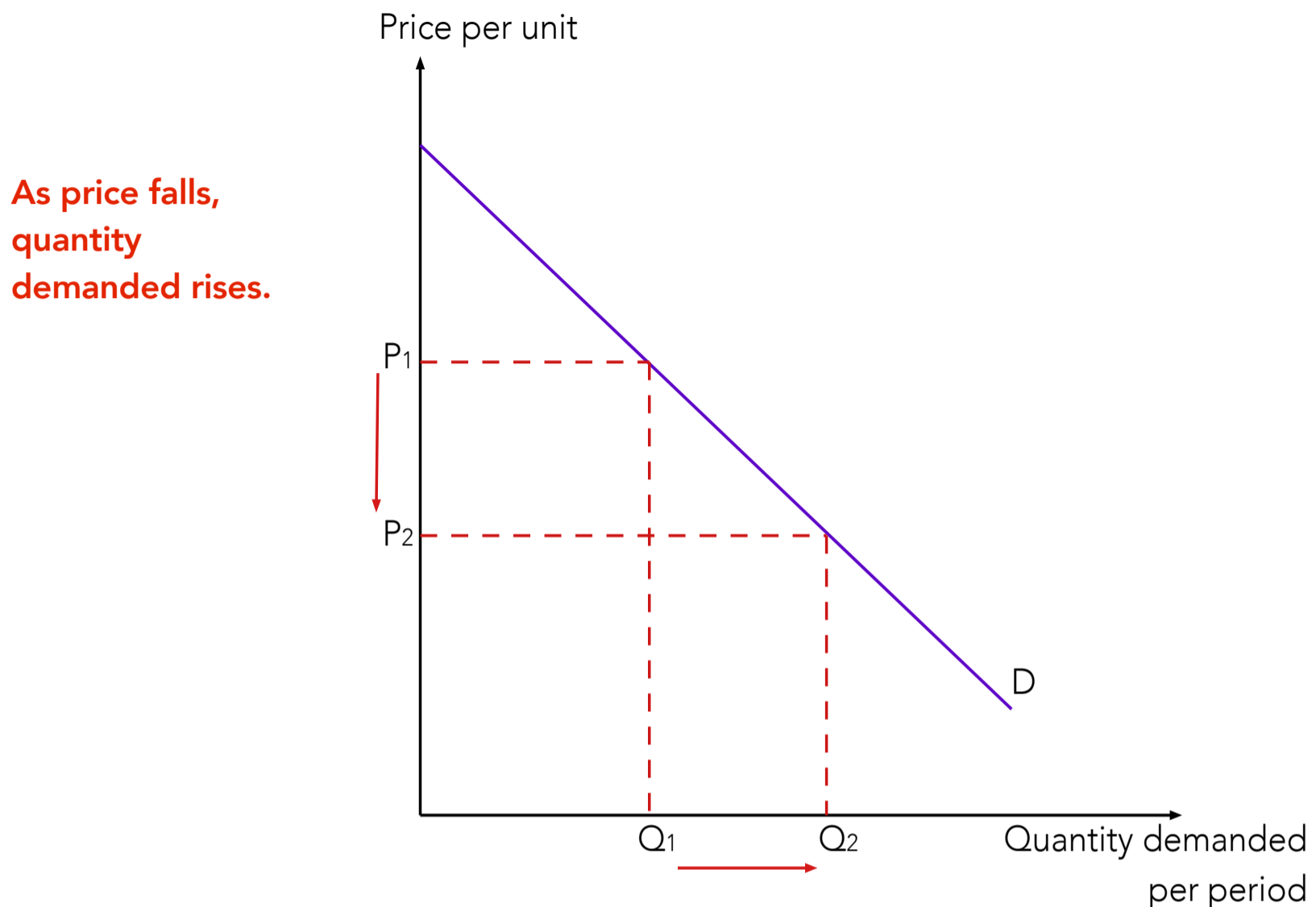
The inverse relationship between price and quantity demanded is referred to as **the law of demand**. The law of demand states that if the price of a good rises, then quantity demanded per period will fall, ceteris paribus.

Why is demand curve downward sloping?

1. **Income Effect**: When price of a good falls, people will find that their ability to buy goes up. That is, the purchasing power of their income or real income has gone up. This leads them to buy more of the good. This is called the income effect of a price change.

2.   **Substitution Effect**: When the price of a good falls then all other goods automatically become relatively expensive so consumers will tend to substitute other goods for the cheaper good. This is called substitution effect of a price change.

Determinants of Demand

1. **Price:** As the price of a good or service changes, consumers tend to move along the market demand curve. An extension in demand (increase in quantity demanded) occurs when price falls. A contraction in demand (decrease in quantity demanded) occurs when price rises. If the market demand for a good or service changes for any reason other than a change in price it will cause the market demand curve to shift.

2. **Non-Price factors:** Any change in non-price factors results in a shift of the demand curve. A rise in demand will shift the market demand curve outwards to the right and shows that consumers now demand more than they did before at every possible price. A fall in demand will shift the market demand curve inwards to the left and shows that consumers now demand less than they did before at every possible price.

   2.1. **Income:** A change in income can cause a shift in the demand curve.

      2.1.1. **Normal Goods:** For a normal good, an increase in consumer incomes will, ceteris

Movement along the demand curve occurs due to a price factor while a shift of the demand curve occurs due to non-price factors.

A rise in income leads to a rise in the demand for normal goods. A rise in income leads to a fall in the demand for inferior goods.

paribus, lead to an increase in the quantity demanded at any given price. Foreign holidays are an example of a normal good because, as people's incomes rise, they will tend to demand more foreign holidays at any given price. In figure 4.2, for the normal goods diagram, D_0 represents the initial demand curve for foreign holidays. An increase in consumers' incomes causes demand to be higher at any given price, and the demand curve shifts to the right, to D_1.

FIGURE 3.2 **Normal and Inferior Goods**

Normal Good

Inferior Good

2.1.2. Inferior Goods: For some goods, typically lower-quality goods, an increase in income will lead to a decrease in demand and a shift of the demand curve to the left. This is the case of 'inferior' goods. For example, think about bus journeys. As incomes rise in a society, more people can afford to have a car, or to use taxis. This means that, as incomes rise, the demand for bus journeys may tend to fall. This time an increase in consumers' incomes causes the demand curve to shift to the left, from its initial position at D_0, to D_1 where less is demanded at any given price.
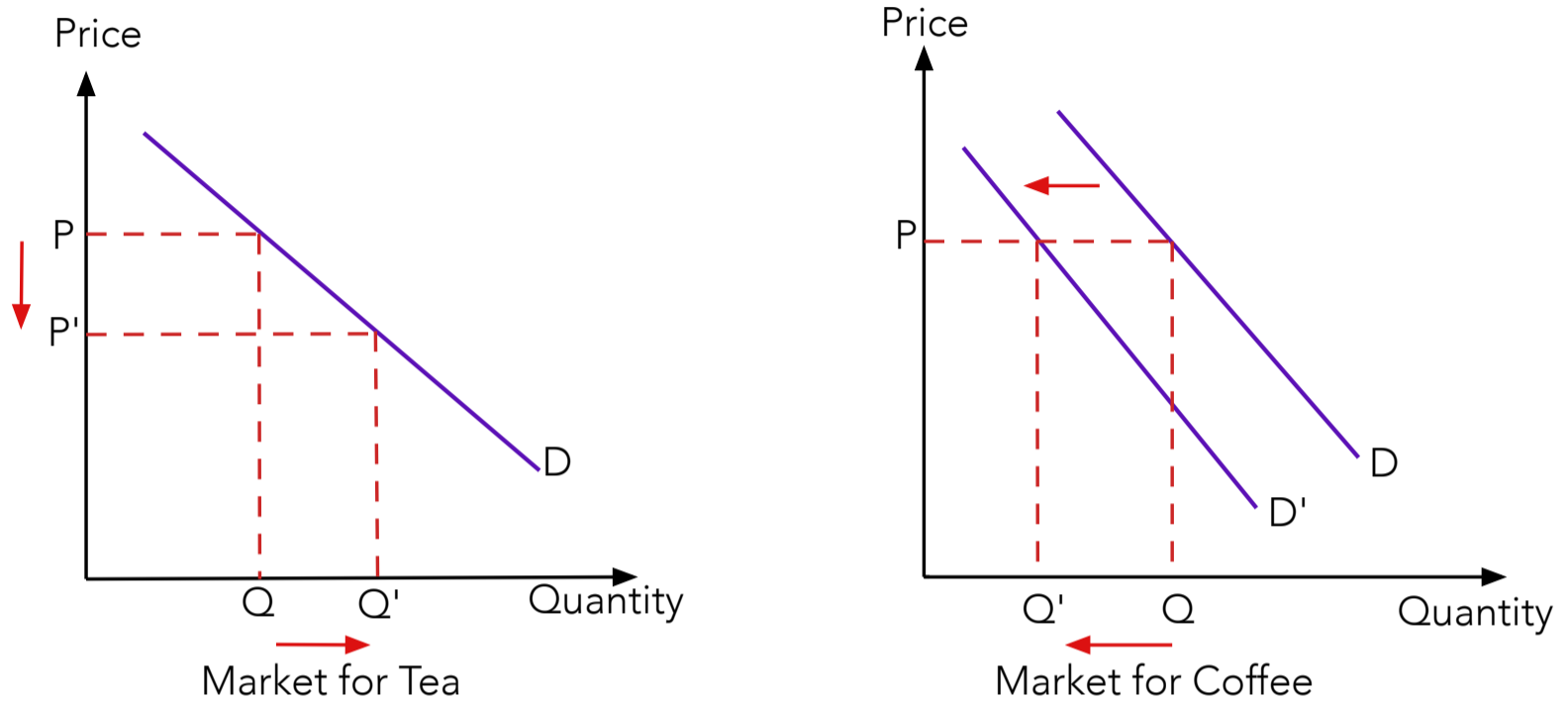
2.2. Price of related goods

2.2.1. Substitutes – A substitute is a good, which can be replaced by another good. If two goods are substitutes to each other, they are said to be in competitive demand. For example, tea and coffee are substitutes to each other. Economic theory predicts that a fall in the price of one good will lead to a decrease in demand for its substitute. For example, when the price of tea falls, the quantity demanded of tea rises as people substitute tea for coffee, resulting in the demand for coffee to fall. Not all consumers will switch, of course – some may be deeply

Substitutes: Two goods are said to be substitutes if consumers regard them as alternatives, so that the demand for one good is likely to rise if the price of the other good rises.

committed to coffee – but some of them are certainly likely to change over.

FIGURE 3.3 **Substitutes**

Market for Tea

Market for Coffee

2.2.2. Complements – are in joint demand, i.e., when demanding one good, a consumer will also be likely to demand another good. For example, tea and milk. Economic theory suggests that a fall in the price of one good results in an increase in quantity demanded of that good and therefore a rise in the demand for its complement. A fall in the price of tea results in more tea to be consumed and a rise

Complements: Two goods are said to be complements if people tend to consume them jointly, so that an increase in the price of one good causes the demand for the other good to fall.

in the demand for its complement, milk as well.

FIGURE 3.4 **Complements**

Market for Tea

Market for Milk
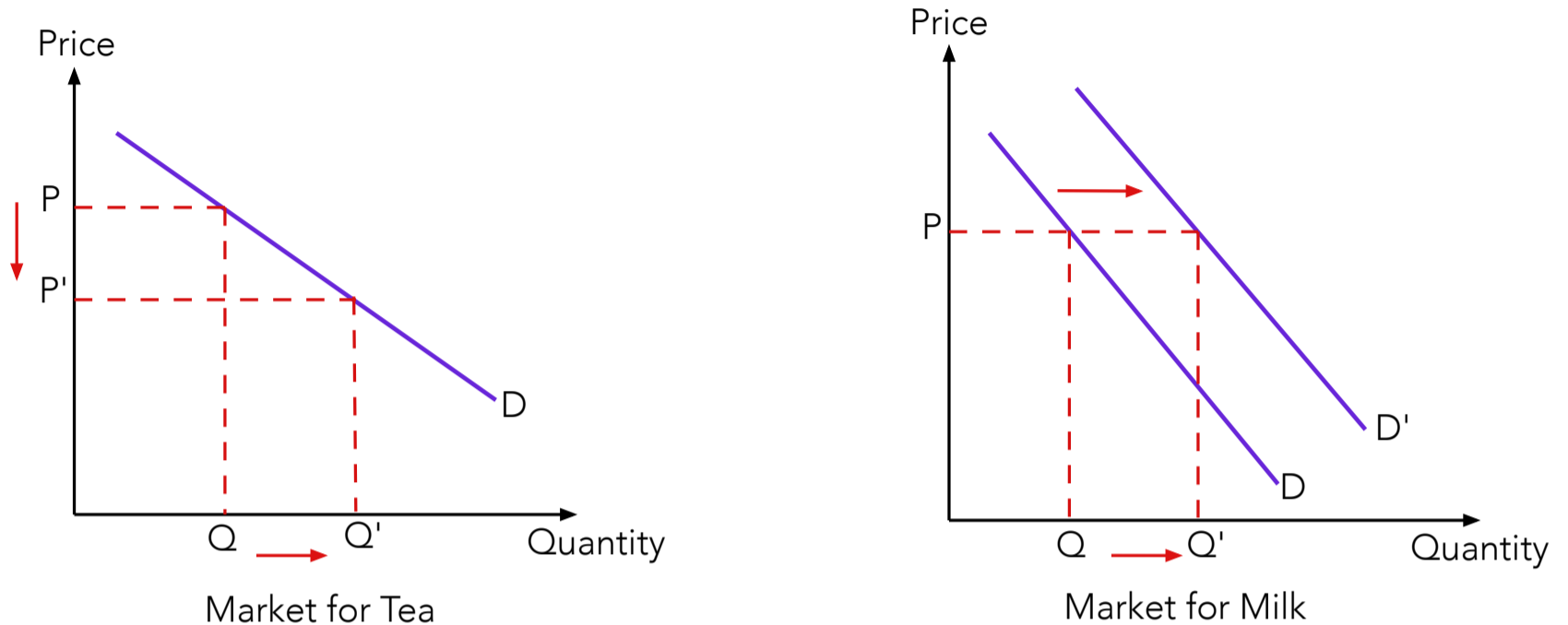
2.3. Change in fashion/taste

The more desirable people find a good, the more they will demand. Tastes are affected by advertising, fashion or by observing other consumers.
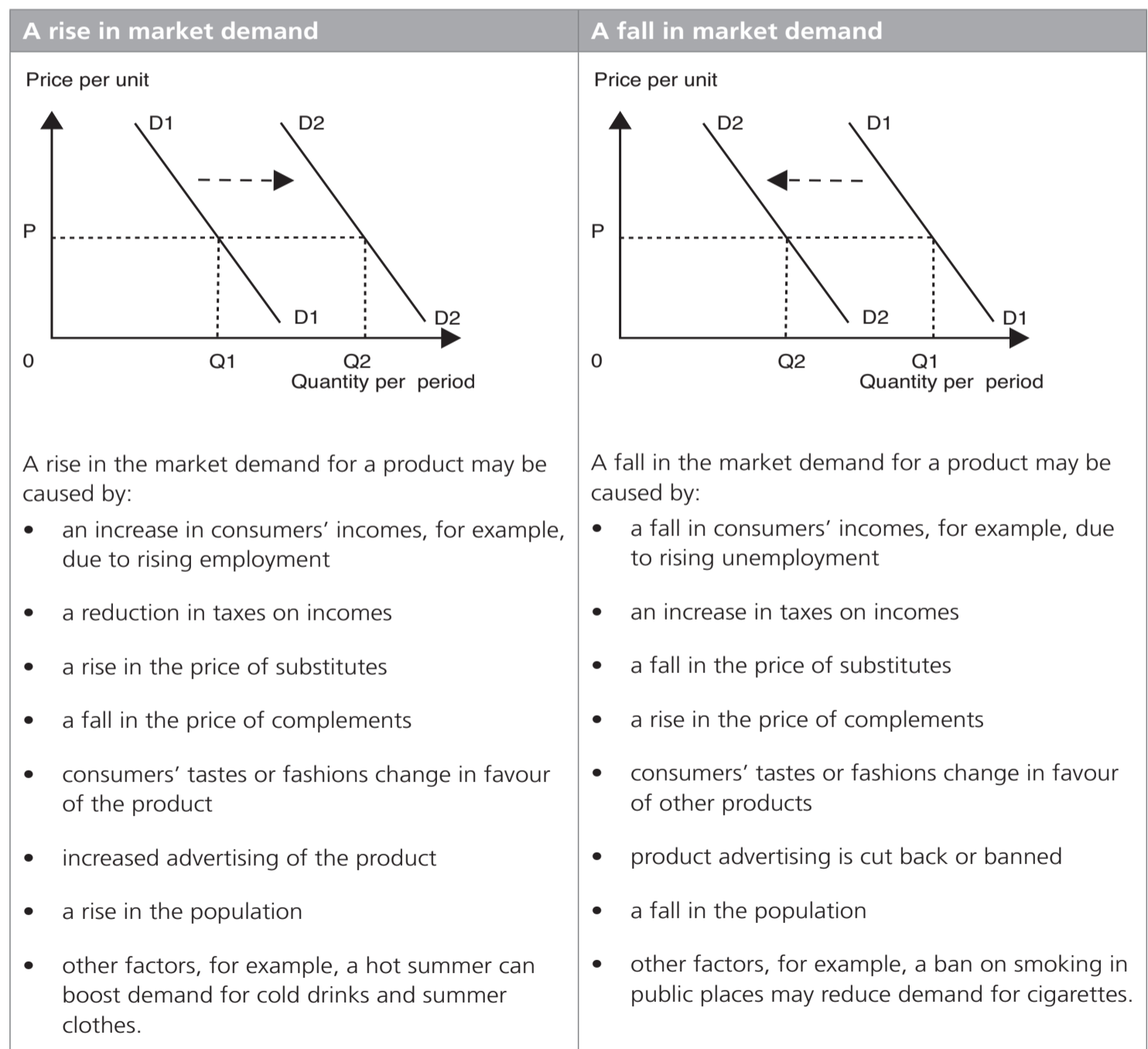
2.4. Distribution of Income

If national income were distributed from the poor to the rich, the demand for luxury goods would rise. At the same time, as the poor get poorer, they might have to turn to buying inferior goods whose demand would also rise.

2.5. Expectation of future price changes

If people think that prices are going to fall in the future, they are likely to buy more later, when the price falls. This has been common with many hi-tech products; initially a newly launched product may sell at a high price, but as production levels rise, costs may fall, and prices fall as well. People may therefore delay purchase in the expectation of future price reductions.
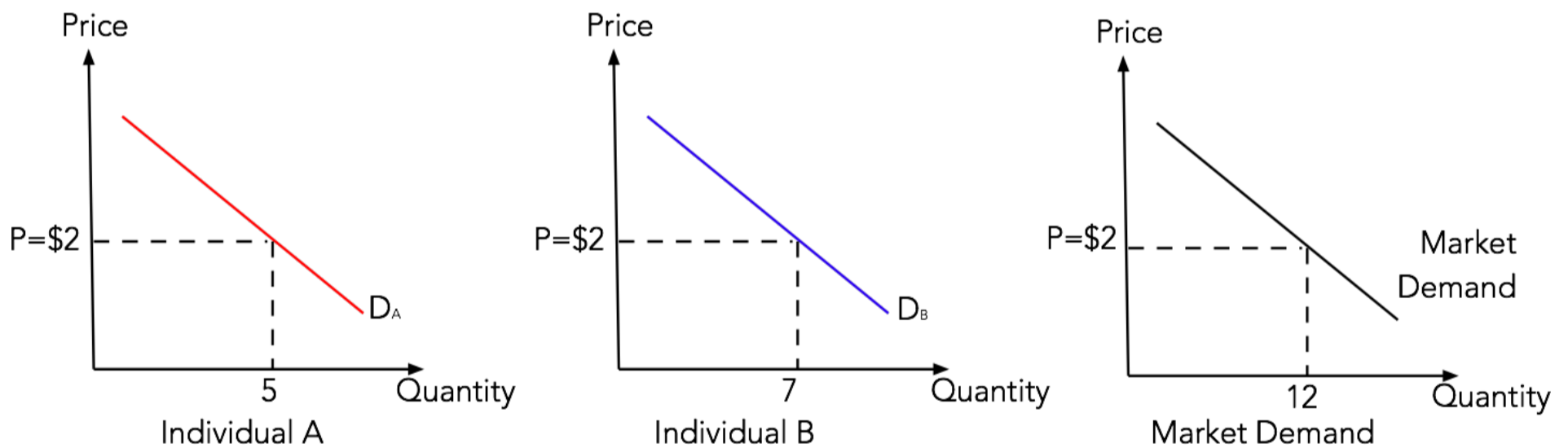
FIGURE 3.5 **Factors affecting demand**

A rise in market demand	A fall in market demand
Price per unit	Price per unit

A rise in the market demand for a product may be caused by:

- an increase in consumers' incomes, for example, due to rising employment

- a reduction in taxes on incomes

- a rise in the price of substitutes

- a fall in the price of complements

- consumers' tastes or fashions change in favour of the product

- increased advertising of the product

- a rise in the population

- other factors, for example, a hot summer can boost demand for cold drinks and summer clothes.

A fall in the market demand for a product may be caused by:

- a fall in consumers' incomes, for example, due to rising unemployment

- an increase in taxes on incomes

- a fall in the price of substitutes

- a rise in the price of complements

- consumers' tastes or fashions change in favour of other products

- product advertising is cut back or banned

- a fall in the population

- other factors, for example, a ban on smoking in public places may reduce demand for cigarettes.

Market Demand Curve

The market demand curve is the horizontal summation of all the individual demand curves. This means that at each price we add the quantities demanded by each individual. So if a market consists of Individual A and B, and at a price of $2.00 A is willing and able to buy five apples per week while B is willing and able to buy seven apples per week, then at the price of $2.00 the market demand is twelve apples per week.
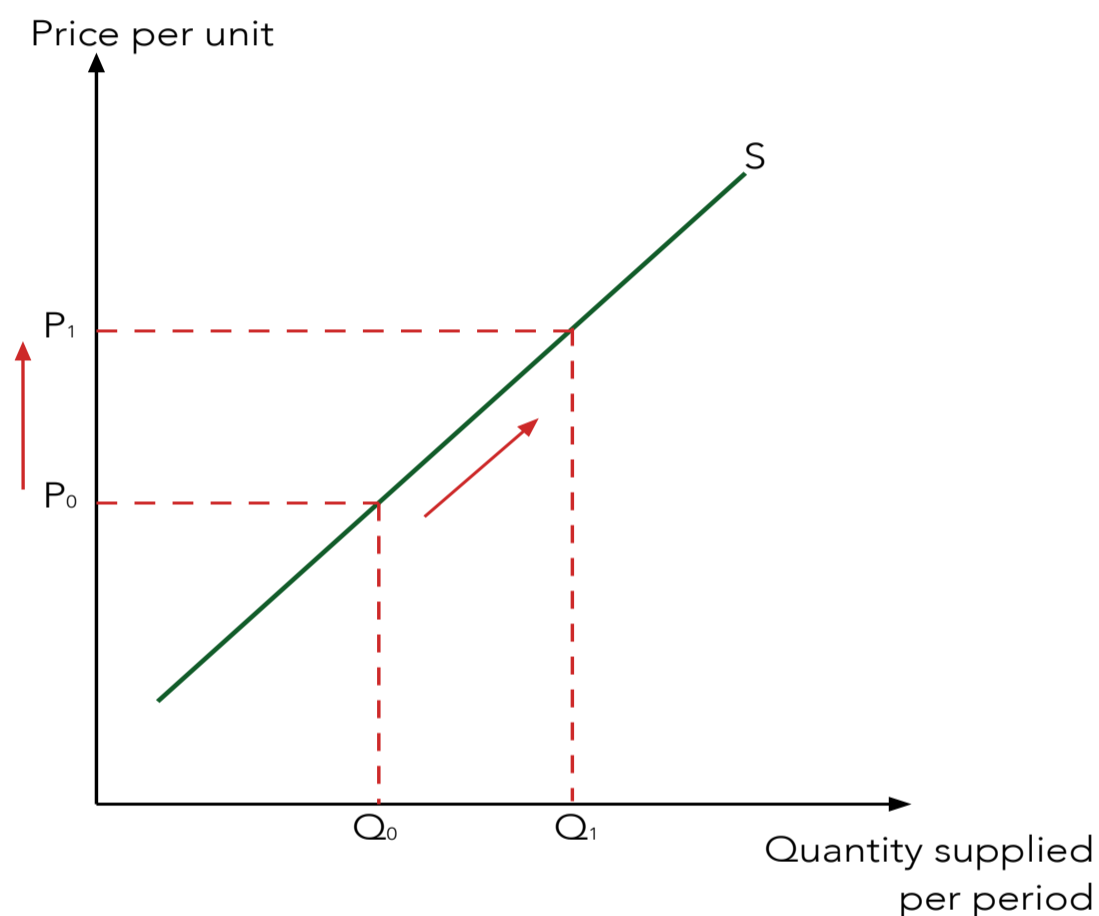
FIGURE 3.6 **Market Demand Curve**

THEORY OF SUPPLY

The supply of a good summarizes the behavior of producers (or firms) in a market. It is the relationship between various possible prices and the corresponding quantities that firms are willing to offer per period, ceteris paribus.

FIGURE 3.7 **Upward sloping supply curve**

The relationship between price per unit and quantity supplied per period is direct (positive), meaning that at higher prices producers will be willing to offer more per period.

Why is the supply curve upward sloping?

Supply curve is upward sloping due to two reasons:

1. **Profit motive**: A higher price results in higher profit encouraging firms to expand their output.

2. **Cost Motive:** In order to expand output in the short run, a firm may find its cost to rise, causing it to increase its price in order to maintain profitability.

This positive relationship between price per unit and quantity supplied per period of time is often referred to as the **law of supply**. The law of supply states that if the price of a product increases then quantity supplied per period is expected to increase ceteris paribus.

Determinants of Supply

1. Price Factors

Any change in price will result in movement along the supply curve. An extension in supply (increase in quantity supplied) occurs when price rises. A contraction in supply (decrease in quantity supplied) occurs when price falls.

2. Non-Price Factors

If the market supply for a good or service changes for any reason other than a change in price it will cause the market supply curve to shift. A rise in supply will shift the market supply curve outwards to the right and shows that firms will now supply more than they did before at every possible price.

A change in price results in a movement along the supply curve while non-price factors result in a shift of the supply curve.

A fall in supply will shift the market supply curve inwards to the left and shows that firms will now supply less than they did before at every possible price.

2.1. Cost of Production: If firms are aiming to maximize profits, an important influence on their supply decision will be the costs of production that they face.

FIGURE 3.8 **A rise in cost**

In figure 3.8 a rise in cost will shift the supply curve to the left while a fall in cost results in the supply curve to shift to the right.
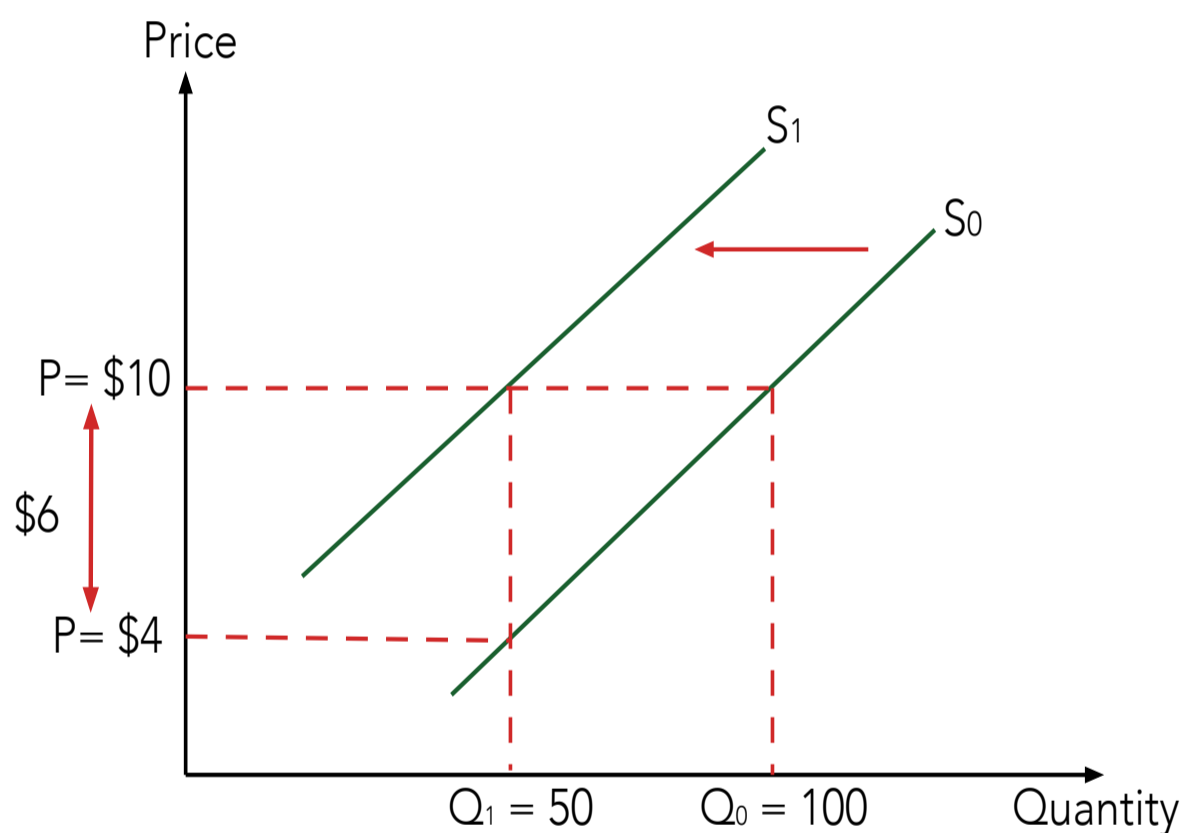
If the cost of those inputs increases, firms will generally be expected to supply less output at any given price. The effect of this is shown in Figure 4.8, where an increase in production costs induces firms to supply less output at each price. The curve shifts from its initial position at S_0 to a new position at S_1. For example, suppose the original price was $10

per unit; before the increase in costs, firms would have been prepared to supply 100 units of the product to the market. An increase in costs of $6 per unit that shifted the supply curve from S_0 to S_1 would mean that, at the same price, firms would now supply only 50 units of the good. Notice that the vertical distance between S_0 and S_1 is the amount of the change in cost per unit.

2.2. **Technology:** Changes to technology affect supply. Improved technology allows firms to offer more units of the good at the same price, increasing supply and shifting the supply curve to the right. Hence, improved technology decreases the cost of producing each extra unit of the good.

2.3. **Changes in productivity:** Productivity is defined as output per unit of input, so labour productivity would be output per worker. If, for example, those in the labour force become more experienced, better-trained and/or healthier then labour productivity will increase. If labour productivity increases then, ceteris paribus, firms will be willing to offer more units at each price, increasing supply and shifting the supply curve to the right. An increase in labour productivity implies decreased production costs.

2.4. Price of related goods

2.4.1. **Joint Supply:** A change in the price of a good that is jointly supplied will have an effect on supply. This is best understood through an example. If a firm produces mutton, it is jointly producing wool. If the price of mutton increases in the market this firm will have a greater incentive to increase the supply of mutton, but at the same time the supply of wool and its supply curve will shift to the right.

FIGURE 3.9 **Joint Supply**

Market for Mutton

Market for Wool
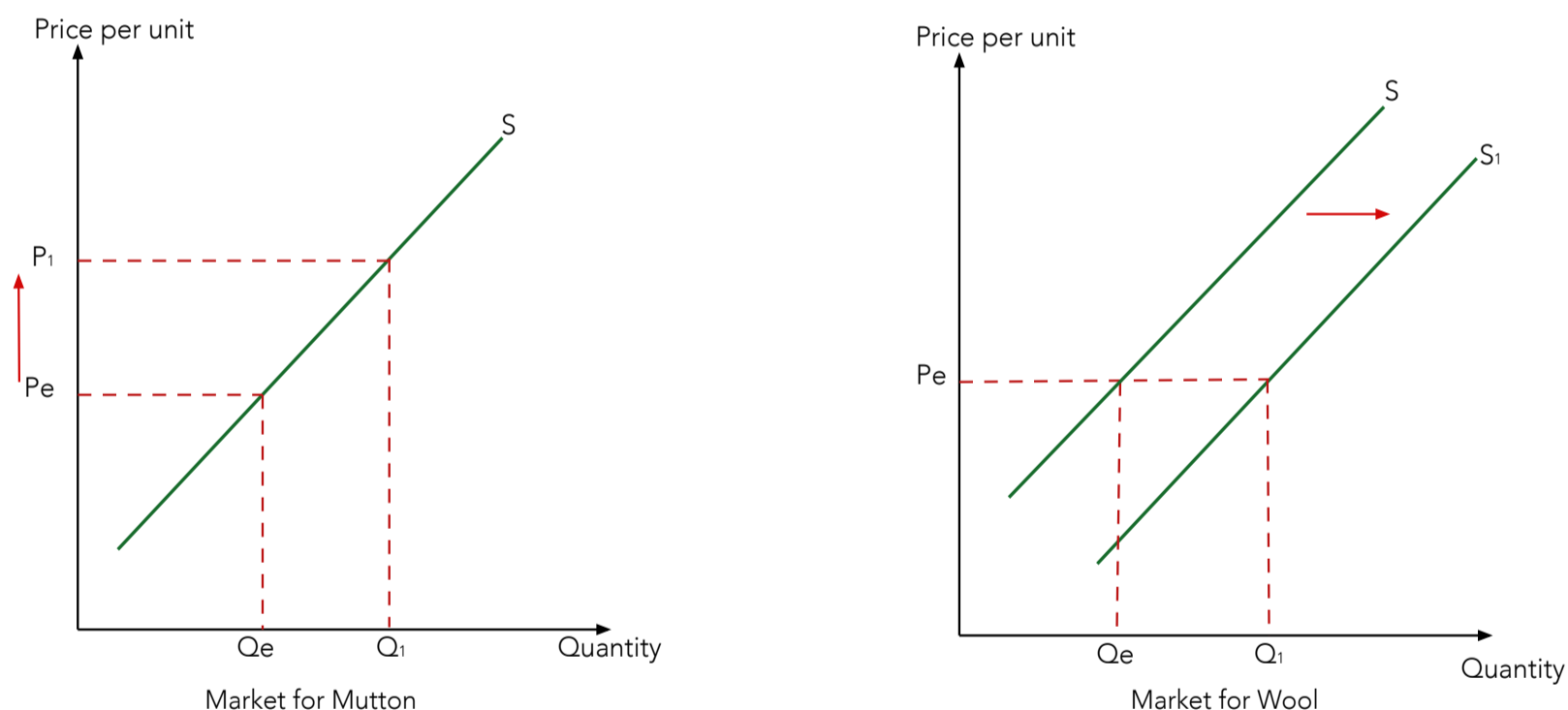
2.4.2. **Competitive Supply:** A change in the price of a good in competitive supply will have an effect. This is also best understood through an example. Assume a farmer with a fixed amount

of land uses it to produce lemons and oranges. If the price of oranges increases then this farmer will have the incentive to increase the quantity supplied of oranges so the supply of lemons will decrease, shifting that supply curve to the left.

2.5. Government Policy:

Changes in government policy affect supply. Indirect taxes and subsidies affect the cost of producing an extra unit of a

FIGURE 3.10 **Competitive Supply**

Market for Oranges

Market for Lemons
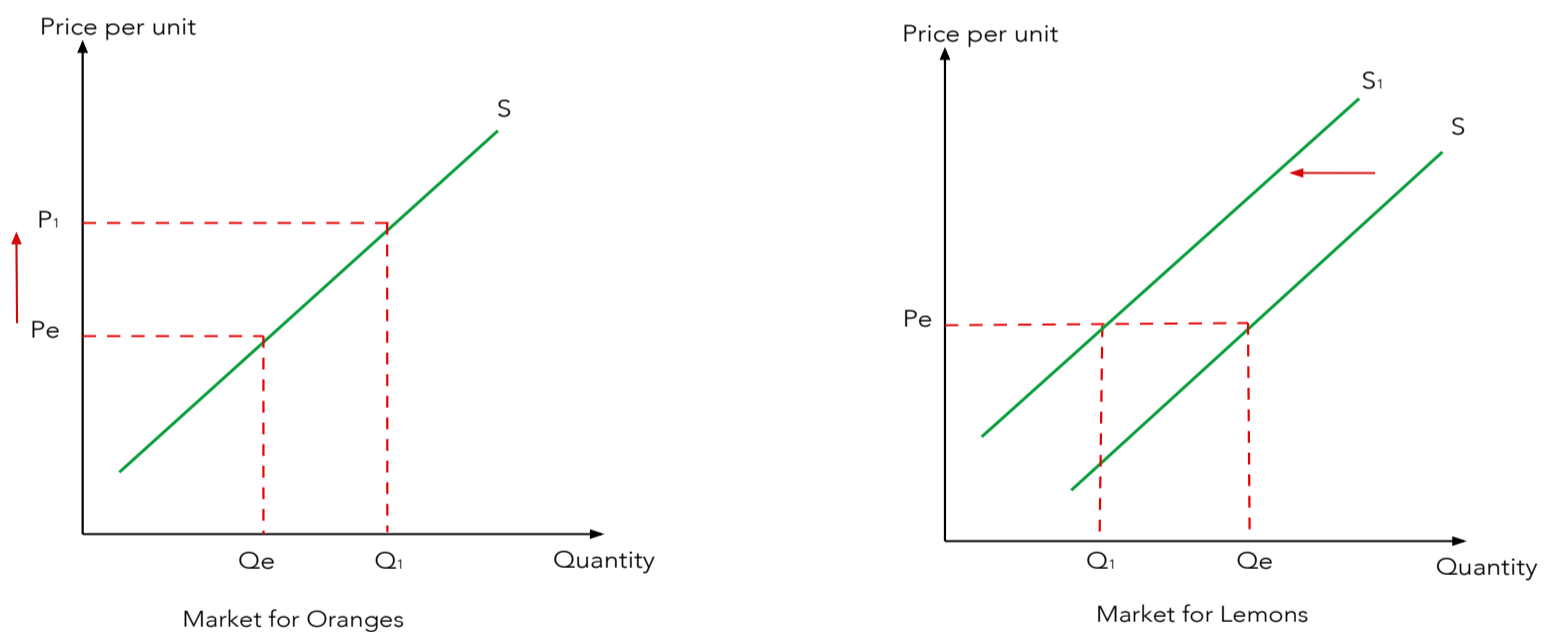
good. An indirect tax is a payment to the government by firms per unit of output produced, whereas a subsidy is a payment to firms by the government per unit of output produced. An indirect tax will increase production costs and

lead to a decrease in supply and a shift of the supply curve to the left, whereas a subsidy will decrease production costs and lead to an increase in supply and a shift of the supply curve to the right.

2.6. Number of Firms:

Changes in the size of the market (the number of firms) affect supply. As more firms join a market, for example, supply will tend to increase, shifting the supply curve to the right.
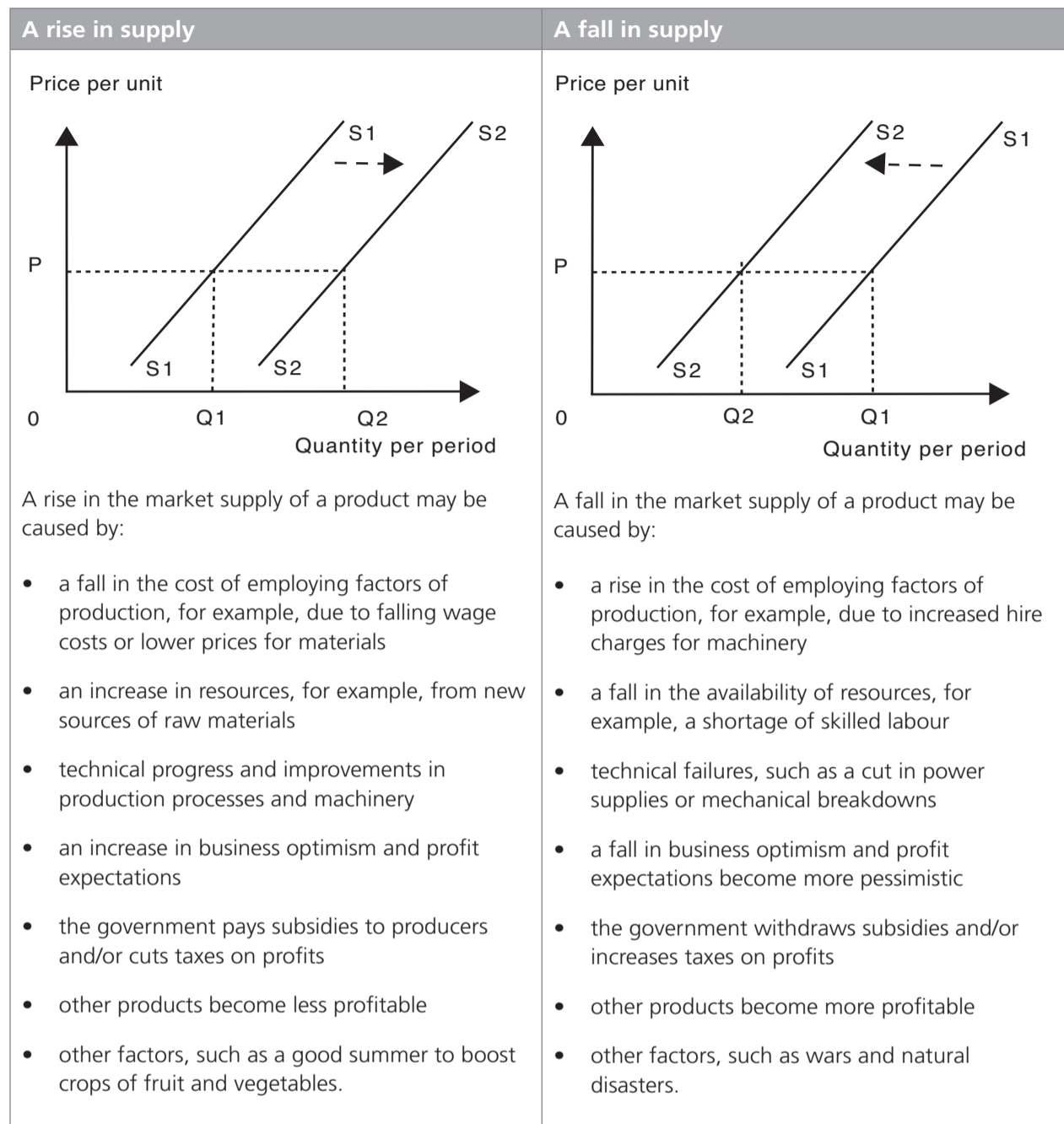
2.7. Exogenous Factors

Changes in other factors can be significant. For obvious reasons, weather conditions affect the supply of farm products. For example,floods in Australia, a heat wave in Russia or drought in Brazil will adversely affect the world supply of wheat, decreasing it and shifting its supply curve to the left. A major accident, a terrorist act or a war may affect the supply of oil.

2.8. Expected prices

Because production takes time, firms often take decisions about how much to supply on the basis of expected future prices. Indeed, if their product is one that can be stored, there may be times when a firm will decide to allow stocks of a product to build up in anticipation of a higher price in

the future, perhaps by holding back some of its production from current sales.

FIGURE 3.11 Factors affecting supply

A rise in supply	A fall in supply

Price per unit (left graph, x-axis: Quantity per period, curves S1 and S2 shifting right, with P, Q1, Q2)

Price per unit (right graph, x-axis: Quantity per period, curves S2 and S1 shifting left, with P, Q2, Q1)

A rise in the market supply of a product may be caused by:

- a fall in the cost of employing factors of production, for example, due to falling wage costs or lower prices for materials

- an increase in resources, for example, from new sources of raw materials

- technical progress and improvements in production processes and machinery

- an increase in business optimism and profit expectations

- the government pays subsidies to producers and/or cuts taxes on profits

- other products become less profitable

- other factors, such as a good summer to boost crops of fruit and vegetables.

A fall in the market supply of a product may be caused by:

- a rise in the cost of employing factors of production, for example, due to increased hire charges for machinery

- a fall in the availability of resources, for example, a shortage of skilled labour

- technical failures, such as a cut in power supplies or mechanical breakdowns

- a fall in business optimism and profit expectations become more pessimistic

- the government withdraws subsidies and/or increases taxes on profits

- other products become more profitable

- other factors, such as wars and natural disasters.

Market Supply

Horizontal summation of individual firms' supply curve results in market supply

A market supply curve is calculated by horizontally summing up the individual firms' supply curve in the market. This means that at each price we add the quantities supplied by each individual firm. So if a market consists of Firm A and Firm B, and at a price of $2.00 Firm A is willing and able to supply five bats per week while Firm B is willing and able to supply seven bats per week, then at the price of $2.00 the market supply is 12 bats per week.

FIGURE 3.12 **Market Supply**
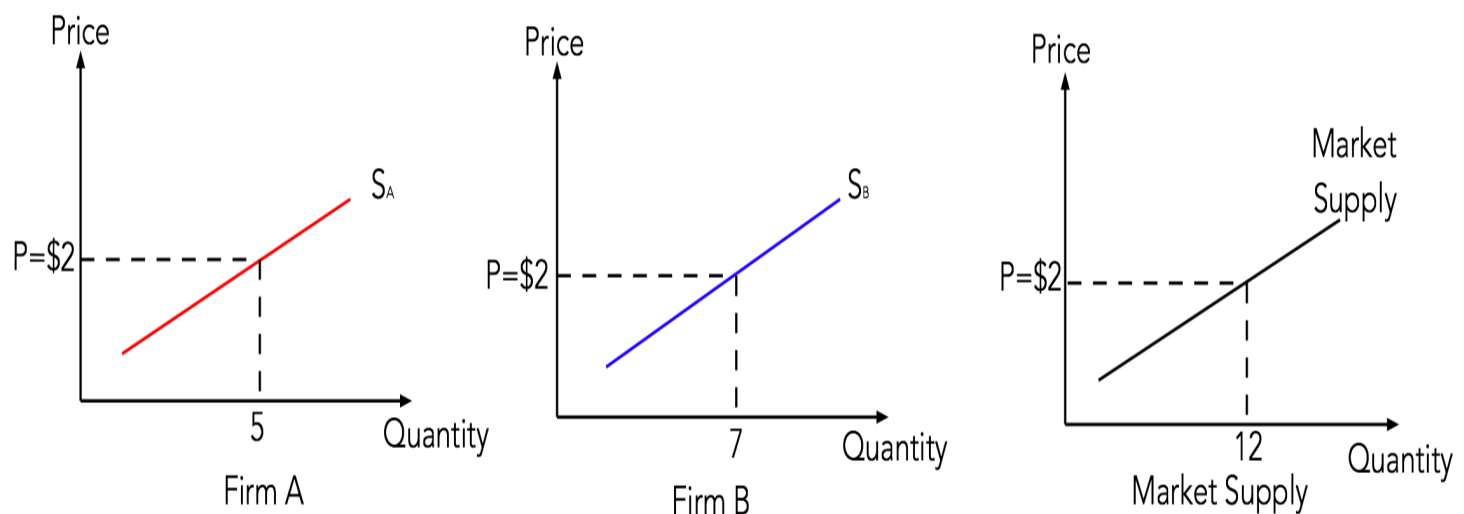
MARKET EQUILIBRIUM

The price at which a good will be sold in a competitive market will be determined by the interaction between consumers and producers; in other words, by the interaction of demand and supply.

If at some price there is excess supply (if quantity supplied per period exceeds quantity demanded) then the price will tend to drop. If at some price there is excess demand (if quantity demanded per period exceeds quantity supplied) then the price will tend to rise as shown in figure 4.13.

At equilibrium price, there is neither a shortage nor a surplus.

FIGURE 3.13 **Equilibrium in the market**
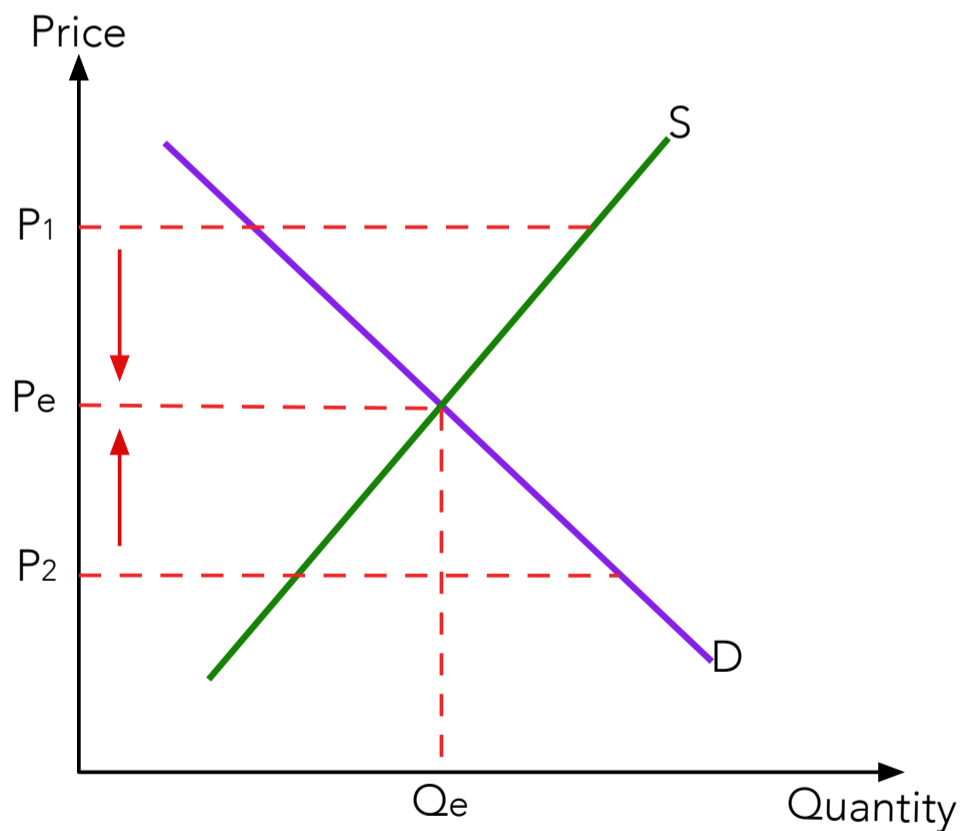
It follows that there will be no tendency for the price to change if there is neither excess supply nor excess demand in the market. This requires that quantity demanded per period at that price is equal to quantity supplied. This price is the equilibrium price and the corresponding quantity is the equilibrium quantity.

A price is an equilibrium price if quantity demanded is equal to quantity supplied, so there is neither excess demand nor excess supply.

Changes in Equilibrium

Any change in demand or supply can lead to a change in equilibrium. Two examples are given below:

***Demand increase*s**: These are the effects if demand increases.

1. The demand curve shifts to the right.

2. At the original equilibrium price there will be excess demand.

3. As excess demand exists there will be a tendency for the price to rise.

4. Assuming typical demand and supply curves, a higher equilibrium price and a greater quantity is expected.

In the figure 4.14 , equilibrium is initially at price P_e and quantity Q_e. If demand increases from D_1 to D_2 then, at the original equilibrium price P_e, there will be excess demand

equal to FH as quantity demanded (Q') exceeds quantity supplied (Qe). Excess demand in the market creates pressure on the price to increase until a new equilibrium is established at P_1 and Q_1.

FIGURE 3.14 **Rise in demand**
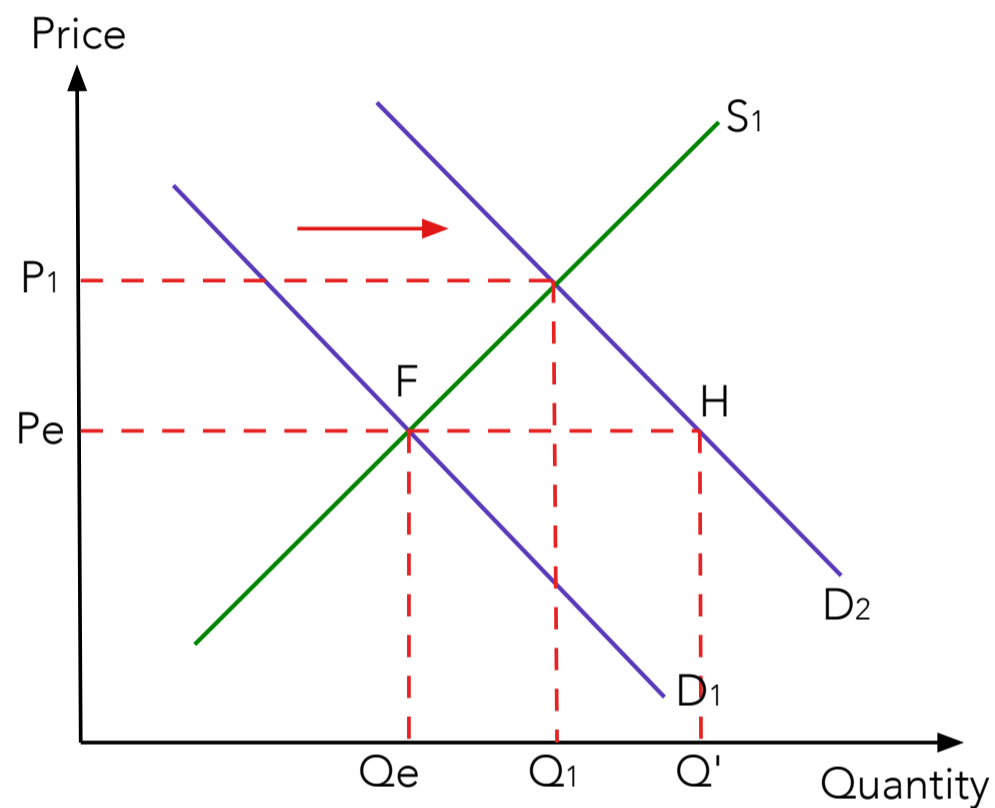

Supply increases: These are the effects if supply increases.

1.   The supply curve shifts to the right.

2.   At the original equilibrium price there will be excess supply.

3.   As excess supply exists there will be a tendency for the price to decrease.

4.   Assuming typical demand and supply curves, a lower equilibrium price and a higher quantity is expected.

In the figure 4.15, equilibrium is initially at price Pe and quantity Qe. If supply increases from S_1 to S_2 then, at the original equilibrium price Pe, there will be excess supply equal to FG as quantity supplied (Q') exceeds quantity demanded (Qe). Excess supply in the market creates pressure on the price to decrease until a new equilibrium is established at P_1 and Q_1.

FIGURE 3.15 **Rise in supply**
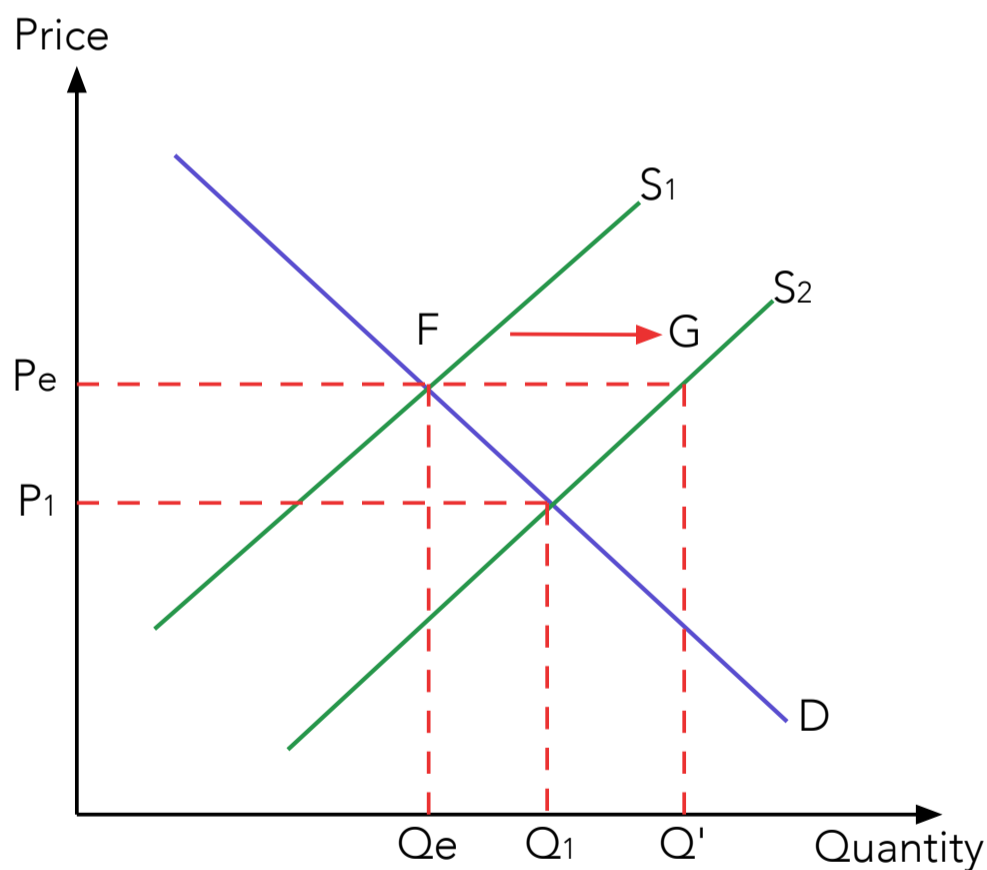
CONSUMER AND PRODUCER SURPLUS

Consumer Surplus

The demand curve shows how much a consumer would be willing to pay for a given quantity of goods. The downward sloping demand curve shows that there are many consumers willing to pay more than the market price. The difference between the amounts a consumer is willing to pay and the market price is called the consumer surplus. It is the area above the market price and below the demand curve.

Consumer surplus is the difference between the amount consumers are willing to pay and the amount they actually pay.

FIGURE 3.16 **Consumer Surplus**
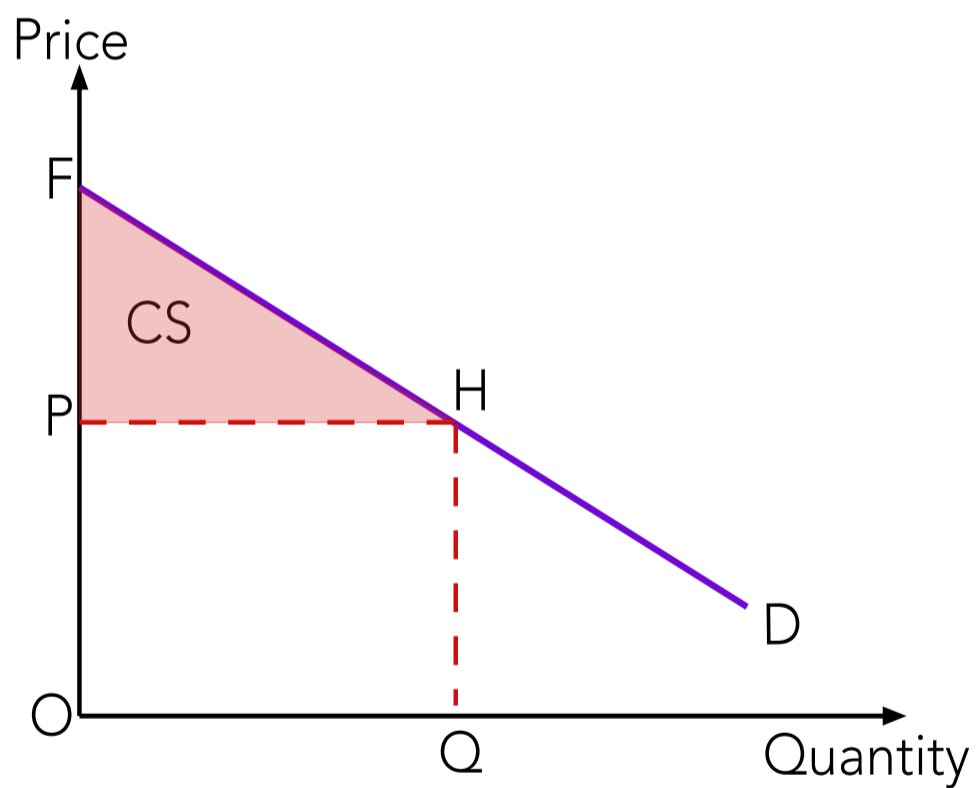
For each quantity in a demand diagram, the vertical distance to the curve illustrates how much that specific unit

is worth, at the most, to consumers. Unit Q in the figure above is worth P dollars (or distance QH) to consumers as they would be willing to pay P dollars at the most to buy it, not a cent more. The vertical distance to a demand curve measures the marginal benefit (MB) enjoyed from that unit. If it happens that the price in the market is P dollars then consumers will buy all units up until (at the limit) unit Q, as each of these units is worth more to them than the market price would require them to pay. They would not buy any units past unit Q.

It follows that Q units are worth area 0QHF to consumers as that is the amount they would have been willing to pay to enjoy all these units. Given a market price of P dollars, they will end up paying area 0QHP to enjoy Q units, or the price per unit times the quantity consumed. Consumer surplus is therefore area (PHF), the difference between area 0QHF and area (0QHP).

Consumer surplus is a function of market price. The lower the market price, the higher the consumer surplus and vice versa.

Producer Surplus

Parallel to the notion of consumer surplus is the concept of producer surplus. Think about the nature of the supply curve: it reveals how much output firms are prepared to supply at any given price in a competitive market. Figure 4.17 depicts a supply curve. Assume the price is at P, and

that all units are sold at that price. P represents the value to firms of the marginal unit sold. In other words, if the price had been set slightly below P, the last unit would not have been supplied, as firms would not have found this profitable.

FIGURE 3.17 **Producer Surplus**
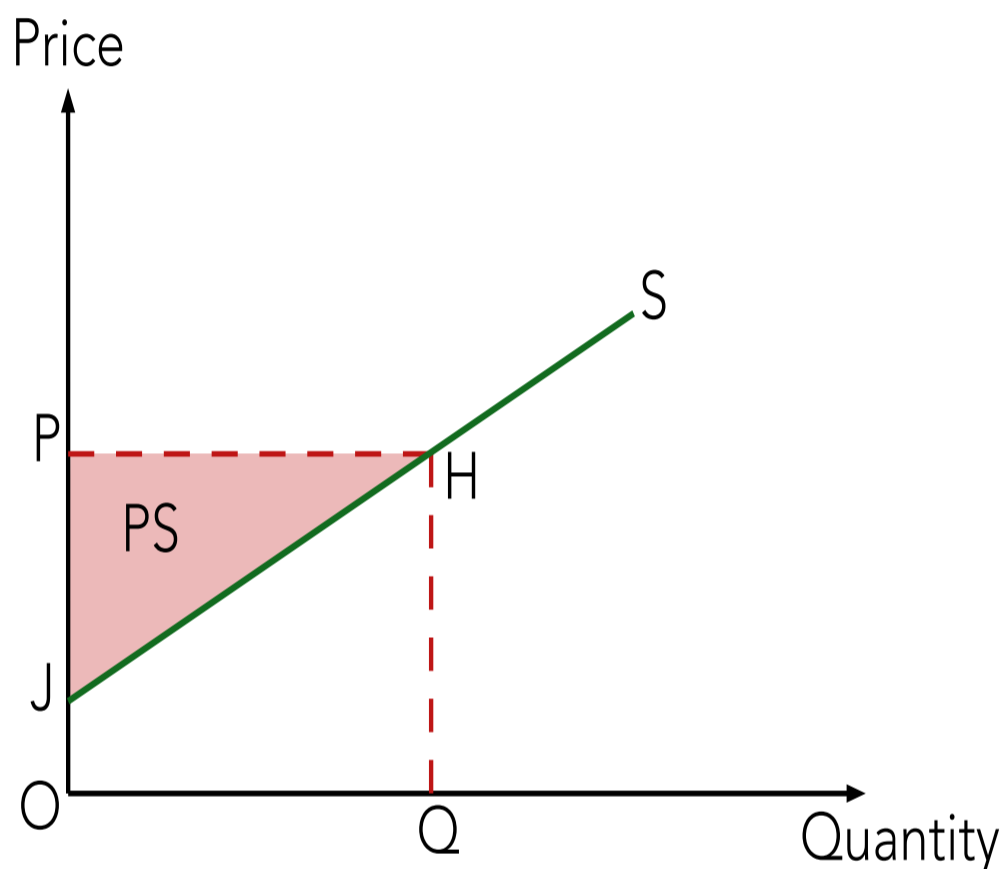
Producer surplus is the surplus earned by firms over and above the minimum that would have kept them in the market.

The supply curve shows that, in the range of prices between point J and P, firms would have been willing to supply positive amounts of this good or service. So at P, they would gain a surplus value on all units of the good supplied below Q. The total area is shown as are JPH : it is the area above the supply curve and below P, shown as the shaded triangle.

One way of defining this producer surplus is as the surplus earned by firms over and above the minimum that would have kept them in the market.

Social Welfare

Social or community surplus is defined as the sum of the consumer surplus and the producer surplus. It is a measure of welfare.

FIGURE 3.18 **Social Welfare**
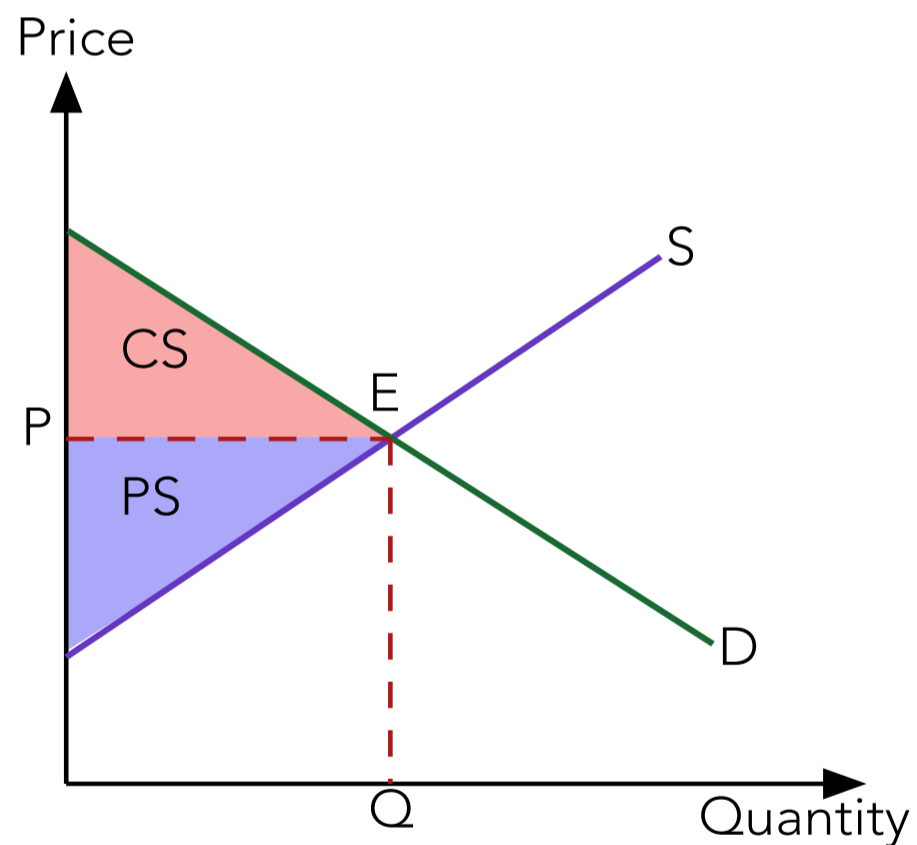
MARGINAL DECISION RULE

In economics we argue that rational choices involve weighing up marginal costs (MC) and marginal benefits (MB). These are the costs and benefits of doing a little bit more or a little bit less of a specific activity. If the marginal benefit exceeds the marginal cost, it is rational to do the activity (or to do more of it). If the marginal cost exceeds the marginal benefit, it is rational not to do it (or to do less of it).

Marginal Benefit: The extra benefit from consumption of a good. For example, utility or satisfaction from a bar of chocolate. The demand curve represents the MB of consuming a good.

Marginal Cost: The extra cost of producing a good measured in terms of the price of the good. It is represented by the supply curve.

Marginal Benefit: The extra benefit from consumption of a good

Marginal Cost: The extra cost of a good measured in terms of the price of the good.

CHAPTER 4

PRICE ELASTICITY

In general, elasticity is defined as the responsiveness of some economic variable when another economic variable changes.

Elasticity of Demand

There are three demand elasticities:

1. Price Elasticity of Demand (PED)

2. Income Elasticity of Demand (YED)

3. Cross Elasticity of Demand (XED)

Price Elasticity of Demand (PED)

PED measures the responsiveness of quantity demanded to a change in price.

$$E = \frac{\%\Delta Q}{\%\Delta P} = \frac{\Delta Q/Q}{\Delta P/P}$$

$$E = \frac{\Delta Q/Q}{\Delta P/P} = \frac{\Delta Q}{\Delta P} \cdot \frac{P}{Q}$$

$$E = \frac{1}{\text{slope}} \cdot \frac{P}{Q}$$

$$PED = \frac{\text{\% change in quantity demanded}}{\text{\% change in the price}}$$

Example:

Assume that the price of a good increases from \$12.00 to \$18.00 and, as a result, quantity demanded decreases from 200 units a week to 180 units a week. What is the PED for this good equal to?

Example :

Lets assume the equation is $Q_0 = 1000 - 200P$
Find the value of PED when P = 3

if
P = mQ + c (linear line equation)

$200P = 1000 - Q$
$200*3 = 1000 - Q$
$600 = 1000 - Q$
$Q = 400$

To calculate the elasticity:

$= (1 / slope) * (P_0 / Q_0)$
$= (1/(1/200)) * (3/400)$
PED = 1.5

P1 = $12	Q1 = 200,000
P2 = $18	Q2 = 180,000

$$\frac{\frac{(Q2 - Q1)}{Q1} \times 100}{\frac{(P2 - P1)}{P1} \times 100} = \frac{\frac{(180,000 - 200,000)}{200,000} \times 100}{\frac{(18 - 12)}{12} \times 100} = \frac{-10}{50} = -0.2$$

PED is always negative because of the inverse relationship of price and quantity demanded. Hence, in this example, PED = 0.2

Ranges of PED

1. If PED > 1 we say that demand is price elastic. It means that the percentage change in quantity demanded is larger than the percentage change in price, or that a small change in price leads to a proportionately greater change in quantity demanded.

2. If 0 < PED < 1 we say that demand is price inelastic. It means that the percentage change in quantity demanded is smaller than the percentage change in price, or that a small change in price leads to a proportionately smaller change in quantity demanded.

3. If PED = 1 we say that demand is unit elastic. It means that the percentage change in quantity demanded is equal to the percentage change in price, or that a small change in price leads to a proportionately equal change in quantity demanded.

4. If PED → ∞ we say that demand is infinitely elastic. It means that a small change in price leads to an infinitely large change in quantity demanded.

5. If PED = 0 we say that demand is perfectly inelastic. It means that a change in price leads to no change in quantity demanded.

Values are	Terms used are	Given a change in P
PED> 1	Price elastic demand	% Δ in Q is larger
0< PED < 1	Price inelastic demand	% Δ in Q is smaller
PED = 1	Unitary price elastic demand	% Δ in Q is equal
PED → ∞	Infinitely price elastic demand	% Δ in Q is infinite
PED = 0	Perfectly price inelastic demand	% Δ in Q is zero

It is a common mistake to assume that elasticity of demand is constant along a straight line or linear demand curve. Elasticity varies along the length of the demand curve, except for the following three cases

1. **Perfectly Inelastic Demand Curve (PED = 0)**: In this case the demand curve is vertical at a certain quantity. Any change in price will lead to no change in quantity demanded. The perfectly inelastic demand curve (PED = 0) is often used to describe the case of highly addictive goods such as drugs, or to describe the individual demand for pharmaceutical products for which no substitutes exist.

FIGURE 4.1 **Perfectly inelastic demand**
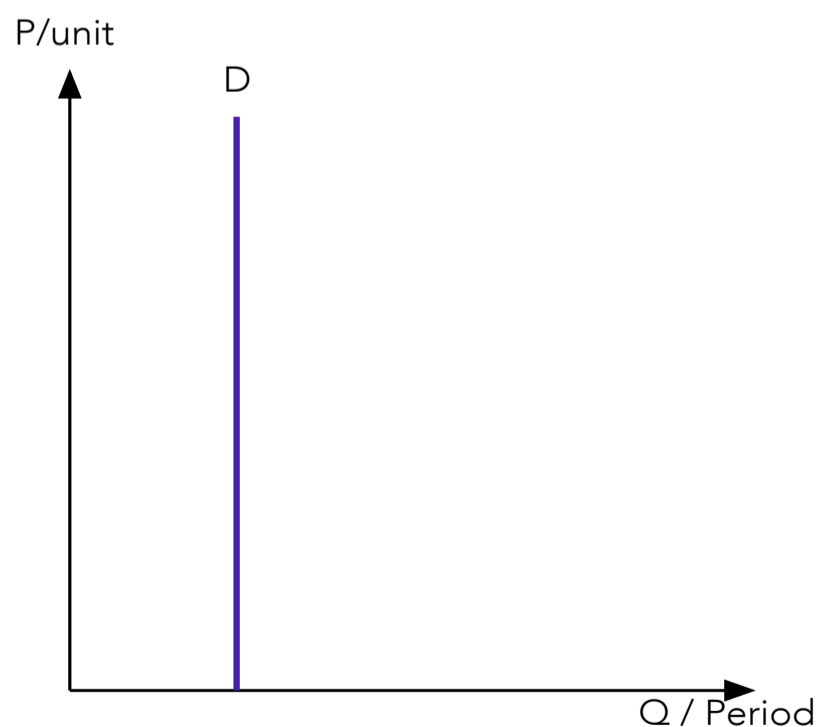
2. **Perfectly Elastic Demand Curve (PED → ∞):** In this case the demand curve is horizontal at a certain price. It is used to describe the demand that a firm faces with perfect substitutes available. Such a firm is so tiny in size compared with the market that it can sell any amount at the going market price. It is as if it is facing a perfectly elastic demand at the market price. Therefore, any amount can be demanded at market price or below it, while nothing will be demanded at a higher price.

FIGURE 4.2 **Perfectly elastic demand**
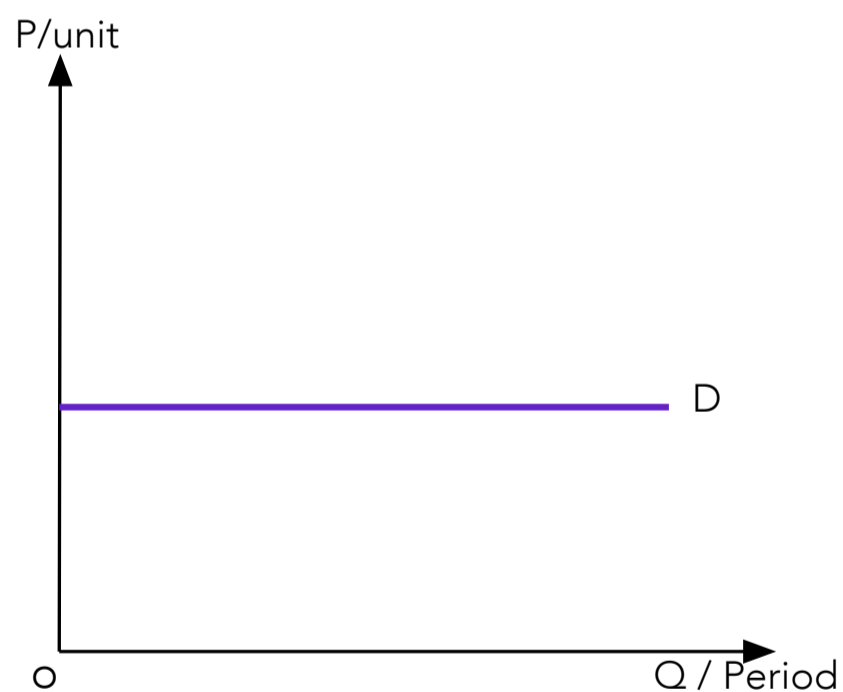
3. **Unitary Elastic Demand Curve (PED = 1)**: The demand curve in this case is asymptotic to both axes (that is, it never touches either axis). The shape of the demand curve is a rectangular hyperbola. All areas below this curve represent the revenues of firms and are equal in size. In other words, in a unitary elastic demand curve, a change in price does not change firms' total revenues.

FIGURE 4.3 **Unitary elastic demand**

Downward sloping demand curve
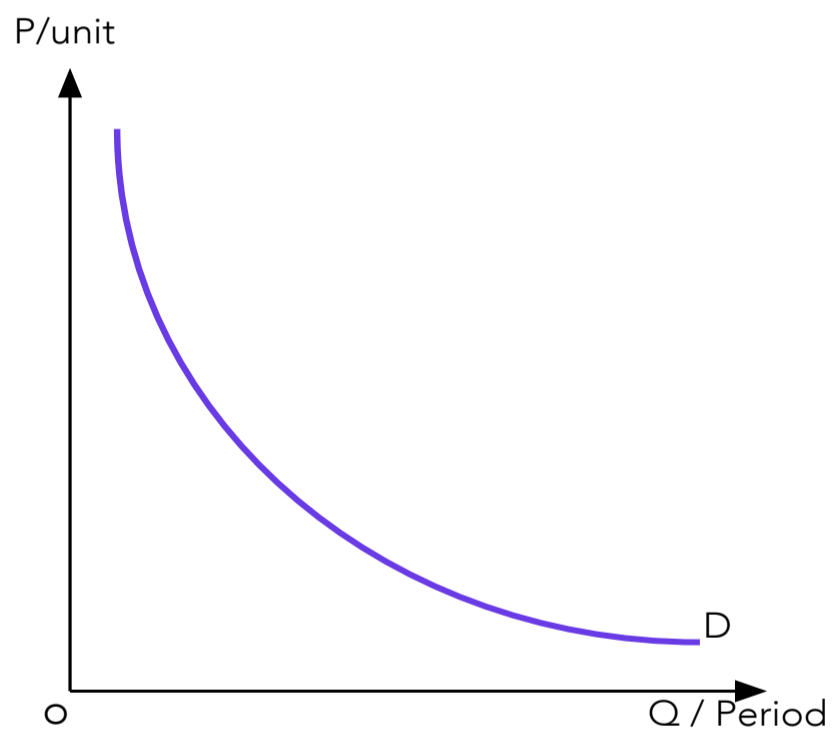
Price elasticity varies along the length of a straight downward sloping demand curve, moving from ∞ where it cuts the price axis, to unitary at halfway, to 0 where it cuts the quantity axis. It makes sense. Responsiveness to a price change (that is, PED) will be higher, the higher the initial price of the good, so the more expensive it is.

FIGURE 4.4 **Downward Sloping Demand Curve**
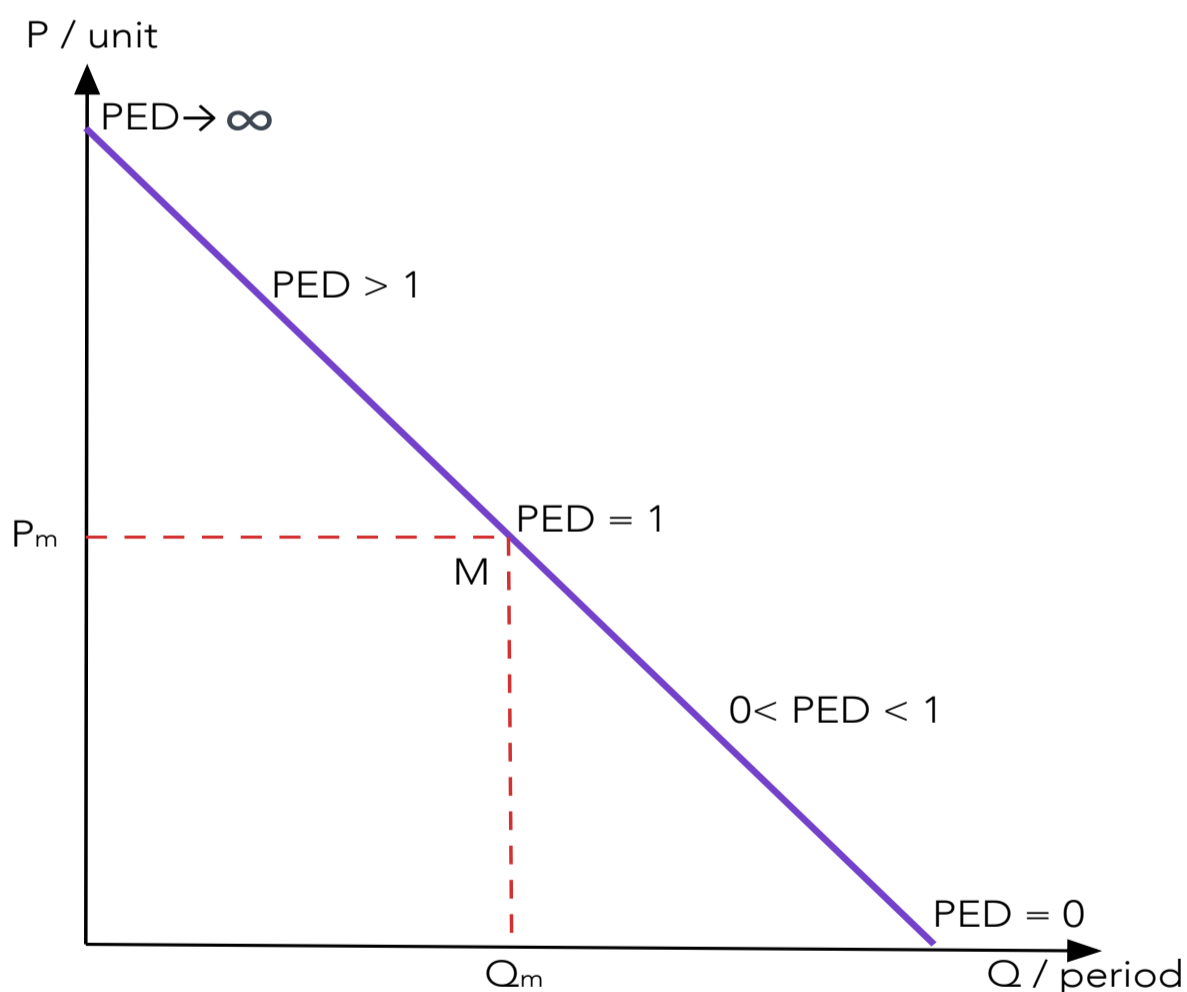
Determinants of PED

1. **The number and closeness of available substitutes** affects PED. The higher the number and closeness of substitutes, the higher would be the PED as the more easily people will switch to alternatives when the price of the good rises. Therefore the narrower the definition of a good, the lower would be the elasticity of demand, as the lower will be the closeness of substitutes. For example Coca Cola has a few substitutes in the cola market. But within a broader category such as the soft drink market, it will have more substitutes.

2. **The proportion of income spent on the good** is relevant. The higher the proportion of income spent on a good, the more consumers will be forced to lower consumption when its price rises (the bigger the income effect will be) and the more price elastic the demand will be. If we spend a small proportion of our income on a good (if it is 'insignificant'), then a change in price will not affect our spending behavior; demand will be price inelastic.

3. **The time period involved** affects PED. The longer the time period under consideration, the more elastic will be the demand as people take time to adjust their consumption pattern and find alternatives when the price of a good rises. Therefore demand tends to be price inelastic in the short run and elastic in the long run.

4. **Whether a good or service is a necessity** affects PED. When a good is a necessity, it is important for our survival, making its demand to be inelastic as people may not lower quantity that much when there is a rise in the price of the good.

5. **The nature of the good** matters. Some goods are habit-forming or addictive in nature such as cigarettes and alcohol and therefore the demand tends to be inelastic for such goods.

Revenue & Elasticity

What will happen to firms' revenues (and hence to consumer expenditures) if there is a change in price? The answer depends on PED. Total revenues (TR) a firm collects are the product of the price per unit times the quantity sold (TR = P x Q). It is not the same as profits, which are the difference between the TR collected and the total costs (TC) incurred.

Perfectly Inelastic Demand Curve (PED = 0)

For perfectly inelastic goods, revenue is a function of price. The higher the price, the higher will be the revenue as quantity demanded does not change.

FIGURE 4.5 **Perfectly Inelastic Demand**

TR_{before} = Area 2
TR_{after} = Area 2 + Area 1

Perfectly inelastic demand curve
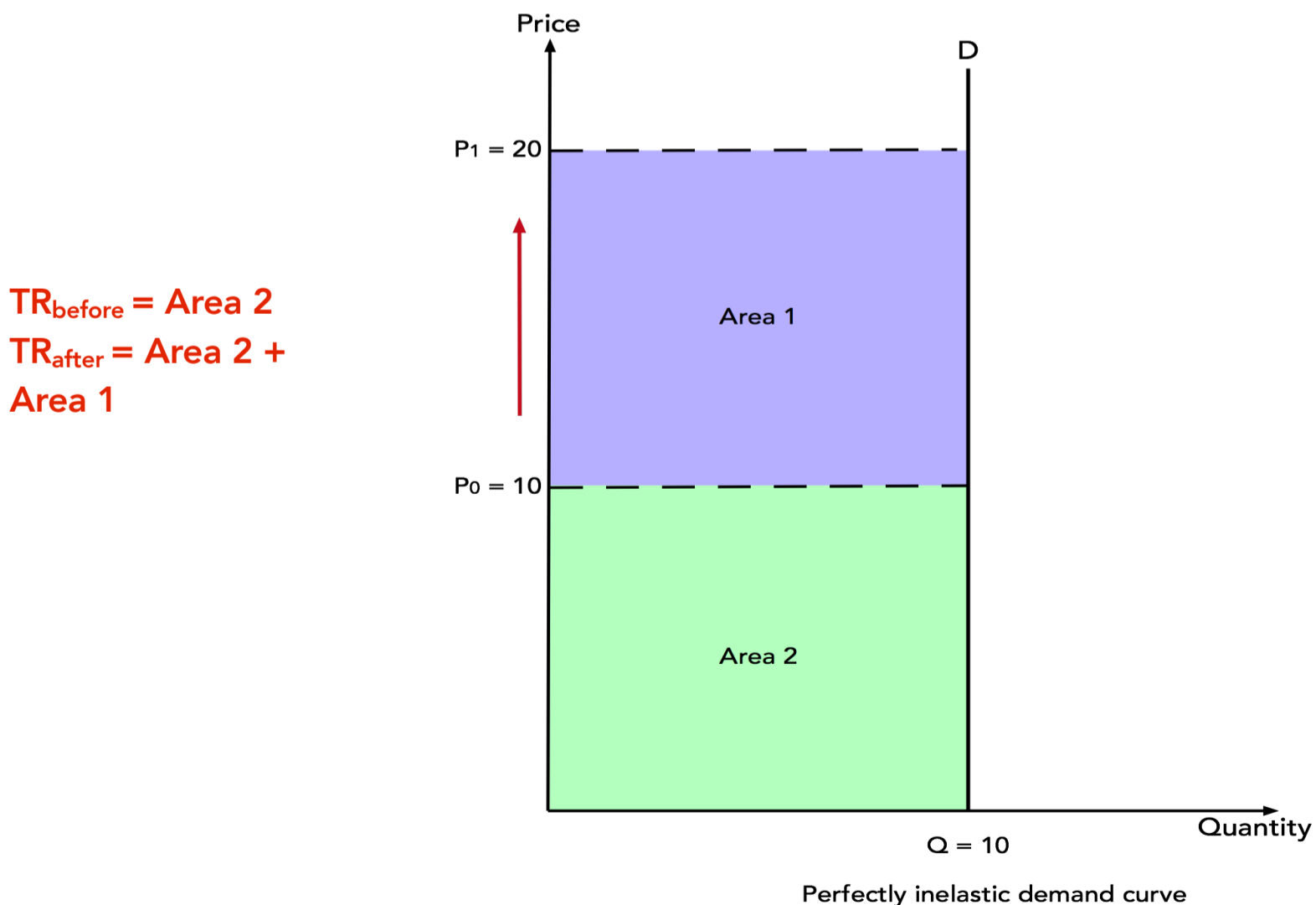
An increase in price from $10 to $20 will increase total revenue from $100 to $200. Therefore the higher the price the higher the total revenue because the quantity sold does not change.

Relatively Inelastic Demand (0 < PED < 1)

For inelastic goods, an increase in price results in an increase in total revenue. For inelastic goods, there exists a direct relationship between price and total revenue. When demand is price inelastic, price rises, quantity falls proportionately less and therefore total revenue increases. Similarly when price falls, quantity increases proportionately less and total revenue falls.

FIGURE 4.6 **Relatively Inelastic Demand**
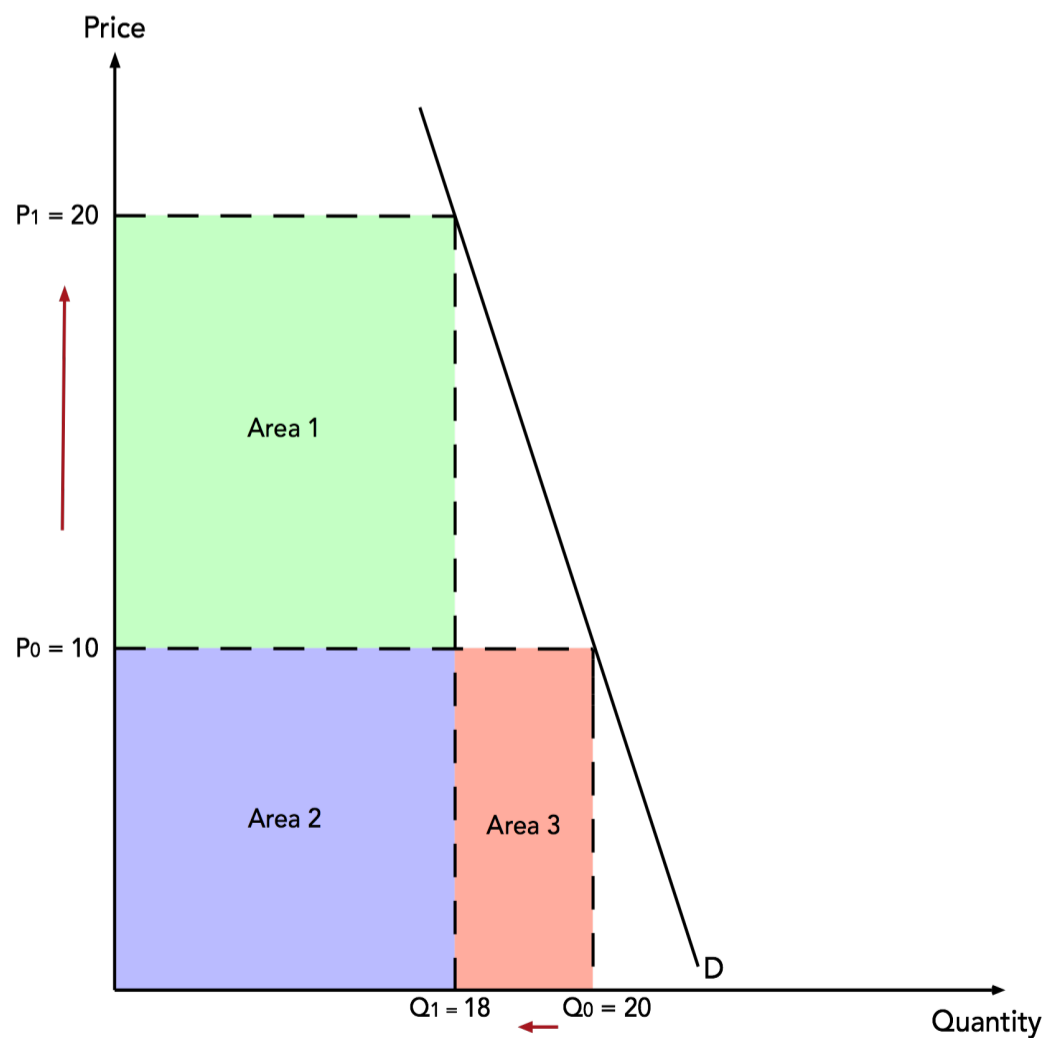
TR$_{beofre}$ = Area 2 + Area 3
TR$_{after}$ = Area 2 + Area 1

In order for total revenue to increase, the producer must increase the price as the quantity demanded falls by much less when the good is relatively inelastic. In Figure 5.6 when the price rises from $10 to $20 the percentage increase in price is 100%. Quantity demanded falls from 20 units to 18 units, the percentage fall is 10%. Total Revenue increases from $200 to $360. The gain in total revenue is area 1 which is larger than the loss of area 3.

Unitary Elastic Demand (PED = 1)

In this case, price and quantity change in exactly the same proportion. The demand curve is a rectangular hyperbola.

FIGURE 4.7 **Unitary Elastic Demand**

% change in Price =
%change in Qd
PED = 1 therefore
$P_0 \times Q_0 = P_1 \times Q_1$
Area 1+2 = Area 2+3
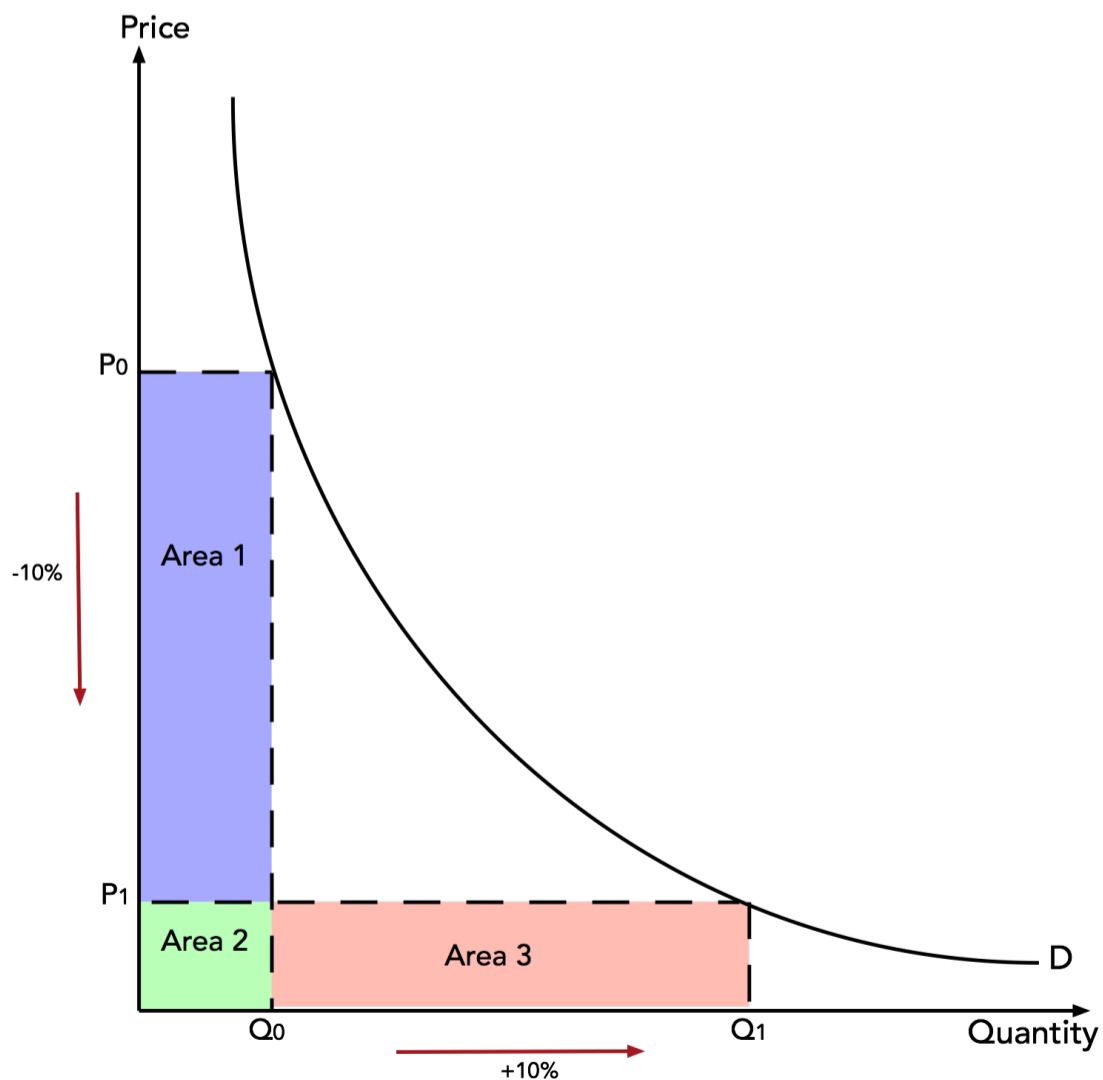
A change in price will have no effect on TR.
If we plot TR against Q, the function will be a straight line parallel to the horizontal axis.Total Revenue remains unchanged. when price falls from P_0 to P_1.

Relatively Elastic Demand (1< PED < ∞)

For elastic goods, lowering price will result in an increase in total revenue. There exists an inverse relationship between price and total revenue, for elastic goods; when price goes down, quantity increases proportionately more and total revenue increases. For elastic goods, an increase in price therefore lowers total revenue for a producer.

FIGURE 4.8 **Relatively Elastic Demand**

TR_{before} = Area 1 + Area 2
TR_{after} = Area 2 + Area 3
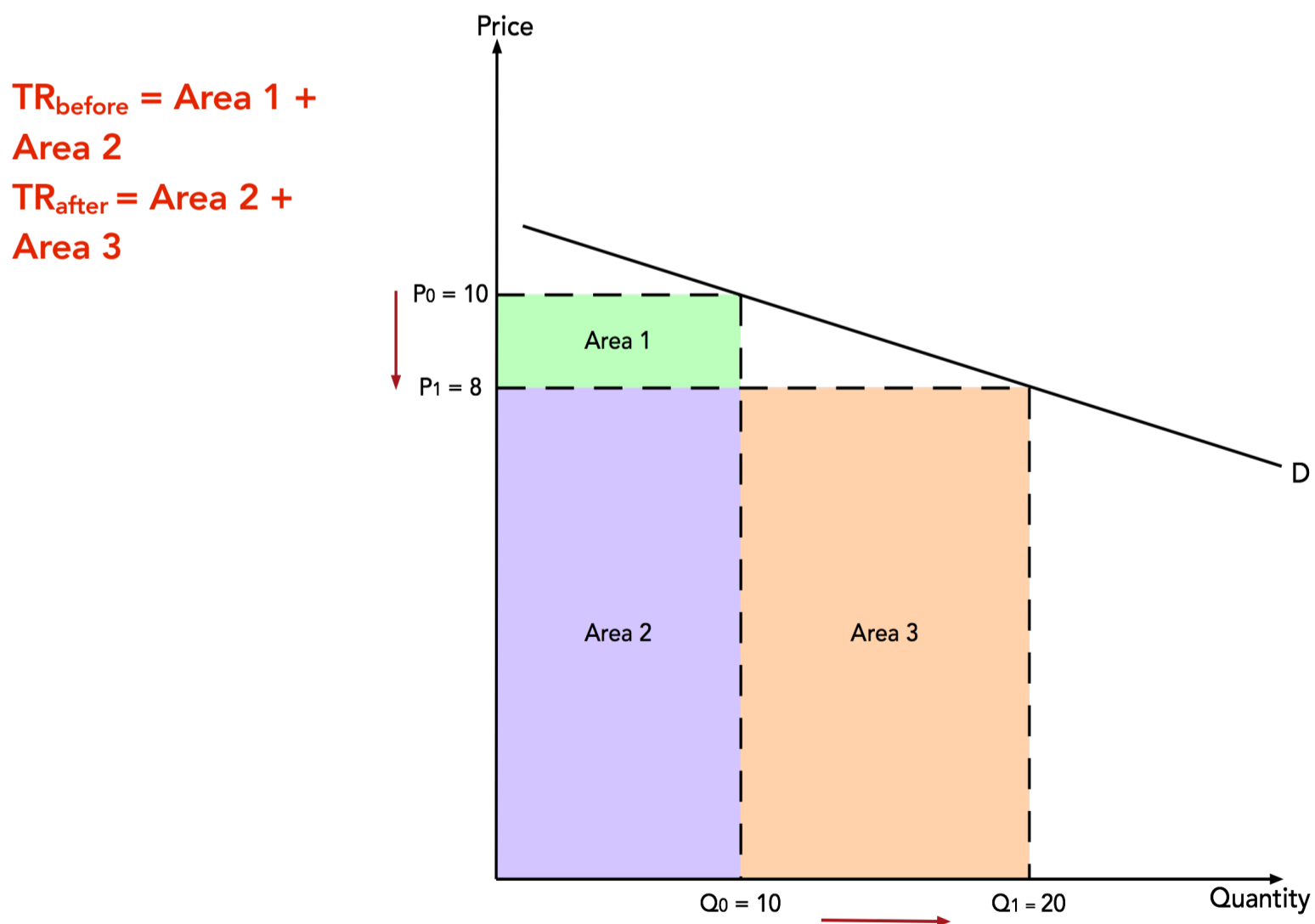
In figure 5.8 when price falls from $10 to $8 the quantity demanded increases from 10 units to 20 units. The fall in price is of 20% but the increase in quantity sold is 100%. Therefore total revenue increases from $100 to $160. Therefore when price falls, quantity demanded increases by much more and total revenue increases. The gain of area 3 is much larger than the loss of area 1.

Perfectly Elastic Demand Curve

For perfectly elastic goods, revenue is a function of quantity. The higher the quantity sold, the higher will be the revenue, as price does not change. The firm has no control over price. Therefore, total revenue increases from $100 to $200 as the firm's quantity sold rises from 10 units to 20 units.
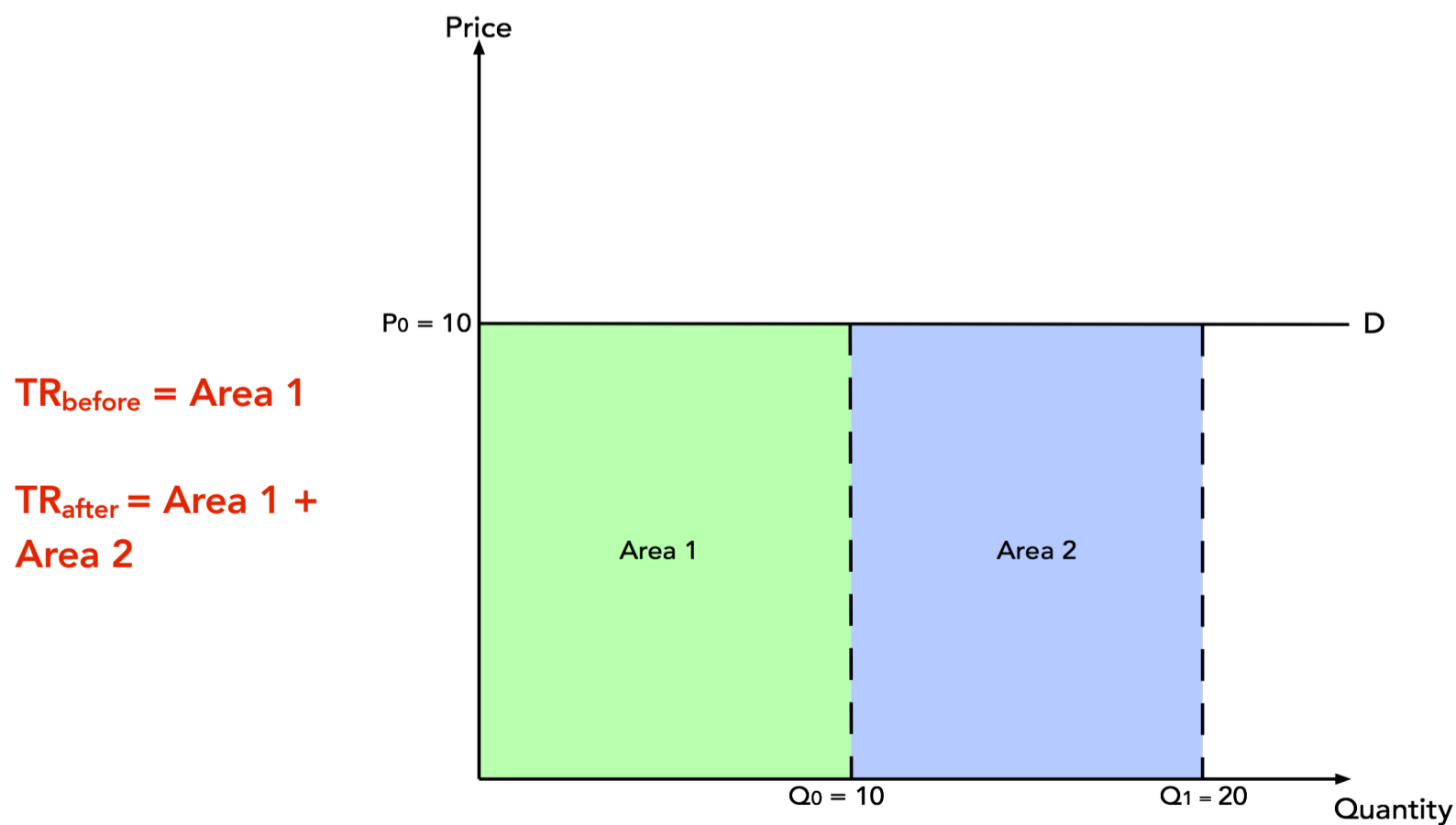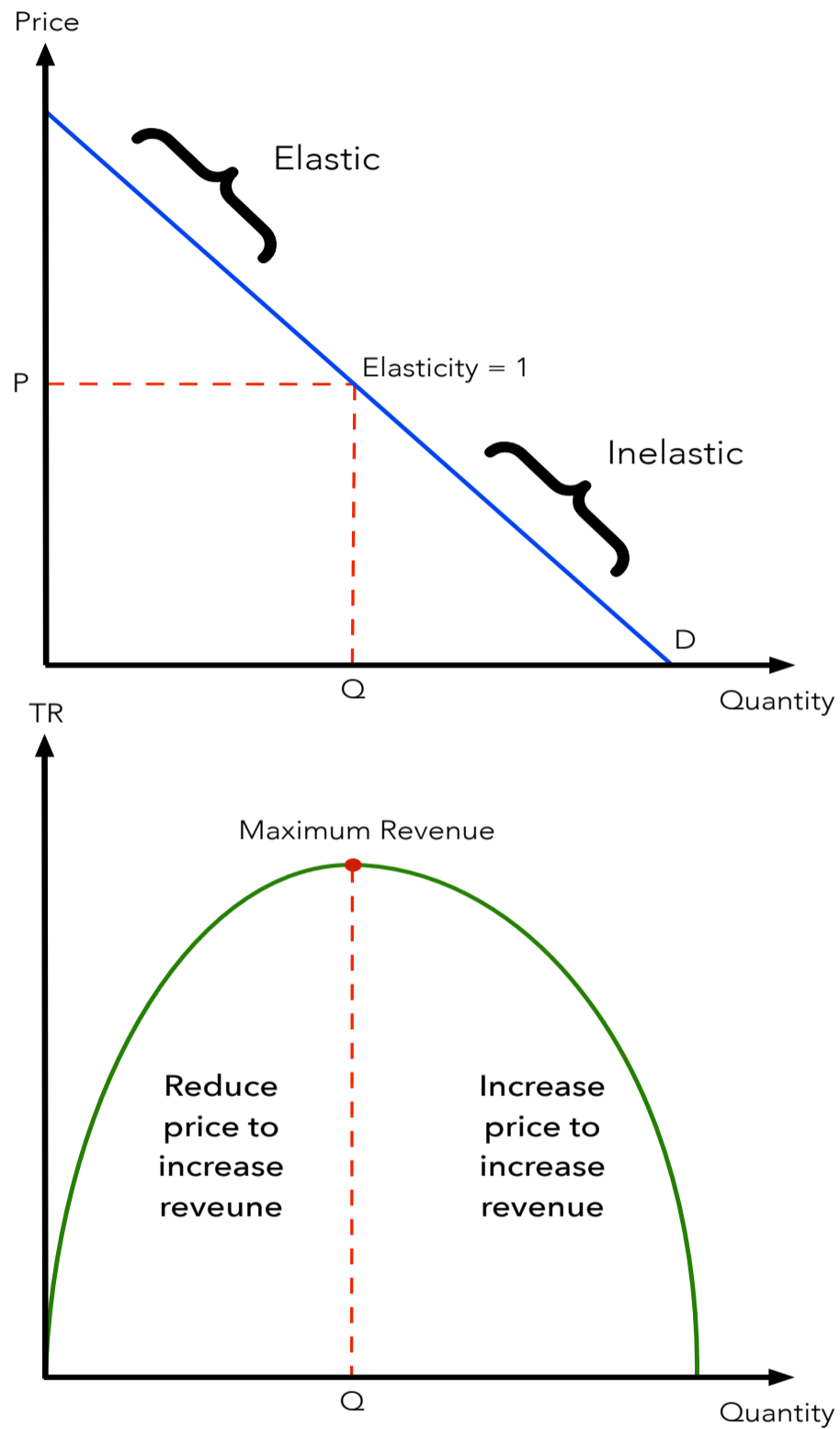
FIGURE 4.9 **Perfectly Elastic demand**

TR$_{before}$ = Area 1

TR$_{after}$ = Area 1 + Area 2

Price

$P_0 = 10$ D

Area 1   Area 2

$Q_0 = 10$ $Q_1 = 20$

Quantity

FIGURE 4.10 **Revenue and elasticity**

Figure 4.10 shows the relationship between elasticity and total revenue along a downward sloping demand curve. When PED = 1, total revenue is maximized. When PED is relatively elastic, prices should be reduced to increase total revenue and when it is relatively inelastic prices should be increased to increase total revenue.

Price

Elastic

Elasticity = 1

P

Inelastic

Q

D

Quantity

TR

Maximum Revenue

Reduce price to increase reveune

Increase price to increase revenue

Q

Quantity

Limitation of PED Analysis

1. There are large statistical problems associated with the calculation of PED values in practice. For example, it is difficult to calculate accurate PED given sample issues, time lags and response bias. Hence estimates may be inaccurate.

2. Conditions may change. For example, income or taste changes, making the PED calculation invalid or outdated.

3. Collecting and tabulating data can be expensive both, in terms of money and time.

Relevance of PED

1. PED permits a firm to predict the direction of change of its revenues given a price change. For example, a firm wishing to increase its revenues will lower the price of a good if demand for it is thought to be price elastic and it will increase the price if its demand is price inelastic.

2. PED enables comparison of quantity changes with monetary (price) changes.

3. PED allows a government to estimate the size of the necessary tax required to decrease consumption of 'demerit' goods, such as cigarettes or alcoholic drinks.

4. Firms can affect the PED through advertisements, which can help them build brand loyalty and make them lower the elasticity of demand for their good. Hence the

marketing strategy of firms may also be affected by the knowledge of the PED.

5. The burden of taxation is also determined through PED. The incidence of tax will be higher on the consumer; the more inelastic is the demand curve. For example, a cigarette manufacturer selling an inelastic good would pass on the burden of tax onto the consumer.

INCOME ELASTICITY OF DEMAND (YED)

YED is the responsiveness of quantity demanded to a change in income.

$$YED = \frac{\% \text{ change in quantity demanded}}{\% \text{ change in income}}$$

- If YED > 0 the good is a normal good since demand increases (decreases) as consumer income increases (decreases): both income and demand change in the same direction.

- If YED < 0 the good is an inferior good since demand decreases (increases) as consumer income increases (decreases): income and demand change in opposite directions.

Example 1:

Income	Quantity
$Y_0 = 100$	$Q_0 = 50$
$Y_1 = 120$	$Q_1 = 100$

$$YED = \frac{\frac{100-50}{50}}{\frac{120-100}{100}} = \frac{100\%}{20\%} = +5 \text{ (Normal Good)}$$

Income Elastic: If YED > 1 then the percentage change in demand is greater than the percentage change in income.

Example 2:

$$YED = \frac{\frac{10-20}{20}}{\frac{120-100}{100}} = \frac{-50\%}{20\%} = \text{-2.5 (Inferior Good)}$$

Income	Quantity
$Y_0 = 100$	$Q_0 = 20$
$Y_1 = 120$	$Q_1 = 10$

We say that demand is income elastic, as a rise in income leads to a faster rise (a proportionately greater increase) in demand. Luxury goods (as well as most services) are usually considered income elastic. For example, demand for plastic surgery, spa therapy or haute couture clothing is income elastic in many markets. Example: YED = +1.5

Income Inelastic: If 0 < YED < 1 then the percentage change in demand is smaller than the percentage change in income. We say that demand is income inelastic as a rise in income leads to a slower rise (a proportionately smaller increase) in demand. Basic goods (every day goods or 'staple' goods) are usually income inelastic. For example,

demand for many food products is income inelastic. Example: YED = +0.5

If YED = 0 then demand for the good is not affected by a change in income. Income may increase or decrease but demand for the good remains the same.

If YED = 1 then the percentage change in income is equal to the percentage change in quantity demanded: a 5% increase in income leads to a 5% increase in quantity demanded, for example.

Therefore in this case, the sign of the elasticity is not ignored.

The sign that precedes the YED shows the nature of the relationship between income and demand of the good, while the numerical value explains the strength of the relationship.

Relevance of YED

1. Firms would like to know whether demand for their product is highly income elastic or moderately income inelastic to help them better plan their investments. If an economy is growing and incomes are increasing fast, then firms producing highly income elastic products may have to invest now in expanding their capacity to be able to meet the increased demand.

2. A government may also be interested in knowing YED in various sectors to plan ahead regarding training for

unemployed workers. The economic significance and viability of income inelastic sectors will shrink in the long run for a growing economy so some workers in these sectors may lose their jobs and will need re-training.

3. YED is also relevant in pricing policy. When incomes are falling, demand for normal goods are also falling so firms may decide to lower price to raise sales.

CROSS ELASTICITY OF DEMAND

XED is the responsiveness of demand for one good (x) to a change in the price of another good (y).

$$XED= \frac{\% \text{ change in the quantity demanded of good A}}{\% \text{ change in the price of good B}}$$

Here, the sign determines how we interpret XED for a product:

- If XED > 0 then the two goods x and y are substitutes, meaning that they are in competitive demand: if one becomes more expensive then consumers will switch to the other.

- If XED < 0 then the two goods x and y are complements, meaning that they are jointly demanded: if one becomes more expensive and people buy it less, they will also buy less of the other one.

- If XED = 0 then the two goods x and y are unrelated.

- It follows that the further away from zero XED is, the stronger the relationship between the goods. Conversely, the closer (absolutely) to zero XED is, the weaker the relationship between the two goods.

XED measures the responsiveness of the quantity demanded to a change in pice of another good.

Example 1: Substitutes

Price	Quantity
$P_0 = 10$	$Q_0 = 10$
$P_1 = 20$	$Q_1 = 15$

$$XED = \frac{\frac{15-10}{10}}{\frac{20-10}{10}} = \frac{50\%}{100\%} = +0.5 \text{ (substitutes)}$$

Example 2: Complements

Price	Quantity
$P_0 = 10$	$Q_0 = 10$
$P_1 = 15$	$Q_1 = 8$

$$XED = \frac{-\frac{2}{10} \times 100}{\frac{5}{10} \times 100} = \frac{-20\%}{50\%} = -0.4 \text{ (complements)}$$

Relevance of XED

1. Firms can use XED to guide their pricing policy changes. The higher the XED, the greater will be the producer's reaction to the pricing strategy of a related good. For example if the price of a substitute product increases, a firm may react by lowering its price in order to maintain sales.

2. In terms of marketing strategy, firms that are closely related due to higher XED may follow each other. For example if one firm decides to increase its marketing budget, the rival will do the same in order to ensure it does not lose its market share.

3. Government may use the XED value to understand the implication of taxes on interrelated goods. For example, a tax on petrol can affect the demand for car, and may have a serious implication in terms of employment and contribution to GDP by the car industry.

ELASTICITY OF SUPPLY

PES is the responsiveness of quantity supplied when the price of the good changes

$$PES = \frac{\%\ \text{change in quantity supplied}}{\%\ \text{change in price}}$$

The sign of PES is positive since supply curves typically have a positive slope (firms offer more of a good per period at a higher price).

Determinants of PES

1. Increase in costs as output is increased: If total costs rise significantly as a producer attempts to increase supply then it is likely that the producer will not raise the supply and so the elasticity of supply for the product will be relatively inelastic. It would take large price rises to make increasing the supply worthwhile. If, however, total costs do not rise significantly then the producer will raise the quantity supplied and take advantage of the low increase in costs to benefit from the higher prices, thus making more profits. Total costs will not rise significantly if the costs of factor inputs do not increase quickly as the firm uses more of them. There are a number of factors that assist in preventing a significant rise in costs, such as:

a. The existence of unused capacity: If a firm has a lot of unused capacity, i.e. if it has significant productive resources that are not being fully used, then it will be able to increase output easily and without great cost increases. In this case the elasticity of supply for the product will be relatively high. If a firm is producing at capacity then it is difficult to increase supply without a significant increase in productive resources, which will be expensive. It is therefore unlikely that the firm will increase supply. PES will be relatively inelastic.

b. The mobility of factors of production: If factors of production are easily moved from one productive use to another then PES will be relatively elastic. For example, if it is easy to shift production from manufacturing one liter plastic bottles to manufacturing two liter plastic bottles, when the price of two liter bottles goes up, then the extra cost of switching to the larger bottles will not be great and the change will take place.

2. Perishable vs. Non-Perishable Items: Perishable items cannot be stored therefore supply tends to be price inelastic as compared to non-perishable items which can be stored for future uses. If it is possible to store stocks then it may be possible to meet an increase in demand by releasing stocks, so firms can be more responsive in their supply than if their goods are perishable or no stocks are held.

3. The time period considered: The amount of time over which PES is measured will affect its value. In general terms the longer the time period considered the more elastic the supply will be. In the immediate time period firms are not really able to increase their supply very much, if at all, if price increases, since they cannot immediately increase the number of factors of production that they employ. The value of PES will be very inelastic. In the long run, however, firms may be able to increase the quantity of all of the factors that they employ and so the value of PES will be much more elastic.

Ranges of PES with graphs

Case 1 – Perfectly Inelastic Supply Curve

If PES = 0 then we say that supply is perfectly inelastic. It means that a change in price leads to no change in the quantity supplied. Price changes have no effect on the amount offered per time period.

FIGURE 4.11 **Perfectly inelastic supply curve**

Case 2 – Relatively Inelastic Supply

If 0 < PES < 1 then we say that supply is price inelastic. It means that the percentage change in quantity supplied is smaller than the percentage change in price, or that a change in price leads to a proportionately smaller change in quantity supplied. The linear inelastic supply curve cuts the quantity axis. It is important to note that PES does not remain constant throughout the length of the supply curve. In fact, it increases as quantity rises.

FIGURE 4.12 **Relatively inelastic supply**
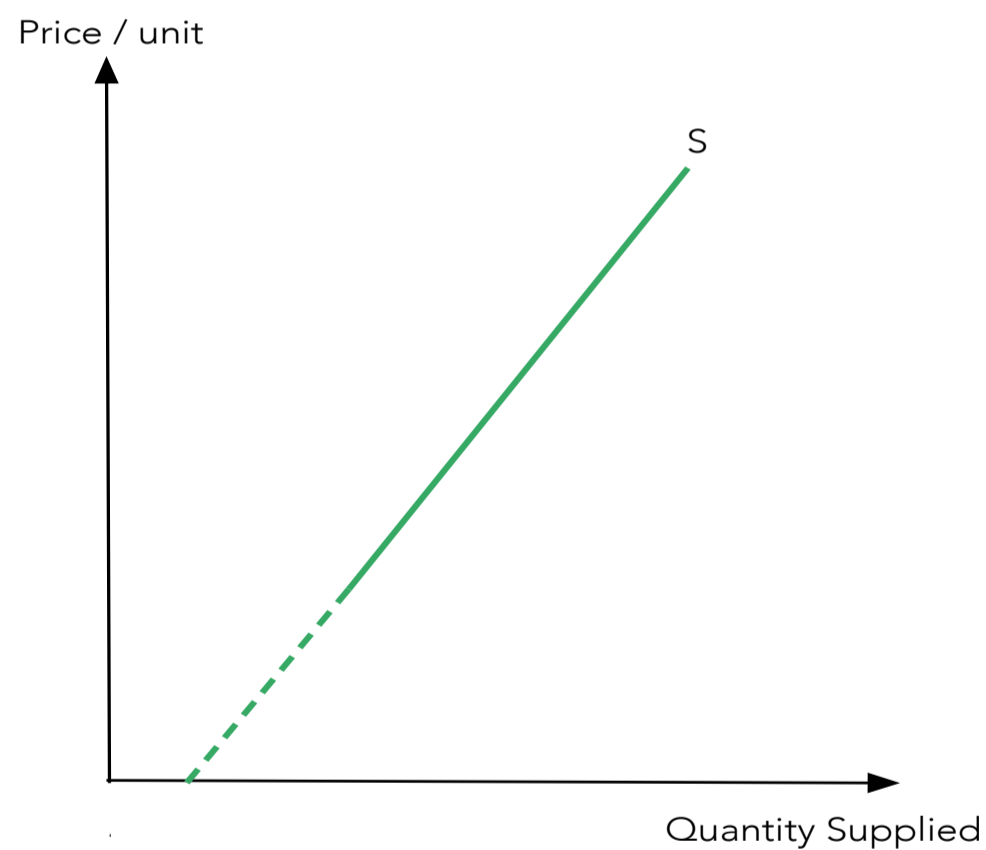
Case 3 – Unitary Elastic Supply

The linear unitary elastic supply curve (PES = 1) always passes through origin. The percentage change in quantity supplied is equal to the percentage change in price.

FIGURE 4.13 **Unitary Elastic Supply**
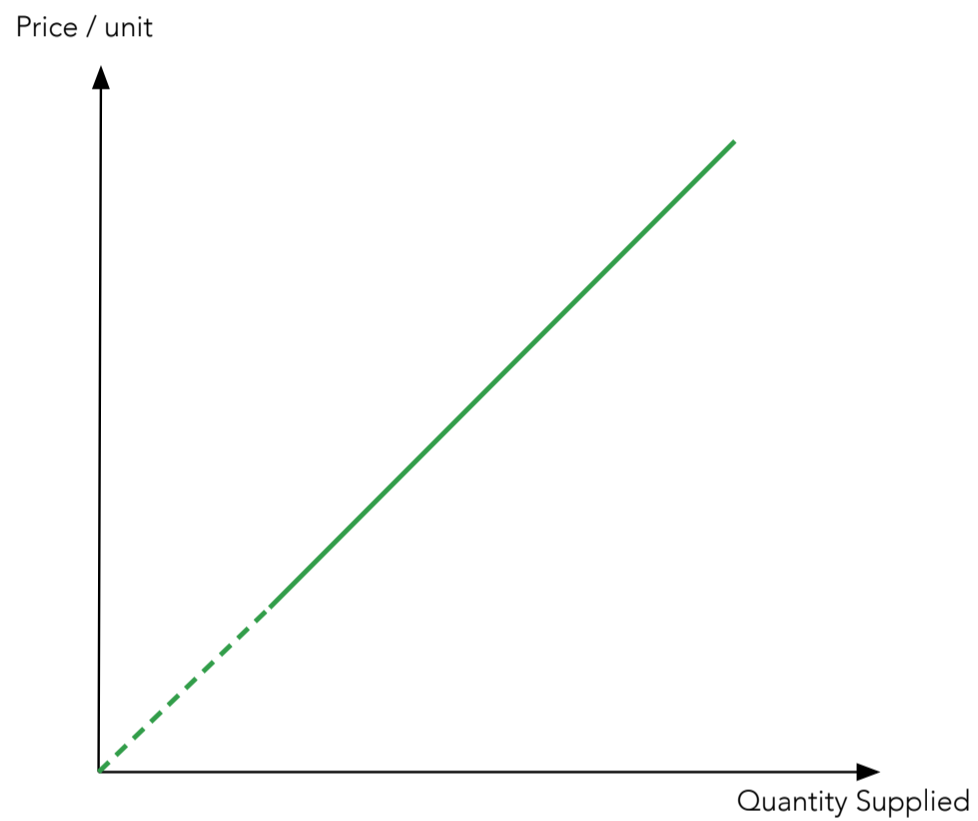
Case 4 – Relatively Elastic Supply Curve

The linear elastic supply curve originates from the price axis. The percentage change in quantity supplied is greater than percentage in price.

FIGURE 4.14 **Relatively Elastic Supply**

The linear elastic supply curve cuts the price axis. In this case, PES does not remain constant throughout the length of the supply curve as well. It decreases as quantity rises.

Case 5 – Perfectly Elastic Supply Curve

In the case of perfectly elastic supply curve, PES = ∞. The producer is able to produce any quantity at price P.

FIGURE 4.15 **Perfectly elastic Supply**

Price / unit

S

Quantity Supplied

Relevance of PES

PES determines the extent to which an increase in demand will affect the price and/or quantity of the good in a market. The more price inelastic supply is, the greater the increase in price given an increase in demand; the more elastic supply is, the greater the impact of an increase in demand on quantity.

Primary agricultural commodities, for example wheat and corn, are characterized by low PES as their production is subject to long time lags. Think, for example, of a producer planting at a particular time but harvesting six months later. Non-agricultural primary products, such as metals and minerals, are also characterized by low PES because of the associated steep extraction costs. On the other hand, products from the manufacturing sector are characterized by higher PES because given a production plant, the extra costs of producing additional units are typically low.

Case 1 – Perfectly Inelastic Demand Curve

In the case of demand being perfectly inelastic, consumer is willing to pay any price, while he pays the market price P. Hence the CS is infinite.

FIGURE 4.16 **Perfectly inelastic demand curve**
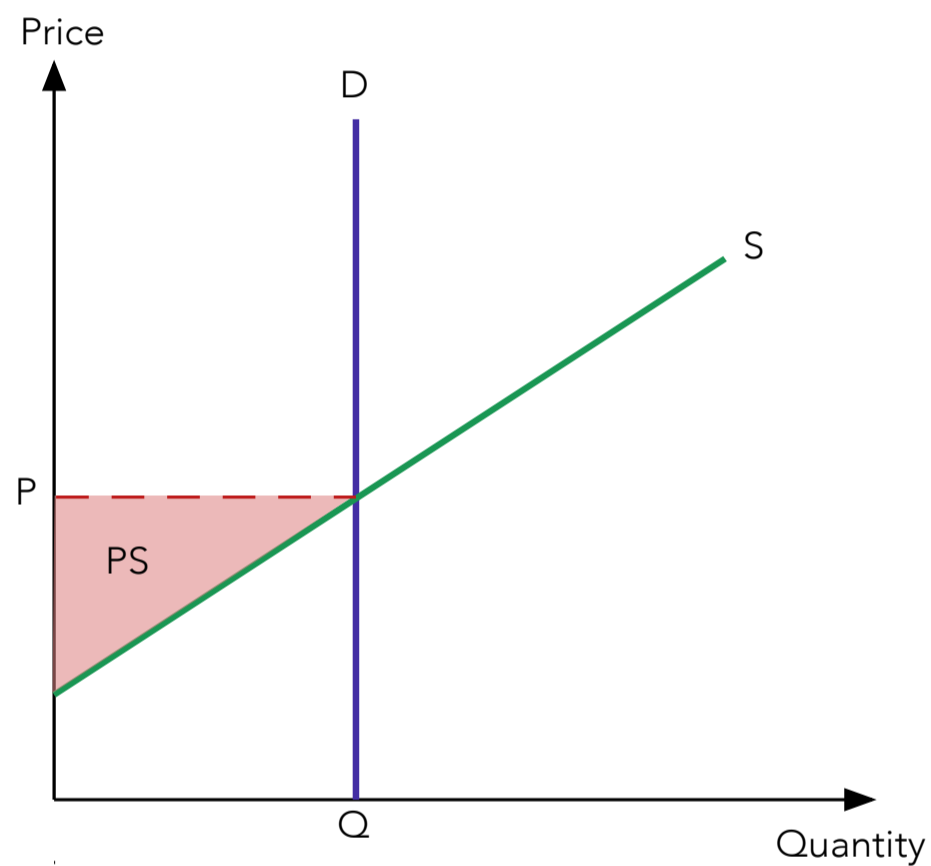
Case 2 – Perfectly Elastic Demand Curve

In the case of demand being perfectly elastic, consumer is willing to pay only one price P. Since this is the price he actually pays, the CS is zero.

Therefore, the lower the elasticity , the more a consumer is willing to pay and therefore the higher will be the consumer surplus.

FIGURE 4.17 **Perfectly elastic demand curve**
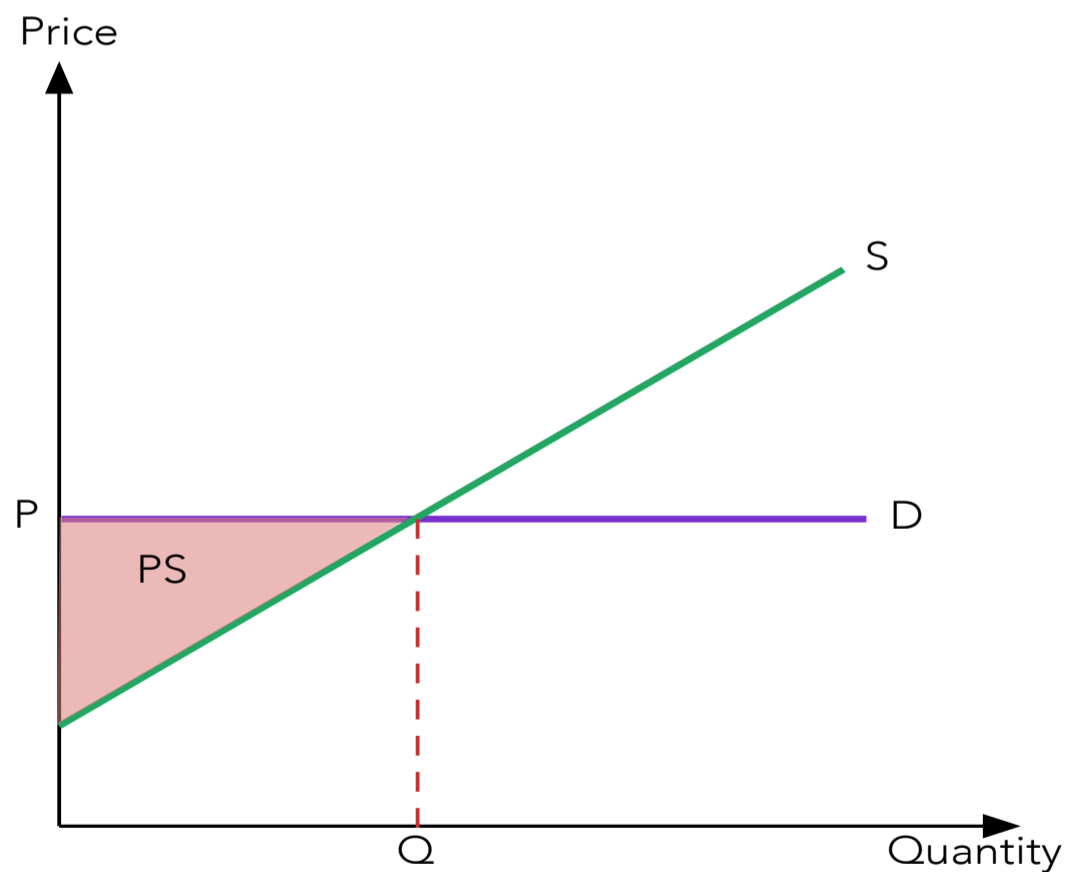
MARKET STABILISATION

ROLE OF PRICES IN THE MARKET

In a market there are buyers who demand goods and services, and sellers who supply goods. This results in a market price at which the exchange takes place. Price has three important functions:

1. Rationing: Scarce resources need to be allocated among competing uses. One function of price in a market is to allocate and ration (distribute) these resources. If many consumers demand a good, but its supply is relatively scarce, then prices will be high. Limited supply will be rationed to these buyers who are prepared to pay high enough price. If prices are low, then high number of goods will be bought reflecting the lack of scarcity of the good.

2. Signaling: The price of the good is a key piece of information to both buyers and sellers in the market. They reflect market conditions and therefore act as a signal to those in the market. Decisions about buying and selling are based on these signals. For example, an increase in market price has signaling power as it contains information that more of the good is wanted and it also provides an incentive to firms to react to that information and offer more of the good per period.

3. Incentive: Prices act as an incentive for both, buyers and sellers. Low price encourages buyers to purchase more while higher price discourages buying because consumers get fewer goods per dollar spent. On the supply side, higher price encourages sellers to sell more, while lower

Market price facilitates the role of buyers and sellers and enables the exchange of goods and services.

The three important functions of price are rationing, signaling and incentivizing.

price discourages production and even drives firms out of business.

Need for Government Intervention

The market mechanism establishes the equilibrium price for goods and services in the economy; however this price may not lead to an efficient allocation of resources. The price may fluctuate in the short run, or it may be too high or too low.

1. **Large Fluctuation in prices**: In some markets, particularly agriculture, there can be large fluctuation in prices over a short space of time. Prices act as a signal and serve as an incentive to producer. Large fluctuations in price mean that these signals can give a very confusing picture to producers and results in over or under production in the short run, and over or under investment in the long run. This in turn can lead to a less than optimal allocation of resources.

2. **Too high a price**: The price of goods may be high such as bread, rice or education, which poor households are unable to afford to buy in sufficient amounts. The government may judge these items as merit goods, or it may want to reduce inequality in society and hence may want to reduce their prices.

3. **Too low a price**: The free market price of some goods, like cigarettes, may be too low, because their consumption gives rise to significant negative externality.

Alternatively, government may judge that too low a price may have a negative impact on producers. For example, low prices for agricultural goods may discourage farmers and may result in them to switch to other professions.

## METHODS OF GOVERNMENT INTERVENTION

Maximum Price

The government can intervene to regulate prices by setting a maximum price for goods which are overpriced.

Government can fix the maximum price (price ceiling) for a good in a market. It could do this for goods and services that it feels are overpriced and may not be affordable for lower income groups. For example, housing market in a city may have high rents and low-income groups may be unable afford to rent houses.

FIGURE 5.1 **Maximum Price**

Before Max Price :
CS = 1+2+3
PS = 4+5+6

After Max Price :
CS = 1+2+5
PS = 6
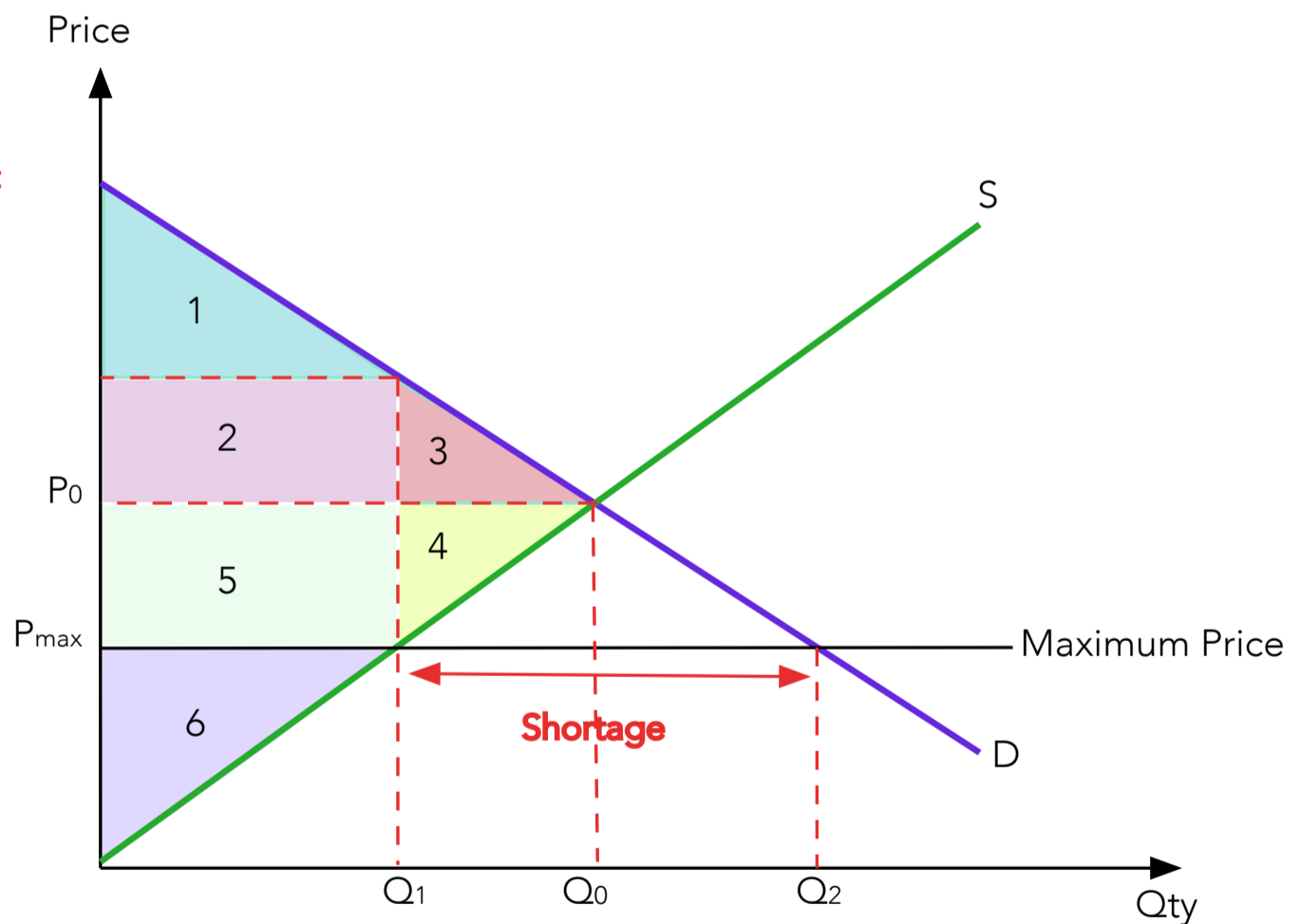
Governments can formulate ways to deal with shortages including providing the food on a first come first serve basis, rationing the food on a need basis, determining methods to minimize the shortages or devising ways to reduce demand for the particular good.

After the maximum price is put, the quantity demanded will be more than quantity supplied, and there will be a shortage of $Q_2 - Q_1$. Permanent price controls will discourage some landlords ($Q_0 - Q_1$) and encourage some tenants ($Q_2 - Q_0$) to rent houses resulting in this shortage.

The price P_{max} cannot perform its rationing function anymore: individuals may be willing and able to pay the price but it is not certain that they will end up with the good, as a shortage exists. For Q_1 consumers, the consumer surplus is higher by area 5 but for $Q_0 - Q_1$ consumers, the consumer surplus is zero, as they did not get the good at all. Tenants lucky enough to find housing at the lower rent are better off but tenants who are discriminated against or who end up paying significantly more as a result of the shortage are also worse off.

In general, landlords are worse off as they rent out fewer units at a lower rent. The producer surplus will be lower by Area 4 and 5, as it is now Area 6 only.

The government may react to the shortage in a number of ways:

1. The government can give the good on 'first come first serve basis' to ration the good; however, it would be a matter of luck rather than money whether one is able to get the good.

2. The state may devise a system to ration on the basis of greatest need or issuing a restricted quantity of the good, per person or per family.

3. To minimize shortages and the related problems, a government may attempt to encourage supply (that is, attempt to shift the supply curve to the right on the diagram). It might do this through various means, for example it may draw on stocks, assume direct production of the good or grant subsidies or tax relief to producers.

4. Governments may attempt to reduce demand. For example, it may encourage production of more and cheaper substitutes.

Another problem with maximum price is that a **black market** may develop, where some landlord and even tenants may illegally extract 'under the table' payments from those consumers who are willing to pay a price above Pmax.

Economic theory therefore predicts that maximum price may benefit some that may be able to afford the good, but will be a disappointment to those who are prepared to pay a higher price for the good but are unable to obtain it because of a shortage of supply. A maximum price set above equilibrium will be ineffective.
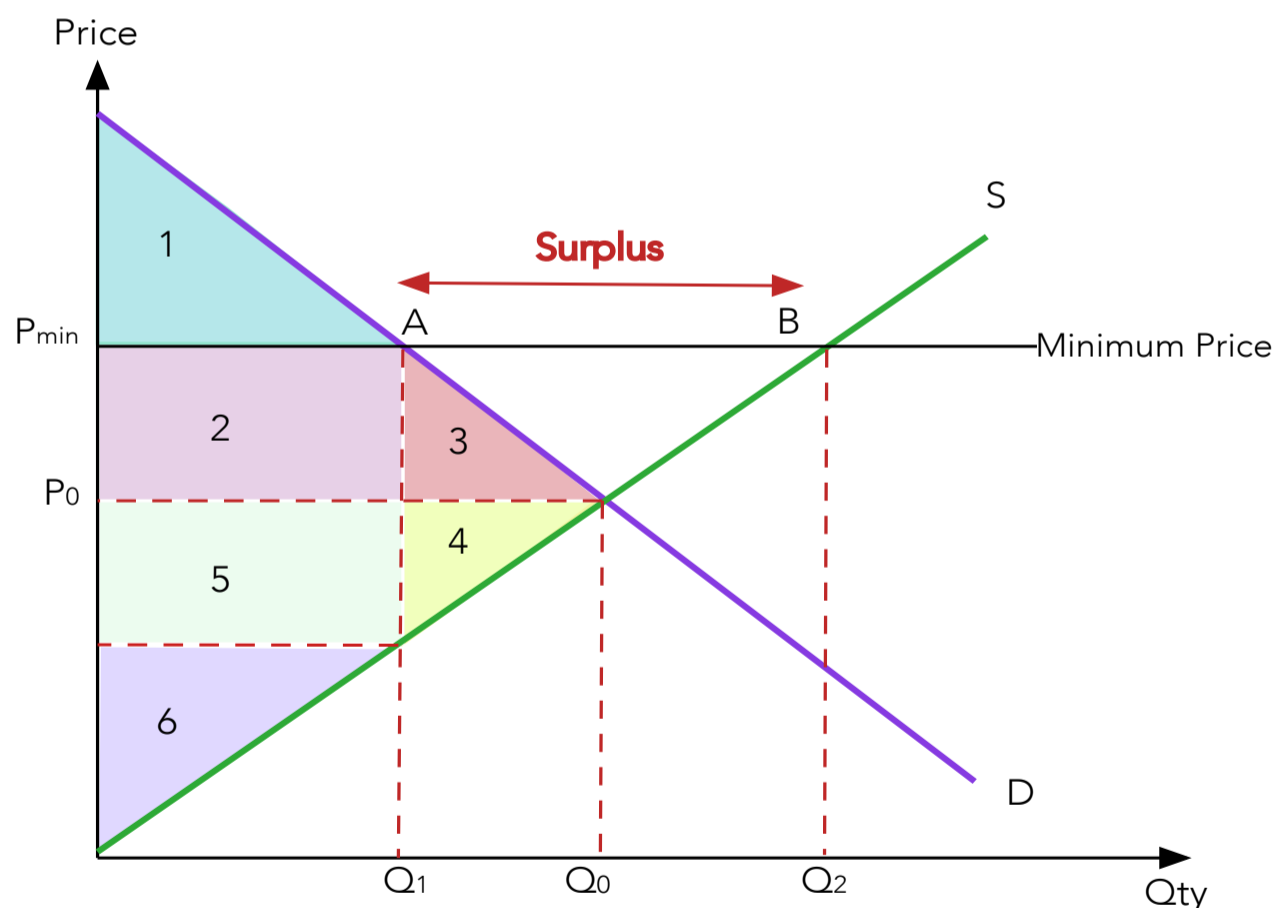
Minimum Price

Minimum price is used to protect producer incomes, encourage production of some goods and to protect vulnerable people in society.

Government sets a minimum price (also referred to as a price floor or, sometimes, price support) if it considers the market determined price is too low. A minimum price is set above the market-determined price and the aim is to protect producers. In order for a minimum price to be effective it must be set above the equilibrium price. Typically, minimum prices are encountered in agricultural markets where governments set a price floor to protect farmers' income.

FIGURE 5.2 **Minimum Price**

Before Min Price:
CS = 1+2+3
PS =4+5+6

After Min Price:
CS = 1
PS= 2+5+6

The purpose of minimum price can be:

- To protect producer's income. For example, in agricultural market, prices have gone down overtime and minimum price can protect the farmer's income.

- In order to encourage the production of certain goods, especially where government prefer a surplus in order to prepare for future shortages. For example, staple food such as sugar or wheat.

- To protect certain groups those are viewed as vulnerable. For example, the introduction of minimum wage can be used to protect the income of poor workers to go down.

The government decides to set a minimum price above equilibrium, and as a result, producers will now produce $Q_2 - Q_0$ more quantity, while consumers will react to the higher price by reducing their demand by $Q_0 - Q_1$. The total surplus or excess capacity due to minimum price is therefore $Q_2 - Q_1$. This results in consumers to be worse off as they enjoy less of the product at a higher price per unit. The consumer surplus will reduce from Area 1 + 2 + 3 to Area 1 only. The producers, as a group, will have a producer surplus equal to Area 2 +5 +6. This means while they gain Area 2, they will lose Area 4. Hence, if Area 2 is greater than Area 4, the producers will benefit despite the surplus not being bought. This can only be possible if the good is inelastic.

There are many problems that can come from minimum price:

1.   It results in surplus. The government can use various methods to deal with a surplus, such as:

a.   The government could buy the surplus and could store it, destroy it or sell it abroad in other markets. In this case, the government would pay Q_1ABQ_2 and farmer's total income will increase to $P_{min} \times Q_2$

b.   Government could artificially lower supply by restricting producers to a particular quota.

c.   Demand could be raised by advertising, finding alternative uses for the good or by reducing consumption of substitute goods like imports.

2.   Firms may become inefficient, as they may not feel the need to find more efficient methods of production, and cut their cost if their profits are protected by the higher price.

3.   Government expenditures increase or government spending in other areas has to decrease. If government spending rises then taxpayers eventually bear the burden of this policy, as they pay for it in the form of increased taxes.

GOVERNMENT INTERVENTION IN THE AGRICULTURAL MARKET

Features of agricultural market that requires government intervention

There are two big inherent problems in the agricultural market:

1. **Short-run price instability**: The short run price instability comes about due to three reasons:

   1.1. **Inelastic Demand**: Demand is very inelastic in the short-run as food is a necessity

   1.2. **Inelastic short run supply**: Supply is also inelastic due to difficulties of storage and long production periods.

   1.3. Agricultural harvest is affected by a number of **unpredictable factors** such as weather, pests and diseases and therefore supply is vulnerable to sudden shifts, e.g. changes in the weather.

FIGURE 5.3 Agricultural Market

During good crop, the supply curve is S_1 and the farmers' income is $P_1 * Q_1$.

During bad crop, the supply curve is S_2 and the farmers' income is $P_2 * Q_2$.

The inelastic demand results in price to rise by much more during bad crops causing a significant rise in income for the farmers.
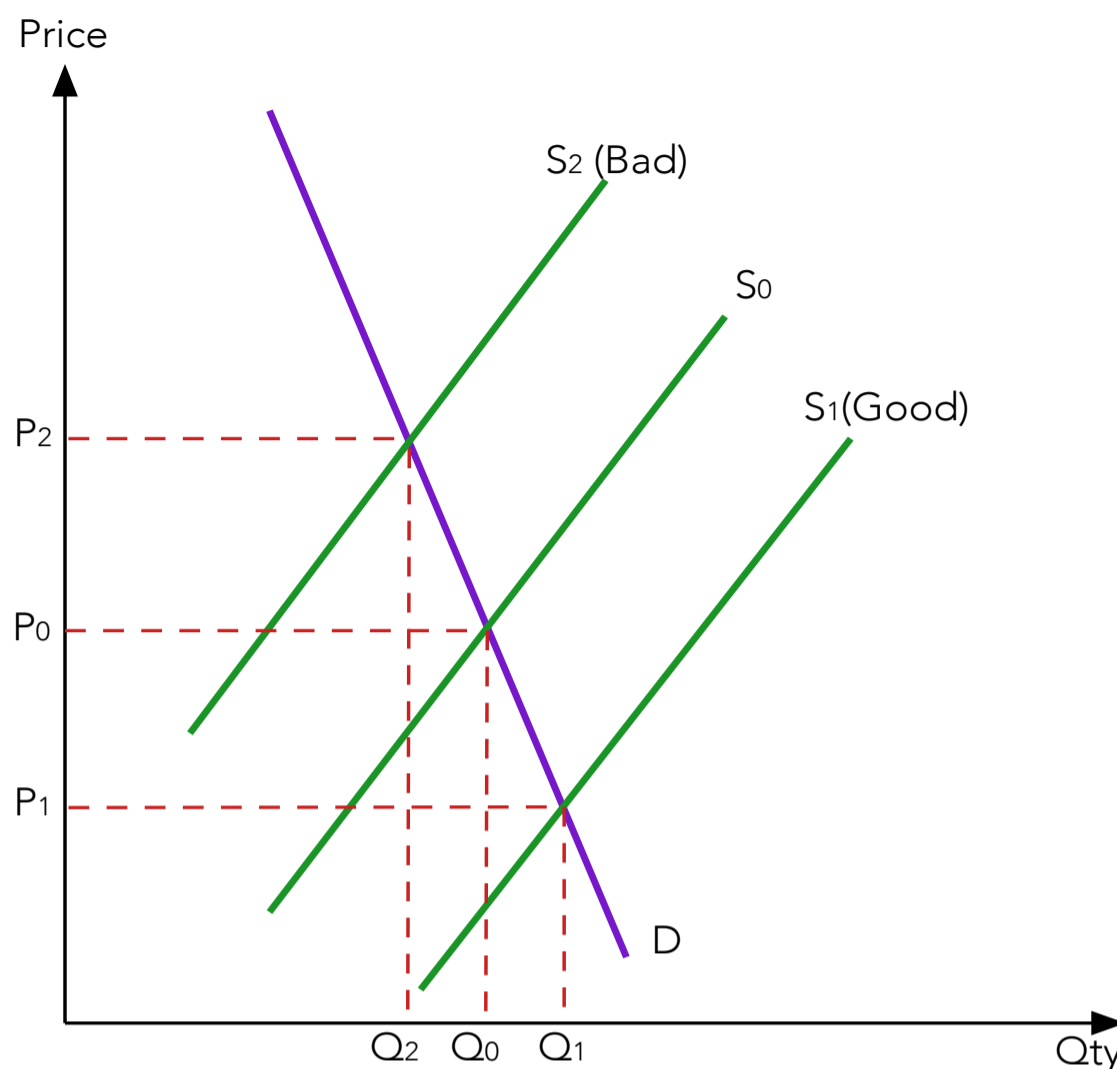
Due to this, there are major changes in prices and price rise and fall are both large. Unstable prices also mean unstable incomes for farmers. This results in paradox of bumper crop, where producers earn more in bad crops and less in good or bumper crops. As can be seen from the diagram, with a fall in supply due to bad crop (S_2), prices increases and producers earn more.

2. **Long run downward trend in prices**: There are two factors that have resulted in falling prices in agriculture overtime.

   2.1. Income Elasticity of Demand: There is a limit to the amount people wish to eat. As people get richer, they spend very little of their extra income on basic

food stuff, hence income elasticity of demand for basic food stuff is very low resulting in demand not growing fast.

2.2. Farming Productivity: Farming productivity has grown dramatically over the years, as improvement in technology and farming methods has caused the supply to rise by much more.

FIGURE 5.4 **Farming productivity**

Overtime rise in supply has outweighed the rise in demand leading to falling prices and income for farmers.
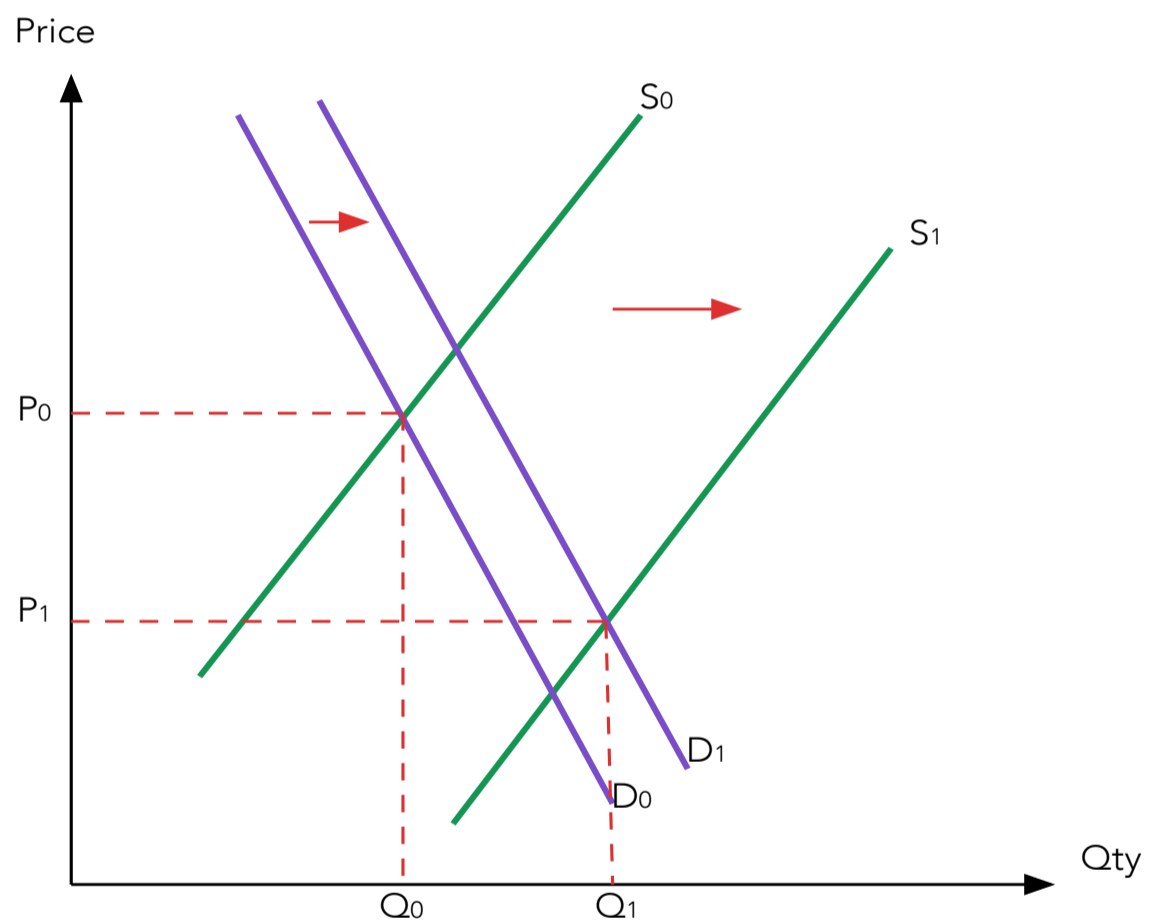
Overtime, the increases in supply are more than increases in demand. This has caused the long run price to fall.

Government can intervene in the agricultural market in three ways

1. **Buffer Stock schemes**

2. **Guaranteed Price Scheme**

3. **Income Support Schemes**

Buffer Stock Scheme

Stable prices help maintain farmers incomes. A rapid drop in prices can make farmers go out of business. Also, price stability enables investment in agriculture. For consumers. stable prices prevent excess prices and help reduce food inflation In a buffer stock scheme, the government tries to stabilize prices as shown in figure 6.5. It involves the government buying surplus and storing it when harvests are good, and then releasing it later in the market when harvests are bad. This way the government fixes the price at P and the quantity sold at Q. The system will stabilize prices at P but farmer's income will fluctuate with the size of the harvest. It will be P x Q_2 during bad crop and P x Q_1 during good crop.

FIGURE 5.5 **Buffer Stock Scheme**

Price

S₂ (Bad)

S₀

S₁(Good)

P

D

Q₂ Q Q₁ Qty
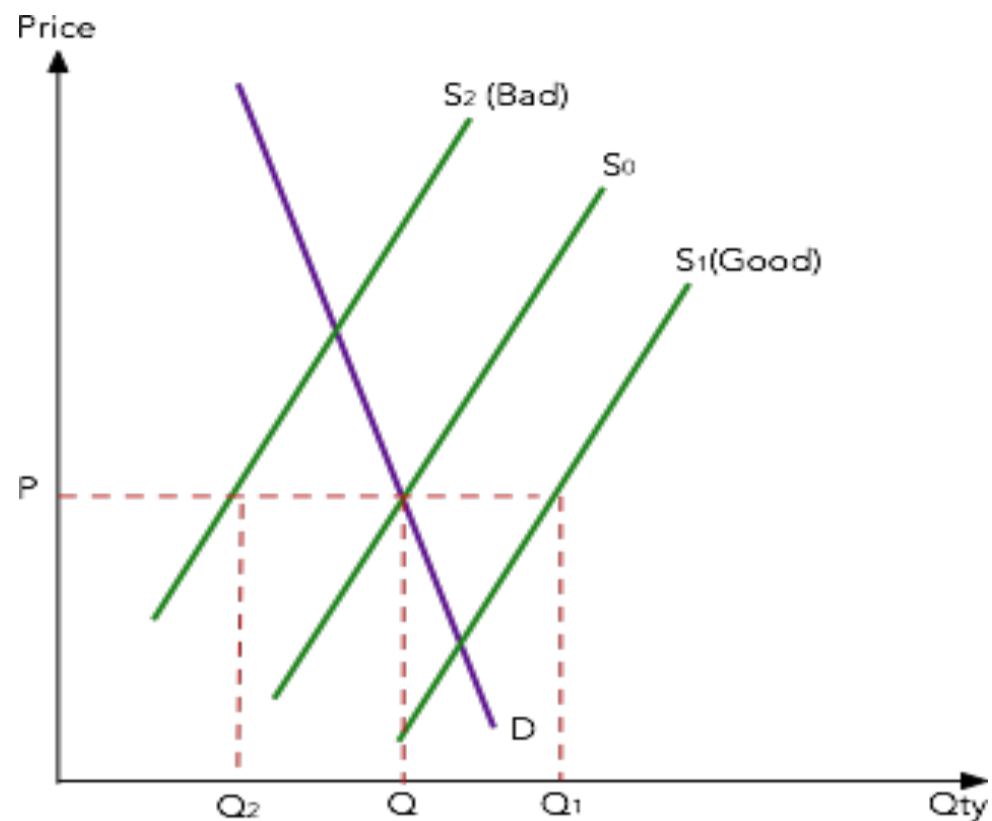
Problems of Buffer Stock Scheme

The problems with the buffer stock scheme include a high set up cost, excessive stock production for storage and inability to solve the fluctuating income problem.

- Considerable amount of money is needed to set up the scheme, as money would be required to buy produce when quantity is high due to good crop. Also there will be a cost of administration and storage.

- It works only if goods are non-perishable.

- It is nearly impossible to ensure that the amount kept in storage will equal the amount required for release in the future to lower prices. Many buffer stock schemes end up storing too much.

- Buffer stock scheme may stabilize food prices but will not solve the problem of fluctuating incomes. In order to
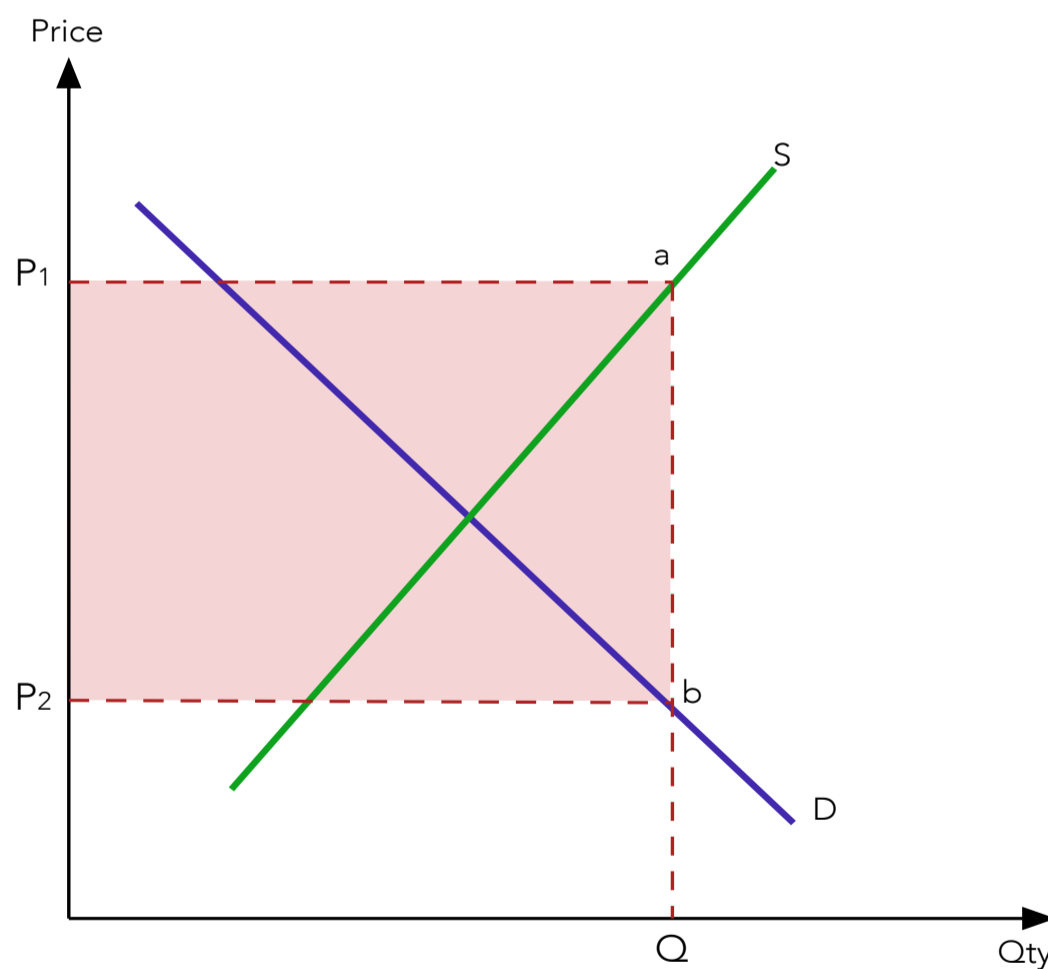
overcome this problem, government may undertake buffer stock schemes that stabilize incomes, but in that case, prices will fluctuate.

Guaranteed Price Scheme

The government guarantees a price e.g. P_1. Farmers therefore produce Q. The market-clearing price for this quantity is P_2 (i.e. this is the price at which this quantity is demanded) and so the government pays a subsidy to the farmers equal to P_2 P_1 per unit and the total subsidy is P_2P_1ab (the shaded region). By allowing the market to clear, this system means the government does not have to store the crops.

Figure 5.6 **Guaranteed price scheme**

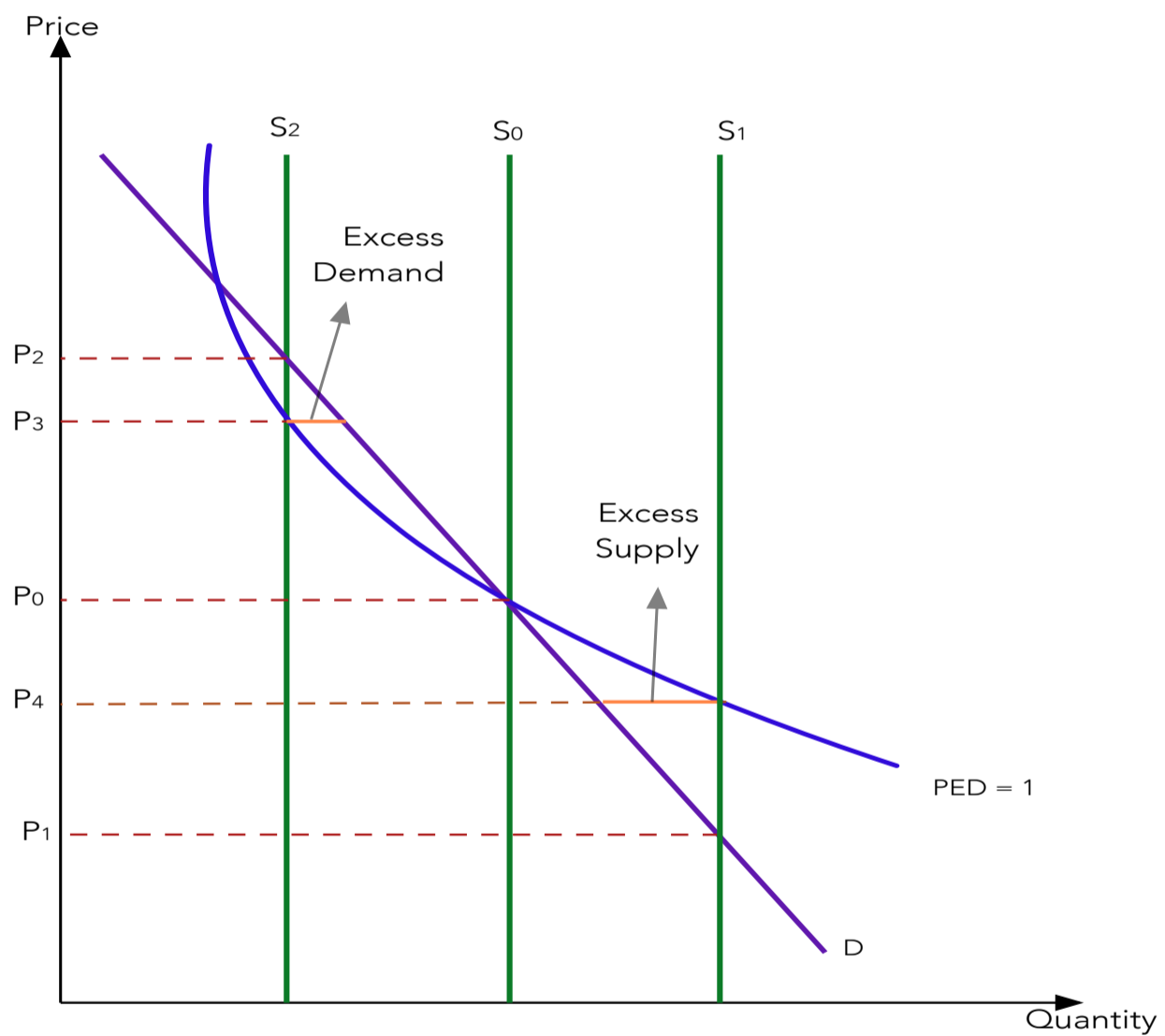## Income Support Scheme

A scheme, which keeps the price that farmers receive constant, still leads to unstable income. Alternatively the government can stabilize income but this means prices will still fluctuate.

FIGURE 5.7 **Income Support Scheme**

In a free market the price would fluctuate from P_0, P_1 and P_2 and incomes would fluctuate. Government sets prices from the unit elastic demand curve so that farmers' incomes are constant, i.e. P_3, P_0, P_4. When supply is S_1 government sets price P_4. At this price there is excess supply; government buys this up creating a buffer stock. When supply is S_2 government sets price P_3. There is excess demand which is eliminated by the government selling the buffer stock.

INDIRECT TAXES AND SUBSIDIES

Taxes can be categorized as direct or indirect taxes. Indirect tax is levied on expenditure on goods or services while direct tax is a tax charged directly to an individual based on a component of income.

Indirect taxes can be imposed on a specific or an ad valorem basis. Specific or unit taxes are a fixed amount per unit of the good produced or consumed. For example, a tax of $5 per unit of a good is a specific tax. Ad valorem taxes are a percentage of the price and so of consumer expenditures. Value added tax (VAT) is an example of an ad valorem tax, which is expressed as a percentage, say 25%, of the price of the good.

Governments impose indirect taxes for a variety of reasons. Typical reasons include revenue collection or an attempt to decrease the consumption of goods. Governments need revenues to finance their expenditures and indirect taxation is one source of revenue. Some goods are considered harmful and governments often try to limit their consumption; examples include cigarettes, alcoholic drinks and petrol (gasoline). Another reason for governments imposing taxes is that they wish to switch expenditures away from imports towards domestically produced goods. One way of doing this is by imposing taxes (known as tariffs) on imports.

1. Specific Tax

A specific tax will shift the supply curve in a parallel fashion where the vertical distance of the shift will be equal to the tax.
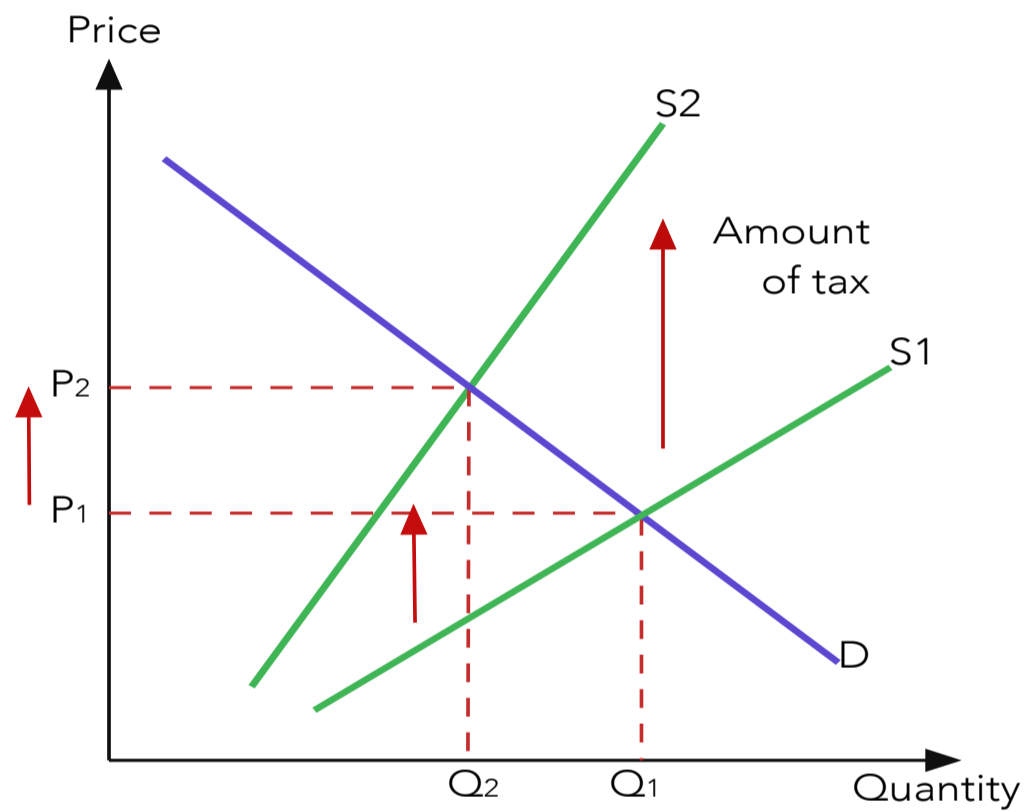
FIGURE 5.8 **Specific Tax**
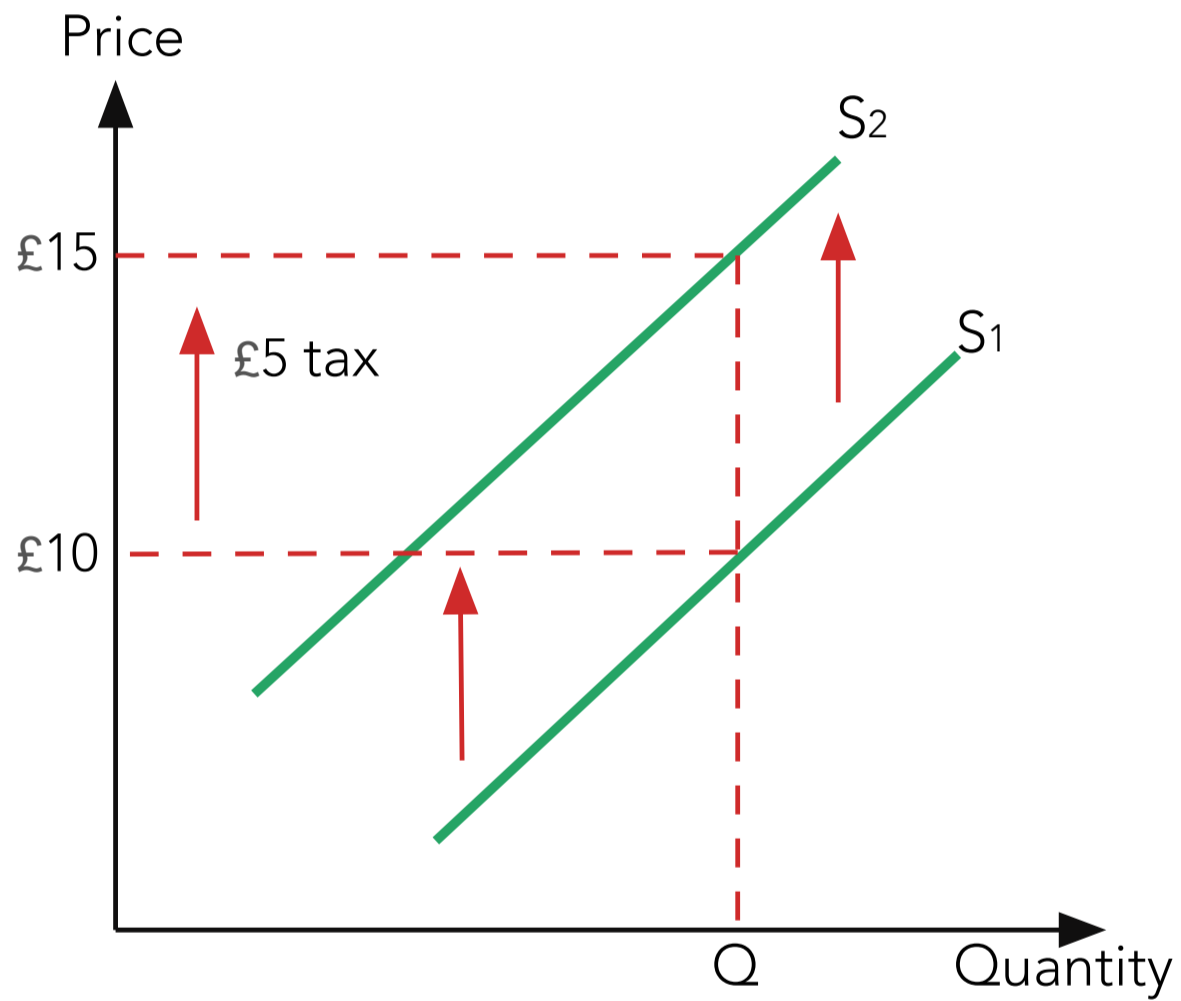
2. Ad valorem Tax

An ad valorem tax shifts the supply curve to the left in a non-parallel fashion, where the vertical distance widens at higher prices.

FIGURE 5.9 **Ad Valorem Tax**

Consequences of a specific indirect tax

Assuming typical demand and supply curves, an indirect tax will make the good more expensive, will decrease the amount consumed and produced, and will create revenues for the government. Producers will be earning lower revenues both on a per unit basis and as a total. Consumer spending on the good may increase or decrease, depending on PED. More specifically, and referring to the figure below, the following occurs.

FIGURE 5.10 **Specific Indirect Tax**

Before Tax:
CS = 1+2+3
PS = 4+5+6

After Tax:
CS = 1
PS = 6

Tax Revenue = 2+5
DWL= 3+4
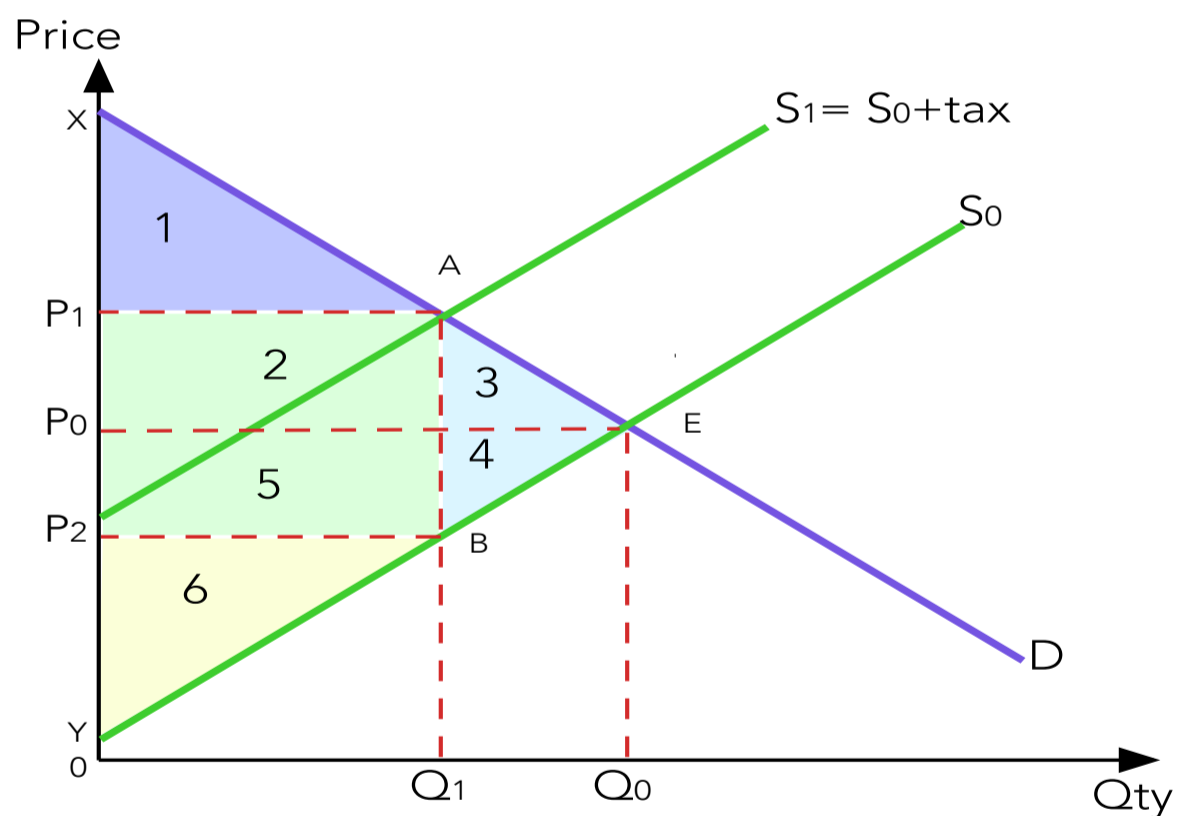
In the figure 6.10 a market is illustrated with a demand curve D and a supply curve S_0. Assume a specific tax equal to AB dollars per unit (P_1- P_2). Supply will shift vertically upwards to S_1 by distance AB. Alternatively, you may think

of MC increasing by AB dollars per unit so that the new supply curve, S_1 is equal to the initial one S_0 plus the tax.

- The market price rises from P_0 to P_1 per unit while the equilibrium quantity decreases from Q_0 to Q_1 per period. Output and consumption of the good therefore shrink. As a result, the consumer surplus falls from Area 1 + 2 + 3 (Triangle XEP_0) to Area 1 only (Triangle XAP_1)

- Producers earn only P_2 per unit sold, so their new revenue is less (Q_1 x P_2). The producer surplus decreases from Area 4 + 5 + 6 (Triangle YEP_0) to Area 6 (YBP_2).

- Consumer expenditures may increase, decrease or stay the same, depending on the PED, as there is a movement along the demand curve following the shift in supply. Since the price consumers pay increases, their expenditures on the good will increase if demand is price inelastic.

- The government collects tax revenues equal to Area 2 + 5. This area is found by multiplying the tax per unit (AB or P_2 - P_1) by the number of units sold Q_1.

- Resources are misallocated and a welfare loss equal to Area 3 + 4 (Triangle ABE) results, unless the tax is imposed to limit production of a polluting industry or to curtail consumption of a harmful good, such as cigarettes.

Advantages of Indirect Taxes

a) Indirect taxes use the market forces of demand and supply to alter production.

b) Indirect taxes are easy to administer. Since the tax is included in the price of a product, tax evasion is difficult.

c) Indirect taxes raise revenue for the government.

Disadvantages of Indirect Taxes

a) Indirect taxes do not allow the market to operate freely. By raising the cost of production, indirect taxes force producers to reduce supply. The interference with forces of demand and supply leads to welfare losses.

b) Indirect taxes are less effective when demand for a good is price inelastic. When demand for a good is price inelastic, quantity demanded is less sensitive to price changes. Therefore, a large tax will be needed to initiate a small proportionate reduction in quantity demanded.

c) They are regressive in nature as the rich and poor may pay the same tax if consumption is same.

d) They are also inflationary as they increase the cost of production artificially.

Elasticity & Incidence of Taxation

The extent, to which the incidence of tax falls on consumers, rather than producers, depends upon the elasticity of demand and supply. Elasticity will also determine the extent to which the quantities will change after tax.

FIGURE 5.11 **Incidence of tax on consumers**

Perfectly Inelastic Demand

Perfectly Elastic Supply
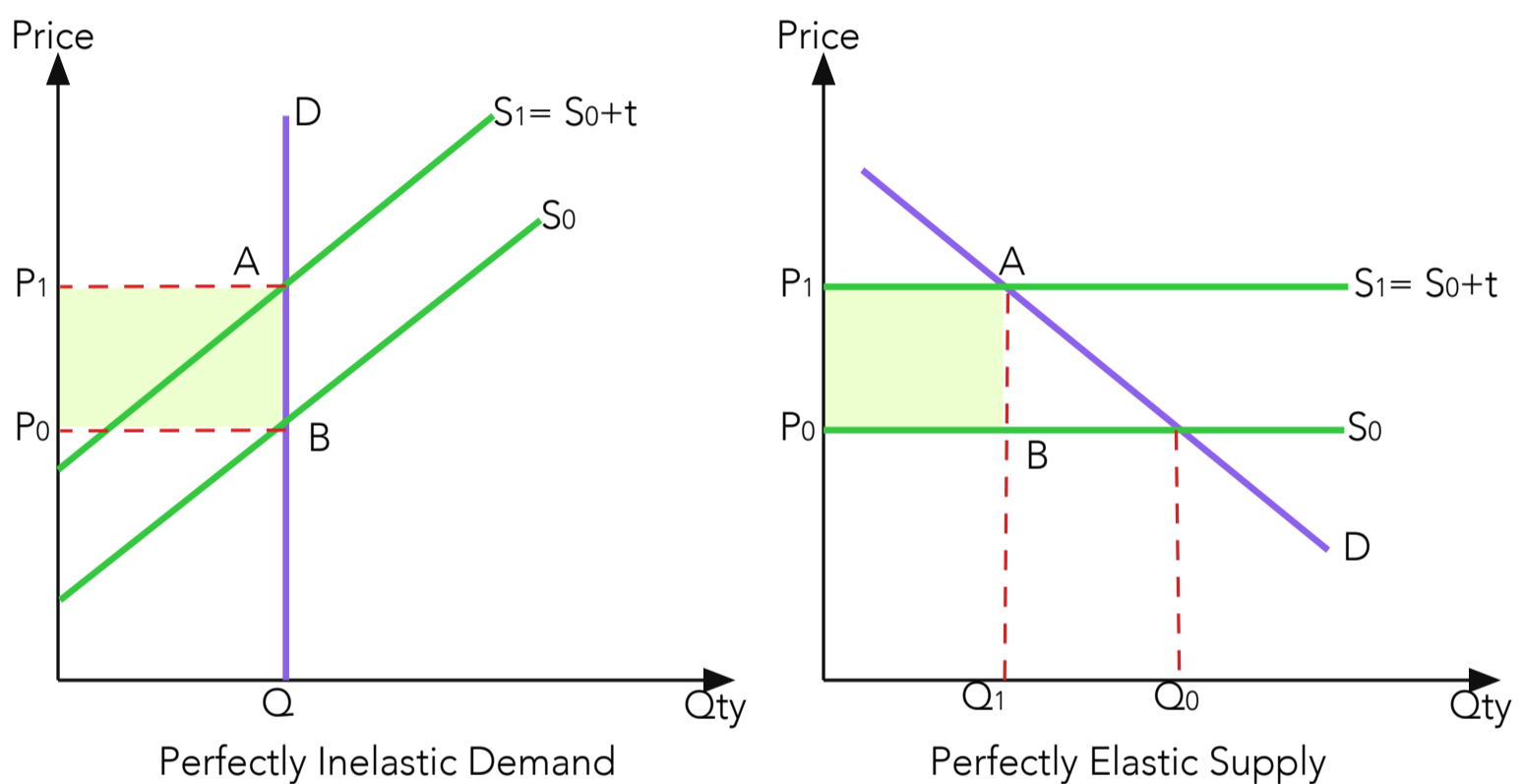
In the diagram above, when the demand is perfectly inelastic and the supply is perfectly elastic, the consumer bears the whole incidence of the tax. The price rise after tax is equal to the amount of the tax.

If	Then	In other words
PES > PED	Tax incidence on consumers is bigger than on producers	% of tax on consumers > % of tax on producers
PES = PED	Tax incidence is split between consumers and producers	% of tax on consumers = % of tax on producers
PES <PED	Tax incidence on producers is bigger than on consumers	% of tax on consumers < % of tax on producers
PES = 0	Producers are burdened by the full amount of tax	100% of tax is on producers and 0% on consumers
PED = 0	Consumers are burdened by the full amount of tax	100% of tax is on consumers and 0 % on producers
PES → ∞	Consumers are burdened by the full amount of tax	100% of tax is on consumers and 0% on producers
PED → ∞	Producers are burdened by the full amount of tax	100% of tax is on producers and 0% on consumers

SUBSIDIES

A subsidy is defined as a per unit payment to firms by the government aimed at lowering their costs and the market price, and at increasing production, consumption and firms' revenues. Its analysis is symmetrical to that of an indirect tax as once a subsidy is granted the government is paying (and not getting paid) a per unit amount of money to firms. Production costs are lower by the amount of the subsidy so supply shifts vertically downward by that amount (the marginal cost of producing each unit of output is now lower).

FIGURE 5.12 **Subsidy**

Before Subsidy:
CS = A+B+C
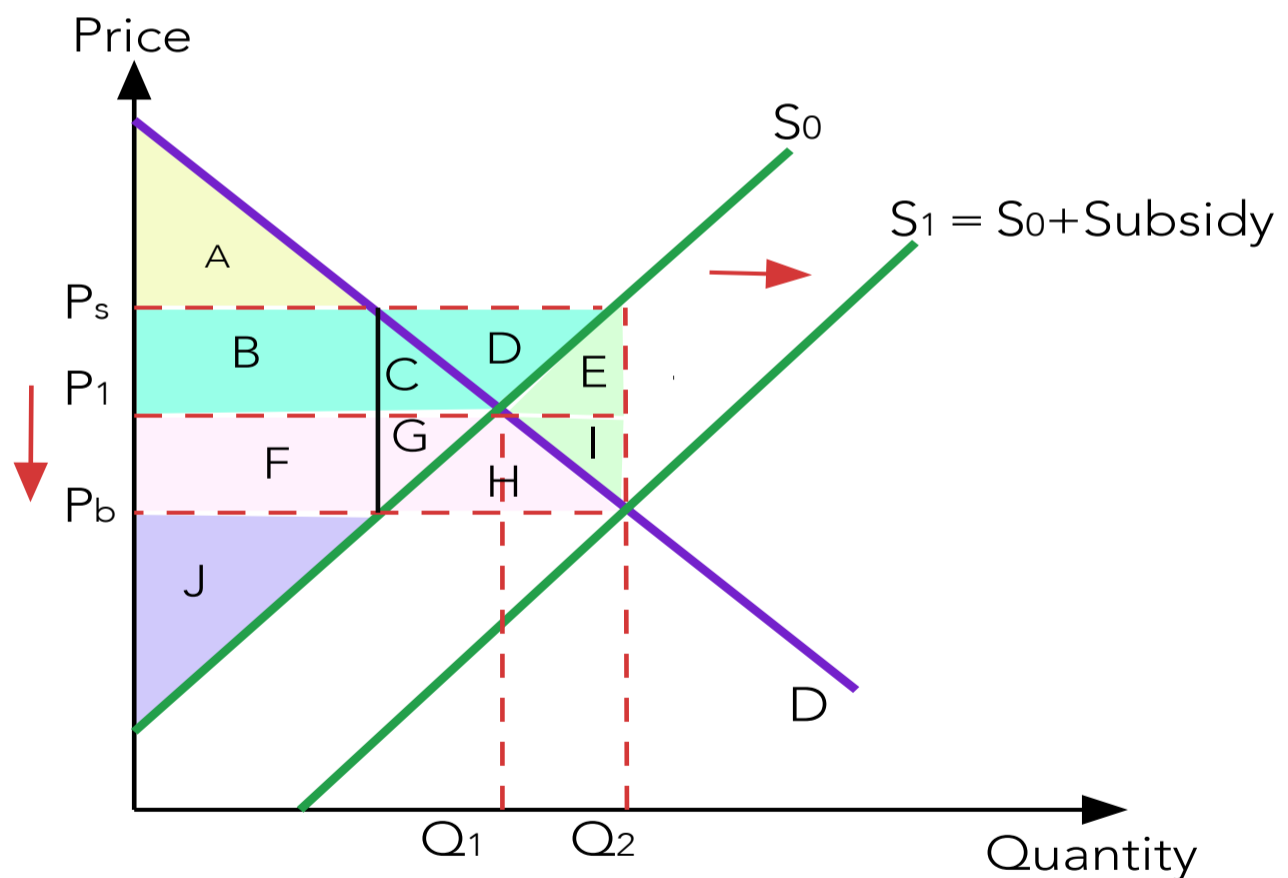**PS = F+G+J**

After Subsidy:
CS =
A+B+C+F+G+H
PS =
F+G+J+B+C+D

Cost =
B+C+D+E+F+G+
H+I
DWL = E+I

Governments grant subsidies for a variety of reasons. Typically, they are granted when it is considered desirable

to make a particular good cheaper so that its consumption increases and it becomes accessible to lower-income households. This includes many health-care and education-related products. Or governments may wish to expand output and consumption of products that are environmentally friendlier. Often governments grant subsidies to farmers to increase their income because of certain characteristics of the agricultural sector. Or it could be that a subsidy is used to make a particular good more competitive and attractive abroad so that it penetrates foreign markets, or to limit imports of competing goods from abroad.

In the pre-subsidy market for gasoline, the supply curve S0 intersects with the demand curve D at the equilibrium price P_1 and equilibrium quantity Q_1. The consumer surplus is A + B + C, and the producer surplus is F + G + J. After a government subsidy is put in place, the supply curve shifts down by the amount of the subsidy, Ps – Pb, to S_1. At the equilibrium, the quantity increases to Q2, the price facing suppliers is Ps, and the price facing buyers is Pb. Consumer surplus is now A + B + C + F + G + H, and producer surplus is F + G + J + B + C + D. The cost of the subsidy is B + C + D + E + F + G + H + I, and the deadweight loss is E + I. Therefore, the costs associated with the subsidy are larger than the sum of the benefits to producers and consumers.

Advantages of Subsidies

a) Subsidies use the market forces of demand and supply to alter production.

b) Subsidies are less costly to government in comparison of direct provision of goods and services.

c) Subsidies allow local producers to reduce cost of production. Producers can then use more funds for investment in new production methods and product development.

Disadvantages of Subsidies

a) There is an opportunity cost associated with the subsidy, as government must spend money on subsidizing goods instead of spending funds on other initiatives such as building schools or infrastructure.

b) Subsidies are less effective when demand for a good is price inelastic. When demand for a good is price inelastic, quantity demanded is less sensitive to price changes. Therefore, a large subsidy will be needed to initiate a small proportionate increase in quantity demanded.

c) Subsidies might increase inefficiency, if given for a long period of time. Producers may start relying on government grants to reduce the cost of production and may not make any efforts on their own to reduce wastage and become more efficient.

d) Subsidies are beneficial only if producers pass them onto consumers in form of lower prices and higher output. Government will need to allocate resources in order to administer whether firms are doing so.

e) Subsidies are paid out of tax revenue. Therefore, higher subsidies would eventually put more burden on the tax payers.

Public Goods

	Rival	Non - Rival
Excludable	PRIVATE GOODS eg. chocolate bar	QUASI PUBLIC GOODS eg. cable television
Non - Excludable	QUASI PUBLIC GOODS eg. public park	PUBLIC GOODS eg. national defence

Public goods are **non-rival** and **non-excludable**. Non-rival means that consumption of a good or service does not prevent another person from consuming that good. For example, streetlight is non-rival because if one person uses the light provided by it, it does not prevent another person from also benefitting. Non-excludable means that once a good is provided it is impossible to exclude payers from non-payers of the goods.

Few examples of pure public goods exist. A lighthouse, national defense and traffic lights are typical examples. If a lighthouse is built and maintained on some island no fisherman can be excluded from its benefits. If the lighthouse is 'used' by one boat the amount of its service available to other boats is the same (the marginal cost of one more boat using the service is zero).

A different example of a pure public good is broadcast television and radio. Both public good properties are satisfied. A broadcast television program is normally available to any household with a television (a private, separate good). Also, if one person watches the program there is no less of it available for others to watch. Interestingly, television and radio broadcasting, despite its public good features, is produced and offered by private, for profit companies. This is possible because broadcasters are not selling the programs but the advertising time, which is both excludable and rival.

If the provision of public goods were left to the market mechanism, there would be a market failure; this is because of the free rider problem, as these goods are non-rival and non-excludable, making people to have no incentive to pay for it. The only way these goods are provided, is through direct provision by the government which is funded through raising tax revenue.

MERIT AND DEMERIT GOODS

Merit good

Merit goods are a special class of goods that are defined in terms of positive externalities generated and in terms of informational failures involved. If the consumption of a good creates very significant positive externalities then it is referred to as a merit good. As a result it is under provided by the market mechanism. Education and health care are prime examples which not only have positive effect on people who consume them but they can benefit others. Also, individuals may not be aware of the benefits arising from the consumption of the good because of lack of information as costs occur today but the benefits received come only in the future (time lags). Government would like all members of society to consume in adequate quantities independently of their income or even their preferences.

Demerit good

Demerit goods are a special class of goods that are defined in terms of negative externalities generated and in terms of informational failures involved. If the consumption of a good creates very significant negative externalities then the product is referred to as a demerit good. Alcoholic drinks and tobacco products are good examples. Not only do they have a negative effect on people who consume them in excessive amounts but they can also harm others, for example, through passive smoking. Also , individuals may not be aware of the costs arising from the consumption of the good because of lack of information. They are unable to stop consuming them because these goods are addictive. It can therefore be said that consumers of these goods are not the best judges of their own interest. Hence, governments would like to limit consumption.

PROVISION OF INFORMATION

Market failure can be caused by imperfect information. A government could therefore decide to intervene in a market to increase the availability of information in order to try to influence economic behaviour.

It is assumed that consumers will always aim to maximise their utility or satisfaction, but this objective will only be achieved if they have all the necessary information. If this is not the case, it is unlikely that they will make rational decisions.

Information failure is a major cause of market failure and so a government will need to take measures to improve both the accuracy and the availability of information that consumers need. For example, a government could make people as well informed as possible about the potential advantages of merit goods, such as education and health care. It could also make people as well informed as possible about the potential disadvantages of demerit goods, such as alcohol and tobacco. A particular example of such an approach in relation to the consumption of demerit goods is 'nudge' theory.

Income and wealth

It is important to be aware of the distinction between income and wealth. Income is the flow of wages and earnings from other sources in a period, whereas wealth is the stock of accumulated assets. An example of such assets would be where an individual owns property. If an individual saves part of his or her income, this accumulates as wealth. However, wealth may also come from other sources – in particular, from legacies. Ownership of wealth can also generate a flow of income in the form of interest and dividend payments.

The distribution of income and wealth and inequality

The income distribution describes how income is distributed amongst the population. You will be aware that not everyone receives the same income, so
there is some inequality in the income distribution. The same applies to the wealth distribution; indeed, wealth tends to be more unequally distributed than income. There are differences between countries in the extent of such inequality in income and wealth.

MEASURING INCOME AND WEALTH INEQUALITY

Inequality is present in all societies, and always will be. However, the degree of inequality varies from one country to another; and before exploring the causes of inequality, and the policies that might be used to influence how income and wealth are distributed within society, it is necessary to be able to characterise and measure inequality. This is important in order to be able to judge relative standards of living in different countries or different periods.

One way of presenting data on this topic is to rank households in order of their incomes, and then calculate the share of total household income that goes to the poorest 10%, the poorest 20% and so on.

THE GINI COEFFICIENT

The Gini coefficient is a way of expressing the degree of inequality in a country in quantitative terms, making it possible to compare inequality across countries.

In published data, the Gini coefficient is usually expressed as a percentage (i.e. multiplied by 100). The closer the Gini coefficient is to 100, the more unequal is the income distribution. It is measured by the ratio of the area between the diagonal line of total equality and the Lorenz curve to the total area under the diagonal line The bigger this area, the more unequal is the distribution of income.

Country	Gini Coefficient
USA	41.5
Pakistan	33.5
China	38.6
Brazil	53.3
Belarus	25.4
South Africa	63.0

ECONOMIC REASONS FOR INEQUALITY OF INCOME AND WEALTH

There are a number of different possible economic reasons for the inequality of income and wealth, including the following:

1. **Employment**: a major cause of income equality is the ability of people to obtain well-paid employment. When there is an increase in unemployment in an economy, there will be fewer people receiving wages and salaries and more people receiving benefits. When there is a decrease in full-time employment and an increase in part-time employment, income inequality will increase because pay is usually lower in part-time than in full-time employment.

2. **Government policy**: For many workers, a weak economic situation could have given rise to a "wage freeze" or to lower-than-inflation wage rises as a result of government policy to reduce the rate of inflation. This is particularly true of workers in the public sector who may have experienced a fall in their real standard of living where wage increases have been less than price increases

3. **Taxation:** A government may decide to raise the level of taxation in order to increase public revenue. It might also make tax more regressive where proportionally more tax is taken from people on lower incomes than those on higher incomes

4.**Distribution of wealth:** People who already hold wealth are able to invest which creates new wealth, i.e. the existing concentration of wealth makes inequality a vicious cycle

POLICIES TO REDISTRIBUTE INCOME AND WEALTH

Governments have a range of measures that can be introduced to affect the distribution of income and wealth.

A MINIMUM WAGE

Minimum wage can be seen as one way of influencing the distribution of income, by ensuring that low-paid workers are not exploited by employers paying low wages. It is not clear to what extent this will have a significant impact on the overall income distribution. With a minimum wage in effect, workers (those who manage to remain in employment) are better off, and now receive a better wage. However, those who are now unemployed are worse off. It is not then clear whether the effect of the minimum wage is to make society as a whole better off – some people will be better off, but others will be worse off.

It is not clear how many workers would benefit from the imposition of a minimum wage, even if they remain in employment. Partly this may depend on the level at which the minimum wage is set – there may be workers who are unaffected by the policy because they earn marginally more than the minimum, or because they are paid on piecework rather than by time. In countries where there is significant informal working, the policy may not reach those in most need.

TRANSFER PAYMENTS

Governments in many countries make transfer payments to poor households. These may be in the form of cash benefits, such as income support, child benefit, incapacity benefit and working families tax credit. These benefits are designed to protect families in certain circumstances whose income would otherwise be very low. Second, there are benefits in kind, such as health and education. These benefits accrue to individual households depending on the number of members of the household and their age and gender.

TAXATION

There are two main forms of taxation – direct taxes levied on various forms of income, and indirect taxes that are levied on expenditure.

Direct taxes (taxes on incomes) tend to be progressive: in other words, higher income groups pay tax at a higher rate. Direct taxes include income tax, corporation tax (paid by firms on profits) and capital gains tax (paid by individuals who sell assets at a profit).

With a tax such as income tax, its progressive nature is reflected in the way that the percentage rates payable increase as an individual moves into higher income ranges. In other words, the marginal tax rate increases as income increases. The progressive nature of the tax ensures that it does indeed contribute to reducing inequality in the income distribution.

The effect of indirect taxes can sometimes be regressive: in other words, indirect taxes may fall more heavily on lower-income households. Indirect taxes are taxes that are paid on items of expenditure, rather than on income.

STATE PROVISION OF ESSENTIAL GOODS AND SERVICES

In the case of public or merit goods, the state may choose to intervene directly to ensure that essential goods and services are made accessible to the population. The authorities may subcontract this provision to the private sector. In the case of goods and services like health and education, the government may indeed intervene directly, but practice does vary between countries. In times of war or civil conflict, it may be that markets break down, so that the state (or other organizations) have to supply essential goods and services to the population.