

# Unit 1: Introduction to Economics

Brendan F. Kenny

November 16, 2021

# Assessment Objectives

## SL/HL Content: Learning Objectives

AO2	Explain the social nature of economics
AO2	Distinguish between microeconomics and macroeconomics
AO2	Introduction to the nine central concepts: scarcity, choice, efficiency, equity, economic well-being, sustainability, change, interdependence, intervention
AO2	Explain the meaning of scarcity. – as unlimited human needs and wants met by limited resources – in relation to sustainability
AO2	Identify and explain the four factors of production
AO2	Explain the meaning of opportunity cost and its relationship to choice and free goods

# What is economics?

- The economic problem is that of having unlimited wants but a limited supply of economic resources with which to satisfy them.
- **Economics** is the study of choices leading to the best possible use of scarce resources in order to best satisfy unlimited human needs and wants.
  - ▶ It is a social science because it deals with human society and behaviour
  - ▶ The economics approach is based on the scientific method
- There are two central questions that will be used to explore and motivate our discussion throughout the course.
  1. How do people and firms respond to incentives?
  2. How do we allocate scarce resources with alternative uses?

# Branches of economics

- Economics can be divided into two main branches.
1. **Microeconomics** is the branch of economics that examines the behaviour of individual decision-making units, consumers and firms.
    - ▶ It is concerned with consumer and firm behaviour and how their interactions in markets determine prices in goods markets and resource markets.
  2. **Macroeconomics** is the branch of economics that examines the economy as a whole by use of aggregates, which are wholes or collections of many individual units such as output of the entire economy as well as total employment and the general price level.
    - ▶ It is concerned with economy-wide issues such as unemployment, inflation, and growth. [[Website of macroeconomic indicators](#)]

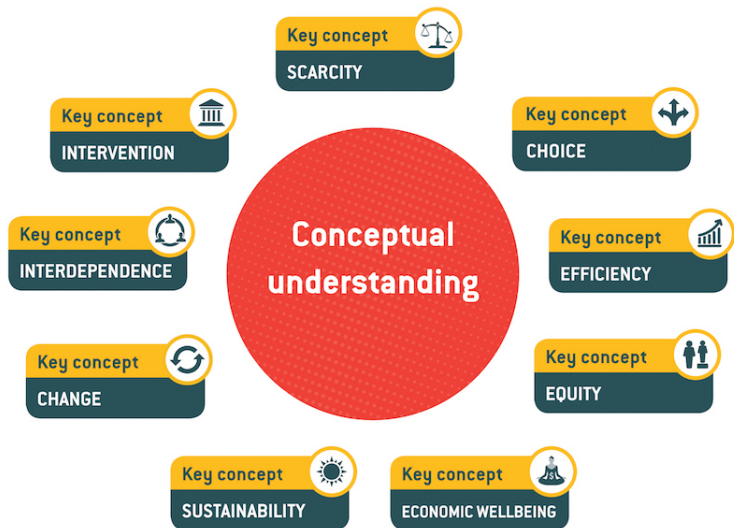
# Central concepts

- There are nine central concepts that guide the field of economics and that you will encounter throughout the course.
1. **Scarcity** refers to the idea that resources are insufficient to satisfy unlimited human wants and needs.
  2. **Choice** refers to the fact that since resources are scarce, choices must be made about what will be produced and what will be forgone.
    - ▶ Choices must be made between competing alternative options
  3. **Efficiency** refers to making the best possible use of scarce resources to avoid resource waste.
    - ▶ **Productive efficiency** means using the fewest resources possible to produce goods and services.
    - ▶ **Allocative efficiency** means producing the goods and services that most satisfy society's needs and wants.

4. **Equity** refers to the idea of being fair or just.
  - ▶ Fairness is a normative concept because ideas of what is fair vary according to beliefs, value judgements and ideologies.
  - ▶ Governments face a trade-off between equity and efficiency when intervening in markets.
5. **Economic well-being** refers to levels of prosperity, satisfaction and standards of living among members of society.
6. **Sustainability** refers to the long-term maintenance or viability of any particular activity or policy.
  - ▶ Ability of the present generation to satisfy its needs by the use of resources without limiting future generations' ability to satisfy their own needs.

7. **Change** refers to the dynamism in economic theory and in real-world events.
  - ▶ Real-world phenomena is characterized by continuous change in the institutional, technological, social, political and cultural environments in which economic events occur.
8. **Interdependence** refers to the idea that economic decision-makers interact with and depend on each other.
9. **Intervention** refers to government involvement with the workings of markets.
  - ▶ Market failure provides a justification for government intervention into free markets.
  - ▶ Free markets on their own often fail to achieve equity, sustainability, economic well-being or efficiency

# Central concepts





# Scarcity and choice

- **Scarcity** is the situation in which available resources, or factors of production, are finite, whereas wants are infinite. There are not enough resources to produce everything that human beings need and wants.
  - ▶ The fundamental problem of economics is having unlimited needs and wants but limited resources with which to satisfy them.
  - ▶ Wants and needs are satisfied by physical objects called **goods** (food, clothing, housing, television, car etc.) and non-physical activities called **services** (education, health care, entertainment, banking, travel etc.)
  - ▶ Due to limited resources, economic agents must continually make choices.
  - ▶ Since resources are scarce, it is important to avoid waste in how they are used.

# Test your understanding

**Question:** Explain why diamonds are far more expensive than water, even though diamonds are a luxury while water is a necessity without which we cannot live.

## Paradox of value



# Economic choice

- Economic choices are made according to the following four principles.
1. **Self-interest motive** refers to the assumption that individuals are rational and pursue their own self-interest and are primarily concerned with their own welfare.
    - ▶ Economic agents will continually compare the costs and benefits of their actions when making choices.
  2. **Utility maximization** refers to maximizing the satisfaction that one expects to receive from owning and using an economic good or service.
    - ▶ Economists assume that whenever you make an economic choice that you are trying to maximize your own utility.

3. **Opportunity cost** refers to the cost of any activity measured in terms of the best alternative activity that is forgone.
  - ▶ Economic agents must keep in mind the opportunity cost of each alternative when making decisions
4. **Profit maximization** refers to the assumption that firms supply consumers to maximize their own profit.
  - ▶ Firms may pursue alternative objectives, but the primary objective of the firm is to maximize profits

# Scarcity and sustainability

- **Sustainability** refers to maintaining the ability of the environment and the economy to continue to produce and satisfy needs and wants into the future.
  - ▶ Economic activities in many countries are often achieved at the expense of the natural environment and natural resources.
  - ▶ Sustainability depends on **sustainable resource use** referring to the preservation of the environment over time.
  - ▶ The problem of sustainability arises because resources are scarce.
  - ▶ **Sustainable development** involves meeting the needs of the present without compromising the ability of future generations to meet their own needs.

# Resources as factors of production

- **Economic resources** are the scarce resources that are used to produce economic goods and are called factors of production. These fit into one of four categories.
1. **Land** refers to any factor of production that is provided by nature.
    - ▶ Consists of all natural resources as well as everything that is under or above the land.
    - ▶ **Example(s):** Minerals, oil reserves, forests and lakes
  2. **Labour** refers to the human input into the production process
    - ▶ Includes the physical and mental effort that people contribute to the production of goods and services.
    - ▶ **Example(s):** Efforts of a doctor, taxi driver, and construction worker

# Resources as factors of production

3. **Capital**, also known as physical capital, is the man-made factor of production used to produce goods and services.
  - ▶ Physical capital is also referred to as a capital good or investment good
  - ▶ **Example(s):** Machinery, tools, factories, road systems and harbours
4. **Entrepreneurship (Management)** refers to the resource that organizes the other three factors of production and takes on the risks of success or failure of a business.
  - ▶ It is the human skill involving the ability to innovate, to take business risks and seeks new opportunities for opening and running a business
  - ▶ **Example(s):**  
Elon Musk (CEO of Tesla) and Jeff Bezos (CEO Amazon)

# Other types of capital

- Capital, in the most general sense, refers to resources that can produce a future stream of benefits.
- **Physical capital** refers one of the factors of production consisting of man-made inputs that provide future benefits in the form of the ability to produce greater quantities of output.
- **Human capital** refers to the skills, abilities and knowledge acquired by people, as well as good levels of health, all of which make them more productive.
- **Financial capital** refers to investments in financial instruments, like stocks and bonds, or the funds that are used to buy financial instruments.
- **Natural capital** refers to an expanded meaning of land resources and includes additional natural resources such as the global climate.



# Opportunity Cost

- **Opportunity cost** is the value of the next best alternative that must be sacrificed to obtain something else.
  - ▶ Every time we choose to do something, we give up something else we could have done instead
  - ▶ Opportunity cost is central to the economic perspective of the world and results from the scarcity that forces choices to be made.
  - ▶ **Example(s):** The opportunity cost of university is the sum of your university expenses plus the money you could have earned had you chosen to work

# Test your understanding

**Question:** Think of three choices that you have made during the past week and describe the opportunity cost of each one.

# Free and economic goods

- **Free good** is any good that is not scarce, and therefore has a zero opportunity cost.
  - ▶ Since it is not limited by scarcity, it includes anything that can be obtained without sacrificing something else.
- **Economic good** is any good that is scarce, either because it is a naturally occurring scarce resource, or because it is produced by scarce resources.
  - ▶ Sometimes a good can be a free good in certain situations and an economic good in others
  - ▶ **Public goods** and **common pool resources** are two categories of goods that are available free of charge, but which do have opportunity costs and are therefore economic goods.

# Test your understanding

**Question:** Identify which of the following goods are “free goods” and explain why:

1. Public parks
2. Sand in the Sahara desert
3. Garbage collection
4. Free health care services
5. Wildlife

# Unit 1: Introduction to Economics

Brendan F. Kenny

September 30, 2020

# Assessment Objectives

## SL/HL Content: Learning Objectives

AO2	Identify and explain the three basic economic questions
AO2	Distinguish between the role of markets and government intervention in designing and proposing solutions to the basic economic questions
AO2	Distinguish between economic systems: the free market economy, planned economy and mixed economy

# The basic economic questions

Scarcity forces every economy in the world to answer three basic questions.

- **What/how much to produce?**

- ▶ All economies must choose what particular goods and services and what quantities of these they wish to produce.

- **How to produce?**

- ▶ All economies must make choices on how to use their resources in order to produce goods and services.
- ▶ Goods and services can be produced by use of different combinations of factors of production, by using different skill levels of labour, by using different technologies or by using different raw materials.

- **For whom to produce?**

- ▶ All economies must make choices about how the goods and services produced are to be distributed among the population.

# Test your understanding

**Question(s):** Read the statements below. Determine whether each statement refers to a market or command system and which economic decision the statements reflect (What?, How? and For whom?)

1. Goods and services are distributed primarily according to ability and willingness of the buyers to pay.
2. Resources are distributed primarily by competitive bidding among producers.
3. The use to which resources are put is determined by the goals set for society.
4. Signals are sent through chains of markets indicating the pattern of consumer choices.
5. Decisions about whether to produce more cars and refrigerators rather than more factories are made by a central authority.



# Test your understanding

6. A significant number of goods and services are made available without cost to all citizens.
7. Competitions among producers, stimulated by the desire for profit, motivates producers to keep their costs as low as possible in order to appeal to consumers.
8. The motivation for increased productivity is the desire to reach output goals rather than to make the largest possible profit.
9. The use to which resources are put is determined by the desire for profit.
10. Consumers have choices in the market, but their choices do not act as signals in determining what will be produced.

# Resource allocation

**Resource allocation** refers to assigning available resources or factors of production, to specific uses chosen among many possible alternatives.

- ▶ Involves answering the “What/how much to produce?” and “How to produce?” questions.
- ▶ If a decision is made to change the amount of goods produced, this involves a **reallocation of resources**.
- ▶ If too many units are being produced there is an **overallocation** of resources to production of these units.
- ▶ If too few socially desirable goods and services are being produced, we say there is **underallocation** of resources to the production of these.

# Test your understanding

**Question:** Consider the following, and identify each one as referring to output/income distribution or redistribution; or to resource allocation, reallocation, overallocation or under-allocation (note there may be more than one answer).

1. Evidence suggest that over two decades in many countries around the world the rich are getting richer and the poor are getting poorer
2. In Brazil, the rich 10% of the population receive 48% of total income
3. If countries around the world spend less on defence, they would be in a position to expand provision of social services, including health care and education.
4. Pharmaceutical companies spend most of their research funds on developing medicines to treat diseases common in rich countries, while ignoring the treatment of diseases common in poor countries.

# Output/Income distribution

The third basic economic question “For whom to produce” involves the **distribution of output**.

- ▶ Concerned with how much output different individuals or different groups in the population receive.
- ▶ The amount of output people can get depends on how much of it they can buy, which in turn depends on the amount of income they have.
- ▶ **Redistribution of income** involves changes in the distribution of income or output so that different social groups now receive more, or less, income and output than previously.

# Markets versus government intervention

In the **market method**, resources are owned by private individuals or groups, and it is mainly consumers and firms who make economic decisions by responding to prices that are determined in markets.

In the **command method**, resources are owned by the government, which makes economic decisions by commands.

**Government intervention** changes the allocation of resources and distribution of output and income from what markets would have achieved working on their own.

1. **Perspective 1:** Markets are able to work reasonably well on their own, and can produce outcomes that generally support society's well-being.
2. **Perspective 2:** Markets have the potential to work well, but in the real world their imperfections may be so important that they make government intervention necessary.

# Schools of economic thought

**Classical economics** follows the belief that a self-regulating economy is the most efficient and maintains that government involvement in managing the economy should be limited as much as possible.

- ▶ The free-market economy will allocate scarce resources in the most efficient manner to meet the needs of individuals and businesses.

**Keynesian Economics** follows the view that government should take an active role in managing the economy, particularly in depression/recession like periods.

- ▶ Maintains the view that government spending is necessary and important in stimulating economic activity.

# Test your understanding

**Question:** Identify some more examples of command methods (government intervention) in market economies.

**Question:** Outline the main source of disagreement between those who argue there should be little government intervention in the economy and those who argue the government intervention should be more extensive.

# Economic systems

**Free market economies** are based on the market approach.

- ▶ Households and firms are the resource owners and economic decision-makers.
- ▶ Product and resource markets determine prices of goods, services and resources.
- ▶ **Example(s):** USA, Hong Kong, Singapore

**Planned economies** is based on the command approach.

- ▶ Government makes all allocation and distribution decisions through non-price rationing
- ▶ Characterized by the absence of markets or the limited operation of markets
- ▶ **Example(s):** North Korea, Cuba, Russia



# Economic systems

**Mixed economies** combine mixed and command elements.

- **Example(s):** Canada, Sweden, Norway

The ideal-type free market and planned economies are distinguished from each other on the basis of three criteria.

Criteria	Free market	Planned economy	Mixed economy
Resource ownership	private	public	both
Decision-making	private	public	both
Rationing system	price	non-price	both

# Unit 1: Introduction to Economics

Brendan F. Kenny

June 22, 2021

# Assessment Objectives

## SL/HL Content: Learning Objectives

AO2	Identify and explain the relationships illustrated in the production possibilities curve model PPC
AO2	Use the PPC model to explain opportunity cost, scarcity, choice, unemployment, efficiency, actual growth and growth in production possibilities
AO4	Draw a diagram to explain all of the above concepts in the PPC model
AO2	Distinguish between increasing versus constant opportunity cost in the PPC model
AO4	Draw a diagram to illustrate the difference between increasing and constant opportunity cost in the PPC model

# Assessment Objectives

## **SL/HL Content: Learning Objectives**

AO2	Identify and explain the interdependent activities of decision-makers in the circular flow of income model: households, firms, the government, banks and the financial sectors, and the foreign sector
AO2	Explain the role of leakages and injections in the circular flow of income model
AO4	Draw a diagram to identify and explain the relationships illustrated in the circular flow of income model including leakages and injections

# Economic models

**Models** are simplified representations of something in the real world.

- They represent only the important aspects of the real world being investigated, ignoring unnecessary details.
- In order to focus on the relationship between two variables, economists must make assumptions to simplify the real world.
- **Ceteris paribus** is the assumption that all other things are held equal, or constant, except those under investigation
- This is used in economic models where we want to see the effect on one variable of a second variable changing.
- Sometimes the assumptions made in these models may reduce the models usefulness and validity.
- Economic models rely on the assumption that humans are **rational** with **perfect foresight** and will attempt to maximize their utility

# Production possibilities curve (PPC) model

The **production possibilities curve (PPC) model** is used to demonstrate how an economy and the key decision-makers within an economy deal with the scarcity of resources.

- PPC model is a positive economic tool that allows us to analyse the opportunity costs and trade-offs that individuals, firms and nations face when confronted with scarcity.
- The model will also be used to further analyse opportunity costs and efficiency.
- The **production possibilities curve** represents all combinations of the maximum amount of two goods that can produced by an economy, given its resources and technology, when there is full employment of resources and efficiency in production.
- All points on the curve are known as **production possibilities**.

# Production possibilities curve (PPC) model: Assumption(s)

In order for the economy to produce the greatest possible output, in other words somewhere on the PPC, two conditions must be met:

## 1. All resources must be fully employed

- ▶ This means that all resources are fully used.
- ▶ If there was unemployment of some resources, in which case they would be sitting unused, the economy would not be producing the maximum it can produce.

## 2. All resources must be used efficiently

- ▶ **Efficiency** refers to resources being used in the best possible way to avoid waste.
- ▶ Efficiency in production means that output is produced by the use of the fewest possible resources or at the lowest possible cost.

# Production possibilities curve (PPC) model: Example 1

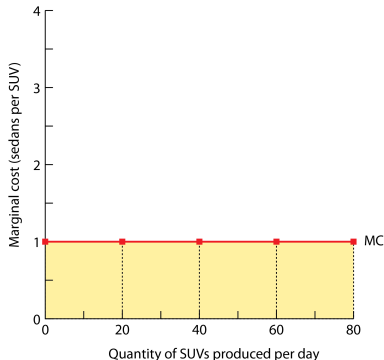
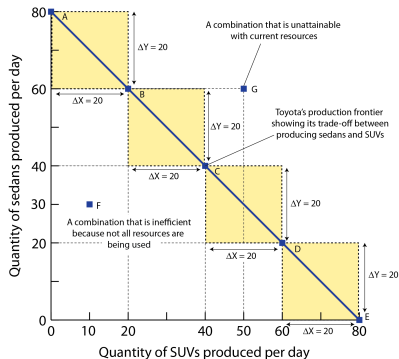
As an example we'll analyse the trade-off that Toyota Canada faces when producing two vehicles.

- Toyota has the choice of producing either sedans or sports utility vehicles (SUVs).
- We will make the assumption of constant opportunity costs.

Toyota's Production Possibilities at its Cambridge Plant		
Choice	Sedans Produced	SUVs Produced
A	80	0
B	60	20
C	40	40
D	20	60
E	0	80



# Production possibilities curve (PPC) model: Example 1



## Key takeaways

1. The economy cannot produce outside its PPC.
2. The economy must make a choice about what particular combination of goods will be produced. Choices involve opportunity cost.

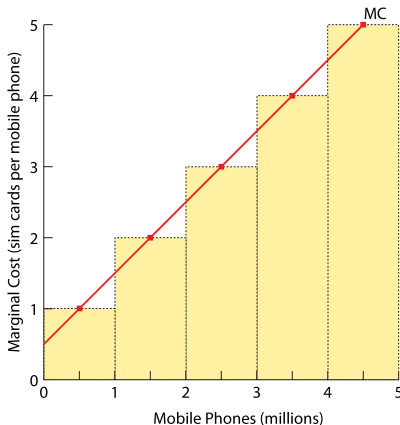
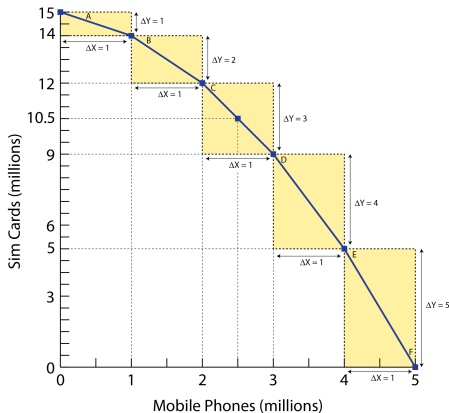
# Production possibilities curve (PPC) model: Example 2

Let's now look at the trade-off a mobile phone company, such as Rogers, faces when producing its products.

- Suppose the firm has the choice of producing either sim cards or mobile phones.
- We will now make the assumption of increasing opportunity costs.

Rogers Production Possibilities		
Choice	Sim cards produced	Mobile phones produced
A	15	0
B	14	1
C	12	2
D	9	3
E	5	4
F	0	5

# Production possibilities curve (PPC) model: Example 2



- The concave or bowed out shape of the PPC denotes increasing opportunity cost. The steeper the slope of the PPC, the higher the opportunity cost.

# Production possibilities curve (PPC) model: Efficiency

Producing any combination on the PPF indicates **productive efficiency**.

- Productive efficiency occurs when production takes place at the lowest possible cost.
- This means the firm is fully employing all resources and achieving maximum production at the lowest cost.

**Question** How do we choose among the points on the PPF? How do we know which point is best?

- Producing the very best combination on the PPF indicates **allocative efficiency**. This occurs when firms produce the particular combination of goods and services that consumers most prefer.
- That is, resources have been allocated in the most optimal manner such that the marginal benefit (MB) of production exactly equals the marginal cost (MC).

# Production possibilities curve (PPC) model: Efficiency

The **marginal cost (MC)** of a good is the opportunity cost of producing one more unit of it.

- We calculate marginal cost from the slope of the PPF.

The **marginal benefit (MB)** from a good or service is the benefit received from consuming one more unit of it.

- We measure marginal benefit by the most people are willing to pay for an additional unit of it.
- The benefit is subjective and depends on people's preferences.
- Preferences describe what people like and want and the production possibilities describe the limit or constraints on what is feasible.
- The marginal benefit curve is unrelated to the PPF and cannot be derived from it. The marginal benefit decreases with the quantity consumed because of the preference for variety.

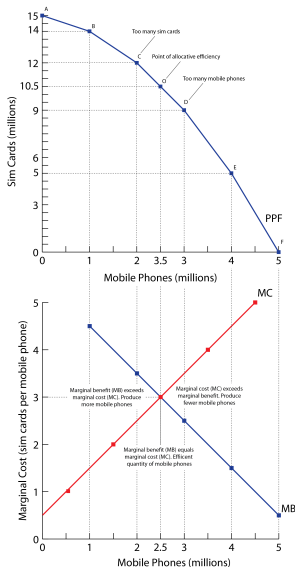
# Production possibilities curve (PPC) model: Efficiency

Allocative efficiency occurs where the marginal cost (MC) equals the marginal benefit.

Mobile phones	Sim cards	Marginal cost	Marginal benefit
0.5	14.5	1	5
1.5	13	2	4
2.5	10.5	3	3
3.5	7	4	2
4.5	2.5	5	1

The equilibrium occurs when 2.5 mobile phones and 10.5 sim cards are produced.

# Production possibilities curve (PPC) model: Efficiency



# Marginal analysis

Economics is concerned with the marginal or “extra” benefits (MB) and marginal or “extra” costs (MC) of any course of action.

- If  $MB > MC$  then we should do more of it because “it’s worth it”
- If  $MB < MC$  then we should do less of it because “it’s not worth it”



# Production possibilities curve (PPC) model: Real world

In the real world, no economy is ever likely to produce on its PPC.

- An economy's actual output or the quantity of output actually produced, is always at a point inside the PPF, because in the real world all economies have some unemployment of resources and some inefficiency in production.
- The greater the unemployment or the inefficiency, the further away the point is from the PPC.

# Production possibilities curve model: Economic Growth

**Economic growth** refers to increases in the quantity of output, usually measured in terms of gross domestic product (GDP), produced in an economy over time.

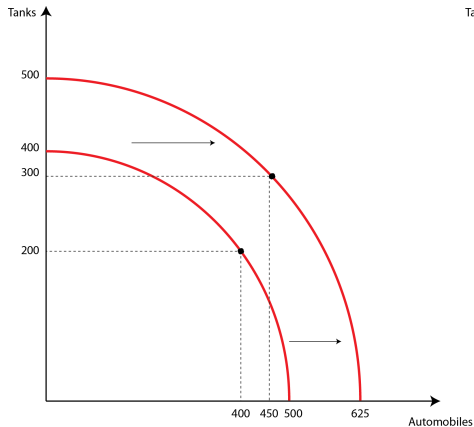
**Actual growth** involves movement from one point inside the PPC to another point closer to the PPC.

- It is caused by reduction in unemployment and increases in efficiency in production.

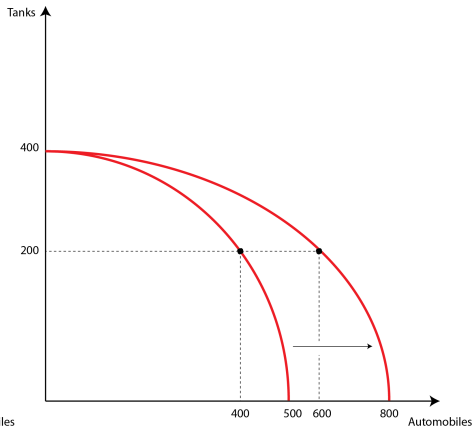
**Growth in production possibilities** involves an outward shift of the PPC

- It is caused by increases in the quantity of resources, improvements in the quality of resources and technological improvements.

# Production possibilities curve model: Changes



(a) Shifting out the production possibilities frontier



(b) Technological change in the automobile industry

# Test your understanding

**Question:** Use the production possibilities curve model and diagrams to show how the following can result in actual growth or growth (or decrease) in production possibilities

1. a discovery of new oil reserves
2. firms hire more workers
3. a vaccine for contagious diseases is invented
4. firms improve how they manufacture and lower the costs of production
5. the widespread use of a new technology
6. a violent conflict destroys a portion of a country's factories, machines and road system
7. large cuts in government spending on education and health care lower levels of education and health in a population

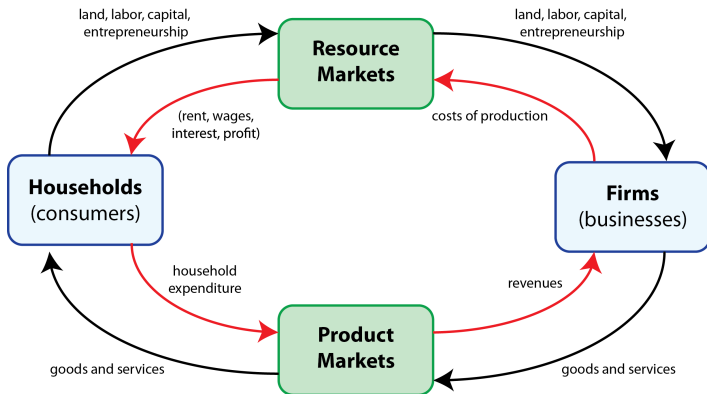
# Markets

A **market** is any arrangement that individuals have for exchanging goods or services with one another.

- A market is a meeting place of buyers and sellers
- Markets can be local, national or international
- Markets are characterized by their competitive structure. The degree of competition depends upon:
  - ▶ The number of buyers and sellers in the market
  - ▶ The type of product
  - ▶ Barriers to entry in the market

# Circular flow model: Microeconomics

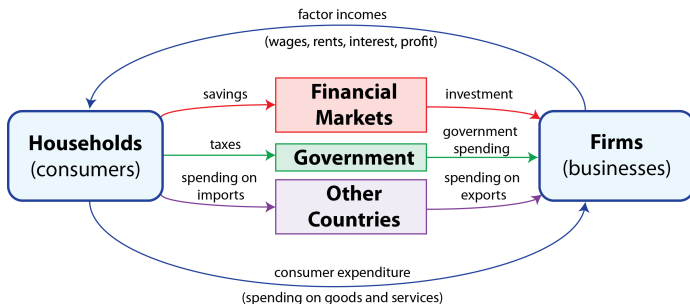
The **Circular flow of income** shows that in any given time period, the value of any output produced in an economy is equal to the total income generated in producing that output, which is equal to the expenditure made to purchase that output.



# Circular flow model: Macroeconomics

In the circular flow of income model if injections are larger than leakages the size of the flow increases; if leakages are larger than injections the size of the flow shrinks.

- **Leakages** are diversions of money outside of the circular flow
- **Injections** are insertions of money into the circular flow



# Unit 1: Introduction to Economics

Brendan F. Kenny

October 14, 2020



# Assessment Objectives

<b>SL/HL Content: Learning Objectives</b>	
AO2	distinguish between positive and normative economics
AO2	explain the use of logic, hypotheses, models and theories in positive economics
AO2	Explain the role of the ceteris paribus assumption
AO2	Explain the roles of empirical evidence and refutation in positive economics
AO2	Explain the role of value judgements in policy-making in normative economics
AO2	Distinguish between equity and equality

# Positive versus normative economics

**Question:** Imagine that you are an economic advisor to the Premier of Ontario. What kinds of questions might the Premier ask you to answer?

- **Question 1:** How much would the revenue of Harmonized Sales Tax (HST) increase if the tax were raised by 1%?
- **Question 2:** Should the government increase the tax?

There is a difference between the above two questions.

- The first question is about facts and can be validated by analysing the data.
- The second question is a matter of opinion. Two people who agree on the effects of higher HST could still disagree about whether raising the tax is a good idea.

The above example highlights a key distinction between two roles of economic analysis.

# Positive versus normative economics

**Positive economics** is the body of economics based on positive statements, which are about things that are, were or will be.

- Positive statements may be true or false and can be verified by observation.
- Positive statements form the basis of theories and models that try to explain economic events.
- **Example(s):** The current unemployment rate in Canada is 5.6%.

**Normative economics** is the body of economics based on normative statements, which involve beliefs, or value judgements about what ought to be.

- Normative statements cannot be true or false; they can only be assessed relative to beliefs and value judgements.
- Normative economics forms the basis of economic policies.
- **Example(s):** We should raise the minimum wage in Ontario.

# Test your understanding

**Question:** Classify the following statements as normative statements or positive statements.

1. Economics is a Social Sciences discipline.
2. Provinces to the east of Quebec have lower provincial income tax rates than those to the west of Quebec.
3. The federal government should be made to balance its budget.
4. The inflation rate in Canada is 2%.
5. If the interest rate goes up, history has shown it is likely that the value of the Canadian dollar will increase.

# Methodology in economics: The role of positive economics

Economists attempt to understand the real world and predict events. In order to accomplish this they use the scientific method which involves the formulation of hypotheses, theories, laws and models.

The following steps are used to understand economic problems:

## 1. Recognizing the problem or issue

- Economists make observations about the world around them and identify questions they would like to answer and the formulate hypotheses.
- The hypothesis attempts to establish causality or a cause-and-effect relationship.

## 2. Cutting away unnecessary detail by making assumptions

- **Ceteris paribus** assumption establishes that all exogenous factors are held constant

## 3. Developing a model, or story of the problem or issue

- A **theory** is a general explanation of a set of interrelated events, based on several hypotheses that have been tested successfully.
- A **law** is a statement that describes an event in a concise way and is supposed to have universal validity.

## 4. Making predictions

- Positive economics attempts to predict economic events that are likely to occur in the future.

## 5. Testing the model

- Comparison of the predictions of the hypothesis with real-world events based on empirical evidence.

## 6. Refutation

# The role of normative economics

Normative economics is based on **value judgements** about what should happen, about what is good or bad, or about what is right or wrong.

- Value judgements are opinions; they are subjective rather than factual statements.
- Statements based on normative economics are not refutable or falsifiable.
- Value judgements in normative economics are important for economic policy making.
- Positive economics and normative economics, while distinct, often work together to guide public policy decisions.

# Equity and Equality

**Equity** refers to the idea of being just or fair.

- The idea of equity, or fairness is a normative concept because fairness depends on people's beliefs or value judgements, which differ from person to person.

**Equality** is the state of being equal with respect to something.

- Equality is a positive concept, since two or more things are either equal or not equal based on a measure.



# Demand



# Assessment Objectives

<b>Specific Expectations</b>	
2.A	Define (using graphs as appropriate) the law of demand.
2.A	Explain (using graphs as appropriate) the relationship between the price of a good or service and the quantity demanded.
2.B	Explain (using graphs as appropriate) the determinants of demand.

# Markets

- **Markets** include any kind of arrangement where buyers and sellers of goods, services or resources are linked together to carry out an exchange.
  - ▶ A market is a meeting place of buyers and sellers
  - ▶ Markets can be local, national or international
- Markets are characterized by their competitive structure. The degree of competition depends upon:
  - ▶ The number of buyers and sellers in the market
  - ▶ The type of product
  - ▶ Barriers to entry in the market
- A **competitive market** is a market composed of many buyers and sellers acting independently, none of whom has any ability to influence the price of the product.

- The **demand** of an individual consumer indicates the various quantities of a good (or service) the consumer is willing and able to buy at different possible prices during a particular time period, *ceteris paribus*.
  - ▶ Demand is concerned with the behaviour of buyers
  - ▶ Consumers (or households) are buyers of goods and services in product markets
  - ▶ Firms (or businesses) are buyers of the factors of production in resource markets
  - ▶ **Quantity demanded** is the amount of the good that consumers are willing to purchase at each price

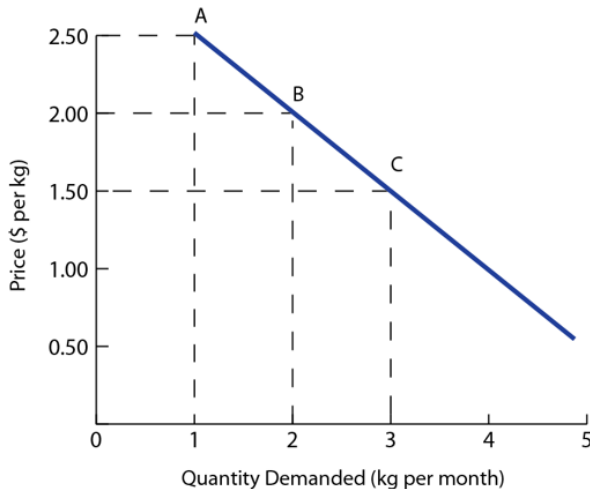
# Demand curve

- **Demand schedule:** is a list of the quantities of a good or service demanded at different prices, holding everything else constant (all other factors that influence consumers planned purchases)

Price (\$CAD per kg)	Quantity Demanded (kg per month)	Point on Graph
\$2.50	1	A
\$2.00	2	B
\$1.50	3	C

- **Demand curve:** is a curve showing the relationship between the price of a good and the quantity of the good demanded, *ceteris paribus*.
  - ▶ A change in the quantity demanded means that there is a movement along the demand curve (for instance, from A to B).

# Demand curve (Continued)

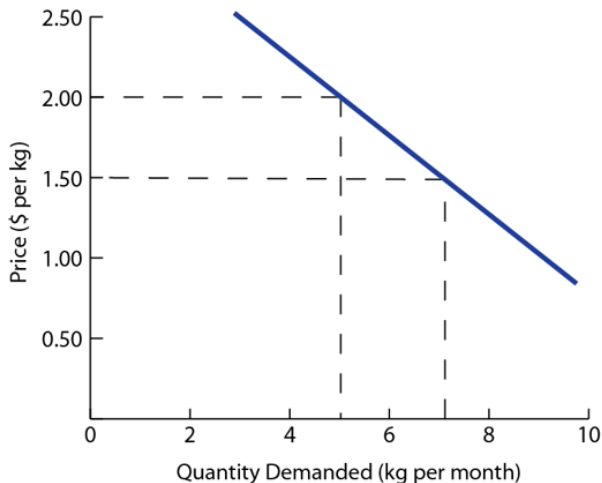


# Market demand

- **Market demand:** is the sum of all individual demands for a good. The market demand curve illustrates the law of demand, shown by the negative relationship between the price and quantity demanded.

Price (\$CAD per kg)	Quantity Demanded (Household A)	Quantity Demanded (Household B)	Market Demand
\$2.50	1	2	3
\$2.00	2	3	5
\$1.50	3	4	7

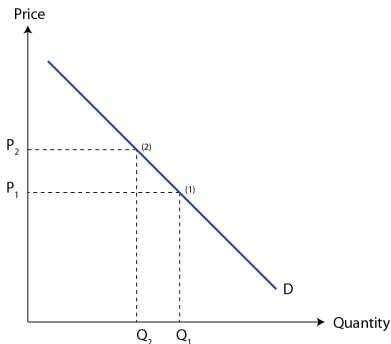
# Market demand (Continued)





# Law of demand

- **Law of demand:** a law stating that there is a negative relationship between the price of a good and quantity of the good demanded, over a particular time period, *ceteris paribus*.
  - ▶ As the price of a good increases, the quantity of the good demanded falls (and vice versa).



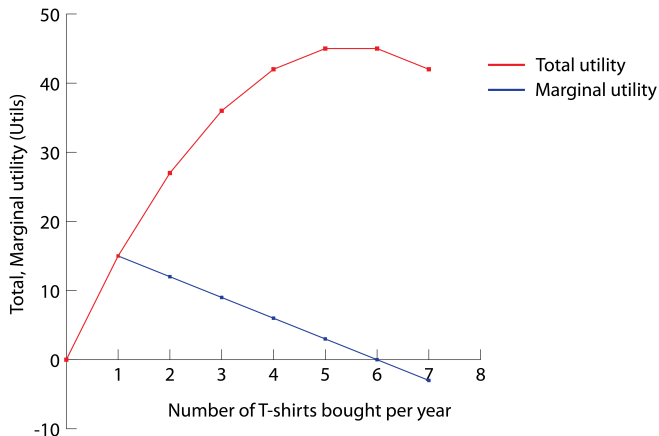
# Law of diminishing marginal utility

- **Utility:** is the satisfaction that consumers gain from consuming something.
  - ▶ It is a subjective concept, because satisfaction is something that depends entirely on personal tastes and preferences.
  - ▶ **Total utility** is the total satisfaction that consumers get from consuming something.
  - ▶ **Marginal utility:** is the extra satisfaction that consumers receive from consuming one more unit of the good.
- According to the **law of diminishing marginal utility**, as consumption of a good increases, marginal utility, or the extra utility the consumer receives, decreases with each additional unit consumed.
  - ▶ This underlies the law of demand, as it shows that a consumer will be willing to buy an additional unit of a good only if its price falls.

# Law of diminishing marginal utility (Continued)

<b>Number of T shirts bought per year</b>	<b>Total utility (Utils)</b>	<b>Marginal utility (Utils)</b>
0	0	–
1	15	15
2	27	12
3	36	9
4	42	6
5	45	3
6	45	0
7	42	–3

# Law of diminishing marginal utility (Continued)

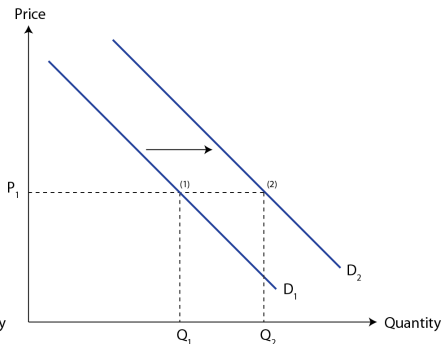
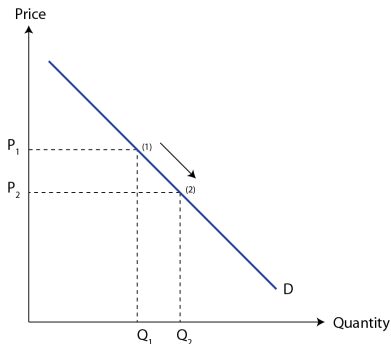


# Income and substitution effects

- The income and substitution effects are an alternative explanation of the law of demand and explain why the demand curve slopes downward.
  1. **Substitution effect:** there is an inverse relationship between price and quantity demanded because as price falls consumers substitute the now less expensive good for other products.
    - ▶ There is always a negative relationship between price and quantity demanded as a result of the substitution effect.
  2. **Income effect:** as price falls (increases) real income increases (falls) causing the consumer to buy more (less) of the good.
    - ▶ The substitution effect and the income effect reinforce each other; a fall in the price leads to an increase in quantity demanded, both because of the substitution effect and because of the income effect.

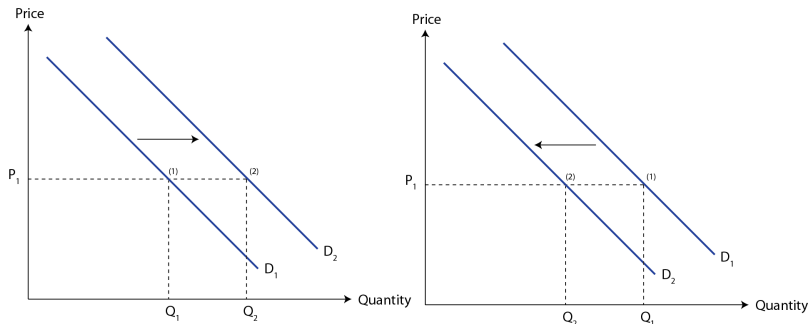
# Changes in demand vs. Changes in quantity demanded

- Any change in price produces a **change in the quantity demanded**, shown as movement on the demand curve.
- Any change in a non-price determinant of demand leads to a **change in demand**, represented by a shift of the entire demand curve.



# Changes in demand

- An increase (decrease) in demand shifts the demand curve upwards (downwards) and to the right (left). The quantity demanded increases (decreases) at every price.



# Non-price determinants of demand

- The **non-price determinants of demand** are the variables other than price that can influence demand.
  - ▶ They are the variables assumed to be unchanging by use of the ceteris paribus assumption.
  - ▶ Changes in the non-price determinants of demand cause shifts in the demand curve where the entire demand curve moves to the right or to the left.
- The non-price determinant of market demand include:

## 1. **Consumer tastes and preferences**

- ▶ If preferences and tastes change in favour of a product (the good become more popular), demand increases and the demand curve shifts to the right.



# Non-price determinants of demand (Continued)

## 2. Consumers' incomes

- ▶ A good is a **normal good** when demand for it increases in response to an increase in consumer income.
- ▶ A good is an **inferior good** when demand for it decreases as consumer income increases.

## 3. Price of related goods

- ▶ Two goods are **substitutes** if they satisfy a similar need. A fall (increase) in the price of one results in a fall (increase) in the demand for the other.
- ▶ Two goods are **complements** if they tend to be used together. A fall (increase) in the price of one results in a increase (fall) in the demand for the other.

# Non-price determinants of demand (Continued)

## 4. Number of consumers (Size of the market)

- ▶ If there is an increase in the number of consumers, demand increases and therefore the market demand curve shifts to the right.
- ▶ If the number of consumers decreases demand decreases and the curve shifts to the left.

## 5. Expectations of future prices

- ▶ Expectations of higher (lower) future prices leads an an increase (decrease) in current demand.

# Test your understanding

**Question:** Using diagrams, show the impact of each of the following

1. The number of consumers in the market for product A increases
2. Consumer income increases and product A is an inferior good
3. Consumer income decreases and product A is a normal good
4. A news report claims that use of product A has harmful effects on health
5. The price of substitute good B falls
6. The price of complementary good B increases

- **Enduring Understanding**

- ▶ In a competitive market, demand for and supply of a good or service determine the equilibrium price.

- **Essential Knowledge**

- ▶ The law of demand states there is an inverse relationship between price and quantity demanded, leading to a downward-sloping demand curve.
- ▶ Factors that influence consumer demand, such as changes in consumer income, cause the market demand curve to shift.

# Supply



# Assessment Objectives

<b>Specific Expectations</b>	
2.C	Define (using graphs as appropriate) the law of supply.
2.C	Explain (using graphs as appropriate) the relationship between the price of a good or service and the quantity supplied.
2.D	Explain (using graphs as appropriate) the determinants of supply.

# Supply

- The **supply** of an individual firm indicates the various quantities of a good (or service) a firm is willing and able to produce and supply to the market for sale at different possible prices, during a particular time period, *ceteris paribus*.
  - ▶ Supply is concerned with the behaviour of sellers, which include firms in the product markets and households in the resource markets.
  - ▶ **Quantity supplied** is the amount of the good that firms are willing to purchase at each price

# Supply curve

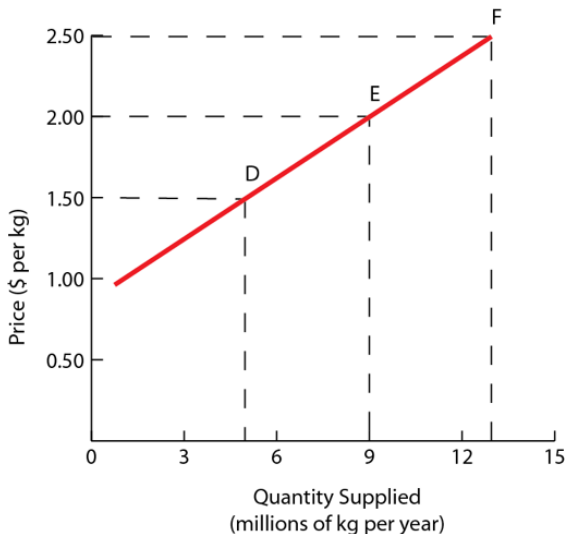
- **Supply schedule:** is a list of the quantities of a good or service supplied at different prices, holding everything else constant (all other factors that influence firms ability to supply the market)

Price (\$CAD per kg)	Quantity Supplied (kg per year)	Point on Graph
\$1.50	5	D
\$2.00	9	E
\$2.50	13	F

- **Supply curve:** is a curve showing the relationship between the price of a good and the quantity of the good supplied, *ceteris paribus*.
  - ▶ A change in the quantity supplied means that there is a movement along the supply curve (for instance, from D to E).



# Supply curve (Continued)



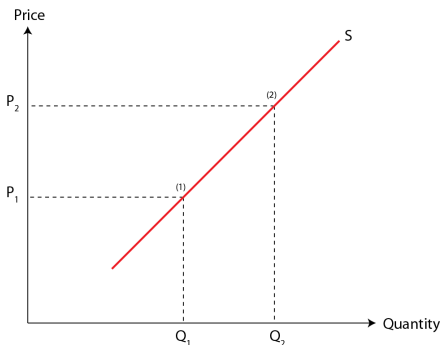
# Market Supply

- **Market supply:** is the sum of all individual firms' supplies for a good. The market supply curve illustrates the law of supply, shown by a positive relationship between price and quantity supplied

Price (\$CAD per kg)	Quantity Supplied (Firm A)	Quantity Supplied (Firm B)	Market Supply
\$1.50	5	7	12
\$2.00	9	11	20
\$2.50	13	15	28

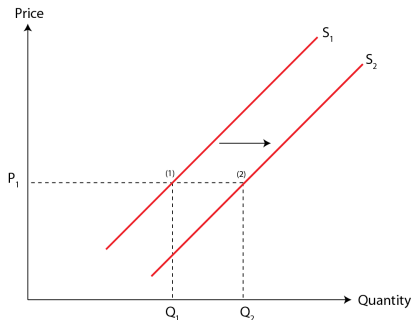
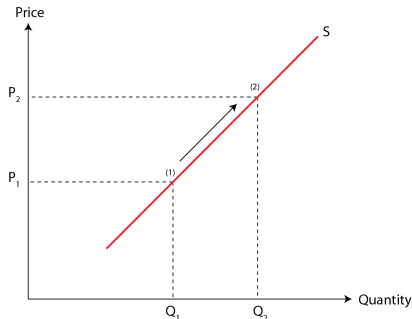
# Law of supply

- **Law of supply:** a law stating that there is a positive relationship between the quantity of a good supplied over a particular time period and its price, *ceteris paribus*.
  - ▶ As the price of the good increases (decreases), the quantity of the good supplied also increases (decreases).



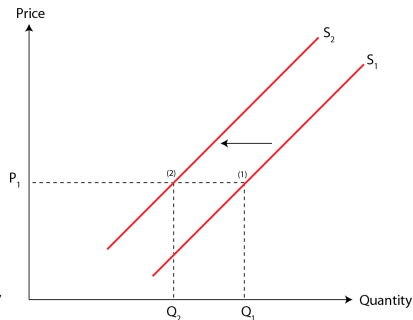
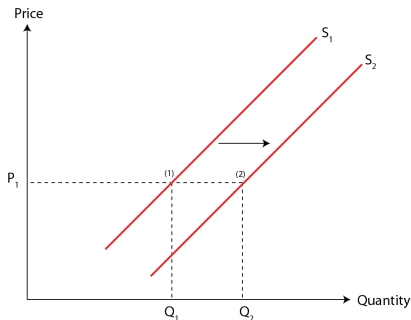
# Changes in supply vs. Changes in quantity supplied

- Any change in price produces a **change in the quantity supplied**, shown as movement on the supply curve.
- Any change in a non-price determinant of supply leads to a **change in supply**, represented by a shift of the entire supply curve.



# Changes in supply

- An **increase (decrease) in supply** shifts the supply curve downwards (upwards) and to the right (left). The quantity supplied increases (decreases) at every price.



# Non-price determinants of supply

- The **non-price determinants of supply** are the variables other than price that can influence supply.
  - ▶ They are the variables assumed to be unchanging by use of the ceteris paribus assumption.
  - ▶ Changes in the non-price determinants of supply cause shifts in the supply curve where the entire supply curve moves to the right or to the left.
- 1. **Costs of factors of production (Factor or resource prices)**
  - ▶ The firm buys various factors of production (land, labour, capital, entrepreneurship) that it uses to produce its product.
  - ▶ If a factor price rises (falls), production cost increase (decrease), production becomes less (more) profitable and the firm produces less (more); the supply curve shifts to the left (right).

# Non-price determinants of supply (Continued)

## 2. Number of firms (Size of the market)

- ▶ An increase (decrease) in the number of firms producing the good increases (decreases) supply resulting in a rightward (leftward) shift in the supply curve.

## 3. Technology used in the production of a good

- ▶ A new improved technology lowers costs of production, thus making production more profitable. Supply increases and the supply curve shifts to the right.

## 4. Shocks or sudden unpredictable events

- ▶ Sudden, unpredictable events called “shocks”, can affect supply, such as weather conditions in the case of agricultural products, war, or natural/man-made catastrophes.

# Non-price determinants of supply (Continued)

## 5. Taxes (Government intervention)

- ▶ Taxes (indirect or taxes on profits) are treated as if they were costs of production, so supply will decrease and the supply curve shifts to the left.

## 6. Subsidies (Government intervention)

- ▶ Subsidies are payments made to the firm by the government and have the opposite effect of a tax.
- ▶ The introduction of a subsidy or an increase in an existing subsidy is equivalent to a fall in production costs, resulting in a rightward shift of the supply curve.

## 7. Price of related goods (Competitive supply)

- ▶ **Competitive supply (Substitutes in production)** of two or more products refers to production of one or the other by a firm; the goods compete for the use of the same resources, and producing more of one means producing less of the other.



# Non-price determinants of supply (Continued)

## 8. Price of related goods (Joint supply)

- ▶ **Joint supply (Complements in production)** of two or more products refers to production of goods that are derived from a single product, so that it is not possible to produce more of one without producing more of the other.
- ▶ The increase in the price of one leads to an increase in its quantity supplied and also to an increase in supply of the other joint product(s).

## 9. Producer (firm) price expectations

- ▶ If firms expect the price of their product to rise, they may withhold some of their current supply from the market (not offer it for sale), expecting that they will be able to sell it at a higher price in the future.
- ▶ If the expectation is that the price of their product will fall, supply increases in the present to take advantage of the current higher price, hence a rightward shift in the supply curve.

# Short-run and the long-run in microeconomics

- The law of supply is based on the relationship between production and costs of production.
  - ▶ The **short-run** is the time period during which at least one input is fixed and cannot be changed by the firm.
    - The buildings and heavy machinery that are unchanging are **fixed**, whereas labour and materials are **variable**.
  - ▶ The **long-run** is a time period in which all inputs can be changed.
    - In the long run the firm has no **fixed** inputs; we say all inputs are **variable**.
    - This is the time period the firms can build new buildings and factories and buy more heavy machinery.
  - ▶ Note that the short run and the long run do not correspond to any particular length of time.
  - ▶ Some industries may change their fixed inputs over weeks or months while others may do so over many years.

# Law of diminishing marginal returns

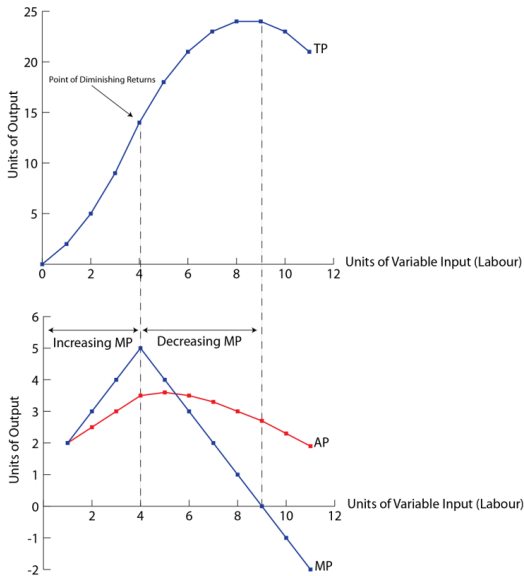
- In the short-run there is a pattern on increasing and then falling marginal product.
  - ▶ The **law of diminishing marginal returns** states that as more and more of a variable input (such as labour) are added to one or more fixed inputs (such as land), the marginal product of the variable input at first increases, but there comes a point where it begins to decrease.
    - The relationship presupposes that the fixed input(s) remain fixed, and that the technology of production is also fixed.
    - **Total product** is the total quantity of output produced by the firm.
    - **Marginal product** is the extra or additional output produced by one additional unit of a variable input.

$$MP = \frac{\Delta TP}{\Delta \text{Labour}}$$

# Law of diminishing marginal returns: Example

Labour (L)	Total Product (TP)	Marginal Product (MP)	Average Product (AP)
0	0	–	–
1	2	2	2
2	5	3	2.5
3	9	4	3
4	14	5	3.5
5	18	4	3.6
6	21	3	3.5
7	23	2	3.3
8	24	1	3
9	24	0	2.7
10	23	-1	2.3
11	21	-2	1.9

# Law of diminishing marginal returns: Example



# Increasing marginal costs & the firm's supply curve

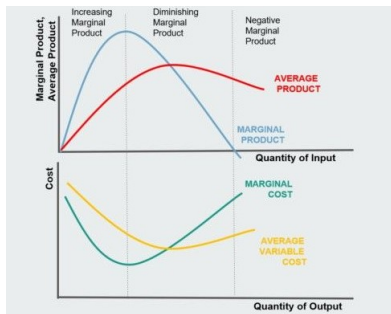
- There is a relationship between diminishing marginal returns, costs of production, and the firm's supply curve.
  - ▶ **Total costs** are the total costs incurred by a firm that undertakes production of a good or service.
  - ▶ **Marginal cost** are the extra or additional cost of producing one more unit of output.
    - It tells us by how much total costs increase if there is an increase in output by one unit.

$$MC = \frac{\Delta TC}{\Delta Q}$$

- ▶ When marginal product increases, marginal cost decreases; when marginal product is maximum, marginal cost is minimum; and when marginal product falls, marginal cost increases.

# Increasing marginal costs & the firm's supply curve

- ▶ The firm's supply curve is a portion of its marginal cost curve that shows the price-quantity combination where the extra cost of producing one more unit of output (the marginal cost) is equal to the price of that unit.
- A firm making an economic loss in the short-run will continue to produce a positive level of output as long as  $P \geq AVC$ .



# Test your understanding

**Question:** Using diagrams, show the impact of each of the following

1. The number of consumers in the market for product A increases
2. Consumer income increases and product A is an inferior good
3. Consumer income decreases and product A is a normal good
4. A news report claims that use of product A has harmful effects on health
5. The price of substitute good B falls
6. The price of complementary good B increases



- **Enduring Understanding**

- ▶ In a competitive market, demand for and supply of a good or service determine the equilibrium price.

- **Essential Knowledge**

- ▶ The law of supply states there is a positive relationship between price and quantity supplied, leading to an upward-sloping supply curve.
- ▶ Factors that influence producer supply, such as changes in input prices, cause the market supply curve to shift.

# Market Equilibrium



# Assessment Objectives

<b>Specific Expectations</b>	
2.E	Define (using graphs as appropriate) market equilibrium.
2.F	Define a surplus and shortage.
2.F	Explain (using graphs as appropriate) how prices adjust to restore equilibrium in markets that are experiencing imbalances.
2.F	Calculate (using graphs as appropriate) the surplus or shortage in the market experience an imbalance.
2.G	Explain (using graphs as appropriate) how changes in demand and supply affect equilibrium price and equilibrium quantity.

# Market equilibrium: Shortages & Surpluses

- **Surplus** is the extra supply that results when the quantity supplied is greater than the quantity demanded.
  - ▶ Surpluses occur when the price is above its equilibrium level.
  - ▶ When a surplus exists, producers have too much inventory building up. They have a glut of unsold goods.
  - ▶ The only way for them to get rid of their inventories is by reducing their price.
- **Shortage** is the extra demand that results when the quantity demanded is greater than the quantity supplied.
  - ▶ Shortages occur when the price is below the equilibrium level.
  - ▶ When a shortage exists, consumers “bid up” the prices of goods. their price.
  - ▶ At the same time, producers/retailers realize that the good they are selling is scarce and in demand. This allows them to raise their prices.

# Competitive market equilibrium

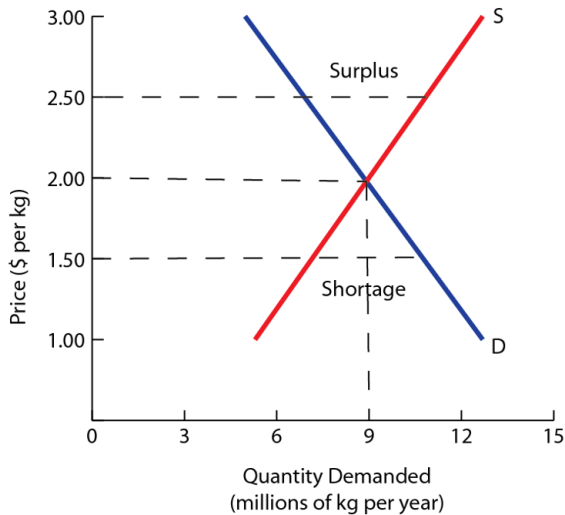
- The existence of excess demand (a shortage) or excess supply (a surplus) in a free market will cause price to change so that the quantity demanded will be made equal to the quantity supplied.
  - ▶ In the event of excess demand, price will rise.
  - ▶ In the event of excess supply, price will fall.
- **Competitive market equilibrium** occurs where quantity demanded equals quantity supplied, and there is no tendency for the price to change.
  - ▶ In a **market disequilibrium**, there is excess demand (shortage) or excess supply (surplus), and the forces of demand and supply cause the price to change until the market reaches equilibrium

# Market equilibrium (Continued)

Price (\$ per kg)	Quantity demanded (millions of kg)	Quantity supplied (millions of kg)	Surplus/Shortage (millions of kg)
3.00	5	13	+8
2.50	7	11	+4
2.00	9	9	0
1.50	11	7	-4
1.00	13	5	-8

- ▶ When price is \$2.00 the quantity demanded equals the quantity supplied. Thus, the equilibrium price is \$2 and the equilibrium quantity demanded is 9 million kg.
- ▶ For prices above \$2.00 there is a surplus where quantity supplied exceeds the quantity demanded ( $Q_S > Q_D$ ).
- ▶ For price below \$2.00 there is a shortage where the quantity demanded exceeds the quantity supplied ( $Q_D > Q_S$ ).

# Market equilibrium (Continued)



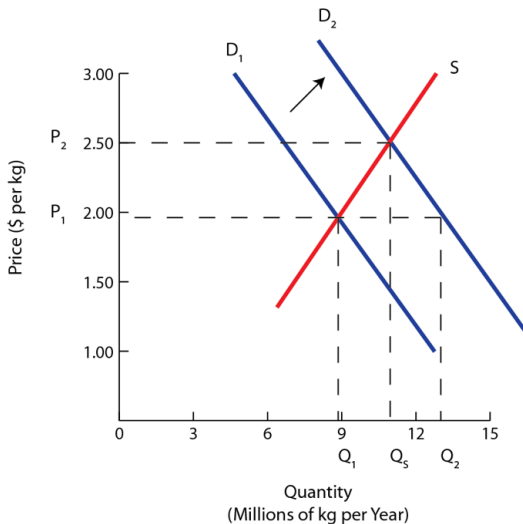
# Market equilibrium: Increases in Demand (Example)

Price (\$ per kg)	Quantity demanded (millions of kg)	Quantity demanded (millions of kg)	Quantity supplied (millions of kg)
	<b>D<sub>1</sub></b>	<b>D<sub>2</sub></b>	<b>S</b>
3.00	5	9	13
2.50	7	11	11
2.00	9	13	9
1.50	11	15	7
1.00	13	17	5

- ▶ An increase in demand implies the quantity demanded increases at every price.
- ▶ This leads to a rightward shift of the demand curve and an increase in the equilibrium quantity and price.

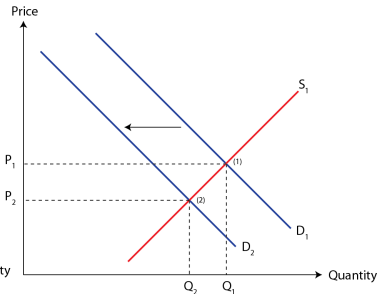
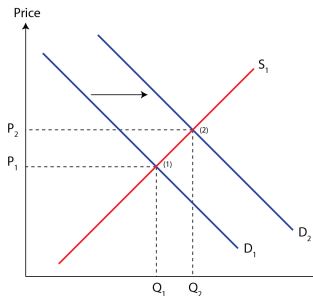


# Market equilibrium: Increases in Demand (Example)



# Market equilibrium: Changes in Demand

- Changes in demand cause the price and quantity to change in the same direction.
  - ▶ A decrease in demand causes the equilibrium price to decrease and the equilibrium quantity to decrease.
  - ▶ If demand increases, equilibrium price and equilibrium quantity both increase.

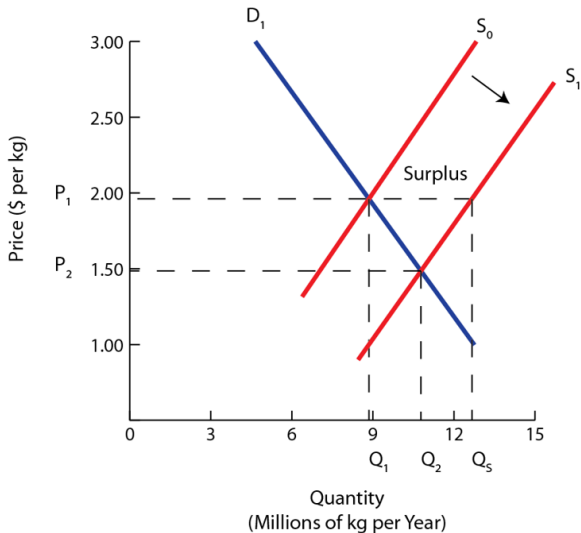


# Market equilibrium: Increases in Supply (Example)

Price (\$ per kg)	Quantity demanded (millions of kg)	Quantity supplied (millions of kg)	Quantity supplied (millions of kg)
	<b>D<sub>1</sub></b>	<b>S<sub>0</sub></b>	<b>S<sub>1</sub></b>
3.00	5	13	17
2.50	7	11	15
2.00	9	9	13
1.50	11	7	11
1.00	13	5	9

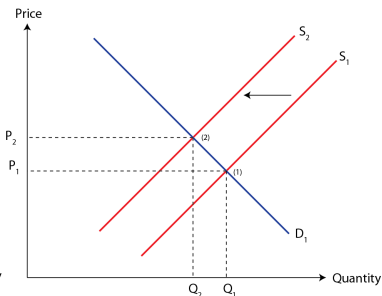
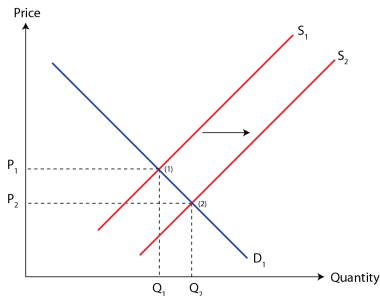
- ▶ An increase in supply implies the quantity supplied increases at every price.
- ▶ This leads to a rightward shift of the supply curve, an increase in the equilibrium quantity and a decrease in the equilibrium price.

# Market equilibrium: Increases in Supply (Example)



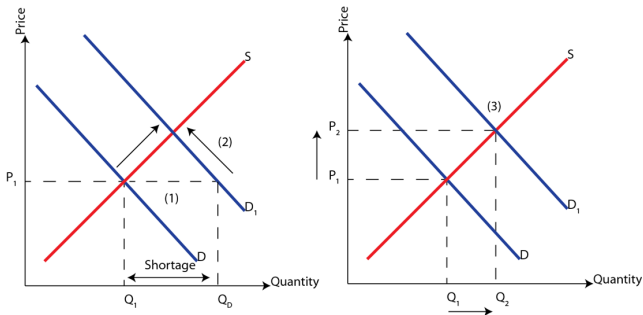
# Market equilibrium: Changes in Supply

- Changes in supply cause the price and quantity to change in the opposite direction.
  - ▶ A decrease in supply causes the equilibrium price to increase and the equilibrium quantity to decrease.
  - ▶ If supply increases, equilibrium price decreases and equilibrium quantity increases.



# Functions of the price mechanism

- The key to the market's ability to allocate resources can be found in the **signalling** and **incentive** functions of prices in resources allocation.
  - As signals, prices communicate information to decision makers.
  - As incentives, prices motivate decision-makers to respond to the information.



# Market equilibrium: Summary

- When demand and supply both shift, the change in the price and quantity will depend on the relative magnitude of each curve's shift.
  - ▶ The impact of simultaneous shifts in demand and supply on the equilibrium price and equilibrium quantity may, therefore, be indeterminate.

	<b>No change in supply</b>	<b>Supply increases</b>	<b>Supply decreases</b>
<b>No change in demand</b>	No change in quantity or price	Quantity increases, price decreases	Quantity decreases, price increases
<b>Demand increases</b>	Quantity increases, price increases	Quantity increases, change in price is indeterminate	Price increases, change in quantity is indeterminate
<b>Demand decreases</b>	Quantity decreases, price decreases	Price decreases, change in quantity is indeterminate	Quantity decreases, change in price is indeterminate

# Test your understanding

**Question:** Use supply and demand diagrams to illustrate the following events

1. Freezing weather destroys the orange crop and the price of oranges rises.
2. The mass media report on the fat content of cheese and the price of cheese falls.
3. A new technology of production for computers is developed and the price of computers falls.
4. Milk, an input for ice cream production, becomes more expensive and the price of ice cream increases.
5. The mass media report on the health benefits of olive oil and the price of olive oil increases.



# Test your understanding

**Question:** Assuming a competitive market, use demand and supply diagrams to show in each of the following cases how the change in demand or supply for product A creates disequilibrium consisting of excess demand or excess supply, and how the change in price eliminates the disequilibrium

1. Consumer income increases (A is a normal goods).
2. Consumer income falls (A is an inferior good).
3. There is an increase in labour costs.
4. The price of substitute good B falls.
5. The number of firms in the industry producing product A increases.
6. A successful advertising campaign emphasises the health benefits of product A.

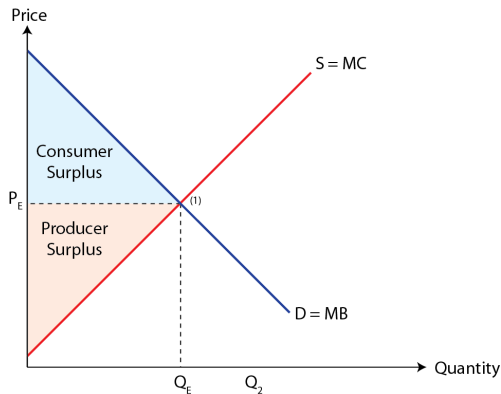
# Allocative efficiency in competitive markets

- **Allocative efficiency** refers to an allocation of resources that results in producing the combination and quantity of goods and services mostly preferred by consumers.
  - ▶ Allocative efficiency is achieved when the economy allocates its resources so that the society gets the most benefits from consumption.
  - ▶ The condition for allocative efficiency is given by  $MSB = MSC$  where the marginal social benefit (MSB) equals the marginal social cost. Alternatively, where  $P = MC$ 
    - Since the marginal benefit decreases as the quantity of a good consumed increases, consumers will be willing to buy an extra unit of the good only if its price falls. The demand curve can therefore also be called a **marginal benefit (MB) curve**.

# Allocative efficiency in competitive markets

- Since marginal cost increases as the quantity of a good produced increases, producers will be willing to produce and sell an extra unit of the good only if its price increases. The supply curve can therefore also be called a **marginal cost (MC)** curve.
- At the point of a competitive market equilibrium, where  $MB = MC$ , the economy achieves allocative efficiency.
- ▶ There is another way we can understand how allocative efficiency is achieved by the competitive market economy.
  - **Consumer surplus (CS)** refers to the difference between the highest price consumers are willing to pay for a good and the price actually paid. In a diagram, it is shown by the area under the demand curve and above the price paid by consumers up to quantity purchased.
  - **Producer surplus (PS)** refers to the difference between the price received by firms for selling their good and the lowest price they are willing to accept to produce the good. In a diagram, it is shown as the area under the price received by producers and above the supply curve up to the quantity sold.

# Allocative efficiency in competitive markets



- At the point of competitive market equilibrium, social surplus, defined as the sum of consumer plus producer surplus, is maximum.

# Allocative efficiency in competitive markets

- ▶ At the point of competitive market equilibrium, production of a good occurs where  $MB = MC$ , which is also where social surplus, or the sum of consumer plus producer surplus is maximum.
  - This means that markets are achieving allocative efficiency, producing the quantity of goods mostly wanted by society.
  - Society is making the best possible use of its scarce resource.
  - In competitive markets, when  $MB = MC$ , or when social surplus is maximum, social welfare is maximum.
- ▶ When markets fail to achieve allocative efficiency, this means that social surplus is reduced, resulting in what is shown as **welfare loss** (also called **deadweight loss**).
  - ▶ In other words, social welfare is no longer maximum on account of a portion of it being lost.

# Summary

- **Enduring Understanding**

- ▶ In a competitive market, demand for and supply of a good or service determine the equilibrium price.

- **Essential Knowledge**

- ▶ Equilibrium is achieved at the price at which quantities demanded and supplied are equal.
- ▶ Whenever markets experience imbalances—creating disequilibrium prices, surpluses, and shortages—market forces drive prices toward equilibrium.
- ▶ Changes in the determinants of supply and/ or demand result in a new equilibrium price and quantity.

# Critique of the maximizing behaviour of consumers and producers



# Assessment Objectives

## Specific Expectations

AO1	Evaluate the assumptions of consumer rationality, utility maximization and perfect information
AO3	Evaluate the assumptions of consumer rationality, utility maximization and perfect information.
AO3	Discuss the limitations of standard consumer behaviour made by behaviour: anchoring, framing, availability, bounded rationality, bounded self-control, bounded selfishness, imperfect information
AO3	Discuss policies inspired by behavioural economics: choice architecture with respect to default, restricted, mandated choices, and nudge theory.
AO3	Distinguish between various objectives of businesses: profit maximization, CSR, market share, growth, satisficing.



# Rational economic decision-making

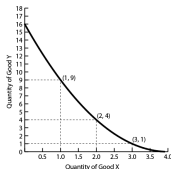
- Classical economic theories and models are based on an important assumption, that of “rational self interest” or **rational economic decision-making**.
  - ▶ Individuals are assumed to act in their best self-interest, trying to maximize the satisfaction they expect to receive from their economic decisions.
    - It is assumed that consumers spend their money on purchases to maximize the satisfaction they get from buying different goods and services.
    - Similarly, it is assumed that firms (or producers) try to maximize the profits they make from their businesses.
    - Workers try to secure the highest possible wage when they get a job.
    - Investors in the stock market try to get the highest possible returns on their investments, and so on.

# Rational Consumer Choice

- **Rational consumer choice** in the microeconomic theory of consumer behaviour, consumers make choices about what goods and services to buy based on the following assumptions.
    1. **Consistent tastes and preferences (Rational consumer choice)** – consumers make purchasing decisions according to their tastes and preferences which satisfy three assumptions
      - i. **Completeness** – the consumer is able to rank goods according to their preferences. For any  $x, y \in X$ , either  $x \succeq y$  or  $y \succeq x$  holds.
      - ii. **Transitivity** – preferences among alternative choices are consistent. For any  $x, y$  and  $z \in X$ , if  $x \succeq y$  and  $y \succeq z$ , then  $x \succeq z$ .
      - iii. **Non-satiation** – the consumer always prefers more of the good to less.
- If  $\succeq$  on  $X$  is complete and transitive, it is called a **preference relation**.

# Rational Consumer Choice

2. **Perfect Information** – consumers and producers have perfect and instantaneous knowledge of all market prices, their own utility, and own cost functions. There is no uncertainty.
  - ▶ When a consumer chooses good A over good B, she possesses all possible information about good A and good B, so that there are no doubts, questions, or uncertainties about the good being chosen.
3. **Utility Maximization** – consumers maximize their utility by buying the combination of goods and services that results in the greatest amount of utility for a given amount of money spent (the consumer's budget or income).



# Behavioural Economics

- **Behavioural Economics** is a method of economic analysis that applies psychological insights into human behaviour to explain economic decision-making.
- Behavioural economics criticises consumer rationality and the idea of utility maximization on the following grounds.
  1. **Cognitive Bias** – is a term from psychology that refers to systematic errors in thinking or evaluating. Biases are departures from normal standards of thought or judgements. Biases that affect consumer choices include the following:
    - i. **Rules of thumb (Heuristics)** – are simple guidelines based on experience and common sense, simplifying complicated decisions that would have to be based on the complex consideration of every possible choice.

# Behavioural Economics

- ii. **Anchoring** – involves the use of irrelevant information to make decisions, which often occurs due to its being the first piece of information that consumers happen to come across.
- iii. **Framing** – deals with how choices are presented to decision-makers (framed).
- iv. **Availability** – refers to information that is most recently available, which people tend to rely on more heavily, though there is no reason to expect that this information is any more reliable than other information that was available at an earlier time.

People remember recent events or information more readily than older events or older information.

# Behavioural Economics

- The presence of biases that influence consumer choices has led to alternative concepts and ideas put forward that may be more accurate descriptions of consumer behaviour.
  1. **Bounded rationality** – is that idea that consumers are rational within limits.
    - People do not have an unlimited capacity to process information and searching for information needed to maximize utility is itself a costly process.
    - Consumer rationality is limited by consumers' insufficient information, the costliness of obtaining information, and the limitations of the human mind to process large amounts of information.
    - Rather than maximize, consumers **satisfice**, meaning they seek a satisfactory outcome rather than the optimal (or best) one.

# Behavioural Economics

2. **Bounded self-control** – refers to the idea that people in reality exercise self-control only within limits.
  - This means they often do not have the self-control that would be required of them to make rational decisions.
  - People may at times eat too much, spend too much, save too little or work too little; this is inconsistent with the assumption of rational behaviour.
3. **Imperfect information** – a situation where either the buyer or the seller, or both, are uncertain about the qualities of what is being bought and sold.
  - Classical economics is based on the assumption that consumers have access to all the information needed to make fully informed decisions, regarding prices, products, and product quality.

# Nudge Theory

- **Nudge theory** is a concept in behavioural economics, political theory, and behavioural sciences that proposes positive reinforcement and indirect suggestions as ways to influence the behaviour and decision-making of groups or individuals.
  - Examples of nudges and their results include the following:
    - Putting health foods in more visible and accessible positions in stores has been shown to increase sales of such foods.
    - When taxpayers received notifications from tax authorities in white envelopes instead of brown with their names handwritten rather than typed, there was a 16% increase in people paying their tax.
    - In a Danish municipality, the streetlights turn red when solar panels are no longer sufficient to power the light, making residents more aware of their electricity consumption.



# Choice Architecture

- **Choice architecture** is the design of particular ways or environments in which people make choices.
  - ▶ It is based on the idea that consumers make decisions in a particular context and that the choices of decision-makers are influenced by how options are presented to them.
  - ▶ Choice architects are individuals or organizations that arrange the context in which choices are made.
  - ▶ Choice architecture offers different kinds of choices that are described below:
    1. **Default choice** – is a choice made by default, which means doing the option that results when one does not do anything.
      - People often make choices by default due to habit or lack of interest in taking a deliberate action, even if doing nothing may not be the best.

# Choice Architecture

2. **Restricted choice** – is a choice that is limited by the government or other authority.
    - It is argued that restricting choice is necessary because people have too many choices available to them. and in the absence of more and better information, or due to poor judgement, they often make poor choices.
    - Choice architecture can take advantage of restrictions to encourage people to make choices with socially desirable outcomes.
  3. **Mandated choice** – is the choice between alternatives that is made mandatory (compulsory) by the government or other authority.
    - It is a free choice, but it is compulsory to make that free choice.
- Note that default choice, restricted choice and mandated choice are different types of nudges within choice architecture that are intended to work toward influencing people's choices in a direction held to be socially desirable.

# Evaluating behavioural economics and economic policy

## Potential advantages

- ▶ Behavioural economics may be a relatively simple and low-cost way to influence people's behaviour to act in socially desirable ways.
- ▶ Successful in a number of area, suggesting that the methods of choice architecture and nudging may have numerous applications.
- ▶ Offers consumers and citizens freedom of choice without restricting their choices.
- ▶ May overcome weaknesses of the theory of consumer behaviour, which is not always able to explain the inconsistencies and seeming irrationality of actual consumer behaviour.
- ▶ Policies are based on principles of psychology, such as framing, many of which have been previously tested over many years.

# Evaluating behavioural economics and economic policy

## Potential disadvantages

- ▶ The body of knowledge being developed is not based on any understanding of human behaviour and is unable to lead to a systematic and unifying theory of how consumers behave with general applicability.
- ▶ There may be risks of using psychological principles to manipulate consumers.
- ▶ There may be risks that behavioural policies may be used as substitutes for necessary but politically costly economic problems.
- ▶ Traditional economic policies may be more effective.
- ▶ Choice architecture and nudging may affect people's choices, but these choices may not be a reflection of their true preferences.

# Firm business objectives

- **Rational producer behaviour** the basis of standard theory of the firm according to which firms try to maximize profit.
  - ▶ Profit maximization involves determining the level of output that the firm should produce to make profit as large as possible.
  - ▶ Profit is equal to the total revenue earned by a firm minus the total costs by the firm in the process of producing its output.

$$\text{Profit} = \text{Total Revenue (TR)} - \text{Total Cost (TC)}$$

- ▶ The objective of profit maximization is to make the difference between revenues and costs as large as possible so as to make profit as large as possible.

# Alternative Business Objectives

- Profit maximization may not be the overriding objective of firms, as in fact they may have other goals that may be more important.
  - ▶ The self-interested behaviour of firms often leads to negative consequences for society.
  - ▶ It is often the case that the well-being for firms is not consistent with the well-being for society.
- 1. **Corporate social responsibility (CSR)** is the practice of some corporations to avoid socially undesirable activities, as well as undertaking socially desirable activities
  - Many firms recognize that the pursuit of self-interest need not necessarily conflict with ethical and environmentally responsible behaviour

# Alternative Business Objectives

- A negative image of the firm held by workers and buyers of the product can cut deeply into the firm's revenues and profits by lowering worker productivity and the firm's sales.
- Socially irresponsible firm behaviour may lead to government regulation of the firm intended to minimize the negative consequences of the firm's actions for society.

2. **Market share** refers to the percent of total sales in a market that is earned by a single firm.

- It may be a goal of some firms to maximize market share, or to make it as large as possible.
- A high market share means the firm is enjoying large sales of its product or products, and is an indication of the product's popularity among buyers.

# Alternative Business Objectives

- A large market share means that it is likely that the firm is achieving economic of scale (falling costs per unit of output as the firm grows) allowing it to increase its profitability.
- In order to increase its market share, the firm may try to lower its prices, or introduce new or innovative products into the market, or use advertising. Each of these strategies may have the effects of lowering profits.

### 3. **Growth maximization** is one possible goal of firms, involving the objective to make the growth of the firm as high as possible.

- A growing firm can achieve economies of scale and lower its average costs of production, thus increasing profitability.
- As a firm grows it can diversify into production of different products and markets and reduce its dependence on a single product or market.
- A larger firm has greater market power and increased ability to influence prices.



# Alternative Business Objectives

- A larger firm reduces its risks because it may be less affected in an economic downturn (a recession) and is less likely to be taken over (bought) by another firm.
4. **Revenue maximization** is focused on increasing sales and maximizing revenues.
- Sales can be identified and measured more easily over short term than profits, and increased sales targets can be used to motivate employees.
  - Rewards for managers and employees are often linked to increased sales.
  - It is often assumed that revenue from more sales will increase more rapidly than costs, leading to higher profits.
5. **Satisficing** is a goal of firms to achieve satisfactory results, rather than pursue a single maximizing objective, such as to maximize profits or revenues

# Alternative Business Objectives

- Modern firms may have numerous objective which may partly overlap or conflict.
- Firms are forced to compromise and reconcile conflicts, rather than pursue optimal results.

## Price elasticity of demand (PED)



# Assessment Objectives

## Specific Expectations

AO4	Use formula for price elasticity of demand (PED) to calculate PED, changes in price, changes in quantity and total revenue.
AO2	Identify the various degrees and range of values for PED.
AO2	Explain and illustrate in a diagram changing PED along a straight-line downward sloping demand curve.
AO2	Analyse the determinants of PED.
AO2	Explain the relationship between PED and total revenue.
AO4	Draw a diagram to show how total revenue changes in response to a price change depending on elastic or inelastic demand.
AO3	Apply PED to discuss the importance for firms and government decision-making.
AO2	Analyse the reasons why primary commodities generally have a lower PED than manufactured products.

# Price elasticity of demand (PED)

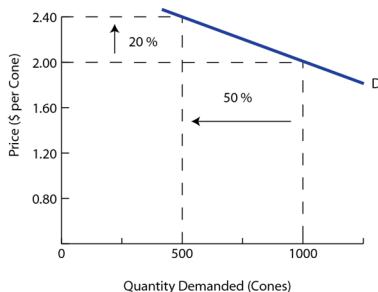
- **Price elasticity of demand (PED)** is a measure of the responsiveness of the quantity of a good demanded to changes in its price.
  - ▶ PED is calculated along a given demand curve.
  - ▶ In general, if quantity demanded is highly responsive to a change in price, demand is referred to as being **price elastic**.
  - ▶ If quantity demanded is not very responsive, demand is **price inelastic**.

$$\text{Price elasticity of demand (PED)} = \frac{\% \Delta Q}{\% \Delta P} = \frac{\Delta Q / Q}{\Delta P / P}$$

- ▶ PED is a unitless quantity and is always negative, but it is common practice to use the absolute value.

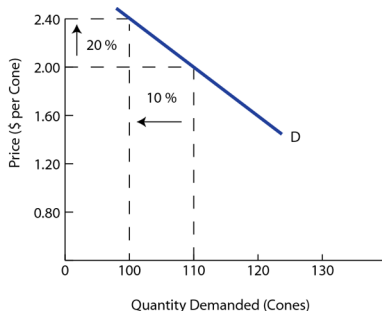
# Elastic Demand

- **Price elastic** the percentage change in the quantity demanded is larger than the percentage change in price.
  - ▶ Quantity demanded is relatively responsive to price changes.
  - ▶ The value of PED is greater than one ( $PED > 1$ ).



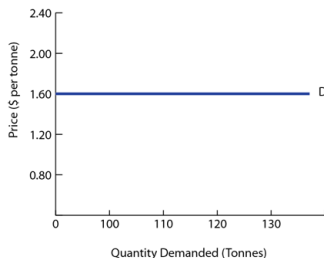
# Inelastic Demand

- **Price inelastic** the percentage change in the quantity demanded is smaller than the percentage change in price.
  - ▶ Quantity demanded is relatively unresponsive to price changes.
  - ▶ The value of PED is less than one ( $PED < 1$ ).



# Perfectly elastic Demand

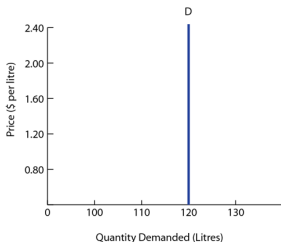
- **Perfectly elastic demand** occurs when a change in price results in an infinitely large change in quantity demanded.
  - ▶ At the price, consumers will buy any quantity that is available.
  - ▶ If price falls, buyers will buy all they can (an infinitely large response); if there is an increase in price, quantity demanded drops to zero.
  - ▶ The value of PED is equal to infinity ( $PED = \infty$ ).





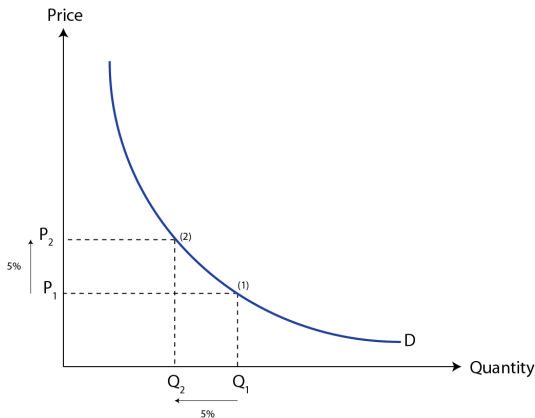
# Perfectly inelastic Demand

- **Perfectly inelastic demand** occurs when the percentage change in quantity demanded is zero.
  - ▶ There is no change in quantity demanded, which remains constant no matter what happens to price.
  - ▶ The demand for a good is perfectly inelastic if the demand curve is a vertical line.
  - ▶ The value of PED is equal to zero ( $PED = 0$ ).



# Unit elastic Demand

- **Unit elastic demand** occurs when the percentage change in quantity demanded is equal to the percentage change in price.
  - ▶ The value of the PED is equal to 1 ( $PED = 1$ )

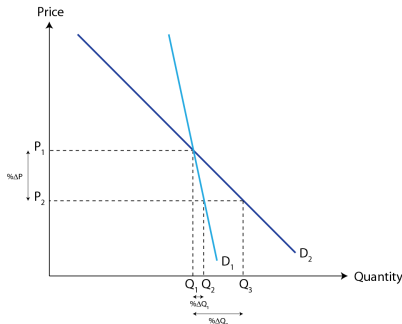


# Price elasticity of demand (PED): Summary

Value of PED	Classification	Interpretation
$0 < PED < 1$	Price inelastic	Quantity demanded is relatively unresponsive to price.
$1 < PED < \infty$	Price elastic	Quantity demanded is relatively responsive to price.
$PED = 1$	Unit elastic	Percentage change in quantity demanded equals percentage change in price.
$PED = 0$	Perfectly inelastic	Quantity demanded is completely unresponsive to price.
$PED = \infty$	Perfectly elastic	Quantity demanded is infinitely responsive to price.

# PED and the steepness of the demand curve

- We often use the relative steepness of the demand curves to be an indication of PED.
  - ▶ Comparing two demand curves, the one that is flatter is said to be more elastic which the one that is steeper is said to be more inelastic.
  - ▶ Demand curves drawn on different scales are not comparable.

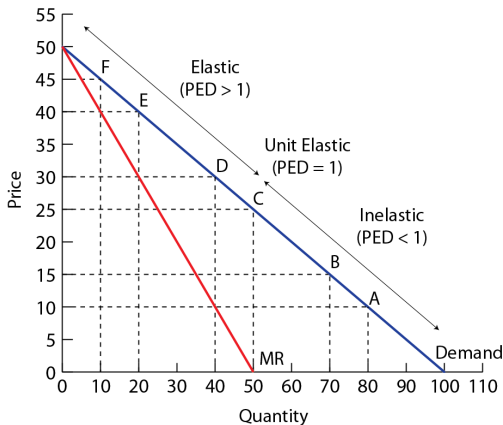


# Changing PED and the straight-line demand curve

- Along any downward-sloping, straight-line demand curve, the PED varies (changes) as we move along the curve.
  - ▶ Demand is more elastic toward the upper left.
    - At high prices the average price is relatively large and the change in the average quantity demanded is relatively small.
  - ▶ Demand is more inelastic toward the lower right
    - At low prices the average price is relatively small and the average quantity demanded is relatively large.
  - ▶ At the midpoint of the demand curve, there is unit elastic demand.
  - ▶ The terms “elastic” and “inelastic” should not be used to refer to an entire demand curve (with the exception of the three special cases where PED is constant), but only to a portion of the demand curve corresponding to a particular price or price range.

# Changing PED and the straight-line demand curve

$$\text{Price elasticity of demand (PED)} = \frac{\% \Delta Q}{\% \Delta P} = \frac{\Delta Q / Q}{\Delta P / P} = \frac{1}{\text{Slope}} \times \frac{P}{Q}$$



# Determinants of price elasticity of demand

- There are four major factors that affect the price elasticity of demand.

## 1. Number and closeness of substitutes

- The more substitutes a good (or service) has, the more elastic its demand.
- If the price of a good with many substitutes increases, consumers can switch to other substitute products, therefore resulting in a relatively large drop (large responsiveness) in quantity demanded.
- If a good or service has few or no substitutes, then an increase in price will bring forth a relatively small drop in quantity demanded.
- Also important is the closeness of substitutes called the **degree of substitutability**.
- The closer two substitutes are to each other, the greater the responsiveness of quantity demanded to a change in the price of the substitute, because it is easier for the consumer to switch from one product to the other.

# Determinants of price elasticity of demand

## 2. Necessities versus luxuries

- **Necessities** are goods or services we consider to be essential or necessary in our lives; we cannot do without them.
- **Luxuries** are not necessary or essential.
- The demand for necessities is less elastic than the demand for luxuries.
- In general, the more necessary a good, the less elastic the demand.
- A special case of necessity is a consumer's addiction to a good. The greater the degree of addiction to a substance, the more inelastic is the demand.

## 3. Length of time

- The longer the time period in which a consumer makes a purchasing decision, the more elastic demand.
- As time goes by, consumers have the opportunity to consider whether they really want the good, and to get information on the availability of alternatives to the good in question.



# Determinants of price elasticity of demand

## 4. Portion of income spent on a good

- The larger the proportion of one's income needed to buy a good, the more elastic the demand.

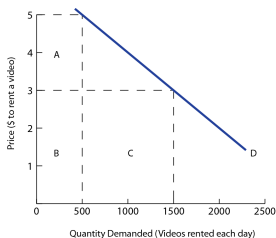
<b>S</b>	<b>Substitutes</b>	The number of substitutes available. The more substitutes, more elastic demand, as consumers can replace a good whose price has gone up with one of its now relatively cheaper substitutes.
<b>P</b>	<b>Proportion of income</b>	The proportion of income the purchase of a good represents. If a good represent a higher proportion of a consumer's income, his demand tends to be more elastic.
<b>L</b>	<b>Luxury or necessity?</b>	Luxury or necessity? If a good is a necessity, changes in price tend not to affect quantity demand, i.e. demand is inelastic. If it's a luxury that a consumer can go without, consumers tend to be more responsive.
<b>A</b>	<b>Addictive?</b>	If a product is addictive or habit forming, demand tends to be inelastic.
<b>T</b>	<b>Time</b>	The amount of time a consumer has to respond to the price change. If prices remain high over a longer period of time, consumers can find substitutes or learn to live without, so demand is more elastic over time.

# Total revenue and price elasticity of demand

- **Total Revenue (TR)** is the amount of money received by firms when they sell a good (or service), and is equal to the price (P) of the good times the quantity (Q) of the goods sold.

## 1. Elastic Demand ( $PED > 1$ )

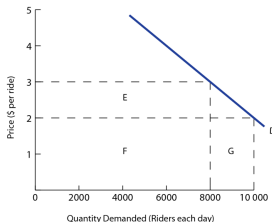
- When demand is elastic, an increase in price causes a fall in total revenue, while a decrease in price causes a rise in total revenue.
- Price and total revenue change in opposite directions.



# Total revenue and price elasticity of demand

## 2. Inelastic Demand ( $PED < 1$ )

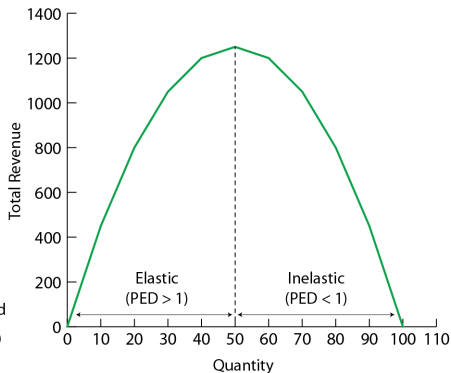
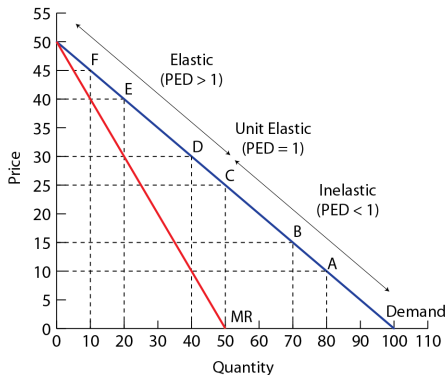
- When demand is inelastic, an increase in price causes an increase in total revenue, while a decrease in price causes a fall in revenue.
- Price and total revenue move in the same direction.



## 3. Unit Elastic Demand ( $PED = 1$ )

- when demand is unit elastic, a change in price does not cause any change in total revenue.

# Total revenue and price elasticity of demand

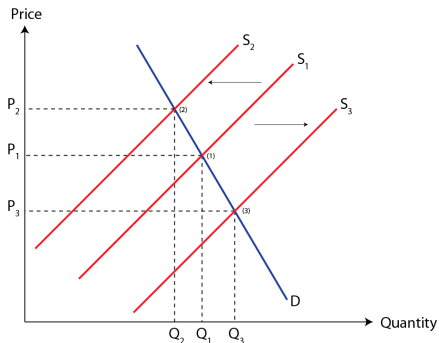
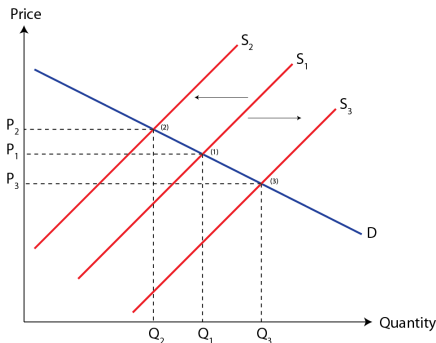


# PED in relation to commodities & manufactured products

- **Primary commodities** are goods arising directly from the use of natural resources, or the factor of production “land”.
  - ▶ Primary commodities therefore include agricultural, fishing, and forestry products, as well as products of extractive industries (oil, coal, minerals, and so on).
  - ▶ Many primary commodities have a relatively low PED (price inelastic demand) because they are necessities and have no close substitutes (for example, food and oil).
  - ▶ Prices fluctuations are larger for primary commodities because of low PED.
  - ▶ As primary commodities prices fluctuate widely, so do producers' incomes, which depend on the revenues producers receive from selling their output.

# PED in relation to commodities & manufactured products

- **Manufactured products** are goods produced by labour usually working together with capital as well as raw materials.
  - ▶ The PED of manufactured products is relatively high (price elastic demand) because they usually have substitutes.



## Income (YED) & Cross-Price Elasticity (XED)



# Assessment Objectives

## Specific Expectations

Specific Expectations	
AO4	Use the formula for income elasticity of demand (YED) and cross-price elasticity of demand (XED) to calculate elasticities.
AO4	Draw an Engel curve diagram to show income elastic, income inelastic, and inferior goods.
AO2	Distinguish between normal and inferior goods.
AO2	Distinguish between substitutes and complements.
AO2	Depending on the value of YED (less than one or greater than one), distinguish between necessities, services and luxury goods.



# Income elasticity of demand (YED)

- **Income elasticity of demand (YED)** is a measure of the responsiveness of demand to changes in income, and involves demand curve shifts.
  - ▶ It provides information on the direction of change of demand a change in income (increase or decrease) and the size of the change (size of demand curve shifts).

$$\text{Income elasticity of demand (YED)} = \frac{\% \Delta Q}{\% \Delta Y} = \frac{\Delta Q / Q}{\Delta Y / Y}$$

- ▶ Unlike, the price elasticity of demand, the income elasticity's sign is important.

# Normal goods & Inferior goods

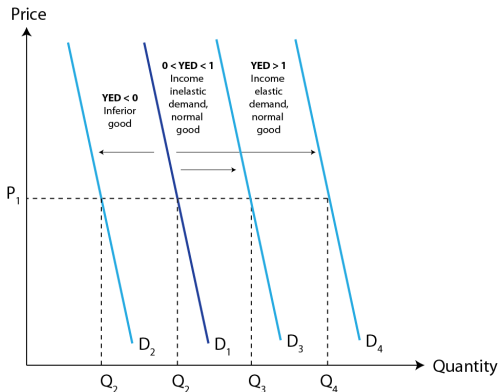
- **Normal good** a good the demand for which varies positively (or directly) with income. **Example:** Rolex watches, sports cars.
  - ▶ Demand for the good and income change in the same direction.
  - ▶ As income increases (decreases), the demand for the good increases (decreases).
  - ▶ Most goods are normal goods.
- **Inferior good** a good the demand for which varies negatively (or indirectly) with income. **Example:** Bus rides, used cars.
  - ▶ As income increases (decreases), the demand for the good decreases (increases).
  - ▶ Demand for the good and income move in opposite directions.
  - ▶ The demand for these goods falls as consumers switch to consumption of normal goods.

# The numerical value of income elasticity of demand

- **Necessities** are goods that are necessary or essential.
  - ▶ They have a price inelastic demand ( $PED < 1$ ) and income inelastic demand ( $YED < 1$ ).
  - ▶ **Income inelastic demand** means relatively low responsiveness of demand to changes in income.
    - A percentage increase in income produces a smaller percentage increase in quantity demanded.
- **Luxuries** are goods that are not necessary or essential.
  - ▶ They have a price elastic demand ( $PED > 1$ ) and income elastic demand ( $YED > 1$ ).
  - ▶ **Income elastic demand** means relatively high responsiveness to changes in income.
    - A percentage increase in income produces a larger percentage increase in quantity demanded.

# The numerical value of income elasticity of demand

- In the case of necessities, an increase in income will produce a relatively small rightward shift in the demand curve.
- ▶ In the case of luxuries and services, the rightward shift will be larger.

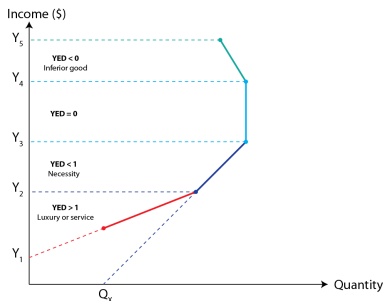


# The Engel curve

- **Engel curve** a curve that shows the relationship between consumer income and demand for a product; indicates whether a good is normal or inferior.
  - ▶ With income on the vertical axis and quantity on the horizontal axis of an Engel curve diagram, we can see the following:
    - $YED > 0$  in the upward sloping part of the curve showing quantity and income both increasing, which indicates the good is normal.
    - $YED < 0$  in the downward sloping part showing quantity decreasing as income increases, which indicates the good is inferior.
  - ▶ The Engel curve is a continuum.
    - At very low incomes a good may be a luxury.
    - As income increases it becomes a necessity and finally at high income levels it becomes inferior.

# The Engel curve

- Imagine each segment of the Engel curve extending backward to touch either the vertical axis or horizontal axis, as shown by the dotted lines:
  - $YED > 1$  if the line touches the vertical axis, as with the line AB, so that it is a luxury or service.
  - $YED < 1$  if the line touches the horizontal axis, as with BC, so that it is a necessity.



# Applications of income elasticity of demand

- Over time, as countries experience economic growth, society's income increases.
  - ▶ Increasing income means a growing demand for goods and services.
    - The higher the YED for a good or service, the greater the expansion of the of its market is likely to be in the future.
    - The lower the YED, the smaller the expansion.
    - Producers interested in producing in an expanding market may therefore want to know YEDs of various goods and services.
  - ▶ During an economic recession there is falling output and incomes.
    - Good and services with higher YED ( $YED > 1$ ) are the hardest hit, experiencing the largest decline in sales.
    - Producers with low YED ( $YED < 1$ ) can avoid large falls in sales, while inferior goods ( $YED < 0$ ) can even experience increase in sales.

# Cross-price elasticity of demand (XED)

- **Cross-price elasticity of demand (XED)** is a measure of the responsiveness of demand for one good to a change in the price of another good, and involves demand curve shifts.
  - ▶ It provides us with information on whether demand increases or decreases, and on the size of demand curve shifts.

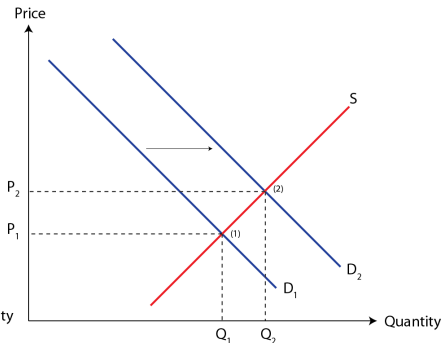
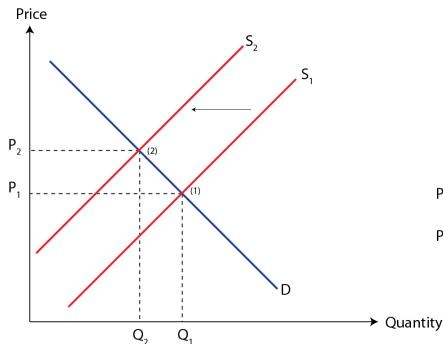
$$\text{Cross-price elasticity of demand (XED)} = \frac{\% \Delta Q_x}{\% \Delta P_y} = \frac{\Delta Q_x / Q_x}{\Delta P_y / P_y}$$

- **Substitute goods** two or more goods that satisfy a similar need, so that one good can be used in place of another.
  - ▶ Cross-price elasticity of demand for two goods is positive ( $\text{XED} > 0$ ) and the demand for one good and the price of the other good change in the same direction.



# Cross-price elasticity of demand (XED): Substitutes

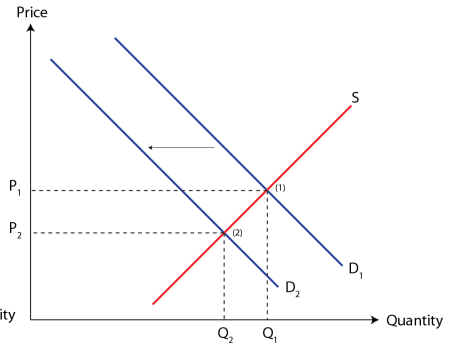
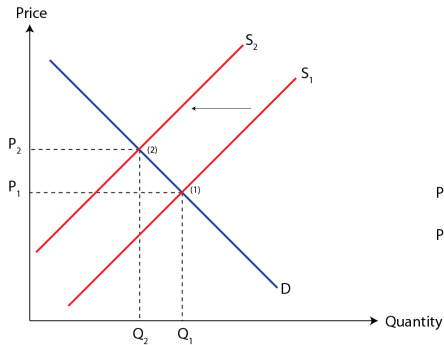
- ▶ Given two pairs of substitute goods, the larger the value of cross-price elasticity of demand (XED), the greater the substitutability between two goods, and the larger the demand curve shift in the event of a price change.



# Cross-price elasticity of demand (XED)

- **Complementary goods** two or more goods that tend to be used together.
  - ▶ Cross-price elasticity of demand for two goods is negative ( $XED < 0$ ) when the demand for one good and the price of the other good change in opposite directions.
  - ▶ When the price of one good increases (decreases), the demand for the other falls (rises).
  - ▶ The larger the absolute value of the negative cross-price elasticity of demand, the greater is the complementarity between two goods, and the larger is the demand curve shift in the event of a price change.

# Cross-price elasticity of demand (XED): Complements



# Applications of cross-price elasticity of demand (XED)

- There are some situations where businesses would be interested in knowing cross-price elasticities of demand for various products.

## 1. Substitute products by a single business

- When a business produces lines of products that are similar to each other, it must consider the XED for these products when making decisions about prices.

## 2. Substitutes produced by rival businesses

- A business is also interested in knowing the XED of substitutes when they are produced by rival businesses.

## 3. Substitutes and mergers between firms

- A **merger** takes place when two firms unite to form a single firm.
- Businesses producing close substitutes with a high positive XED, might be interested in merging because that way they would eliminate the competition between them (although this is usually illegal).

# Applications of cross-price elasticity of demand (XED)

## 4. Complementary goods

- Products that have a low absolute value (negative) XED are weakly complementary and will not be of much interest.
- High absolute value of a (negative) XED means that lowering the price of one good can result in a large increase in demand and sales for the other.
- Businesses producing strongly complementary goods often collaborate.  
**Example:** charter flights and holiday hotels.

## Price elasticity of supply (PES)



# Assessment Objectives

## Specific Expectations

AO4	Use the formula for price elasticity of supply (PES) to calculate PES, changes in price and changes in quantity.
AO2	Identify the various degrees and range of values of PES.
AO4	Draw diagrams showing the range of values for PES, including relatively elastic and inelastic supply; and constant values for perfectly elastic supply, perfectly inelastic supply and unitary PED.
AO2	Analyze the determinants of PES.
AO2	Apply PES to analyze the reasons why primary commodities generally have a lower PES than manufactured products.

# Price elasticity of supply (PES)

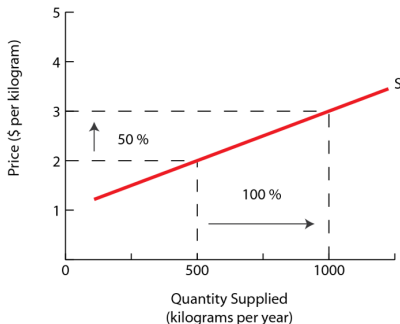
- **Price elasticity of supply** is a measure of the responsiveness of the quantity of a good supplied to changes in its price.
  - ▶ PES is calculated along a given supply curve
  - ▶ In general, if there is a relatively large responsiveness of quantity supplied, supply is referred to as being **elastic**.
  - ▶ If there is a relatively small responsiveness, supply is **inelastic**.

$$\text{Price elasticity of supply (PES)} = \frac{\% \Delta Q_S}{\% \Delta P} = \frac{\Delta Q_S / Q_S}{\Delta P / P}$$



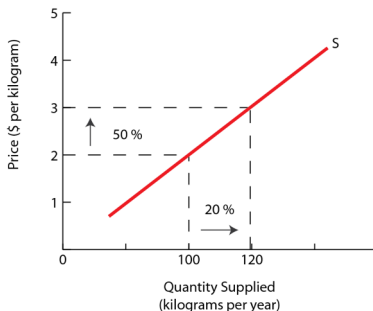
# Elastic Supply

- **Price elastic** the percentage change in the quantity supplied is larger than the percentage change in price.
  - ▶ The value of PES is greater than one ( $PES > 1$ ).
  - ▶ Quantity supplied is relatively responsive to price changes, and supply is price elastic or elastic.



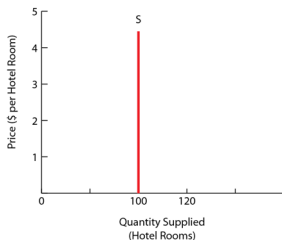
# Inelastic Supply

- **Price inelastic** the percentage change in the quantity supplied is smaller than the percentage change in price.
  - ▶ The value of PES is less than one ( $PES < 1$ ).
  - ▶ Quantity supplied is relatively unresponsive to price changes, and supply is price inelastic or inelastic.



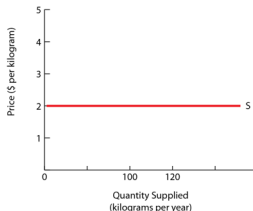
# Perfectly Inelastic Supply

- **Perfectly inelastic supply** occurs when the percentage change in quantity supplied is zero.
  - ▶ There is no change in quantity supplied, which remains constant no matter what happens to price.
  - ▶ The supply for a good is perfectly inelastic if the supply curve is a vertical line.
  - ▶ The value of PES is equal to zero ( $PES = 0$ ).



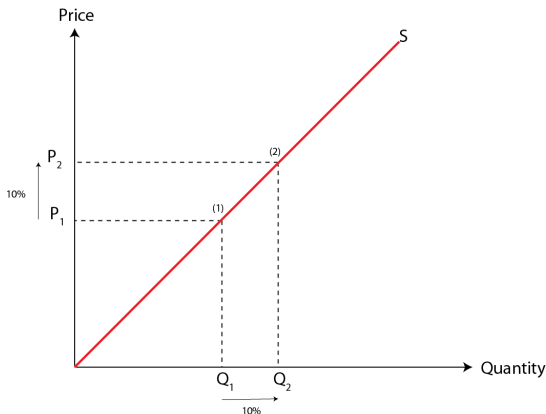
# Perfectly Elastic Supply

- **Perfectly elastic supply** occurs when a change in price results in an infinitely large change in quantity supplied.
  - ▶ The price of the good remains constant regardless of the quantity supplied.
  - ▶ The supply for a good is perfectly elastic if the supply curve is a horizontal line.
  - ▶ The value of PES is equal to infinity ( $PES = \infty$ ).



# Unit Elastic Supply

- **Unit Elastic Supply** occurs when the percentage change in quantity supplied is equal to the percentage change in price.
  - ▶ The value of the PES is equal to 1 ( $PES = 1$ )

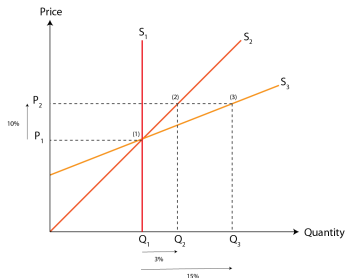


# Price elasticity of demand (PES): Summary

Value of PED	Classification	Interpretation
$0 < PES < 1$	Price inelastic	Quantity supplied is relatively unresponsive to price.
$1 < PES < \infty$	Price elastic	Quantity supplied is relatively responsive to price.
$PES = 1$	Unit elastic	Percentage change in quantity supplied equals percentage change in price.
$PES = 0$	Perfectly inelastic	Quantity supplied is completely unresponsive to price.
$PES = \infty$	Perfectly elastic	Quantity supplied is infinitely responsive to price.

# Determinants of price elasticity of supply (PES)

- There are five major factors that affect the price elasticity of supply.
  1. **Length of time** – the amount of time that firms have to adjust their inputs and the quantity supplied in response to changes in price.
    - Over a very short time period, the firm may be unable to increase or decrease any of its inputs to change the quantity it produces.
    - As the length of time that firms have increases, the responsiveness of quantity supplied to price changes begins to rise, and PES increases.



# Determinants of price elasticity of supply (PES)

2. **Mobility of factors of production** – the ease and speed with which firms can shift resources and production between different products.
  - The more easily and quickly resources can be shifted out of one line of production and into another, the greater the responsiveness of quantity supplied to changes in price.
3. **Spare (unused) capacity of firms** – sometimes firms may have capacity to produce that is not being used (for example, factories or equipment may be idle for some hours each day).
  - The greater the spare (unused) capacity, the higher the PED (the more elastic the supply).
4. **Ability to store stocks** – some firms store stocks of output they produce, but do not sell it right away.
  - Firms that have an ability to store stocks are likely to have a higher PES (more elastic) for their products than firms that cannot store stocks.



# Determinants of price elasticity of supply (PES)

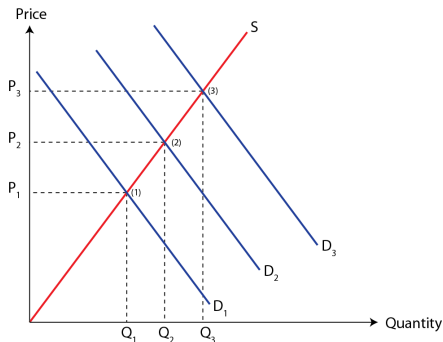
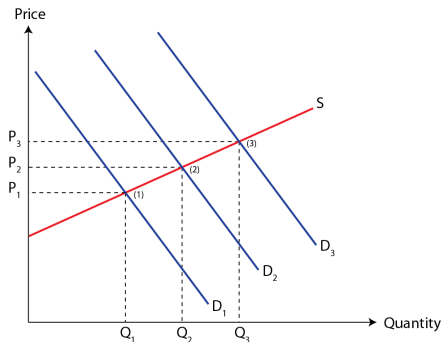
5. **Rate at which costs increase** – if the costs of producing extra output increase rapidly, then supply will be inelastic, as firms will have difficulty expanding their output since they are unlikely to want to incur large costs.
- If the costs of producing more output rise slowly, it will be easier for firms to expand their output so supply will be elastic.

- 1 Marginal Cost
- 2 Time
- 3 Number of Firms
- 4 Mobility of Factors of Production
- 5 Capacity

# Applications of price elasticity of supply

- In general, primary commodities usually have a lower PES than manufactured products.
  - ▶ The main reason is the time needed for quantity supplied to respond to price changes.
  - ▶ The longer the time producers have to make the necessary adjustments, the greater the responsiveness of the quantity supplied to changes in price.
  - ▶ Inelastic supply of agricultural and other primary products also contributes to price and income instability for primary product producers.
    - Price fluctuations are larger in the case of inelastic supply.
    - Large price fluctuations mean large revenue fluctuations, or unstable revenue for producers of primary commodities.

# Applications of price elasticity of supply



# Applications of price elasticity of supply: Examples

<b>Commodity</b>	<b>Short-term PES</b>	<b>Long-term PES</b>
Cabbage	0.36	1.20
Carrots	0.14	1.00
Cucumbers	0.29	2.20
Onions	0.34	1.00
Green Peas	0.31	4.40
Tomatoes	0.16	0.90
Cauliflower	0.14	1.10
Celery	0.14	0.95

## Government intervention in markets



# Assessment Objectives

Specific Expectations	
AO2	Outline the key reasons why governments intervene in markets

# Why governments intervene in markets

- There are several main reasons for government intervention at the microeconomic level.
  1. **Earn government revenue** – governments can earn revenue from indirect taxes, which are taxes on goods and services.
    - The lower the price elasticity of demand for a good, the greater the amount of tax revenue earned.
    - Indirect tax are often imposed on goods that have a price inelastic demand ( $PED < 1$ ), such as cigarettes, alcohol, and gasoline.
  2. **Provide support to firms** – governments provide support to firms for many reasons.
    - Small firms that have just been set up may require financial assistance to become well established so they can compete with larger firms.
    - Support may also be offered to firms in an industry whose growth the government would like to encourage.
    - Government may want to protect domestic firms from foreign competition arising from imports.

# Why governments intervene in markets

3. **Provide support to households on low income** – households often do not earn enough income to be able to provide all necessities to meet their basic needs (food shelter, clothing).
4. **Influence the levels of production of firms** – government supports increase the firms' level of production.
5. **Influence levels of consumption of households/consumers** – the government may intervene to influence consumers to consume greater quantities of goods and services that are held to be beneficial to them (merit goods) or reduce consumption of goods and services held to be harmful (demerit goods).
6. **Correct market failure** – market failure refers to the failure of the market to achieve allocative efficiency.
  - When market failure occurs, it means that the market produces quantities of a good or service that are too large or too small in relation to what society most prefers.



# Why governments intervene in markets

- It may mean that certain goods that are socially desirable are not produced at all by the market.

## 7. **Promote equity (equality)** – the market system as a rule does not achieve an equitable (or fair) distribution of income and wealth.

- The market system results in income and wealth distributions that are too unequal.
- A relatively small proportion of the population receives only a relatively small share of income.
- Governments undertake to redistribute income.

# Forms of government intervention

- There are several forms of government intervention at the microeconomic level.
  - ▶ These policies work to influence demand or supply of a good or service, thus affecting market outcomes.
  - ▶ The main forms of these interventions include the following:
    1. **Price controls**
    2. **Indirect taxes**
    3. **Subsidies**
    4. **Direct provision of services**
    5. **Command and control regulation and legislation**
    6. **Consumer nudges**

## Price Controls



# Assessment Objectives

## Specific Expectations

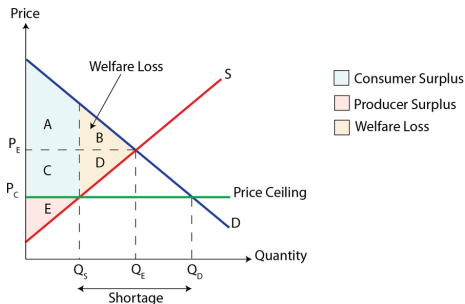
AO1	Explain the consequences of price ceilings and price floors on markets and stakeholders
AO4	Draw diagrams to illustrate the effects of price ceilings and price floors on markets and stakeholders
AO3	Evaluate the effects of price ceilings and price floors on markets and stakeholders
AO4	Calculate the effects of price ceilings and price floors on markets and stakeholders

# Price Controls

- **Price controls** refer to the setting of a minimum or maximum prices by the government (or private organizations) so that the prices are unable to adjust to their equilibrium level determined by demand and supply.
  - ▶ Price controls result in market disequilibrium, and therefore in shortages (excess demand) or surpluses (excess supply).
  - ▶ There are two primary forms of price controls,
    - **Price ceiling** – is a **maximum price** set below the market equilibrium price, in order to make goods more affordable to people on low incomes.
    - **Price floor** – is a **minimum price** set above the equilibrium price, in order to provide income support to farmers or to increase the wages of low-skilled workers.

# Price Ceiling

- A government may set a legal **maximum price** for a particular good; this is called a **price ceiling**.
  - ▶ It means that the price that can be legally charged by sellers of the good must not be higher than the legal maximum price.
  - ▶ Price ceilings are usually set in order to make certain goods more affordable to people on low incomes.



# Consequences of price ceilings: Markets

- A price ceiling does not allow the market to clear; it creates a situation of disequilibrium where there is a shortage (excess demand).
  1. **Shortages** – A price ceiling,  $P_C$ , set below the equilibrium price of a good creates a shortage.
    - At  $P_C$ , not all interested buyers who are willing and able to buy the goods are able to do so because there is not enough of the good being supplied.
    - The shortage is  $Q_D - Q_S$ .
  2. **Non-price rationing** – once a shortage arises due to a price ceiling, the price mechanism no longer achieves its rationing function.
    - The quantity,  $Q_S$  can only be distributed through non-price rationing methods.
    - **Queuing** – waiting in line and the first-come-first served principle

# Consequences of price ceilings: Markets

- **Rationing** – the distribution of coupons to all interested buyers, so that they can purchase a fixed amount of the good in a given time period.
  - **Favouritism** – the sellers can sell the good to their preferred customers.
3. **Underground (or parallel) markets** – involve buying or selling transactions that are unrecorded, and are usually illegal.
- For price ceilings, this involves buying a good at the maximum legal price, then illegally reselling it at a price above the legal maximum.
  - Underground markets can arise when there are dissatisfied people who have not succeeded in buying the good because there was not enough of it, and they are willing to pay more than the ceiling price to get it.
  - Underground markets are inequitable, and frustrate the objective sought by the price ceiling, which is to set a maximum price.



# Consequences of price ceilings: Markets

4. **Underallocation of resources and allocative inefficiency** – the price ceiling, being lower than the equilibrium price, results in a smaller quantity supplied.
  - Not enough of resources are allocated to the production of the good, resulting in underproduction relative to the social optimum.
  - Society is worse off due to underallocation of resources and allocative inefficiency.
5. **Negative welfare impacts** – a price ceiling creates a welfare loss, indicating that the price ceiling introduces allocative inefficiency due to underallocation of resources to the production of the good.
  - This is shown by  $Q_S < Q_E$ . Also  $MB > MC$ , indicating that society is not getting enough of the good.
  - **Welfare loss** (also known as deadweight loss) represents social surplus or welfare benefits that are lost to society because resources are not allocated efficiently.

# Price ceilings: Examples

- Price ceilings are for the most part set in order to make certain goods considered to be necessities more affordable to low-income earners.
1. **Rent controls** – consist of a maximum legal rent on housing, which is below the market-determined level of rent (the price of rental housing)
    - Housing becomes more affordable to low-income earners.
    - A shortage of housing, as the quantity of housing demanded at the legally maximum rent is greater than the quantity available.
    - Long wait lists of interested tenants waiting their turn to secure an apartment/flat.
    - A market for rented units where tenants sublet their apartments at rents above the legal maximum (an underground market).
    - Run-down and poorly maintained rental housing because it is unprofitable for landlords to maintain or renovate their rental units since low rents result in low revenues.

# Price ceilings: Examples

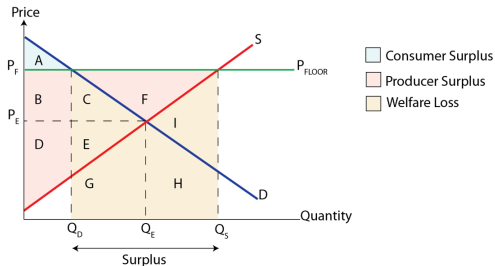
2. **Food price controls** – some governments use food price controls as a method to make food more affordable to low-income earners, especially during times when food prices are rising rapidly.
- Lower food prices and greater affordability
  - Food shortages as quantity demanded is greater than quantity supplied
  - Non-price rationing method (such as queues) to deal with shortages
  - Development of underground markets
  - Falling farmer incomes due to lower revenues
  - More unemployment in the agricultural sector
  - Misallocation of resources and welfare loss.
  - Possible greater popularity for the government among consumers who benefit.

# Price Floor

- A government may set a legal **minimum price** for a particular good; this is called a **price floor**.
  - ▶ Price floors are commonly used for three reasons:
    1. **Support firms** – to provide income to farmers by offering them prices for their products that are above market-determined prices.
    2. **Reduce overconsumption of demerit goods** – to provide a price disincentive and reduce negative externalities of consumption.
    3. **Protect low-skilled, low-wage workers** – by offering them a wage (the minimum wage) that is above the level determined by the market.
  - ▶ **Note:** to avoid getting confused, the position of a price floor and a price ceiling in relation to the equilibrium price is always the opposite of the floor and ceiling of a room.
    - The price floor is above and the price ceiling is below.

# Price Floor: Support firms

- Farmers' incomes in many countries, resulting from the sale of their products in free markets, are often unstable or too low.
  - ▶ Unstable incomes arise from unstable agricultural product prices, which are due to low price elasticities of demand and supply.
  - ▶ One method government use to support farmers' incomes is to set price floors for certain agricultural products, the objective is to raise prices above their equilibrium market price.



# Price Floor: Support firms – Consequences for markets

- A price floor does not allow the market to clear; it creates situation of disequilibrium where there is a surplus (excess supply).
  1. **Surplus** – A price floor,  $P_F$ , set above the equilibrium price of a good creates a surplus.
    - At  $P_F$  the price floor results in a larger quantity supplied,  $Q_S$ , and a lower quantity demanded  $Q_D$  relative to the original equilibrium.
    - The surplus is  $Q_S - Q_D$
    - A common practice is for the government to buy this excess supply, thereby shifting the demand curve so the market clears at  $P_F$ .
    - By buying up the excess supply the government is able to maintain the price floor at  $P_F$ .
    - If the government did not buy the surplus, the price would fall back to its equilibrium level.

# Price Floor: Support firms – Consequences for markets

2. **Government measures to dispose of surpluses** – the government must make a decision about what to do with the surplus (excess supply) it purchases.
  - **Store** – where governments store it, giving rise to additional costs for storage above the costs of the purchase.
  - **Export the surplus** – selling the product abroad. This often requires granting a subsidy to lower the price of the good since foreign countries would not want to buy it at the high price.
3. **Firm inefficiency** – higher than equilibrium product prices can lead to inefficient production.
  - Inefficient firms with high costs of production do not face incentives to cut costs by using more efficient production methods because the high price offers them protection against low-cost competitors.

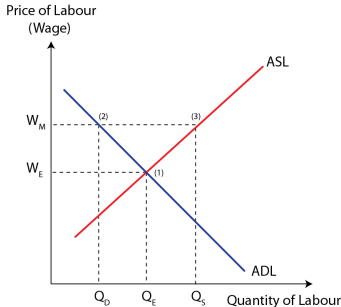
# Price Floor: Support firms – Consequences for markets

4. **Overallocation of resources and allocative inefficiency** – too many resources are allocated to the production of the good, resulting in a larger than optimum quantity produced.
5. **Negative welfare impacts** – a price floor creates a welfare loss, indicating that the price floor introduces allocative inefficiency due to overallocation of resources to the production of the good, shown by  $Q_S > Q_E$ .
  - Also  $MB < MC$ , indicating that society is getting too much of the good.



# Price Floor: Minimum wage

- **Minimum wage** a minimum price of labour set by the government in the labour market, in order to ensure that low-skilled workers can earn a wage high enough to secure them with access to basic goods and services.
- The objective is to guarantee an adequate income to low-income workers, who tend to be mostly unskilled.



# Price Floor: Minimum wage – Consequences

- Minimum is a **labour market rigidity** which is a factor preventing the forces of supply and demand from operating in the labour market.
  1. **Labour surplus (excess supply) and unemployment** – the imposition of a minimum wage in the labour market creates a surplus of labour equal to  $Q_S - Q_D$ , which is unemployment, as it corresponds to people who would like to work but are not employed.
  2. **Illegal workers at wages below the minimum wage** – illegal employment of some workers at wages below the legal minimum wage; this often involves illegal immigrants who may be willing to supply their labour at very low wages.
  3. **Misallocation of labour resources** – the minimum wage affects the allocation of labour resources, as it prevents the market from establishing a market-clearing price of labour.
    - The imposition of a minimum wage changes these signals and incentives for unskilled labour, whose wage is affected by the price floor.

- Industries that rely heavily on unskilled workers are more likely to be affected, and will hire less unskilled labour.
4. **Misallocation in product markets** – firms relying heavily on unskilled workers experience an increase in their costs of production, leading to a leftward shift of their product supply curve, resulting in smaller quantities of output produced.
- The misallocation of labour resources leads also to misallocation in product markets.

## Indirect Taxes



# Assessment Objectives

## Specific Expectations

AO2	Explain the consequences of indirect taxes on markets and stakeholders
AO4	Draw diagrams to illustrate the effects of indirect taxes on markets and stakeholders.
AO3	Evaluate the effects of indirect taxes on markets and stakeholders.
AO4	Calculate the effects of indirect taxes on markets and stakeholders.

# Indirect Taxes

- **Indirect taxes** are taxes levied on spending to buy goods and services.
  - ▶ Whereas payment of some or all of the tax by the consumer is involved, they are paid to the government authorities by the suppliers (firms).
  - ▶ There are two types of indirect taxes:
    1. **Excise taxes** – are imposed on particular goods and services such as petrol (gasoline), cigarettes and alcohol.

**Pigouvian tax** – is a tax on a market transaction that creates a negative externality, or an additional cost, borne by individuals not directly involved in the transaction.
    2. **Taxes on spending** – placed on all or most goods or services such as valued added taxes or general sales taxes.
  - ▶ Indirect may be percentage-based on a specific amount per unit

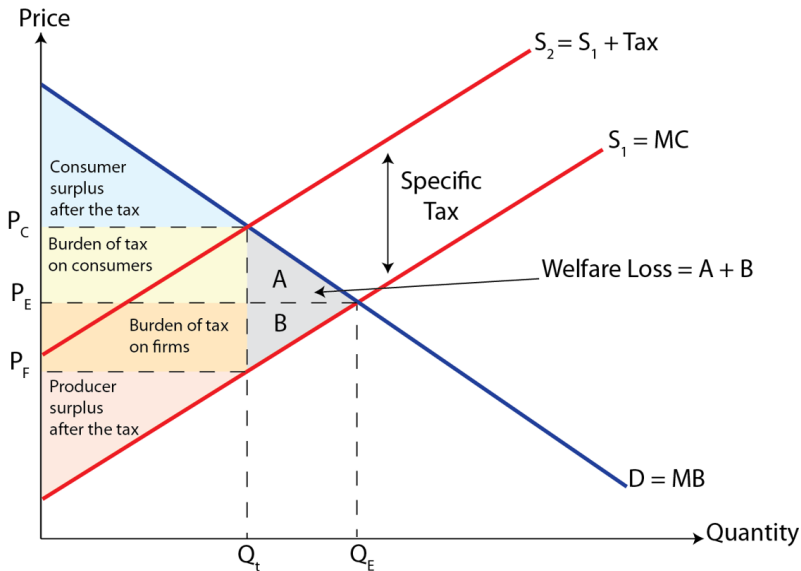
# Indirect Taxes

1. **Specific tax** – is a fixed amount of tax placed on a particular good. It is proportional to the particular quantity of a product sold, regardless of its price.
  2. **Ad valorem tax** – defined in terms of a fixed percentage of the price of a good or service. The supply curve shifts up proportionately at each price, and the amount of tax increases as the price of the good or service increases.
- Governments impose excise taxes for several reasons:
    1. **Source of government revenue** – governments collect revenue from indirect taxes. The lower the price elasticity of demand, the greater the government revenue generated.
    2. **Discourage consumption of demerit goods** – the consumption of certain goods is considered harmful to the individual. Taxing these goods is likely to reduce their consumption and improve the allocation of resources.

3. **Redistribute income** – some taxes focus on luxury goods. The objective is to tax goods that can only be afforded by high-income earners. Payment of a tax on the purchase of these goods reduces after-tax income, thus narrowing differences with the incomes of lower-income earners.
- ▶ When a tax is imposed on a good or service, it is paid to the government by the firm.
    - For every level of output the firm is willing and able to supply to the market, it must receive a price that is higher than the original price by the amount of the tax.
    - This involves a shift of the supply curve upward by the amount of tax.



# Indirect Tax



# Indirect Tax – Market Outcomes

- ▶ The market outcomes due to the indirect tax are the following:
  - Equilibrium quantity produced and consumed falls from  $Q_E$  to  $Q_T$
  - Equilibrium price increases from  $P_E$  to  $P_C$ , which is the price paid by consumers
  - Consumer expenditure on the good is given by the price of the good per unit times the quantity of units bought, it is therefore changes from  $P_E \times Q_E$  to  $P_C \times Q_T$
  - Price received by the firm falls from  $P_C$  to  $P_F$ , which is  $P_F = P_C - \text{Tax per unit}$
  - The firm's revenue falls from  $P_E \times Q_E$  to  $P_F \times Q_T$
  - The government receives tax revenue, given by  $(P_C - P_F) \times Q_T$ , or the of tax per unit times the number of units sold.
  - There is underallocation of resources to the production of the good,  $Q_T$  is less than the free market quantity  $Q_E$ .

# Indirect Tax – Market Outcomes

- ▶ Note that when identifying producer surplus after the imposition of an indirect tax, we always refer to the initial supply curve.
  - The imposition of an indirect tax result in reduced consumer and producer surplus, part of which is transformed into government revenue, and part of which is a welfare loss.
  - The welfare loss in this case is the result of underallocation of resources to the production of the good (underproduction).
  - This is also indicated by  $MB > MC$ : too little of the good is produced and consumed relative to the social optimum.

# Indirect Tax – Summary

- ▶ The effects of imposing an excise tax on a particular good can be summarized by the following three effects,
  1. **Incidence of the tax** – the stakeholder with the lower elasticity has a higher tax incidence.
    - The more inelastic the demand and the more elastic supply the higher incidence of a tax on consumers.
    - The more elastic the demand and the more inelastic the supply the higher the incidence of a tax on producers.
  2. **Government revenue** – will be greater the lower the elasticity of demand and the lower the elasticity of supply.
  3. **Resource allocation** – will be most changed the higher the elasticity of demand and the higher the elasticity of supply.

## Subsidies



# Assessment Objectives

## Specific Expectations

Specific Expectations	
AO2	Explain the consequences of subsidies on markets
AO4	Draw diagrams to illustrate the effects of subsidies on markets and stakeholders
AO3	Evaluate the effects of subsidies on markets and stakeholders
AO4	Calculate the effects on subsidies on markets and stakeholders

# Subsidy

- **Subsidy** is an amount of money paid by the government to firm.
  - ▶ Subsidies are a negative indirect taxes, the government pays producers which in turn lower the cost of production.
  - ▶ A subsidy shifts the supply curve to the right by the amount of the subsidy.
  - ▶ A subsidy given to a firm results in a higher level of output and lower price for consumers.
  - ▶ May also be paid to consumers as financial assistance or for income redistribution.

# Subsidies – Rationale for Implementation

- There are several reasons why the government grant subsidies to firms
  1. **Increase revenues (incomes) of producers**
  2. **Improve affordability to low-income consumers**
    - Subsidies have the effect of lowering the price of the good that is paid by consumers, thus making the good more affordable.
  3. **Encourage production and consumption**
    - A subsidy has the effect of increasing the quantity of a good produced and consumed.
  4. **Support the growth of particular industries**
    - If granted to firms in a particular industry, they support the growth of that industry.



# Subsidies – Rationale for Implementation

## 5. Encourage exports of a particular good

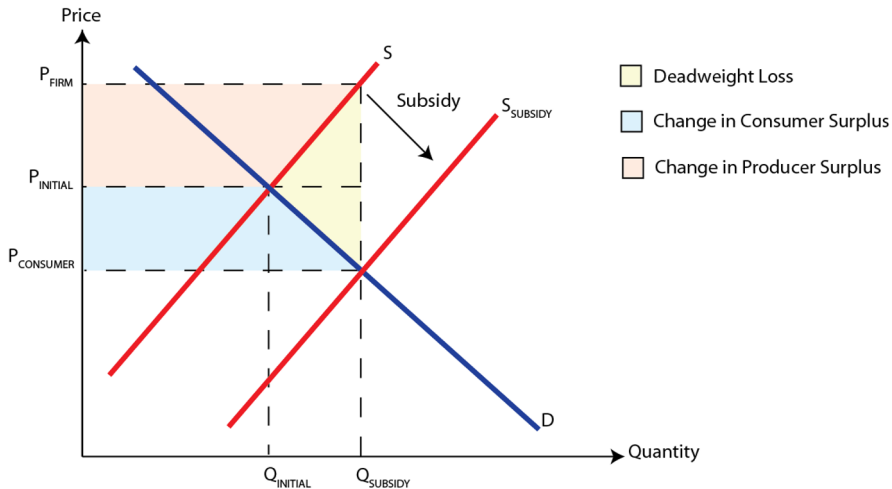
- Since subsidies lower the price paid by consumers, they are sometimes granted on goods that are exported (sold to other countries), since lower export prices increase the quantity of exports.

## 6. Improve resource allocation

- Subsidies are a method to improve the allocation of resources (reduce allocative inefficiencies) by correcting positive externalities.

# Subsidies

- Note that when identifying the producer surplus after granting the subsidy, we always refer to the initial supply curve, which is  $S_1$ .



# Subsidies – Market Outcomes

- ▶ The market outcomes due to the subsidy are the following:
  - The equilibrium quantity produced and consumed increase from  $Q_{\text{Initial}}$  to  $Q_{\text{Subsidy}}$ .
  - The equilibrium price falls from  $P_{\text{Initial}}$  to  $P_{\text{Consumer}}$ ; this is the price paid by consumers.
  - The price received by producers increases for  $P_{\text{Initial}}$  to  $P_{\text{Firm}}$
  - The amount of the subsidy is given by  $(P_{\text{Firm}} - P_{\text{Consumer}}) \times Q_{\text{Subsidy}}$ , or the amount of subsidy per unit is multiplied by the number of units sold; this is the entire shaded area, and represents government spending to provide the subsidy.
  - There is overallocation of resources to the production of the good;  $Q_{\text{Subsidy}}$  is greater than the free market quantity,  $Q_{\text{Initial}}$
  - The granting of a subsidy results in greater consumer and producer surplus; however society loses due to government spending on the subsidy.

# Subsidies – Market Outcomes

- The losses from government spending is greater than the gain in consumer and producer surplus, welfare loss results, reflecting allocative inefficiency, which in this case is due to overallocation of resources to the production of the good (overproduction).
- This is also illustrated by  $MB < MC$ : too much of the good is being produced and consumed relative to the social optimum.
- **Welfare loss (dead-weight loss)** – is a loss of economic efficiency (allocative inefficiency) that can occur when the equilibrium for a good or service is not Pareto optimal.

## Common Pool Resources



# Assessment Objectives

Specific Expectations	
AO2	Explain the meaning of common pool resources in terms of the concepts of rivalry and non-excludability and in terms of tragedy of the commons.
AO2	Explain the meaning of unsustainable production

# Common Pool Resources

- **Common pool resources** resources that are not owned by anyone, do not have a price, and are available for anyone to use without payment.
  - ▶ **Examples:** Lakes, rivers, fish in the open seas, open grazing land, ozone layer.
  - ▶ Their depletion or degradation leads to environmental unsustainability.
  - ▶ Common pool resources are **rivalrous** but **non-excludable**.
    - **Rivalrous** is a characteristic of a good according to which its consumption by one person reduces its availability for someone else.
    - **Excludable** is a characteristic of goods according to which it is possible to exclude people from using the good by charging a price for it; if someone is unwilling or unable to pay the price they will be excluded from using it.

# Public and private goods

- **Public goods** are goods which are **non-rivalrous** (its consumption by one person does not reduce consumption by someone else) and **non-excludable** (it is not possible to exclude someone from using the good).
  - ▶ Since it is not possible to exclude someone from using the good even though they do not pay for it, firms do not have an incentive to produce it.
  - ▶ Public goods may give rise to the “**free rider problem.**” A free-rider is a person who receives the benefit of a good without paying for it.
  - ▶ This is a type of market failure.
  - ▶ Public goods are therefore provided by the government.
  - ▶ **Examples:** Libraries, national defence, lighthouses, street-lamps, and clean air.



# Public and private goods

- **Private goods** are goods which are **rivalrous** (consumption by one person reduces consumption by someone else) and **excludable** (it is possible to exclude someone from using the good).
  - ▶ Ownership is restricted to the group or individual that purchased the good for their own consumption.
  - ▶ **Examples:** Sports cars, laptops, and cellphones

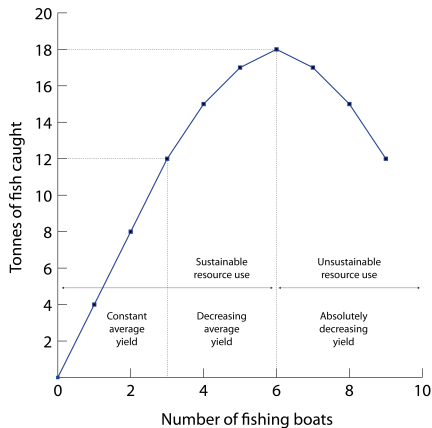
	Excludable	Non-Excludable
Rivalrous	<b>Private goods</b> <b>Examples:</b> Clothings, restaurants	<b>Common goods</b> <b>Examples</b> Fish, timber
Non-Rivalrous	<b>Collective goods</b> <b>Examples:</b> Movie theatre, internet	<b>Public goods</b> <b>Examples</b> Lighthouse, air

# Tragedy of the commons

- **Tragedy of the Commons** is a dilemma arising from the situation in which multiple individuals, acting independently and rationally consulting their own self-interest, will deplete a shared limited resource, even when it is clear that it is not in anyone's long-term interest for this to happen.
  - ▶ The solution to the tragedy of the commons is to make the commonly held resource private property.
  - ▶ Economies depend on resources and we must be careful how we manage them.
    - **Sustainability** refers to the use of resources in ways that do not result in fewer or lower quality resources for future generations.
    - **Unsustainable production** production that uses resources unsustainably, leading to their depletion or degradation.

# Tragedy of the commons

- Sustainable resource use means that resources are used at a rate that allows them to reproduce themselves, so they do not become degraded or depleted.



## Market Failure & Externalities



# Assessment Objectives

## Specific Expectations

AO2	Explain market failure as the failure of the market to achieve allocative efficiency
AO2	Explain that socially optimum output is produced when there is allocative efficiency; this occurs when $MSC = MSB$ and social (community) surplus is maximum.
AO4	Draw a diagram illustrating allocative efficiency and socially optimum output.
AO2	Explain the meaning of externalities as an example of market failure

# Market Failure

- **Market failure** refers to the failure of the market to allocate resource efficiently.
  - ▶ Market failure results in **allocative inefficiency**, where too much or too little of goods or services are produced and consumed from the point of view of what is socially most desirable.
  - ▶ Where there is market failure there is justification to modify the way the market works to allocate resources differently.
  - ▶ **Overprovision** of a good means too many resources are allocated to its production (overallocation).
  - ▶ **Underprovision** means that too few resources are allocated to its production (underallocation).
  - ▶ There are several factors that can lead to market failure:
    - Existence of externalities
    - Market power
    - Asymmetric information

# Pareto Optimality & Externalities

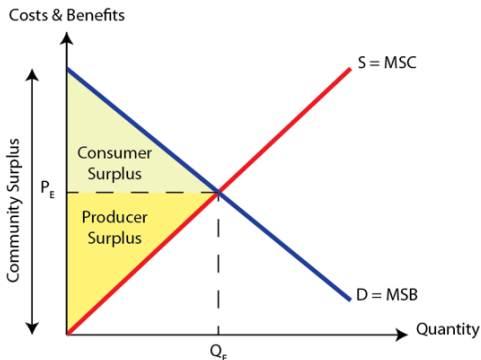
- **Pareto optimality** refers to a market situation where no one can be made better off without making someone else worse off.
  - ▶ There are no possible combinations of price and quantity that can improve one group's situation without hurting the other.
  - ▶ At a normally functioning competitive equilibrium, there exists a state of Pareto optimality.
  - ▶ **Community surplus = Producer surplus + Consumer surplus**
  - ▶ The maximization of community surplus is synonymous with Pareto optimality and is achieved at  $P_E$  and  $Q_E$  where  $MSB = MSC$ .
  - ▶ **Marginal private costs (MPC)** refer to costs to the producers of producing one more unit of a good.
  - ▶ **Marginal social costs (MSC)** refer to the costs to society of producing one more unit of a good.

# Pareto Optimality & Externalities

- $MSC = MPC + \text{External costs}$
- ▶ **Marginal private benefits (MPB)** refer to benefits to consumers from consuming one more unit of a good.
- ▶ **Marginal social benefits (MSB)** refer to benefits to society from consuming one more unit of a good.
  - $MSB = MPB + \text{External benefits}$
- ▶ **Socially optimum output** refers to the level of output that is best from the socially point of view, determined by the achievement of allocative efficiency.
  - Occurs when marginal social benefits are equal to marginal social costs  $MSB = MSC$ .
  - When there is no externality, the competitive free market leads to an outcome where  $MPC = MSC = MPB = MSB$  indicating allocative efficiency.



# Pareto Optimality & Externalities



- **Externality** occurs when the actions of consumers or producers give rise to negative or positive side-effects on other people who are not part of these actions, and whose interests are not taken into consideration.

# Pareto Optimality & Externalities

- ▶ An externality creates a divergence between MPC and MSC or between MPB and MSB.
  - **Positive externality** a type of externality where side-effects on third parties are positive or beneficial, also known as “spillover benefits”.
  - **Negative externality** a type of externality where the side-effects on third parties are negative or harmful.
  - Externalities can result either from consumption activities (**consumption externalities**) or from production activities (**production externalities**).
- ▶ The free market leads to an outcome when  $MPB = MPC$ , but where  $MSB$  is not equal to  $MSC$  ( $MSB \neq MSC$ ), indicating allocative inefficiency.
- ▶ Either too much (**overallocation**) or too little (**underallocation**) is produced or consumed relative to the social optimum.

## Negative production externalities



# Assessment Objectives

## Specific Expectations

AO2	Explain negative externalities of production
AO4	Draw a diagram illustrating negative externalities of production and welfare loss
AO4	Calculate welfare loss that arises from negative externalities of production
AO2	Explain that negative production externalities of production can be used to illustrate overuse of common pool resources.
AO2	Explain government intervention to correct negative externalities of production and prevent over use of common pool resources including: Indirect (Pigouvian) taxes, Carbon taxes, Tradable permits, Legislation and regulation, Collective self-governance, Education-awareness creation, International agreements.

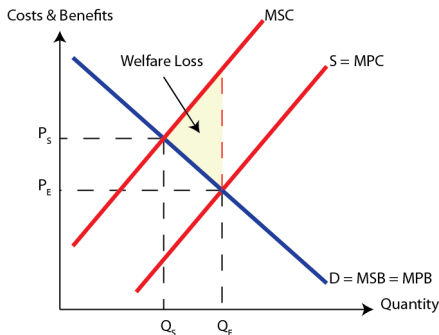
# Assessment Objectives

## Specific Expectations

AO4	Draw diagrams to illustrate the above government responses
AO3	Discuss strengths and limitations of the above government policies with respect to: difficulties in measurement of externalities, degree of effectiveness, consequences of stakeholders.

# Negative production externalities

- **Negative production externalities** a negative externality caused by production activities, leading to a situation where marginal social costs are greater than marginal private costs ( $MSC > MPC$ ).
  - ▶ The external costs suffered by others increases the overall social costs which exceed the costs to the individual.



# Negative production externalities

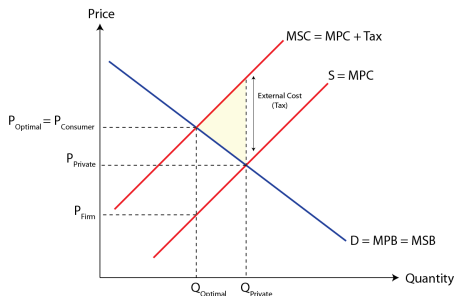
- ▶ When there is a negative production externality, the free market overallocates resources to the production of the good and too much of it is produced relative to the social optimum.
  - This is shown by  $Q_E > Q_S$  and  $MSC > MSB$  at the point of production  $Q_E$ .
  - For all units of output greater than  $Q_S$ ,  $MSC > MSB$ , meaning that society would be better off if less were produced.
  - The welfare loss is equal to the difference between  $MSC$  and  $MSB$  for the amount of output that is overproduced ( $Q_S - Q_E$ ).
  - It is a loss of social benefits due to overproduction of the good caused by the externality.
  - If the externality were corrected, so that the economy reaches the social optimum, the loss of benefits would disappear.

# Policies to correct negative production externalities

- An important group of policies that can be pursued by governments rely on the market to correct negative production externalities and promote sustainable use of common pool resources.
  - ▶ Market-based policies work by changing the incentives face by firms.
- 1. **Pigouvian taxes** – indirect taxes designed to correct negative externalities of production or consumption.
  - The tax results in an upward shift of the supply curve from  $S = MPC$  to  $MSC = MPC + Tax$ .
  - The optimal tax policy is to impose a tax that is exactly equal to the external cost, so the MPC curve shifts upward until it overlaps with MSC.
  - The new after-tax equilibrium results in the lower, optimal quantity of the good produced,  $Q_{Optimal}$ , and higher, optimal price,  $P_{Optimal}$ .
  - Indirect tax in the present context are intended to lead to allocative efficiency.



# Policies to correct negative production externalities

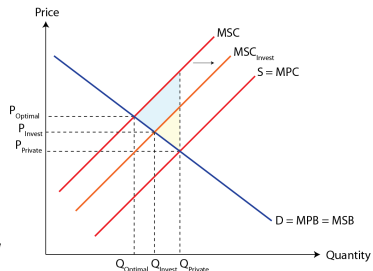
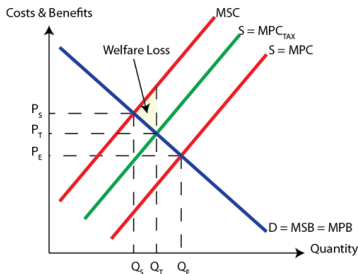


2. **Carbon tax** – a tax per unit of carbon emissions of fossil fuels, considered by many countries as a policy to deal with the problem of climate change.

- A tax on carbon (or on emissions) has the effect of creating incentives for producers to reduce the amount of pollution they create by purchasing less polluting resources (such as fossil fuels), and switch to less polluting technologies (alternative energy sources).

# Policies to correct negative production externalities

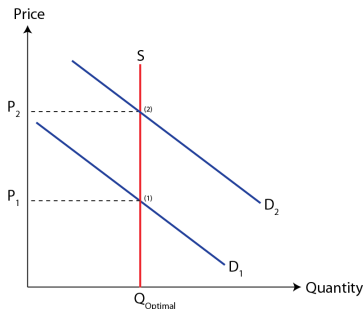
- This reduces the size of the negative externality and increases the optimum quantity of output.
- A tax on the output of the polluter does not have this effect; it corrects the overallocation of resources to the good, reducing the quantity of output produced.



# Policies to correct negative production externalities

3. **Tradable permits** – permits that can be issued to firms by a government authority or an international body, and that can be traded (bought and sold) in a market, the objective being to limit the total amount of pollutants emitted by firms.
- If a firm can produce its product by emitting a lower level of pollutants than the level set by its permits, it can sell its extra permits in the market.
  - If a firm needs to emit more pollutants than the level set by its permits, it can buy more permits in the market.
  - With respect to pollutants, the price of such rights is determined by the demand for the right to discharge the pollutants and a perfectly inelastic supply curve of such rights.
  - The supply of permits is determined by the restricted quantity established by the government.

# Policies to correct negative production externalities



- Potential polluters have a monetary incentive not to pollute because they must pay for the right to discharge pollutants.
- Rising price of pollution rights should stimulate the search for improved pollution control techniques and technology.
- Growing revenue from the sale of a fixed quantity of pollution rights can be devoted to environmental improvements.

# Advantages of market-based policies

- ▶ Both taxes and tradable permits have the effect of internalizing the externality, meaning the costs that were previously external are made internal, because they are now paid for by producers and consumers who are parties to the transaction.
- ▶ Taxes on emissions such as a carbon tax are superior to taxes on output.
  - Taxes on output only provides incentives to producers to reduce the quantity of output produced with a given technology and given polluting resources, but not to reduce the amount of pollution they create or switch to less polluting resources.
  - Taxes on pollutants emitted provide incentives to firms to economize on the use of polluting resources (such as fossil fuels) and use production methods that pollute less.
  - Taxation leads to lower pollution levels at a lower overall cost to society since firms that will switch to clean forms of energy are the ones that can do it more cheaply.

# Disadvantages of market-based policies

- ▶ Taxes and tradeable permits are simple in theory, in practice they are faced with numerous technical difficulties.
  - A serious problem with carbon taxes is that they are usually set too low to make a significant impact.
  - It is often politically difficult to impose carbon taxes that are high enough to make the necessary difference.
- ▶ An effective tax policy requires answers to the following questions:
  1. **What production methods produce pollutants?**
    - It is necessary to identify what production methods produce which pollutants, which is technically very difficult.
  2. **Which pollutants are harmful?**
    - There is much controversy among scientists over the extent of harm done by each type of pollutant

# Disadvantages of market-based policies

## 3. What is the value of the harm?

- It is necessary to attach a monetary value to the harm.

## 4. What is the appropriate amount of the tax?

- It is necessary to determine the size of the tax to make it equal to the value of harm.

## 5. How will consumers be affected?

- Indirect taxes are regressive meaning that lower income people have to pay a higher proportion of their income in tax than higher income people, which is considered inequitable.

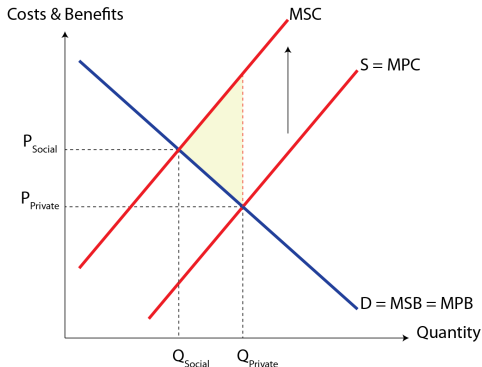
# Government legislation and regulation

- ▶ **Government legislation and regulation** rely on the “command approach”, where government uses its authority to enact legislation and regulation in the public’s interest.
  - Restrictions on emissions of pollutants from factories and industrial production by setting a maximum level of pollutants permitted.
  - Banning the use of harmful substances.
  - Issuing licenses or permits for particular activities (such as hunting).
  - Prohibiting construction (such as housing) or industry in agriculture in protected areas.
  - Restrictions on the quantity of logging.
  - Restrictions in the form of quotas for fishing (maximum permissible quantity of fish that can be caught).
  - Establishment of protected areas for the protection of biodiversity and endangered ecosystems.



# Government legislation and regulation

- ▶ The government's policy objective is to make the MPC curve upwards until it coincides with the MSC curve.
- ▶ The quantity produced declines to  $Q_{\text{Social}}$ , price increases from  $P_{\text{Private}}$  to  $P_{\text{Social}}$ , and the problem of overallocation of resources to the production of the good is corrected.



# Government legislation and regulation

- ▶ Correction of negative externalities by market-based approaches or government legislation usually involve shifting the MPC curve upward toward the MSC curve through a variety of policies.
  - For allocative efficiency to be achieved, the quantity of the good produced and consumed must fall to  $Q_{\text{Social}}$  as price increases to  $P_{\text{Social}}$ .
- ▶ **Advantages**
  - Simple to implement and oversee.
  - Force firms to comply and reduce their harmful activities.
- ▶ **Disadvantages**
  - Cannot distinguish between firms that have lower or higher costs of reducing pollution, which would limit the overall costs of reducing pollution.
  - Informational asymmetry on the costs, types, and amounts of pollutants emitted.
  - Costs of monitoring and supervision to detect possible violations.

# Collective Self-Governance

- **Collective self-governance** a solution to the use of common pool resources where users take control of the resources and use them in a sustainable way.
  - ▶ Runs counter to the idea of tragedy of the commons.
  - ▶ This solution presupposes that the users of the resources can communicate with each other, resulting in rules about the use of the resources along with sanctions for violations of the rules.
  - ▶ **Advantages**
    - Cooperative solutions can be achieved in the absence of private ownership of resources and in the absence of government-owned property, but it is important to have a legal system of land rights.
  - **Disadvantages**
    - Requires that stakeholders be able to communicate with each other to create rules for the use of the common pool resources, and there must be a boundary for the resource.

# Education and awareness creation

- ▶ Education of the public and provision of information regarding the polluting activities of firms (or other activities with negative external effects) often makes consumers turn away from the products, with negative effects on the firms' sales.
  - As a result the firms are forced to take consumers' opinions into consideration and change their production methods in order to reduce externalities.
- ▶ **Advantages**
  - Firms are influenced by the opinions of consumers and want to keep them happy, otherwise they will suffer drops in sales.
- ▶ **Disadvantages**
  - Can only make a small difference in terms of solving the problem of production externalities and sustainability.
  - Problems of a more general and broad nature, such as the use of fossil fuels that cause climate change plus a host of other environmental problems, require more comprehensive solutions.

# International Agreements

- Negative production externalities and the overuse of common pool resources very often has international repercussions, in which case co-operation among governments and international agreements are crucially important to control and prevent negative consequences on certain resources.
  - Co-operation among governments is very important for the development and diffusion of new technologies intended to deal with global environmental issues.
  - However, less comprehensive policies are often made by national governments.
- **Examples**
  - European Union Emissions Trading System (2005)
  - Kyoto Protocol (2005 – 2012)
  - Paris Agreement (2019)

## Negative consumption externalities



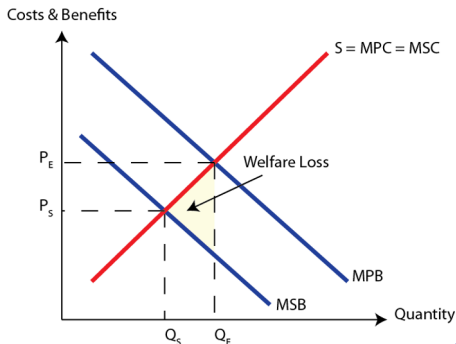
# Assessment Objectives

## Specific Expectations

AO2	Explain negative externalities of consumption and the resulting welfare loss.
AO2	Explain the meaning of demerit goods.
AO4	Calculate the welfare loss that arises from negative externalities of consumption.
AO2	Explain government intervention to correct negative externalities of consumption: indirect (Pigouvian) taxes, legislation and regulation, education and awareness creation, nudges.
AO4	Draw diagrams to illustrate the above government responses.
AO3	Discuss strengths and limitations of the above government policies with respect to: difficulties in measurement of externalities, degree of effectiveness, consequences for stakeholders.

# Negative consumption externalities

- **Negative consumption externalities** a negative externality caused by consumption activities, leading to a situation where marginal social benefits are less than marginal private benefits ( $MSB < MPB$ ).
  - ▶ The negative external benefits (costs) suffered by others decreases the overall social benefit which is lower than the benefits to the individual.





# Negative consumption externalities

- ▶ When there is a negative consumption externality, the free market overallocates resources to the production of the good, and too much of it is consumed relative to what is socially optimal.
  - This is shown by  $Q_E > Q_S$  and  $MSC > MSB$  at the point of production  $Q_E$ .
  - For all units of output greater than  $Q_S$ ,  $MSC > MSB$ , meaning that society would be better off if less were consumed.
  - The welfare loss is equal to the difference between  $MSC$  and  $MSB$  for the amount of output that is overproduced ( $Q_S - Q_E$ ).
  - It is a loss of social benefits due to overconsumption of the good caused by the externality.
  - If the externality were corrected, so that the economy reaches the social optimum, the loss of benefits would disappear.

# Demerit goods

- **Demerit goods** are goods that are considered to be undesirable for consumers and are overprovided by the market.
  - ▶ Reasons for overprovision are usually that the goods have **negative consumption externalities**, in which case the market overallocates resources for its production.
  - ▶ This could occur because of consumer ignorance about its effects or indifference.
    - Consumers may not be aware of the harmful effects upon others of their actions, or they may not care.
  - ▶ **Example(s):** Cigarettes, marijuana, alcohol, and gambling

# Overuse of common pool resources

- ▶ Overuse of common pool resources is seen as resulting more from production activities than consumption activities, therefore relating more to negative production rather than consumption externalities.
- ▶ Overuse of common pool resources results from negative consumption externalities.
- ▶ **Example:** The demand for heating oil, represented by the demand curve MPB.
  - The overuse of clear air (the common pool resource) is the external costs that causes the marginal social benefit curve (MSB) to lie below the MPB curve.
- ▶ **Example:** Air travel is a consumption activity that results in significant and rapidly increasing greenhouse gases that cause global warming.

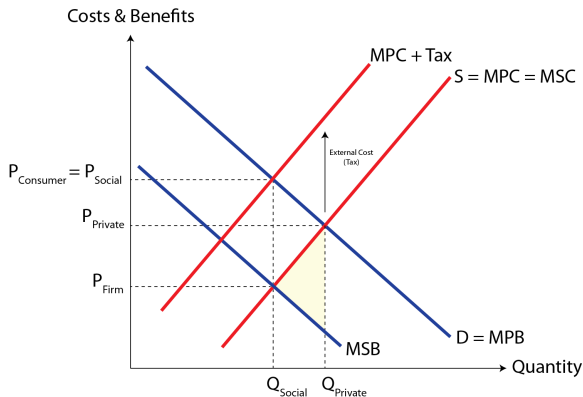
# Policies to correct negative production externalities

- ▶ Market-based policies work by changing the incentives face by firms.

## 1. **Pigouvian taxes** – indirect taxes designed to correct negative externalities of production or consumption.

- Indirect taxes can be imposed on the good whose consumption creates external costs.
- The tax results in an upward shift of the supply curve from  $S = MPC$  to  $MSC = MPC + Tax$ .
- If the tax equals the external costs, the  $MPC + Tax$  curve intersects  $MPB$  at  $Q_{Social}$  level of output, and the quantity produced and consumed drops to  $Q_{Social}$ .
- The new after-tax equilibrium results in the lower, optimal quantity of the good produced,  $Q_{Social}$ , and higher price,  $P_{Social}$ .
- Indirect tax in the present context permits allocative efficiency to be achieved.

# Policies to correct negative consumption externalities



## Advantages

- Indirect taxes create incentives for consumers to change their consumption patterns; the good that is taxed becomes relatively more expensive and consumption is reduced.

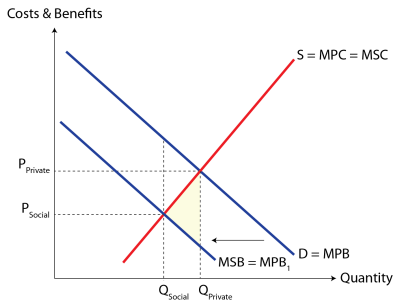
# Policies to correct negative consumption externalities

## Disadvantages

- Difficulties in measuring the value of external costs.
- There are many technical details involved in trying to assess who and what is affected, as well as to determine the value of the external costs, on the basis of which a tax can be designed.
- Many goods whose consumption leads to negative consumption externalities have an inelastic demand.
- It is possible that imposing a indirect taxes works to increase government tax revenues while not significantly decreasing the quantity demanded of these goods.
- In order to achieve  $Q_{\text{Social}}$ , a very high tax would have to be imposed, while would very likely be politically unacceptable.
- Large tax revenues can be used for negative advertising and education programmes to discourage consumption of particular goods.

# Government legislation and regulation

- Regulations can be used to prevent or limit consumption activities that impose costs on third-parties.
- This has the effect of shifting the MPB curve towards the MSB curve until  $MPB_1$  overlaps with MSB.
- This would eliminate the externality and achieve allocative efficiency, with production and consumption occurring at  $Q_{\text{Social}}$  and price falling to  $P_{\text{Social}}$ .



# Education and awareness-creation

- ▶ Educating the public and creating awareness by the government can be used to try to persuade consumers to buy fewer goods with negative externalities.
  - The objective is to try to decrease demand for goods giving rise to negative consumption externalities.
  - The effects are the same as government regulation.
  - The MPB curve shifts to  $MPB_1$  after the campaign, where it coincides with MSB, where  $Q_{\text{Social}}$  is produced and consumed, and the price falls from  $P_{\text{Private}}$  to  $P_{\text{Social}}$ .

## Advantages and disadvantages

- Education and awareness-creation have the advantage that they are simpler than other methods.
- The cost to the government campaigns, which are funded out of tax funds, meaning there are less funds available for use elsewhere in the economy (there are **opportunity costs**).



**Nudge** is part of behavioural economics, it is a method designed to influence consumers' choice in a predictable way, without offering financial incentives or imposing sanctions, and without limiting choice.

- They can be used in ways similar to education and consumer awareness to encourage consumers to rely less on goods with negative externalities.
- **Example:** Unhealthy foods can be placed in less accessible places in shops.
- In such cases demand for the product falls so that the MPB curve shifts toward MSB.
- Nudges also be used to encourage desirable behaviour.
- **Example:** Creating bicycle lanes to motivate car drivers to use bicycles instead.
- There are difficulties in designing nudges and not enough is known how consumers respond to particular nudges and choice architecture.

# Summary

- ▶ Correction of negative consumption externalities involve either decreasing supply and shifting the MPC curve upward by imposing and indirect (Pigouvian) tax.
- ▶ Alternatively, by decreasing demand and shifting the MPB curve towards the MSB curve through regulations, education, and awareness creation or nudges.
- ▶ Both supply decreases and demand decreases are intended to lead to production and consumption at  $Q_{\text{Social}}$  and the achievement of allocative efficiency.

## Positive production externalities



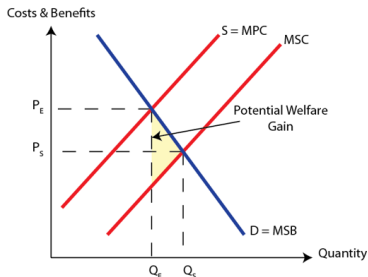
# Assessment Objectives

## Specific Expectations

Specific Expectations	
AO2	Explain positive externalities of production and the resulting welfare loss
AO4	Draw a diagram illustrating positive externalities of production and welfare loss
AO4	Calculate welfare loss that arises from positive externalities of production
AO2	Explain government intervention to correct positive externalities of production: government provision, subsidies
AO4	Draw diagrams to illustrate the above government responses
AO3	Discuss strengths and limitations of the above government policies with respect to: difficulties in measurement of externalities, degree of effectiveness, consequences for stakeholders.

# Positive Production Externalities

- **Positive production externalities** a positive externality caused by production activities, leading to a situation where marginal social costs are less than marginal private costs ( $MSC < MPC$ ).
- ▶ **Example:** If a firm engages in research and development, and succeeds in developing a new technology that spreads throughout the economy, there are external benefits not only to the firm but also society benefits from the widespread adoption of the new technology.



# Positive Production Externalities

- ▶ The MSC curve lies below the MPC curve, and the difference between the two curves is the value of the external benefits (these can be thought of as “negative costs”).
- ▶ When there is a positive production externality, the free market underallocates resources to the production of the good.
- ▶ Too few resources are allocated to its production, and too little of it is produced. This shown by  $Q_E < Q_S$  and  $MSB > MSC$  at  $Q_E$ .
- ▶ The underallocation of resources to the production of a good with a positive production externality leads to a welfare loss.
- ▶ **Example:** A firm provides first aid classes to employees to improve work safety; external benefits are created as this knowledge is applied also to people outside the workplace.

# Correcting Positive Production Externalities

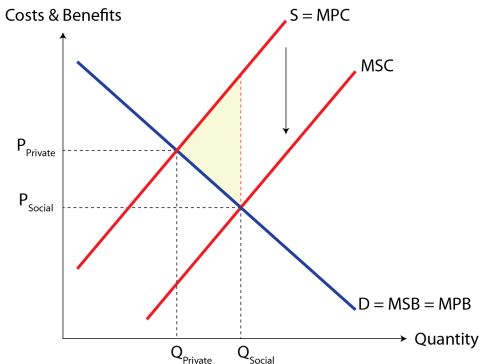
- ▶ Correction of positive production externalities involve shifting the MPC curve downward toward the MSC curve through direct government provision or by subsidies.
- ▶ For allocative efficiency to be achieved, the quantity produced and consumed must increase to  $Q_{\text{Social}}$  as price falls to  $P_{\text{Social}}$ .

## 1. Direct government provision

- A solution often pursued by governments involves direct government provision of the good or service creating the positive production externality
- **Example:** Governments often engage in research and development (R&D) for new technology, for medicine and pharmaceuticals, and many other areas.
- Governments pay for such activities with government funds, raised through taxes.

# Correcting Positive Production Externalities

- The government intervenes by providing the good and service itself, this has the effect of shifting the supply curve (MPC) downward toward the MSC curve so that the optimum quantity of the good,  $Q_{\text{Social}}$ , will be produced with price falling from  $P_{\text{Private}}$  to  $P_{\text{Social}}$ .





# Correcting Positive Production Externalities

## 2. Subsidies

- Subsidies can correct allocative inefficiency by correcting market failure
- If the government provides a subsidy to a firm per unit of the good produced that is equal to the external benefit, then the marginal private cost (MPC) curve shifts downward until it coincides with the MSC curve.
- The result is to increase the quantity produced to  $Q_{\text{Optimal}}$  and to lower the price from  $P_{\text{Private}}$  to  $P_{\text{Optimal}}$ .
- The problem of underallocation of resources and underprovision of the good is corrected, and allocative efficiency is achieved.
- Direct government provision and subsidies have the same market outcomes.

## Positive consumption externalities



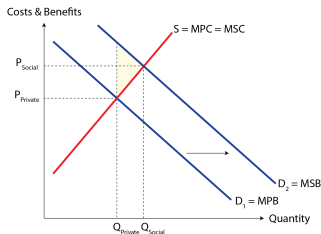
# Assessment Objectives

## Specific Expectations

AO2	Explain positive externalities of consumption and the resulting welfare loss
AO4	Draw a diagram illustrating positive externalities of consumption and welfare loss
AO2	Explain the meaning of merit goods
AO4	Calculate welfare loss that arises from positive externalities of consumption
AO2	Explain government intervention to correct positive externalities of consumption: legislation and regulation, education and awareness creation, nudges, government provision, subsidies
AO4	Draw diagrams to illustrate the above government responses
AO3	Discuss strengths and limitations of the above government policies with respect to: difficulties in measurement of externalities, degree of effectiveness, consequences for stakeholders

# Positive consumption externality

- **Positive consumption externalities** a positive externality caused by consumption activities, leading to a situation where marginal social benefits are greater than marginal private benefits ( $MSB > MPB$ )
  - ▶ **Example:** The consumption of education benefits the person who receives the education, but in addition gives rise to external benefits, involving social benefits from a more productive workforce, lower unemployment, higher rate of growth, more economic development, lower crime rate, and so on.



# Positive consumption externality

- ▶ The marginal social benefit (MSB) curve lies above the marginal private benefit (MPB) curve, and the difference between the two consists of the external benefits to society.
- ▶ When there is a positive consumption externality, the free market underallocates resources to the production of the good, and too little of it is produced relative to the social optimum  $Q_S < Q_E$  and  $MSB > MSC$  at  $Q_S$ .
- ▶ In general, positive externalities (external benefits), whether these arise from production or consumption activities, lead to an underallocation of resources to the good in question, and therefore to its underprovision.
- ▶ The welfare loss arising from a positive consumption externality is the difference between the MSB and MSC curves for the amount of output that is underproduced relative to the social optimum ( $Q_S - Q_E$ ).
  - It represents the loss of social benefits due to underproduction of the good.

- **Merit goods** are goods that are held to be desirable for consumers, but which are underprovided by the market. Reasons for the underprovision include:

1. **Positive externalities**

- In this case too little is provided by the market.

2. **Low levels of income and poverty**

- Some consumers may want certain goods or services but cannot afford to buy them.

3. **Consumer ignorance**

- Consumers may be better off if they consume certain goods and services but they may be ignorant of the benefits, and so do not demand them.
- Lack of knowledge about the benefits may lead consumers to demand too little of these services.

# Correcting positive consumption externalities

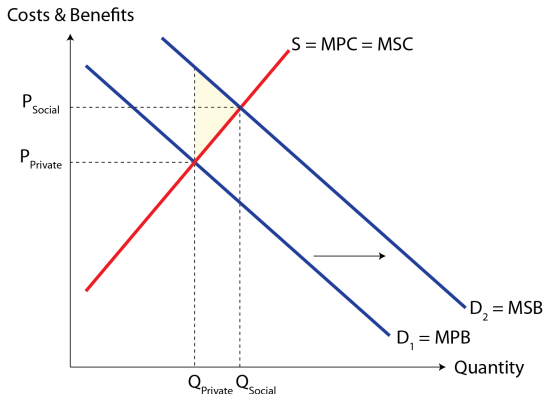
- ▶ Correction of positive consumption externalities involves either increasing demand and shifting the MPB curve towards the MSB curve through legislation or education and awareness creation.
- ▶ Alternatively, increasing supply and shifting the MPC curve downward by direct government provision or by granting a subsidy.
- ▶ Both demand increases and supply increases can lead to production and consumption at  $Q_{\text{Optimal}}$  and the achievement of allocative efficiency.
- ▶ The price paid by consumers increases when demand increases, and falls when supply increases.

## 1. Government legislation

- Legislation can be used to promote greater consumption of goods with positive externalities.
- **Example:** Most countries have legislation that makes education compulsory up to a certain age.

# Correcting positive consumption externalities

- The demand increases and the demand curve  $D_1 = MPB$  shifts to the right.
- Ideally it will shift until it reaches the MSB curve, where  $D_2 = MSB$ , and  $Q_{\text{Optimal}}$  is produced and consumed.





# Correcting positive consumption externalities

## 2. Education and awareness creation

- Governments can use education of the public, awareness creation, to try to persuade consumers to buy more goods with positive externalities.
- The objective is to increase demand for such services, and the effect is the same as with legislation as  $D_1$  shifts to  $D_2 = MSB$  and  $Q_{Optimal}$  is produced and consumed, while price increases to  $P_{Optimal}$ .

## 3. Nudges

- Nudges have similar effects as education and awareness creation programmes
- The objective is to increase demand shifting  $D_1$  toward  $D_2$ .
- **Example:** Governments can use nudges like the creation of bicycle lanes to encourage the use of bike riding and physical exercise

# Correcting positive consumption externalities

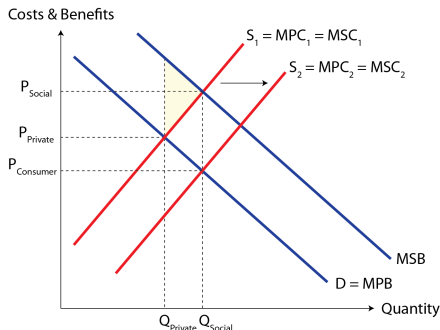
## 4. Government direct provision

- Governments are frequently involved in the direct provision of goods and services with positive consumption externalities.
- **Example:** Government (public) provision of education and health care in virtually all countries in the world.
- Direct provision has the effect of increasing supply and therefore shifting the supply curve from  $S_1$  to  $S_2$ .
- To achieve the social optimum  $Q_{\text{Optimal}}$ , the new supply curve must intersect MPB at the level of output  $Q_{\text{Optimal}}$ .
- At the new equilibrium, price falls to  $P_{\text{Consumer}}$  and  $Q_{\text{Optimal}}$  is produced and allocative efficiency is achieved.

## 5. Subsidies

- A subsidy to the producer of the good with the positive externality has the same effects as direct government provision.

# Correcting positive consumption externalities



- It results in an increase in supply and shifting the supply curve rightward.
- If the subsidy is equal to the external benefit, the new supply curve is  $S_2 = MPC_2$ , and it intersects MPB at the  $Q_{Optimal}$  level of output.
- Price falls from  $P_{Private}$  to  $P_{Consumer}$ ,  $Q_{Optimal}$  is produced and allocative efficiency is achieved.

# Evaluating policies to correct positive externalities

- ▶ Direct government provision and subsidies are widely used as methods to deal with positive consumption externalities.
  - Direct provision and granting of subsidies involved the use of government funds that rely on tax revenues.
  - Choices must be made on which goods should be supported, and by how much they should be supported.
  - In practice it is very difficult to measure the size of the external benefits, and therefore to calculate precisely which goods and services should be supported and the level of support they should receive.
  - Governments are often susceptible to political pressure and sometimes make choices based on political rather than economic criteria.
- ▶ It is difficult to design effective nudges in view of insufficient knowledge about how people respond to nudges and choice architecture.

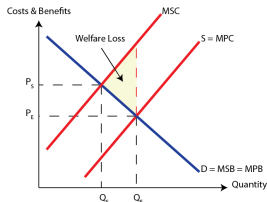
# Evaluating policies to correct positive externalities

- ▶ Legislation, education and awareness creation are subject to similar limitations concerning calculating the size of the external benefits.
  - Such policies raise the price of the good to consumers, which may make the good unaffordable for some consumer groups.

## Summary of Externalities



# Negative Production Externality



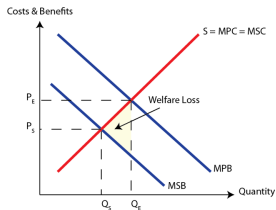
## ► Examples

- Producers impose external costs on society.
- Production by use of fossil fuels; external costs include global warming, negative effects on health, environmental pollution.

## ► Policies

- Indirect (Pigouvian taxes), carbon taxes, tradeable permits, legislation & regulation, collective self-governance, education & awareness creation, international agreements.

# Negative Consumption Externality



## ► Examples

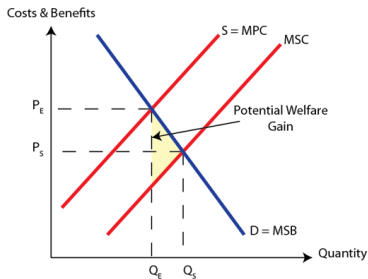
- Consumers impose external costs on society.
- Use of cars and heating using fossil fuels; external costs include global warming, negative effects on health, environmental pollution.

## ► Policies

- Indirect (Pigouvian) taxes, legislation & regulation, education & awareness creation, nudges



# Positive Production Externality



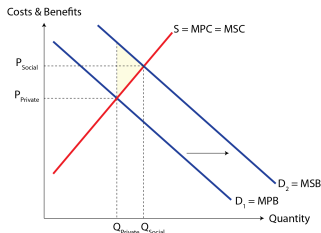
## ► Examples

- Producers create external benefits for society
- Research by private firms leads to development of new technologies that benefit the whole of society.

## ► Policies

- Government provision, subsidies

# Positive Consumption Externality



## ► Examples

- Consumers create external benefits for society.
- Education and healthcare lead to benefits for the whole of society, including lower unemployment, lower crime rates, higher economic growth

## ► Policies

- Legislation & regulation, education & awareness creation, nudges, government provision, subsidies

## Asymmetric Information



# Assessment Objectives

## Specific Expectations

AO2	Distinguish between adverse selection and moral hazard
AO3	Evaluate government responses to the problem of asymmetric information, including legislation and regulation, and provision of information
AO3	Evaluate private responses to the problem of asymmetric information, including signalling and screening

# Asymmetric Information

- **Asymmetric information** is a type of market failure where buyers and sellers do not have equal access to information.
  - ▶ Usually resulting in an underallocation of resources to the production of goods and services, and therefore allocative inefficiency.
  - ▶ Parties to a transaction with less access to information try to protect themselves against the consequences of the information asymmetry.
  - ▶ In some cases buyers may have more information than sellers; in other cases the opposite holds where sellers have more information than buyers.
  - ▶ Usually, the competitive market mechanism presupposes that all firms and all consumers have complete information regarding products, prices, resources and methods of production.

# Adverse Selection

- **Adverse selection** a type of asymmetric information where one party has more information than the other party about the quality of the product being sold.
  - ▶ In a free unregulated market, the result is usually to underallocate resources to the production of the good.
    - If the seller has more information, such as when selling a used car, the buyer will reduce demand.
    - If the buyer has more information, such as regarding one's health condition when buying health insurance, the seller will reduce supply.
  - ▶ Consumers are likely to be aware of the possible dangers to themselves, and will be cautious about buying the good or service, resulting in lower demand, less production and lower sales.
  - ▶ However, if consumers are unaware of the possible hidden dangers, there could be overallocation of resources to the production of these goods and services.

# Adverse Selection: Solutions

- There are several possible solutions to adverse selection where the seller knows more than the buyer including:

## 1. Regulation

- Government can pass laws and regulations that ensure quality standards and safety features that must be maintained by producers and sellers of goods and services.
- Legislation and regulation are time-consuming bureaucratic procedures, which sometimes work to slow down economic activities
- Regulatory and quality control activities have very large opportunity costs.

## 2. Provision of information

- Governments may also respond by directly supplying information to consumers, or by forcing producers to provide information, thus protecting consumers in their purchasing decisions.

# Adverse Selection: Solutions

- There are difficulties involving the collection and dissemination of all the necessary information to consumers, the accuracy of the information, as well as the opportunity costs in providing the information.
- It is sometimes not possible to eliminate an information asymmetry between sellers and buyers, because no matter what regulations and information are provided, there is still room for the seller to hide some information from the buyers.
- **Example:** Doctors and lawyers have specialized, technical information about their clients that the clients themselves do not possess. Doctors and lawyers often use this information for their own private gain by selectively revealing information to their clients that causes them to demand more services than are necessary.
- **“Supplier-induced demand”** is the demand that is induced (created) by the supplier, which would not have appeared if the client has equal access to information.



## 3. Licensure

- Licensing is often required for professions in many countries in order to ensure adequate training and professional competence.
- Licensing may limit the supply of people in a profession, raising the price of their services and increasing their incomes at the expense of consumers who must pay higher prices.

## 4. Screening

- Method used by the party with the limited information, in this case the buyer.
- The buyer may try to get more information about what they are buying, in other words they screen the product or the producer or seller of the product.
- It may in providing consumers with some missing information, but it can not on its own provide systematic and complete information to match the information available on the seller's side.

## 5. Signalling

- Method used by the party that has more information, or in this case the seller.
  - The purpose of signalling is to convince the buyers that the produce being sold is of good quality.
  - Common methods include the use of warranties, and the establishment of brand names that convey feelings of reliability.
  - The problem with signalling is that it is unlikely to provide full information to buyers, and it may even provide inaccurate or misleading information by sellers eager to promote and sell their product.
- Adverse selection may also arise where the buyer has information not available to the seller.
- Often arises in the area of insurance services, where the buyer of insurance has more information than the seller.
  - In a free unregulated market, adverse selection results in an underallocation of resources to health insurance services, as the insurance company reduces the supply of insurance to protect itself.

# Adverse Selection: Solutions

- There are several possible solutions to adverse selection where the buyer knows more than the seller including:

## 1. Private responses

- Private insurance companies usually protect themselves by offering a range of policies where the lower the cost of the insurance, the higher the deductible (out-of-pocket payment).
- This offers people choice, so that those who believe they have a low risk, can buy a low-cost policy with a higher deductible, while higher-cost policies with lower deductibles can be selected by people who believe they have high levels of risk.
- This is a method of **screening** undertaken by the party with the limited information, or the seller of the insurance.
- The choice of high or low deductible given to the buyers of insurance is intended to screen them by indirectly providing information about their state of health to the seller of the insurance.
- However, lower-income earners choose the low-cost policies with high out-of-pocket payments because they are affordable, regardless of the

# Adverse Selection: Solutions

- Trying to protect themselves against high risks, insurance companies usually refuse to insure people with specific criteria.
- The result is that those who most need insurance coverage, and poor people who cannot afford to buy coverage in the private market, are left with little to no insurance coverage.

## 2. Government responses

- Government responses may take the form of direct provision of health care services at low or zero prices to an entire population, financed by tax revenues, thus ensuring that the entire population has health insurance coverage.
- The benefit of these approaches, is that no one in need of health care goes without it.
- A potential problem with government-funded or social health care systems involves difficulties in controlling costs of providing health care and growing burdens on the government budget.

# Moral Hazard

- **Moral hazard** refers to situations where one party takes risks, but does not face the full costs of these risks because the full costs of the risks are borne by the other party.
  - ▶ Usually arises when the buyer of the insurance changes his or her behaviour after obtaining insurance, so that the outcome works against the interests of the seller of the insurance.
  - ▶ **Example:** Buyers of car theft insurance may be less careful about protecting their car against theft, because they know they will be reimbursed if someone steals their car.
  - ▶ In all these cases, the buyers of insurance have information about their future intentions that is not available to the sellers of the insurance.
  - ▶ In a free, unregulated market, the result of moral hazard is to underallocate resources to the production of insurance services, as sellers of insurance try to protect themselves against higher costs due to the risky behaviour of the buyers of insurance.

# Moral Hazard: Solutions

- ▶ Problems of moral hazard in insurance are usually dealt with by the provider of the insurance.
  - This is often done by making the buyer of insurance pay for part of the cost of damages through deductibles (out-of-pocket payments).
  - This is intended to make the insurance buyer face the consequences of risky behaviour, thus leading to less risky behaviour.
  - Deductibles are a form of **screening**.
  - The problem with deductibles is that it has different effects depending on the income level of insurance buyers.
  - Higher-income earners usually choose higher-cost policies with low deductibles, while lower-income earners choose low-cost policies with high deductibles because these are more affordable.
  - In the financial area, moral hazard is dealt with through government regulation of financial institutions, intended to oversee and prevent highly risky behaviour.