

MICROECONOMICS

Introduction

Definition of economics :Greek word for "one who manages a household"

Economics is the study of how society manages its scarce resources.

Economics is the study of methods of allocating scarce resources and distributing the product of those resources and the study of consequences of these methods of allocation and distribution.

The subject is divided into two main parts: microeconomics and macroeconomics.

Microeconomics is the study of individual decisions and the interactions of these decisions.

Macroeconomics is the study of the performance of the national economy and the global economy, mainly using general economic magnitudes and their interaction.

Scope of economics

How do the choices that people make end up determining what, how, when, where and for whom goods and services are produced? When do choices made in the pursuit of self-interest also promote social interest?

Factors of Production : Land (natural resources) = rent, Labour (human capital)= wages, Capital (machines, buildings, money)= interest , Entrepreneurship = profit.

Ten principles of economics

1. **People face tradeoffs:** „There is no such thing as a free lunch” or guns and butter.

2. The cost of something is what you give up to get it making decisions requires comparing costs and benefits of alternative actions. The highest-value alternative that we give up to get something is the **opportunity cost** of the activity chosen.

3. Rational people think at the margin The cost of an increase in an activity is called **marginal cost**. To make your decision, you compare the *marginal benefit* from an extra night of study with its **marginal cost**.

4. People respond to incentives A change in the marginal cost or a change in the marginal benefit changes the incentives that people face and leads them to change their choice. More of an activity is undertaken when its marginal cost falls or its marginal benefit rises, less of an activity is undertaken when its marginal cost rises or its marginal benefit falls.

5. Trade can make everyone better off Concentrating on the production of only one good or a few goods is called **specialization**.

6. Markets are usually a good way to organise economic activity Unlike is a **central planned economy**, where the government guides economic activity, in a **market economy**, the decisions of a central planner are replaced by the decisions of millions of firms and households. prices guide these individual decision makers to reach outcomes that, in many cases, maximize the welfare of society as a whole.

7. Government can sometimes improve market outcomes : market failure refers to a situation in which the market on its own fails to allocate resources efficiently and is even less able to ensure that economic prosperity is distributed fairly (basketball players earn more than chess players). One goal of the study of economics is to help you judge when a government policy is justifiable to promote efficiency or equity and when it is not.

8. A country's standard of living depends on its ability to produce goods and services : to boost living standards, policymakers need to raise productivity by education, access to technology etc.

9. Prices rise when the government prints too much money : Inflation is the growth in the quantity of money. Because high inflation imposes various costs on society, keeping inflation at a low level is a goal of economic policymakers around the world.

10. Society faces a short-run tradeoff between inflation and unemployment

1. Market economy

1.1. What is a market?

In ordinary speech, the word market means a place where people buy and sell goods such as fish, meat, fruits and vegetables. In economics, a market has a more general meaning. To an economist, a market is not necessarily a place where buyers and sellers meet in person. Instead, a market is any arrangement that enables buyers and sellers to get information and to do business with each other.

A market can also be defined as the totality of all acts of buying and selling a particular good or service in a given period of time or, simpler, as a social institution in which participants can exchange a good or service with one another on terms they find mutually agreeable.

A market has two sides: buyers and sellers. Buyers include consumers, who purchase goods and services, and firms, which buy labour, capital and raw materials that they use to produce goods and services. Sellers include firms, which sell their goods and services; workers, who sell their labour services; and resource owners, who rent land or sell mineral resources to firms. Clearly, most people and most firms act as both buyers and sellers, but we will find it helpful to think of them as simply buyers when they are buying something and sellers when they are selling something. Together, buyers and sellers interact to form markets. From that point, a market is a collection of buyers and sellers that interact, resulting the possibility for exchange.

There are markets for goods such as apples and cars, for services such as haircuts and tennis lessons, for resources as computer programmers and earth-movers, and for other manufactured inputs such as memory chips and car parts. There are also markets for money such as the euro and the dollar and for financial securities such as BP shares. Only our imagination limits what can be traded in markets.

Some markets are highly organized, such as the markets for many agricultural commodities. In these markets, buyers and sellers meet at a specific time and place, where an auctioneer helps set prices and arrange sales.

More often, markets are less organized. For example, consider the market for ice cream in a particular town. Buyers of ice cream do not meet together at any one time. Sellers of ice cream are in different locations and each seller posts a price for an ice cream cone. Each buyer decides how much ice cream to buy at each store.

Even though it is not organized, the group of ice cream buyers and sellers forms a market. Each buyer knows that there are different sellers from which to choose, and each seller is aware that his product is similar to that offered by other sellers. The price of the ice cream and the quantity of ice cream sold are not determined by any single buyer or seller, but they are determined by all buyers and sellers as they interact in the marketplace.

A market may be a physical place where buyers and sellers meet but most markets are groups of people spread around the world who never meet and know little about each other but are connected through the Internet or by the telephone or fax. Examples are e-commerce markets and currency markets.

Markets are the centers of economic activity, and many of the most interesting questions and issues in economics concern how markets work in order to fulfill their primary objective which is allocating the economy's scarce resources.

1.2. Market price

Markets provide the possibility of transactions between buyers and sellers. Goods and services are sold at specific prices and in perfectly competitive markets a simple price – the market price – will usually prevail.

In everyday life, the price of an object is the number of monetary units that must be given up in exchange for it. Economists refer to this price as **the money price, the nominal price** or **the current price**.

We often want to compare the price of a good today with what it was in the past or is likely to be in the future. To make such a comparison meaningful, we need to measure prices relative to the overall price level. In absolute terms, the price of a dozen eggs is many times higher today than it was 50 years ago, but relative to prices overall, it is actually lower. Therefore, we must be careful to correct for inflation when comparing prices across time. This means measuring prices in real rather than nominal terms.

The real price of a good or service (sometimes also called the constant price) is the price relative to an aggregate measure of prices, and the aggregate measure most often used is The Consumer Price Index (CPI).

We will usually be concerned with real rather than nominal prices, because the theory of demand and supply involve an analysis of how our price compares with another, and relative prices can most easily be evaluated if there is a common basis of comparison. This theory determines relative prices, and the word price means relative price. When we predict that a price will fall, we do not mean that its money price will fall – although it might. We mean that its relative price will fall or, in other words, its price will fall relative to the average price of other goods and services.

1.3. What Is Competition?

The market for ice cream, like most markets in the economy, is highly competitive. Each buyer knows that there are several sellers from which to choose, and each seller is aware that his or her product is similar to that offered by other sellers. As a result, the price of ice cream and the quantity of ice cream sold are not determined by any single buyer or seller. Rather, price and quantity are determined by all buyers and sellers as they interact in the marketplace.

Economists use the term **competitive market** to describe a market in which there are so many buyers and so many sellers that each has a negligible impact on the market price. Each seller of ice cream has limited control over the price because other sellers are offering similar products. A seller has little reason to charge less than the going price, and if he or she charges more, buyers will make their purchases elsewhere. Similarly, no single buyer of ice cream can influence the price of ice cream because each buyer purchases only a small amount.

A **competitive market**, sometimes called a perfectly competitive market, has two characteristics:

- *There are many buyers and many sellers in the market.*
- *The goods offered by the various sellers are largely the same.*

As a result of these conditions, the actions of any single buyer or seller in the market have a negligible impact on the market price. Each buyer and seller takes the market price as given.

As an example, consider the market for milk. No single consumer of milk can influence the price of milk because each buyer purchases a small amount relative to the size of the market. Similarly, each dairy farmer has limited control over the price because many other sellers are offering milk that is essentially identical. Because each seller can sell all he wants at the going price, he has little reason to charge less, and if he charges more, buyers will go elsewhere.

Buyers and sellers in competitive markets must accept the price the market determines and, therefore, are said to be price takers.

In addition to the foregoing two conditions for competition, there is a third condition sometimes thought to characterize perfectly competitive markets:

- *Firms can freely enter or exit the market.*

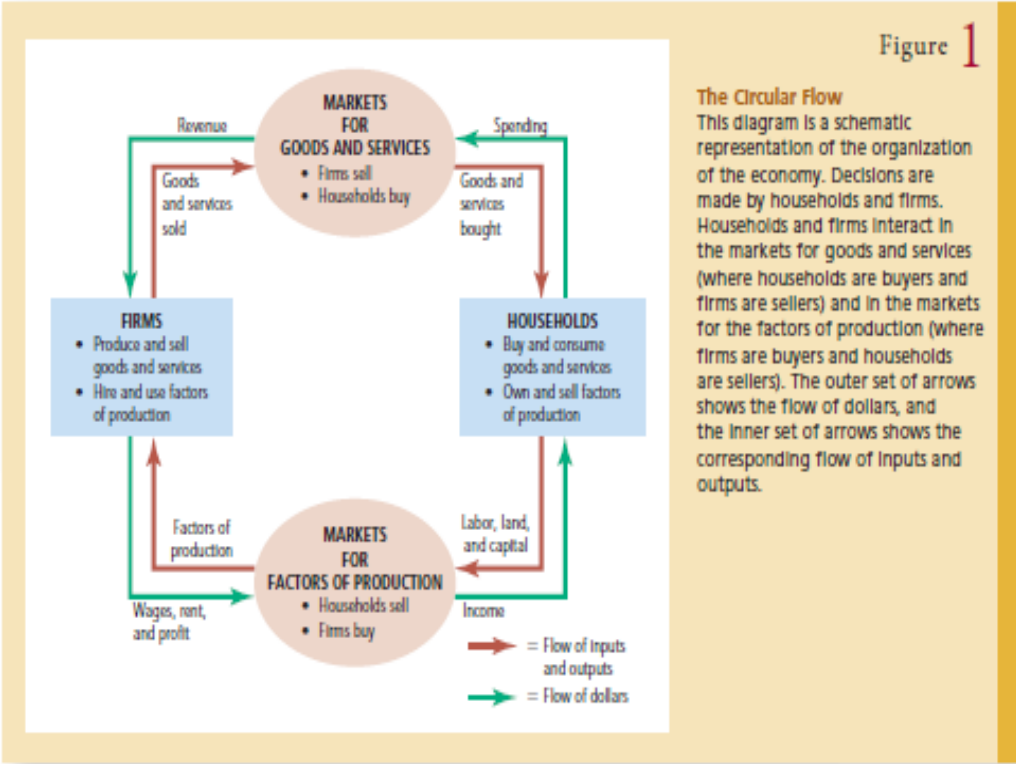
If, for instance, anyone can decide to start a dairy farm, and if any existing dairy farmer can decide to leave the dairy business, then the dairy industry would satisfy this condition. Much of the analysis of competitive firms does not need the assumption of free entry and exit because this condition is not necessary for firms to be price takers. Yet, as we will see later in this chapter, if there is free entry and exit in a competitive market, it is a powerful force shaping the long-run equilibrium.

2. Economic agents

The economy consists of millions of people engaged in many activities—buying, selling, working, hiring, manufacturing, and so on. To understand how the economy works, we must find some way to simplify our thinking about all these activities. In other words, we need a model that explains, in general terms, how the economy is organized and how participants in the economy interact with one another.

Figure 2.1 presents a visual model of the economy called a circular-flow diagram. In this model, the economy is simplified to include only two types of decision makers—firms and households. Firms produce goods and services using inputs, such as labor, land, and capital (buildings and machines). These inputs are called the factors of production. Households own the factors of production and consume all the goods and services that the firms produce.

Figure 2.1. The circular flow diagram



Households and firms interact in two types of markets. In the markets for goods and services, households are buyers, and firms are sellers. In particular, households buy the output of goods and services that firms produce. In the markets for the factors of production, households are sellers, and firms are buyers. In these markets, households provide the inputs that firms use to produce goods and services.

The circular-flow diagram offers a simple way of organizing the economic transactions that occur between households and firms in the economy. The two loops of the circular-flow diagram are distinct but related. The inner loop represents the flows of inputs and outputs. The households sell the use of their labor, land, and capital to the firms in the markets for the factors of production.

The firms then use these factors to produce goods and services, which in turn are sold to households in the markets for goods and services. The outer loop of the diagram represents the corresponding flow of dollars. The households spend money to buy goods and services from the firms. The firms use some of their revenue from these sales to pay for the factors of production, such as the wages of their workers. What's left is the profit of the firm owners, who themselves are members of households.

Let's take a tour of the circular flow by following a dollar bill as it makes its way from person to person through the economy. Imagine that the dollar begins at a household, say, in your wallet. If you want to buy a cup of coffee, you take the dollar to one of the economy's markets for goods and services, such as your local Starbucks coffee shop. There, you spend it on your favorite drink. When the dollar moves into the Starbucks cash register, it becomes revenue for the firm.

The dollar doesn't stay at Starbucks for long, however, because the firm uses it to buy inputs in the markets for the factors of production. Starbucks might use the dollar to pay rent to its landlord for the space it occupies or to pay the wages of its workers. In either case, the dollar enters the income of some household and, once again, is back in someone's wallet. At that point, the story of the economy's circular flow starts once again.

The circular-flow diagram in Figure 2.1 is a very simple model of the economy. It dispenses with details that, for some purposes, are significant. A more complex and realistic circular-flow model would include, for instance, the roles of government and international trade. (A portion of that dollar you gave to Starbucks might be used to pay taxes or to buy coffee beans from a farmer in Brazil.) Yet these details are not crucial for a basic understanding of how the economy is organized. Because of its simplicity, this circular-flow diagram is useful to keep in mind when thinking about how the pieces of the economy fit together.

3. Supply and Demand

3.1. Demand

It is said that we demand something if we:

- 1) want it ;
- 2) can afford it and
- 3) plan to buy it.

People have unlimited wants, desires or wishes for goods and services. But scarcity guarantees that many – perhaps most – of our wants will never be satisfied. Demand reflects a decision of a decision about which wants to satisfy.

The quantity demanded of a good or service is the amount that consumers plan to buy during a given time period at a particular price. The quantity demanded is not necessarily the same as the quantity actually bought. Sometimes the quantity demanded exceeds the amount of goods available, so the quantity bought is less than the quantity demanded.

The quantity demanded is measured as an amount per unit of time. For example, suppose that you buy one cup of coffee a day. The quantity of coffee that you demand can be expressed as 1 cup per day, 7 cups per week or 365 cups per year.

Our buying plans are influenced by many factors and the most important of them is price. *The relationship between the quantity demanded of a good or service and its price is called the law of demand.*

The law of demand states:

Other things remaining the same (ceteris paribus), the higher the price of a good or service, the smaller is the quantity demanded; and the lower the price of a good or service, the greater is the quantity demanded.

In other words, in most markets we expect the number of units of the good or service demanders will offer to buy to decrease if the price they have to pay increases. There are two reasons for this:

- 1) **Substitution effect.** When the price of a good rises, other things remaining the same, its relative price (opportunity cost) rises. Although each good is unique, it has substitutes – other goods that can be used in its place. As the opportunity cost of a good rises, people buy less of that good and more of its substitutes.
- 2) **Income effect.** When the price of a good rises and other influences on buying plans remain unchanged, the price rises relative to incomes. Face with a higher price and unchanged income, people cannot afford to buy all the things they previously bought. They must decrease the quantities demanded of at least some goods and services, and normally, the good whose price have increased will be one of the goods that people buy less of.

Demand curve and demand schedule

The term demand refers to the entire relationship between the price of the good and the quantity demanded of the good. Demand is illustrated by the demand curve and the demand schedule.

Figure 3.1 is a **demand curve**, a graph of the relationship between the price of a good and the quantity demanded, when the all other influences on consumers' planned purchases remain the same. This figure shows the demand curve for CD-Rs.

Table 3.1 is a **demand schedule**, a table that shows the relationship between the price of a good and the quantity demanded and lists the quantities demanded at each price when all other influences on consumers' purchases remain the same.

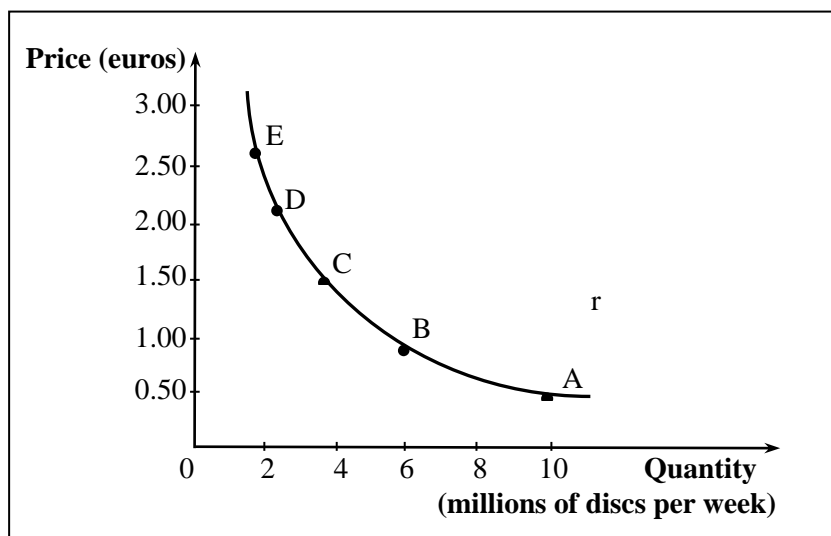
Table 3.1: The demand schedule

	Price (euros per disc)	Quantity demanded (millions of discs per week)
A	0.50	9
B	1.00	6
C	1.50	4
D	2.00	3
E	2.50	2

For example, if the price of a CD-R is 50 eurocent, the quantity demanded is 9 million a week. If the price is € 2.50, the quantity demanded is 2 million a week. The other rows of the table show the quantities demanded at prices of € 1.00, € 1.50 and € 2.00.

We graph the demand schedule as a demand curve with the quantity demanded of CD-Rs on the x – axis and the price of a CD-R on the y – axis. The points on the demand curve labelled A through E correspond to the rows of the demand schedule. For example, point A on the graph shows a quantity demanded of 9 million discs a week at a price of 50 eurocent a disc.

Figure 3.1: The demand curve



A change in demand

When any factor that influences buying plans other than the price of good changes, there is a change in demand. When demand increases, the demand curve shifts rightwards and the quantity demanded is greater at each and every price. When demand decreases, the demand curve shifts leftwards and the quantity demanded is lower at each and every price.

Main factors that bring change in demand are changes in:

- 1) **Consumers' income.** Generally if people's incomes increase, more goods are demanded and if people's incomes decrease, fewer goods are demanded.

If the demand for a good falls when income falls and rises when income rises, the good is called **normal good**. But not all goods are normal goods. If the demand for a good rises when income falls, and demand decreases as income increases, the good is called an **inferior good**. Bus rides might be examples of inferior goods, because as the income falls, it is less likely to buy a car or take a cab and more likely to take the bus.

- 2) **Prices of related goods.** The quantity of a good that consumers plan to buy depends on the prices of its substitutes. A **substitute** is a good that can be used in the place of another good. For example, a bus ride is a substitute for a train ride. If the price of a bus ride rises, people are less likely to ride a bus and more likely to take the train.

The quantity of a good that people plan to buy also depends on the prices of its complements. A **complement** is a good that is used in conjunction with another good. CD-Rs and CD burners are complements. If the price of a CD burner falls, people buy more CD burners and more CD-Rs. A fall in the price of a CD burner increases the demand for CD-Rs.

- 3) **Tastes.** The most obvious determinants of the demand are tastes. If a person likes ice cream, he or she buys more of it. Economists normally do not try to explain people's tastes because tastes are based on historical and psychological forces that are beyond the realm of economics. Economists do however; examine what happens when tastes change.
- 4) **Expectations.** Expectations about the future may affect the demand for a good or service today. For example, if you expect to earn a higher income next month, you may be more willing to spend some of your current savings buying ice cream. As another example, if you expect the price of ice cream to fall tomorrow, you may be less willing to buy an ice-cream cone at today's price.
- 5) **Population.** Demand also depends on the size and the age structure of the population. The larger the population, the greater is the demand for all goods and services; the smaller the population, the smaller is the demand for all goods and services.

3.2. **Supply**

If a firm supplies a good or service, the firm:

- 1) has resources and technology to produce it,
- 2) can profit from producing it and
- 3) plans to produce and sell it.

A supply is more than just having the resources and technology to produce something. Resources and technology are constraints that limit what is possible to produce. Many useful things can be produced, but they are not produced because they are not profitable. Supply reflects a decision about which technologically feasible items to produce.

The quantity supplied of a good or service is the amount that producers plan to sell during a given time period at a particular price. The quantity supplied is not necessarily the same amount as the quantity actually sold. Sometimes the quantity supplied is greater than the quantity demanded, so the quantity bought is less than the quantity supplied.

Like the quantity demanded, the quantity supplied is measured as an amount per unit of time. For example, suppose that Ford produces 1000 cars a day. The quantity of cars supplied by Ford can be expressed as 1000 a day, 7000 a week, or 365000 a year. Without the time dimension, we cannot tell whether a particular number is large or small.

Many factors influence selling plans and again, one of the most important is price. *The relationship between the quantity supplied of a good or service and its price is called the law of supply.*

The law of supply states:

Other things remaining the same (*ceteris paribus*), the higher the price of a good or service, the greater is the quantity supplied and the lower the price of a good or service, the smaller is the quantity supplied.

In other words, in most markets, we expect the number of units of the good suppliers will offer to sell to increase if the price they require for the good increases. There are two reasons for this as well:

- 1) At higher prices, they are likely to be more suppliers. That is, at a low price, some potential suppliers may choose not to play the role of seller at all, but at a higher price they may decide it is worth to “enter the market”. So, at higher prices, we might have a greater number of individual suppliers.
- 2) Individual suppliers who were already selling a certain quantity at the lower price may wish to sell more units at higher prices.

We saw that people specialize voluntarily only if they can obtain more goods through exchange than they can obtain if they are self-sufficient. So more people want to specialize in producing of good if they can sell it for a high price, than they get little money for it. Those who organize firms are also likely to want to produce more when they receive a higher price.

Supply curve and the supply schedule

The term supply refers to the entire relationship between the quantity supplied and the price of a good. Supply is illustrated by the supply curve and the supply schedule.

Figure 3.2 is a **supply curve**, a graph of the relationship between the quantity supplied of a good and its price, when all other influences on producers planned sales remain the same. This figure shows the supply curve of CD-Rs.

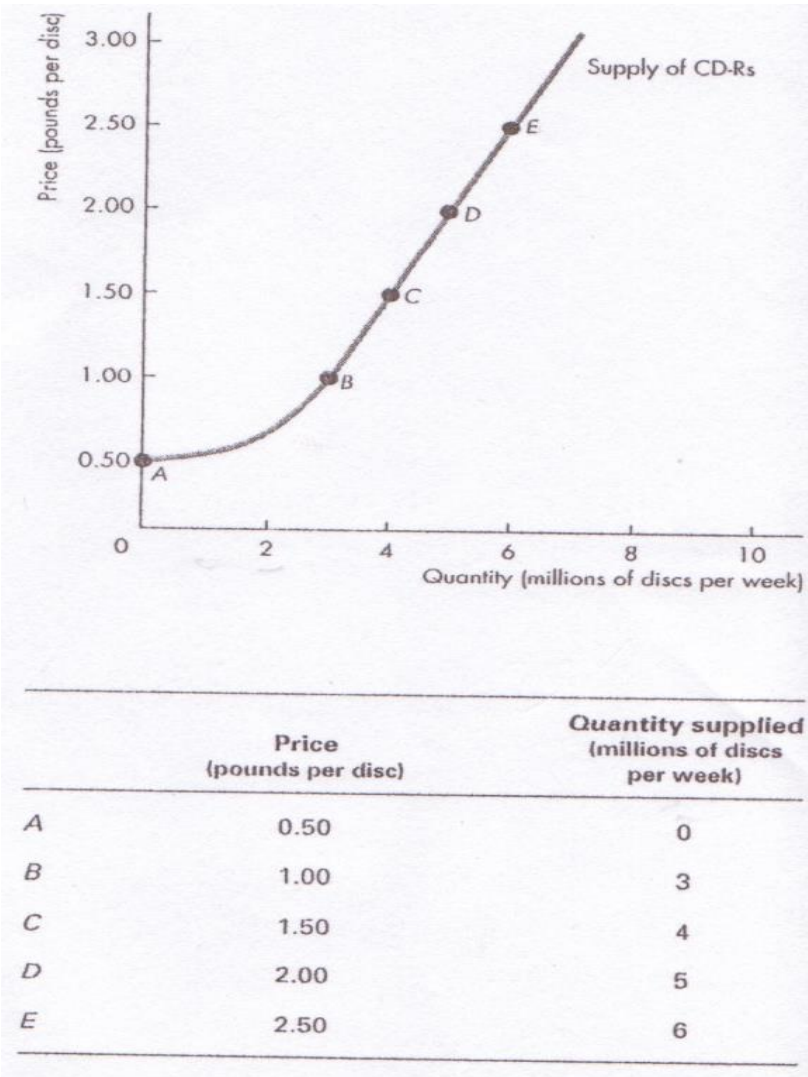
Table 3.2 is a **supply schedule**, a table that lists the quantities supplied at each price when all the other influences on producers planned sales remain the same

Table 3.2: The supply schedule

	Price (euros per disc)	Quantity supplied (millions of discs per week)
A	0.50	0
B	1.00	3
C	1.50	4
D	2.00	5
E	2.50	6

For example, if the price of a CD-R is 50 eurocent, the quantity supplied is 0 - in row A of the table. If the price of a disc is €1.00, the quantity supplied is 3 million discs a week – in row B. The other rows of the table show the quantity supplied at prices of €1.50, €2.00 and €2.50.

Figure 3.2: The supply curve



To make a supply curve, we graph the quantity supplied on the x-axis and the price on the y-axis, just as in the case of the demand curve. The points on the supply curve labelled A through E correspond to the rows of the supply schedule. For example, point A on the graph shows a quantity supplied of 0 at a price of 50 eurocent a disc.

A change in supply

When any factor that influences selling plans other than the price of the good changes, there is a change in the supply. When supply increases, the supply curve shifts to the right and the quantity supplied at every price rises. Similarly, when supply decreases, the supply curve shifts to the left and the quantity supplied at every price is lower.

Main factors that bring changes in supply are changes in:

- 1) **Prices of factors of production (Input prices).** If those prices increase, supply is likely to fall because producing the good is less profitable, and some suppliers can no longer make a profit, so they are likely to go out of business. Thus, the supply of a good is negatively related to the price of the inputs used to make the good.
- 2) **Prices of related goods produced.** A supplier may switch from producing good 1 to producing good 2 if the price of good 2 increases; hence the supply of good 1 depends on the price of good 2. This switching is most likely to occur when a firm can produce different goods with similar factors. For example, farmers switch from growing wheat to growing barley if the price of barley increases but the price of wheat does not.
- 3) **Expected future prices.** If the price of a good is expected to rise, the return from selling the good in the future is higher than is it today. So supply decreases today and increases in the future.
- 4) **The number of suppliers.** The larger the number of firms that produce a good, the greater is the supply of the good. And as firms enter an industry, the supply in that industry increases. As firms leave an industry, the supply in that industry decreases.
- 5) **Technology.** The term “technology” is used broadly to mean the way that factors of production are used to produce a good. Technology changes both positively and negatively. A positive technology change occurs when a new method is discovered that lowers the cost of producing a good. A negative technology changes occurs when an event such as extreme weather or natural disaster increases the cost of producing a good. A positive technology change increases supply, and a negative technology change decreases supply.

4. Productivity

Each firm is an institution that hires productive resources and organizes these resources to produce and sell goods and services. To understand what decisions a firm makes, it is important to understand the firm's objective. Most firms make statements about their goals in their annual reports and accounts. Some of them talk about making a quality product, others about business growth, market share or job satisfaction for their workforce. All of these goals are pursued, but they are not the fundamental goal. They are means to that goal.

Let's take for example a cookie factory. Helen, the owner of the firm, says that she started her firm because of an altruistic desire to provide the world with cookies or of love for the cookie business. More likely, however, Helen started her business to make money.

Economists normally assume that the goal of a firm is to maximize profit, and they find that this assumption works well in most cases. A firm that does not aim for maximum profit will eventually go out of business or be bought by firms that do aim to maximize profit.

What is a firm's profit? The amount that the firm's receives for the scale of its outputs is called **total revenue**. The amount that the firm pays to buy inputs is called the total cost. We define profit as a firm's total revenue minus its total cost. That is:

$$\text{Profit} = \text{Total revenue} - \text{Total cost}$$

In order to see what is the profit that a firm seeks to maximize and to predict the decisions that a firm makes, we must consider fully how to measure its total revenue and its total cost. Total revenue is the easy part, it equals the quantity of output the firm produces times the price at which it sells its output. If Helen produces 10000 cookies and sells them at €2 a cookie, her total revenue is €20000. By contrast, the measurement of a firm's total cost is more subtle.

The production function

In the production process, firms turn inputs, which are also called factors of production, into outputs (or products). For example, Helen's Cookie Factory uses inputs that include the behavior of its workers; raw materials such as flour and sugar; and the capital invested in ovens, mixers and other equipment to produce such outputs as cookies, cakes and pastries.

We can divide inputs into the broad categories of labor, materials, and capital, each of which might include more narrow subdivisions:

- *Labor* inputs include skilled workers (carpenters, engineers) and unskilled workers (agricultural workers), as well as the entrepreneurial efforts of the firm's managers.
- *Materials* include steel, plastics, electricity, water, and any other goods that the firm buys and transforms into a final product.
- *Capital* includes buildings, equipment, and inventories.

The relationship between the inputs to the production process and the resulting output is described by a production function. **A *production function*** indicates the output Q that a firm produces for every specified combination of inputs.

To understand the concept of a production function, let's consider, for the sake of simplicity, that Helen's factory produces only one output - cookies and uses only two inputs – capital and labor. We assume that the size of Helen's factory is fixed and that own vary the quantity of cookies produced only by changing the number of workers. This assumption is realistic in the short run, but not in the long run.

The short run refers to a period of time in which one or more factors of production cannot be changed. Factors that cannot be varied over this period are called fixed inputs. In our example, capital is what economists call *fixed input*, as Helen cannot build a larger factory overnight. On the other hand, Helen is free to

decide how many workers to hire. The labor provided by these workers is called a *variable input* – an input whose quantity the firm can vary.

The long run is the amount of time needed to make all inputs variable. All fixed inputs in the short represent the outcomes of previous long-run decisions based on firms’ estimates of what they could profitably produce and sell.

But for now, we will restrict our attention to the short run and analyze the production decisions in this time horizon, assuming that at least one input is fixed.

Table 4.1 shows how the quantity of cookies Helen’s factory produces per hour depends on the number of workers. If there are no workers in the factory, Helen produces no cookies. When there is 1 worker, she produces 50 cookies. Where there are 2 workers, she produces 90 cookies, and so on.

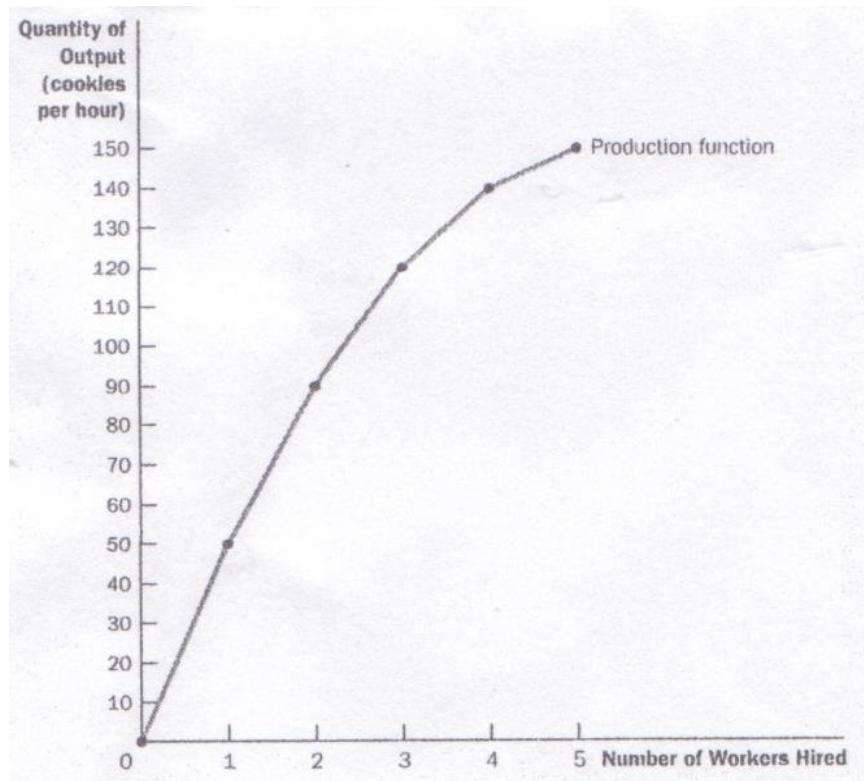
Table 4.1 Production

NUMBER OF WORKERS	OUTPUT (QUANTITY OF COOKIES PRODUCED PER HOUR)	MARGINAL PRODUCT OF LABOR	COST OF FACTORY	COST OF WORKERS	TOTAL COST OF INPUTS (COST OF FACTORY + COST OF WORKERS)
0	0	50	\$30	\$0	\$30
1	50	40	30	10	40
2	90	30	30	20	50
3	120	20	30	30	60
4	140	10	30	40	70
5	150		30	50	80

Figure 4.1 presents a graph of these two columns of numbers. The number of workers is on the horizontal axis and the number of cookies produced is on the vertical axis. This relationship between the quantity of inputs (workers) and

quantity of output (cookies) is the **factory's production function** or the **factory's total product curve**.

Figure 4.1: Production function



The total product curve here is upward sloping, reflecting the fact that more cookies are produced as more workers are employed. Although the total product curve slopes upward along its entire length, the slope isn't constant: as you move up the curve to the right, it flattens out. To take a step toward understanding this changing slope, we must look at the third column in the table which shows the change in the quantity of output that is generated by adding one more worker. In other words, it shows **the marginal product of labor** (that is one more worker).

The marginal product of any input in the production process is the increase in the quantity of output obtained from an additional unit of that input. When the number of workers goes from 1 to 2, cookie production increases from 50 to 90, so the

marginal product of the second worker is 40 cookies. And when the number of workers goes from 2 to 3, cookies production increases from 90 to 120, so the marginal product of the third worker is 30 cookies.

We can use the following equation to figure out the marginal product of labor:

$$\text{Marginal product of labour} = \frac{\text{Change in quantity of output}}{\text{Change in quantity of labor}}$$

$$\text{MPL} = \frac{\Delta Q}{\Delta L}$$

In this example, the marginal product of labor steadily declines as more workers are hired – that is, each successive worker adds less to output than the previous worker. So, as employment increases, the total product curve gets flatter.

The second worker has a marginal product of 40 cookies, the third worker has a marginal product of 30 cookies, and the fourth worker has a marginal product of 20 cookies. The property is called **diminishing marginal product** or **diminishing return to labor**. There are diminishing returns to an input when an increase in the quantity of that input, holding the quantity of all other inputs fixed, reduces that input's marginal product.

At first, when only a few workers are hired, they have easy access to Helen's kitchen equipment. As the number of workers increases, additional workers have to share equipment and work in more crowded conditions. Hence, as more and more workers are hired, each additional worker contributes less to the production of cookies.

The production's functions slope tells us the change in Helen's output of cookies for each additional input of labor. That is the slope of the production function

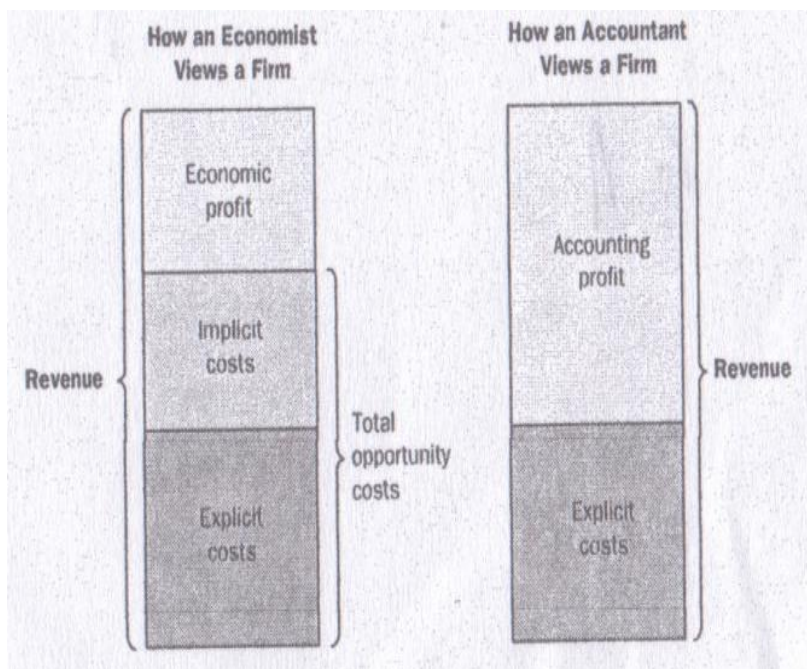
measures the marginal product of worker. As the number of workers increases the marginal product declines and the production function becomes flatter.

5. Profit

Because economists and accountants measure costs differently, they also measure profit differently. An economist measures a firm's **economic profit** as the firm's total revenue minus all the opportunity 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.

Figure 5.1 summarizes the difference. Notice that because the accountant ignores the implicit costs, accounting profit is larger than economic profit. For a business to be profitable from an economist's standpoint, total revenue must cover all the opportunity costs, both explicit and implicit.

Figure 5.1: Economic and accounting profit



The Revenue of a Competitive Firm

A firm in a competitive market, like most other firms in the economy, tries to maximize profit (total revenue minus total cost).

6. Costs

When measuring costs at any firm, it is important to keep in mind the **opportunity cost** of any action – that is the highest value alternative forgone. The action that you choose not to do is the cost of the action that you choose to do. For a firm, the opportunity costs of the production is the value of the firm's best alternative use of its resources, the cost associated with opportunities that are forgone by not putting the firm's resources to their highest value use.

A firm's opportunity costs of production are sometimes obvious and sometimes less so. A firm's opportunity costs are:

- explicit costs
- implicit costs

Explicit costs are costs that are paid in money, input costs that require an outlay of money by the firm. The amount paid for a resource that could have been spent on something else is the opportunity cost of using the resource. When Helen pays €1000 for flour, that €1000 is an opportunity cost, because she can no longer use that €1000 to buy something else, and this cost is explicit.

A firm incurs **implicit costs** when it forgoes an alternative but does not make a payment. Implicit costs are inputs that do not require an outlay of money by the firm and incurs when a firms:

1. Uses its own capital
2. Uses its owner's time or financial resources

The cost of using its own capital is an implicit cost – and an opportunity cost – because the firm could rent the capital to another firm. If a firm buys the capital it

uses, it incurs an implicit cost, if it rents the capital, the cost incurred is an explicit one.

A firm's owner often supplies labor, entrepreneurship or financial resources to the firm. Imagine Helen is skilled with computers and could earn €100 per hour working as a programmer. For every hour that Helen works at her cookie factory, she gives up €100 in income, and this forgone income is an implicit opportunity cost.

Or suppose, for instance, that Helen used €300000 of her savings to buy her cookie factory from the previous owner. If Helen had instead left this money deposited in a savings account that pays an interest of 5 percent, she would have earned €15000 per year. To own her cookie factory, therefore, Helen has given up €15000 a year in interest income. This forgone €15000 is one of the implicit opportunity costs of Helen's business.

This distinction between explicit and implicit costs highlights an important difference between how economists and accountants analyze a business. Economists take a forward looking view of the firm. They are concerned with what cost is expected to be in the future, and with how the firm might be able to manage its resources to lower its cost and improve its profitability. Economists are interested in studying how firms make production and pricing decisions. Because these decisions are based on both implicit and explicit costs, economists include both when measuring a firm's costs. By contrast accountants tend to take a retrospective look at the firm's finances because they have to keep track of assets and liabilities and evaluate past performance. They have the job of keeping track of the money that flows into and out of the firms. As a result, they measure the explicit costs and often ignore the implicit costs.

Although opportunity cost is often hidden, it should be taken into account when making economic decisions. Just the opposite is true of sunk cost - it is usually

visible, but after it has been incurred, it should always be ignored when making future economic decisions.

A **sunk cost** is an expenditure that has been made and cannot be recovered. Because it cannot be recovered, it should not influence the firm's decisions. For example, consider the purchase of specialized equipment designed to order for a plant. We assume the equipment can be used to do only what it was originally designed for and cannot be converted for alternative use. The expenditure on this equipment is a sunk cost. Because it has no alternative use, its opportunity cost is zero. Thus it shouldn't be included as part of the firm's costs. The decision to buy this equipment may have been good or bad. It doesn't matter. It's water under the bridge should not affect the firm's current decisions.

For example, suppose a firm is considering moving its headquarters to a new city. Last year it paid €500.000 for an option to buy a building in the city; the option gives it the right to buy the building at a cost of €5.000.000 so that its total expenditure will be €5.500.000 if it indeed buys the building. Now it finds that a comparable building has become available in the same city at a price of €5.250.000. Which building should it buy? The answer is the original building. The €500.000 option is a cost that has been sunk and that should not affect the firm's current decision. The economic cost of the original property is €5.000.000 to the firm (because the sunk cost of the option is not part of the economic cost), while the newer property has an economic cost of €5,250.000. Of course, if the new building cost €4.750.000, the firm should buy it, and forgo its opinion.

Fix and variable costs

Total cost can be divided into two types. Some costs, called fixed costs, do not vary with the quantity of output produced. They are incurred even if the firm produces nothing at all. Starbucks's fixed costs include any rent it pays because this cost is the same regardless of how much coffee it produces. Similarly, if Starbucks needs

to hire a full-time bookkeeper to pay bills, regardless of the quantity of coffee produced, the bookkeeper's salary is a fixed cost.

Some of the firm's costs, called variable costs, change as the firm alters the quantity of output produced. Starbucks's variable costs include the cost of coffeebeans, milk, sugar, and paper cups: The more cups of coffee Starbucks makes, the more of these items it needs to buy. Similarly, if Starbucks has to hire more workers to make more cups of coffee, the salaries of these workers are variable costs.

A firm's **total cost** is the sum of fixed and variable costs.

7. Salaries

When you finish school, your income will be determined largely by what kind of job you take. If you become a computer programmer, you will earn more than if you become a gas station attendant. This fact is not surprising, but it is not obvious why it is true. No law requires that computer programmers be paid more than gas station attendants. No ethical principle says that programmers are more deserving. What then determines which job will pay you the higher wage?

Your income, of course, is a small piece of a larger economic picture. In 2010, the total income of all U.S. residents was about \$15 trillion. People earned this income in various ways. Workers earned about three-fourths of it in the form of wages and fringe benefits. The rest went to landowners and to the owners of capital—the economy's stock of equipment and structures—in the form of rent, profit, and interest. What determines how much goes to workers? To landowners? To the owners of capital? Why do some workers earn higher wages than others, some landowners higher rental income than others, and some capital owners greater profit than others? Why, in particular, do computer programmers earn more than gas station attendants?

The answers to these questions, like most in economics, hinge on supply and demand. The supply and demand for labor, land, and capital determine the prices paid to workers, landowners, and capital owners. To understand why some people have higher incomes than others, therefore, we need to look more deeply at the markets for the services they provide.

The factors of production are the inputs used to produce goods and services. Labor, land, and capital are the three most important factors of production. When a computer firm produces a new software program, it uses programmers' time (labor), the physical space on which its offices are located (land), and an office building and computer equipment (capital). Similarly, when a gas station sells gas, it uses attendants' time (labor), the physical space (land), and the gas tanks and pumps (capital).

In many ways factor markets resemble the markets for goods and services we analyzed in previously, but they are different in one important way: The demand for a factor of production is a derived demand. That is, a firm's demand for a factor of production is derived from its decision to supply a good in another market. The demand for computer programmers is inseparably linked to the supply of computer software, and the demand for gas station attendants is inseparably linked to the supply of gasoline.

What Causes the Labor-Demand Curve to Shift?

a few of the things that might cause the labor-demand curve to shift:

- *The Output Price* The value of the marginal product is marginal product times the price of the firm's output.

Thus, when the output price changes, the value of the marginal product changes, and the labor-demand curve shifts. An increase in the price of apples, for instance, raises the value of the marginal product of each worker who picks apples and, therefore, increases labor demand from the firms that supply apples. Conversely, a

decrease in the price of apples reduces the value of the marginal product and decreases labor demand.

- *Technological Change* Between 1960 and 2009, the output a typical U.S. worker produced in an hour rose by 183 percent.

Why? The most important reason is technological progress: Scientists and engineers are constantly figuring out new and better ways of doing things. This has profound implications for the labor market. Technological advance typically raises the marginal product of labor, which in turn increases the demand for labor and shifts the labor-demand curve to the right.

It is also possible for technological change to reduce labor demand. The invention of a cheap industrial robot, for instance, could conceivably reduce the marginal product of labor, shifting the labor-demand curve to the left. Economists call this labor-saving technological change. History suggests, however, that most technological progress is instead labor-augmenting. Such technological advance explains persistently rising employment in the face of rising wages: Even though wages (adjusted for inflation) increased by 150 percent during the last half century, firms nonetheless increased the amount of labor they employed by 87 percent.

- *The Supply of Other Factors* The quantity available of one factor of production

can affect the marginal product of other factors. A fall in the supply of ladders, for instance, will reduce the marginal product of apple pickers and thus the demand for apple pickers. We consider this linkage among the factors of production more fully later in the chapter.

The Supply of Labor

The Trade-off between Work and Leisure

One of the Ten Principles of Economics is that people face trade-offs. Probably no trade-off is more obvious or more important in a person's life than the trade-off between work and leisure. The more hours you spend working, the fewer hours you have to watch TV, enjoy dinner with friends, or pursue your favorite hobby.

The trade-off between labor and leisure lies behind the labor-supply curve. Another of the Ten Principles of Economics is that the cost of something is what you give up to get it. What do you give up to get an hour of leisure? You give up an hour of work, which in turn means an hour of wages. Thus, if your wage is \$15 per hour, the opportunity cost of an hour of leisure is \$15. And when you get a raise to \$20 per hour, the opportunity cost of enjoying leisure goes up.

The labor-supply curve reflects how workers' decisions about the labor-leisure trade-off respond to a change in that opportunity cost. An upward-sloping labor supply curve means that an increase in the wage induces workers to increase the quantity of labor they supply. Because time is limited, more hours of work mean that workers are enjoying less leisure. That is, workers respond to the increase in the opportunity cost of leisure by taking less of it.

It is worth noting that the labor-supply curve need not be upward sloping. Imagine you got that raise from \$15 to \$20 per hour. The opportunity cost of leisure is now greater, but you are also richer than you were before. You might decide that with your extra wealth you can now afford to enjoy more leisure. That

is, at the higher wage, you might choose to work fewer hours. If so, your labor supply curve would slope backward.

What Causes the Labor-Supply Curve to Shift?

The labor-supply curve shifts whenever people change the amount they want to work at a given wage. Let's now consider some of the events that might cause such a shift.

- *Changes in Tastes*

In 1950, 34 percent of women were employed at paid jobs or looking for work. In 2009, the number had risen to 59 percent. There are many explanations for this development, but one of them is changing tastes, or attitudes toward work. A generation or two ago, it was the norm for women to stay at home and raise children. Today, family sizes are smaller, and more mothers choose to work. The result is an increase in the supply of labor.

- *Changes in Alternative Opportunities*

The supply of labor in any one labor market depends on the opportunities available in other labor markets. If the wage earned by pear pickers suddenly rises, some apple pickers may choose to switch occupations, and the supply of labor in the market for apple pickers falls.

- *Immigration Movement* of workers from region to region, or country to country, is another important source of shifts in labor supply.

When immigrants come to the United States, for instance, the supply of labor in the United States increases, and the supply of labor in the immigrants' home countries falls. In fact, much of the policy debate about immigration centers on its effect on labor supply and, thereby, equilibrium wages in the labor market.

MACROECONOMICS

8. Macroeconomic index

Composition of GDP

- **Consumption (C)** refers to the goods and services purchased by consumers.
- **Investment (I)**, sometimes called **fixed investment**, is the purchase of capital goods. It is the sum of **nonresidential investment** and **residential investment**.
- **Government Spending (G)** refers to the purchases of goods and services by the federal, state, and local governments. It does not include **government transfers**, nor interest payments on the government debt.
- **Imports (IM)** are the purchases of foreign goods and services by consumers, business firms, and the U.S. government.
- **Exports (X)** are the purchases of U.S. goods and services by foreigners.

Net exports ($X - IM$) is the difference between exports and imports, also called the **trade balance**.

- Imports = Exports => trade balance
- Imports < Exports => trade surplus
- Imports > Exports => trade deficit

Inventory investment is the difference between production and sales.

The total demand for goods is written as:

$$\mathbf{Z = C + I + G + X - IM}$$

Tabel 8.1 Composition of US GDP in 2003

	Billions of dollars	Percent of GDP
GDP (Y)	11,004	100
1. Consumption (C)	7,760	70.5
2. Investment (I)	1,667	15
Nonresidential	1,094	10
Residential	572	5
3. Government spending (G)	2,075	19
4. Net exports	-498	-5
Exports (X)	1,046	9.5
Imports (IM)	-1,544	-14
5. Inventory investment	-1	0

Composition of US GDP, 2003

Investment (I) Variables that depend on other variables within the model are called **endogenous**. Variables that are not explain within the model are called **exogenous**. Investment here is taken as given, or treated as an exogenous variable:

Government spending, G , together with taxes, T , describes **fiscal policy**—the choice of taxes and spending by the government.

We shall assume that G and T are also exogenous for two reasons:

- Governments do not behave with the same regularity as consumers or firms.
- Macroeconomists must think about the implications of alternative spending and tax decisions of the government.

Equilibrium in the goods market requires that production, Y , be equal to the demand for goods, Z :

$$Y = Z$$

The **equilibrium condition** is that, production, Y , be equal to demand. Demand, Z , in turn depends on income, Y , which itself is equal to production.

To summarize:

An increase in demand leads to an increase in production and a corresponding increase in income. The end result is an increase in output that is larger than the initial shift in demand, by a factor equal to the multiplier.

To estimate the value of the multiplier, and more generally, to estimate behavioral equations and their parameters, economists use **econometrics**—a set of statistical methods used in economics.

A **forecast error** is the difference between the actual value of GDP and the value that had been forecast by economists one quarter earlier.

The **consumer confidence index** is computed from a monthly survey of about 5,000 households who are asked how confident they are about both current and future economic conditions.

Saving is the sum of private plus public saving.

- **Private saving** (S), is saving by consumers.
- **Public saving** equals taxes minus government spending.
 - If $T > G$, the government is running a **budget surplus**—public saving is positive.
 - If $T < G$, the government is running a **budget deficit**—public saving is negative.

$$\mathbf{I = S + (T - G)}$$

The equation above states that equilibrium in the goods market requires that investment equals saving—the sum of private plus public saving.

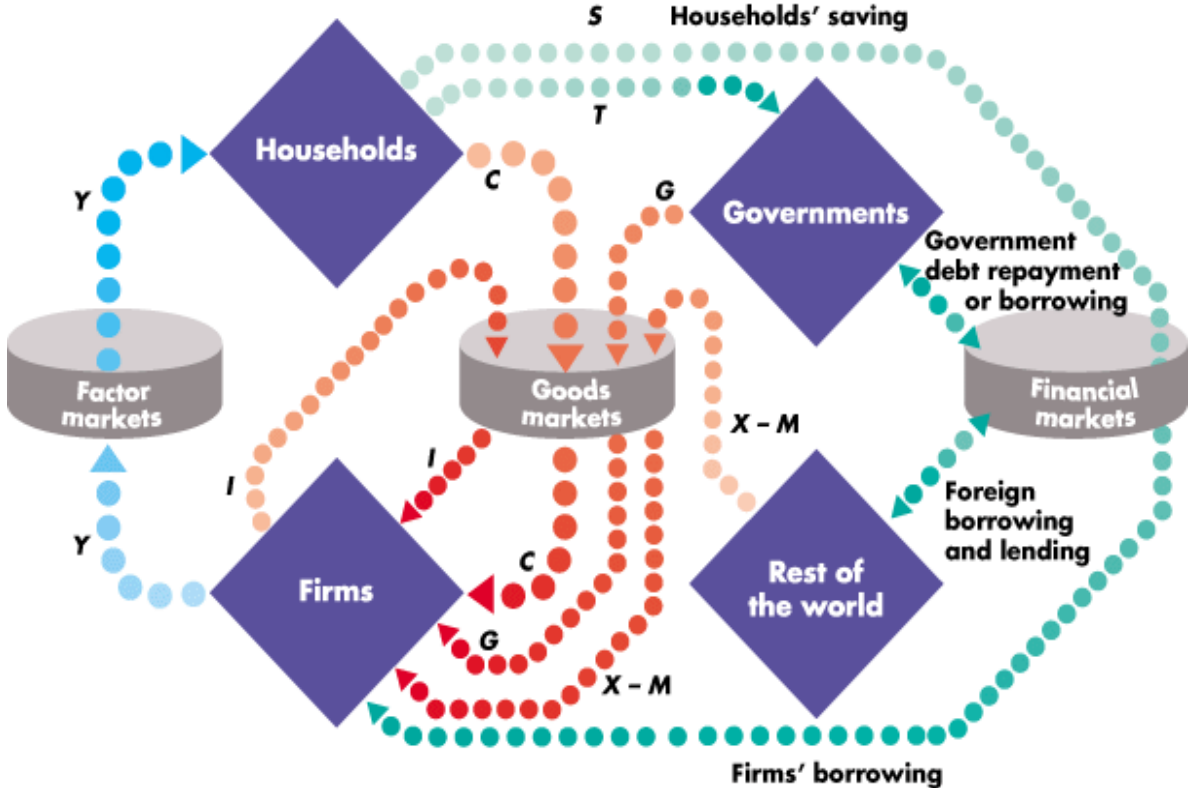
This equilibrium condition for the goods market is called the **IS relation**. What firms want to invest must be equal to what people and the government want to save.

9. The Market Systems

There are three markets that we typically focus on in macroeconomics:

- The Factor Market
- The Financial Market
- The Goods Market

Figure 9.1. The map of the economy



Financial markets

- Channel funds from savers to investors, thereby promoting economic efficiency
- Affect personal wealth and behavior of business firms

Together, money markets and capital markets comprise a large portion of the financial market and are often used together to manage liquidity and risks for companies, governments and individuals.

Debt Instrument: Contractual agreement by borrower to pay holder of the instrument a fixed dollar amount at regular intervals (principal + interest), until a specified date (example : car loan.

Types of securities traded in financial markets

- **Money Market Instruments**

- Because of short term to maturity, debt instruments traded in the money market do not have much fluctuation in their prices, and hence are the least risky
- Types of instruments:

- 1) US Treasury Bills

- Issued by US govt, with 1, 3, and 6 month maturities.
- Pay a set amount at maturity, and have no interest payments; effectively pay interest by selling at a discount.

- 2) Negotiable Bank Certificates of Deposit

- a. CD's are debt instruments sold by banks to depositors that pays an annual interest of a given amount, and pays back the original purchase price at maturity

- 3) Commercial Paper

- a. Short term debt instrument issued by large banks and well known corporations (e.g. Microsoft, GM).

4) Repurchase Agreements

- a. Repos are effectively short term loans (usually with a maturity of less than 2 weeks) for which T-bills serve as collateral. The most important lenders in this market are usually large corporations.

5) Federal (Fed) Funds

- a. These are typically overnight loans of reserves between banks, of their deposits at the Federal Reserve.

- **Capital Market Instruments**

- b. Debt and equity instruments with maturities greater than a year; these have much greater fluctuations in their prices (compared to money market instruments) and as such are considered more risky

Types of instruments

1) Stocks

- a. These are equity claims on net income and assets of a corporation.
- b. Issue of new stocks in any given year is typically quite small, although the total value of stocks exceed that of any other type of security in the capital markets.

2) Mortgages

- a. Mortgage market is the largest debt market in the US
- b. Residential mortgages are approximately 4 times the amount of commercial and farm combined.

3) Corporate Bonds

- a. Long term bonds issued by corporations with very strong credit ratings.
 - b. Typical corporate bond sends the holder an interest payment twice a year and pays off the face value when the bond matures.
 - c. Some “convertible” corporate bonds allows the holder to convert them into a specified number of shares of stock at any time up to the maturity date.
- 4) US Government Securities
- a. These are long term debt instruments issued by the US Treasury to finance the deficits of the government.
- 5) US Government Agency Securities
- a. Issued by various agencies such as Ginnie Mae, the Federal Farm Credit Bank, etc, to finance such items as mortgages, farm loans or power generating equipment.
 - b. Many of the securities are guaranteed by the federal government.
- 6) State and Local bonds
- a. Also called municipal bonds, which are long term debt instruments issued by the state and local governments to finance expenditures on roads, schools, and other programs.
 - b. Interest payments from these bonds are exempt from federal income tax and generally from the state taxes issuing the bond.
- 7) Consumer and Bank loans

9.1. Money market

Money markets are used by government and corporate entities as a means for borrowing and lending in the short term, usually for assets being held for up to a year.

The money market is often accessed alongside the capital markets. While investors are willing to take on more risk and have patience to invest in capital markets, money markets are a good place to "park" funds that are needed in a shorter time period – usually one year or less. Institutions operating in money markets are central banks, commercial banks and acceptance houses, among others.

Money: Anything that is generally accepted in payment for goods and services

- In the United States:
 - ❑ $M1 = \text{Currency} + \text{Traveler's Checks} + \text{Demand Deposits} + \text{Other Checkable Deposits}$
 - ❑ $M2 = M1 + \text{Small denomination time deposits \& repurchase agreements} + \text{Savings Deposits and money market deposit accounts} + \text{retail Money Market mutual fund shares}$
 - ❑ There also used to be a broader measure of money, M3 which was discontinued as of March 2006.

Role of money

- Medium of exchange: Form of transaction technology
- Unit of account: The common unit by which everyone measures prices and values.
- Store of value

Hence money helps to:

- Lower transaction costs
- Increase **Liquidity** in an economy

The **money supply** is the quantity of money available in the economy.

Monetary policy is the control over the money supply. Monetary policy is conducted by a country's **central bank**.

The **quantity theory of money** implies:

one-for-one relation between changes in the money growth rate and changes in the inflation rate.

1. countries with higher money growth rates should have higher inflation rates.

2. the long-run trend behavior of a country's inflation should be similar to the long-run trend in the country's money growth rate. inflation rate.

The proportions of money and bonds you wish to hold depend mainly on two variables:

- *Your level of transactions*
- *The interest rate on bonds*

Money market funds pool together the funds of many people and use these funds to buy bonds – typically, government bonds.

Your **financial wealth**, or simply **wealth**, is the value of all your financial assets minus all your financial liabilities. Wealth is a **stock** variable—measured at a given point in time.

Investment is a term economists reserve for the purchase of new capital goods, such as machines, plants, or office buildings. The purchase of shares of stock or other financial assets is **financial investment**.

The demand for money: $M_d = \$YL(i)$

- increases in proportion to nominal income ($\$Y$), and

- depends negatively on the interest rate ($L(i)$ and the negative sign underneath).

Equilibrium in financial markets requires that money supply be equal to money demand, or that $M^s = M^d$. Then using this equation, the equilibrium condition is:

$$\text{Money Supply} = \text{Money demand}$$

This equilibrium relation is called the **LM relation**.

Open-market operations, which take place in the “open market” for bonds, are the standard method central banks use to change the money stock in modern economies.

If the central bank buys bonds, this operation is called an **expansionary open market operation** because the central bank increases (*expands*) the supply of money.

If the central bank sells bonds, this operation is called a **contractionary open market operation** because the central bank decreases (*contracts*) the supply of money.

Financial intermediaries are institutions that receive funds from people and firms, and use these funds to buy bonds or stocks, or to make loans to other people and firms.

- Banks receive funds from people and firms who either deposit funds directly or have funds sent to their checking accounts. The liabilities to the banks are equal to the value of these *checkable deposits*.
- Banks keep as **reserves** some of the funds they receive.

Banks hold reserves for three reasons:

1. On any given day, some depositors withdraw cash from their checking accounts, while others deposit cash into their accounts.

2. In the same way, on any given day, people with accounts at the bank write checks to people with accounts at other banks, and people with accounts at other banks write checks to people with accounts at the bank.
3. Banks are subject to reserve requirements. The actual **reserve ratio** – the ratio of bank reserves to bank checkable deposits – is about 10% in the United States today.
 1. Loans represent roughly 70% of banks' nonreserve assets. Bonds account for the rest (30%).

The assets of the central bank are the bonds it holds. The liabilities of the central bank are the money it has issued, **central bank money**. The new feature is that not all central bank money is held as currency by the public. Some of it is held as reserves by banks.

Let's think in terms of the supply and the demand for *central bank money*.

- The demand for central bank money is equal to the demand for currency by people plus the demand for reserves by banks.
- The supply of central bank money is under the direct control of the central bank.
- The equilibrium interest rate is such that the demand and the supply for central bank money are equal.

Rumors that a bank is not doing well and some loans will not be repaid, will lead people to close their accounts at that bank. If enough people do so, the bank will run out of reserves—a **bank run**. To avoid bank runs, the U.S. government provides **federal deposit insurance**.

An alternative solution is **narrow banking**, which would restrict banks to holding liquid, safe, government bonds, such as T-bills.

9.2. Capital market

"Capital Markets" refers to activities that gather funds from some entities and make them available to other entities needing funds. The core function of such a market is to improve the efficiency of transactions so that each individual entity doesn't need to do search and analysis, create legal agreements, and complete funds transfer.

Capital markets consist of suppliers and users of funds.

- Suppliers of funds include households and institutions serving them, such as pension funds; life insurance companies; charitable foundations such as colleges, hospitals, and religious institutions; and nonfinancial companies generating cash beyond their needs for investment.
- Users of funds include home and motor vehicle purchasers; nonfinancial companies; and governments financing infrastructure investment and operating expenses.

Markets include:

- primary markets, where new equity stock and bond issues are sold to investors, and
- secondary markets, which trade existing securities.

capital markets are more frequently used for long-term assets, which are those with maturities of greater than one year. Capital markets include the equity (stock) market and debt (bond) market.

Capital markets are perhaps the most widely followed markets. Both the stock and bond markets are closely followed, and their daily movements are analyzed as proxies for the general economic condition of the world markets. As a result, the institutions operating in capital markets – stock exchanges, commercial banks and all types of corporations, including non-bank institutions such as insurance companies and mortgage banks – are carefully scrutinized.

The institutions operating in the capital markets access them to raise capital for long-term purposes, such as for a merger or acquisition, to expand a line of business or enter into a new business, or for other capital projects. Entities that are raising money for these long-term purposes come to one or more capital markets. In the bond market, companies may issue debt in the form of corporate bonds, while both local and federal governments may issue debt in the form of government bonds.

Similarly, companies may decide to raise money by issuing equity on the stock market. Government entities are typically not publicly held and, therefore, do not usually issue equity. Companies and government entities that issue equity or debt are considered the sellers in these markets.

The buyers (or the investors) buy the stocks or bonds of the sellers and trade them. If the seller (or issuer) is placing the securities on the market for the first time, then the market is known as the primary market.

Conversely, if the securities have already been issued and are now being traded among buyers, this is done on the secondary market. Sellers make money off the sale in the primary market, not in the secondary market, although they do have a stake in the outcome (pricing) of their securities in the secondary market.

The buyers of securities in the capital market tend to use funds that are targeted for longer-term investment. Capital markets are risky markets but offer higher returns and are not usually used to invest short-term funds. The magnitude of capital market returns often has a direct correlation to the level of risk, but that's not always the case. Many investors access the capital markets to save for retirement or education, as long as the investors have lengthy time horizons.

Although markets are deemed efficient in the long run, short-term inefficiencies allow investors to capitalize on anomalies and reap higher rewards that may be out of proportion to the level of risk. Those anomalies are exactly what investors in capital markets try to uncover.

9.3. Labor market

The **noninstitutional civilian population** are the number of people potentially available for civilian employment.

The civilian **labor force** is the sum of those either working or looking for work.

Those who are neither working nor looking for work are **out of the labor force**.

The **participation rate** is the ratio of the labor force to the noninstitutional civilian population.

The **unemployment rate** is the ratio of the unemployed to the labor force.

An unemployment rate may reflect two very different realities:

- An active labor market, with many **separations** and many **hires**, or
- A sclerotic, with few separations, few hires, and a stagnant unemployment pool.

The **Current Population Survey (CPS)** produces employment data, including the movements of workers.

The flows of workers in and out of employment are large. Separations consist of: **Quits**, or workers leaving their jobs for a better alternative, and **Layoffs**, which come from changes in employment levels across firms.

The flows in and out of unemployment are large in relation to the number of unemployed.

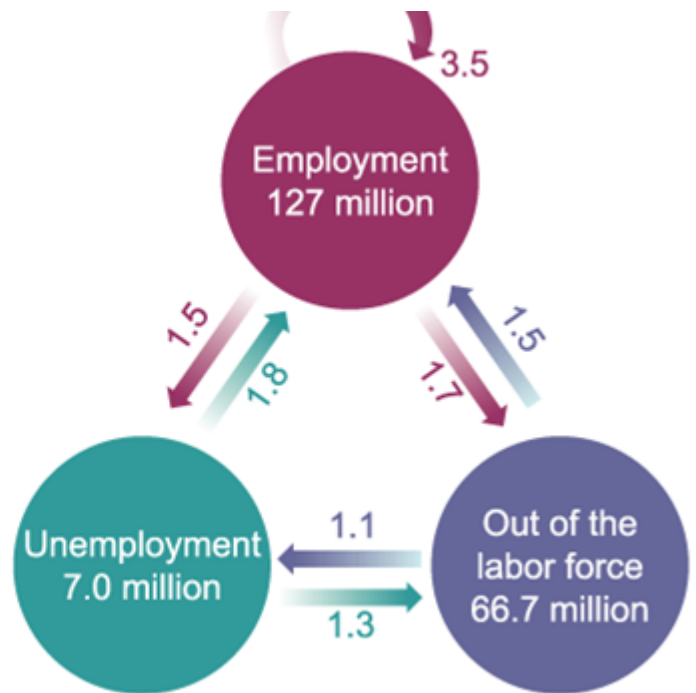
There are large flows in and out of the labor force, much of them directly to and from employment. **Discouraged workers** are classified as “out of the labor force,” but they may take a job if they find it. The **nonemployment rate** is the ratio of population minus employment to population.

The average **duration of unemployment** is about three months.

Figure 9.2 Employment , unemployment and nonparticipation in US

Average Monthly Flows Between Employment, Unemployment, and Nonparticipation in the United States, 1994-1999

- (1) The flows of workers in and out of employment are large
- (2) The flows in and out of unemployment are large in relation to the number of unemployed
- (3) There are also large flows in and out of the labor force, much of them directly to and from employment



Higher unemployment is associated with

- The chance that an unemployed worker will find a job diminishes.
- Employed workers are at a higher risk of losing their jobs

Wage determination

Collective bargaining is bargaining between firms and unions.

Common forces at work in the determination of wages include:

- A tendency for the wage to exceed the **reservation wage**, or the wage that make them indifferent between working or becoming unemployed.
- Dependency of wages on labor market conditions.

How much **bargaining power** a worker has depends on two factors:

- How costly it would be for the firm to replace him—the nature of the job.
- How hard it would be for him to find another job—labor market conditions.

Efficiency wage theories are theories that link the productivity or the efficiency of workers to the wage they are paid.

These theories also suggest that wages depend on both the nature of the job and on labor-market conditions:

- Firms that see employee morale and commitment as essential to the quality of their work, will pay more than firms in sectors where workers' activities are more routine.
- Labor market conditions will affect the wage.

Both workers and firms care about *real wages* (W/P), not nominal wages (W):

- Workers do not care about how many dollars they receive but about how many goods they can buy with those dollars. They care about W/P .
- Firms do not care about the nominal wages they pay but about the nominal wages (W) they pay relative to the price of the goods they sell (P). They also care about W/P .

Also affecting the aggregate wage is the unemployment rate u . If we think of wages as being determined by bargaining, then higher unemployment weakens workers bargaining power, forcing them to accept lower wages. Higher unemployment also allows firms to pay lower wages and still keep workers willing to work.

10. Unemployment

The Phillips curve shows a negative relation between inflation and unemployment.

The **wage-price spiral**:

- Low unemployment leads to a higher wage.
- In response to the higher wage, firms increase their prices.
- In response, workers ask for a higher wage.
- Higher wage leads firms to further increase prices.
- This further increases wages asked for by workers.
- The race continues over wages and price inflation.

The negative relation between unemployment and inflation held throughout the 1960s, but it vanished after that, for two reasons:

- An increase in the price of oil, but more importantly,
- Change in the way wage setters formed expectations due to a change in the behavior of the rate of inflation.
 - The inflation rate became consistently positive, and
 - Inflation became more persistent.

What happened in the 1970's:

- As long as inflation was low and not very persistent, it was reasonable for workers and firms to ignore past inflation and to assume that the price level this year would be roughly the same as the price level last year.
- But, as inflation became more persistent, workers and firms started changing the ways they formed expectations.

Since 1970, a clear negative relation emerged between the unemployment rate and the change in the inflation rate.

Friedman and Phelps questioned the trade-off between unemployment and inflation. They argued that the unemployment rate could not be sustained below a certain level, a level they called the “*natural rate of unemployment.*”

The natural rate of unemployment is the unemployment rate such that the actual inflation rate is equal to the expected inflation rate.

The factors that affect the natural rate of unemployment above differ across countries. Therefore, there is no reason to expect all countries to have the same natural rate of unemployment.

The relation between unemployment and inflation is likely to change with the level and the persistence of inflation.

When inflation is high, it is also more variable.

The form of wage agreements also changes with the level of inflation. **Wage indexation**, a rule that automatically increases wages in line with inflation, becomes more prevalent when inflation is high.

Given the very high rate of unemployment during the Great Depression, we would have expected a large rate of deflation, but deflation was limited and inflation was actually positive.

The reason for this may be that the Phillips curve relation may disappear or at least become weaker when the economy is close to zero inflation.

the U.S. Natural Rate of Unemployment Fallen Since the Early 1990s, Part of the decrease in the natural rate seems attributable to other factors. Among them are the following:

- *The aging of the U.S. population*
- *The increase in the prison population.*
- *The increase in the number of workers on disability*
- *The increase in temporary help employment.*

- *The unexpectedly high rate of productivity growth since the end of the 1990s.*

11. Inflation

The actual relation between output growth and the change in the unemployment rate is known as **Okun's law**.

According to Okun's Law, the change in the unemployment rate should be equal to the negative of the growth rate of output.

For example, if output growth is 4%, then the unemployment rate should decline by 4%.

High output growth is associated with a reduction in the unemployment rate; low output growth is associated with an increase in the unemployment rate.

To maintain the unemployment rate constant, output growth must be 3% per year. This growth rate of output is called the **normal growth rate**.

output growth 1% above normal leads only to a 0.4% reduction in unemployment, for two reasons:

1. **Labor hoarding:** firms prefer to keep workers rather than lay them off when output decreases.
2. When employment increases, not all new jobs are filled by the unemployed. A 0.6% increase in the employment rate leads to only a 0.4% decrease in the unemployment rate.

In the short run, monetary tightening leads to a slowdown in growth and a temporary increase in unemployment. In the medium run, output growth returns to normal, and the unemployment rate returns to the natural rate.

Tabel 11.1 The effects of monetary tightening

		Year0	Year 1	Year 2	Year 3
1	Real money growth % ($g_m - \pi$)	3.0	0.5	5.5	3.0
2	Output growth % (g_y)	3.0	0.5	5.5	3.0
3	Unemployment rate % (u)	6.0	7.0	6.0	6.0
4	Inflation rate % (π)	5.0	4.0	4.0	4.0
5	(Nominal money growth) % (g_m)	8.0	4.5	9.5	7.0

The **Lucas critique** states that it is unrealistic to assume that wage setters would not consider changes in policy when forming their expectations.

If wage setters could be convinced that inflation was indeed going to be lower than in the past, they would decrease their expectations of inflation, which would in turn reduce actual inflation, without the need for a change in the unemployment rate.

Disinflation is commonly used by the Federal Reserve to describe a period of slowing inflation. Unlike inflation and deflation, which refer to the direction of prices, disinflation refers to the rate of change in the rate of inflation. Although sometimes confused with deflation, disinflation is not considered as problematic because prices do not actually drop, and disinflation does not usually signal the onset of a slowing economy. Deflation is represented as a negative growth rate, such as -1%, while disinflation is shown as a change in the inflation rate from 3% one year to 2% the next.

Thomas Sargent, who worked with Robert Lucas, argued that any in order to achieve disinflation, any increase in unemployment would have to be only small.

The essential ingredient of successful disinflation, he argued, was **credibility** of monetary policy—the belief by wage setters that the central bank was truly committed to reducing inflation. The central bank should aim for fast disinflation.

A contrary view was taken by Stanley Fischer and John Taylor. They emphasized the presence of **nominal rigidities**, or the fact that many wages and prices are not readjusted when there is a change in policy.

If wages are set before the change in policy, inflation would already be built into existing wage agreements.

While Fischer argued that even with credibility, too rapid a decrease in nominal money growth would lead to higher unemployment, Taylor's argument went one step further.

He argued that wage contracts are not all signed at the same time, but that they are staggered over time.

He showed that this **staggering of wage decisions** imposed strong limits on how fast disinflation could proceed without triggering higher unemployment.

In 1993, Laurence Ball, from Johns Hopkins University estimated sacrifice ratios for 65 disinflation episodes in 19 OECD countries over the last 30 years. He reached three main conclusions:

- Disinflations typically lead to a period of higher unemployment.
- Faster disinflations are associated with smaller sacrifice ratios.
- Sacrifice ratios are smaller in countries that have shorter wage contracts.