ACF 265: Microeconomics For Business

DEPT. OF ACCOUNTING AND FINANCE
KNUST School of Business
Dr. Daniel Domeher / Dr. Godfred Aawaar

BASIC CONCEPTS

LEARNING OBJECTIVES

At the end of this lecture, students should be able to;

- Illustrate the concept of scarcity in the decision making of economic units
- Explain how rational consumers make their economic choices
- Examine some of the trade-offs that consumers/firms/gov. face
- Distinguish between scarcity & poverty
- Discuss how incentives affect people's behavior
- Discuss why markets are a good, but not perfect, way to allocate resources
- Draw the production possibilities frontier and use it to explain the concepts of scarcity and opportunity cost

INTRODUCTION

- The word 'economy' comes from the Greek word *oikonomos,* which means for '*one who manages a household*'.
- A business must allocate scarce resources among competing uses,
  - taking into account a range of stakeholder wants and needs.
- *Economics* is the study of how society manages its scarce resources which have alternatives uses to meet its unlimited desires
  - In most societies, resources are allocated not by a single central planner but through the combined actions of millions of households and firms.

INTRODUCTION

Resources

- things used to produce goods/services to satisfy human wants
- limited in supply
  - scarce: i.e. their quantities are insufficient to satisfy all human wants
- Natural resources: e.g., rain, crude oil, mineral deposits
- Human resources: labour services
- Man made resources: e.g. machines, equipments. These aid further production
- A fourth resource is Entreprenuership

INTRODUCTION

SCARCITY

- Scarcity is the limited nature of society's resources.
  - Scarcity means that society has limited resources and therefore cannot produce all the goods and services people wish to have.
- A relative concept: we want more than we have
- Central problem of Economics
- Economists study how people make decisions and how people and business interact with one another.
  - Many of the concepts that economists use are also directly applicable and of relevance to businesses.
  - Economics can be described as the science of decision making.

INTRODUCTION

Decision Making Involves Trade-Offs - Choice

- 'There is no such thing as free lunch'.
- To get the benefits of one thing that we like, we usually have to give up the benefits of another thing that we also like,
- or accept that we might have to give up something else and incur a cost of some sort.
- Making decisions requires trading off one goal or the benefits against another.

The Cost Of Something Is What You Give Up to Get It – Opportunity Cost

- Because people and businesses face trade-offs,
  - making decisions requires comparing the costs and benefits of alternative courses of action.
  - In many cases, however, the cost of some action is not as obvious as it might first appear.
- The *opportunity cost* of an item is what you give up to get that item.
  - When making a decision, you should be aware of the opportunity costs that accompany each possible action.
  - Decisions have costs far greater than pure money costs.

Rational People and Businesses Think at the Margin

- Economists use the term marginal changes to describe small incremental adjustments to an existing plan of action.
  - In many situations, people make the best decisions by thinking at the margin.
- A rational decision maker takes an action if and only if the marginal benefit of the action exceeds the marginal cost.
  - For businesses this principle is extremely important because there are more likely to be attempts to rationalize decision making than individuals do on a day-to-to basis.

People and Businesses Respond to Incentives

- people and businesses make decisions by comparing costs and benefits change.
  - That is, people respond to incentives.
- Many policies change the costs or benefits that people face and, therefore, alter behavior.
- When analyzing any policy, we must consider not only the direct effects but also the indirect effects that work through incentives.
  - If the policy changes incentives, it will cause people to alter their behavior.

Markets are Usually a Good Way to Organize Economic Activity

- A *market economy* is an economy that allocates resources through the decentralized decisions of many firms and households (the invisible hands) as they interact in markets for goods and services.

- In a market economy, the decisions of a central planner are replaced by the decisions of millions of firms and households.
  - Firms decide who to hire and what to make.
  - Households decide which firms to work for and what to buy with their incomes.
  - These firms and households interact in the marketplace where prices and self-interest guide their decisions.

Governments Can Sometimes Improve Market Outcomes

- If the invisible hand of the market is so wonderful, why do we need government?
- The invisible hand needs government to protect it.
  - Markets work only if property rights are enforced.
- The government also intervenes in the economy to promote efficiency and to promote equity.
- Economists use the term *market failure* to refer to a situation in which the market on its own fails to produce an efficient allocation of resources.

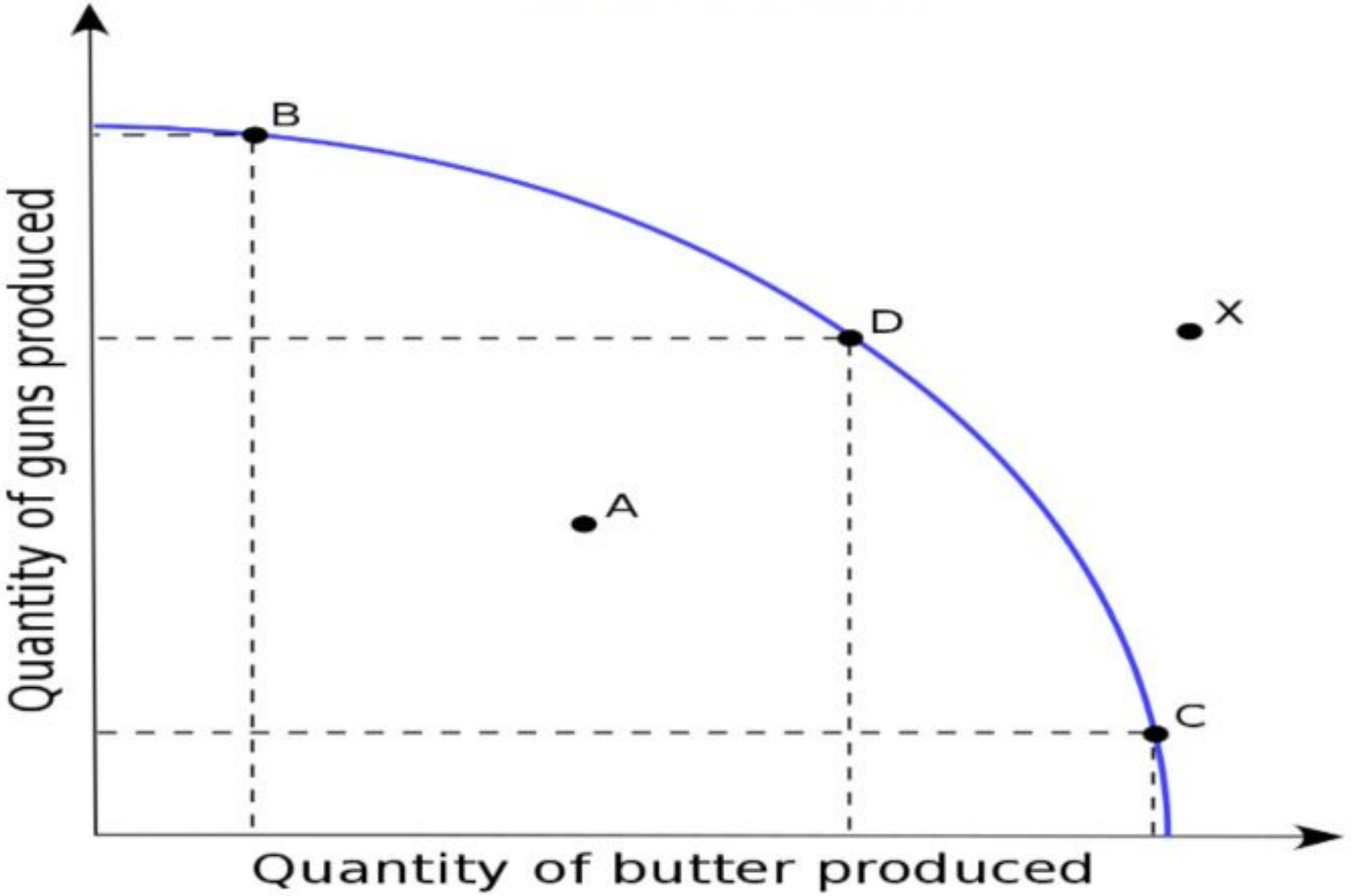
THE PRODUCTIONS POSSIBILITIES FRONTIER

Assumptions Underlying PPF

1. Production over a specified time period – usually a year

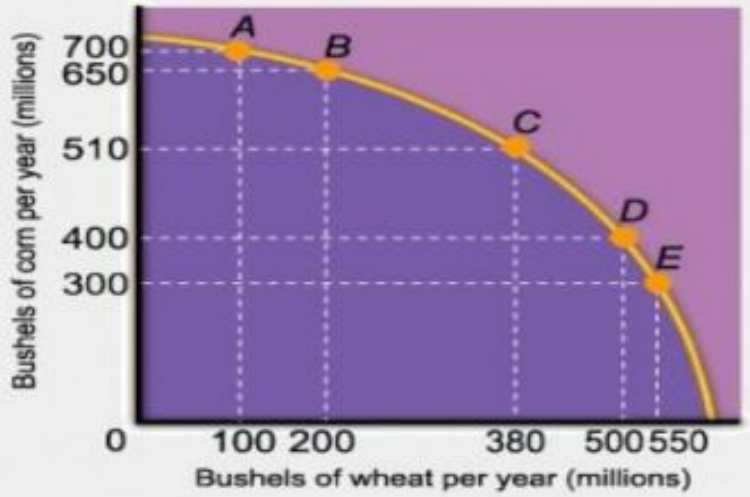
2. Resources are fixed over the time period. i.e.
   - using all human, natural, and manufactured resources to maximum effect.
3. Resources are used efficiently

THE PRODUCTIONS POSSIBILITIES FRONTIER



THE PRODUCTIONS POSSIBILITIES FRONTIER

The Law of Increasing Opportunity Cost



- The ***concave*** shape of the production possibility frontier curve reflects the ***law of increasing opportunity cost.***
- As we increase the production of one good, we sacrifice progressively more of the other.

 Principles of Economics, 6/e Karl Case, Ray Fair

Why the PPF is Bowed Outwards

- The law of increasing relative cost

Or "The law of increasing cost"

Or "The law of increasing opportunity cost"

- Some resources are better suited for the production of one good than another. i.e. economic resources are easily adaptive to alternative uses

Discussion question

1. Explain the circumstances under which the PPF may shift inward/outward or pivot from the vertical/horizontal axis
2. Distinguish between scarcity and poverty
3. Why is economics a science/social science
4. Distinguish between free goods and economic goods and give three examples of each
5. Write short notes on the following:
    1. Microeconomics and macroeconomics
    2. Positive and normative economics
    3. Hypothesis, theory and law
    4. Deductive and inductive approaches to the study of economic of economics
    5. Economic activities and classifications

ANY QUESTIONS?

For any concerns, please contact

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Microeconomics For Business

LECTURE 3

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DEMAND AND SUPPLY: HOW MARKETS WORK

LEARNING OBJECTIVES

At the end of this discussion, students must be able to;

- Know what a competitive market is
- Examine what determines the supply and demand for a good in a competitive market
- Distinguish between a movement along and a shift of a curve
- See how supply and demand together set the price of a good and the quantity sold
- Consider the key role of prices in allocating scarce resources in market economies

THE MARKET FORCES OF DEMAND AND SUPPLY

- A market is made up of two parties – the buyer and the seller. The buyer represents demand and the seller, supply.
- Demand and supply are the forces that make market economies work.
- We refer to them as forces because they act in different ways and cause prices to change, the factor that links the two.
- Demand and supply determine the quantity of each good produced and the price at which it is sold.

Price vs. Cost

- *Price* is the amount of money a buyer has to give up in order to acquire something
- *cost* refers to the payment to factor inputs in production.

MARKETS AND COMPETITION

- A market is a medium/platform/arrangement where a group of sellers and buyers of a particular good interact.
  - This interaction leads determination of prices and quantities
- It is not necessarily a physical location.
- The sellers as a group determine the supply of the product and the buyers as a group determine the demand for the product.

Competitive Markets

- Competition exists when two or more firms are rivals for customers.
- Each firm strives to gain the attention of buyers in the market.
- A ***competitive market*** is a market in which there are many buyers and many sellers so that each has a negligible impact on the market price.

Competition: Perfect And Otherwise

Perfectly competitive markets are defined by two main characteristics:

- The goods being offered for sale are all the same (homogenous) and as a result buyers have no preference between one seller or another, and
- The buyers and sellers are so numerous that no single buyer or seller can influence the market price.
- Because buyers and sellers in perfectly competitive markets must accept the price the market determines, they are said to be ***price takers.***

Competition: Perfect And Otherwise cont'd

- Not all goods are sold in perfectly competitive markets.
- Some markets have only one seller, and this seller sets the price. Such a seller is called a ***monopoly***.
- An ***oligopoly*** has few sellers that do not always compete aggressively.
- An ***imperfectly competitive*** market contains many sellers but each offers slightly different product
- because the products are not exactly the same, each seller has some ability to set the price for its own products.

DEMAND

- It is *the quantity of a good that consumers are able and willing to buy in a market at a given price during a specified period of time*, ceteris paribus (other things being equal
- It is not simply a desire for something
- The desire backed by ability to buy something – effective demand

DEMAND

The Demand Curve: The relationship Between Price and Quantity Demanded

- Many things determine the quantity demanded of any good,
- when analyzing how markets work, the price of the good plays a central role
- The quantity demanded of a product falls as the price rises and rises as the price falls and so we say the quantity demanded is ***negatively related*** to the price.

Demand cont'd

- This relationship is the ***law of demand***:
  - **other things being equal**, when the price of a good rises, the quantity demanded of the good falls, and when the price falls, the quantity demanded rises.
- 'Ceteris paribus' is necessary because *price* is not the only thing that affects purchases.
- There are many others: one for example is income.
- If, the price and income change simultaneously,
  - we wouldn't know the change in the quantity demanded was due to a change in the price or to a change in income.

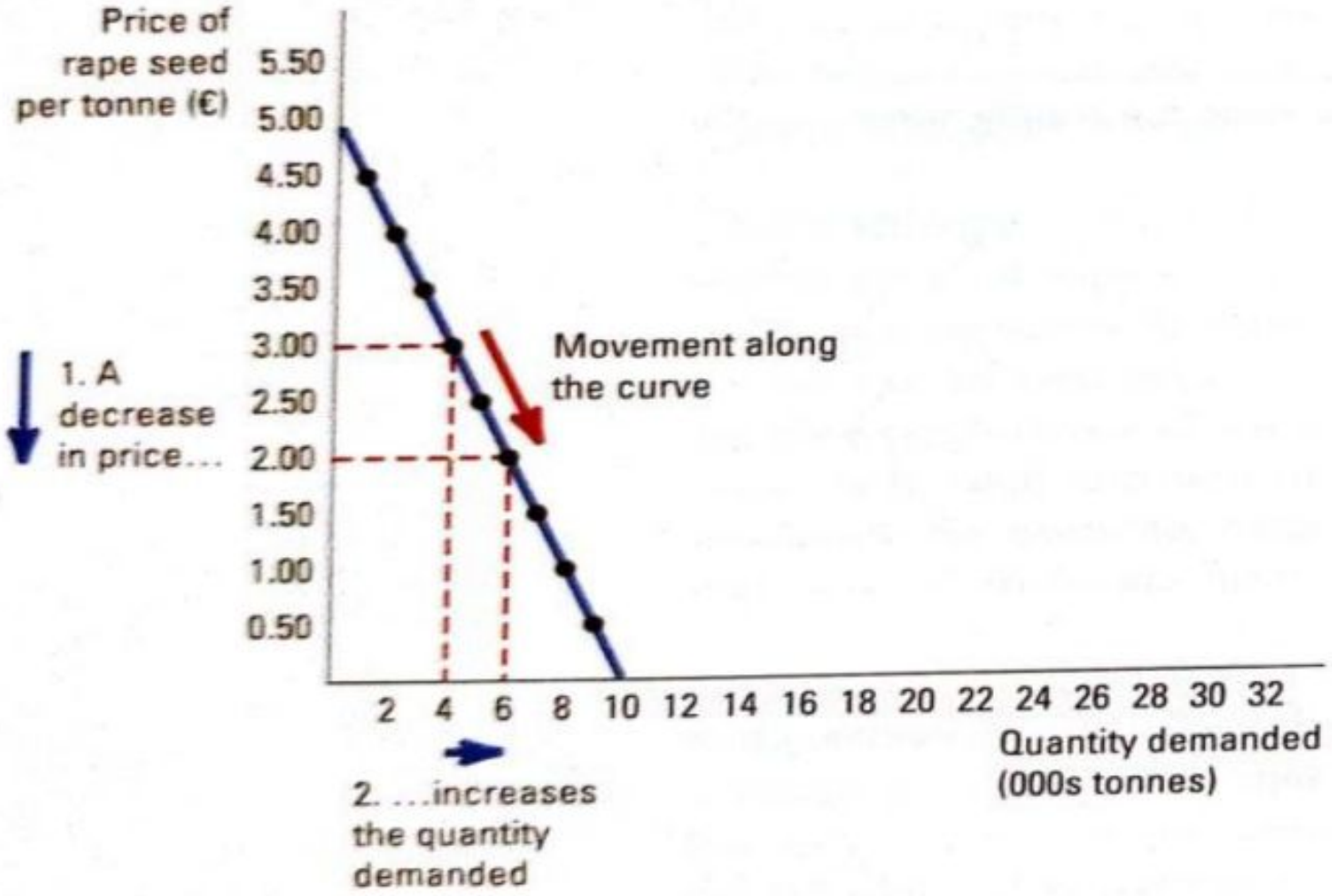
Demand cont'd

- Therefore we hold income constant, as well as any other factor that might affect the quantity of the product demanded.
- A ***demand schedule*** is a table that shows the relationship between the price of a good and the quantity demanded, holding everything else that influences how much consumers of the good want to buy.
- A ***demand curve*** is a graph of the relationship between the price of a good and the quantity demanded.

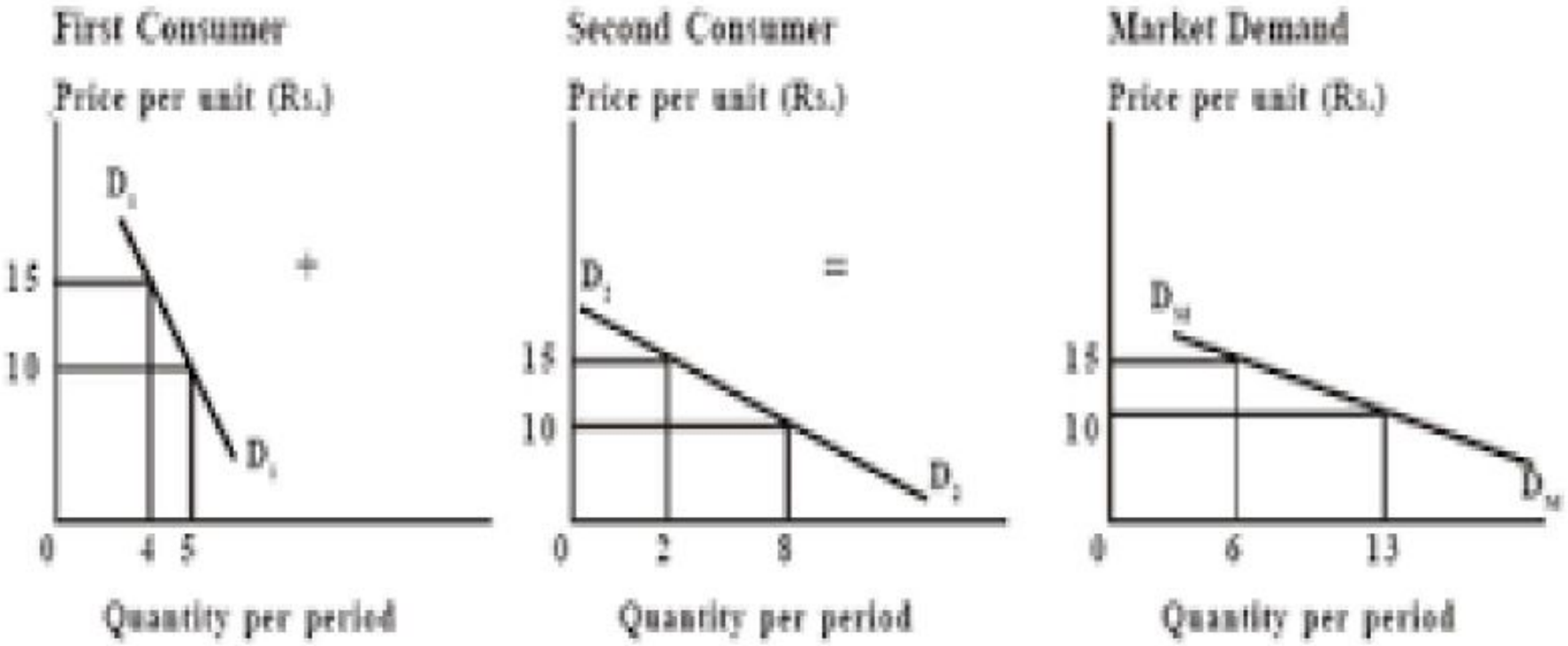
Market Demand Versus Individual Demand

- The demand curve, which graphs the demand schedule, shows how the quantity demanded of the good changes as its price varies.
- Because a lower price increases the quantity demanded, the demand curve slopes downward as shown in figure 1 below.
  - The demand curve in Figure 1 below shows an individual's demand for a product.
- A market demand is the sum of all the individual demands for a particular product or service.
  - The market demand at each price is the sum of the individual demands.

Figure 1. demand curve



MARKET DEMAND CURVE



Shifts versus Movements along the Demand Curve

- A shift in the demand curve is caused by a factor affecting demand other than a change in price. If any of these factors change, then the amount consumers wish to purchase changes, whatever the price.
- The shift in the demand curve is referred to as an increase or decrease in demand.

Cont'd

- A movement along the demand curve occurs when there is a change in price.
  - This may occur because of a change in supply conditions.
  - The other factors affecting demand are assumed to be held constant.
- A change in price leads to a movement along the demand curve and is referred to as a change in quantity demanded.
  - This is shown in figure 1 above.

Microeconomics For Business

LECTURE 4

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Movement Along the Demand Curve

- Let us assume that the price of a particular variety of purified water (everpure) falls, whilst the prices of all other varieties (voltic, bel aqua etc.) remain constant.
  - We know the fall in price will lead to an increase in quantity demanded.
  - There are two main reasons for this;
- The income effect:
  - if we assume that incomes remain constant then a fall in the price of everpure means that consumers who buy this variety can now afford to buy more with their income.
  - In other words, their *real income*, has increased and part of the increase in quantity demanded can be put down to this effect.

Cont'd

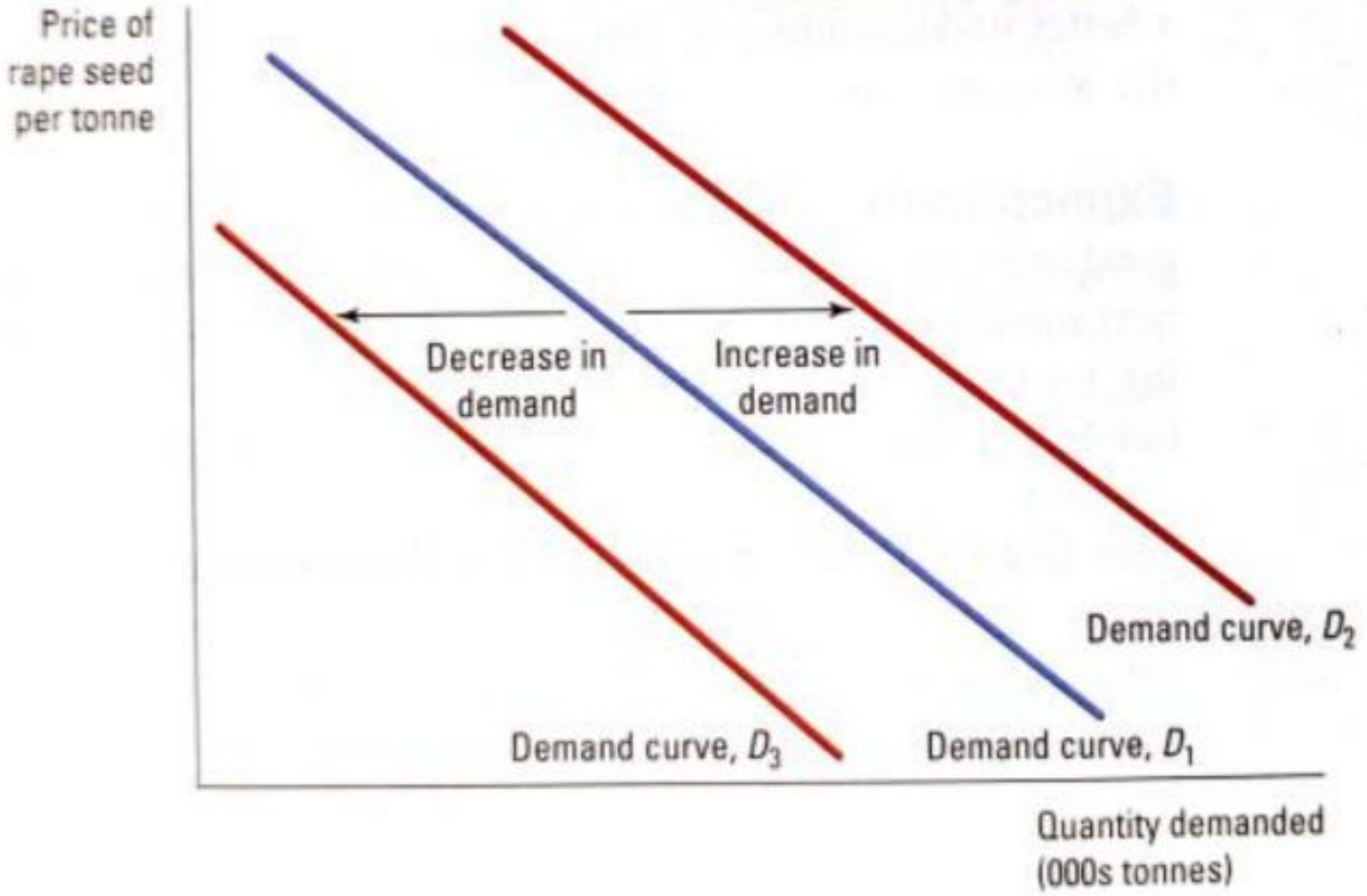
The substitution effect:

- Now that Everpure is lower in price compared to other purified water varieties, some consumers will choose to substitute the more expensive varieties with the now cheaper Everpure.
  - This switch accounts for the remaining part of the increase in quantity demanded.

Shifts in The Demand Curve

- Any change that increases the quantity demanded at a given price shifts the demand curve to the right and is called ***an increase in demand***.
- Any change that reduces the demand at a given price shifts the demand curve to the left and is called *a* ***decrease in demand***.

Figure 2. shifts in demand



Variables that Can Shift the Demand Curve

- Income:
  - Lower incomes means that people have less to spend in total,
  - so they are likely to spend less on some or probably most goods.
  - If the demand for a good falls when income falls and vice versa, the good is called ***a normal good***.
  - If the demand for a good rises when income falls and vice versa, the good is called ***an inferior good***.

- Prices of related goods:
  - When a fall in the price of one good reduces the demand for another good, the two goods are called substitutes.
  - **Substitutes** are often pairs of goods that are used in place of each other, such as sun watt and tiger head batteries.
  - The more closely related substitute products are, the more effect we might see on demand if the price of one of the substitutes changes.
  - When a fall in the price of one good raises the demand for another good, the two goods are called **complements**.

- Tastes:
  - the most obvious determinant of demand are tastes and fashions. If people like a particular product, they buy more of it.

- Expectations:
  - Buyer's expectations about the future may affect their demand for a good or service today.
  - If buyers expect the price of a particular product to fall tomorrow, they may be less willing to buy the product at today's price.

- The size and structure of the population:
  - A larger population, other things being equal, will mean a higher demand for all goods and services.
  - Changes in the way the population is structured also influences demand

SUPPLY

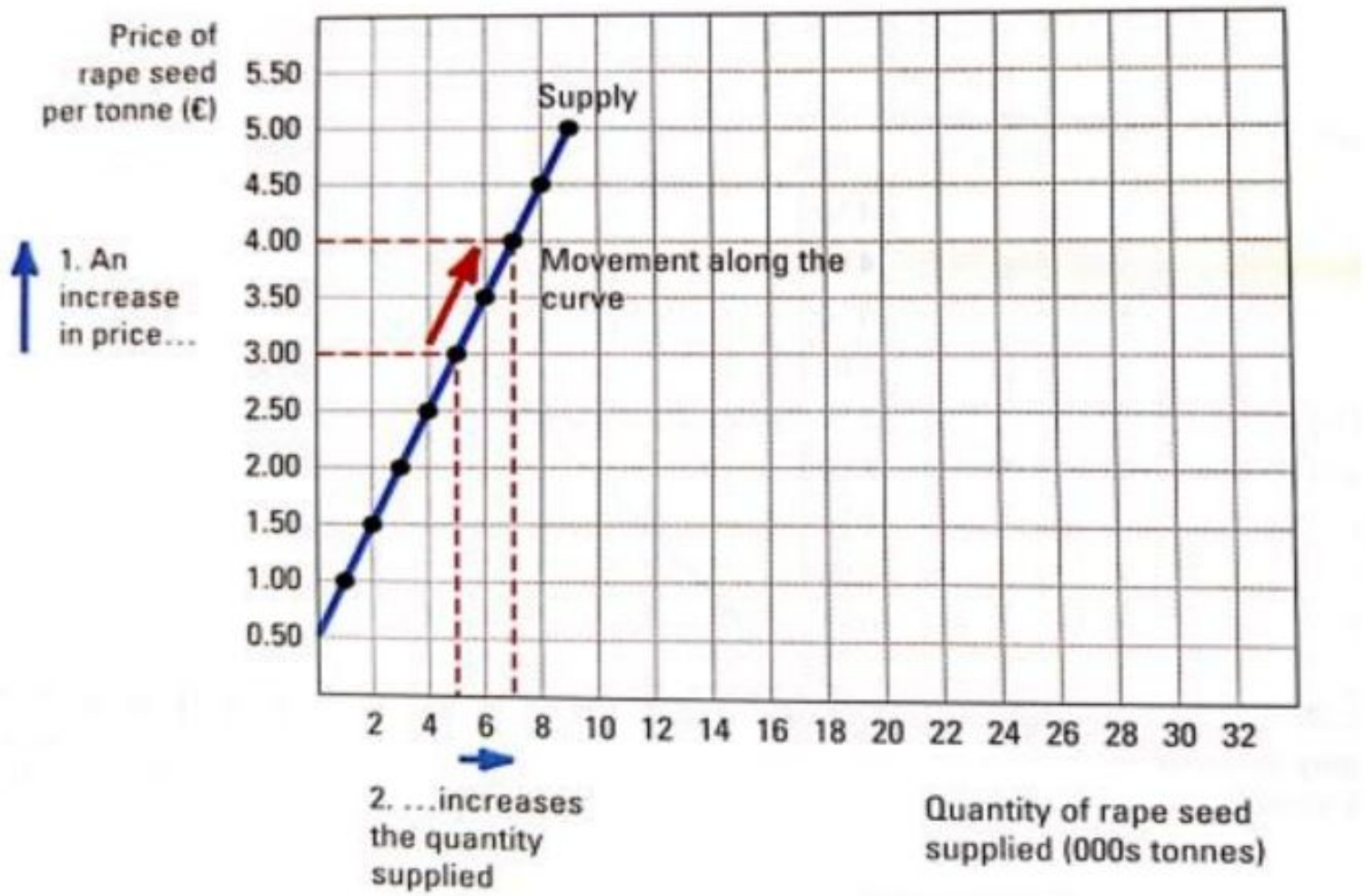
The Supply Curve: The relationship Between Price and Quantity Supplied

- The quantity supplied of any good or service is the amount that sellers are willing and able to sell.
- The quantity supplied rises as the price rises and falls as the price falls
  - so we say the quantity supplied is positively related to the price of the good.
- The relationship between price and quantity supplied is called the law of supply:
  - other things being equal, when the price of a good rises, the quantity producers are willing to supply also rises, and when the price falls, the quantity supplied falls as well.

Market Supply vs Individual Supply

- The supply schedule is a table that shows the relationship between the price of a good and the quantity supplied, holding constant everything else that influences how much producers of the good want to sell.
- The curve relating price and quantity supplied is called the supply curve.
  - The supply curve slopes upward because, other things being equal, a higher price means a greater quantity supplied.
- Market supply is the sum of the supplies of all sellers.
  - We sum the individual supply curves horizontally to obtain the market supply curve.

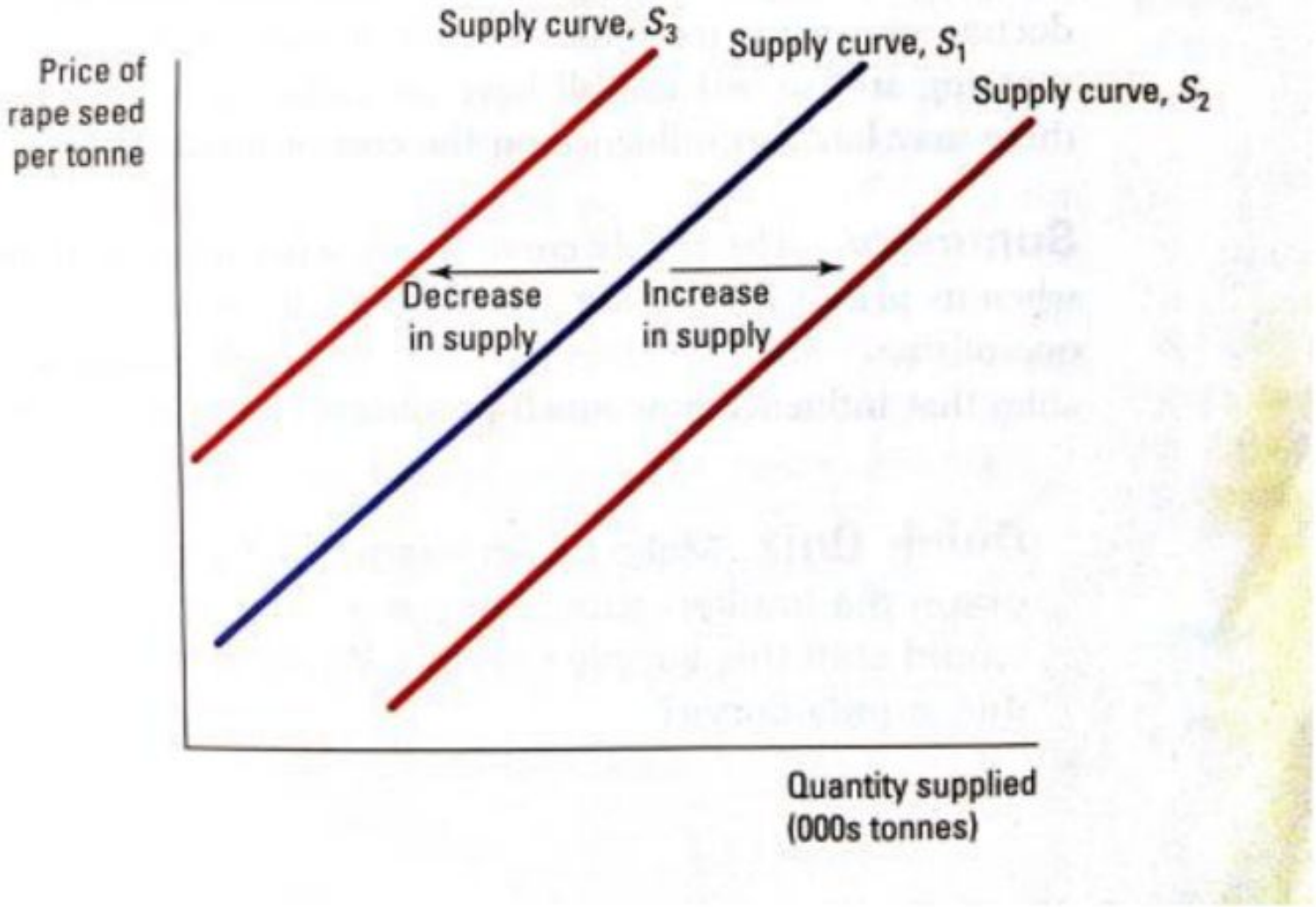
Figure 3. Individual supply curve and movement in the supply cure



Shifts versus Movements along the Supply Curve

- A shift in the supply curve is caused by a factor affecting supply other than a change in price.
  - If any of these factors change, then the amount sellers are willing to offer for sale changes, whatever the price.
  - The shift in the supply curve is referred to as an ***increase or decrease in supply***.
- A movement along the supply curve occurs when there is a change in price.
  - This may occur because of a change in demand conditions.
  - The factors affecting supply are assumed to be held constant.
  - A change in price leads to a movement along the supply curve and is referred to as a ***change in quantity supplied***.

Figure 4: Shifts in the Supply Curve



Variables that Can Shift the Supply Curve

- Input Prices:
  - To produce an output, sellers use various inputs.
    - When the price of one or more of these inputs rises, producing becomes less profitable and firms supply fewer products.
    - If input prices fall for some reason, then production may be more profitable and there is an incentive to supply more at each price.
  - Thus the supply of a good is negatively related to the price of the inputs used to make the good.
- Technology:
  - Advances in technology increase productivity allowing more to be produced using fewer factor inputs. As a result costs, both total and unit, may fall and supply increases.

- **Expectations:**
  - The amount of products firms supply today may depend on their expectations of the future.
  - For example, if growers expect the price of maize to rise in the future, they may put some of their current stock into storage and supply less to the market today.
- **The number of sellers:**
  - Market supply will be affected by the number of firms in the industry.
  - If there were more farmers switching to maize production, then the amount of maize produced would be likely to rise.
- **Natural or Social factors:**
  - There are often many natural or social factors that affect supply.
  - These include such things as the weather affecting crops, natural disasters, changing attitudes, among others.

Equilibrium Analysis

LECTURE 5

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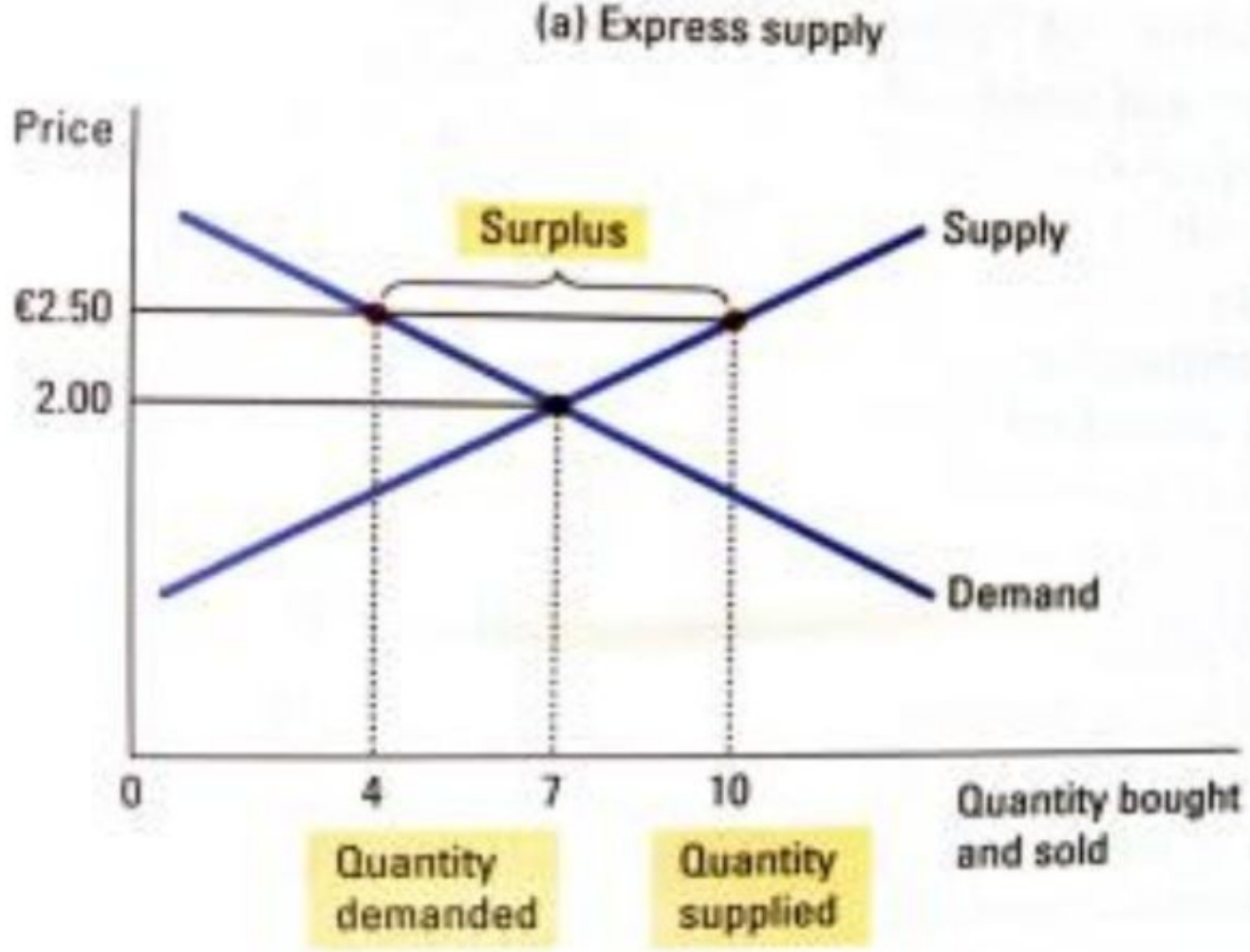
Markets Not in Equilibrium: Surplus

- Suppose the market price is above the equilibrium price.
- The quantity suppliers would like to sell at the price exceeds the quantity which buyers are willing to purchase .
- There is a surplus of the good: suppliers are unable to sell all they want at the going price.
- A surplus is sometimes called a situation of *excess* supply.

FIGURE 5: SURPLUS



Markets Not in Equilibrium: Surplus

- When there is a surplus in the market, sellers find they cannot sell all the supplies they have
- so the market responds to the surplus by cutting prices.
- Falling prices in turn, increase the quantity demanded and decrease the quantity supplied.
- Prices continue to fall until the market reaches the equilibrium.

Markets Not in Equilibrium: Shortage

- Suppose now that the market price is below the equilibrium price.
- The quantity demanded would exceed the quantity supplied.
- There is a shortage of the good: demanders are unable to buy all they want at the going price.
- A shortage is sometimes called a situation of excess demand.

FIGURE 6: SHORTAGE

Markets Not in Equilibrium: Shortage

- When a shortage occurs in the market, buyers may find they cannot acquire all the supplies they need.
- With too many buyers chasing too few goods, the suppliers respond to the shortage by raising prices without losing sales.
- As the price rises, quantity demanded falls, quantity supplied rises and the market once again moves toward the equilibrium.

EQUILIBRIUM

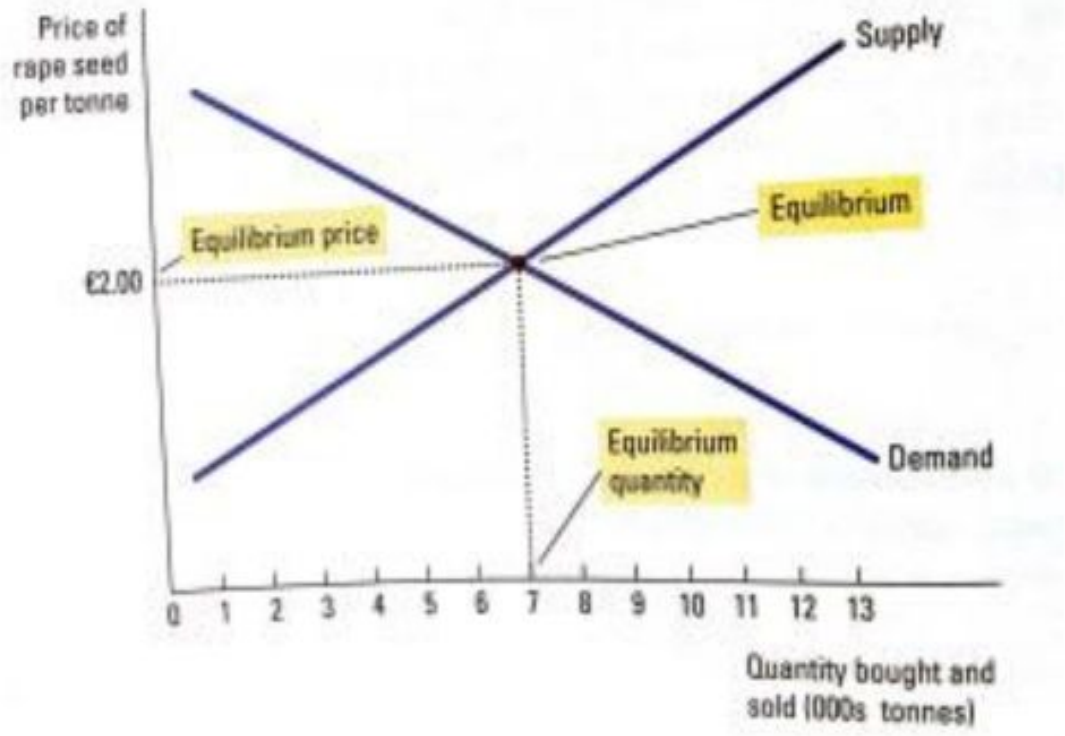
- Equilibrium is defined as a state of rest, a point where there is no force acting for change in the market.
- If supply is greater than demand or vice versa, then there is pressure on price to change.
- However, there is a point at which the supply and demand are equal, This point is called the market's **equilibrium.**
- The price at this intersection is called the **equilibrium price**,
- the quantity is called the **equilibrium quantity**.

EQUILIBRIUM

- At the equilibrium price, that quantity of the good that buyers are willing and able to buy exactly balances the quantity that sellers are willing and able to sell.
- The equilibrium price is sometimes called the market-clearing price because,
  - at this price, everyone in the market has been satisfied: there is neither a shortage nor a surplus.
- The actions of buyers and sellers naturally move markets towards the equilibrium

The Equilibrium of Supply and Demand

The equilibrium is found where the supply and demand curves intersect. At the equilibrium price, the quantity supplied equals the quantity demanded. This is shown in the diagram below.



EQUILIBRIUM CONT'D

- The activities of the many buyers and sellers automatically push the market price towards the equilibrium price.
- Once the market reaches its equilibrium, all buyers and sellers are satisfied, and there is no upward or downward pressure on the price.
- How quickly equilibrium is reached varies from market to market, depending on how quickly prices adjust.

EQUILIBRIUM CONT'D

- In most free markets under an assumption of high levels of information available to buyers and sellers
  - surpluses and shortages are only temporary because prices eventually move towards their equilibrium levels.

Finding Market Equilibrium Using Equations

Finding Market Equilibrium Using Equations

- Applying the relationship between price and quantity demanded and supplied we get typical equations such as;

$$\boldsymbol{Qd = 2100 - 2.5p}$$
$$\boldsymbol{Qs = -10 + 6p}$$

Finding Market Equilibrium Using Equations

- There may also be demand and supply equations which look like:

$$\boldsymbol{P = 840 - 0.40Qd}$$

$$\boldsymbol{P = -120 + 0.8Qs}$$

Finding Price and Quantity

Taking the original two equations

$$\boldsymbol{Qd = 2100 - 2.5p}$$
$$\boldsymbol{Qs = -10 + 6p}$$

$$If\ p = £6,$$

$$Qd = 2100 - 2.5(6)$$
$$Qd = 2100 - 15$$
$$Qd = 2085$$

Finding Market Equilibrium price and quantity:

- at equilibrium, demand equals supply

$$\boldsymbol{Qd = Qs}$$

- To find the market equilibrium,
  - set the demand and supply equations equal to each other
  - and solve for P and Q.

Finding Market Equilibrium:

Example 1.

$$Qd = 32 - 3\,\text{p}$$

$$Qs = 20 + 4p$$

At equilibrium

$$Qd = Qs$$

Therefore,

$$32 - 3p = 20 + 4p$$

$$32 - 20 = 4p + 3p$$

$$12 = 7p$$

$$p = £1.71$$

Finding Market Equilibrium:

- Example 1 cont'd

we can now substitute the equilibrium price into our two equations to find the equilibrium quantity.

$$Qd = 32 - 3p$$
$$Qd = 32 - 3\,(1.71)$$
$$Qd = 32 - 5.31$$
$$Qd = 26.87$$

Finding Market Equilibrium:

- Example 1 cont'd

$$Qs = 20 + 4p$$
$$Qs = 20 + 4(1.71)$$
$$Qs = 20 + 6.84$$
$$Qs = 26.84 \; or \; 27$$

Finding Market Equilibrium:

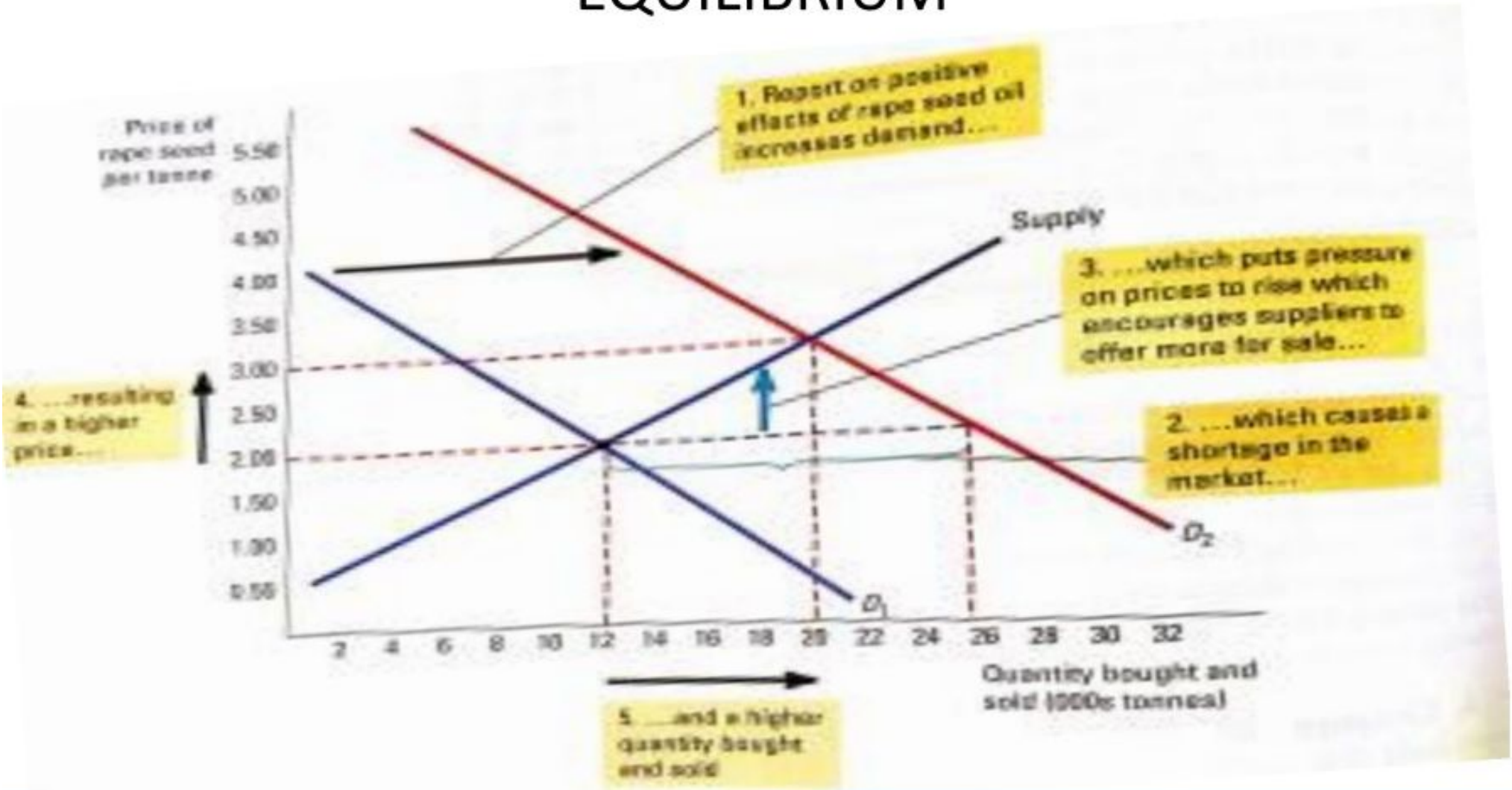
Example 2

$$Qd = 20 - 2p$$
$$Qs = 2 + 2p$$

How an Increase in Demand Affects the Equilibrium

- An event that raises quantity demanded at any given price shifts the demand curve to the right.
- The equilibrium price and the equilibrium quantity both rise, establishing a new equilibrium point.
- The effect of an increase in demand on the equilibrium is shown below.

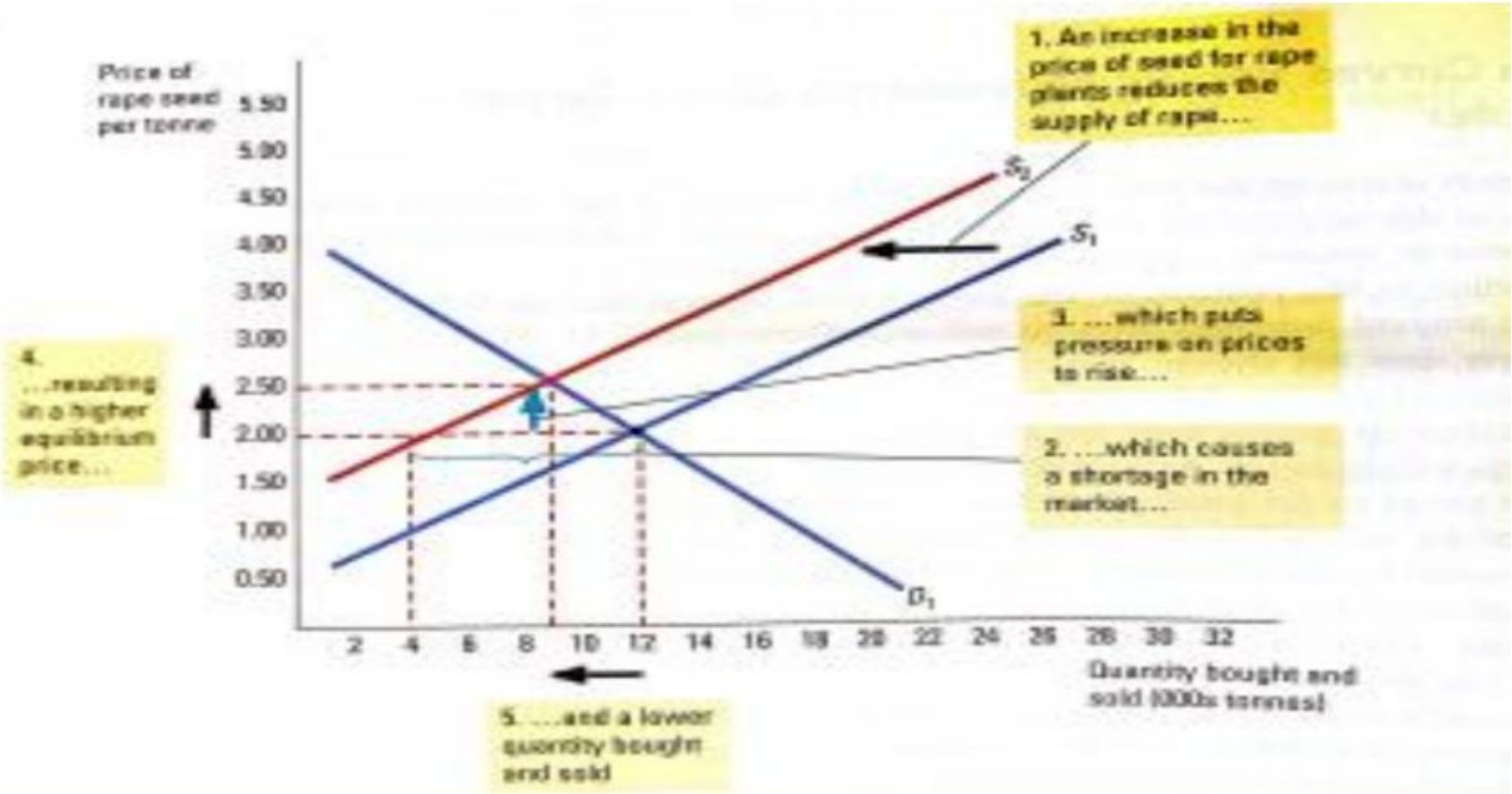
HOW AN INCREASE IN DEMAND AFFECTS THE EQUILIBRIUM



How a Decrease in Supply Affects the Equilibrium

- An event that reduces supply at any given price shifts the supply curve to the left.
- The equilibrium price rises and, and the equilibrium quantity falls.
- The effect of a decrease in supply on the equilibrium is shown below.

HOW A DECREASE IN SUPPLY AFFECTS THE EQUILIBRIUM

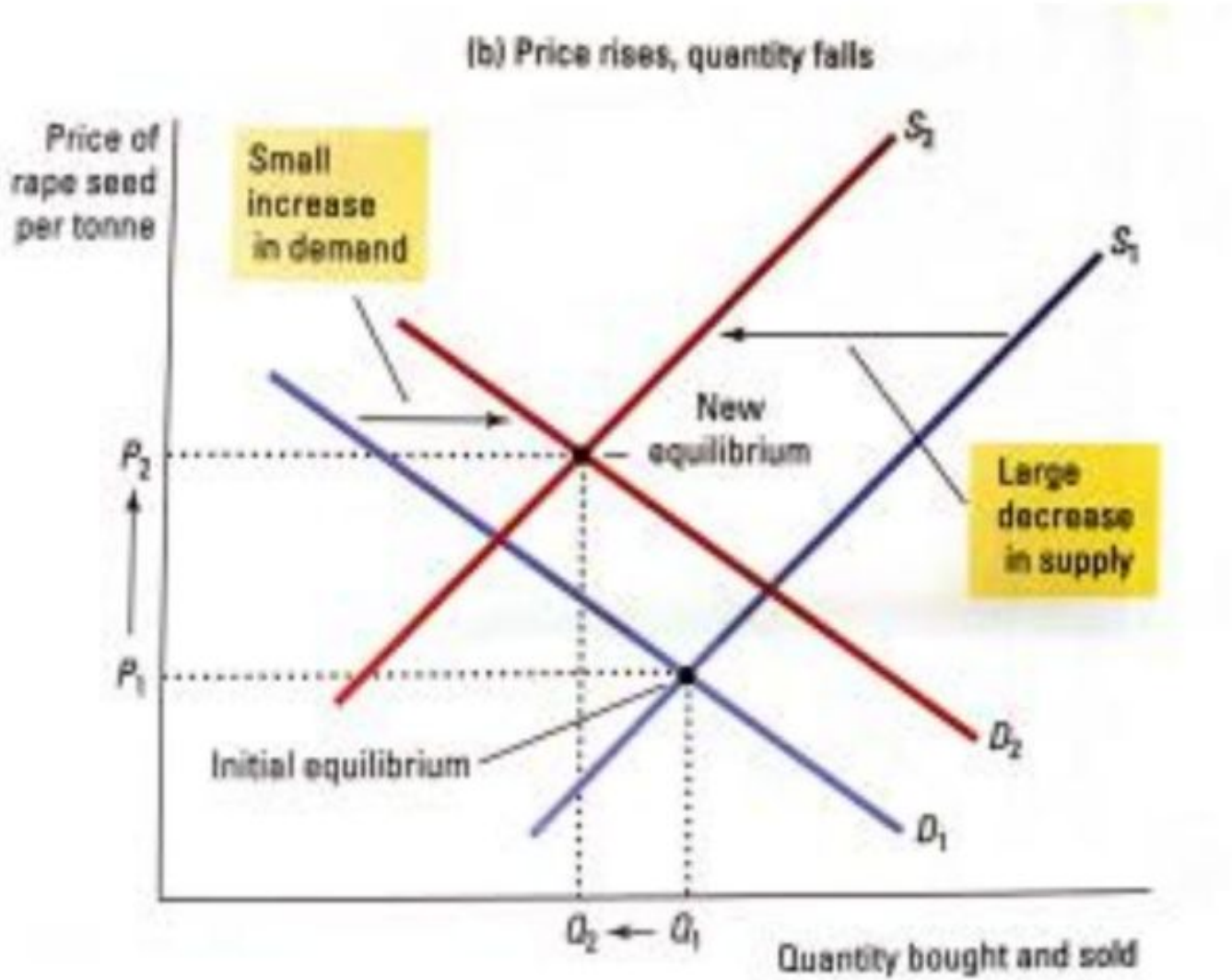


A SHIFT IN BOTH SUPPLY AND DEMAND

- Here we observe a simultaneous increase in demand and decrease in supply.
  - Two outcomes are possible.
- These outcomes are shown in the diagrams below.

Large Increase in demand

Small increase in Demand



THANK YOU

MEASUREMENT OF ELASTICITES

Price

Income

and Cross Elasticity

Elasticity – the concept

- The responsiveness of one variable to changes in another
- When price rises or income falls, what happens to demand?
- Demand falls
- BUT!
- How much does demand fall?

Elasticity – the concept

- If price rises by 10%, income falls by 5% or the price of another goods increases by 2% - what happens to demand?
- We know demand will fall if price rises or if income falls.
- We also know that if the price of another good (a complement or a substitute) increases, demand for our good may fall or increase.
- The question is, by what percentage?
- By more than 10%?
- By less than 10%?

Elasticity – the concept

- **Elasticity measures the extent to which demand will change or respond to changes in any of its determinants.**
- ***NB:***
  - ***if demand is responding to changes in price, we talk of "price elasticity of demand";***
  - ***if on the other hand, demand is responding to changes in Income, we talk of "income elasticity of demand"***
  - ***and if demand is responding to changes in the price of other goods, we talk of "cross price elasticity of demand"***

Elasticity: The Four Basic Types

- Price elasticity of demand
- Price elasticity of supply
- Income elasticity of demand
- Cross elasticity

Price Elasticity of Demand (PED)

- **Measures the relative or degree of responsiveness of demand to changes in price.**
- **Simply put, it measures how consumers respond to price changes.**
  - Where % change in demand is greater than % change in price (PED > 1) – **demand is elastic**
  - Where % change in demand is less than % change in price (PED < 1) – **demand is inelastic**
  - Where % change in demand is equal to change in price (PED = 1) – **demand is unitary elastic**

Price Elasticity of Demand

The Formula:

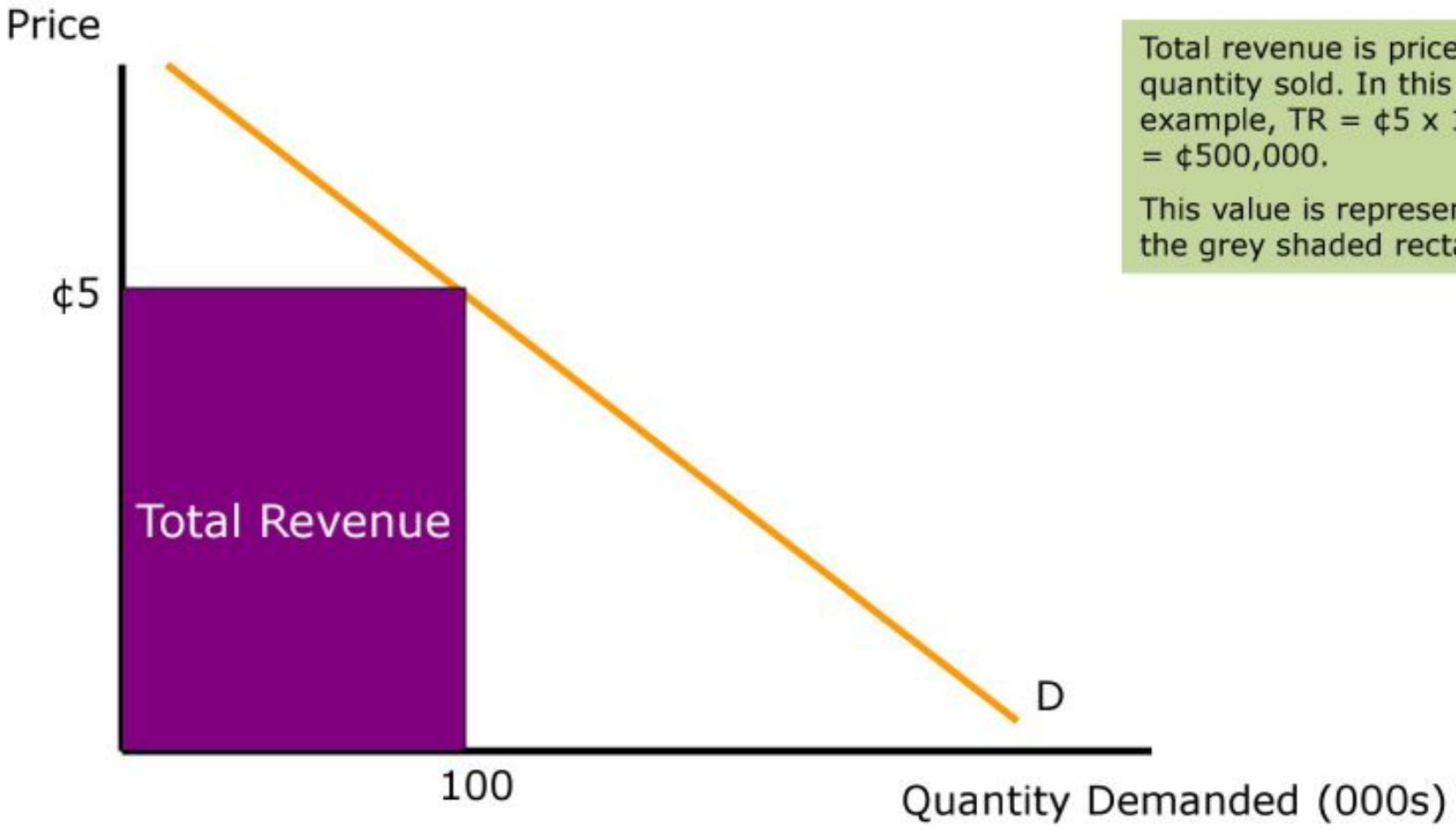
$$\text{Ped} = \frac{\%\ \text{Change in Quantity Demanded}}{\%\ \text{Change in Price}}$$

If answer is between 0 and 1: the relationship is inelastic

If the answer is between 1 and infinity: the relationship is elastic

Note: PED has – sign in front of it and it will always be so; because as price rises demand falls and vice-versa (inverse relationship between price and demand)

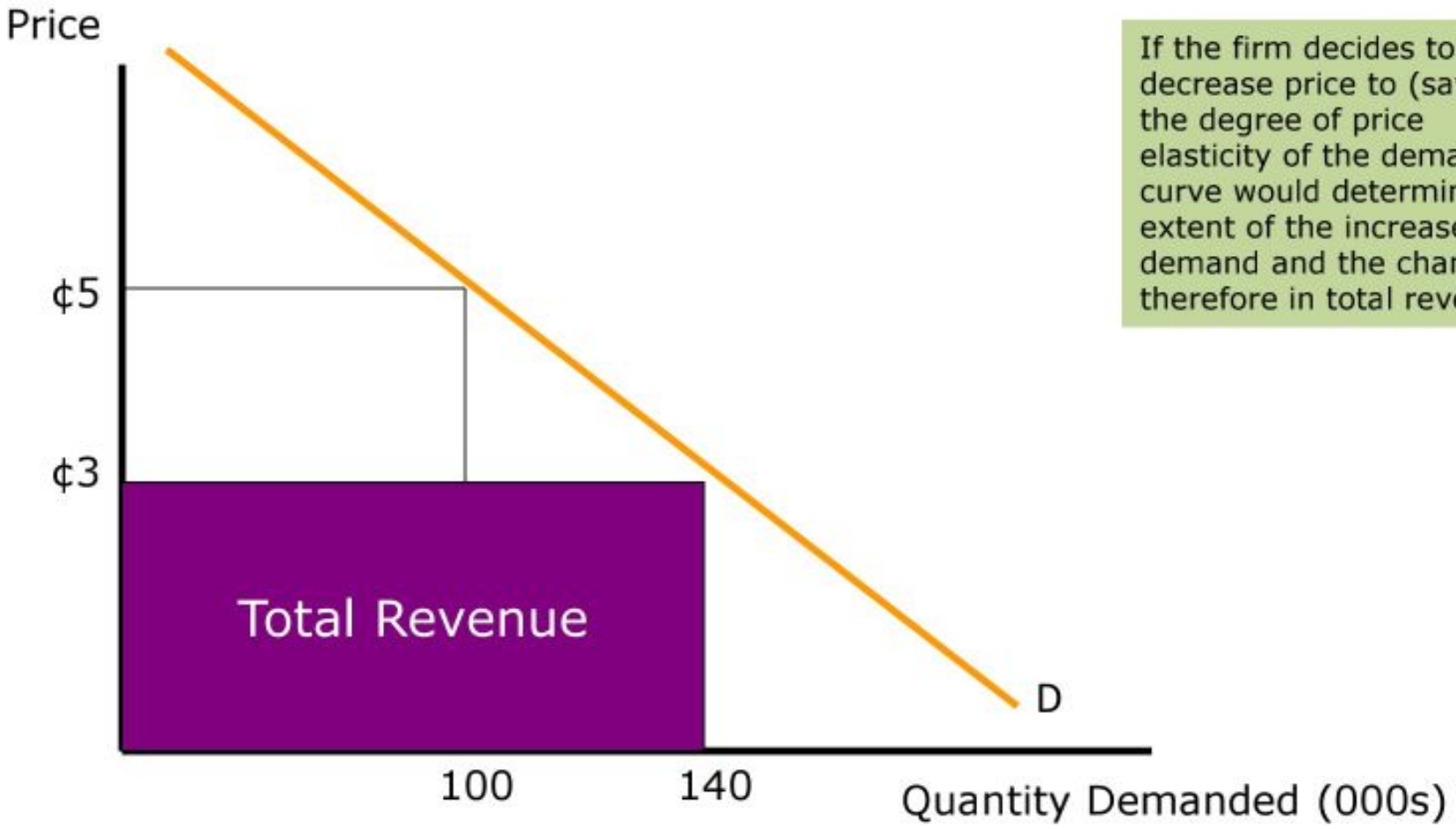
PED and Total Revenue



Total revenue is price x quantity sold. In this example, TR = ¢5 x 100,000 = ¢500,000.

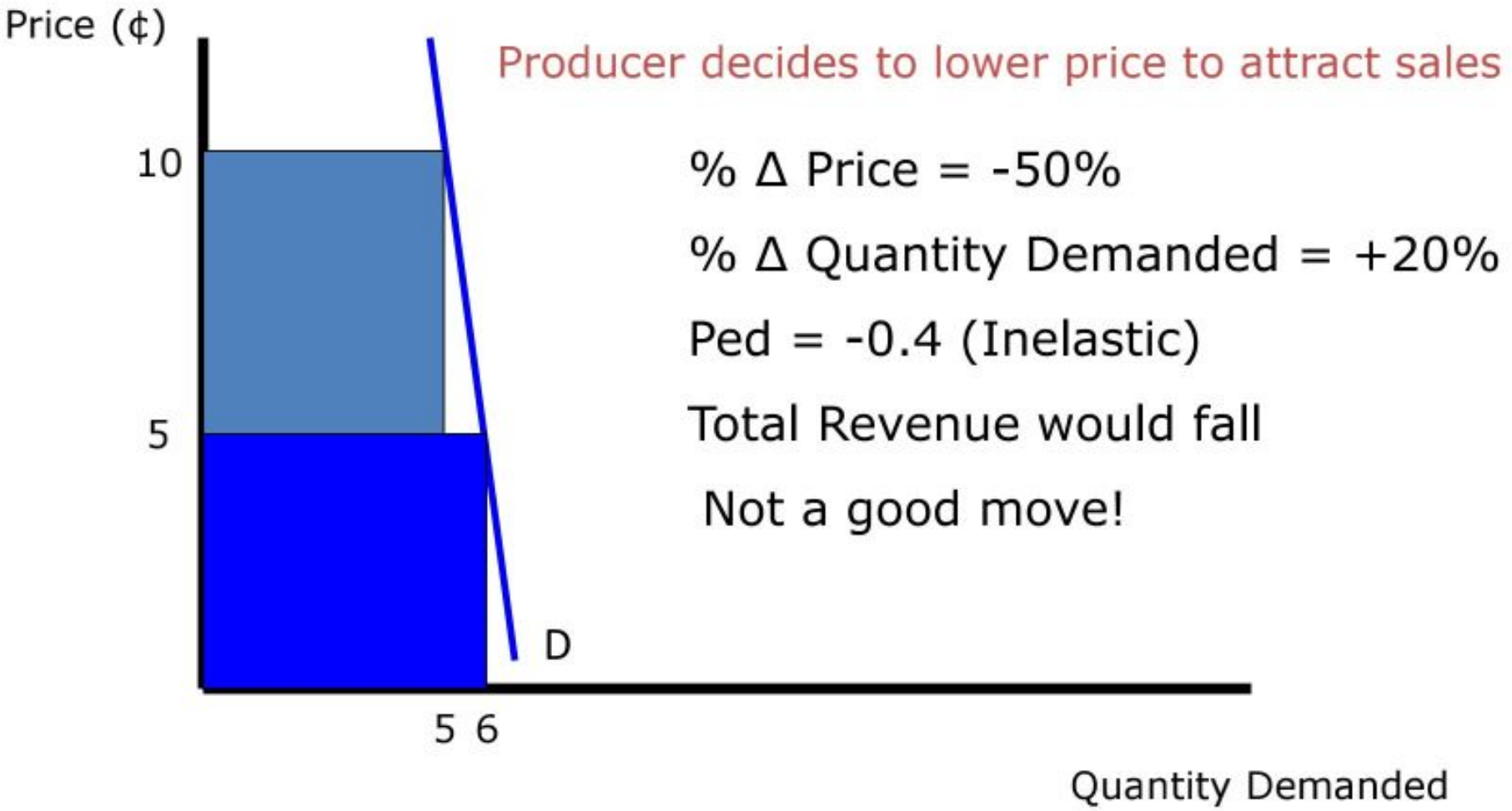
This value is represented by the grey shaded rectangle.

PED and Total Revenue Cont'd



If the firm decides to decrease price to (say) ¢3, the degree of price elasticity of the demand curve would determine the extent of the increase in demand and the change therefore in total revenue.

PED and Total Revenue Cont'd



Producer decides to lower price to attract sales

% Δ Price = -50%

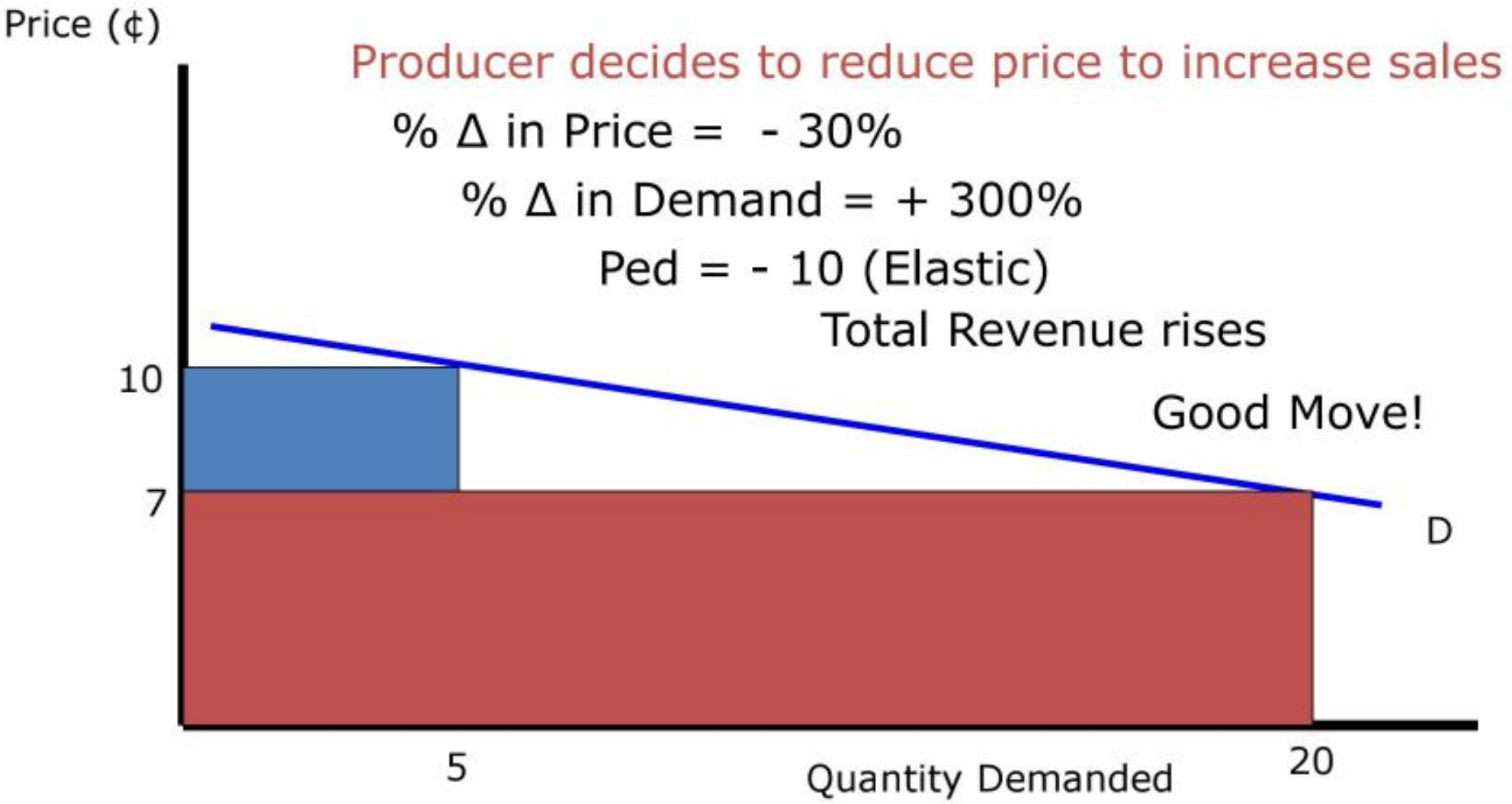
% Δ Quantity Demanded = +20%

Ped = -0.4 (Inelastic)

Total Revenue would fall

Not a good move!

PED and Total Revenue Cont'd



PED and Total Revenue Cont'd

- **If demand is price elastic:**
- Increasing price would **reduce** TR (%Δ Qd > % Δ P)
- Reducing price would **increase** TR

  (%Δ Qd > % Δ P)

- **If demand is price inelastic:**
- Increasing price would **increase** TR

  (%Δ Qd < % Δ P)
- Reducing price would **reduce** TR (%Δ Qd < % Δ P)

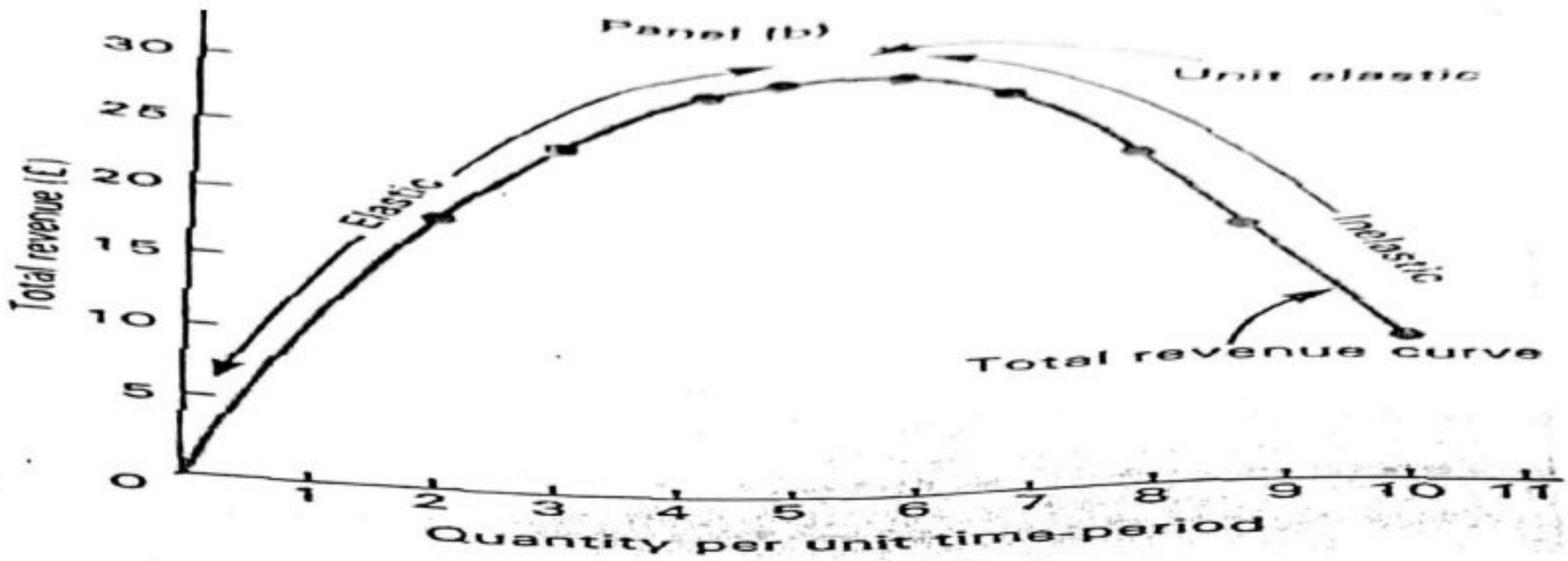
DETERMINANTS OF PRICE ELASTICITY OF DEMAND

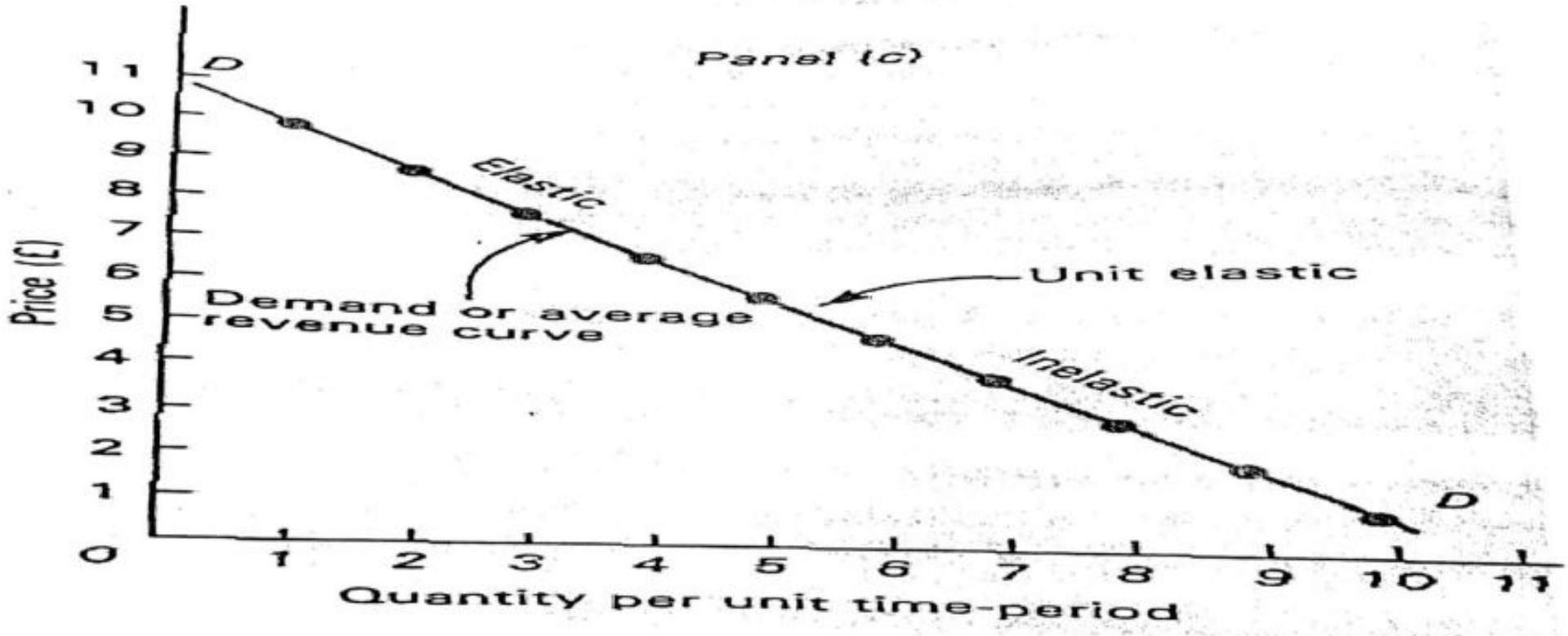
- **Degree of necessity of the commodity**
- **Availability and closeness of substitutes**
- **Size of consumer's income:**
  - poorer consumers have a more elastic demand than the rich
- **Proportion of consumers' income used in buying the commodity.**
- **Habit formation**
- **Durability of commodity:**
  - the more durable the good the more inelastic they tend to be
- **Number of uses of the commodity – goods that have composite demand (several uses) are usually more elastic in demand than those that have only one use.**
- **Width of Definition – narrowly defined goods are more elastic in demand than broadly defined goods. E.g. Lipton is a type of tea/beverage and so if defined narrowly as lipton, its demand tends to be elastic than when it is defined broadly as a beverage**
- **Time – in the short run, demand tends to be inelastic than in the long run.**

NB. The long run in this context is that time period long enough for

USES (APPLICATIONS) OF PRICE ELASTICITY OF DEMAND

- Pricing of a commodity
- Charging for labour services
- Effects (incidence) of indirect taxation
- Output expansion
- Incidence of taxation
- Ensuring success of price support scheme
- Import restrictions
- Devaluation or depreciation of a currency

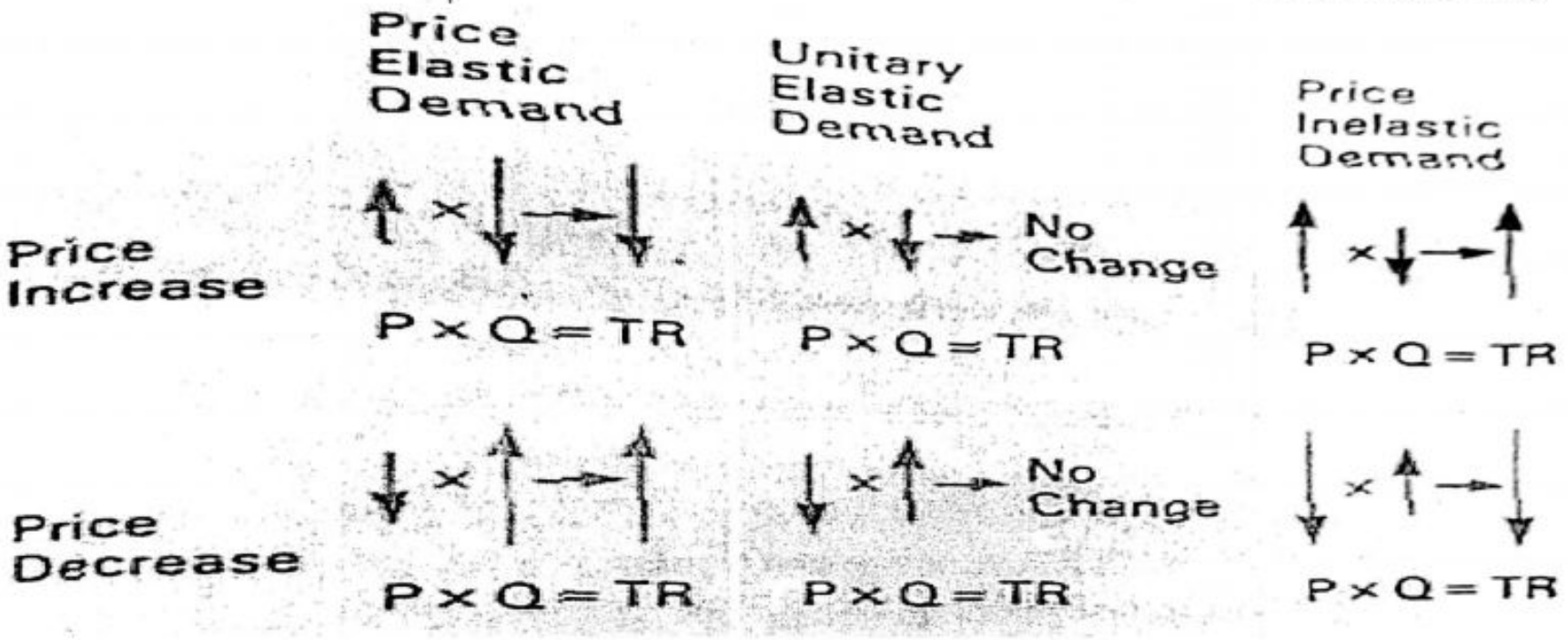




Price elasticity and total revenue

e relationship between price elasticity of demand and total revenue (TR), is nmarized in Figure 4.2:

FIGURE 4.2 The Relationship between Elasticity and Total Revenues



Income Elasticity of Demand (e_y)

- Measures the degree of responsiveness of demand to changes in incomes. Mathematically,

$$e_y = \frac{\%\text{ change in qty demanded}}{\%\text{ change in income}}$$

- Demand is:
- Income-elastic if $e_y > 1$
- income-inelastic if $e_y < 1$
- Negatively income elastic if $e_y < 0$

- Normal Good – demand rises as income rises and vice versa. e_y = +ve
- If $0 < e_y < 1$ = the good is normal and a necessity
- If $e_y > 1$, the good is normal and a luxury
- Inferior Good – demand falls as income rises and vice versa. e_y = -ve i.e. $e_y < 0$

Uses of Income Elasticity of Demand

- Knowledge of income elasticity of demand is particularly important to the firm (producer) or seller) and the government.

<u>To the Firm</u>

- Enables the firm to decide which goods to produce or supply more when income changes.
- When income rises, it would be profitable to supply more of goods with positive income elasticity (normal goods).

<u>To the Government</u>

- serves as a guide to the government to know the kinds of goods whose production should be emphasized in the developmental process.
- Serves as a guide in taxation policies. Following an increase in income, higher taxes may be imposed on goods with high income elasticity in order to yield higher revenue.

Cross Elasticity of Demand

- Measures the degree of responsiveness of demand of one good to changes in the price of a related good – either a substitute or a complement
- If e_{ty} is positive (i.e. $e_{ty} > 0$), then t and y are *substitutes*
- If e_{ty} is negative (i.e. $e_{ty} < 0$), then t and y are *compliments*
- If e_{ty} is equal to zero (i.e. $e_{ty} = 0$), then t and y are *not related (i.e. They are independent of each other)*
- Cross elasticity of demand is used (with difficulty) to define the boundaries of an industry.

$$e_{ty} = \frac{\%\ \Delta\ \text{Qty of good t}}{\%\ \Delta\ \text{Price of good y}}$$

Price Elasticity of Supply (e_s)

- **Measures the degree of responsiveness of supply to changes in price**
  - If the percentage change in quantity supplied is less than the percentage change in price, supply is **inelastic (i.e. $e_s<1$)** - it is difficult for suppliers to react swiftly to changes in price.
  - If on the other hand, the % change in quantity supplied is greater than the % change in price, supply is **elastic (i.e. $e_s> 1$) -** suppliers can react quickly to changes in price.
  - If the percentage changes in both quantity supplied and price was equal, the supply is **unitary elastic (i.e. $e_s = 1$)**

$$e_s = \frac{\%\ \Delta \text{ Quantity Supplied}}{\%\ \Delta \text{ Price}}$$

Determinants of Elasticity of Supply

- Nature of the good or service eg. Mineral deposits
- Input availability
- Existence of spare capacity
- Stage of production
- Factor mobility
- Effects of the weather
- Durability of good or availability of storage facilities
- Number of markets
- Quantity of commodity in stock
- Number of firms in the industry
- Time available for adjustment

Uses of Price Elasticity of Supply

To the Consumer

- Makes the consumer aware that if price is supply inelastic, it follows that they would have to pay more if demand for the commodity rises.

NB. The consumer is worse off if supply is inelastic than if it is elastic.

To the Producer

- Makes the producer aware that if supply was price inelastic and demand increased, they could gain more profits.

NB. The producer is better off if supply is inelastic than if it is elastic.

To the Government

- Pricing or subsidizing to encourage supply
- Fixing wages to encourage supply of labour
- Devaluation

ACF 265: Business Economics

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COSTS OF PRODUCTION

Learning Objectives

At the end of this discussion, students must be able to;

- Explain the difference between economic and accounting profit
- Examine what items are included in a firm's costs of production
- Analyze the link between a firm's production process and its total costs
- Consider the shape of a typical firm's cost curves
- Examine the relationship between short-run and long-run costs

Introduction

- The economy is made up of thousands of firms that produce the goods and services we enjoy everyday.
- Firms' decisions regarding prices and quantities depend on the market conditions they face.
- All firms incur costs as they make the goods and services that they sell. A firm's costs are key determinants of its production and pricing decisions.

Total Revenue, Total Cost and Profit

- Total revenue is the amount received by sellers of a good, computed as the price of the good times the quantity sold.
- Total cost refers to the market value of the inputs a firm uses in production.
- Profit is a firm's total revenue minus its total cost.

Profit = Total revenue – Total cost

Costs as Opportunity Costs

- The cost of something is what you give up to get it.
- The opportunity cost of an item refers to all those things that must be forgone to acquire that item.
- When economists speak of a firm's cost of production, they include the opportunity costs of making its output of goods and services.

Costs as Opportunity Costs

- Some costs require the firm to pay out some money and they are called explicit costs –
  - input costs that require an outlay of money by the firm.
- By contrast, some of a firm's costs, called implicit costs, do not require an outlay of cash.

Costs as Opportunity Costs

- Explicit and implicit costs
  - highlights an important difference between how economists and accountants analyze a business.
- Economists are interested in studying how firms make production and pricing decisions.
  - these decisions are based on both explicit and implicit costs,
  - Hence, economists include both when measuring a firm's cost.

Costs as Opportunity Costs

- By contrast, accountants have the job of keeping track of the money that flows into and out of firms.
  - As a result, they measure the explicit costs but often ignore the implicit costs.

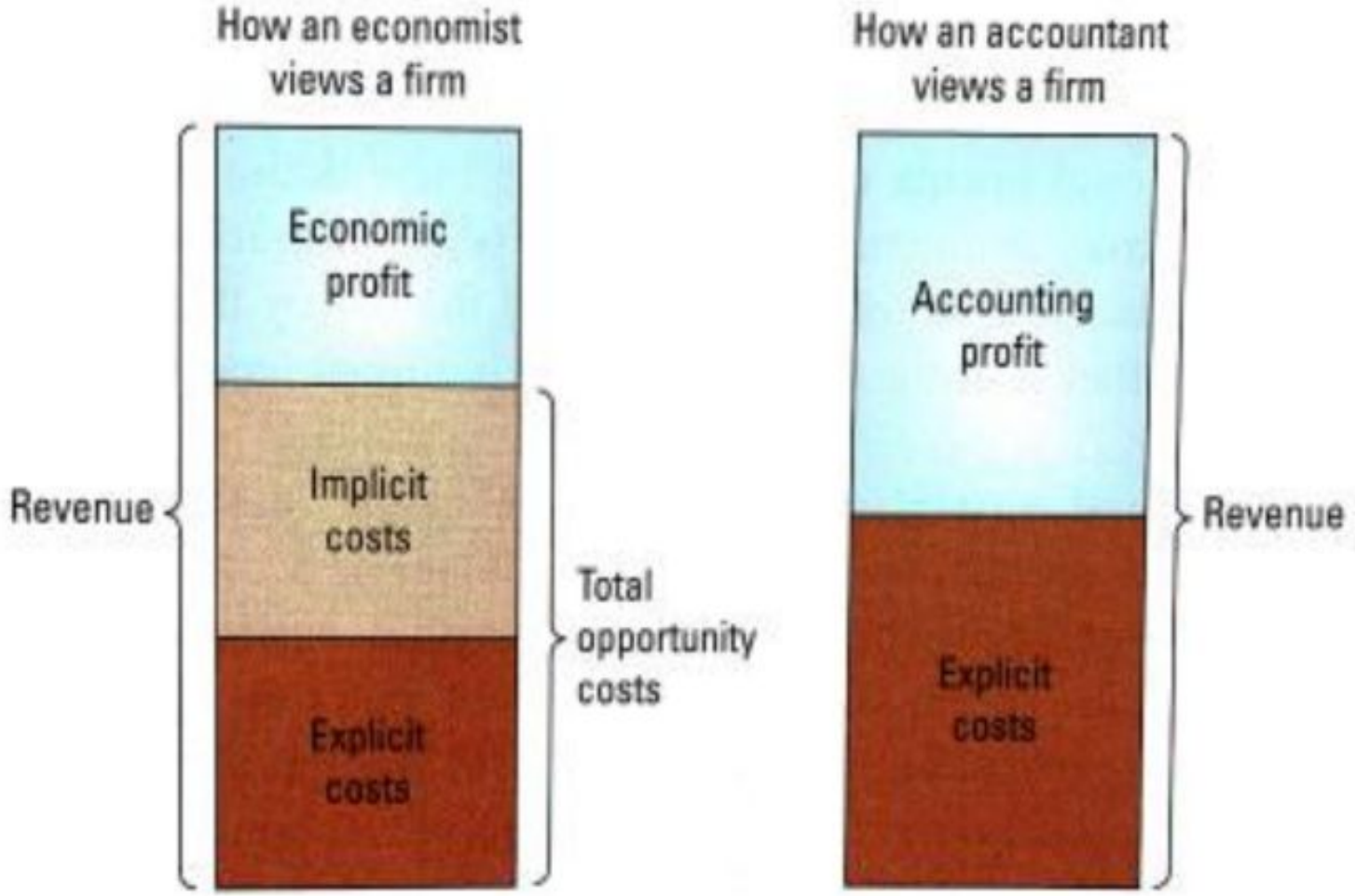
The Cost of Capital as an Opportunity Cost

- An important implicit cost of almost every firm is the opportunity cost of the financial capital that has been invested in the business.
- Suppose, that Primo (a pizza manufacturing company) used €300 000 of savings to buy his pizza factory from the previous owner.
  - If Primo had instead left this money deposited in a savings account that pays an interest of 5%, he would have earned €15000 per year. To own his pizza factory, therefore, Primo has given up €15000 a year in interest.

Economic Profit versus Accounting Profit

- An economist measures a firm's economic profit as the firm's total revenue minus all the costs (explicit and implicit) of producing the goods and services sold.
- An accountant measures the firm's accounting profit as the firm's total revenue minus only the firm's explicit costs.

Economic Profit versus Accounting Profit



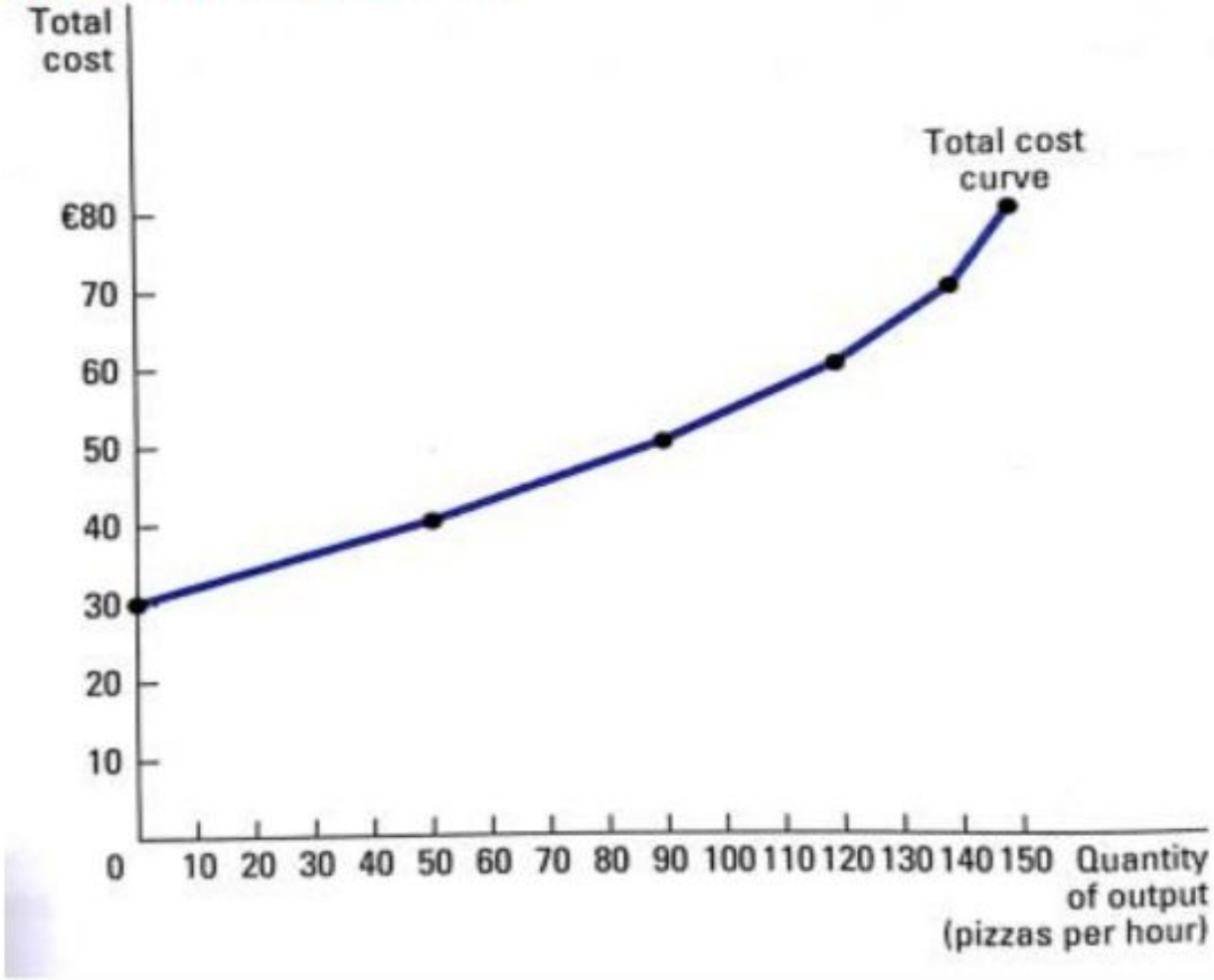
The Various Measures of Cost

Fixed and Variable Costs

- ***Fixed Costs*** are not determined by the amount of output produced;
  - they can change but not as a result of changes in the amount produced.
  - They are incurred even if the firm produces nothing at all.
  - Examples may be rent and salaries paid by a producer.
- ***Variable Costs*** change as the firm alters the quantity of output produced.
- A firm's ***total cost*** is the sum of fixed and variable costs.

The Various Measures of Cost

The Total Cost Curve



The Various Measures of Cost

Average and Marginal Cost

- A key part of business decision making is how costs vary as the level of production changes.

- Total Cost divided by the quantity of output is called ***Average Total Cost***.

  Average Total Cost = Total Cost/Quantity

  ATC = TC/Q

- Because total cost is just the sum of fixed and variable costs, average total cost can be expressed as the sum of average fixed cost and average variable cost.

The Various Measures of Cost

Average and Marginal Cost

- ***Average Fixed Cost*** is the fixed cost divided by the quantity of output.

Average Fixed Cost = Fixed Cost/Quantity

$$AFC = FC/Q$$

- Average Variable Cost is the variable cost divided by the quantity of output.

Average Variable Cost = Variable Cost/Quantity

$$AVC = VC/Q$$

The Various Measures of Cost

Average and Marginal Cost

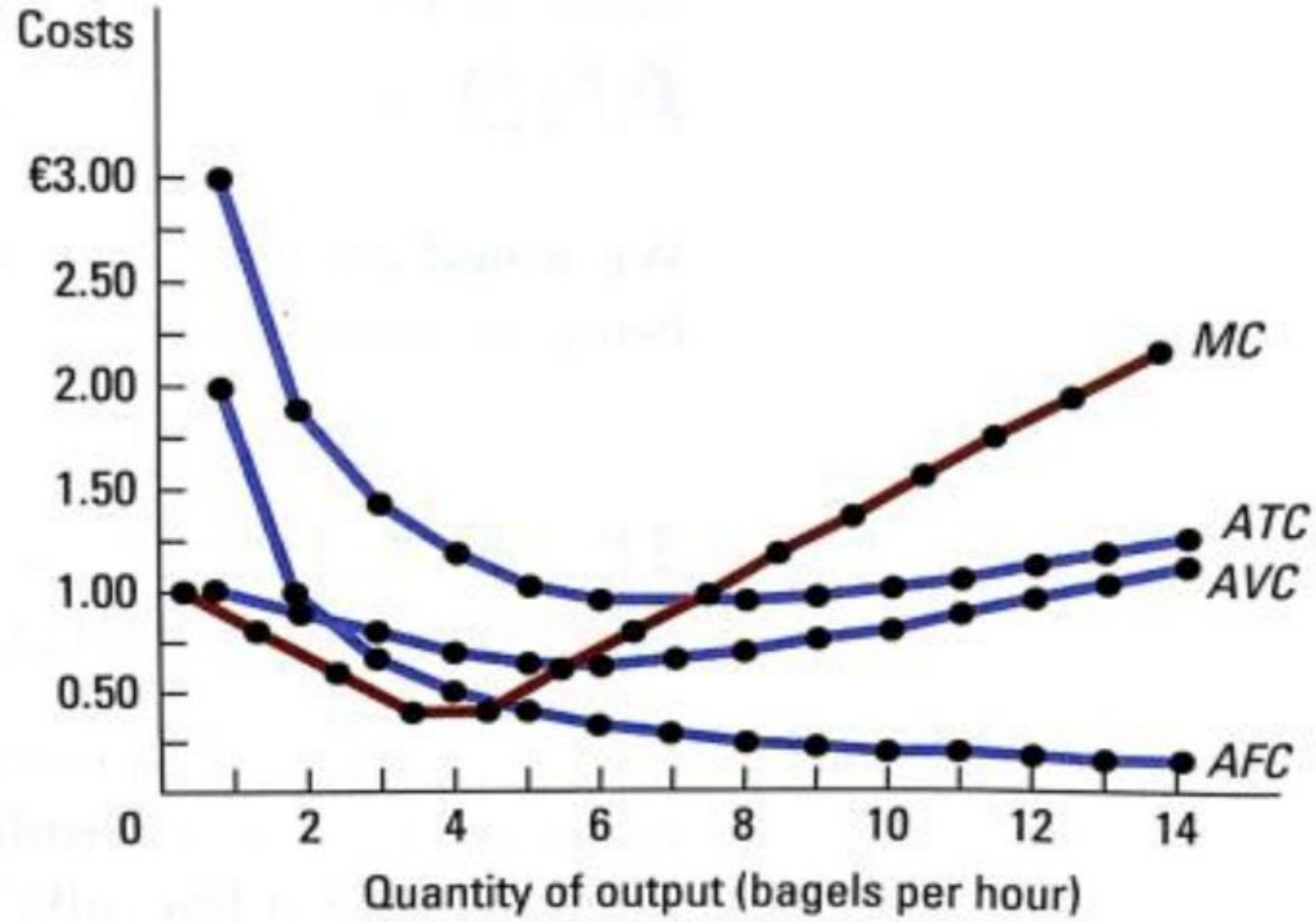
- Although average total cost tells us the cost of the typical unit,
- it does not tell how much total cost will change as the firm alters its level of production.
- The ***marginal cost*** shows the amount that total cost rises when the firm increases production by 1 unit of output.

Marginal Cost = Change in total cost/Change in qty

$$MC = \Delta TC/\Delta Q$$

Total output (Q/day) (1)	Total fixed costs (TFC) (2)	Total variable costs (TVC) (3)	Total costs (TC) (4) = (2) + (3)	Average fixed costs (AFC) (5) = (2) ÷ (1)	Average variable costs (AVC) (6) = (3) ÷ (1)	Average total costs (ATC) (7) = (4) ÷ (1)	Total costs (TC) (4)	Marginal cost (MC) (8) = Change in (4) / Change in (1)
0	£10.00	0	£10.00	—	—	—	£10.00	
1	10.00	£5.00	15.00	£10.00	£5.00	£15.00	£15.00	£5.00
2	10.00	8.00	18.00	5.00	4.00	9.00	18.00	3.00
3	10.00	10.00	20.00	3.33	3.33	6.67	20.00	2.00
4	10.00	11.00	21.00	2.50	2.75	5.25	21.00	1.00
5	10.00	13.00	23.00	2.00	2.60	4.60	23.00	2.00
6	10.00	16.00	26.00	1.67	2.67	4.33	26.00	3.00
7	10.00	20.00	30.00	1.43	2.86	4.28	30.00	4.00
8	10.00	25.00	35.00	1.25	3.13	4.38	35.00	5.00
9	10.00	31.00	41.00	1.11	3.44	4.56	41.00	6.00
10	10.00	38.00	48.00	1.00	3.80	4.80	48.00	7.00
11	10.00	46.00	56.00	0.91	4.18	5.09	56.00	8.00

Cost Curves and Their Shapes



The Shape of The Marginal Cost

- Marginal Cost rises at higher levels of output.
  - This reflects the property of diminishing marginal product.
- When a company is producing a small quantity of a product,
  - the marginal product of an extra worker is large,
  - and the marginal cost of an extra product is small.
- By contrast, when the quantity of a product being produced is already high,
  - the marginal product of an extra worker is low,
  - and the marginal cost of an extra product produced is large.

U-Shaped Average Total Cost

- Average Total Cost is the sum of average fixed cost and average variable cost.
  - Average fixed cost always declines as output rises because the fixed cost does not change as output rises and so gets spread over a larger number of units.
- Average variable cost typically rises at higher levels of output because of diminishing marginal product.
- The bottom of the U-shape occurs at the quantity that minimizes average total cost.
  - This quantity is sometimes called the ***efficient scale***.

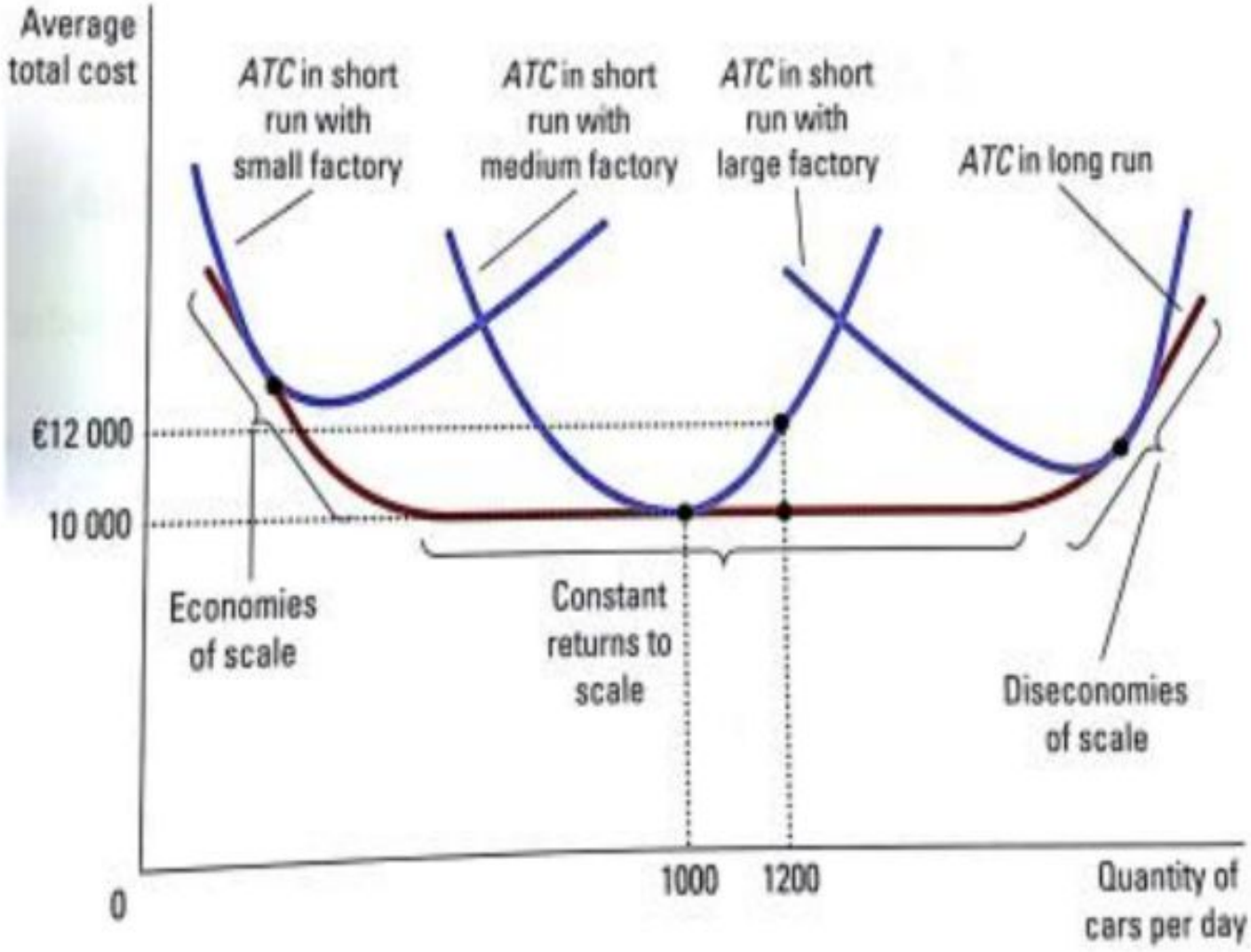
The Relationship Between Marginal Cost and Average Total Cost

- Whenever marginal cost is less than average total cost, average total cost is falling.
- Whenever marginal cost is greater than average total cost, average total cost is rising.
- The marginal cost curve crosses the average total cost curve at its minimum.
  - At this point of intersection, the cost of an additional unit is the same as the average and so the average does not change and the point is the minimum of average total cost.

The Relationship Between Short-Run and Long-Run Average Total Cost

- For many firms, the division of total costs between fixed and variable costs depends on the time horizon.
- Because many decisions are fixed in the short run but variable in the long run, a firm's long run cost curve differs from its short-run cost curves.
- The long-run average total cost curve is a much flatter U-shape than the short-run average total cost curve.
  - In addition, all the short-run curves lie on or above the long-run curve.

The Relationship Between Short-Run and Long-Run Average Total Cost



Economies and Diseconomies of Scale

- When long-run average total cost declines as output increases, there are said to be ***economies of scale***.
- When long-run average total cost rises as output increases, there are said to be ***diseconomies of scale***.
- When long-run average total cost does not vary with the level of output, there are said to be ***constant returns to scale***.

Economies and Diseconomies of Scale

What might cause economies or diseconomies of scale?

- Economies of scale often arise because higher production levels allow specialization among workers and increase the possibility that technology can be used.
- Diseconomies of scale can also arise because of coordination problems that are inherent in any large organization.

The Firm's Short-Run Decision to Shut Down

- We can distinguish between a temporary shut down of a firm and the permanent exit of a firm from a market.
- A ***shutdown*** refers to a short-run decision not to produce anything during a specific period of time because of current market conditions.
- A ***Permanent Exit*** is a long-run decision to leave the market.
- The short-run and long-run decisions defer because most firms cannot avoid their fixed costs in the short-run but can do so in the long run.

The Firm's Short-Run Decision to Shut Down

- A firm that shuts down temporarily still has to pay its fixed costs, whereas a firm that exits the market saves both its fixed and its variable costs.
- When making the short-run decision whether to shut down production for a period, the fixed cost of land and capital is said to be a sunk cost - cost that has been committed and cannot be recovered.

What Determines a Firm's Shutdown Decision in the Short-run

- If the firm shuts down, it loses all revenue from the sale of the products it is not now producing and which could be sold. At the same time, it does not have to pay the variable costs of making its product (but must still pay the fixed costs).
- A firm shuts down if the revenue that it would get from producing is less than its variable costs of production..

Mathematically

- Shut down if,

TR < VC

By dividing both sides by Q,

Shut down if **TR/Q < VC/Q**

- TR/Q is Average Revenue which is simply the good's price, P.
- Similarly, VC/Q is average variable cost, AVC.

Therefore, a firm shuts down if **P < AVC**.

- That is, a firm chooses to shut down if the price of the good is less than the average variable cost of production.

The Firm's Long-Run Decision to Exit or Enter a Market

- If the firm exits, it again will lose all revenue from the sale of its product, but now it saves on both fixed and variable costs of production.
- Thus, the firm exits the market if the revenue it would get from producing is less than its total cost. Exit if **TR < TC**

  Dividing both sides by Q, **TR/Q < TC/Q**

  TR/Q = P AND TC/Q = ATC

Therefore, the firm's exit criterion is if **P < ATC**

- That is, a firm chooses to exit if the price of the good is less than the average total cost of production

THANK YOU

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THEORY OF PRODUCTION

THEORY OF PRODUCTION

- Theory of the Firm – Basic Concepts
- Diminishing Returns
- Production with one Variable Input
  - Total, Average and Marginal Product
  - The shapes of the Average and Marginal Product
  - Stages of Production
- Production with two variable inputs - Isoquants
  - The Marginal Rate of Technical Substitution
  - Characteristics of Isoquants
  - Isocosts
  - Production Equilibrium
  - Expansion Path
  - Constant, Increasing and Decreasing Returns to
  - Scale

Basic Concepts

- Firm - an organization or business unit the brings together the various factors of production to produce a product meant to be sold for a profit.
- Input – a factor of production that goes into producing an output.
- Short run – a time-period when at least one factor of production is fixed.
- Long run – a time-period when all factors are variable

- Production Function – the relationship between physical output and the quantity of factors of production used in the production process. (i.e. it relates output to inputs)

Law of Diminishing Returns

- This is also known as the Law if Diminishing Marginal Productivity

As more and more of a variable input or factor is applied to fixed input(s), the marginal productivity of the variable factor will eventually decline.

NB: This law applies only in the short run when at least one factor of production is fixed <u>but it applies to many different situations</u>

Diminishing Marginal Product

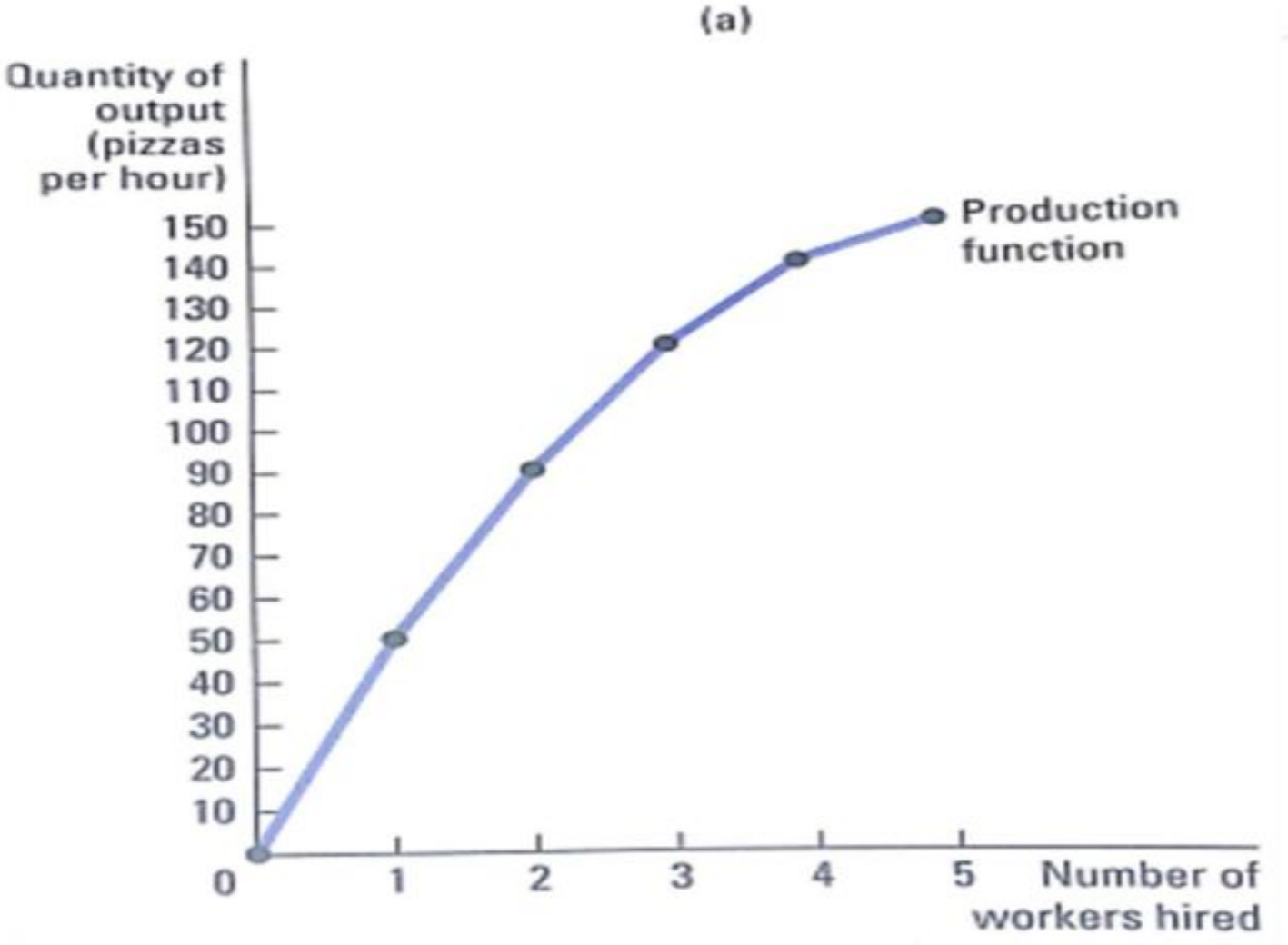
Figure 5(a) - Diminishing Returns: A Hypothetical Case in Agriculture.

Input of labour (no. of worker-weeks)	Total product (output in bushels of wheat per week)	Marginal physical product (in bushels of wheat per week)
0	0	
		10
1	10	
		16
2	26	
		10
3	36	
		8
4	44	
		6
5	50	
		4
6	54	
		2
7	56	
		1
8	55	

Production with one Variable Input

- The production function of any commodity can be an equation, a table or a graph.
- The production function shows the maximum amount of the commodity that can be produced per unit of time for each set of alternative inputs, when the best production techniques available are used.
- Based on the variable input and output obtained, we can talk about the Total Product, Average Product and Marginal Product

The Production Function



Total Product

- This is the total output (quantity) obtained from using a given unit of inputs per unit of time.
- Total product of any variable factor used in production rises initially, attains a maximum and there after falls.
- The total product curve is therefore n shaped.

Average Product

- This refers to production per unit of input.
- It is obtained by dividing the total output by the number of units of inputs used.
- The average product rises at the initial stages of production as more variable units are applied to the fixed input, attains a maximum and then falls.
- It falls but it is never zero as long as the total product is not zero or negative.

Marginal Product

- This refers to the additional productivity gained from employing one more variable factor (labour).
- The marginal product rises initially, reaches a maximum and thereafter falls.
- Marginal product can be negative when additional variable factors and continuously added even as the marginal product falls.
- When the marginal product falls, we are in the area of diminishing marginal physical returns.

A Short-run Production function

Table 1

(1) Land	(2) Labor	(3) TP	(4) AP_L	(5) MP_L
1	0	0	0	-
1	1	3	3	3
1	2	8	4	5
1	3	12	4	4
1	4	15	$3\frac{3}{4}$	3
1	5	17	$3\frac{2}{5}$	2
1	6	17	$2\frac{5}{6}$	0
1	7	16	$2\frac{2}{7}$	−1
1	8	13	$1\frac{5}{8}$	−3

Shape of the Average Product Curve

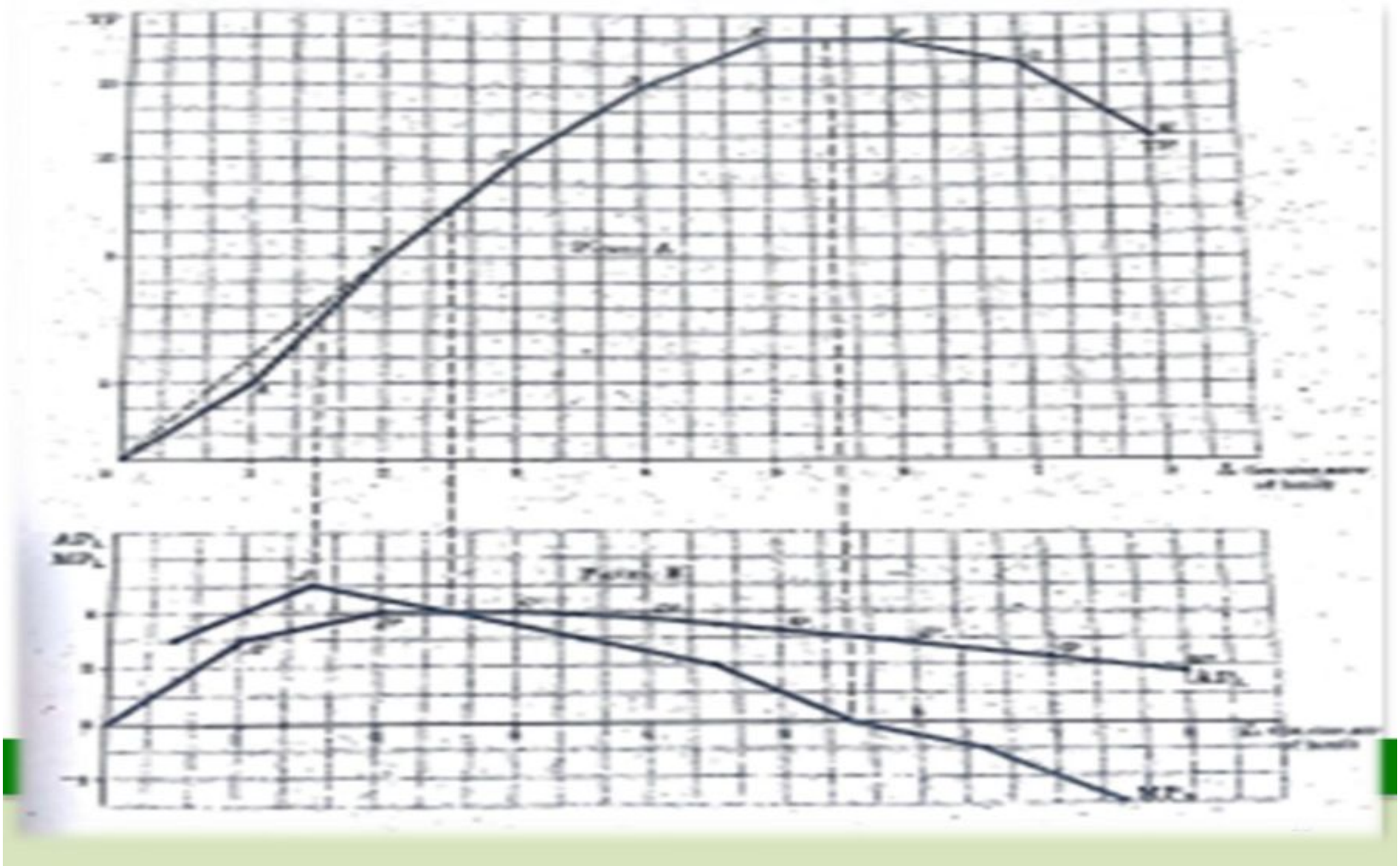
- It is n-shaped because it rises initially, attains a maximum and thereafter falls. It however, remains positive as long as the TP is positive

- The AP at any point is given by the slope of the straight line from the origin to that point of the total product curve.

Shape of the Marginal Product Curve

- The MP curve is also n-shaped because it rises, reaches a maximum and thereafter falls.
- The MP curve reaches a maximum before the AP and becomes zero when the TP is maximum and negative when the TP begins to decline.
- The falling portion of the MP curve illustrates the law of diminishing marginal returns.
- The MP of any two points is equal to the slope of the TP curve between the two points

Shape of the Marginal Product Curve



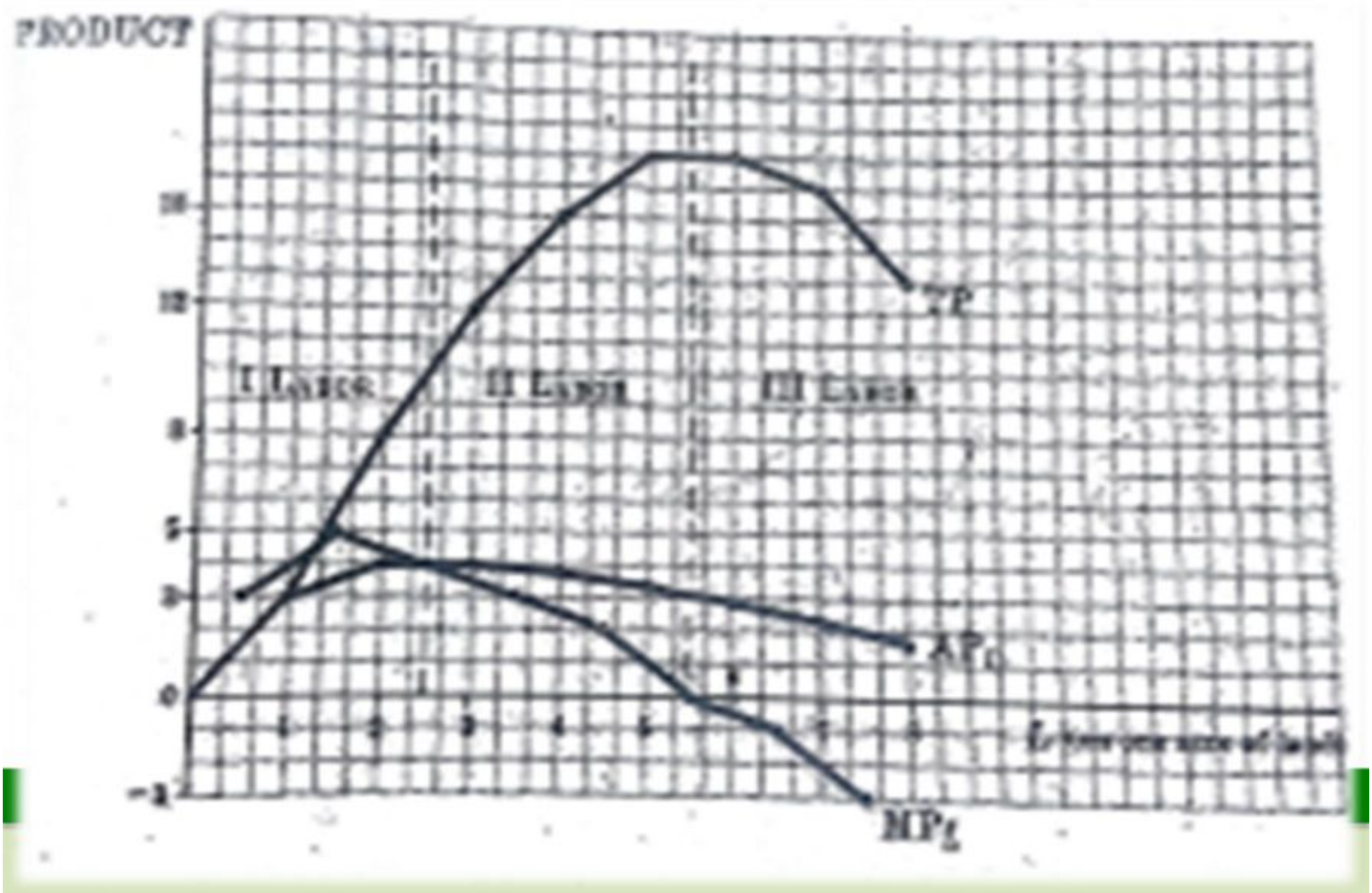
Relationship between the Per Unit Curves

- The per unit production curves are the Average and Marginal Product curves.
- They both rise initially but the MP is above the AP (i.e. the MP rises faster than the AP)
- The MP reaches a maximum before the AP.
- The MP is equal to the AP when the AP attains a maximum.
- The MP falls faster than the AP and lies below it.
- So we say that, as long as the AP is rising, the MP is above it; when it is falling, the MP is below it and when it is maximum, the MP is equal to it.

Stages of Production

- Based on the relationship between the various production curves (AP and MP), we can define three stages of production.
- Stage I goes from the origin to where the AP of the variable factor (labour in our case) is maximum.
- Stage II goes from the point where the AP of the variable factor is maximum to where the MP of that variable is zero.
- Stage III covers the range over which MP for the variable factor is negative.

Stages of Production



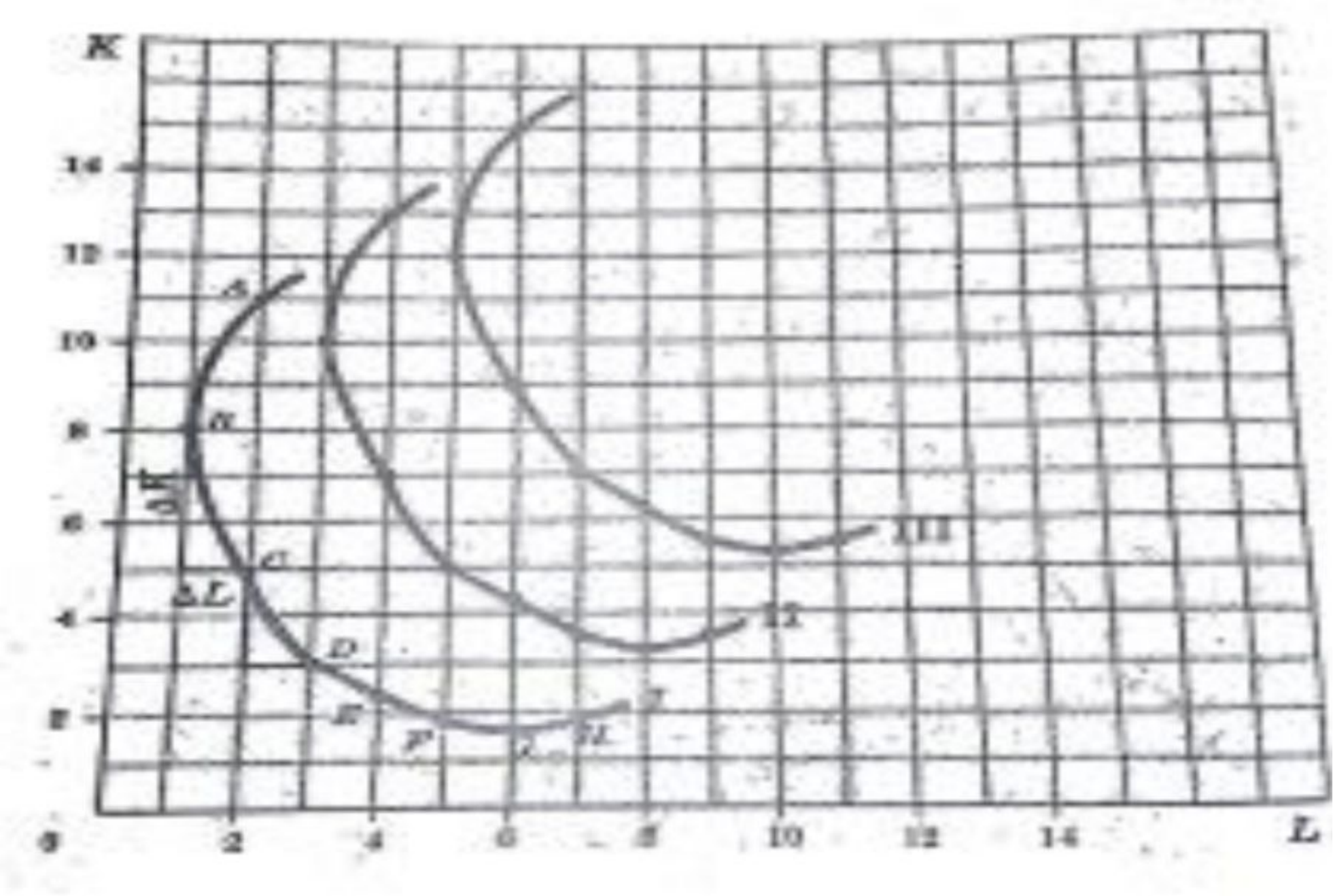
Production Decisions

- A producer has to decide the stage at which to produce given the factors of production he/she has.
- A rational producer will not produce in stage III even if labour was free because he/she could increase output by using less labour (Also, the MP of the variable factor is negative in this region)
- The rational producer will also not produce in stage I because that stage corresponds to stage III for land.
- This means that the rational producer will produce only in stage II where the Marginal Productivity of the variable factor is positive.

Production with two variable inputs: Isoquants

- Since more than one factor of production is variable, we are dealing with the long run.
- To analyze the long run, Isoquants are used.
- An Isoquant is a line that shows the various combinations of factors of production that a firm can use to produce specific outputs.
- A higher Isoquant refers to a higher output.
- Isoquants have three characteristics:
  - 1) in the relevant portion they are negatively sloped
  - 2) isoquants are convex to the origin
  - 3) they never cross

Isoquant



Marginal Rate of Technical Substitution

- This refers to the amount of Labour (L) or Capital (K) that a firm can give up for the other and still remain on the same Isoquant
- $\mathbf{MRTS_{LK} = MP_L/MP_K}$
- As the firm moves down an Isoquant, the $\mathbf{MRTS_{LK}}$ diminishes

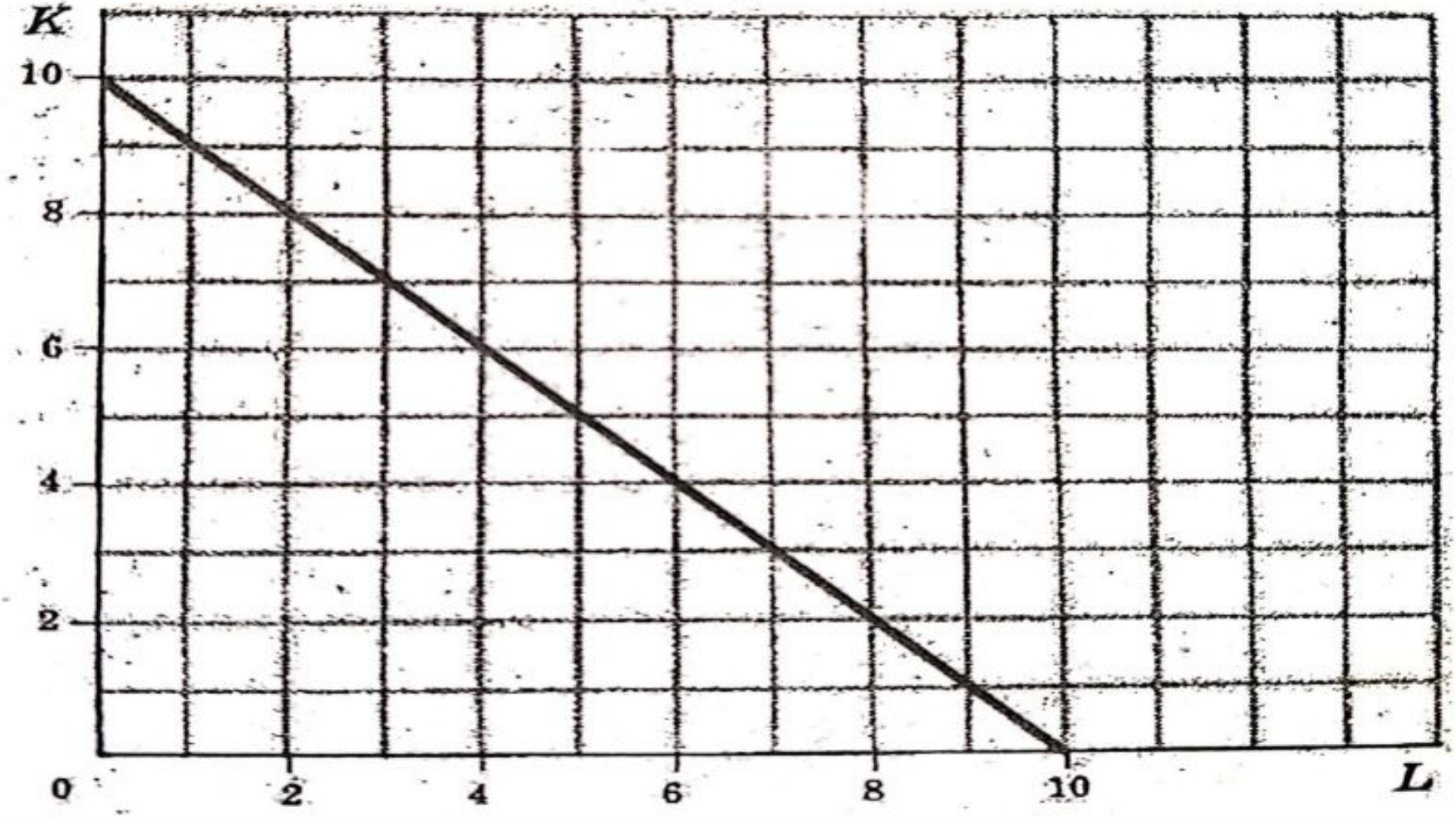
Isocosts

- They show all the different combinations of labor and capital that a firm can purchase given the total outlay (TO)

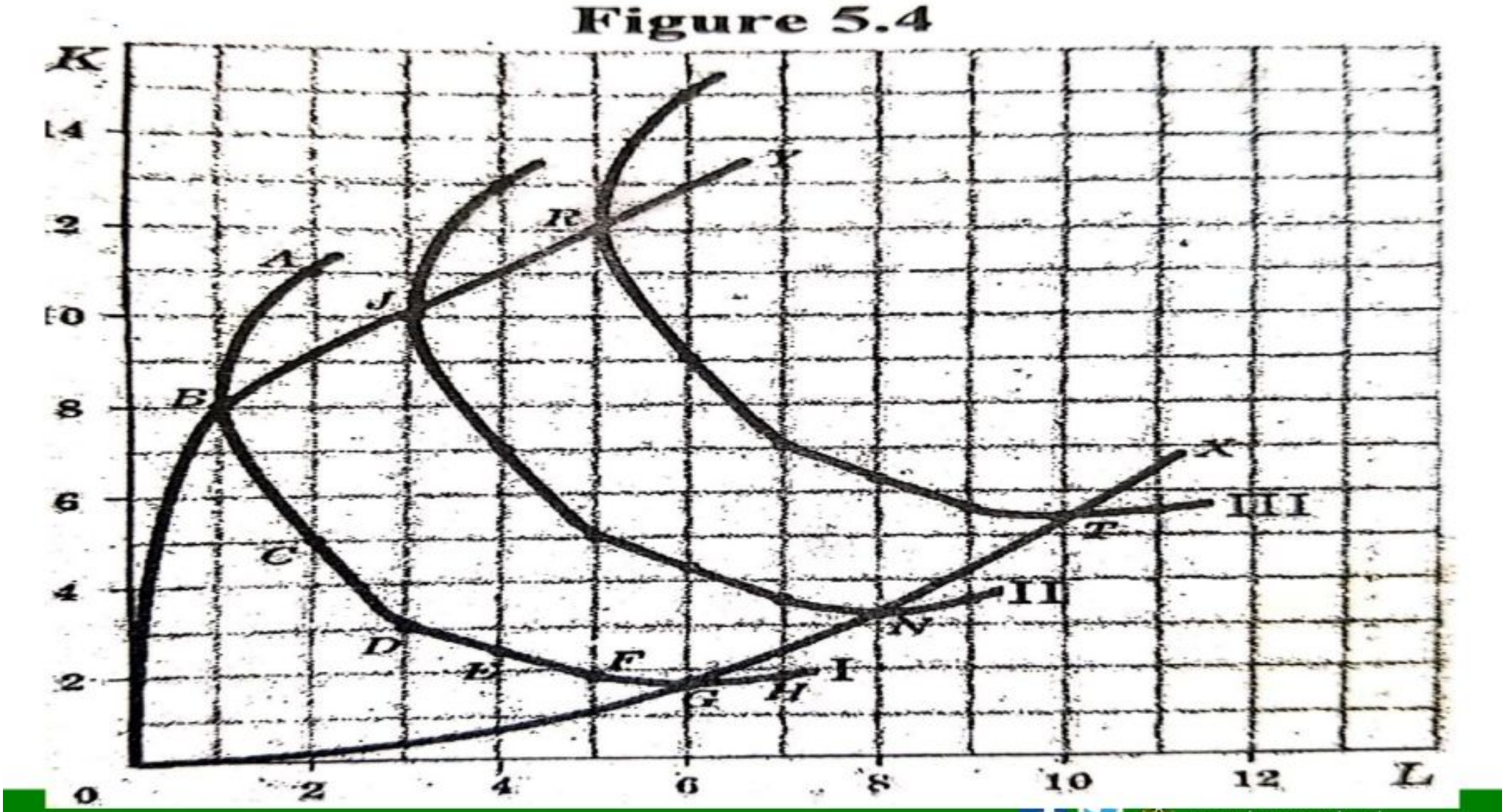
- The slope of an Isocost is given by $-P_L/P_K$

Isocost

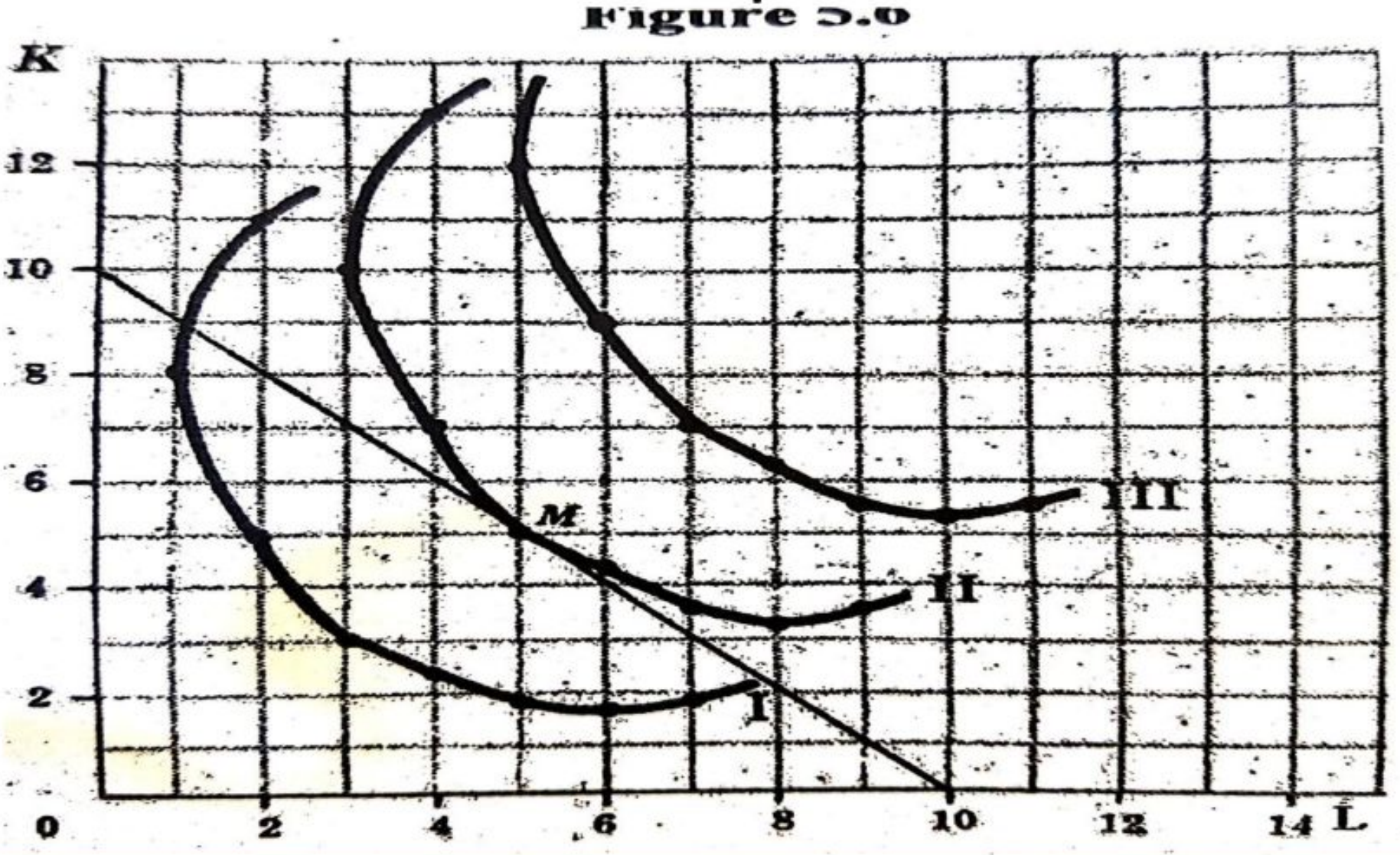
Figure 5.5



Expansion path

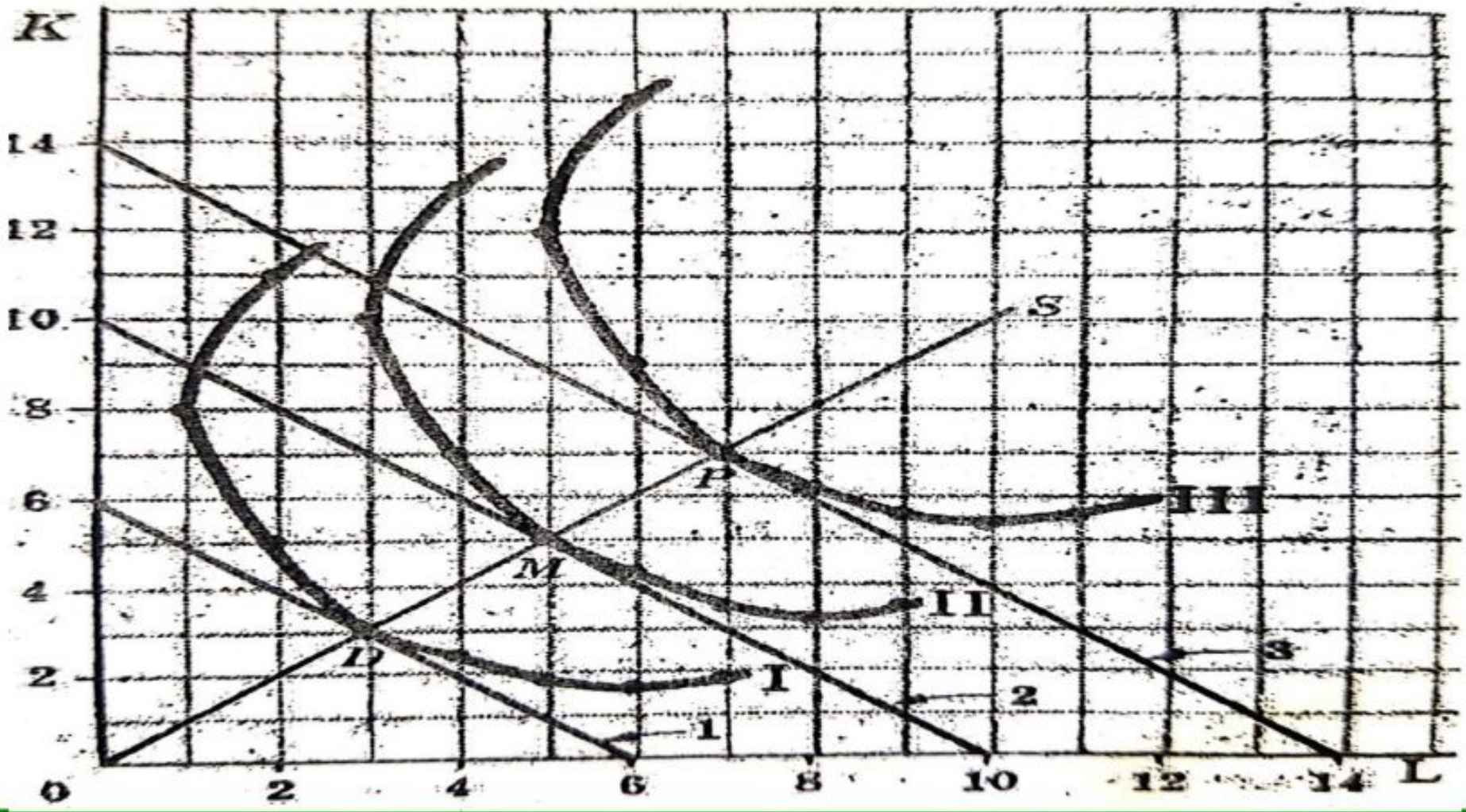


Producer equilibrium



Producer equilibrium

Figure 5.7



THANK YOU