

Module 1

Introduction to the Economic Environment and Understanding the Market Mechanism

Introduction

Economics is the study of how individuals and societies choose to use scarce resources for which it is a behavioural science of how people make choices.

In this module, you will learn that the fundamental problem of economic questions stem from scarcity. You will explore the distinction between macroeconomics and microeconomics and use PEST analysis to make economic choices in business. You will also explore the difference between normative and positive economy.

Then we will review command, *laissez-faire* and market economic systems. We will explain the role of price as a rationing device to allocate scarce resources and how you could apply the demand and supply models in economics. We will also explain the effect of taxes, price ceilings, price floors and conditions that determine the pattern of international trade.

Lastly, you will also explore consumers' responses to price changes i.e., the concept of elasticity, determinants of price elasticity and the calculation of income, cross-price and advertising elasticity of demand.

Upon completion of this module you will be able to:



Outcomes

- *discuss* the efficiency of free market competition.
- *explain* the conditions that determine the pattern of international trade.
- *describe* alternative rationing mechanisms.
- *summarise* the concept of elasticity.
- *distinguish* between the different types of elasticity.
- *calculate* elasticity.
- *predict* the relationship between elasticity and total revenue.
- *describe* the impacts of the determinants of price elasticity.
- *distinguish* between and *calculate* income and cross-price elasticity of demand.

Terminology



Terminology

Cross-price elasticity of demand:	The percentage of change in the quantity demanded to changes in the price of a particular good, Good <i>A</i> , relative to changes in the price of substitute or complementary products, Good <i>B</i> .
Demand:	The quantity of a good or service that a household or a firm chooses to buy at a given price.
Economics:	The study of how individuals and societies choose to use scarce resources.
Income elasticity of demand:	The percentage of change in the quantity demanded with the percentage of change in income.
Law of demand:	The law of demand states that there is a negative relationship between the price and the quantity demanded of a product. When the price of an item increases, we buy less.
Law of supply:	Relationship between the price of the product and the quantity supplied. As per law of demand the price of the product and the quantity supplied are related <i>positively</i> with other things being equal. In other words, the higher the product's own price, the more its producers will supply; and the lower the price, the less its producers will supply.
Marginal analysis:	Marginal analysis refers to the benefit from a one-unit change in an Question (defined as marginal benefit) to the cost of making a one-unit change in an Question (defined as marginal cost).
Opportunity costs:	The alternatives that one forgoes to obtain the best.

Introduction to the Economic Environment

Introduction

Economics is the study of how individuals and societies choose to use scarce resources that nature and previous generations have provided. Economics is a behavioural science that concerns the study of how people make choices.

There are four main reasons to study economics: to learn a way of thinking, to understand the society, to understand global affairs and to be an informed citizen (voter). Probably the most important reason for studying economics is to learn a particular way of thinking. Some basic questions on economics are:

1. What is produced and in what quantities?
2. How are these goods and services produced?
3. For whom are they produced?
4. Who takes economic decisions and by what process?

In the process of studying economics, you will be aware of the fundamental problem from which economic questions stem: that human beings have limited resources but unlimited wants. When wants exceed the resources available to satisfy them, there is *scarcity*. Scarcity is prevalent. People want good health and long life, material comfort, security, physical and mental recreation, and knowledge. None of these wants is completely satisfied and everyone has some wants that remain unsatisfied. However, it is safe to say that no one feels entirely satisfied with his/her state of health and expected length of life. Furthermore, no one has enough time for sports, travel, vacation, movies, theatre, reading and other leisure pursuits.



Study skills

Economics is the study of how—

- A. Scarce resources are used to satisfy unlimited wants.
- B. We choose to use unlimited resources.
- C. Limitless resources are used to satisfy scarce wants.
- D. Society has no choice.

Solution:

- A. Economics is about choice—how we allocate limited resources to unlimited wants.

Costs

Faced with scarcity, people must make choices. When we cannot have everything we want, we choose among the alternatives available. The concepts of scarcity and choice provide a definition of economics as the study of how people make choices to cope with scarcity. Because scarcity forces people to make choices, economics is sometimes called the *science of choice* – the science that explains the choices that people make and predicts how choices change as circumstances change.

Choosing more of one thing means having less of something else. In other words, in making choices, we face costs. Economists use the term *opportunity cost* to emphasise that making choices in the face of scarcity implies a cost. Perhaps it might be playing a round of golf or studying for an economics examination. The opportunity cost of the trip to the zoo is



the value you attach to the one question that you would otherwise have chosen.



Study skills

Your opportunity cost of attending university includes—

- A. The money you spend on meals while at university.
- B. Your tuition and the money you spend on traveling between home and university.
- C. The income you could have earned if you had been employed full time.
- D. Both B and C.

Solution:

- D. You will buy food whether or not you attend university. All other expenses occur solely because of attending university.

The economic way of thinking

Five core economic ideas indicate the economic way of thinking on the choices that must be decided:

1. Rational choices.
2. Opportunity cost.
3. Benefit is what is gained when you get something and is measured by what is willing to be given up to get it.
4. A rational choice is made on the margin.
5. Choices respond to incentives.

Rational choices

- People make rational choices by comparing between costs and benefits.
- If a person uses the available resources or information effectively in making his/her choice, then he/she has made a rational choice. The rational choice is made by comparing the marginal costs and marginal benefits, that is, it is responses to incentives.

Opportunity cost

- The **opportunity cost** of something is the best thing you must give up to get it.
- Choices have opportunity costs; for instance, the opportunity cost of travelling forgone from going to university to attend lectures because a student is not able to do these different things at the same time. There is a trade-off to the student for choosing one of these activities as time is a limited resource to him/her.

Benefit: What you are willing to sacrifice

- The **benefit** or advantage of something is the pleasure or gain it embodies. Economists measure the gain of something by what a person is willing to sacrifice to obtain it.

On the margin

- People make choices based on the **marginal analysis** that is, comparing all the relevant choices or alternatives incrementally and systematically.
- Marginal analysis refers to the benefit from a one-unit change in an economic question (defined as **marginal benefit**) to the cost of making a one-unit change in an economic question (defined as **marginal cost**).
- If the marginal benefit of an economic question is more than the marginal cost of the question, then the **rational** choice is to proceed with the question.

Responding to incentives

- An **incentive** is a reward that encourages an action or a penalty that discourages an action.
- Changes in marginal benefits and marginal costs affect the incentives that people face in making rational choices. People's decisions change when incentives change. For instance, if homework assignments are weighed more heavily in a class's final grade, the marginal benefit of completing homework assignments has raised and more students tend to do the homework assignments.

**Study skills**

In making your decision whether to take a trip during summer semester break, you compare all the other choices you could undertake. As a consequence, you—

- A. incur a sunk cost.
- B. are making a choice on the margin.
- C. are not making a rational choice.
- D. do not face an opportunity cost.

Solution:

Discuss your answer with your tutor.

Economic environment of business

Economic news is exchanged in the public media every day because economic issues affect everyone. Business conditions exist within an economic environment containing technological, institutional, cultural and political factors. Reciprocally, the economic environment is affected by business decisions in which economic principles are variously



implicit, consciously applied, or present in the background; in the form of government policies towards businesses. Corresponding with the two sides of this reciprocal influence are the two branches of economics. *Macroeconomics* focuses on aggregate economic conditions – those conditions that set the environment within which a business operates and *microeconomics* focuses on the economic forces that influence the decisions made by individual consumers, firms and industries. These decisions are often made in an instinctive way, yet consistent economic forces underlie them. Thus, an explicit recognition and understanding of the forces that influence these decisions is a vital part of a manager's intellectual equipment.

Macroeconomics is concerned with the economy as a whole. Thus it is concerned with aggregate demand and aggregate supply. Aggregate demand accounts for the total amount of spending in the economy, by consumers, overseas customers for our exports, the government or firms when they buy capital equipment or stock up on raw materials. On the other hand, aggregate supply accounts for the total national output of goods and services. The overall economic question is measured in a variety of ways. These measurements – the number of people with jobs, the total income of persons, the output of factories, and the amount of total goods and services produced in the economy (GDP) are regularly reported in newspapers, business periodicals, news through television and radio. These reports often fail to explain the importance of these as well as other economic indicators. A business manager should be able to put these announcements in perspective with regard to both the relationships among indicators and the manager's own business.

Microeconomics is concerned with the individual parts of the economy. It is concerned with the demand and supply of *particular* goods, services and resources such as cars, clothes and haircuts; electricians, secretaries, blast furnaces, computers and coal. The most basic economic forces a firm has to address are those that shape the supply and demand for the goods or services it produces. Even as businesses around the world are undergoing massive management changes, it is increasingly recognised that changing market conditions provoke these responses. The crux of microeconomic influences on business decision-making is the answer to the two-part question: How much should the firm produce, and how much should it charge for this output?

**Study skills**

Which of the following is true?

- A. Microeconomics studies consumer behaviour, while macroeconomics studies producer behaviour.
- B. Microeconomics studies producer behaviour, while macroeconomics studies consumer behaviour.
- C. Microeconomics studies behaviour of individual households and firms, while macroeconomics studies national aggregates.
- D. Microeconomics studies inflation and opportunity costs, while macroeconomics studies unemployment and sunk costs.

Solution:

- C. Microeconomics studies the behaviour of individual decision-makers, firms and households, whereas macroeconomics studies aggregate concepts, inflation, unemployment, interest rates, exchange rates, etc..

Making economic choices in business

Firms will normally want to make as much profit as possible, or at the very least to avoid a decline in profits. In order to meet these and other objectives, managers must make choices in terms of what types of output to produce, how much to produce and at what price; what techniques of production to use, how many workers to employ and what type, which suppliers to use for raw materials, equipment, etc. In each case, weighing the alternatives can be less onerous for a manager who is aware of the types of influences that cannot be avoided in business decision making.

Having acquired the knowledge of these external factors, how do firms decide on prices, outputs, inputs, marketing, investments and so on? Here business economists can play a major role in helping firms achieve their business objectives.

The external influences outside the direct control of a firm are the competition it faces, the prices it pays for raw materials, the state of the economy (whether static, growing or in recession) and the level of interest rates. Businesses will need to obtain a clear understanding of their environment before they can set about making the right decisions. (You will notice that most external factors to the firm are also external to the industry, i.e., macroeconomic. Other factors, though outside the firm, are within the industry and so are microeconomic in nature.)

PEST Analysis

The division of the factors affecting a firm into political, economic, social and technological factors is known as a PEST analysis. It is widely used by businesses to study their environment and to help them establish a strategic approach to their business activities.



Political/legal/institutional factors

Firms will be directly affected by the actions of government, since the role of the government is to make law and modern governments enact laws such as industrial relations legislation, product safety standards and laws preventing collusion between firms to keep prices up. Political developments such as the collapse of communism strongly affect the business community.

Economic factors

Economic factors constitute a wide range of factors from rising costs of raw materials to the market entry of a new rival, from the forthcoming budget to the instability of international exchange rates. A business organisation must constantly take such factors into account when devising and acting upon its business strategy. As discussed above, it is conventional to divide the economic environment, in which the firm operates into two levels, macroeconomics and microeconomics, and you must consider both realms in making decisions.

Social and cultural factors

Social attitudes and values may or may not be codified in law and they include attitudes towards working conditions and the length of the working day, equal opportunities for different groups of people (by ethnicity, gender, physical attributes, etc.), the use and abuse of animals and images portrayed in advertisements. The social/cultural environment also includes demographic trends such as an increase in the average age of the population or changes in attitudes towards seeking paid employment while bringing up small children. In recent times, various ethical issues, especially those concerning the protection of the environment have had a big impact on the actions of business and the image that many firms seek to present.

Technological factors

Over the last 20 years, the pace of technological change has quickened, transforming not only how firms produce products but also how their business is organised. The use of robots and other forms of computer-controlled production has changed the nature of work for many workers. It has also created a wide range of new opportunities for business, many of which are yet to be realised. The information-technology revolution also enables rapid communication with the opportunity for many workers to work from home or while travelling.

Government intervention in business

Dealing with government policies toward business is a very important subject in the private sector and implementing such policies is a major function of the public sector. Most citizens of modern developed countries expect government policy to play an important role in their lives. We expect governments to provide law enforcement, education and a variety of other goods and services with the expectation that

governments will finance these activities by imposing taxes, subsidies and so on. Most of us also recognise that government policy has some influence on the rate of unemployment, inflation, interest rates and general business conditions. However, many people are surprised when they discover the extent to which business decisions of private sector firms are affected by government intervention.

Three dominant macroeconomic principles

Economic policies throughout the world have recently converged around three basic principles:

1. Increasing emphasis on *using market mechanisms* to achieve objectives rather than supplanting them with state intervention.
2. Formulation of more macroeconomic policies to ensure a *stable economic framework* rather than to achieve proactive counter-cyclical targets or national planned growth rates and investment targets.
3. *More outward-looking* national policies as a result of a steady increase in the membership of the World Trade Organization (WTO), the relaxation of controls on capital mobility and the globally more benign stance towards foreign investment.

Such policy changes in Europe, North America, Asia and elsewhere have a profound effect on the business environment. Throughout Eastern Europe and the former Soviet Union, policymakers have turned away from economic planning and price controls and are searching for ways to make their markets function more efficiently.

Types of economic evaluation

You might wonder what government intervention is intended to achieve and why governments choose the policies they do. Economists are often called upon to make judgements on matters of public policy. Should the government reduce the deficit? If so, how? In this type of public policy discussion, economists tend to disagree. They differ in their *description* of the economy and in their predictions of the consequences of certain actions. When they describe the economy and construct models that predict either how the economy will change or be affected by different policies, they are engaged in *positive economics*. When they evaluate alternative policies, they are engaged in what is called *normative economics*.

Positive economics is concerned with what is, with a description of how the economy functions. It is, therefore, 'descriptive' in the sense that it tries to explain or describe why things are as they are. The positive approach to policy analysis focuses on the objectives, behaviour and interaction of individuals and groups who influence policy decisions. Instead of focusing on what a policy should be as normative analysis does, positive analysis examines the reasons why a policy takes the form it does.



One important influence on policy decisions is voting. Another influence arises from special interest groups including business lobbies who spend time and energy trying to influence government policies. Public sector managers (or bureaucrats) themselves are an important influence as are elected politicians.

Normative economics deals with what *should be*, by making judgements about the desirability of various courses of action. Normative economics is, therefore, 'prescriptive,' because in answering it we are trying to suggest or prescribe what governments should do. The starting point in the analysis of this question is that government policies towards business should seek to promote public interest. However, it is difficult to say exactly what public interest is. One policy may benefit some people, another may benefit others. One policy is not unambiguously better than another. It depends on your own personal view.

Accepted government objectives

Nevertheless, there is a well-established set of goals that is widely accepted as legitimate objects of government attention. These include:

1. *Economic efficiency* that corresponds to trying to make the per capita benefits from the consumption of goods and services as high as possible.
2. *Macroeconomic stabilisation and growth* which relates to the objectives to smooth the business cycle, keep unemployment rates and inflation rates low and stable and to assist in promoting economic growth.
3. *Fairness (equity)* in seeking to make the overall size of the 'economic pie' as large as possible. Fairness or equity is concerned mainly with the distribution of that pie among different claimants and *other social objectives*.

It is possible that actual policies towards business will be just as normative analysis suggests they should be. However, actual policies often coincide very poorly with normative analysis. Therefore we are forced to conclude that general public interest is not the major determinant of policies.



Study skills

A difference between positive economics and normative economics is that—

- A. Positive statements are true by definition.
- B. Only positive statements are subject to empirical verification.
- C. Economists use positive statements and politicians use normative statements when discussing economic matters.
- D. Positive economics involve value judgments.

Solution:

- B. Clearly, D and C are wrong. Positive statements can be disproved by empirical verifications.

Economic debate

Statements made by those engaged in positive economics are not necessarily true; they can be disproved by empirical verification. Nevertheless, normative statements, being theoretical, are not subjected to empirical verification at all if their basis is based on value judgements. Hence the importance of debate i.e. accuracy and reliability improve as different judgements are aired and considered by different individuals.

Economists are often called upon to make judgements on matters of public policy. They differ in their views of on how the world works, for two reasons:

1. **Different objectives.** In macroeconomics, for example, economists place different weights on objectives such as:
 - a. To reduce wage inequality.
 - b. To maintain (or increase) economic an question.
 - c. To reduce the inflation rate.
 - d. To reduce the unemployment rate.
2. **Absence of controlled experiments.** Actual economies are highly complex, consisting of many individuals, firms and markets. This complexity prevents macroeconomists from conducting controlled experiments to study, for example, the effects of monetary policy on the economy. As a result, different macroeconomists can look at the same event and reach different conclusions.

Activity 1.1



Activity

Choose a firm or a business that you are familiar with. Briefly describe that firm or business. Discuss how various aspects of business environment – internal, external and global could have influenced its performance.



Understanding the market mechanism and analysing market demand

Introduction

Now that you have understood the essential economic problem as scarcity in its most objective sense, let us explore how different economic systems answer the following questions:

1. How does price work as a rationing device (allocating scarce resources)?
2. How efficient is a price system?

Command economy

In a command economy, a central authority or agency draws up a plan that establishes what will be produced and when; sets production goals and makes rules for distribution. Even in a pure planned economy, the public exercises choices by setting the volume that it wishes to consume.

Laissez-faire economy

*Laissez-faire*¹ is a French phrase which means: ‘allow to do’. This is an economy in which individual households and firms pursue their own self-interests without any central direction or regulation. In this environment (known today as a market economy), no central direction or regulation coordinates the decisions of individual households and firms. Some markets are simple and others are complex, but they all involve buyers and sellers engaging in different exchanges. The behaviour of buyers and sellers in a laissez-faire economy determines what gets produced, how it is produced and who gets to buy the goods.

Nevertheless, the involvement of the government cannot be denied. In every market economy today, governments produce many services, redistribute income through taxes and expenditures regulate many activities.

Prices in a free market act as a signalling device. A rise in the price of a product indicates that this product has become scarcer. The price increase signals to consumers the need to purchase less by seeking cheaper substitutes, for instance, and it signals to a business the need for more supply. If the free market system is to operate efficiently, it requires an adequate institutional framework of law, custom and behaviour. In long-established market economies, this background tends to be taken for granted. Its absence however, can be costly as the newly liberalised economies of Europe have discovered.

¹Oxford dictionary pronunciation code is ‘leseɪ’ fer, roughly equivalent to ‘less-ay-fair’

The market system in action

The free market consists of many interconnected markets which, for the purposes of this course, you can assume to be highly competitive and they operate free of government interference.

In reality, many markets are subjected to imperfectly competitive and monopolistic influences and government intervention in the market system is a feature of even the most enthusiastically capitalist society. Indeed, in some circumstances, such intervention can be shown to be a necessary condition for achieving economic efficiency.

What is a market?

There are many types of market but the type of market structure truest to the traditional model of a physical marketplace is a *perfectly competitive* market with the following characteristics:

- Large number of sellers and buyers, each acting independently and exerting no individual monopolistic power.
- Full information: Everyone knows what the going price is and can evaluate the quality of the good or service being produced.
- Consumers aim to maximise utility (i.e., personal satisfaction) and firms aim to maximise profits.
- Prices are flexible in all markets.

Given these conditions, the market system fulfills the function of allocating resources between different uses and among different people. It acts as an equilibrating mechanism between supply and demand. Prices act as *signals* and the price system is the coordinating mechanism that ensures that markets are ‘clear’: supply equals demand in each market.

The market system

Your reading on economic measurements has brought three key elements of the market system to your attention, one being the product market: the markets for individual goods and services. The others are the labour market – the buying and selling of labour – and the capital market – the lending and borrowing of capital. In each market, the typical buyers and sellers are firms and households. Households sell their labour to firms and with the income earned in such a way, they buy goods and services from firms. Firms produce goods and services by hiring labour and capital from households (and other firms). Households and firms also interact on the capital market. If individuals choose not to spend all their income, their savings are channelled to firms by intermediaries such as banks and pension funds. If they choose to spend more than their income, loans will be supplied by the same intermediaries. This is a much-simplified conceptualisation of the market system as we know it in the real world. However, it is sufficient to illustrate the strong interconnections between markets as depicted in **Figure 1.1**.

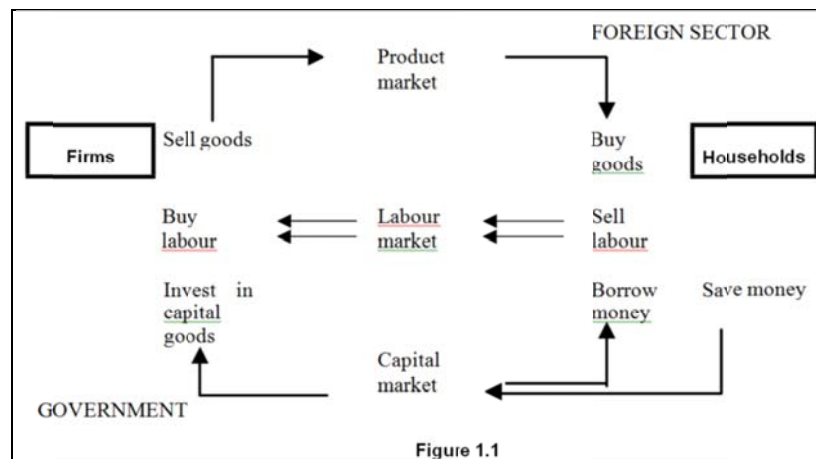


Figure 1.1
Foreign and government sectors

Two other market participants must be considered: the *foreign sector* and the *government sector*. Domestic firms do not have to sell their entire output to domestic consumers. They also have the option of exporting. Likewise, households can import goods and services instead of buying the output of domestic firms. Imports, exports and the foreign trade market are an integral part of an analysis of the market system. Factors of production such as capital and labour can also be traded internationally. The rise in global capital mobility, especially between developed countries, indicates that the domestic economy is no longer restricted to domestic savings for its supply of investment funds. Since the middle of the twentieth century, the foreign sector has been growing rapidly in relative importance.

The government is also an important participant in the market. The size of government spending as a percentage of the nation's aggregate spending varies from one nation to the next, but in industrial countries, government spending amounts to about 40 per cent of total national expenditure. The role of governments is very important in the labour market. They hire civil servants directly or indirectly in the form of contracts with the private sector to acquire services, supervise procurements and so on. Public intervention takes many forms in addition to government spending. All areas of economic life are subjected to official regulations. Examples are planning requirements for new buildings, health and safety regulations as well as environmental restrictions.

State-owned commercial companies are another vehicle of government influence which is not reflected in the spending GDP ratio.

Business in a competitive market

If a firm wants to increase its profits, should it raise its prices, or should it lower them? Should it increase or reduce its output? Should it modify its

product, or keep the product unchanged? The answer to these and many other questions is that it depends on the market in which the firm operates. If the market is buoyant, the firm might be well advised to increase its output in anticipation of greater sales. If customers give evidence of being willing to pay more for the product, a price rise might also be a good idea. If, however, the market is declining, the firm may well decide to reduce output, or cut prices, or diversify its product line.

Price theory and the price mechanism

Price theory

The basic coordinating mechanism in a market system is price. A price is the amount that a product sells for per unit, and it reflects what society is willing to pay. Prices of inputs i.e. labour, land and capital determine the production cost of a product. Prices of various kinds of labour (wage rates) determine the rewards for working in different jobs and professions. Many of the independent decisions made in a market economy involve the weighing of prices and costs, so it is not surprising that much of economic theory focuses on the factors that influence and determine prices. This is why microeconomic theory is often simply called price theory.

In a free market, individuals are free to make their own economic decisions. Consumers are free to decide what to buy with their incomes: free to make demand decisions. Firms are free to choose what to sell and what production methods to use: free to make supply decisions. The resulting demand-and-supply decisions of consumers and firms are transmitted to each other through their effect on prices: through the price mechanism.

The market system, also called the price system, performs two important and closely related functions in a society with unregulated markets. First, it provides an automatic mechanism for distributing scarce goods and services. In other words, it serves as a price-rationing device for allocating goods and services to consumers when the quantity demanded exceeds the quantity supplied. Second, the price system ultimately determines both the allocation of resources among producers and the final mix of outputs.

The demise of the command systems

The market system, or price system has three merits, namely efficiency, incentives and freedom. However, in the command system (also known as socialism or communism) governments own most economic resources and the decisions are making via a central economic plan. This central economic board examines production levels for each business or firm and determines the total amount of resources to be allocated to each firm in achieving its production goals. Nevertheless, this system has two main problems.



The coordination problem

The central planner or government is required to coordinate the millions of individual decisions by consumers, sellers and businesses. For example, if the central planners had to set up a factory to produce 10,000 cars, they had to ensure the availability of all necessary inputs such as labour, capital, equipment, steel, tyres, electric power, paint, glass, transportation, etc. for the production and delivery of those 10,000 cars. Hence, the failure of the production is relative high as the outputs of many industries serves as inputs to other industries. If any of the industry fails to achieve its target in the production chain, then the production of a good is delayed or failed.

The incentive problem

The command system also faces the problem of providing incentive. In this system, the central planners determine the output mix. If they misjudged the total numbers of goods or services required at the government-determined prices, then persistent shortages or surpluses of those goods or services arise. However, as long as the person-in-charge who oversaw the production of those goods or services was rewarded for meeting their assigned production targets, they had no incentives to adjust supply in response to the shortages or surpluses. Moreover, central planning did not trigger the profit motive, nor did it reward innovation and enterprise. The route for obtaining advancement was mainly via participation in the political hierarchy of the Communist Party.

Product (Output) market

Demand

In economics, the concept of demand is used to describe the quantity of a good or service that a household can, or a firm chooses, to buy at a given price.

Market demand and individual demand

The market demand for a good or service is simply the total quantity that all the consumers in the economy are willing to demand for a time period at a given price.

Determinants of demand

The amount of a product that consumers wish to buy in a given period is influenced by the following variables:

- The product's own price
- The price of related products
- Average income of households
- Tastes and preferences
- Income distribution

- Population.

It is difficult to consider the impact of changes in all these variables at once. Studying each variable in isolation is only possible in theory, but theory still improves understanding. Therefore, this module will employ a convenient assumption called *ceteris paribus* to focus on the impact of a single variable at a time (*ceteris paribus* means ‘everything else remaining constant’).

Price and quantity demanded: The law of demand

How are prices determined? To develop a theory, we need to study the relationship between the quantity demanded of each product and that product’s price. This requires that we hold all other influences constant and ask, “How will the quantity of a product demanded change as its price changes?”

The headlines announce a move by the Organization of Petroleum Exporting Countries which states ‘Major cutback in OPEC production and exports of crude oil’. Shortly afterwards, you find that oil and gas prices – wherever not regulated by government – have doubled at service stations. What do you do? If you have a fixed transportation budget but drive a car, you will cut down on the use of your car. Perhaps you will drive less and might substitute public transport for private transportation. Perhaps in time you will consider buying a smaller car.

Why might this be so? There is almost always more than one product that will satisfy any desire or need. For example, the desire for a new car may be satisfied by a variety of different cars of a certain category: imported, domestic, sedan, coupe and so on.

This is simply an illustration of the general relationship between price and consumption. When the price of a good rises, the quantity demanded will fall. This relationship is known as the law of demand. The *law of demand* states that there is a negative relationship between the price and the quantity demanded of a product. When the price of an item increases, we buy less. There are two reasons for this predictable response to a price increase:

1. People will feel poorer. They cannot afford to buy so much of the good with their money. The purchasing power of their income (their *real income*) has fallen. This is called the *income effect* of a rise in price.
2. The good will now be dearer relative to other goods. Thus, people will switch to alternative or substitute goods. This is called the *substitution effect* of a rise in price.

Similarly, when the price of a good falls, the quantity demanded will rise. People can afford to buy more (the income effect), and they will switch from consuming alternative goods (the substitution effect). The amount by which the quantity demanded falls will depend on the size of the income and substitution effect.

The demand schedule and the demand curve

A demand schedule is one way of showing the relationship between quantity demanded and the price of a product with the assumption that other things being equal. It is a numerical tabulation that shows the quantity that is demanded at certain prices.

Price per apple	Quantity demanded (per week)
0.60	30
0.50	35
0.40	40
0.30	45
0.20	50
0.10	55

Table 1.1

A demand curve is a graphical representation of a demand schedule such as that of **Table 1.1**. A strict and regular relationship between the X and Y entities produces a straight slope, not the swoop you might expect when you think about the ‘learning curve’ and similar graphs. When the word ‘shape’ is used about a curve, it refers to the direction of the curve either up or down, in the case of a simple slope.

The position and shape of the market demand curve depends on the positions and shapes of the individual consumers’ demand curves from which it is derived. However, it also depends on the number of individual consumers who consume in that market. **Figure 1.2** shows the demand curve for apples. The price-quantity combinations shown in **Table 1.1** are plotted on the graph shown in **Figure 1.2**. Price is plotted on the vertical axis and quantity on the horizontal axis.

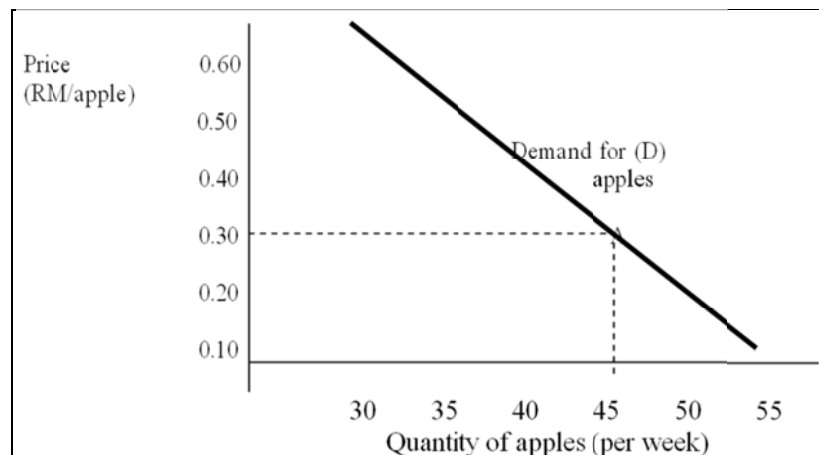


Figure 1.2

The smooth curve drawn through these points is called a demand curve. It shows the quantity that purchasers would like to buy at each price. The negative slope of the curve indicates that the quantity demanded increases as the price falls. Each point on the demand curve indicates a single price-quantity combination. The demand curve represents the relationship between quantity demanded and price with other things being equal.

As you see, the term ‘demand’ refers to the entire relationship between the quantity demanded of a producer and the price of that product (as shown, for example, by the demand schedule in **Table 1.1** or the demand curve in **Figure 1.2**). In contrast, a single point on a demand schedule or curve is the *quantity demanded* at that point. This distinction between ‘demand’ and ‘quantity demanded’ is an extremely important one and both terms will be examined in detail later in this section.

Shifts in the demand curve

Now consider what happens if income, tastes, population and the prices of all other products remain constant and the price of only one product changes. As the price goes up, that product becomes increasingly expensive to satisfy a desire. Some consumers will stop buying it altogether; others will buy smaller amounts; and some may still continue to buy the same quantity. Because many consumers will switch wholly or partly to other products to satisfy the same desire, fewer consumers would buy the product whose price has risen. For instance, as meat becomes more expensive, consumers may to some extent switch to meat substitutes; they may also forgo meat when having their meals and eat less meat at others.

Conversely, as the price goes down, the product becomes a cheaper method of satisfying a desire. Households will buy more of it. Consequently, they will buy less of similar products whose prices have not fallen and as a result have become expensive *relative* to the product in question. When a bumper tomato harvest drives prices down, shoppers switch to tomatoes and cut their purchases of many other vegetables that will look relatively more expensive at the time.

Average income

Tastes have an effect on people’s desired purchases. A change in taste may be long-lasting as seen in the shift from fountain pens to ballpoint pens or from typewriters to computers. It may also be short-lived, such as the fad for hula hoops or collapsible scooters. In either case, a change in taste in favour of a product shifts the demand curve to the right. Therefore more will be demanded at each price.

Prices of related goods

You have seen that the negative slope of a product’s demand curve occurs because the lower its price, the cheaper the product becomes relative to other products that can satisfy the same needs or desires. These other products are called substitutes, each being a good that can be used in place of another good. For example, a bus ride is a substitute for a train



ride; therefore, a bus ride can become cheap relative to a train ride probably because the price of the bus ride falls or because the price of the train ride rises. Either change will increase the demand for (frequency of) bus rides that consumers wish to buy as consumers substitute train rides. Thus a rise in the price of a substitute for a product shifts the demand curve for the product to the right. More will be demanded at each price.

Complements are products that tend to be used jointly. Cars and petrol are complements; so are hamburgers and French fries, DVDs and DVD players. Because complements tend to be consumed together; a fall in the price of one will increase the demand for both products. Thus a fall in the price of a complement for a product will shift that product's demand curve to the right. More will be demanded at each price. For example, a fall in the price of a DVD player will lead to a rise in the demand for DVDs, even though the price of DVDs is unchanged.

Population

Demand also depends on the size as well as the composition of the population. The larger the population (with all else being the same), the greater the demand is for all goods and services and vice versa.

Population growth does not create new demand unless the additional people have the means to purchase goods; that is unless they have purchasing power. If there is an increase in population with purchasing power – for example, the immigration of wealthy foreigners – the demands for all the products purchased by the immigrants will rise. Thus we expect that an increase in population will shift the demand curves for most products to the right, indicating that more will be demanded at each price.

The composition or the age structure of a population is important as well. Demand for certain products depends very much on the proportion of the population in a given age. For example, the older the population the greater the demand for nursing homes.

Distribution of income

If a constant total income is redistributed among the population, demands may change. If, for example, the government increases the deductions that may be taken for children on income-tax returns and compensates by raising basic tax rates, income will be transferred from childless persons to households with large families. Demands for products bought by childless people will decline while demands for products bought by households with large families will increase. A change in the distribution of income will therefore cause an increase in the demand for products bought by most households whose income have increased and a decrease in the demand for products bought by most households whose income have decreased.

Tastes and preferences of the household

Households' tastes and preferences tend to change for time to time. For example, in societies such as Canada, anti-smoking campaigns have been so strong that demand for cigarettes has diminished for a large segment of the population.

Consider an increase in household income while price remains constant. If households increase their purchases of the product, the new quantity demanded cannot be represented by a point on the original demand curve. It must be represented on a new demand curve that is to the right of the old curve. Thus the rise in consumer income shifts the demand curve to the right, as shown in **Figure 1.3**. This illustrates the operation of an important general rule.

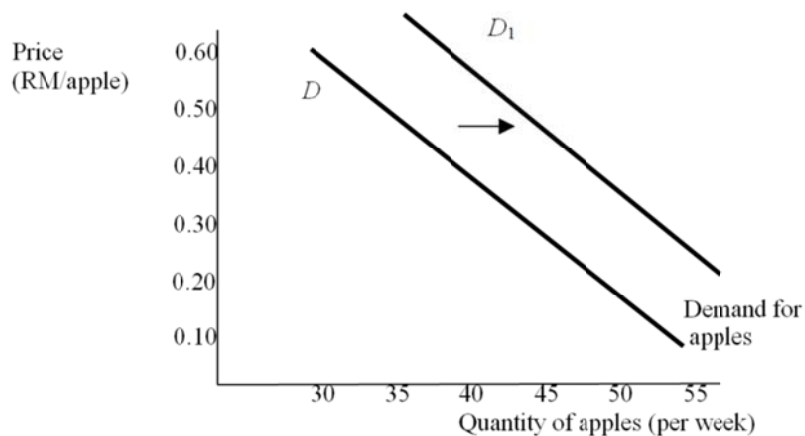


Figure 1.3

You can study the influence of changes in variables other than price by determining how changes in each variable shift the demand curve. Any change will shift the demand curve to the right if it increases the amount that households wish to buy with other things remaining equal. On the contrary, it will shift the demand curve to the left if it *decreases* the amount that households wish to buy with other things remaining equal. Note that changes in people's *expectations about future values* of variables such as income and prices can also influence the current demand. However, to simplify, we consider only the influence of changes in the current values of these variables.

Movements along the curve versus shifts of the curve

Suppose that you read in today's newspaper that the soaring price of heating oil has been caused by an increased demand for cooking oil. The next day, you read that the rising price of heating oil is reducing typical consumers' purchases of heating oil, as shoppers switch to burning natural gas, coal and wood. The two stories appear to be in contradiction with each other. The first associates a rising price with a rising demand; the second associates a rising price with a declining demand. Can both statements be true? The answer is yes because they refer to different

circumstances. The first describes a shift in the demand curve; the second refers to a movement along a demand curve in response to a change in price.

First, consider the statement that the increase in the price of heating oil is caused by an increase in demand for heating oil. This statement refers to a shift in the demand curve for heating oil. In this case, the demand curve must have shifted to the right, indicating more heating oil demanded at each price. This shift, as we will see later in this chapter; will increase the price of heating oil as depicted in **Figure 1.4**.

Now consider the statement that less heating oil is being bought because heating oil has become more expensive. This refers to a movement along a given demand curve and reflects a change between two specific quantities being bought, one before the price rose and one afterward.

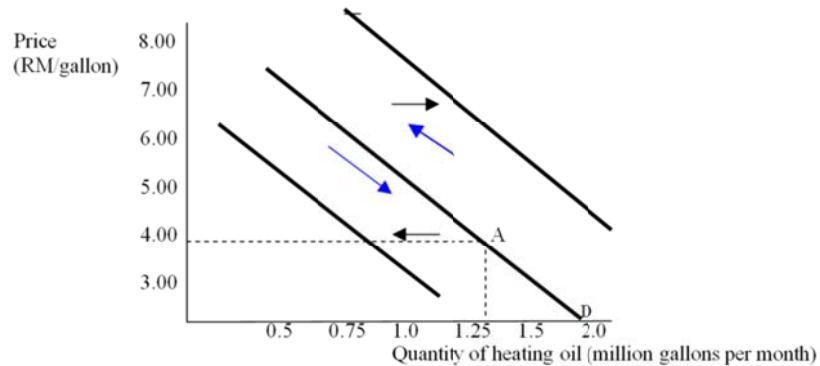


Figure 1.4

As indicated above, to prevent the type of confusion caused by our two stories in the newspaper, economists use a specialised vocabulary to distinguish between shifts of curves and movements along curves.

We have seen that demand refers to the *whole* demand curve, whereas quantity demanded refers to a specific quantity that is demanded at a specified price, as indicated by a particular *point* on the demand curve. In **Figure 1.4**, for example, demand is given by the curve *D*; at a price of \$4.00, the quantity demanded is 1.25 million gallons of heating oil per month, as indicated by Point A.

An illustration of change in demand versus quantity demanded

Here is an example that points out the difference between a ‘change in quantity demanded’ and ‘a change in demand’.

In **Figure 1.5** below, we have a demand curve for the Honda Civic on the left and the competing Toyota Corolla on the right. Initially, the price of the Honda Civic is \$22,000 and 10,000 units are demanded per year. Toyota Corolla sells for \$21,000 and has a demand of 8,000 at that price

per year. (Note: it is irrelevant whether the Honda Civic's price is above, below or equal to that of the Toyota Corolla.)

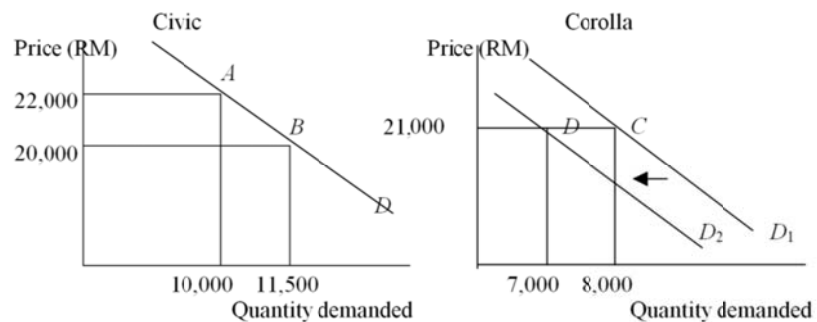


Figure 1.5

Suppose that the price of the Honda Civic decreases to \$20,000. More Civics will be purchased and there will be an increase in quantity demanded as there is a movement along the demand curve from *A* to *B*. Some of the new Civic customers would have been Corolla drivers but now they are not. Therefore at the price (\$21,000), the demand for Corolla has decreased, perhaps to 7,000. Note that the increased demand for Civic (by 1,500 units) rises partly because some of the existing Corolla customers switched to Civic. Potential car buyers might find the reduced price of Honda Civic more attractive.



Study skills

1. Refer to **Table 1.1**. Suppose that prices of other fruits you might buy increase. What would happen to the number of apples you demand per month? Sketch this change on your diagram. Label the demand curve *D2*. What is likely to happen to the price of apples?
2. Which of the following will cause a decrease in the demand for tennis rackets?
 - A. A rise in the price of squash rackets.
 - B. A movement along a given demand curve.
 - C. A shift in the position of the demand curve.
 - D. A change in the shape of a demand curve.

Solution:

1. Refer to **Figure 1.1**. Presumably, you would demand more apples at each price. The demand curve shifts right, to *D2*. Because apples are more popular now, the price will likely rise.
2. C. A 'change in demand' means that, at every price level, more or less is being demanded. This is represented by a shift in the position of the demand curve.



Supply

When we refer to the economy of our own country, we find that the economy, in the most recent year for which statistics are available, produced goods and services worth millions, or billions, or even perhaps trillions in the local currency. In studying the subject of production, there is a single question that economists attempt to answer: *What determines the quantities of products that will be produced and offered for sale?* Such an attempt requires an examination of the basic relationship between the price of a product and the quantity produced and offered for sale as well as an examination of the forces that lead to shifts in this relationship.

What is quantity supplied?

The amount of a product that firms wish to sell in some period is called the quantity supplied of that product. Quantity supplied is a flow; it is so much per unit of time. Note also that quantity supplied is the amount that firms are willing to offer for sale; it is not necessarily the amount that they succeed in selling.

The amount of a product that firms are willing to produce and offer for sale is influenced by the following important variables:

- Product's own price
- Prices of inputs
- Technology
- Number of suppliers.

This scenario also applies to supply. There are several influencing variables and we will use the *ceteris paribus* assumption (everything else remaining constant) to study the influence of the variables, one at a time.

Quantity supplied and the law of supply

We begin by holding all other influences constant and ask how we expect the quantity of a product supplied to vary in its own price.

A basic hypothesis of economics is that for many products, the price of the product and the quantity supplied are related *positively* with other things being equal. In other words, the higher the product's own price, the more its producers will supply; and the lower the price, the less its producers will supply.

Why might this be so? It is true because the profits earned from producing a product will increase if the price of that product rises while the costs of inputs used to produce it remain unchanged. This will make firms, which are in business to earn profits, wish to produce more of the product whose price has risen.

The supply schedule and the supply curve

The general relationship discussed earlier can be illustrated by a supply schedule which indicates the relationship between quantity supplied of a product and the price of the product with the assumption of other things being equal. A *supply schedule* is analogous to a demand schedule; the former shows what producers are willing to sell, whereas the latter shows what households are willing to buy at alternative prices of the product.

Table 1.2 presents a hypothetical supply schedule for apples.

Price per apple (\$)	Quantity supplied (per week)
0.60	120
0.50	110
0.40	100
0.30	90
0.20	80
0.10	70

Table 1.2

A *supply curve*, the graphical representation of the supply schedule, is illustrated in **Figure 1.6**.

Each point on the supply curve represents a specific price-quantity combination. However, the supply curve shows more information besides this combination.

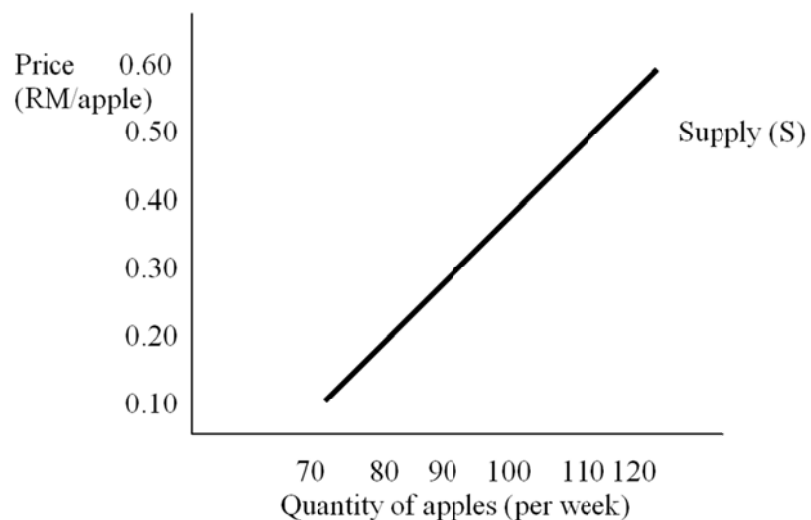


Figure 1.6

The supply curve represents the relationship between quantity supplied and price, assuming other things being equal. Its positive slope indicates



that quantity supplied varies in the same direction as price. When economists make statements about the conditions of supply, they are not referring just to the particular quantity being supplied at the moment, that is, not to just one point on the supply curve. Instead, they are referring to the entire supply curve, that is the complete relationship between desired sales and all possible prices of the product.

Supply refers to the entire relationship between the quantity supplied of a product and the price of that product with other things being equal. A single point on the supply curve refers to the *quantity supplied* at that price.

The position and shape of the market supply curve depends on the positions and shapes of the individual firm's supply curves from which it is derived. Nevertheless, it also depends on the number of individual firms in the market.

Shifts in the supply curve

The supply curve will shift to a new position with a change in any of the variables (other than the product's own price) that affects the amount of a product firms are willing to produce and sell. A shift in the supply curve means that at each price, the quantity supplied will be different. An increase in the quantity supplied at each price is shown in **Figure 1.7**. This change appears as a rightward shift in the supply curve. In contrast, a decrease in the quantity supplied at each price appears as a leftward shift. A shift in the supply curve must be the result of a change in one of the factors that influence the quantity supplied other than the product's own price.

Influences on supply

As indicated before, supply depends on several factors other than a good's own price. Changes in these other factors are sources of shifts in market supply curves, similar to the market demand curves discussed previously.

Price of inputs (Changes in costs of production)

Items that a firm uses to produce its outputs such as materials, labour and machines are called the firm's *inputs*. Other things being equal, the higher the price of any input used to make a product, the less will be the profit from making that product. We expect, therefore, that the higher the price of any input used by a firm, the lower will be the amount that the firm will produce and offer for sale at any given price of the product. Therefore, a rise in the price of inputs shifts the supply curve to the left, indicating that less will be supplied at any given price. A fall in the cost of inputs shifts the supply curve to the right.

Technology

At any time, what is produced and how it is produced depends on what is known. Over time, knowledge changes; so do the quantities of individual

products supplied. The technological improvements in the computer industry over the past two decades have led to a rightward shift in the supply curve.

Taxes and subsidies

Firms view most taxes imposed by the government as part of their production costs. For example, an increase in sales or excise taxes will increase production costs and, hence, reduce supply. On the other hand, if the government provides subsidies to firms for their production, it will decrease the costs of production and increase supply.

Price of other goods

A substitute in production is a good that can be produced in place of another good, such as Dell Computer and Acer Computer. A complement in production is a good that must be produced along with the initial good, such as computer and computer software. A fall in the price of a complement in production or a rise in the price of a substitute in production decreases the supply of the good.

Producer expectations

Producer expectations about future prices influence current supply. For example, if the price of a good is anticipated to increase in the future, the current supply of the good falls.

Number of firms

If firms that produce for a particular market are earning high profits, other firms may be tempted to go into that business. When the technology to produce computers for home use became available, literally, hundreds of new firms got into the act. The popularity and profitability of the Internet led to the formation of Internet service providers (ISPs). When new firms enter an industry, the supply curve shifts to the right. When firms go out of business or exit the market, the supply curve shifts to the left.

Suppose that the price of sugar rises. How does this affect the demand for ice cream? Sugar is an input into the production of ice cream. An increase in the price of an input tends to raise the cost of production and lowers profitability. In response to increased cost, ice cream producers will cut their supply of ice cream. At any given price of ice cream, suppliers will be less inclined to continue producing the same amount. As they produce less, the supply curve for ice cream shifts to the left. **Figure 1.7** exhibits the shift in the supply curve to the left for any change that reduces the quantity that suppliers wish to produce at any given price and to the right for any change that increases the suppliers' wish to produce at any given price.

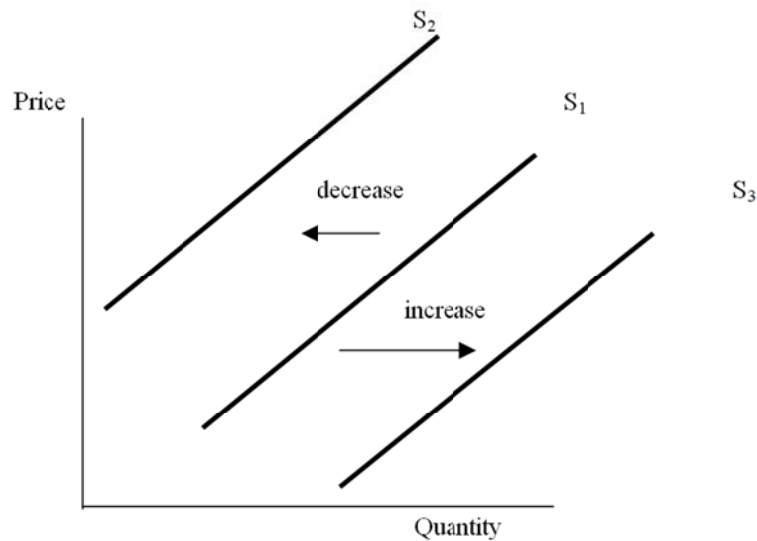


Figure 1.7



Study skills

1. Battery brands such as Energizer and Duracell's Coppertop are substitutes. The 'Energizer Bunny' advertising campaign increases the price of Energizer batteries. Therefore the Equilibrium price will _____ and quantity exchanged will _____ in the market for Duracell.
 - A. rise, rise
 - B. fall, rise
 - C. fall, fall
 - D. rise, fall

2. The supply of four-cylinder cars will shift to the right if—
 - A. consumers switch over to six- (and higher) cylinder cars.
 - B. manufacturers of four-cylinder cars see the price of larger cars (six-cylinder and higher) decreasing permanently.
 - C. the cost of labour inputs stays constant.
 - D. consumers experience an increase in their income.

Solutions:

1. A. If Energizer increases the price of its batteries, consumers will switch over to substitutes such as Duracell, increasing the demand for Duracell. This will raise both equilibrium price and quantity.
2. B. As the price of larger cars drops, car manufacturers will switch over to another production option: 4-cylinder cars.

Shifts in a supply curve versus movements along a supply curve

A **point on** the supply curve shows the quantity supplied at a given price. A **movement along** the supply curve shows a change in *quantity supplied*.

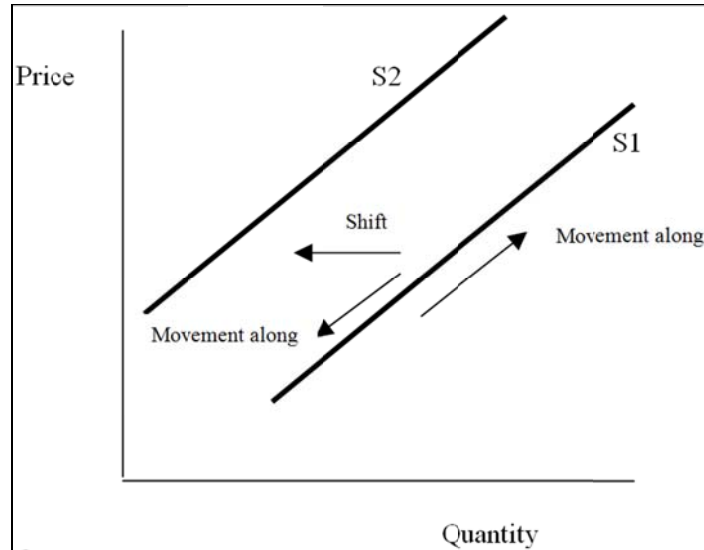


Figure 1.8

If the price of ice cream changes but everything else remains constant, there is a movement along the supply curve as the seller attempts to respond to a change in this market signal. If the price of ice cream remains the same but other factors that influence supply change, for instance the price of inputs (sugar), supply changes and there will be a **shift** of the supply curve. (Refer to **Figure 1.8**).



Study skills

If the farmers producing wheat must obtain a higher price than they did previously to produce the same level of output as before, then we can say that there has been—

- A. an increase in quantity supplied.
- B. an increase in supply.
- C. a decrease in supply.
- D. a decrease in quantity supplied.

Solution:

- C. Draw the supply curve. At the same output level and at a higher price, place a point. Draw a line parallel to the first supply curve through this point. The new line (curve) will be to the left and above the initial supply curve—a decrease in supply.



Study skills

An increase in the price of a complement in production leads to —

- A. an increase in the supply of the good.
- B. an increase in the supply of the good.
- C. an increase in the supply of the good in question *and* a decrease in the quantity supplied of the good.
- D. no change in the supply of the good.

It is expected that the price of palm oil will increase in one month. This belief will lead to —

- A. a decrease in the current supply of palm oil.
- B. a decrease in the future supply of palm oil.
- C. an increase in the current quantity supplied of palm oil.
- D. an increase in the current supply of palm oil.

Solutions:

Discuss your answers with your tutor.

Supply and demand together

Having analysed supply and demand separately, we now combine them to see how they determine the quantity of a good sold in a market and its price.

Market equilibrium

In discussions so far, there has been a clear distinction of two things: one involves household decisions on how much to demand; and the other involves firms' decisions on how much to supply. The operation of the market, however, clearly depends on the interaction between suppliers and demanders. At any moment, one of following three conditions prevails in every market:

1. If the quantity demanded exceeds the quantity supplied at the current price, a situation called *excess demand* or *shortage* happens is represented by *DC* in **Figure 1.9**. In this market for ice cream, at the price of \$0.50 (per cone of ice cream), the quantity demanded - Point *C* on the demand curve is 30,000 cones, while the quantity supplied – represented by Point *D* on the supply curve is 5 thousand cones. The size of excess demand is 25,000 cones.
2. If the quantity supplied equals the quantity demanded at the price of \$1.00, it is a situation called *equilibrium*. The quantity demanded is equal to quantity supplied i.e. 20,000 cones.

3. If the quantity supplied exceeds the quantity demanded at the current price, a situation called *excess supply* or *surplus* happens. This is represented by Points *BA* in **Figure 1.9**. At the price of \$1.25, the size of the excess supply is 15 thousand cones of ice cream.

Equilibrium is a situation in which supply and demand have been brought into *balance*. The equilibrium price is the market-clearing price because at this price, the needs of the buyers are exactly matched by the desire of sellers to sell. At the equilibrium, there is no tendency for price to change.

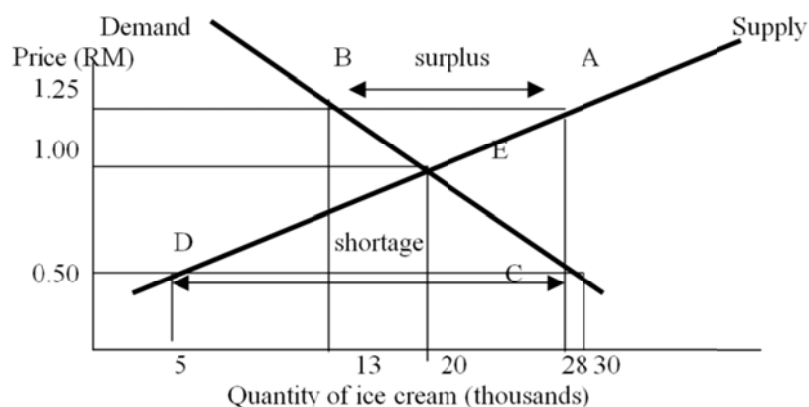


Figure 1.9

The adjustment of price is the rationing mechanism in free markets. In such markets, price rationing means that whenever there is a need to ration a good – when excess demand exists, the price of the good will rise until the quantity supplied equals the quantity demanded, until the market clears.

When and if the market price is controlled (typically by a government) or is unable to adjust freely, a different type of rationing, quantity rationing, will be required. In this case, the mechanics of the free market system will be replaced by a government-controlled mechanism. A typical example of quantity, or non-price, rationing would be rationing by coupons. Ration coupons were employed in most parts of the world during the years of the Great Depression, from 1929-1933, and also during the 1940s, where most governments imposed price ceilings on meat, sugar, petrol and many other items. The ration coupon entitled a family to a specific quantity of the product per month and was supposed to ensure that everyone received the same amount, regardless of their income. This practice still exists in most developing countries today.

When ration coupons are used with no prohibition against trading them, the result is similar to a system of price rationing. Those who are willing and able to pay the most will simply buy up the coupons and use them to purchase petrol, chocolate, fresh eggs or anything else that is sold at a restricted price. This means that the price of the restricted good will effectively rise to the market-clearing price. For instance, suppose you

decide not to sell your ration coupon. You are then forgoing what you would have received by selling the coupon. Thus the real price of the good you purchase will be higher (if only in opportunity cost) than the restricted price.

The effect of changes in demand and supply

How will the price mechanism respond to changes in consumer demand or producer supply? After all, the pattern of consumer demand changes over time. For example, people may decide they want more DVDs and fewer VCRs. Likewise, the pattern of supply also changes. For example, changes in technology may allow the mass production of computer hard drives at lower cost while the production of hand-built cars becomes relatively expensive. In all cases of changes in demand and supply, the resulting changes in *price* act as both signals and incentives.

A change in demand

A rise in demand is signalled by a rise in price. This acts as an incentive for supply to rise. What in effect is happening is that the high price of these goods relative to their costs of production indicates that consumers are willing to see resources diverted from other markets. Firms respond by doing just that. They divert resources from goods with lower prices relative to costs (and hence lower profits) to those goods that are more profitable.

A fall in demand is indicated by a fall in price. This acts as an incentive for supply to fall as these goods are now less profitable to produce.

Returning to the market for ice cream, suppose that due to a possible consequence of the demographic from an aging population, the demand for ice cream drops. This causes the demand curve to shift to the left as seen in **Figure 1.10**. As a result, the new equilibrium will result in a lower price and lower quantity.

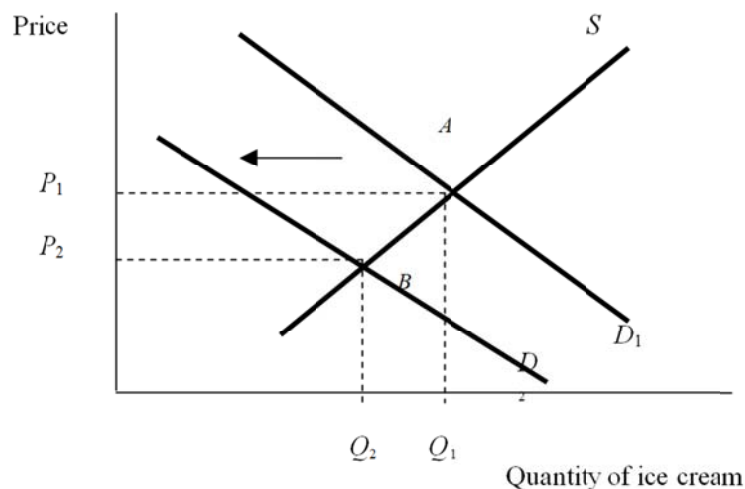


Figure 1.10

A change in supply

A rise in supply is signalled by a fall in price. This acts as an incentive for demand to rise. A fall in supply is signalled by a rise in price. This, on the other hand, acts as an incentive for demand to fall.

Let us explore these dynamics in the market for ice cream. As noted before, let us assume that sugar has become more expensive. As a result, at each price, the suppliers of ice cream will cut back their supply hence the supply curve shifts to the left as seen in **Figure 1.11**. Therefore, the new equilibrium will result in a higher price and reduced quantity of ice cream.

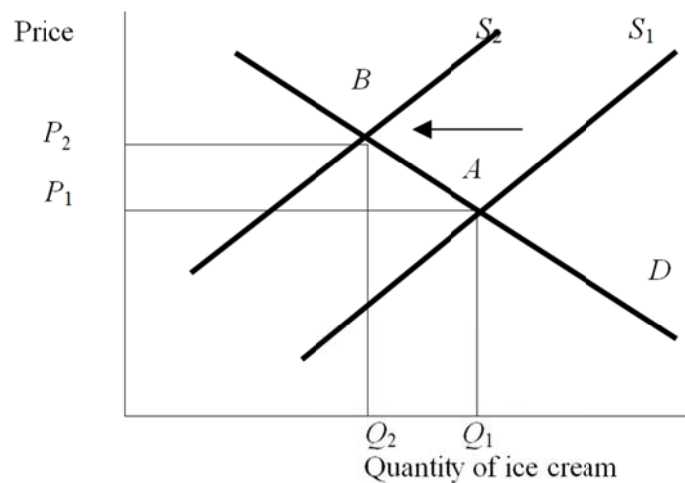


Figure 1.11

A change in both demand and supply

Suppose that there has been a change in supply due to an increase in the price of sugar simultaneously with a change in demand due to the aging factor. In this case, both curves shift to the left as shown in **Figure 1.12**. The new equilibrium point will be associated with a lower quantity but an ambiguous price. The price level could rise or fall or stay the same depending on the relative shifts of these two curves and their slopes. We call the impact on the price in this case as *indeterminate*.

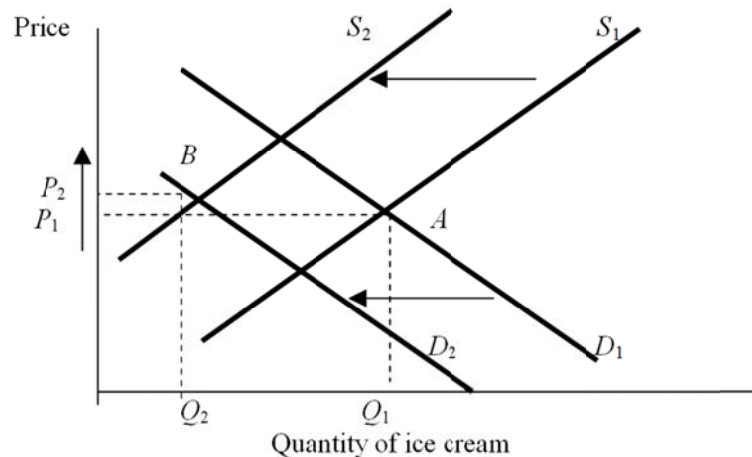


Figure 1.12

In this case, Point *B* lies slightly above Point *A*, indicating a small increase in price whereas the quantity has unambiguously dropped. The fact is that Point *B* could be placed below Point *A* to mark a fall in price or it could be placed horizontally to the left of point *A*, in which case the price would have remained unchanged.

The following **Table 1.3** helps summarise the outcome of a simultaneous shift in both the demand curve and the supply curve when the magnitudes of the shifts are unknown.

Scenario	Price Change	Quantity Change
Demand rise, supply rise	Uncertain	Rise
Demand rise, supply fall	Rise	Uncertain
Demand fall, supply rise	Fall	Uncertain
Demand fall, supply fall	Uncertain	Fall

Table 1.3

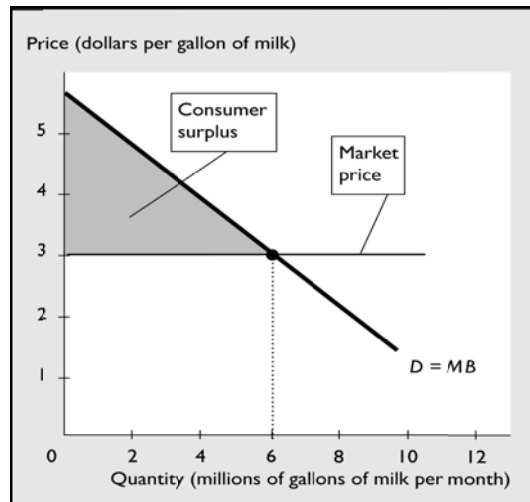
Consumer Surplus, Producer Surplus and Market Efficiency

Demand and marginal benefit

- **Marginal benefit** refers to the value of one more unit of a good or service. It is measured as the maximum price that people are willing to pay for another unit of a good or service. The demand for a good or service is determined by the willingness to pay for it.
- Hence, a **demand curve for a good or service is also its marginal benefit curve**, as shown in the figure.
- The demand curve in the figure indicates that the maximum price a consumer is willing to pay for the 6,000,000th gallon of milk

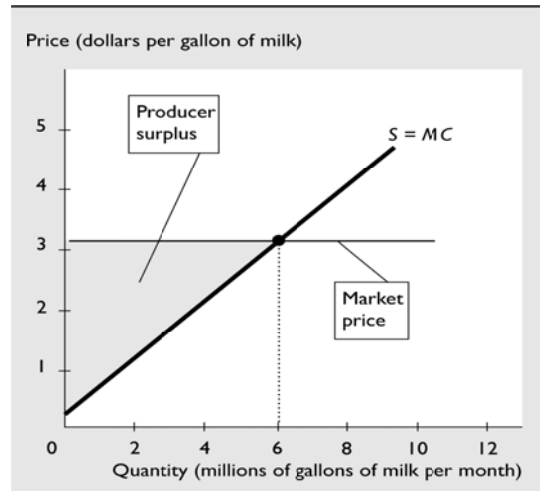
per month is \$3, so \$3 is the value and marginal benefit of this gallon.

- The difference between marginal benefit from a good or service and the price paid for it is called **Consumer surplus**. The shaded triangle as shown in the figure is the consumer surplus when the price is \$3 per gallon.



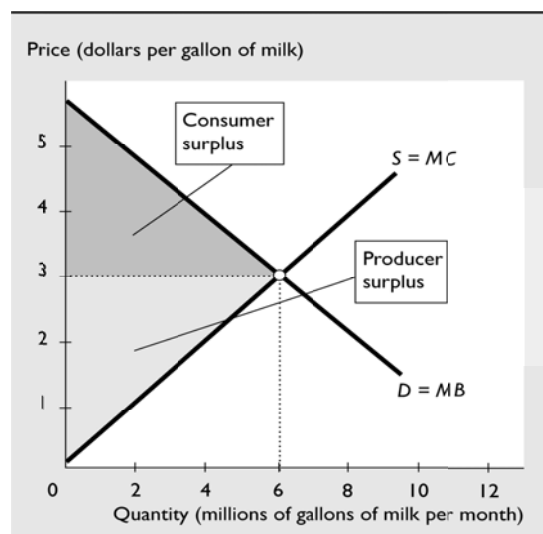
Supply and marginal cost

- Marginal cost refers to the cost of one producing more unit of a good or service. It is measured as the minimum price that producers must receive to induce them to produce another unit of the good or service. Hence, **a supply curve for a good or service is also its marginal cost curve**, as shown in the figure.
- The upward sloping supply curve in the figure shows that the minimum price a producer must receive to be willing to produce the 6 millionth gallon of milk per month is \$3, so \$3 is the marginal cost of this gallon.
- The difference between the price of a good and its the marginal cost of producing it is the producer surplus, summed over the quantity produced. The shaded triangle as shown in the figure is the **producer surplus** when the price is \$3 per gallon.



Markets efficiency

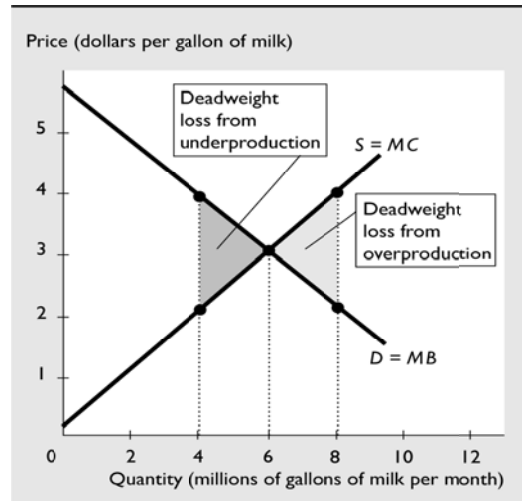
- A competitive equilibrium is defined as the point where the quantity demanded is equal to the quantity supplied in the market. As shown in the figure, the equilibrium quantity is 6 million gallons with the equilibrium price \$3 per gallon. At this equilibrium point, the market is efficient as marginal benefit of the last unit produced equals its marginal cost. Hence, the equilibrium quantity is also the efficient quantity.
- The **total surplus** from a good or service is the sum of the consumer surplus plus the producer surplus. As the figure illustrates, when the efficient quantity of milk is produced, the sum of the consumer surplus and producer surplus is maximised.



- However, if the market does not produce the efficient quantity, it will either produce less than the efficient quantity (underproduction) or produce more than the efficient quantity

(overproduction). In either case, a deadweight loss occurs. A **deadweight loss** is the decrease in the consumer surplus and producer surplus that results from producing an inefficient quantity of a good. The figure shows the deadweight loss from overproduction of milk and from underproduction.

- The main obstacles to achieving an efficient allocation of resources in a market are *price and quantity regulations* and *taxes and subsidies* imposed by government.



Study skills

Jason just bought a used computer. When he was leaving the shop, he thought that he such a great deal and would have paid \$100 more dollars for the stick. Jason received —

- consumer surplus.
- producer surplus.
- marginal cost.
- total surplus.

Consumer surplus exists when —

- consumers value the good more highly than what they must pay to buy it.
- the price of the good is smaller than the marginal cost of producing a unit of the good.
- it costs less to produce goods than buyers must pay for them.
- taxes on goods are less than the appropriate amount.



- Mary's cost of making an additional rocking chair is \$85. —
- A. If she sells it for a \$100, her producer surplus is \$15.
 - B. Her marginal cost is equal to \$15.
 - C. The marginal benefit to the consumer from the chair will be \$85.
 - D. Both answers A and B are correct.

- If marginal cost is equal to marginal benefit, then the —
- A. sum of producer surplus and consumer surplus is as large as possible.
 - B. producer surplus is equal to the consumer surplus.
 - C. deadweight loss is more than zero but less than its maximum.
 - D. sum of producer surplus and consumer surplus equals zero.

- When efficiency is achieved, the sum of the total amount of producer surplus and consumer surplus is —
- A. equal to the deadweight loss.
 - B. minimised.
 - C. maximised.
 - D. equal to zero.

Solutions:

Discuss your answers with your tutor.

Interfering with the law of supply and demand

On many occasions, governments and sometimes private firms may decide to use some mechanism other than the market system to ration an item for which there is excess demand at the current price. This was often the case depicted in the former Soviet Union and other communist nations such as China. The rationale behind the use of these mechanisms is fairness. This is because the law of supply and demand which governs the level at which prices are set, can produce results that some individuals or groups do not like. For example, it is not 'fair' to let landlords charge high rents, or for oil companies to hike the price of petrol and oil.

The purpose of this section is to study how government policies control prices and hence market outcomes. We use the tools of demand and supply to analyse various types of government policies.

The equilibrium price in a free market occurs at the price at which quantity demanded equals quantity supplied. Government *price controls* are policies that attempt to hold the price at some disequilibrium value that could not be maintained in the absence of the government's intervention. We begin by looking at two basic policies: price ceilings, which impose a maximum price that can be charged for a product and

price floors, which impose a minimum price. Rent control laws and agricultural support policies are examples of price ceilings and price floors.

In the case of price ceilings, the control mechanism holds the market price below its equilibrium value. This creates a shortage, with quantity demanded exceeding quantity supplied at the controlled price. If the price ceiling is set above the equilibrium price, it has no effect because the equilibrium remains attainable. If, however, the price ceiling is set below the equilibrium price, the price ceiling lowers the price and is said to be binding or effective.

In the case of price floors, the control mechanism holds the price above the equilibrium price. This creates a surplus, with quantity supplied exceeding quantity demanded at the controlled price. If the price floor is set below the equilibrium price, it has no effect because the equilibrium remains attainable. If, however, the price floor is set above the equilibrium price, it raises the price floor and is said to be binding or effective.

Price ceilings: The case of rent control

Rent controls are perhaps the most extensively studied form of price ceilings and they provide a vivid illustration of the short and long-term effects of this type of market intervention. Note, however, that the specifics of rent-control laws vary greatly and have changed significantly since they were first imposed many decades ago. In particular, current laws often permit exemptions for new buildings and allowances for maintenance costs and inflation. Moreover, in many countries, rent controls have evolved into the second generation where they focus more on *regulating* the rental housing market rather than simply *controlling the price* of rental accommodation.

Figure 1.13 illustrates the effect of rent control laws as an example of a price ceiling. In Panel A, R^* is the market equilibrium rental rate, where the demand for housing equals the supply. However, the local government is concerned that at R^* many poor people cannot afford a house in the city, so it imposes a law that says that rents may be no higher than R_c . At R_c , there is an excess demand (*shortage*) for rental units that worsens as time passes. While the motives behind the government action may have been praiseworthy, the government has created an artificial scarcity.

The short-run supply of housing is shown by the vertical curve SS . Thus quantity supplied remains at Q_1 in the short run and the shortage is Q_1Q_2 . This is because in the short run, landlords have a fixed number of apartments to rent and they cannot adjust their number quickly as market conditions change. Over time, the quantity supplied shrinks, as shown by the long-run supply curve SL . In the long run, there are only Q_3 units of rental accommodation, fewer than when controls were instituted. The housing shortage of Q_2Q_3 , which occurs after the supply has fully adjusted, is larger than the initial shortage of Q_1Q_2 .

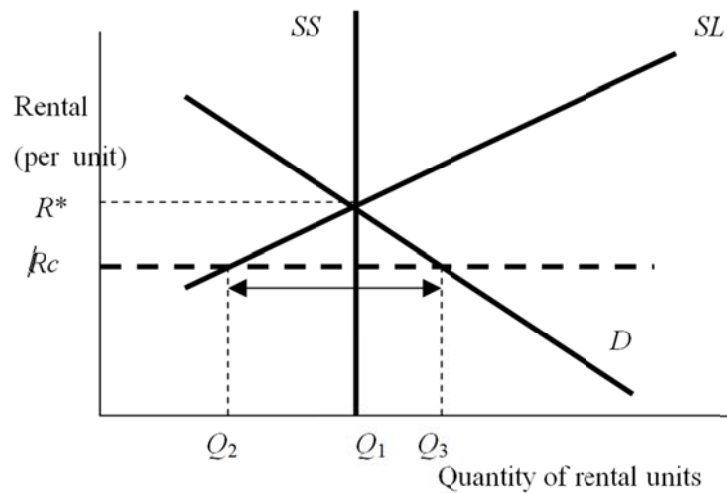


Figure 1.13

The long-run story is different from the short run in the sense that neither side of the market is constrained by time and both can respond freely to market conditions. As the returns from investing in new rental housing fall significantly below what can be earned on comparable investments, funds will go elsewhere. New construction will be halted and old buildings will be converted to other uses or will simply be left to deteriorate. This implies that the long-run supply curve for rental accommodation which refers to the quantity supplied after all adjustments have been made is flat.

As with many government policies, there are some gainers and losers. The gainers will be the households that happen to be lucky enough to have a rental unit. Their rent will be lower than it otherwise would have been. Among the losers will be the owners of rental accommodation, who will receive lower rents and incomes compared to the situation before the implementation of rent controls. There are also potential landlords who would have supplied rental accommodation at the market price but are unable to cover costs at the controlled rent. Perhaps the most important losers are the households that are unable to find any rental accommodation, given the limited supply. Among these will be low-income households that are presumably the ones the policy was meant to benefit.

Price ceilings usually give rise to black markets. A *black market* is any market in which goods are sold at prices that violate a legal price control. Effective price ceilings create the possibility for a black market because a profit results from buying at the controlled price and selling at the black market price.

Price floors: The case of minimum wage laws

Governments sometimes establish a price *floor*, which is the minimum permissible price that can be charged for a particular good or service.

Price floors may be established by rules that make it illegal to sell the product below the prescribed price, as in the case of a minimum wage.

Effective price floors lead to excess supply. Either an unsold surplus will exist, or someone must enter the market and buy the excess supply. The consequences of excess supply will, of course, differ from product to product. If the product is labour which is subjected to a minimum wage, excess supply translates into people without jobs. If the product is wheat, and more is produced than the quantity sold to consumers, the surplus of wheat will accumulate in grain elevators or government warehouses. On the other hand, price ceilings are meant to help demanders (buyers), price floors are meant to help suppliers (sellers). With a price floor such as a minimum wage, buyers (employers) cannot pay less than the government-set minimum wage. The effects of binding price floors are illustrated in **Figure 1.14**.

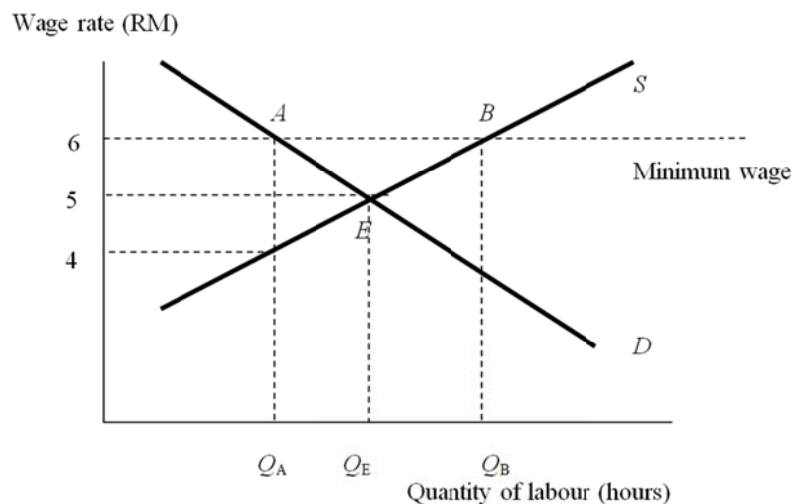


Figure 1.14

As indicated before, the short end of the market determines the quantity exchanged. In this case, the lesser of the market is demand. At the minimum wage (RM6), only Q_A units (hours) of labour are demanded but Q_B units (hours) are supplied. Therefore, $Q_A Q_B$ units are considered unemployed. Note that only $Q_E - Q_A$ units of labour are displaced. The remaining part of unemployment ($Q_B - Q_E$) is due to the increased number of workers who have been drawn to the labour force in response to the higher wage (\$6 versus the market rate, \$5) in their search for a job. With only Q_A employed, the remaining quantity $Q_A Q_B$, will continue to spend time and resources searching for a job. The diagram indicates that these unemployed individuals are willing to supply their labour services for as little as \$4. (Why \$4? This is a good test of your knowledge of supply and demand theory.)

In the case of minimum prices, agricultural price supports are designed with the purpose of making suppliers (farmers) better off. Note, however,



that the excess supply, in the case of agricultural products, is pure waste from an efficiency point of view.

Alternatively, governments can regulate quantities traded on markets, and thereby indirectly determine market prices. For example, if governments can restrict the quantity of a product supplied, this will artificially increase the market price to producers per unit of their restricted production. This would be the case since consumers are willing to pay a higher price for it.



Study skills

When a price floor is established above the equilibrium price, we can say that—

- A. quantity demanded is less than quantity supplied
- B. quantity demanded decreases
- C. quantity supplied increases
- D. all of the above

Solution:

- C. As the price increases, there will be an upward movement along both curves, not a shift in these curves. The quantity supplied increases while quantity demanded decreases.

Taxes

When you buy products subjected to sales taxes, you pay the price tag plus the tax. In some countries, sales taxes are pervasive and cover a large number of goods and services. In others, this is not the case. In some countries and tax jurisdictions, sales taxes are incorporated into the price tags, so you do not pay for taxes separately, whereas in other countries, the sales tax is added to the price. The important questions highlighted in relation to taxes are:

1. How do we analyse the impact of sales taxes in the supply/demand framework?
2. What portion of the sales tax will consumers and producers end up paying? Will consumers end up paying all of it?

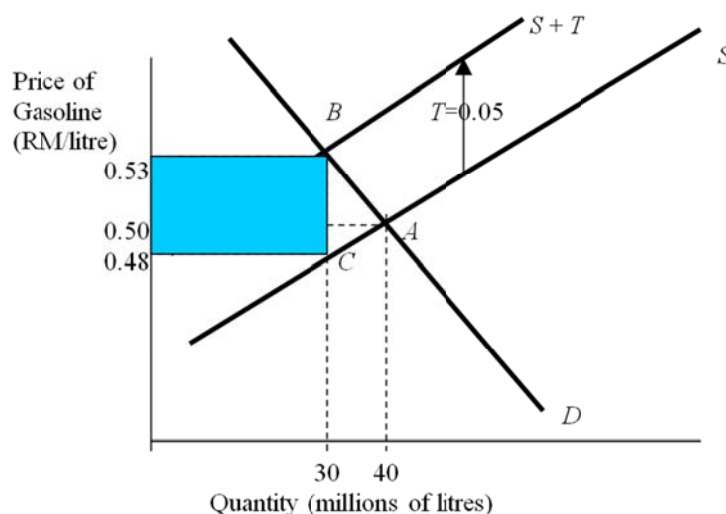


Figure 1.15

Figure 1.15 shows the market for petrol. The demand and supply curves before the tax are represented by D and S . The equilibrium price and the quantity before tax are \$0.50 (50 cents) and 40 million litres per week. Suppose the government levies a sales tax on petrol, let us say \$0.05 (5 cents) per litre of petrol (\$/litre). What are the effects of this tax on the quantity and price paid by consumers and those received by producers?

When the sales tax is introduced, it leaves the demand curve intact while it raises the supply curve by the amount of the tax of 5 cents. To see this logic, remember that the supply curve represents the quantities that a firm is to offer at alternative prices. The supply curve in **Figure 1.15** reflects the prices excluding taxes charged by the sellers. When the tax is levied, the price charged by the sellers must reflect the tax. Therefore, the supply curve shifts up (a decrease in supply) by the amount of tax (5 cents on the vertical axis). Note that this shift is a parallel shift since the amount of tax is fixed per litre of petrol and does not change with the volume of consumption. The tax-inclusive supply curve reflects the fact that sellers are willing to supply the same quantities only if they get paid 5 cents more than before per litre. The 5 cents added to the price is the sellers' new obligation to the government. In other words, sellers are willing to sell as much petrol as before at the same (net of the tax) prices.

At the new equilibrium, Point B , the price has risen and the volume of transactions has fallen.

However, the equilibrium price of 53 cents is the price paid by consumers. Note that the price does not rise by the full amount of 5 cents to consumers even though the government has levied a 5-cent tax. In order to clarify this point, remember that the vertical distance between the two supply curves is 5 cents. As long as the demand curve is not perfectly vertical, consumers will pay only a portion of the tax. The remaining portion is paid by sellers (suppliers) who receive 48 cents per litre as opposed to 50 cents (Point C). Therefore, the burden of the tax is shared



by both consumers and producers: 3 cents by the former and 2 cents by the latter. The government collects its 5 cents regardless of how the burden is shared. In fact, the government revenue from new taxation is equal to the volume of petrol sold after the imposition of tax (30 million litres) multiplied by 5 cents per litre (\$1.5 million). This is equal to the area of the shaded rectangle in **Figure 1.15**.

A final point of this analysis is how the burden of the tax is shared between the two sides. In this example, the consumers' share of the new sales tax (3 cents) is greater than the producers' share (2 cents). In general, who gets to pay a bigger portion of the tax is a function of the *slopes of the demand and supply curve*. The steeper the demand curve for petrol, the greater the portion of the 5 cents that will be paid by consumers. In contrast, the flatter the demand curve, the smaller the consumer's share. Furthermore, the flatter the *supply curve*, the bigger the portion paid by consumers and vice versa.

Ad valorem taxes

In many circumstances, the sales tax – whether levied on buyers or sellers – may take the form of a percentage of the price (known as *ad valorem tax*) as opposed to a fixed amount of tax per unit (specific tax). The case illustrated above is the latter. In terms of the outcome, a specific tax and an *ad valorem* tax of equal value result in the same outcome pertaining to price, quantity and government tax revenue. For example, in the above diagram, the equivalent percentage tax to 5 cents per litre would be 10 per cent i.e. 10 per cent of 50 cents = 5 cents. The only difference between the two types of taxes would be in the way they make the curves shift. A specific tax results in a parallel shift whereas the shift from an *ad valorem* tax is non-parallel. Obviously, the higher the price, the greater the dollar amount of tax for a given fixed percentage (for example 10 per cent of 50 cents is 5 cents, whereas 10 per cent of one dollar is 10 cents). Therefore, the vertical distance between the supply curve (or demand curve) excluding and including the tax widens as the price increases.

Exports and imports

Every nation produces little or none of certain products. Any domestic consumption of these products must therefore be satisfied by imports from other countries. For example, many countries do not produce oil, whereas some produce and export oil. Oil is an example of a mineral that is also considered a commodity. It is standardised, easily gradable and internationally tradable. There are numerous other examples of commodities such as gold, other precious metals, forest products such as timber, as well as agricultural products. Certainly, exports and imports are not limited to commodities. These days, the bulk of world trade is in the form of services.

It is believed that markets for commodities around the world should command a single price. In other words, the price of crude oil should be the same in the world markets irrespective of the market location. A single world price situation, however, requires that transactions costs (the

costs of buying and selling as well as transportation costs) be insignificant. The concept of a single world price or *law of one price*, therefore, applies to commodities. The world price for a tradable commodity is the price that is determined by world demand and world supply. The law of one price does not apply to manufactures and services that are differentiated. Naturally, it does not apply to products that are non-tradable internationally.

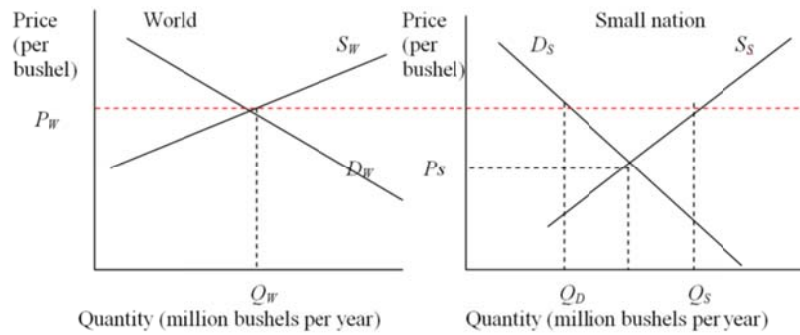
How much influence a country may have on the world market depends on the relative importance (supply and demand) of that country in the world market. For example, Saudi Arabia is a major player in the market for oil and Canada for nickel, uranium and wheat. However, the simplest case for us to study arises when a country accounts for only a small part of the total worldwide demand and supply. As a small economy, the country neither buys nor sells quantities large enough to influence the world price significantly. Assuming that the law of one price prevails in this case, producers and consumers in the small economy face a world price that they cannot influence by their own actions. This implies that in a small importing nation, consumers can buy whatever amount of the product they choose at that price. The world price does not change irrespective of the volume of the nation's purchase. In other words, a horizontal world supply curve prevails.

Similarly, in a small exporting nation, producers can sell whatever amount of the product they choose at that price. The world price does not change irrespective of the volume of the nation's sale. Therefore a horizontal world demand curve prevails.

To determine the pattern of trade for a nation, we first show the domestic demand and supply curves for some product, for example: oil. The intersection of these two curves tells us what the price and quantity would be if there is no foreign trade. Now compare this no-trade price with the world price of that product. If the world price is lower, the actual domestic price will fall below the no-trade price and there will be an excess demand for the product. The shortage of domestic supply will be imported from abroad. Conversely, if the world price is higher, the actual price in the nation will exceed the no-trade price and will be an excess of domestic supply over domestic demand. The surplus will be exported for sale abroad.

Figures 1.16 and **1.17** show respectively, the case of an exporting and importing nation.

Suppose the exporting market is the market for wheat. D_S and S_S are the small nation's demand and supply curve respectively. D_W and S_W refer to the world demand and supply curves in the wheat market. P_S and P_W are the small nation's domestic price and the world price of wheat respectively.



Figures 1.16

Facing the world price level, P_w , which is above the domestic price P_s , the nation's consumers will demand less, Q_D , and its producers will produce more Q_S . The resulting excess supply (surplus) for wheat, $Q_S Q_D$, will be exported abroad as seen in **Figure 1.16**.

Suppose the importing market is the market for oil. D_S and S_S are the small nation's demand and supply curves respectively. D_W and S_W represent world demand and supply curves in the oil market. P_S and P_W represent the small nation's domestic and the world price of oil respectively.

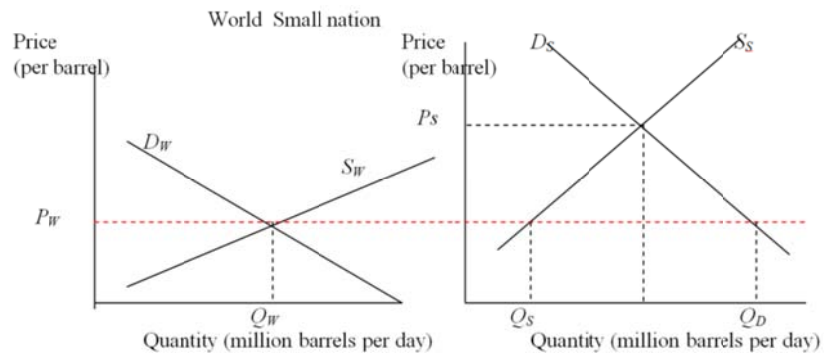
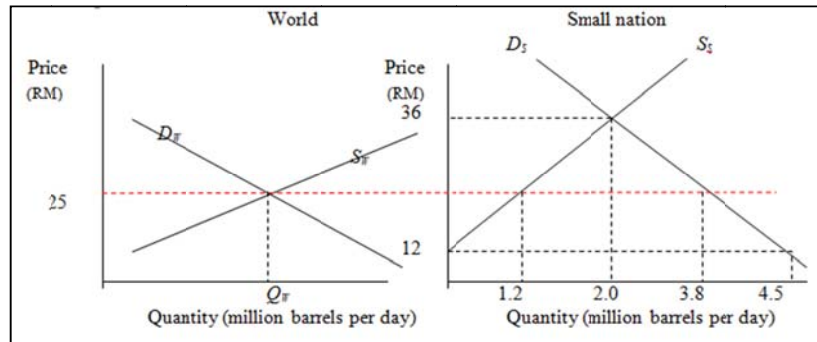


Figure 1.17

Facing the world price level, P_w , which is below the domestic price, P_s , the nation's consumers will demand more, Q_D , and its producers will produce less, Q_S . The resulting excess demand (shortage) for oil, $Q_S Q_D$, will be imported from abroad as seen in **Figure 1.17**.



Study skills



1. If the world price of \$25 per barrel is the market price in the small nation, then there will be an _____ of _____ million barrels per day.
 - A. excess supply, 1.2
 - B. excess supply, 2.6
 - C. excess demand, 3.8
 - D. excess demand, 2.6
2. If the world price \$25 per barrel is the market price in the small nation, then the nation's domestic production will be _____ and its imports will be _____ million barrels per day.
 - A. 3.8, 3.8
 - B. 3.8, 1.2
 - C. 1.2, 2.6
 - D. 3.8, 2.6

Solution:

1. D. At \$25 per barrel, quantity supplied is 1.2 million and quantity demanded is 3.8 million.
2. C. At \$25 per barrel, quantity supplied is 1.2 whereas quantity demanded is 3.8 million, leaving an excess demand of 1.6 to be imported.

Market Demand and Pricing Decision

Introduction

Suppose you are the CEO of a major airline. The current economic recession has decreased the demand for air travel. As a result, you decide to build air traffic by offering low fares between major destinations. In



doing so, you also hope to increase your demand by taking a certain amount of the shrinking market for air travel from your competitors. However, you wonder if the increased volume that you hope to generate is large enough to make up for the loss of income caused by the lower prices you are initiating. You can also predict if your major competitors will quickly match your price cuts with the result that everyone in the industry suffers from the reductions.

It is important that managers understand consumers' responses to price changes. Managers also need to understand other producers' responses. In this section, we will focus on the former – consumers.

Demand elasticity

As discussed in the previous section, the amount that people are willing to buy of a good or service and its price are inversely related. In other words, consumers will buy more as the price of a good or service decreases and will buy less as the price increases. Air Canada, General Motors and Compaq could therefore assume that they were going to sell more when they lowered their prices. What they did not know for certain was whether the increase in unit sales was going to be sufficient to offset their price reductions. From the seller's standpoint, it is important to know the extent of the consumer's response relative to price changes.

Suppose at a price of \$6, consumers buy 1,000 units per time period of a particular product. The total revenue earned by sellers is determined by the unit price multiplied by the quantity purchased. Thus, at the price of \$6, sellers' revenue is equal to \$6,000. Suppose now that the price falls to \$5 and, as a result, consumers increase their purchases to 2,000 units per time period. In terms of total revenue, this price reduction will benefit the sellers because the total revenue will increase to \$10,000. But what if the price reduction from \$6 to \$5 causes the quantity demanded to increase to only 1,100 units? This will hurt sellers because their revenue will drop to \$5,500 (see **Table 1.4** for examples of demand schedules).

In **Table 1.4**, each demand schedule has the same set of prices. The only difference is the responsiveness of the buyers to the different prices. Demand 1 has the more responsive set of buyers; when the price falls from \$6 to \$5 to \$4, the increase in the quantity demanded is more than enough to compensate for the decrease in price. Hence, total revenue (TR) increases. When these same reductions in price occur in Demand 2, the increase in quantity is not enough to compensate for the price reduction and so total revenue falls. In Demand 3, the change in the quantity demanded is just enough to offset the change in the price. Thus, total revenue is unchanged, regardless of the direction of change in price.

Demand 1			Demand 2			Demand 3		
P	Q	TR*	P	Q	TR	P	Q	TR
\$6	1,000	6,000	\$6	1,000	6,000	\$6	1,000	6,000
\$5	2,000	10,000	\$5	1,100	5,500	\$5	1,200	6,000
\$4	3,000	12,000	\$4	1,200	4,800	\$4	150	6,000

Table 1.4 Three demand schedules

Table 1.5 summarises the relationship between elasticity, price changes and changes in total revenue. It shows that when the price decreases and the total revenue increases, consumers are so responsive that their increase in purchases is more than enough to compensate for the price reduction. This type of response is called *elastic* and also implies that when the price increases, the negative response by consumers is large enough to offset that increase. Thus, sellers end up generating less total revenue. A decrease in price accompanied by a decrease in total revenue indicates an *inelastic* demand. When the price changes and there is no change in total revenue, demand is called *unit elastic*.

	Elastic	Inelastic	Unitary
Price rises	TR falls	TR rises	No Change
Price falls	TR rises	TR falls	No Change

Table 1.5 Price changes, elasticity and changes in total revenue

We have just discussed the concept of elasticity in terms of the impact that price changes will have on total revenue earned by sellers. Elasticity can also be measured in a more precise way by comparing the degree of responsiveness among buyers to changes in price. This measure is defined as the percentage of change in quantity demanded relative to the percentage of change in price. That is:

$$E_p = \frac{\text{Percentage change in } Q}{\text{Percentage change in } P} = \frac{(Q_2 - Q_1)/Q_1}{(P_2 - P_1)/P_1}$$

where

E_p = the elasticity coefficient,

Q_1 = the original quantity demanded,

Q_2 = the new quantity demanded,

P_1 = the original price, and

P_2 = the new price.



If the percentage of change in quantity demanded exceeds the percentage off change in price, the elasticity coefficient E_p will have a value greater than one – it is *elastic*. If the percentage of change in the quantity demanded is less than the percentage of change in price, then E_p will be less than one. This, by definition, is an *inelastic* demand. If E_p is equal to one, demand is *unitary elastic*.

From **Table 1.5** we can calculate the price elasticity of demand. Using Demand 1, we see that the percentage of increase in quantity is 100 per cent i.e. $(2,000 - 1,000)/1,000$. The percentage of change in price is -16.67 per cent ($5 - 6$ divided by 6). Thus, E_p is equal to 100 divided by -16.67 or -6. Using the same formula for Demand 2, we see that the decrease in price from \$6 to \$5 indicates an elasticity coefficient of -0.6. The percentage of increase in quantity in this case would be 10 per cent, $(1,100 - 1,000)/1,000$, whereas the percentage of change in price remains at -16.67.

To handle this inherent ambiguity, we employ a formula that adjusts the difference in base numbers. This formula is expressed as follows:

$$E_p = \frac{(Q_2 - Q_1)}{(Q_1 + Q_2)/2} \div \frac{(P_2 - P_1)}{(P_1 + P_2)/2}$$

By dividing the change in quantity and price by the respective *midpoints* between the changes, this formula provides a common base from which either percentage increases or decreases can be calculated. Thus, for any two prices and quantities, the elasticity coefficient would remain the same no matter which direction the price has changed. For example, in Demand 1, between \$6 and \$5, elasticity coefficient is -3.67. In Demand 2, it is -0.52. In Demand 3, the elasticity coefficient is -1, which explains why economists call this type of demand change *unitary elastic*.

Different types of elasticity

Demand responsiveness may be classified in *absolute* terms as:

a.	Perfectly elastic	$E_p = \infty$ (infinity),
b.	Elastic	$E_p > 1$,
c.	Unitarily elastic	$E_p = 1$,
d.	Inelastic	$E_p < 1$,
e.	Perfectly inelastic	$E_p = 0$.

Figure 1.18 provides a graphic representation of the five degrees of demand responsiveness.

Five demand curves are shown representing four different elasticity situations. D_1 represents the *perfectly elastic*, D_2 the *elastic*, D_3 the *inelastic*, D_4 the *perfectly inelastic* and D_5 the *unitarily elastic* situation.

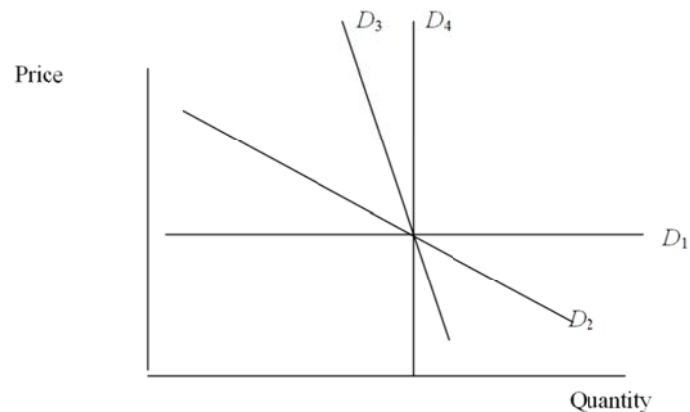


Figure 1.18

Pointers on **Figure 1.18**: Initially, you might confuse the two extreme cases, perfectly inelastic and perfectly elastic. In the case of ‘perfectly’ think ‘completely’. If you have a ‘complete’ lack of response to higher prices, what would happen to the amount you buy? Higher prices will not change the amount you buy. Demand is totally unresponsive and is drawn as a vertical curve. If you have a ‘complete’ response to a higher price, what would happen to the amount you buy? The demand is perfectly elastic and graphically, you are ‘off’ the horizontal demand curve. You buy none of the good.

Total revenue can be viewed as $P \times Q$ (Price \times Quantity) and that is represented by the area of the two rectangles in **Figure 1.19**. It demonstrates the three states of elasticity:

- When demand is *elastic*, D in **Figure 1.19(a)**, a drop in the price *increases* the total revenue – $(P_2 \times Q_2) > (P_1 \times Q_1)$. In terms of the diagram, a price reduction means a larger rectangle.
- Predictably, for inelastic demand, the same drop in price implies a decrease in the size of the rectangle.
- When elasticity is equal to one, unit elastic, the demand curve – D in **Figure 1.19** will be a curvilinear boundary marking a rectangle ($P \times Q$) which remains unchanged in area.

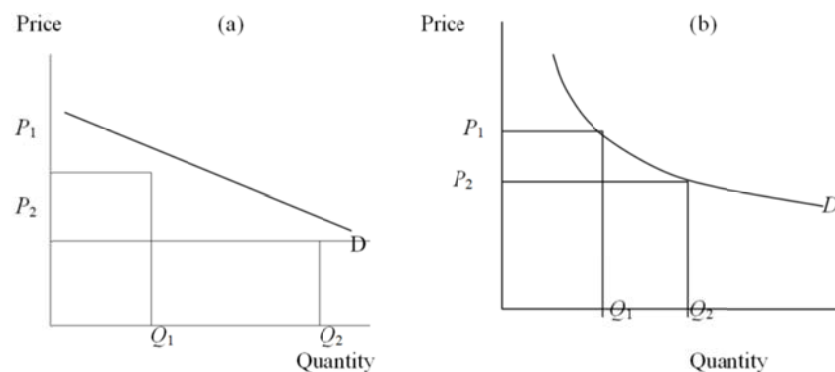


Figure 1.19



Study skills

Use the following information to answer questions 1 and 2. Double Triple Pizza has been experimenting with the price of its Extra Thick Pan Pizza. At the price of \$12, the quantity demanded is 100 pizzas. At \$10, the quantity demanded increases to 120 pizzas. When the price is \$8, the quantity demanded increases to 140 pizzas.

- Using the midpoint formula, determine whether the price elasticity of demand between \$12 and \$10 is—
 - elastic with a coefficient of -2
 - unitarily elastic with a coefficient of -1
 - elastic with a coefficient of -10
 - inelastic with a coefficient of -.1
- Using the midpoint formula, determine whether the price elasticity of demand between \$12 and \$8 is—
 - elastic with a coefficient of $-6/5$
 - elastic with a coefficient of $-5/6$
 - inelastic with a coefficient of $-6/5$
 - inelastic with a coefficient of $-5/6$
- A 10 per cent fall in the price of shampoo results in a 5 per cent increase in the quantity of shampoo demanded. Demand is—
 - inelastic
 - elastic
 - unitarily elastic
 - perfectly elastic
- The price elasticity of demand can be calculated by—
 - multiplying the percentage of change in quantity demanded by the percentage of change in price.
 - dividing the percentage of change in quantity demanded by the percentage of change in price.
 - dividing the percentage of change in price by the percentage of change in quantity demanded.
 - multiplying the percentage of change in price by the percentage of change in quantity demanded.
- The supply of cooking oil increases. There is no effect on the equilibrium quantity. Demand is—
 - perfectly inelastic.
 - Elastic.
 - Inelastic.
 - perfectly elastic.

Solutions:

1. B. P_1 is 12; P_2 is 10; Q_1 is 100; Q_2 is 120. Plug the values into the formula. Note: Confirm your result by using the total revenue test.
2. D. P_1 is 12; P_2 is 8; Q_1 is 100; Q_2 is 140. Options B and C must be incorrect—an elastic demand cannot have a coefficient of $-5/6$ and an inelastic demand cannot have a coefficient of $-6/5$. Note: Confirm your ‘inelastic’ result by using the total revenue test.
3. A. The percentage change in the quantity is less than that in the price.
4. See the definition of elasticity.
5. A. A perfectly inelastic demand curve is a vertical demand curve. This implies, a downward shift in the supply curve has no effect on quantity. Also, intuitively, when demand is perfectly inelastic, a change in price has no effect on the quantity of output demanded.

Factors that determine price elasticity

There are four key characteristics of a product that influence its elasticity. They are:

- A. The degree to which it is viewed as luxury or necessity
- B. The number of substitutes that are available to buyers.
- C. The price of the product in relation to buyers’ incomes.
- D. The amount of time allowed for buyers to react to price changes.

Elastic	Inelastic
1. Luxury	1. Necessity
2. Many substitutes available	2. Few substitutes available
3. Price is a large part of income	3. Price is a small part of income
4. Long-run time period	4. Short-run time period

Table 1.6 Determinants of elasticity of market demand

Consider the following examples as illustrations of the points made in **Table 1.6**.

Electricity has few *substitutes*; therefore the demand for it is inelastic. As more substitutes become available, demand becomes more elastic. AZT, the drug that combats AIDS, at one time had no substitutes; therefore, demand for it was inelastic. The emergence of substitutes will make AZT’s demand more elastic.

Suppose the price of salt or pepper doubled. It is such a small *portion of expenditures* for most people in North America that the price increase



there would pass almost unnoticed, and quantity demanded would respond only slightly: inelastic demand. In contrast, a doubling in the price of a good that is important in one's budget (petrol, perhaps) will provoke a great response. This is a good example of the role price plays in the household budget.

The demand for oil offers a good example of *short and long-run elasticity*. When OPEC conspired to raise the price of oil in 1973 and again in 1979, consumers, especially in industrialised oil importing nations, responded by reducing their purchases by a relatively small amount. One economic study at that time pointed out that the short-run elasticity of demand for oil was about -0.10, a coefficient indicating a very inelastic demand. In the 1980s, however, these consumers had changed their pattern of consumption by car pooling, driving their cars at lower speed, using more fuel-efficient cars and turning their thermostats down. Producers in these countries complemented this response by using more fuel-efficient machinery. Thus, the long-run response to increased oil prices was much more elastic than the short-run response.

Elasticity of a product versus elasticity of a brand

When you examine the elasticity of demand for a product, you must distinguish between the responsiveness of consumers to changes in a given product category and the responsiveness related to a particular brand name within the category. As you might expect, responsiveness is generally greater for a brand than for the product category due to the simple reason that competing brands within the category offer more substitutes to consumers.

For example, if Petro Canada, a nation-wide distributor in Canada, were to increase the price of its petrol, Canadians would anticipate a relatively elastic responsiveness in the quantity purchased because of the decrease in consumption from those who regularly buy this brand. These buyers would be enticed by the relatively lower prices of Petro Canada's rivals. (This example assumes that the sellers of the competing brands do not match Petro Canada's price hike.) An increase in the *average* price of petrol would probably generate a less elastic response because car drivers might not view such substitutes as taxis, public transport, car pooling and so on, as being close alternatives to driving their own cars – at least in the short run.

Point elasticity and the price range factor

In determining the degree of price elasticity, it is also important to consider the range in which changes in price and quantity occur. Suppose we extend the changes in price and quantity in **Table 1.4** by exactly the same increments. That is:

P	Q	R
\$6	1,000	\$6,000
\$5	2,000	\$10,000
\$4	3,000	\$12,000
\$3	4,000	\$12,000
\$2	5,000	\$10,000
\$1	6,000	\$6,000

You will notice that as the price drops from \$6 to \$1, the pattern of change in total revenue alters. Down to \$4, revenue increases, implying an *elastic* response. Between \$4 and \$3, there is no change, implying *unitary elasticity*. As the price drops below \$3, the same incremental response of 100 units results in a decrease in total revenue. Generally, at *higher price* levels, price decreases produce *elastic* responses in quantity demanded; at *lower price* levels, price reductions are accompanied by an *inelastic* response. There is no magic in this observation; it is all in the arithmetic of the elasticity formula and in the demand schedule itself.

The formula for determining elasticity utilises the *percentage* of change, not the *absolute* change, in quantity demanded relative to price. In the upper half consists of the price range (the lower half consists of the quantity range), any decrease in price is bound to be relatively small in percentage terms because the base price is relatively high. By the same concept, the corresponding increases in quantity must be relatively high in percentage terms because the base quantities from which the percentage is calculated are relatively low. This is illustrated in **Figure 1.20**, which shows that the upper half of the demand line is elastic, whereas the lower half is inelastic. At the half point, demand is unitary elastic. In fact, as long as the demand is a straight line as in **Figure 1.20**, we can state that it will have an elastic half and an inelastic half with unitary elasticity occurring right in the middle. If the demand curve is not linear, then the relationship between range of prices and elasticity does not hold.

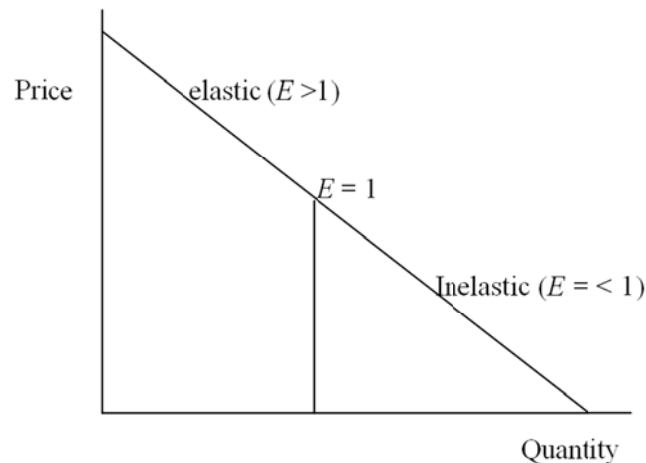


Figure 1.20

Practical application of price elasticities

Price elasticity has several important practical uses. The following is a short list of some of the applications.

- **Governments** have a keen interest in price elasticities because of the help they give in determining products to levy taxes and the rate of tax to impose. Clearly, products with low price elasticity of demand such as tobacco, alcoholic drinks and energy, are the ones to tax. Imposition of a tax on such products has a small effect on quantity and hence proves a lucrative source of tax revenue. Luxury goods are attractive to tax authorities for the same reason. Knowledge of demand theory and empirical estimates of the shape of the demand curve also help to determine the rate of tax to levy. As prices rise as a result of indirect taxes, price elasticity tends to increase. After a point, a rise in tax could lead to a fall in total tax revenue. This is particularly likely where taxes can be evaded through smuggling.
- **Businesses** use elasticities to estimate the effects of changes in their own price as well as the price of their competitors on their revenue. They also use this concept to estimate the impact of government taxes on their revenue, their share of the tax burden and so on.
- **Central banks** use elasticities to estimate the effects of changes in exchange rates on imports and exports and more broadly in assessing the effects of movements in an economy's cost competitiveness on GDP and employment.

Other types of elasticity

In addition to price elasticity, there are three other important types of elasticity that economists track: *income elasticity*, *cross-price elasticity* and *advertising elasticity*. These elasticities measure, respectively, the

responsiveness of demand to changes in consumers' income, the price of substitute goods and advertising expenses.

Income elasticity

You can reasonably expect that when income rises, consumers will buy more of a particular product, less when their income falls. In fact, goods and services that exhibit such a relationship are called *normal*. However, where there is an inverse relationship between changes in income and consumer demand, the products are called *inferior*. Examples of inferior products or services are less expensive means of transportation (bus versus plane), low quality rice, and no-name products. As people's income rises, they start to replace these products with higher-priced substitutes such as branded products.

Income elasticity is measured in the same way as price elasticity. The percentage of change in the quantity demanded is compared with the percentage of change in income. That is:

$$E_I = \frac{\text{Percentage of change in quantity}}{\text{Percentage of change in income}}$$

Where, E_I denotes income elasticity.

We can categorise the results of this computation as follows:

If the income elasticity coefficient is **positive**, it indicates a movement in the same direction for both income and quantity demanded. Products with coefficients greater than zero are called *normal*. As your income increases, you will probably increase your spending on soft drinks, books, clothes, CDs and so on. (E_I has a positive sign).

If the income elasticity is negative, it indicates that quantity demanded and the level of income move in opposite directions. Therefore, the product is *inferior*. Potatoes, beans and generic aspirin are good examples of inferior goods. As your income increases, you will probably decrease your spending on such goods (negative elasticity, $E_I < 0$). Conversely, if real income levels decline, the quantity demanded of an inferior good will increase.

If the income elasticity coefficient is greater than one, it indicates that demand is very sensitive to changes in income. In this case, we can refer to the product as a *luxury* or *superior* product.

Home ownership might be a luxury. If your income is low, you can only rent. If your income rises, you may qualify for mortgage loans and enter the house-purchasing market. In such a case, expenditure on house purchases rises more than the increase in income.

Graphically, the impact of an increase in income on the demand for a necessity good, given *ceteris paribus*, can also be shown as a shift outward of the demand curve (D_2 in **Figure 1.21**).

The extent of the outward shift will be less than for a luxury good, of course, since the demand for necessities is less responsive to changes in income than luxury goods, D_3 . Note that both luxuries and necessities exhibit a positive income effect.

The shift of the demand curve for an inferior good is in the opposite direction to the change in income. In **Figure 1.21** we also show the demand curve shifting back to the left, D_4 , following an increase in consumer income. Consumers now buy less of this product than they did before, as a result of the increase in their income. The extent of the shift depends, of course, on the value of income elasticity: small negative values mean small shifts to the left while relatively large negative income elasticities mean relatively large shifts to the left, in response to an increase in real income.

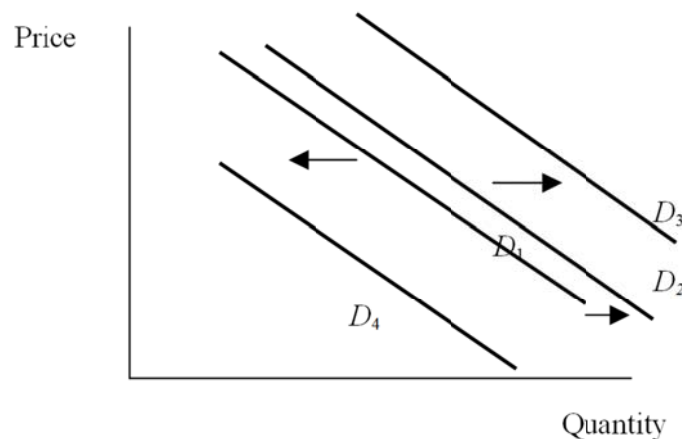


Figure 1.21

Business implications of income elasticity

The implications of income elasticity of demand to business decision-makers are considerable. If the income elasticity for your product exceeds one, the demand for your product will grow more rapidly than total consumer income. Contrastingly, it will fall more rapidly than total consumer income when income levels are generally falling. Hence, while income elasticity greater than one in a growing economy indicates a growth industry, it also indicates a greater vulnerability to downturns in the level of aggregate economic activity. Contrastingly, if the income elasticity of demand for your product is positive but less than one, the demand for your product will grow more slowly than the gross national product or consumer income. (However, it will be relatively recession-proof, in the sense that the demand will not react in the volatile fashion of luxury goods.) Third, if your product is regarded as an inferior good by the market as a whole, you must expect the quantity demanded of your product to decline as the gross national product rises.

Therefore, knowledge of a product's income elasticity can help managers in several different ways. First, it can alert them to the impact on demand caused by movements in the macro economy. A recession is expected to reduce the demand for normal or superior products. In an economic recovery or expansion, similar products should experience rising demand. For example, during the sustained economic expansion of the 1980s, companies that sold luxury consumer products with high-status designer names did very well. In the 1990s, however, many of the same companies experienced sluggish sales because of the slowdown in the economy.

To offset the impact of the business cycle on product demand, a manager might do well to select a portfolio of goods and services with a variety of income elasticities. Thus, in a recession, the demand for a company's inferior or low-income-elasticity products will be sustained and may even increase. In expansionary economic times, the company's high-income-elasticity products would take the lead in sales.

Cross-price elasticity

Cross-price elasticity is a measure of the responsiveness of consumers to changes in the price of a particular good, Good *A*, relative to changes in the price of substitute or complementary products, Good *B*. The cross-elasticity of demand provides a measure of the degree of complementarity between Product *X* and some other product.

Cross-elasticity of demand is defined as the percentage of change in quantity demanded of Product *A*, divided by the percentage of change in the price of some Product *B*

$$E_C = \frac{\text{Percentage of change in } Q_A}{\text{Percentage of change in } P_B}$$

Where, E_C is the cross-elasticity coefficient.

The main point here is the sign (positive or negative) of the relationship rather than the magnitude. If it is a positive relationship, the goods are substitutes; if it is negative, they are complements. As a secondary issue, the larger (in absolute terms) the coefficient, the more related are the two goods. For instance, a small decrease in the price of Pepsi may cause a sizeable decrease in the demand for Coke (close substitutes) but a smaller decrease in the demand for tea.

Knowledge about cross-price elasticity with respect to substitute products is particularly useful to assess the impact on changes in sales in relation to a competitor's price. For example, what impact will a reduction in the price of Microsoft Word have on the sales of Word Perfect? To minimise the cross-price elasticity of a product with respect to changes in the price of a substitute, companies spend a considerable sum on advertisements which are designed to establish or strengthen brand loyalty. At present, there appears to be an increase in cross-price elasticity in consumer goods markets evidenced by the growing market share of lower-priced, private-



label consumer products. This situation poses anxiety for the makers of leading premium brands of consumer products such as Procter & Gamble, Colgate-Palmolive and Philip Morris.

The cross-price elasticity of complementary products is also important for managers to understand. For example, a seller of computer products can reduce the price of its PCs to stimulate demand for its software. If the profit margin is high for the product whose demand is affected by the cut in the price of the complementary products, this pricing tactic is particularly appealing. For instance, a clothing store might reduce the price of its men's suits to stimulate the demand for high-profit margin items such as ties, shirts and socks. Furthermore, the degree of complementarity between suits and the fashion accessories can be stimulated by the friendly persuasion of salespersons.

Advertising elasticity

We know that advertising has an impact on the quantity of output sold. Specifically, the quantity demanded of Product X will typically show a positive response to advertisements in support of Product X and a negative response to the advertisements of substitutes as well as a positive response to the advertising of complements.

The *advertising elasticity of demand* for Product X measures the responsiveness of the change in quantity demanded to a change in the advertising budget for Product X . We expect a positive relationship between advertisements and quantity demanded, but we also expect that the responsiveness of sales through advertisements will decline as advertising expenditure continues to increase.

Similarly, cross-advertising elasticity of demand measures the responsiveness of quantity demanded of Product X to a change in the advertising efforts directed at another Product Y .

As stated earlier, one expects cross-advertising elasticity to be negative between substitute products and positive between complementary products. For example, increased advertising efforts for a particular movie is expected to reduce the quantity demanded of admission tickets to other movies and attractions but to increase the sales at the refreshment kiosk in the lobby of that particular movie theatre. The increased advertising efforts would have shifted the demand curves to the left for all substitute attractions while shifting the demand curve to the right for the refreshment kiosk.

$$E_C = \frac{\text{Percentage of change in quantity demanded for Product } X}{\text{Percentage of change in the advertising budget for Product } Y}$$

It is clear that we might calculate the elasticity of demand with respect to any variable that influences the demand for a product.

The price elasticity of supply

The **price elasticity of supply** measures the responsive of the quantity supplied due to a change in the price a good or service when all other determinants of supply remain constant. In other words, the price elasticity of supply reflects the percentage change in the quantity supplied to the percentage change in the price of a good.

- If the percentage change in the quantity supplied is higher than the percentage change in price, then supply is **high**, or **elastic**.
- If the percentage change in the quantity supplied is similar to the percentage change in price, then supply is **unit elastic**.
- If the percentage change in the quantity supplied is smaller than the percentage change in price, then supply is **inelastic**.

Determinants of the price elasticity of supply

The value of the elasticity of supply is influenced by two main determinants:

1. **Production possibilities:** If the supply or substitute of the productive inputs used to produce the good is limited, the elasticity of supply is smaller (or inelastic). On the other hand, if the productive resources used to produce the good are more common, then the elasticity of supply is higher (or elastic).
2. **Storage possibilities:** If a good can be stored longer, the supply of a good will be more elastic.

Computing the price elasticity of supply

The price elasticity of supply can be measured as follows:

$$\text{Price elasticity of supply} = \frac{\text{Percentage change in quantity supplied}}{\text{Percentage change in price}}$$

For example, the following table has two points on the supply curve for pie.

Price (\$ per pie)	Quantity supplied (pie per day)
1.00	100
2.00	300

- The percentage change in the quantity supplied is $[(300 - 100) \div 200] \times 100 = 100$ percent.
- The percentage change in price is $[(\$2 - \$1) \div \$1.50] \times 100 = 66.67$ percent.
- Between these two points, the elasticity of supply is $100.00\% \div 66.67\% = 1.50$.

- The magnitude of price elasticity of supply for pie is 1.50 (elastic). This suggests that if the price of pie increases by 1 per cent, then the quantity supplied of pie will change by 1.5per cent.

Tax incidence and tax burden

Nowadays, every time consumers buy something, they pay a tax. On some items, customers pay a sales tax that is added to the advertised price while on other items, customers pay an excise tax that is included in the advertised price. In paying the taxes, there is a division of the tax burden between the buyer and the seller. This is called **tax incidence**.

Figure 1.21 shows the market for DVDs. With no tax, the equilibrium price is \$12 and the equilibrium quantity is 10,000 units per month. When a DVD is taxed, it has two prices: a price before inclusion of the tax and a price that includes the tax. Buyers pay to the price that includes the tax while sellers respond to the price that excludes the tax because this is the price that they receive. Hence, the tax imposed by the government is a difference between these two prices. **Figure 1.21** shows the effect of the tax imposed by the government on a DVD. The tax imposed will move the supply curve as the tax is viewed as part of the supplier's cost. Hence, the initial supply curve, S moves to the left. The new market equilibrium after tax occurs where the new supply curve ($S + tax$) intersects the demand curve, D . The buyer pays the equilibrium price \$13. The seller receives the net-of-tax price \$11. The difference between the price paid by seller and buyer is the tax imposed by the government. Government receives tax revenue of \$18,000 ($\$2 \times 9,000$ units). In this case, the buyer and seller split the \$2 tax and pay \$1 each, namely they share the tax burden equally. The tax incidence and tax burden shared by buyer and seller depend on the elasticities of demand and supply.

- For a given elasticity of demand, the more elastic is the supply of the good, the smaller is the portion of the tax paid by the seller.
- For a given elasticity of supply, the more elastic is the demand of the good, the smaller is the portion of the tax paid by the buyer.



Figure 1.21

Activity 1.2



Activity

What would be your income elasticity of demand for:

- a. Essential goods like sugar, salt and rice?
- b. A vacation in Europe?

Module summary



Summary

In this module, you have been exposed to the economic environment of business pertaining to the study of economic decisions made by business in dimensions of microeconomics and macroeconomics. PEST analysis is used by business enterprises to determine strategic approaches to business activities. The three basic principles of macroeconomics are: increasing emphasis on using market mechanisms to achieve objectives, formulation of more macroeconomic policies to ensure a stable economic framework and more outward-looking national policies. In the analyses of government policy affecting business, two sets of questions arise, the first set is referred to as normative or prescriptive and the second as positive or descriptive. Well-established set of goals of the government are economic efficiency, macroeconomic stabilisation, growth and fairness (equity).

You have reviewed the formation of a supply curve and a demand curve, determinants of supply and demand, market supply curve and market demand curve, the difference between movements along supply and demand curves and shifts of these curves. You have also learnt that market equilibrium exists only when quantity supplied equals quantity demanded. The market system – also called the price system – performs two important functions, namely provision of an automatic mechanism for distributing scarce goods and services and determination of both the allocation of resources among producers as well as the final mix of outputs. The government may implement price controls such as price ceilings and price floors. In an open economy, the pattern of trade for a nation is determined by the relationship between its demand and supply to the world's demand and supply, and distinguishing whether an economy functions as to be an exporter or importer.

You have also learnt the estimated functions of price elasticity of demand, income elasticity of demand, cross-price elasticity of demand, advertising elasticity and the elasticities that could be used as a basis for business forecasting and decision making.

In the following study modules, you will be looking at the law of diminishing marginal returns; shapes of the cost curves; increasing, constant and decreasing returns to scale of a business and market structures of perfectly competitive, monopolist, monopolistic competitive and oligopoly industries.

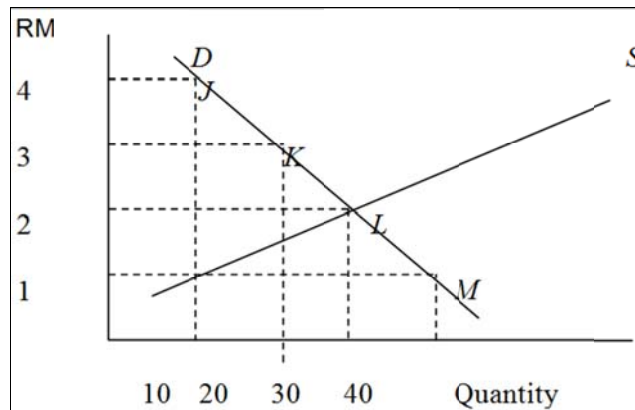
Assignment



Assignment

1. Define the meaning of economics.
2. Differentiate between macroeconomics and microeconomics.
3. What is opportunity cost?
4. What is the difference between scarcity and shortage?
5. Distinguish between normative and positive economics.
6. What is the link between scarcity and choice?
7. Define marginal benefit and marginal cost.
8. Explain the concepts of opportunity cost, marginal cost, and marginal benefit in making rational decisions.
9. How different is a market economy from a centrally planned economy?
10. Discuss the preconditions necessary for the smooth functioning of the market system.
11. Does the existence of a shadow or 'black' economy imply that the price system is not working? Is its existence consistent with the laws of demand and supply?
12. The government gains revenue by imposing a sales tax. Who stands to lose the most, the consumer or the producer, or both?
13. It is often claimed that market forces, with their emphasis on selfish motivation and profit-maximisation, undermine ethics and yet arguably an ethical approach towards contracts and employees by business is essential for the market system to function. Is the first assertion simply incorrect?
14. Is it true or false that a tax on the sale of beer shifts the supply curve vertically by the amount of the tax?
15. Is it true or false that a price ceiling set above the equilibrium price will have no effect on the market?
16. Use the diagram below to decide which statement is false: 'Demand for this product is _____ within the range _____'.
 - A. elastic; J to K.
 - B. elastic; J to L.
 - C. inelastic; L to M.

D. elastic; K to L.



17. Define the following concepts

- A. price elasticity of demand
- B. cross-elasticity of demand
- C. income elasticity of demand.

How are these elasticities estimated? Explain why it might be important for a firm to know their values.

18. In what aspect would you expect determinants of the demand for computers to differ from the determinants of the demand for milk?
19. Discuss why the price elasticity of demand is greater for goods and services that have better close substitutes.
20. If demand is price inelastic, does revenue increase when price rises?
21. Is a perfectly elastic demand associated with a horizontal demand curve?
22. Does total revenue fall if a price increases and demand is elastic?
23. Is the cross-elasticity of demand for two complements positive or negative?
24. Rank the following items in ascending order of elasticity: jeans, black Levi jeans, black jeans, black Levi 501 jeans, trousers, outer garments, clothes.
25. Suppose that computers are a complement to computer software. Suppose the price of a computer falls and at the same time, suppose the number of firms selling computer software decreases. How do these changes influence the price and quantity of computer software?
26. The table shows the demand and supply schedules for car.



plied

- A. Calculate the equilibrium price of a car, the consumer surplus, and producer surplus. What is the efficient quantity of cars?
- B. If the quantity demanded decreases by 10 cars per week at each price, what is the equilibrium price and what is the change in total surplus?
- C. If the quantity supplied decreases by 10 cars per week at each price, what is the equilibrium price and what is the change in total surplus?
- D. If XYZ Cars, Inc., monopolises the car production in the market and cuts production to 10 cars a week, what is the deadweight loss that is created?



Assessment



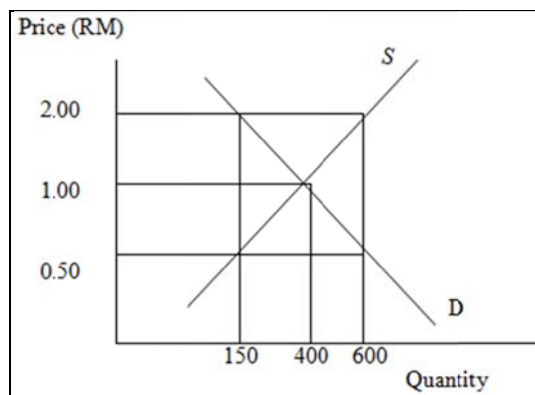
Assessment

- Which of the following statements are positive and which are normative?
 - The moon is made of green cheese.
 - The central government should be made to balance its budget.
 - The most serious economic problem confronting the nation is unemployment.
 - We should eradicate poverty.
- Choose a local natural resource with which you are familiar with e.g. a hectare of farmland or a nearby lake.
 - List three alternative uses for your chosen raw material.
 - Choose one of the three uses. What is the opportunity cost of this use?
 - Is the resource renewable or not? If it is not renewable should this be factored into your calculations?
 - Describe how your community has chosen to use or not to use the resource at all. Who and what determined the choice?
- Which one of the following best describes the study of economics? Economics studies:
 - how businesses can make profits.
 - how the government controls the economy and how people earn a living.
 - how society uses its scarce resources to satisfy its unlimited desires.
 - how income is allocated among different sectors of the economy.
- Macroeconomics approaches the study of economics from the viewpoint of—
 - individual consumers.
 - the government.
 - the entire economy.
 - the operation of specific markets.
- Microeconomics approaches the study of economics from the viewpoint of—
 - the entire economy.
 - the government.
 - the operation of specific markets.

- D. the stock market.
6. Which of the following is most appropriately a microeconomic issue?
- A. The study of the relationship between the unemployment rate and the inflation rate.
 - B. The forces determining the price in an individual market.
 - C. The determination of total output in the economy.
 - D. The aggregate behaviour of all decision-making units in the economy.
7. Which of the following economic variables would most likely be studied in microeconomics?
- A. The unemployment rate
 - B. Automobile production
 - C. Aggregate output
 - D. The aggregate price level
8. Which of the following economic variables would most likely be studied in macroeconomics?
- A. The price of personal computers
 - B. The production of macroeconomic textbooks
 - C. Aggregate output
 - D. The price of university tuition fees.
9. At the beginning of January 1992, price controls were lifted in Russia. Within a day, food prices had increased by 250 per cent but the food queues vanished overnight. Using the demand and supply curves, explain what happened. How would you expect the supply of food in the short run and in the long run? Which groups in the society have gained and which have lost as a result of the abolition of food price controls?
10. We know that the number of personal computers being sold has increased and yet the price is falling. Use the supply and demand curves to explain how this can happen.
11. Discuss what you would consider to be the main determinants of demand and supply of rented apartments. Suppose the government decides that rents are too high and sets a maximum rent. What would you expect the consequences of this action to be for —
- A. apartment owners?
 - B. existing renters?
 - C. future renters?
12. Consider the supply curve of oil for central heating. In each of the cases below, indicate whether there is a movement along the supply curve (in which direction) or a shift of the supply curve (whether left or right):



- A. New oil fields enter production.
 - B. The demand for central heating rises.
 - C. The price of coal falls.
 - D. Oil companies anticipate an upsurge in the demand for central heating oil.
 - E. The demand for petrol rises.
 - F. New technology decreases the costs of oil refining.
 - G. Oil products become more expensive.
13. A leftward shift of the supply curve of Pan Galactic Gargle Blasters causes price to rise by 10 per cent. Olivia Leung buys 20 per cent fewer Gargle Blasters. The price hike has caused Olivia to —
- A. spend less on Gargle Blasters.
 - B. spend more on Gargle
 - C. reduce the quantity bought. We cannot tell what has happened on how much she spends.
 - D. increase the quantity bought. We cannot tell what has happened on how much she spends.
14. Consider the following diagram that shows the market for milk. Quantity is in thousands of litres.



- A. Calculate total income for dairy farmers.
- B. Suppose that this income level is felt to be inadequate and a political decision is made to boost the farm income to \$1,200,000. Suppose the government establishes a price floor at \$2.00 with the government buying the excess supply. How much milk will be supplied?
- C. Who gets the milk?
- D. The plan achieves the income objective but what else has it done? There are costs involved with tampering with the price mechanism. What are they?

Now suppose the government establishes a price ceiling of \$0.50 per litre.

- E. How much milk would consumers actually receive?
- F. Which plan is better for a milk consumer who pays no provincial tax? Why?
15. Dental bills in Toothache City rose again last year. The City Council is considering placing a ceiling on fees that dentists can charge for teeth cleaning. The supply and demand curve for teeth cleaning is given in this table below.

Problem Table: demand and supply for teeth cleaning

Demand		Supply	
Price	Quantity	Price	Quantity
\$65	100	\$65	190
\$60	120	\$60	180
\$55	140	\$55	170
\$50	160	\$50	160
\$45	180	\$45	150
\$40	200	\$40	140

- A. Find the equilibrium price and quantity for teeth cleaning in Toothache City.
- B. The City Council passes a price ceiling ordinance, setting the maximum price at \$40 per cleaning. Use the supply and demand analysis to determine the effects of the price control.
16. Draw a graph showing the demand curve and the supply curve of personal computers. How would your graph be affected by —
- A. A rise in the price of software?
- B. A rise in the price of electric typewriters?
- C. A fall in the price of desktop printers?
- D. An expected increase in next year's PC prices?
- E. A 10 per cent sales tax on computers?
- F. A fall in income tax?
17. Which of the following are likely to have a positive cross-elasticity of demand?
- A. Fishing rods and fishing permits
- B. Imported rice and domestically produced rice
- C. Taxi and bus fares
- D. Beer and wine
- E. Cars and tyres
- F. Cameras and films.
18. Suppose for health reasons, a tax is placed on tobacco consumption, with the objective of reducing the demand for cigarettes. The cigarette industry objects to this tax and argues that since the price elasticity of demand is very low, the only effect of the tax will be an



increase in government revenue. Use diagrams to illustrate and analyse this situation. What other measures could the government use to achieve its objectives?

19. Imagine that you are responsible for running a bus company and you have access to the following information about the elasticities of demand for bus travel:

- Income elasticity = - 0.4
- Own-price elasticity = -1.2
- Cross-price elasticity with respect to rail fares = +2.1.

How might this information be of use to you in circumstances when your company is running a service that is currently taking a loss?

20. You have been hired as an economic consultant by OPEC and given the following statistics showing the world demand for oil:

Price (dollars per barrel)	Quantity demanded (millions of barrels per day)
10	60,000
20	50,000
30	40,000
40	30,000
50	20,000

- A. What is the total revenue-maximizing price?
- B. State explicitly all assumptions and qualifications that underlie your answers.
21. The Bustræen Company is one of five firms that manufacture washing machines. The five firms are all about the same size, have approximately equal market shares, and produce very similar products. Bustræen sells approximately 200,000 washing machines per annum. The company has engaged a market research consultant to provide estimates of the price elasticity and cross-elasticity of demand for its product. These estimates have just been received and they are listed as follows:
- The price elasticity of demand for Bustræen's washing machines: -1.85.
 - The cross elasticity of demand for Bustræen's washing machine: 0.45 vis-à-vis any one of the other firms' machines.
 - The price elasticity of demand for all washing machines (if all prices changed together): -0.55.
- A. Explain what Bustræen should expect to happen to its sales if it were to raise prices by 10 per cent and no other firm changed its price.
- B. Explain what Bustræen should expect to happen to its sales if

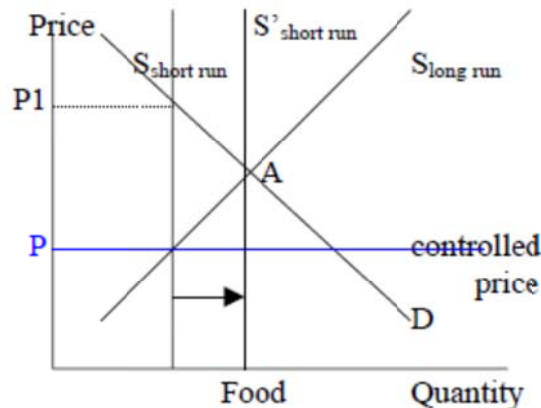
- one of its rivals were to raise its price by 10 per cent, *ceteris paribus*.
- C. Explain what would happen if Bustræen raised its price by 10 per cent and all other firms did the same.
22. You have just bought a company that publishes cookbooks. You consulted your in-house economist. The conversation goes like this:
- He tells you that the elasticity of demand for your cookbooks is -2.4.
 - Then you tell him that you want to maximise sales revenue.
 - He tells you that you should raise the price of the cookbooks.
 - Then you tell him that you are investing the first month of his pay rise in lottery tickets to improve your business chances. Explain your reaction.
23. The price of Goods *A* and of Goods *B* is \$10, and both goods have a quantity demanded of 100 units per week. When the price of Goods *A* falls to \$9, the quantity demanded rises to 200 units per week. However, the price of Goods *B* must fall to \$8 in order to achieve sales of 200 units.
- A. In the price ranges given, which good has a more elastic demand?
- B. Use the total revenue test to confirm that both goods face elastic demand curves.
- C. Verify your answer by calculating the price elasticity coefficient for Goods *A* and Goods *B*.
24. If Goods *X*'s producer wishes its demand to increase, which of the following scenarios is the most preferred, given that the cross-price elasticity coefficient for Goods *X* (to a change in Goods *Y*'s price) is -0.7 and the cross-price elasticity coefficient for Goods *X* (to a change in Goods *Z*'s price) is +0.7 Goods *X*'s income elasticity coefficient is -0.7.
- A. Thanks to unexpected prosperity; the price of Goods *Y* increases.
- B. Because of an unexpected recession; the price of Goods *Y* increases.
- C. Thanks to unexpected prosperity, the price of Goods *Y* decreases.
- D. Because of an unexpected recession; the price of Goods *Z* increases.
- E. The price of Goods *Y* increases; the price of Goods *Z* increases. Explain your answer.



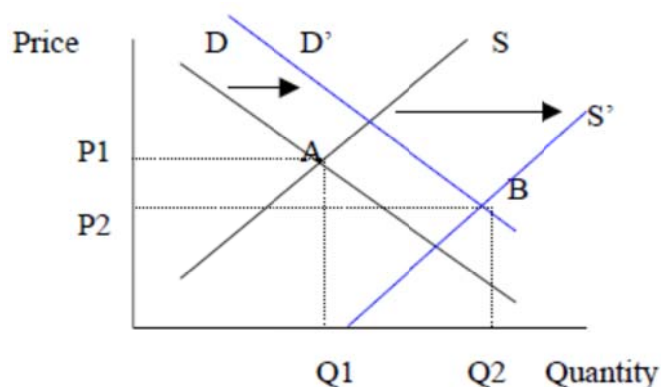
Assessment answers

1. A. Positive, B. normative, C. positive, D. normative.
2. A. The answer varies from a country to the next. Therefore, it is sensitive to your choice of local area.
B. Just remember that opportunity cost reflects the forgone alternative.
C. If the resource is non-renewable, the cost should reflect the forgone value. Therefore, it should be factored in.
D. Again it depends on your choice.
3. C.
4. C.
5. C.
6. B.
7. B.
8. A.
9. The price control had caused long queues and excess demand (prices too low). The removal of the control caused the excess demand to push the price upward, perhaps as high as P_1 . The supply of food in the short run would be fixed (vertical); little time is available for producing more. In the long run, supply would respond to the rising price. More food (S') would be produced, new S'_{short} crossing S_{long} and D at A .

Consumers lost and producers gained in the short run.



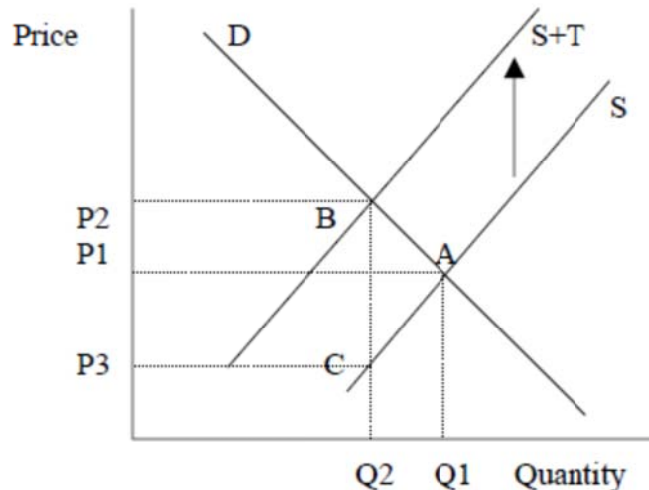
10. Although demand D has increased, supply has increased by more.



11. Main determinants of demand and supply of rented apartments are average income of consumers, price of owner occupied housing units, taste, expected future prices, expected future changes in the economy, demographic factors, cost of construction, location, etc.
- Setting a maximum rent causes: (a) apartment owners to lose, (b) existing renters to gain, (c) future renters to face a difficult time finding decent rental units.
12. A. the supply curve shifts to the right.
 B. movement along upward.
 C. movement along downward.
 D. the curve shifts to the right.
 E. the curve shifts to the left.
 F. the curve shifts to the right.
 G. movement along upward.
13. A.
14. A. \$400,000.
 B. 600,000 (litres).
 C. public buys 150,000 litres. The government ends up buying the remaining 450,000 litres.
 D. it has created inefficiency and waste (deadweight loss) to the society. Taxpayers have to pay a lot more to keep farmers happy.
 E. 150,000 litres.
 F. the latter plan works better for consumers. since they pay less even though they buy the same quantity (150,000 litres) in either case.
15. A. $P = \$50, Q = 160$
 B. This causes development of an excess demand of 60 ($200 - 140$).
 A price ceiling generates a shortage.
16. A. demand shifts back (left) (substitutes)
 B. demand shifts right (substitutes)



- C. demand shifts right (complements)
 - D. demand shifts right
 - E. supply, not demand, shifts to the left, or demand shifts to the left by 10%
 - F. demand shifts left
17. B, C and D. The product pairs in each case are substitutes.
- 18.

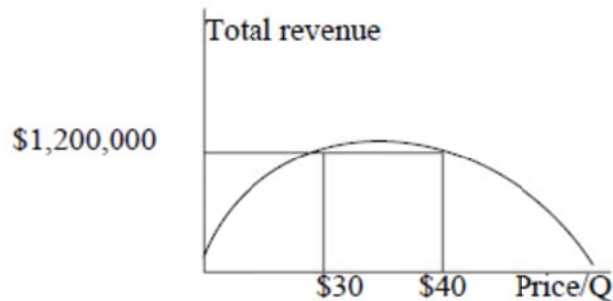


Government revenue from taxation is represented by the area P_2BCP_3 . If the industry is correct and the price elasticity of demand is low (steep demand curve), the effect on the quantity consumed will be minimal while the government revenue will be large. The question is whether or not this objection is valid for all possible price ranges.

In the long run, educating the public about the hazards of smoking will be more effective.

19. The price elasticity is high (elastic demand). Lower your price and expand your market share. This way your revenue will rise. Your cross elasticity is high too. Rail is a substitute, cutting the price will lure customers (riders) away from rail to your business. Your service is considered inferior based on the negative income elasticity. Take advantage of economic downtimes, you will prosper.
20. A. Based on these numbers, revenue is maximized at \$1,200,000 corresponding to $P_2 = \$30$ and $P = \$40$. There is more than one price associated with this revenue. However, at $P = \$30$, revenue is climbing, whereas at $P = \$40$ it is declining. Therefore, it must have peaked between \$30 and \$40,000 – not shown here.

B.



A U shape (quadratic TR function) is assumed. Also, it is assumed that oil price can increase by smaller increments than \$10.

$$21. A. E_p = \frac{\% \Delta Q_x}{\% \Delta P_y} = -1.85$$

Therefore, if P is raised by 10%, $\% \Delta Q$ (Sales) should drop by $\% \Delta Q = -1.85 \times 10\% = -18.5\%$.

$$B. E_c = \frac{\% \Delta Q_x}{\% \Delta P_y} = .45$$

Therefore, if its rival raises its price by 10%, Bustraen's sales should rise by $\% \Delta Q = 10 \times .45 = 4.5\%$.

C. If all other firms raise their price at the same time as Bustraen's, sales drop by 5.5% [$(10\% \times (-.55))$].

22. You tell your economist she is WRONG and that she knows nothing about the link between elasticities and revenue. Where the demand is elastic (-2.4), a decrease (not an increase) in price will increase total revenue.

23. A. A, because a 10% $\left(\frac{10-9}{10}\right)$ drop in price causes an increase in quantity demanded of 100% $\left(\frac{200-100}{100}\right)$ in case of A, whereas in case of B, it takes 20% $\left(\frac{10-8}{10}\right)$ drop in price to bring about the same change (100% increase in quantity).

B. Total revenue (A) = $\$10 \times 100 = \$1,000$ rising to $\$9 \times 200 = \$1,800$.

Total revenue (B) = $\$10 \times 100 = \$1,000$ rising to $\$8 \times 200 = \$1,600$.

$$C. E_p^A = \frac{\% \Delta Q}{\% \Delta P} = \frac{100}{10} = 10$$



$$E_p^B = \frac{100}{20} = 5$$

24. A. not preferred. As PY increases QX falls (negative cross elasticity = -0.7); X and Y are complements.
- B. not preferred, for the same reason.
- C. preferred. As PY drops, QX rises.
- D. preferred. As PZ increases, QX rises (substitutes as evident by a positive cross-elasticity).
- E. If the two prices rise by the same proportion, nothing will happen to sales of X. The impact on X depends on which increase is larger. If PZ rises by more, the sale of X increases and vice versa.