

AS Economics Digital Textbook 2007

Core Topics in Markets

Geoff Riley Eton College

© Tutor2u Limited 2006-7 All Rights Reserved
www.tutor2u.net

Table of Contents

1.	Economic Resources	3
2.	Scarcity and Choice in Resource Allocation.....	9
3.	The Production Possibility Frontier.....	14
4.	Specialisation and Trade.....	18
5.	Positive and Normative Statements	22
6.	Markets: The Theory of Demand.....	23
7.	Markets: The Theory of Supply	30
8.	Market Equilibrium Price	35
9.	Price Elasticity of Demand.....	40
10.	Price Elasticity of Supply	46
11.	Income Elasticity of Demand.....	50
12.	Cross Price Elasticity of Demand.....	53
13.	The Functions of the Price Mechanism.....	56
14.	Price volatility in markets	60
15.	Inter-relationships between Markets.....	64
16.	Consumer Surplus.....	69
17.	Producer Surplus	72
18.	The Market for Oil.....	74
19.	The Market for Copper	80
20.	The Market for Rhodium.....	83
21.	The Market for Coffee	85

1. Economic Resources

Microeconomics is the study of the behaviour and decisions of individuals and businesses in markets across the economy. We start our study of microeconomics by looking at the resources which an economy may have available to supply and produce goods and services to meet the ever-changing needs and wants of individuals and society as a whole.

In economics we classify goods as “tangible” products, example might include food and drink, cars, digital televisions, flat-screen televisions, energy products and cricket bats! Services are sometimes known as intangibles, education and health-care are two important services and tourism, business consultancy, cleaning and home insurance are all examples of services.

Finite resources

There are only a **finite** (or limited) number of workers, machines, acres of land and reserves of oil and other natural resources on the earth. Because most of our resources are finite, we cannot produce an unlimited number of different goods and services and by producing more for an ever-increasing population we are in real danger of destroying the **natural resources** of the planet. This has important consequences for the **long-term sustainability** of economies throughout the world and potentially huge implications for our living standards and the quality of life.



Tuna reaches the quayside and will soon be supplied to the market – but over-fishing may have destroyed fish stocks and risks the whole future of the tuna fishing industry in the European Union

Tuna at risk of extinction

Bluefin tuna are at risk of extinction in the Mediterranean and eastern Atlantic according to a report from the Worldwide Fund for Nature. They lay the blame on fishermen who have caught more than the **quotas** allowed under current European Union rules. Over-fishing has led to a reduction in stocks of tuna and average catch sizes are declining. The WWF has called for an immediate halt to bluefin tuna fishing arguing that failure to act now will lead to the complete destruction of what should be a **renewable resource**.

Source: [Worldwide Fund for Nature](#) and BBC news reports

Environmental pressure groups such as [Friends of the Earth](#) and [Greenpeace](#) seek to highlight the permanent damage to the stock of natural resources available throughout the world and the dangers from economic development and global warming. One such issue is the huge threat posed by the **global shortage of water** as the world's demand for water for household and commercial use continues to grow each year. At the heart of **improving resource sustainability** is the idea of **de-coupling** – a process of trying to increase the efficiency with which resources are used in producing goods and services and breaking the link between ever-increasing output and resource depletion.

Factors of production

Factors of production refer to the **resources** we have available to produce goods and services. We make a distinction between **physical** and **human resources**.

Land

Land includes all of the **natural physical resources** – for example the ability to exploit fertile farm land, the benefits from a temperate climate or the ability to harness wind and solar power and other forms of renewable energy. Some nations are richly endowed with natural resources and then specialise in the extraction and production of these resources – for example – the development of the **North Sea oil and gas** in Britain and Norway or the high productivity of the vast expanse of farm land in Canada and the United States and the [oil sands in Alberta, Canada](#). Other countries have a smaller **natural factor endowment** and may be more reliant on importing these resources. Japan for example is the world's second largest economy but remains heavily dependent on imported oil.

Labour

Labour is the **human input** into the production process. It is inevitable that some workers are more **productive** than others because of the education, training and work experience they have received. What matters is the size and quality of the workforce. An increase in the size and the quality of the labour force is vital if a country wants to achieve **economic growth**. In recent years the issue of the **migration of labour** has become important, can migrant workers help to solve some of the labour shortages that many countries experience? And what of the long-term effects on the countries who suffer a drain or loss of workers through migration?

Labour is the **human input** into the production process. It is inevitable that some workers are more **productive** than others because of the education, training and work experience they have received. What matters is the size and quality of the workforce. An increase in the size and the quality of the labour force is vital if a country wants to achieve **economic growth**. In recent years the issue of the [migration of labour](#) has become important, can migrant workers help to solve some of the labour shortages that many countries experience? And what of the long-term effects on the countries who suffer a drain or loss of workers through [migration](#)?

Capital

To an economist, **investment** is not the money that people put into the stock market or into bank and building society accounts. Instead, in economics the term **capital** means investment in **capital goods** that can then be used to produce other consumer goods and services in the future.

- **Fixed capital** includes machinery, plant and equipment, new technology, factories and other buildings.
- **Working capital** refers to stocks of finished and semi-finished goods (or components) that will be either consumed in the near future or will be made into finished consumer goods.



The global oil and gas industry uses a huge amount of capital equipment to get the product – crude oil – to the refineries and processing stages.

Capital inputs and productivity

New items of capital machinery, buildings or technology are generally used to enhance the **productivity** of labour. For example, improved technology in farming has vastly increased the productivity of our agricultural sector and allowed people to move out of working on the land into more valuable jobs in other parts of the economy. And, investment in information and communication technology can increase the efficiency of workers across many industries.

Infrastructure

Infrastructure is the stock of capital used to support the entire economic system. Examples of infrastructure include road & rail networks; airports & docks; telecommunications eg cables and satellites to enable web access. The World Bank regards [infrastructure as an essential pillar for economic growth](#) in developing countries.



The Gatwick Express – the railway infrastructure is an essential part of our transport network

Entrepreneurship

An **entrepreneur** is an individual who seeks to supply products to a market for a **rate of return** (i.e. to make a profit).

Entrepreneurs will usually invest their own **financial capital** in a business (for example their savings) and take on the risks associated with a business investment. The reward to this risk-taking is the profit made from running the business.

Many economists agree that entrepreneurs are in fact a specialised part of the factor input 'labour'.

Renewable resources

Renewable resources are commodities such as solar energy, oxygen, biomass, fish stocks or forestry that is inexhaustible or replaceable by new growth providing that the rate of extraction of the resource is less than the natural rate at which the resource renews itself. This is becoming an enormously important issue in environmental economics, for example the issue of [the over-extraction of fish stocks](#), and the [global risks of permanent water shortages](#) resulting from rising use of ground water stocks. **Finite resources** cannot be renewed. For example with plastics, crude oil, coal, natural gas and other items produced from fossil fuels, no mechanisms exist to replenish them.



Factor Rewards

Factors of production are used to create output to be sold in markets. Each factor used in production can expect some reward.

High oil prices help Shell to record profits

Soaring crude oil prices are boosting oil companies' profits around the world. [Royal Dutch Shell](#) has announced [record annual profit for a UK stockmarket listed company](#). Shell generated profits of £13.12bn in 2005 – up nearly a third on the 2004 level. Most of Shell's profits come from finding and extracting oil, and then selling it on to the world's oil markets.

Source: Adapted from news articles, February 2006

Income

Income represents a **flow of earnings** from using factors of production to produce an output of goods and services which are then sold in markets. The main sources of income for individuals and households are:

1. **Wages and salaries from work** often supplemented by overtime and productivity bonuses.
2. **Interest from savings** held in banks, building societies and other accounts.
3. **Dividends** from share ownership.
4. **Rent income** from the ownership of property.

For the majority of people, most of their weekly or monthly income comes from their job. The government can also affect people's **disposable (or "post-tax") income** by taxing incomes and by giving **welfare benefits** to households on low incomes or to people who are out of work.

Wealth

Wealth is defined as a **stock of assets** that creates a flow of income and it can be held in a variety of forms by individuals, firms and also the nation as a whole:

- **Financial wealth** - stocks and shares, bonds, savings in bank and building society accounts and contributions to pension schemes.
- **Marketable wealth** - consumer durables that can be sold for a price e.g. rare antiques.
- **Social capital** – including social infrastructure such as transport systems, schools and hospitals.

It is important to distinguish between income and wealth. For example, if you receive a higher wage or salary from your job then this adds to your monthly income and if this is saved in a bank, or by making contributions to a pension fund then you are adding to your financial wealth.

Being wealthy can also generate income for if you own shares in companies listed on the stock market then you expect to receive **dividend income** once or twice a year. And if you have money in a savings account, you will be paid interest on your savings balances. Likewise, if you own properties, then you can earn some income from **renting it out to tenants**. There has been a huge expansion in recent years in the [buy-to-let sector of the housing market](#) with hundreds of thousands of people buying properties and then letting them out. By the summer of 2006 in the UK there were over 700,000 people who had bought property and then let it out to tenants as part of the buy-to-let sector of the housing market.

Of course the value of financial wealth can fluctuate over time. In the UK in recent years we have seen a **boom in the UK housing market** leading to sharp rises in average house prices, particularly in London and the South East. The result has been a jump in housing wealth for people with mortgages, but a growing problem of [affordability](#) for people looking to enter the housing market for the first time on relatively low incomes. Share prices have also been volatile with a collapse in prices from 2000-2003 and then a recovery in the stock market over the last three years.

Inequality in the distribution of income and wealth

Factor incomes or factor rewards are rarely if ever distributed **equitably** in any country. Indeed it is a fact of life that the distribution of income and wealth in the UK is highly unequal there is a huge **gap between the richest and poorest households in our society**. For example, the latest available data shows that 94% of the total wealth in this country is held by 50% of the population. Put another way, the other half of our population can lay claim to only 6% of total wealth. Millions of people must rely on relatively low incomes with little opportunity to accumulate wealth. Is this fair? What are the [consequences of a high level of inequality](#)? Should the government intervene to change the distribution of income? And what might be some of the effects of such policies? These are important questions and we will return to them when we consider the issue of **market failure**.

Income of the richest UK families is sixteen times that of the poorest

In 2004-05, the average gross (pre-tax) income of the richest 20% of families in Britain was £66,300, more than 16 times that of the poorest 20% who earned £4,300 on average. After adjusting for taxes and welfare benefits such as income support and the state pension, however, this ratio fell to four-to-one. For direct taxes, the top fifth of households pay 25% of their gross income in direct taxes such as income tax while for the poorest households the figure is 10%. Levels of inequality are little changed from that seen during the [years of the Thatcher government](#).

Adapted from the ONS and the Guardian, June 2006

Labour and Wages

Most people have the ability to do some form of work. If they are of working age and actively seeking a job then they are included in the **working population**. In industries and jobs where labour is not particularly scarce, wages tend to be lower. Millions of workers in the UK are paid hourly wages well below the national average. The [minimum wage](#) (currently £5.05 for all adult workers – it [rises to £5.35 in October 2006](#)) seeks to address some of the problems associated with low pay. On the other hand, some people have skills that are quite rare, and these people will command high salaries in the labour market.

Capital and Interest

Businesses often need to borrow money to fund capital investment. The reward for investing money is called interest. Interest rates can of course go up or down. If the interest rate is high, it becomes less worthwhile to borrow money because any project will have to make more money than before to be profitable since more interest is now being paid.

Enterprise and Profit

In return for having innovative business ideas and taking the risk in putting funds into a business the entrepreneur takes any money that the business has left after the other factors of production have received their rewards. This is called **gross profit**. Taxes then have to be paid to the government, and the entrepreneur takes what is left. This after-tax profit is called **net profit**.

Profits flow from increased passenger numbers

The low-cost airline EasyJet is reaping the benefits of higher sales and it is forecasting that pre-tax profits in 2006 will be up by as much as 50 per cent. The business is creating higher profits by increasing passenger revenue per seat and achieving extra sales and income from ancillary revenues. EasyJet has managed to overcome the challenge of higher oil prices partly by making cost savings in other parts of their business. EasyJet said it carried 2.6 million passengers in June 2006, up 15.6 percent from a year earlier, while its load factor, a measure of how efficiently it is filling seats on each flight, was 87.6 percent, 2 per cent higher than at the same time in 2005. EasyJet is part of the [Easy Group of companies](#).

Source: [EasyGroup web site](#), Adapted from news reports, June 2006

Passenger data and passenger revenue for EasyJet

	12 months to June 2006	12 months to June 2005	Change over the year
Passengers	32,122,137	28,291,843	+13.5%
Load Factor	84.4%	85.1%	-0.7%
Total Revenue	£1,535m	£1,261m	+21.8%

Source: [EasyJet Investor Relations web site](#), accessed July 2006

Economists often assume that one of the main objectives of a business is to achieve maximum profits. But this is not always the case! Some businesses are looking to achieve **a rising market share** and increasing market share might mean having to sacrifice some profits in the short run by cutting prices and under-cutting rival suppliers in the market.

There is also a growing interest in the concept of **ethical businesses** and **corporate social responsibility** where the traditional assumption of businesses driven solely by the profit motive is being challenged and where businesses are encouraged to take account of their economic, social and environmental impacts.

Factor	Description	Reward
Land	all natural resources (gifts of nature) including fields, mineral wealth, and fishing stocks	The reward for landlords for allowing firms to use their property is rent
Labour	The physical and mental work of people whether by hand, by brain, skilled or unskilled	The reward for workers giving up time to help create products is wages or salaries
Capital	Man made goods used to produce more goods including factories (plant), machines and roads.	The reward for creditors lending money to firms to invest in buildings and capital equipment is interest
Enterprise	An entrepreneur risks financial capital and organises land labour & capital to produce output in the hope of profit	The reward for individuals risking funds and offering products for sale is profit . Unsuccessful firms make losses .

Source: Richard Young, *Markets Question and Answer*, Tutor2u

2. Scarcity and Choice in Resource Allocation

In this chapter we consider the nature of economics and the choices that all economic agents, be they consumers, businesses and different levels of government must make every day.

What is Economics?

The [Economist's Dictionary of Economics](#) defines economics as

"The study of the production, distribution and consumption of wealth in human society"

Another definition of the subject comes from the economist [Lionel Robbins](#), who said in 1935 that

"Economics is a social science that studies human behaviour as a relationship between ends and scarce means which have alternative uses. That is, economics is the study of the trade-offs involved when choosing between alternate sets of decisions."

The purpose of economic activity

It is often said that the central purpose of economic activity is the production of goods and services to satisfy consumer's needs and wants i.e. to meet people's need for consumption both as a means of survival but also to meet their ever-growing demand for an improved lifestyle or standard of living.

The **basic economic problem** is about **scarcity** and **choice** since there are only a limited amount of resources available to produce the unlimited amount of goods and services we desire.

All societies face the problem of having to decide:

- (i) **What goods and services to produce:** Does the economy use its resources to operate more hospitals or hotels? Do we make iPod Nanos or produce more coffee? Does the National Health Service provide free IVF treatment for thousands of childless couples? Or, do we choose instead to allocate millions of pounds each year to providing beta-interferon to sufferers of multiple sclerosis?
- (ii) **How best to produce goods and services:** What is the best use of our scarce resources of land labour and capital? Should school playing fields be sold off to provide more land for affordable housing? Or are we contributing to the problem of obesity by selling off these playing fields?
- (iii) **Who is to receive goods and services:** What is the best method of distributing products to ensure the highest level of wants and needs are met? Who will get expensive hospital treatment - and who not? Should there be a minimum wage? If so, at what level should it be set?

Road space throughout the world is becoming increasingly scarce as the demand for motor transport increases each year – what do you think are some of the best solutions to reducing the problem of congestion on our roads?



Scarcity

Water, water everywhere

We use an average of 158 litres of water a day in Britain, for which we pay a price of 28p per litre — but much of it is just cash down the drain, according to water companies. Most are campaigning to cut the amount we use. And the front-line weapon in their campaign is the [water meter](#). They [want us all to have one](#) and one company is seeking powers to make them compulsory. When a meter is installed, in most homes, consumption drops by 20 per cent and, in some, it goes down by a third. According to [Ofwat](#), the water industry regulator, the average water and sewerage bill for homes with a meter is £248 compared with £289 for those with flat-rate bills. At present only 25 per cent of households have meters and most of those are in East Anglia. They are installed free by water companies but households then have about £43 added to each bill to cover the cost of installing and reading the meter. Unsurprisingly, we use more water in summer. Peak demand on hot days can be 50 to 70 per cent above average. Most of this is for lawns, flowers, paddling pools and extra showers and baths.

Source: Adapted from an article by Valerie Elliott, the Times, 9 July 2005

If something is scarce - it will have a market value.

If the supply of a good or service is low, the market price will rise, providing there is sufficient demand from consumers. Goods and services that are in plentiful supply will have a lower market value because supply can easily meet the demand from consumers. Whenever there is excess supply in a market, we expect to see prices falling. For example, the prices of new cars in the UK have been falling for several years and there have been huge falls in the prices of clothing as supply from countries such as China and Vietnam has surged.

Insatiable human wants and needs



The Swedish furniture giant [IKEA](#) sells to millions of consumers throughout the world

Human beings want better food; housing; transport, education and health services. They demand the latest digital technology, more meals out at restaurants, more frequent overseas travel, more leisure time, better cars, cheaper food and a wider range of cosmetic health care treatments.

Opinion polls consistently show that the majority of the electorate expect government policies to deliver improvements in the standard of education, the National Health Service and our transport system. (Whether voters are really prepared to pay for these services through higher taxes is of course another question!)

Economic resources are limited, but **human needs and wants are infinite**. Indeed the development of society can be described as the **uncovering of new wants and needs** - which producers attempt to supply by using the available factors of production. For a perspective on the achievements of countries in meeting people's **basic needs**, the [Human Development Index](#) produced annually by the United Nations is worth reading. Data for each country can be accessed and cross-country comparisons can be made.

Making choices



Because of scarcity, **choices** have to be made on a daily basis by all consumers, firms and governments. For a moment, just have a think about the hundreds of millions of decisions that are made by people in your own country every single day.

Take for example the choices that people make in the city of London about how to get to work. Over six million people travel into London each day, they have to make choices about when to travel, whether to use the bus, the tube, to walk or cycle – or indeed whether to work from home. Millions of decisions are being taken, many of them are habitual (we choose the same path each time) – but somehow on most days, people get to work on time and they get home too! This is a remarkable achievement, and for it to happen, our economy must provide the resources and the options for it to happen.

Trade-offs when making choices

Making a choice made normally involves a **trade-off** - in simple terms, choosing more of one thing means giving up something else

in exchange. Because wants are unlimited but resources are finite, choice is an unavoidable issue in economics. For example:

1. **Housing:** Choices about whether to rent or buy a home – a huge decision to make and one full of uncertainty given the recent volatility in the British housing market! There are costs and benefits to renting a property or choosing to buy a home with a mortgage. Both decisions involve a degree of risk.
2. **Working:** Choosing between full-time or part-time work, or to take a course in higher education lasting three years – how have these choices and commitments been affected by the introduction of university tuition fees?
3. **Transport and travel:** The choice between using Euro-Tunnel, a speedy low-cost ferry or an airline when travelling to Western Europe. Your choices about which modes of transport to use to get to and from work or school each day.

Consumer welfare and rationality

What makes people happy? Why despite several decades of rising living standards do surveys of happiness suggest that people are not noticeably happier than previous generations? When we study the decisions of consumers in different markets, we can start to consider and explore what their aims are. Our working assumption for the moment is that consumers make choices about what to consume based on the aim of **maximising their own welfare**. They have a **limited income** (i.e. a limited budget) and they seek to allocate their funds in a way that improves their **standard of living**.

Of course in reality consumers rarely behave in a perfectly informed and rational way. We will see later that often decisions by people are based on **imperfect or incomplete information** which can lead to a loss of satisfaction and welfare not only for people themselves but which affect other and our society as a whole. As consumers we have all made **poor choices** about which products to buy. Do we always learn from our mistakes? To what extent are our individual choices influenced and distorted by the effects of persuasive advertising? Multinational companies have **advertising and marketing** budgets that often run into hundreds of millions of pounds. We are all influenced by them to a lesser or greater degree and there is always the risk that [advertising can be misleading](#).

Economic Systems

An economic system is best described as a **network of organisations** used by a society to resolve the basic problem of what, how and for whom to produce.

There are four categories of economic system.

1. **Traditional economy:** Where decisions about what, how and for whom to produce are based on custom and tradition. Land is typically held in common ie private property is not well defined.
2. **Free market economy:** Where households own resources and free markets allocate resources through the workings of the **price mechanism**. An increase in demand raises price and encourages firms to switch additional resources into the production of that good or service. The amount of products consumed by households depends on their income and household income depends on the market value of an individual's work. In a free market economy there is a limited role for the government. Indeed in a highly free market system, the government limits itself to protecting the **property rights** of people and businesses using the legal system, and it also seeks to protect the value of money or the value of a currency.
3. **Planned or command economy:** In a planned or command system typically associated with a socialist or communist economic system, scarce resources are owned by the state (i.e. the government). The state allocates resources, and sets production targets and growth rates according to its own view of people's wants. The final income and wealth distribution is decided by the state. In such a system, market prices play little or no part in informing resource allocation decisions and queuing rations scarce goods.
4. **Mixed economy:** In a mixed economy, some resources are owned by the public sector (government) and some resources are owned by the private sector. The public sector typically supplies public, quasi-public and merit goods and intervenes in markets to correct perceived market failure. We will come back to all of these concepts later on in our study of microeconomics.

Opportunity Cost

There is a well known saying in economics that “[there is no such thing as a free lunch!](#)” Even if we are not asked to pay a price for consuming a good or a service, scarce resources are used up in the production of it and there must be an opportunity cost involved.

Opportunity cost measures the cost of any choice in terms of the **next best alternative foregone**. Many examples exist for individuals, firms and the government.

- **Work-leisure choices:** The opportunity cost of deciding not to work an extra ten hours a week is the lost wages foregone. If you are being paid £6 per hour to work at the local supermarket, if you choose to take a day off from work you might lose £48 from having sacrificed eight hours of paid work.
- **Government spending priorities:** The opportunity cost of the government spending nearly £10 billion on investment in National Health Service might be that £10 billion less is available for spending on education or the transport network.
- **Investing today for consumption tomorrow:** The opportunity cost of an economy investing resources in new capital goods is the current production of consumer goods given up. We may have to accept lower living standards now, to accumulate increased capital equipment so that long run living standards can improve.
- **Making use of scarce farming land:** The opportunity cost of using arable farmland to produce wheat is that the land cannot be used in that production period to harvest potatoes.

Sectors of production in the economy

1. **Primary sector:** This involves extraction of natural resources e.g. agriculture, forestry, fishing, quarrying, and mining
2. **Secondary sector:** This involves the production of goods in the economy, i.e. transforming materials produced by the primary sector e.g. manufacturing and the construction industry
3. **Tertiary sector:** the tertiary sector provided services such as banking, finance, insurance, retail, education and travel and tourism
4. **Quaternary sector:** The quaternary sector is involved with information processing e.g. education, research and development



Manufacturing industry in the United Kingdom only accounts for 18 per cent of national output. The bulk of our income and employment comes from the service sector.

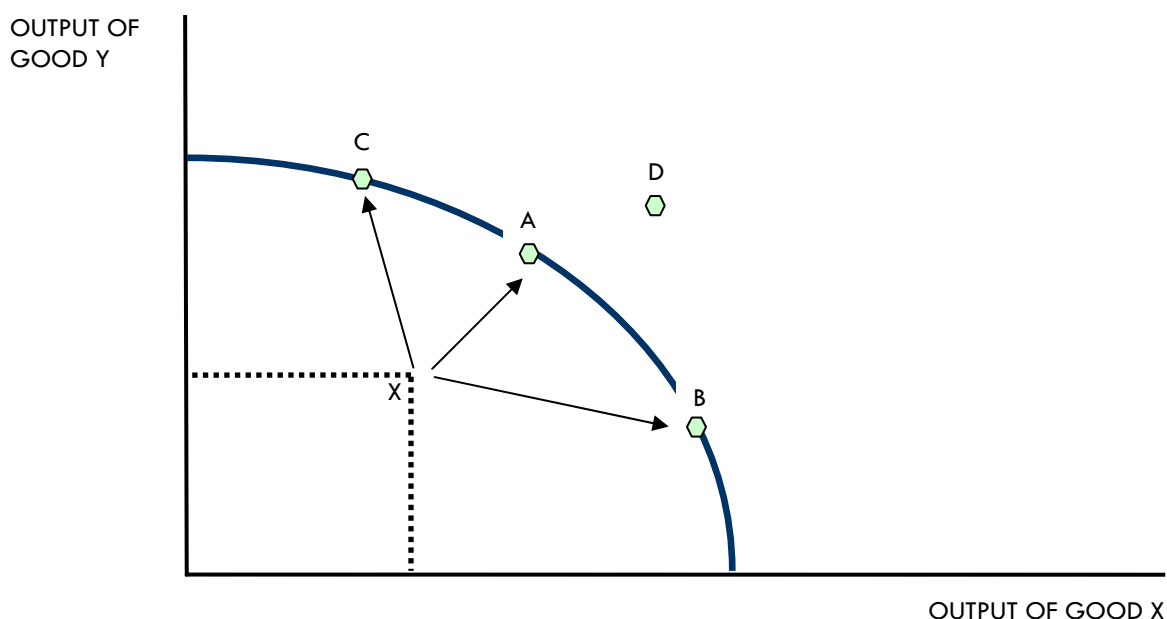
3. The Production Possibility Frontier

In this chapter we will consider the nature of the production possibility frontier and its relationships with the fundamental economic problem.

A **production possibility frontier** (PPF) is a curve or a boundary which shows the combinations of two or more goods and services that can be produced whilst using all of the available factor resources efficiently.

We normally draw a PPF on a diagram as concave to the origin. This is because the extra output resulting from allocating more resources to one particular good may fall. I.e. as we move down the PPF, as more resources are allocated towards Good Y, the extra output gets smaller – and more of Good X has to be given up in order to produce the extra output of Good Y. This is known as the principle of **diminishing returns**. Diminishing returns occurs because not all factor inputs are equally suited to producing different goods and services.

A PPF shows the different combinations of goods and services that can be produced with a given amount of resources in their most efficient way
Any point inside the curve – suggests resources are not being utilised efficiently
Any point outside the curve – not attainable with the current level of resources



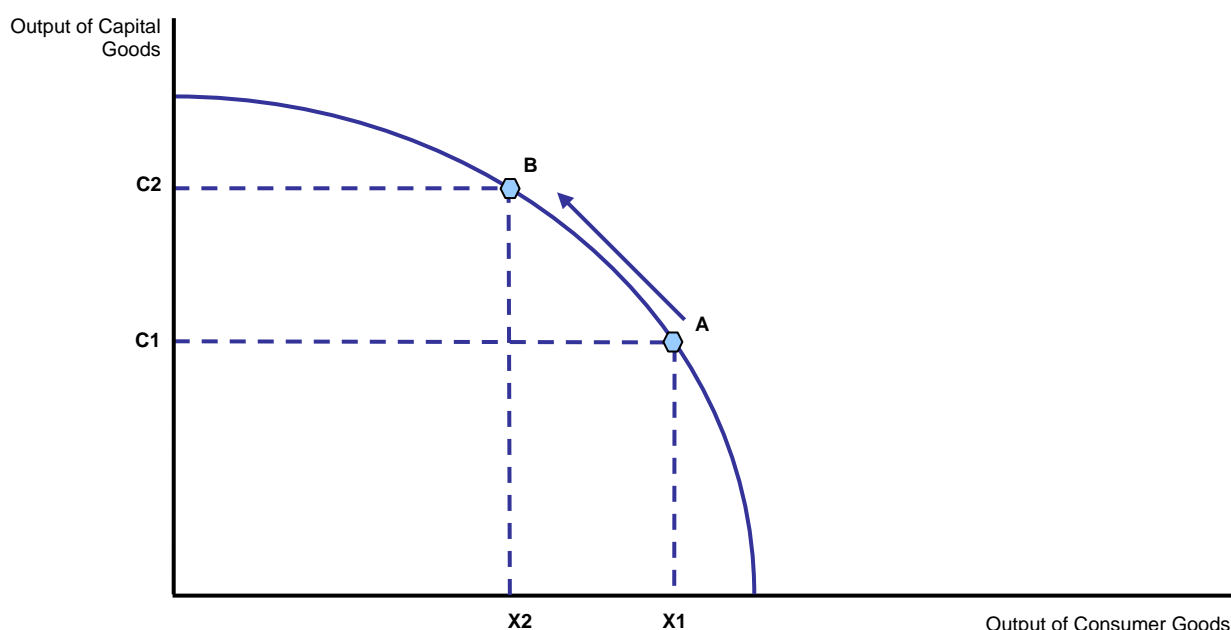
Combinations of output of goods X and Y lying inside the PPF occur when there are **unemployed resources** or when the economy uses resources **inefficiently**. In the diagram above, point X is an example of this. We could increase total output by moving towards the production possibility frontier and reaching any of points C, A or B.

Point D is unattainable at the moment because it lies beyond the PPF. A country would require an **increase in factor resources**, or an **increase in the efficiency (or productivity)** of factor resources or an **improvement in technology** to reach this combination of Good X and Good Y. If we achieve this then output combination D may become attainable.

Producing more of both goods would represent an improvement in our economic welfare providing that the products are giving consumers a positive satisfaction and therefore an improvement in what is called **allocative efficiency**

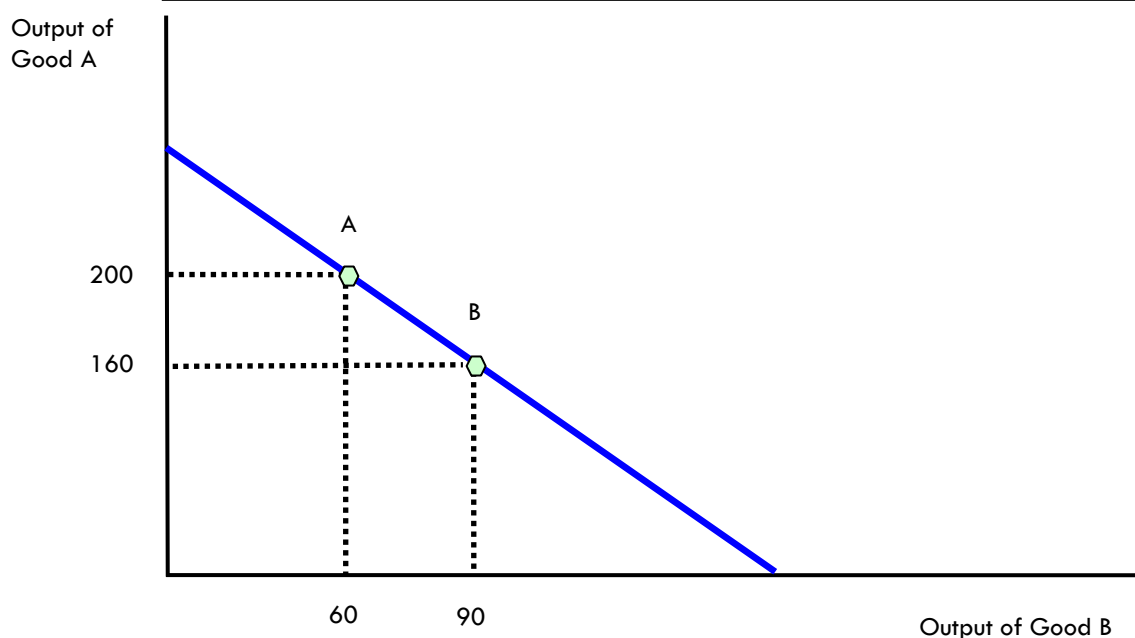
Reallocating scarce resources from one product to another involves an **opportunity cost**. If we go back to the previous PPF diagram, if we increase our output of Good X (i.e. a movement along the PPF from point A to point B) then fewer resources are available to produce good Y. Because of the shape of the PPF the

opportunity cost of switching resources increases – i.e. we have to give up more of Good Y to achieve gains in the output of good X.



The PPF does not always have to be drawn as a curve. If the opportunity cost for producing two products is constant, then we draw the PPF as a straight line. The gradient of that line is a way of measuring the opportunity cost between two goods.

A straight line PPF shows a constant opportunity cost between two products
 Increasing output of good B from 60 to 90 units implies giving up 90 units of good A
 The marginal opportunity cost for each extra unit of good B is 30 units of Good A



Explaining Shifts in the Production Possibility Frontier

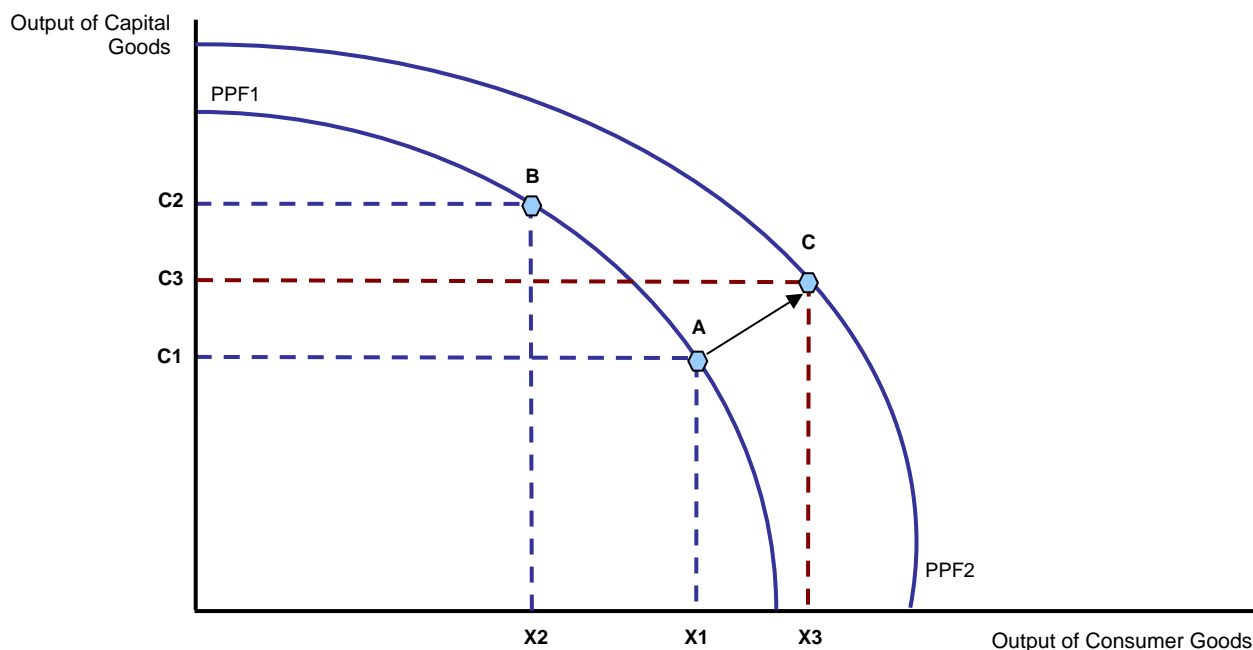
The production possibility frontier will shift when:

- There are **improvements in productivity and efficiency** perhaps because of the introduction of **new technology** or **advances in the techniques of production**)

- **More factor resources are exploited** perhaps due to an increase in the size of the workforce or a rise in the amount of capital equipment available for businesses

In the diagram below, there is an improvement in technology which shifts the PPF outwards. As a result of this, output possibilities have increased and we can conclude (providing the good provides positive satisfaction to consumers) that there is an improvement in economic welfare.

An outward shift in the PPF shows that there has been either an improvement in productivity or an increase in the total stock of resources available to produce different goods and services. The outward shift represents an improvement in economic efficiency



Technology, prices and consumer welfare

Improved technology should bring market prices down and make products more affordable to the consumer. This has been the case in the market for personal computers and digital products. The exploitation of **economies of scale** and improvements in production technology has brought prices down for consumers and businesses.

External Costs

In the case of air pollution there is an **external cost** to society arising from the contamination of our air supplies. **External costs** are those costs faced by a third party for which no compensation is forthcoming. Identifying and then estimating a monetary value for air pollution can be a very difficult exercise – but one that is important for economists concerned with the impact of economic activity on our environment. We will consider this issue in more detail when we study **externalities** and **market failure**.

Free Goods

Not all goods have an opportunity cost. **Free goods are not scarce** and no cost is involved when consuming them.



Air conditioning uses up scarce resources especially during hot weather

Is fresh air an example of a free good? Usually the answer is yes – yet we know that air can become contaminated by pollutants. And, in thousands of offices, shops and schools, air-conditioning systems cool the air before it is “consumed”. With air conditioning, scarce resources are used up in providing the “product” – for example the capital machinery and technology that goes into manufacturing the air conditioning equipment; the labour involved in its design, production, distribution and maintenance and the energy used up in powering the system.

Cool air might appear to be free – but in fact it is often an expensive product to supply!

4. Specialisation and Trade

One feature of nearly every aspect of economic life is that individuals, businesses and countries engage in **specialisation**. Specialisation is when we concentrate on a particular product or task. Surplus products can then be exchanged and traded with the potential for gains in welfare for all parties.

The potential benefits from specialisation

By concentrating on what people and businesses do best rather than relying on self sufficiency:

- **Higher output:** Total output of goods and services is raised and quality can be improved. A higher output at lower costs means more wants and needs might be satisfied with a given amount of scarce resources.
- **Variety;** Consumers have improved access to a greater variety of higher quality products i.e. they have more and better choice both from their own economy and from the production of other countries
- **A bigger market:** Specialisation and international trade increase the size of the market offering opportunities for economies of scale (a fall in long run costs per unit of output)
- **Competition and lower prices:** Increased competition for domestic producers acts as an incentive to minimise costs and innovate to remain competitive. Competition helps to keep prices down and maintains low inflation

The division of labour



Specialisation occurs in nearly every business – from manufacturing to restaurants

The [division of labour](#) is a particular type of specialisation where the production of a good is broken up into many separate tasks each performed by one person or by a small group of people. The division of labour raises output per person, thereby reducing costs per unit because lower skilled workers are easily trained and quickly become proficient through constant repetition of a task – ‘practice makes perfect’ – or “[learning by doing](#)”. Low unit costs allow firms to remain competitive in the markets in which they operate. Traditionally the division of labour and high level of specialisation in manufacturing industries is associated with the concept of scientific management or [Taylorism](#).

Limitations of division of labour

There are limits and downsides to the breaking down of production into many small tasks. Perhaps the greatest downside is that the division of labour may eventually reduce efficiency and increase unit costs

because unrewarding, repetitive work lowers worker motivation and productivity. Workers begin to take less pride in their work and quality suffers, the result may be a problem of diseconomies of scale.

The division of labour also runs the risk that if one machine breaks down then the entire factory stops. Some workers receive a narrow training and may not be able to find alternative jobs if they find themselves out of work (they may suffer [structural unemployment](#)). Another disadvantage is that mass-produced standardized goods tend to lack variety.

The concept of comparative advantage

First introduced by [David Ricardo](#) in 1817, comparative advantage exists when a country has a '**margin of superiority**' in the production of a good or service i.e. where the **marginal cost of production is lower**.

Countries will usually specialise in and then export products, which use intensively the factors inputs, which they are most abundantly **endowed**. If each country specializes in those goods and services where they have an advantage, then total output can be increased leading to an improvement in **allocative efficiency and economic welfare**. Put another way, trade allows each country to specialise in the production of those products that it can produce most efficiently (i.e. those where it has a comparative advantage).

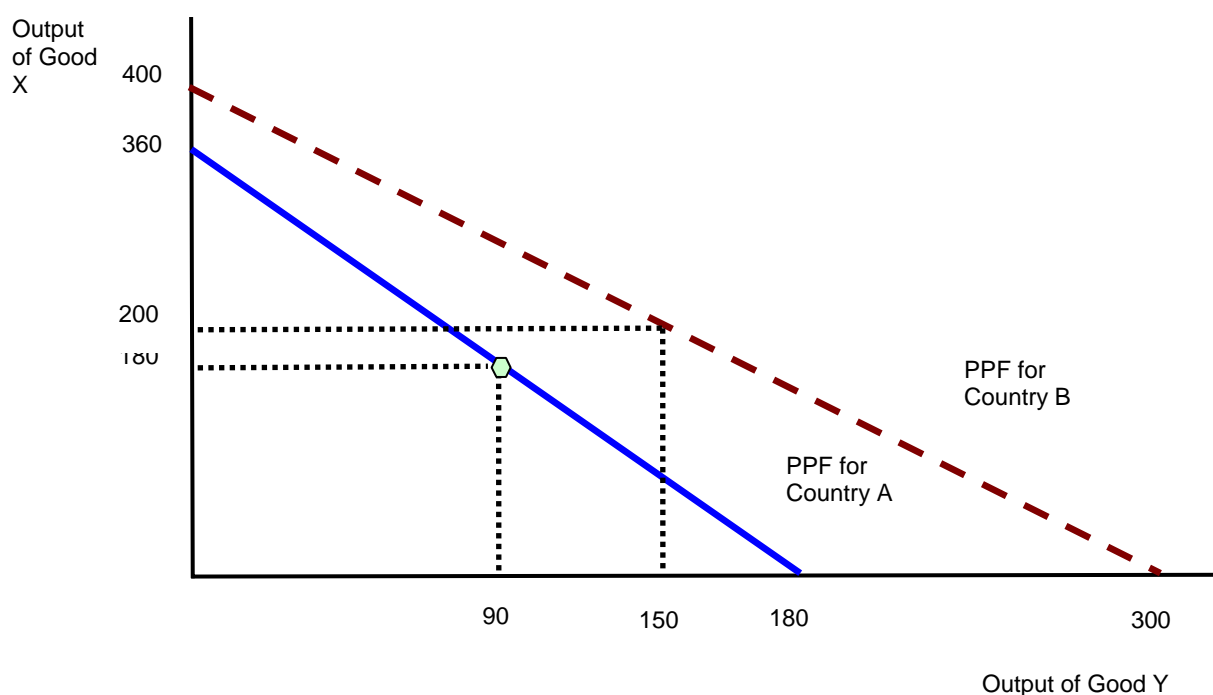
This is true even if one nation has an **absolute advantage** over another country. So for example the Canadian economy which is rich in low cost land is able to exploit this by specializing in agricultural production. The dynamic Asian economies including China have focused their resources in exporting low-cost manufactured goods which take advantage of much **lower unit labour costs**.

In highly developed countries, the comparative advantage is shifting towards specializing in producing and exporting **high-value and high-technology manufactured goods** and **high-knowledge services**.

Production advantage, the PPF and specialisation

Two countries are producing two products (X and Y). With a given amount of resources,

	Output of X	Output of Y
Country A	180	90
Country B	200	150



In this example, country B has an absolute advantage in both products. Absolute advantage occurs when a country or region can create more of a product with the same factor inputs.

But although country A has an absolute disadvantage, in fact it has a comparative advantage in the production of good X. It is 9/10ths as efficient at producing good X but it is only 3/5ths as efficient at producing good Y.

Comparative advantage exists when a country has lower opportunity cost, ie, it gives up less of one product to obtain more of another product. Economists argue countries benefit if they specialise in a product in which they have a comparative advantage and trade.

In our example above, for country A, every extra unit of good Y produced involves an opportunity cost of 2 unit of good X. Whereas for country B, an additional unit of good Y involves a sacrifice of only 4.3 units of good X.

There are gains to be had from country A specializing in the supply of good X and country B allocating more of their resources into the production of good Y.

Another worked example of comparative advantage

In this second example, we will work through an example of comparative advantage and also show some of the possible benefits that might flow from specialisation and trade between two countries. Consider two countries producing two products – digital cameras and vacuum cleaners. With the same factor resources evenly allocated by each country to the production of both goods, the production possibilities are as shown in the table below.

<i>Pre-specialisation</i>	Digital Cameras	Vacuum Cleaners
UK	600	600
United States	2400	1000
Total	3000	1600

Working out the comparative advantage

To identify which country should specialise in a particular product we need to analyse the **internal opportunity costs** for each country. For example, were the UK to shift more resources into higher output of vacuum cleaners, the opportunity cost of each vacuum cleaner is one digital television. For the United States the same decision has an opportunity cost of 2.4 digital cameras. Therefore, the UK has a comparative advantage in vacuum cleaners.

If the UK chose to **reallocate resources** to digital cameras the opportunity cost of one extra camera is still one vacuum cleaner. But for the United States the opportunity cost is only 5/12ths of a vacuum cleaner. Thus the United States has a comparative advantage in producing digital cameras because its opportunity cost is lowest.

Output after Specialization

	Digital Cameras	Vacuum Cleaners
UK	0 (-600)	1200 (+600)
United States	3360 (+960)	600 (-400)
Total	3000 3360	1600 1800

- The UK specializes totally in producing vacuum cleaners – doubling its output to 1200
- The United States partly specializes in digital cameras increasing output by 960 having given up 400 units of vacuum cleaners
- As a result of specialisation according to the principle of comparative advantage, output of both products has increased - representing a gain in economic welfare.

For mutually beneficial trade to take place, the two nations have to agree an **acceptable rate of exchange of one product for another**.

There are gains from trade between the two countries. If the two countries trade at a rate of exchange of 2 digital cameras for one vacuum cleaner, the post-trade position will be as follows:

- The UK exports 420 vacuum cleaners to the USA and receives 840 digital cameras
- The USA exports 840 digital cameras and imports 420 vacuum cleaners

Post trade output / consumption

	Digital Cameras	Vacuum Cleaners
UK	840	780
United States	2520	1020
Total	3360	1800

Compared with the pre-specialisation output levels, consumers in both countries now have an increased supply of both goods to choose from.

We have seen in this chapter how specialisation and trade based on the idea of comparative advantage can lead to an improvement in economic welfare.

5. Positive and Normative Statements

In this brief chapter we introduce you to the idea of positive and normative statements and the idea of value judgements contained in statements and articles.

Detecting bias in arguments

Whenever you are reading articles on current affairs it is important to be able to distinguish where possible between objective and subjective statements. Very often the person writing an article has a particular argument to make and will include in their piece **subjective statements** about what ought to be or what should be happening. Their articles are said to carry **value judgements**, they are trying to persuade you of the particular merits or demerits of a particular policy decision or issues. These articles may be lacking in objectivity.

Positive Statements

Positive statements are **objective statements** that can be tested or rejected by referring to the available evidence. Positive economics deals with **objective explanation** and the testing and rejection of theories. For example:

- A rise in consumer incomes will lead to a rise in the demand for new cars.
- A fall in the exchange rate will lead to an increase in exports overseas.
- More competition in markets can lead to lower prices for consumers.
- If the government raises the tax on beer, this will lead to a fall in profits of the brewers.
- A reduction in income tax will improve the incentives of the unemployed to search for work.
- A rise in average temperatures will increase the demand for chicken.
- Poverty in the UK has increased because of the fast growth of executive pay.

Normative Statements

Normative statements express an **opinion** about what ought to be. They are subjective statements rather than objective statements – i.e. they carry **value judgments**. For example:

- The level of duty on petrol is too unfair and unfairly penalizes motorists.
- The London congestion charge for drivers of [petrol-guzzling cars](#) should increase to £25 - three times the current charge.
- The government should increase the national minimum wage to £6 per hour in order to reduce relative poverty.
- The government is right to introduce a [ban on smoking in public places](#).
- The retirement age should be raised to 75 to combat the effects of our ageing population.
- The government ought to provide financial subsidies to companies manufacturing and developing [wind farm technology](#).

6. Markets: The Theory of Demand

We now consider the basic theories of how the market mechanism works. In this chapter we consider the economics of the law of demand. This is important background to understanding the determination of prices in competitive markets.

Demand

Demand is defined as the quantity of a good or service that consumers are **willing and able to buy** at a **given price in a given time period**. Each of us has an **individual demand** for particular goods and services and the level of demand at each market price reflects the **value** that consumers place on a product and their **expected satisfaction** gained from purchase and consumption.

Market demand

Market demand is the **sum of the individual demand for a product from each consumer in the market**. If more people enter the market and they have the ability to pay for items on sale, then demand at each price level will rise.

Effective demand and willingness to pay

Demand in economics must be **effective** which means that only when a consumers' desire to buy a product is backed up by **an ability to pay for it** does demand actually have an effect on the market. Consumers must have sufficient **purchasing power** to have any effect on the allocation of scarce resources. For example, what price are you willing to pay to view a world championship boxing event and how much are you prepared to spend to watch Premiership soccer on a pay-per-view basis? Would you be willing and able to pay to watch Elton John perform live through a subscription channel?

Auctions of film posters

Classic film posters are fetching thousands of pounds as more and more private collectors vie for a piece of cinema history. The prices that collectors are prepared to pay for film posters continues to rise, some of the buyers are hoping for a financial return whereas others are just willing and able to pay for the satisfaction that comes from owning a small slice of cinema memorabilia.

Rockonomics – rising ticket prices for pop concerts

Tickets for the most popular rock and pop concerts keep getting more expensive but consumers seem happy and able to pay for them judging from the number of sell-out gigs in London this spring. The price of a seat for to see Madonna's "Confessions on a Dancefloor" tour ranges from £80 to £160, with an additional £13 booking fee. A ticket to see Red Hot Chili Peppers will set you back £40 and the chance to see Bruce Springsteen at the Hammersmith Apollo is priced at just under £50 for a standard ticket. Ticket prices have been rising much faster than the overall rate of inflation which has led to a large rise in the real price of seeing your favourite pop star on stage.

Latent Demand

Latent demand is probably best described as the potential demand for a product. It exists when there is willingness to buy among people for a good or service, but where consumers lack the purchasing power to be able to afford the product. Latent demand is affected by **advertising** – where the producer is seeking to influence consumer tastes and preferences.

The concept of derived demand

The demand for a product X might be strongly linked to the demand for a related product Y – giving rise to the idea of a **derived demand**.

For example, the demand for steel is strongly linked to the demand for new vehicles and other manufactured products, so that when an economy goes into a downturn or recession, so we would expect the demand for steel to decline likewise. The major producer of steel in the UK is [Corus](#). They produce for a wide range of different industries; from agriculture, aerospace and construction industries to consumer goods producers, packing and the transport sector. Steel is a **cyclical industry** which means that the total market demand for steel is affected by changes in the economic cycle and also by fluctuations in the exchange rate.



The demand for new bricks is derived from the demand for the final output of the construction industry- when there is a boom in the building industry, so the market demand for bricks will increase

The Law of Demand

Other factors remaining constant (*ceteris paribus*) there is an **inverse relationship between the price of a good and demand**.

1. As prices fall, we see an **expansion of demand**
2. If price rises, there will be a **contraction of demand**.

The *ceteris paribus* assumption

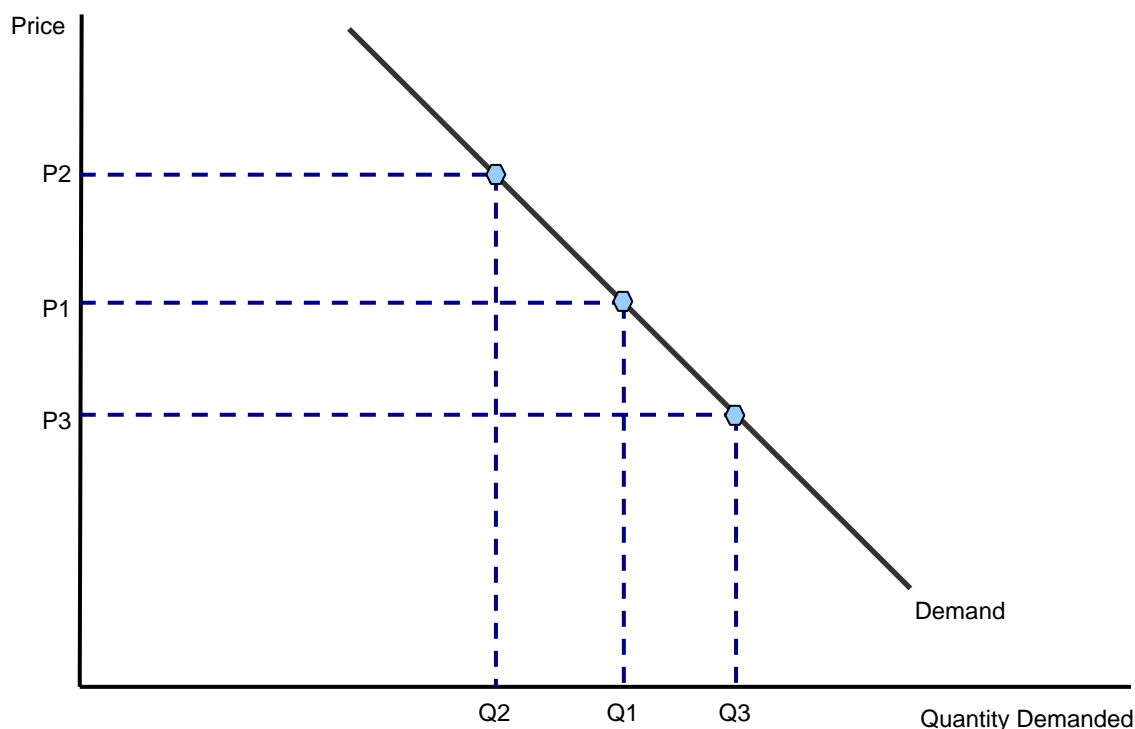
Understanding [ceteris paribus](#) is the key to understanding much of microeconomics. Many factors can be said to affect demand. Economists assume all factors are held constant (ie do not change) except one – the price of the product itself. A change in a factor being held constant invalidates the *ceteris paribus* assumption

The Demand Curve

A demand curve shows the relationship between the price of an item and the quantity demanded over a period of time. There are two reasons why more is demanded as price falls:

1. **The Income Effect:** There is an income effect when the price of a good falls because the consumer can maintain current consumption for less expenditure. Provided that the good is normal, some of the resulting increase in real income is used by consumers to buy more of this product.
2. **The Substitution Effect:** There is also a substitution effect when the price of a good falls because the product is now relatively cheaper than an alternative item and so some consumers switch their spending from the good in competitive demand to this product.

Demand – the amount consumers desire to purchase at various alternative prices
At higher prices, consumers generally willing to purchase less than at lower prices
At lower prices there is a financial incentive to demand more of a good or service



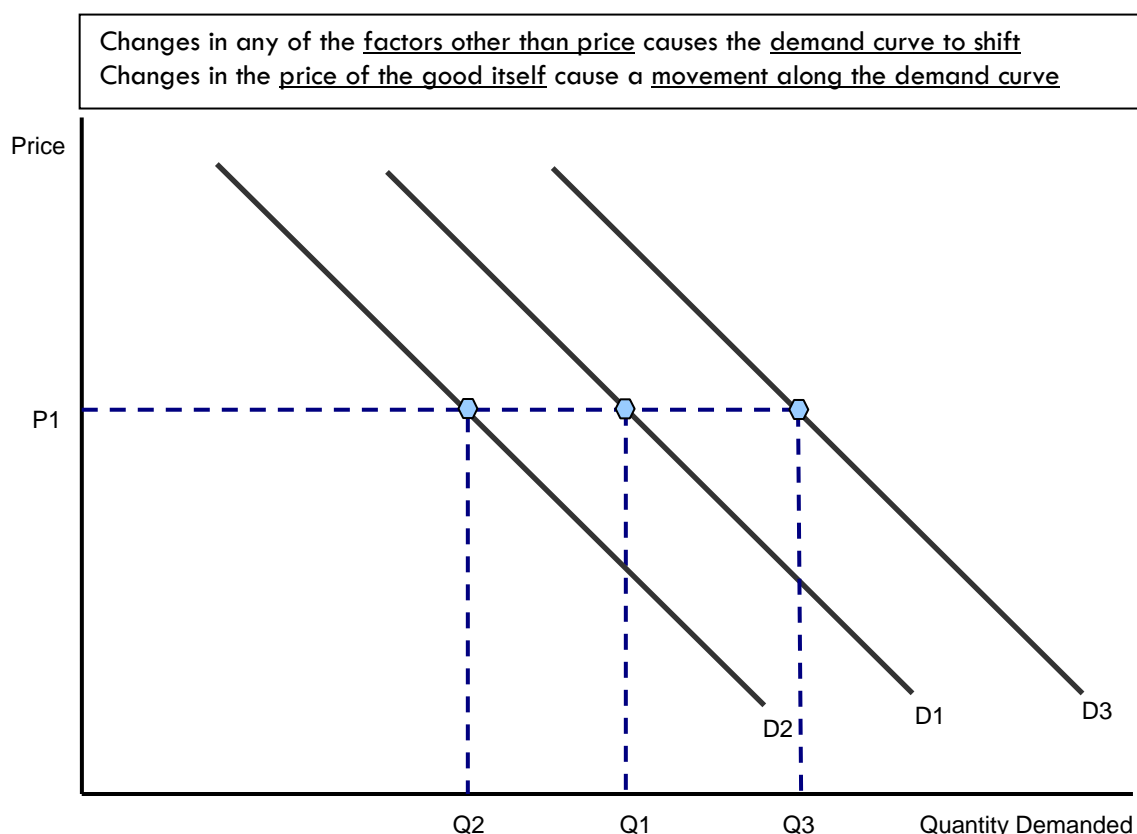
The demand curve is normally drawn in textbooks as a straight line suggesting a linear relationship between price and demand but in reality, the demand curve will be non-linear! No business has a perfect idea of what the demand curve for a particular product looks like, they use real-time evidence from markets to estimate the demand conditions and they accumulated experience of market conditions gives them an advantage in constructing demand-price relationships.

A change in the price of a good or service causes a movement along the demand curve. A fall in the price of a good causes an expansion of demand; a rise in price causes a contraction of demand. Many other factors can affect total demand - when these change, the demand curve can shift. This is explained below.

Shifts in the Demand Curve Caused by Changes in the Conditions of Demand

There are two possibilities: either the demand curve shifts to the right or it shifts to the left. In the diagram below we see two shifts in the demand curve:

1. D1 – D3 would be an example of an outward shift of the demand curve (or an increase in demand). When this happens, more is demanded at each price.
2. A movement from D1 – D2 would be termed an inward shift of the demand curve (or decrease in demand). When this happens, less is demanded at each price.



The conditions of demand

The conditions of demand for a product in a market can be summarised as follows:

$$D = f(P_n, P_{n-1}, Y, T, P, E)$$

Where:

- P_n = Price of the good itself
- P_{n-1} = Prices of other goods – e.g. prices of Substitutes and Complements
- Y = Consumer incomes – including both the level and distribution of income
- T = Tastes and preferences of consumers
- P = The level and age-structure of the population
- E = Price expectations of consumers for future time periods

Changing prices of a substitute good

Substitutes are goods in **competitive demand** and act as **replacements** for another product.

For example, a rise in the price of Esso petrol should cause a substitution effect away from Esso towards competing brands. A fall in the monthly rental charges of cable companies or Vodafone mobile phones might cause a decrease in the demand for British Telecom services. Consumers will tend over time to switch to the cheaper brand or service provider. When it is easy and cheap to switch, then consumer demand will be sensitive to price changes.

Much depends on whether consumers have sufficient **information about prices** for different goods and services. One might expect that a fall in the charges from one car rental firm such as Budget might affect the demand for car rentals from Avis Hertz or EasyCar. But searching for price information to get the best deal in the market can be time consuming and always involves an opportunity cost. The development of the internet has helped to increase **price transparency** thereby making it easier for consumers to compare relative prices in markets.

Changing price of a complement

Two complements are said to be in **joint demand**. Examples include: fish and chips, DVD players and DVDs, iron ore and steel.

- A rise in the price of a complement to Good X should cause a fall in demand for X. For example an increase in the cost of flights from London Heathrow to New York would cause a decrease in the demand for hotel rooms in New York and also a fall in the demand for taxi services both in London and New York.
- A fall in the price of a complement to Good Y should cause an increase in demand for Good Y. For example a reduction in the market price of computers should lead to an increase in the demand for printers, scanners and software applications.

Change in the income of consumers

Most of the things we buy are **normal goods**. When an individual's income goes up, their ability to purchase goods and services increases, and this causes an outward shift in the demand curve. When incomes fall there will be a decrease in the demand for most goods.

Change in tastes and preferences

Changing tastes and preferences can have a huge effect on demand. Persuasive advertising is designed to cause a change in tastes and preferences and thereby create an outward shift in demand. A good example of this is the recent surge in sales of smoothies and other fruit juice drinks.



The market for health fruit and vegetable drinks has grown rapidly in recent years following a change in consumer preferences. How much are we influenced by the effects of advertising?

The market demand for smoothies

The UK's growing thirst for healthy eating and fears about the longer term health effects of the consumption of fast food has meant that the demand for smoothies and other fresh fruit drinks has expanded rapidly in recent years. [Innocent](#), the leading brand in supermarkets, estimates that the market could be worth £170m in 2007. More and more retail outlets such as Crush are appearing on the high streets, and demand is rising in school canteens and workplaces. Innocent has seen its turnover expand to £37m in the past six years and has over 50 per cent of the UK market. It sells 1m smoothies a week, compared with 20 on its first day of operation in 1999. Some stockmarket experts are forecasting that a fruit juice manufacturer could eventually enter the FTSE-100 list of top stockmarket businesses.

Source: Adapted from news reports, June 2006 and the [Innocent web site](#)

Discretionary income

Discretionary income is disposable income less essential payments like electricity & gas and, especially, mortgage repayments. An increase in interest rates often means an increase in monthly mortgage payments reducing demand. And during 2005 and 2006 we have seen a sharp rise in the cost of utility bills with a series of hikes in the prices of gas and electricity. This has eaten into the discretionary incomes of millions of households across the UK. The [discretionary incomes](#) of people suffering from **fuel poverty** have become a major current issue.

Interest rates and demand

Many products are bought on credit using borrowed money, thus the demand for them may be sensitive to the **rate of interest** charged by the lender. Therefore if the [Bank of England](#) decides to raise interest rates – the demand for many goods and services may fall. Examples of “**interest sensitive**” products include household appliances, electronic goods, new furniture and motor vehicles. The demand for housing is affected by changes in mortgage interest rates.

Exceptions to the law of demand

Does the demand for a product always vary inversely with the price? There are two possible reasons why more might be demanded even when the price of a good or service is increasing. We consider these briefly – ostentatious consumption and the effects of speculative demand.

(a) Ostentatious consumption

Some goods are **luxurious items** where satisfaction comes from knowing both the price of the good and being able to flaunt consumption of it to other people! The demand for the product is a direct function of its price.

A higher price may also be regarded as a **reflection of product quality** and some consumers are prepared to pay this for the “**snob value effect**”.

Examples might include perfumes, designer clothes, and top of the range cars. Consider the case of VI which is considered to be the most exclusive perfume in the world. Only 475 bottles have been produced and bottles have been selling for £47,500 each – a classic case of paying through the nose for an exclusive good.

Goods of ostentatious consumption are known as [Veblen Goods](#) and they have a **high-income elasticity of demand**. That is, demand rises more than proportionately to an increase in income.

(b) Speculative Demand

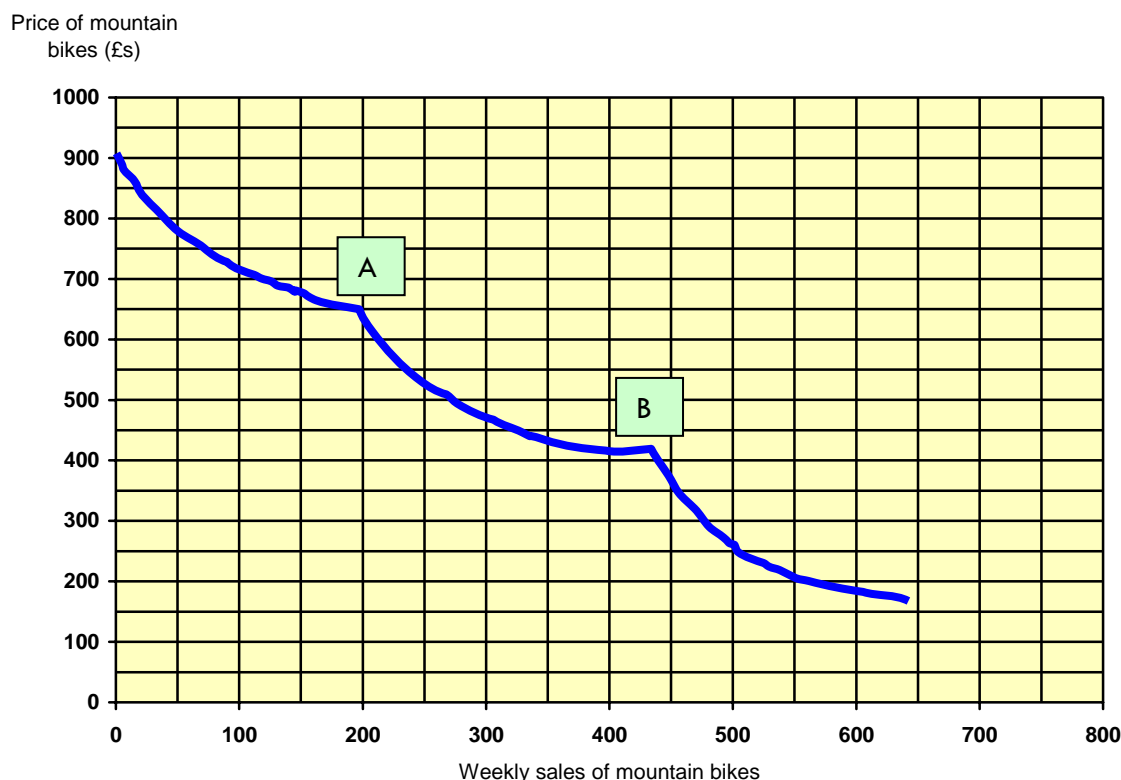
The demand for a product can also be affected by **speculative demand**. Here, potential buyers are interested not just in the satisfaction they may get from consuming the product, but also the **potential rise in market price** leading to a **capital gain or profit**. When prices are rising, speculative demand may grow, adding to the upward pressure on prices. The speculative demand for housing and for shares might come into this category and we have also seen, in the last few years, strong speculative demand for many of the world's essential commodities.

Speculation drives the prices of commodities to fresh highs

World commodity prices have reached new highs this year helped by an increase in the rate of economic growth in the global economy. Among the metals that have achieved record price levels are [copper](#), zinc, gold and platinum; prompting sceptics to question how much longer prices can continue rising. Many market experts believe that the demand for commodities has been spurred by [heavy speculator activity](#). For example, pension funds and hedge funds have been investing in commodity mutual funds over recent years leading to increased demand for precious metals. Prices have risen quickly because commodity producers are unable to raise output sufficiently to meet unexpectedly strong demand.

Source: Adapted from news reports, July 2006

The non-linear demand curve and the idea of price points



So far in our introductory theory of demand, we have drawn the demand curve for a product to be linear (a straight line). In many real world markets this assumption of a linear relationship between price and quantity demanded is not realistic. Many price-demand relationships are non-linear and an example of this is provided in the chart above, used to illustrate the idea of **price-points**.

Price points are points on the demand curve where demand is relatively high, but where a small change in price may cause a sizeable contraction in demand leading to a loss of total revenue for the producer. Consider price point A. Raising the selling price of the mountain bike above £650 causes demand to decline quite quickly. From selling 250 bikes per week, raising the price to £700 leads to sales dipping to 175 per week. In technical terms we say that the price elasticity of demand is higher at a price just above the price point. Another price point might exist at B. Looking at this in a slightly different way, cutting the price below £400 leads to a large expansion of demand.

Price points can be justified in a number of ways:

1. A price rise at the price point may make the product more expensive than a close substitute causing consumers to change their preferences
2. Customers may have become used to paying a certain price for a type of product and if they see a further price rise, this may cause them to revalue how much satisfaction they get from buying and consuming something, leading to a decline in demand
3. There may be psychological effects at work, supermarkets for example know the importance of avoiding price points - £2.99 somehow seems cheaper than £3.00 despite the tiny price difference

For AS level economics, you will be expected to draw and use linear demand curves in your basic analysis. But it is important to realise that in the real world of business, price-demand relationships can be complex and often a business does not have enough information about the behaviour of consumers for them to actually construct an accurate demand curve. As with many aspects of economic theory, we are constructing curves to illustrate economic relationships. They are simplifications of reality.

7. Markets: The Theory of Supply

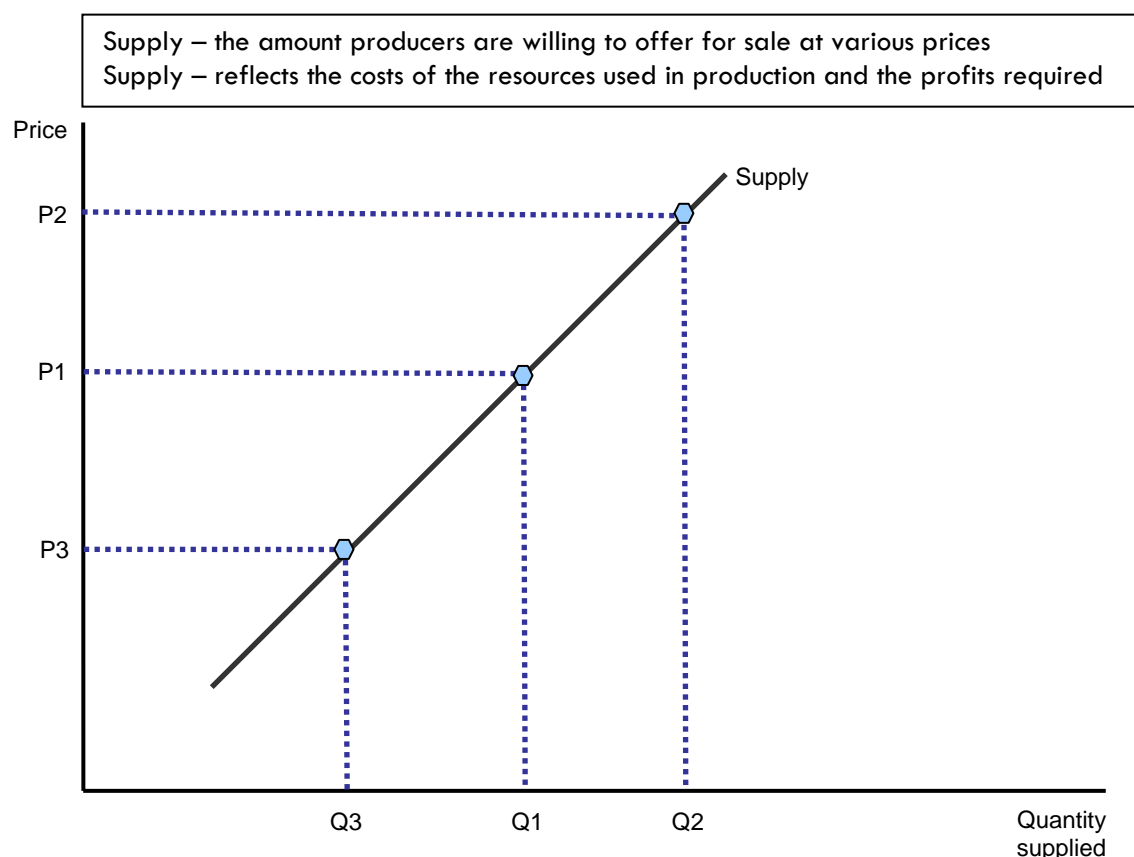
In this chapter we turn our attention to the decisions that producers make about how much of a product to supply to a market at any given price. Once we have understood the basics of supply, we can then put supply and demand together to consider the determination of equilibrium prices in a market.

Definition of Supply

Supply is defined as the quantity of a product that a producer is **willing and able to supply** onto the market **at a given price in a given time period**.

Note: Throughout this study companion, the terms firm, business, producer and seller have the same meaning.

The basic **law of supply** is that as the price of a commodity rises, so producers expand their supply onto the market. A supply curve shows a relationship between price and quantity a firm is willing and able to sell.



A supply curve is drawn assuming *ceteris paribus* - ie that all factors influencing supply are being held constant except price. If the price of the good varies, we move along a supply curve. In the diagram above, as the price rises from P1 to P2 there is an **expansion of supply**. If the market price falls from P1 to P3 there would be a **contraction of supply** in the market. Businesses are responding to **price signals** when making their output decisions.

Explaining the Law of Supply

There are three main reasons why supply curves for most products are drawn as sloping upwards from left to right giving a **positive relationship between the market price and quantity supplied**:

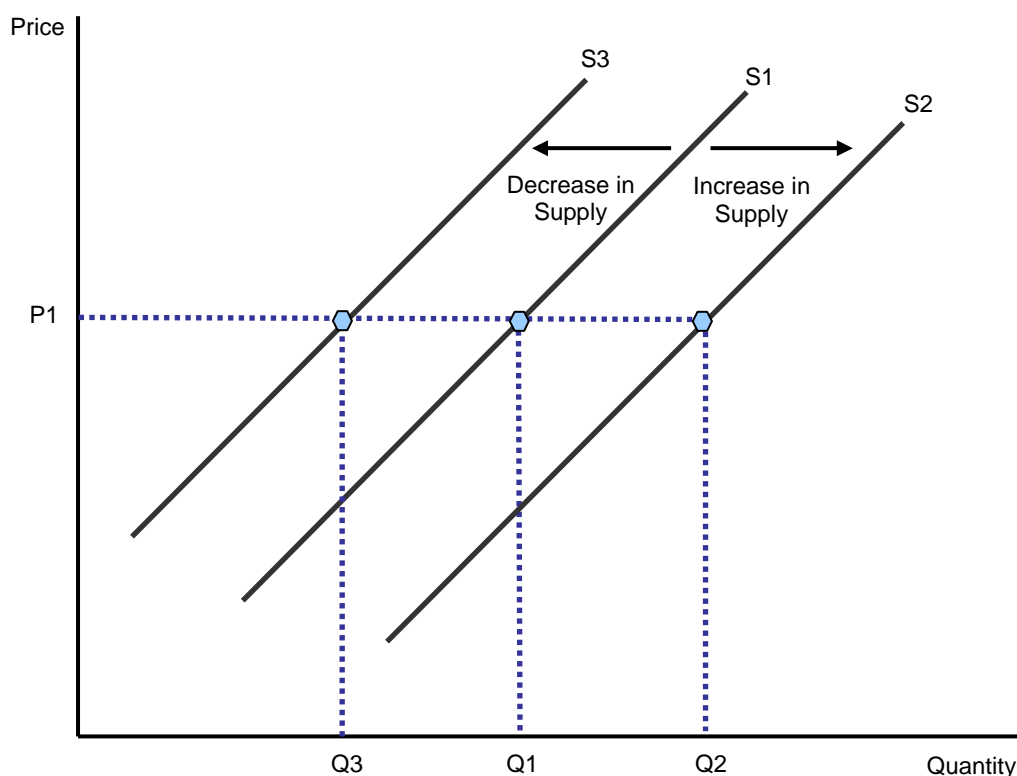
1. **The profit motive:** When the market price rises (for example after an increase in consumer demand), it becomes more profitable for businesses to increase their output. Higher prices send signals to firms that they can increase their profits by satisfying demand in the market.

2. **Production and costs:** When output expands, a firm's production costs rise, therefore a higher price is needed to justify the extra output and cover these extra costs of production.
3. **New entrants coming into the market:** Higher prices may create an incentive for other businesses to enter the market leading to an increase in supply.

Shifts in the Supply Curve

The supply curve can shift position. If the supply curve shifts to the right (from S1 to S2) this is an increase in supply; more is provided for sale at each price. If the supply curve moves inwards from S1 to S3, there is a decrease in supply meaning that less will be supplied at each price

Changes in any of the factors other than price cause a shift in the supply curve
 A shift in supply to the left – the amount that producers offer for sale at every price will be less
 A shift in supply to the right – the amount producers wish to sell at every price increases



Changes in the costs of production

Lower costs of production mean that a business can supply more at each price. For example a magazine publishing company might see a reduction in the cost of its imported paper and inks. A car manufacturer might benefit from a stronger exchange rate because the cost of components and new technology bought from overseas becomes lower. These cost savings can then be passed through the [supply chain](#) to wholesalers and retailers and may result in lower market prices for consumers.

Conversely, if the costs of production increase, for example following a rise in the price of raw materials or a firm having to pay higher wages to its workers, then businesses cannot supply as much at the same price and this will cause an inward shift of the supply curve.

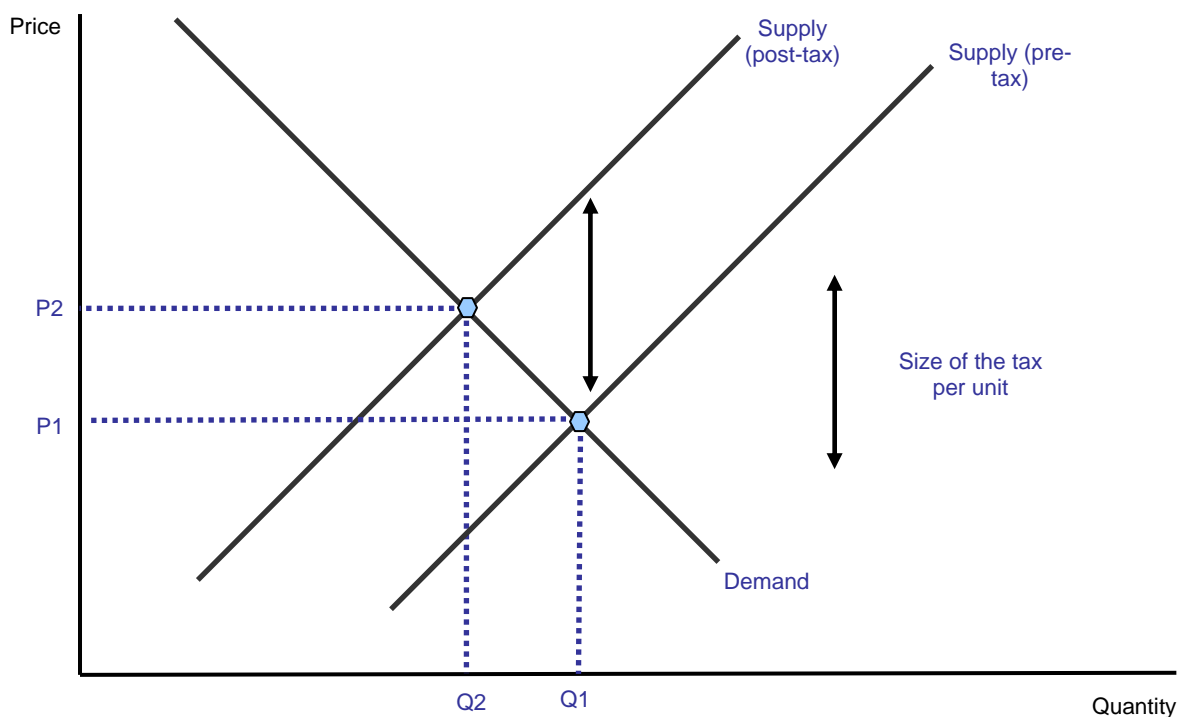
A **fall in the exchange rate** causes an increase in the prices of imported components and raw materials and will (other factors remaining constant) lead to a decrease in supply in a number of different markets and industries. For example if the pounds falls by 10% against the Euro, then it becomes more expensive for British car manufacturers to import their rubber and glass from Western European suppliers, and higher prices for paints imported from Eastern Europe.

Changes in production technology

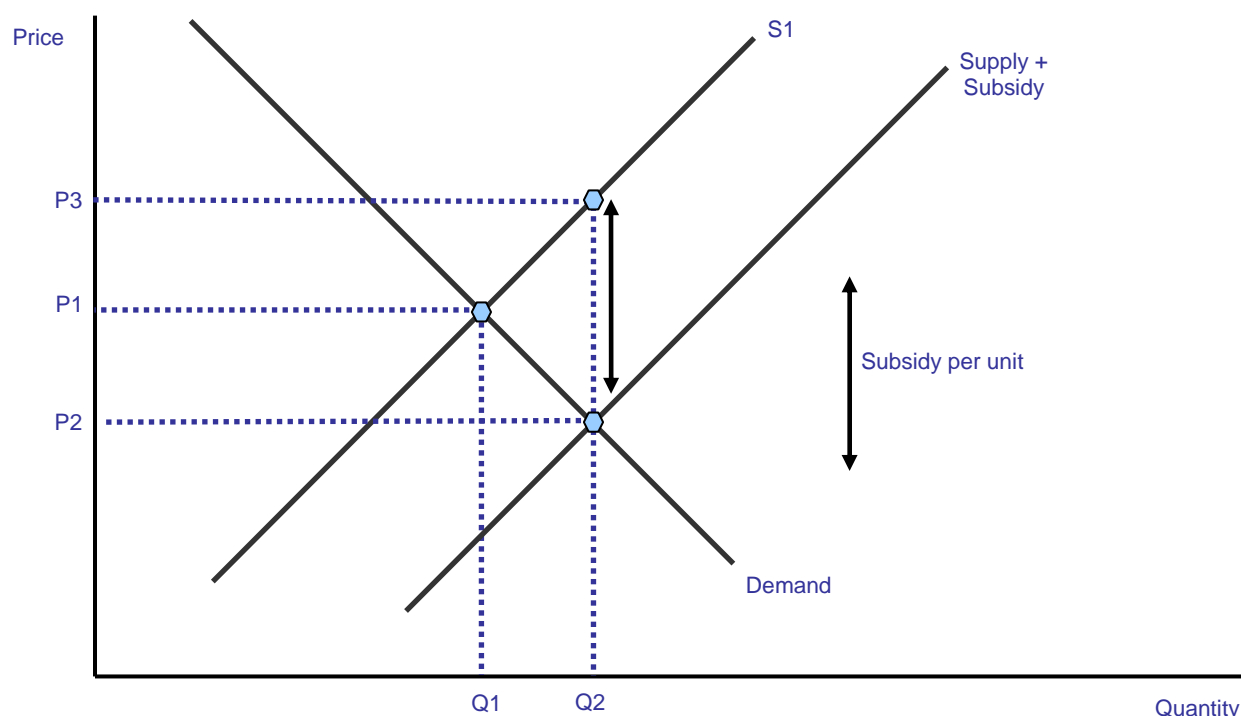
Production technologies can change quickly and in industries where technological change is rapid we see increases in supply and lower prices for the consumer.

Government taxes and subsidies

A tax increases the costs faced by producers. The amount of the tax is shown by the vertical distance between the two supply curves. Because of the tax, less can be supplied at each price level. The result is an increase in the equilibrium market price and a contraction in market demand to a new equilibrium output of Q_2



A government subsidy encourages an increase in supply at each price level because the subsidy provides a reduction in a firm's costs of production. The extent of the subsidy per unit is shown by the vertical distance between the two supply curves.



Changes in climate

For commodities such as coffee, oranges and wheat, the effect of **climatic conditions** can exert a great influence on market supply. Favourable weather will produce a bumper harvest and will increase supply. Unfavourable weather conditions will lead to a poorer harvest, lower yields and therefore a decrease in supply.

Changes in climate can therefore have an effect on prices for agricultural goods such as coffee, tea and cocoa. Because these commodities are often used as ingredients in the production of other products, a change in the supply of one can affect the supply and price of another product. Higher coffee prices for example can lead to an increase in the price of coffee-flavoured cakes. And higher banana prices as we see in the article below, will feed through to increased prices for banana smoothies in shops and cafes.

Cyclone destroys the Australian banana crop and sends prices soaring

Cyclone Larry has devastated [Australia's banana industry](#), destroying fruit worth \$300 million and leaving up to 4,000 people out of work. Australians now face a shortage of bananas and likely price rises after the cyclone tore through the heart of the nation's biggest growing region. Queensland produces about 95 per cent of Australia's bananas. The storm ruined 200,000 tonnes of fruit and market supply shortages will be severe because Australia does not allow banana imports because of the bio-security risks in doing so. Bananas are grown throughout the year in north Queensland, with the fruit having a growing cycle of around two months.

Source: Adapted from news reports, April 2006

Change in the prices of a substitute in production

A **substitute in production** is a product that could have been produced using the same resources. Take the example of barley. An increase in the price of wheat makes wheat growing more financially attractive. The profit motive may cause farmers to grow more wheat rather than barley.

The number of producers in the market and their objectives

The **number of sellers (businesses) in an industry** affects market supply. When new businesses enter a market, supply increases causing downward pressure on price.

Competitive Supply

Goods and services in competitive supply are alternative products that a business could make with its factor resources of land, labour and capital. For example a farmer can plant potatoes or maize.



Farmers can change their crops if there are sizeable changes in market prices and if expectations of future price movements also change.

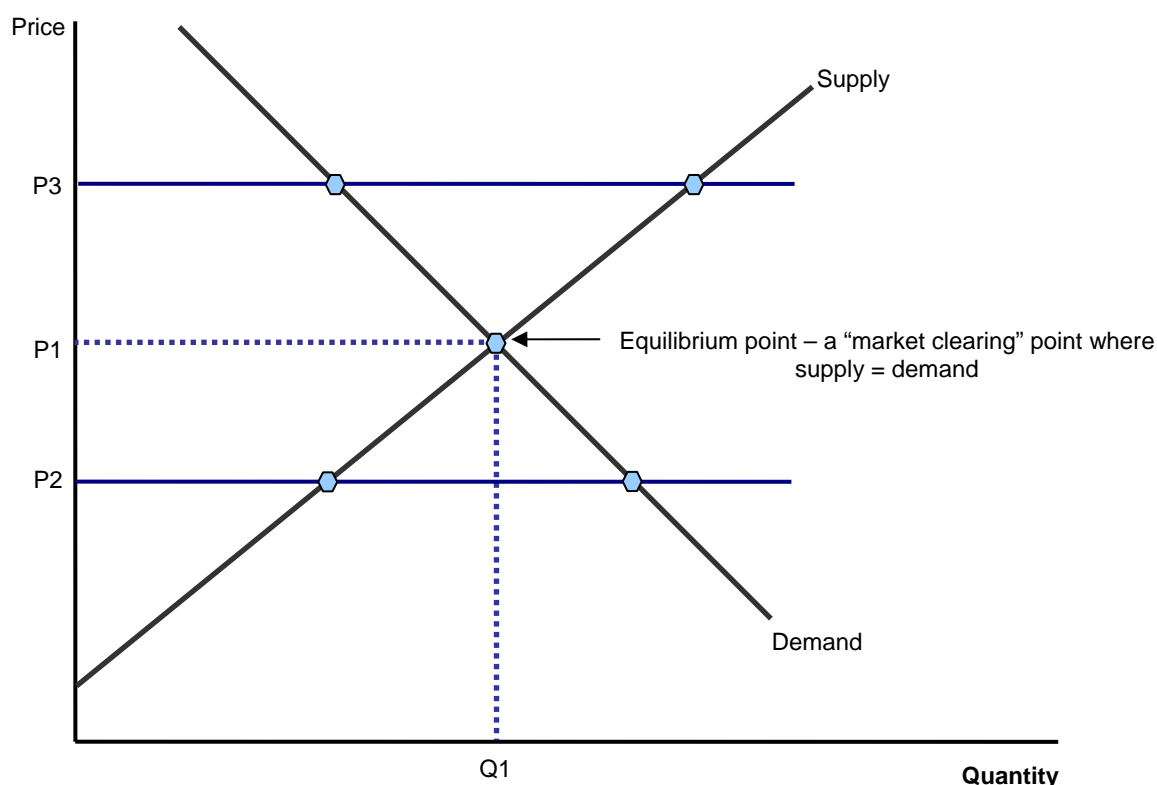
8. Market Equilibrium Price

In this chapter we bring the forces of supply and demand together to consider the determination of equilibrium prices.

The Concept of Market Equilibrium

Market price is set by the interaction of supply and demand

Equilibrium price is the price at which the quantity demanded by consumers and the quantity that firms are willing to supply of a good or service are the same.



Equilibrium means a **state of equality or a state of balance between market demand and supply**.

Without a shift in demand and/or supply there will be no change in market price. In the diagram above, the quantity demanded and supplied at price P1 are equal. At any price above P1, supply exceeds demand and at a price below P1, demand exceeds supply. In other words, prices where demand and supply are out of balance are termed points of disequilibrium.

Changes in the conditions of demand or supply will shift the demand or supply curves. This will cause changes in the equilibrium price and quantity in the market.

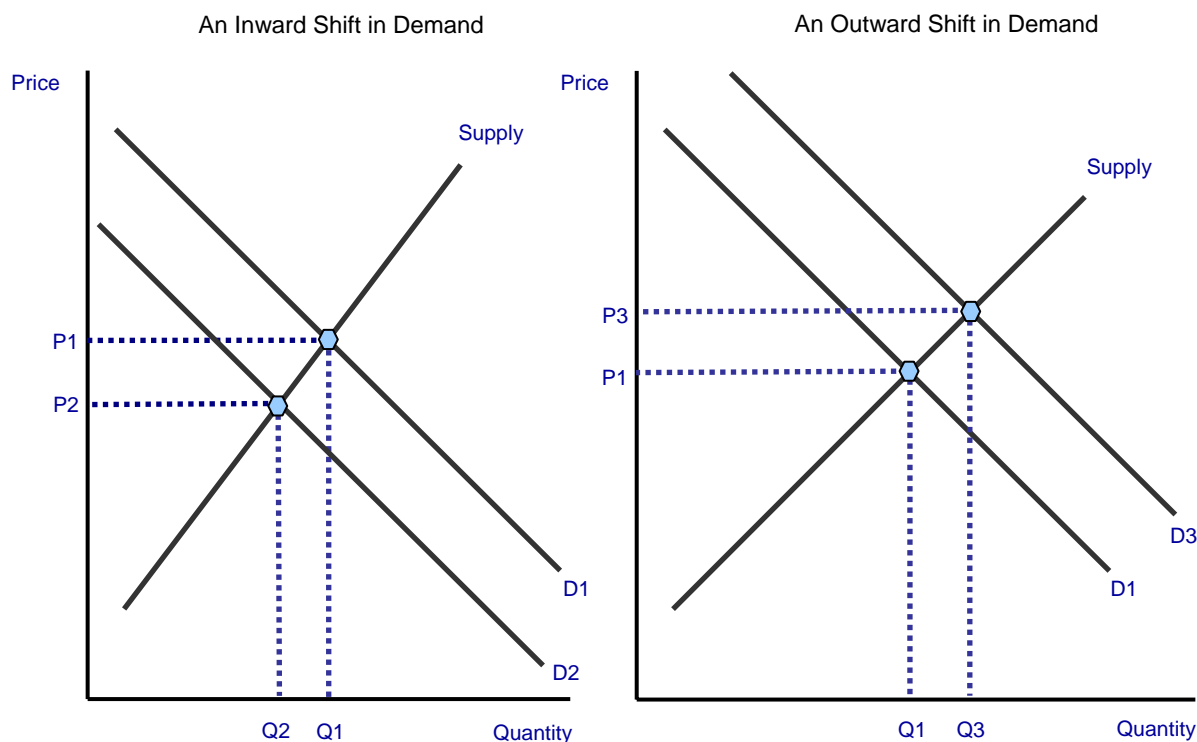
Demand and supply schedules can be represented in a table. The example below provides an illustration of the concept of equilibrium. The weekly demand and supply schedules for T-shirts (in thousands) in a city are shown in the next table:

Price per unit (£)	8	7	6	5	4	3	2	1
Demand (000s)	6	8	10	12	14	16	18	20

Supply (000s)	18	16	14	12	10	8	6	4
New Demand (000s)	10	12	14	16	18	20	22	24
New Supply (000s)	26	24	22	20	18	16	14	12

1. The equilibrium price is £5 where demand and supply are equal at 12,000 units
2. If the current market price was £3 – there would be excess demand for 8,000 units
3. If the current market price was £8 – there would be excess supply of 12,000 units
4. A change in fashion causes the demand for T-shirts to rise by 4,000 at each price. The next row of the table shows the higher level of demand. Assuming that the supply schedule remains unchanged, the new equilibrium price is £6 per tee shirt with an equilibrium quantity of 14,000 units
5. The entry of new producers into the market causes a rise in supply of 8,000 T-shirts at each price. The new equilibrium price becomes £4 with 18,000 units bought and sold

Changes in Market Demand and Equilibrium Price



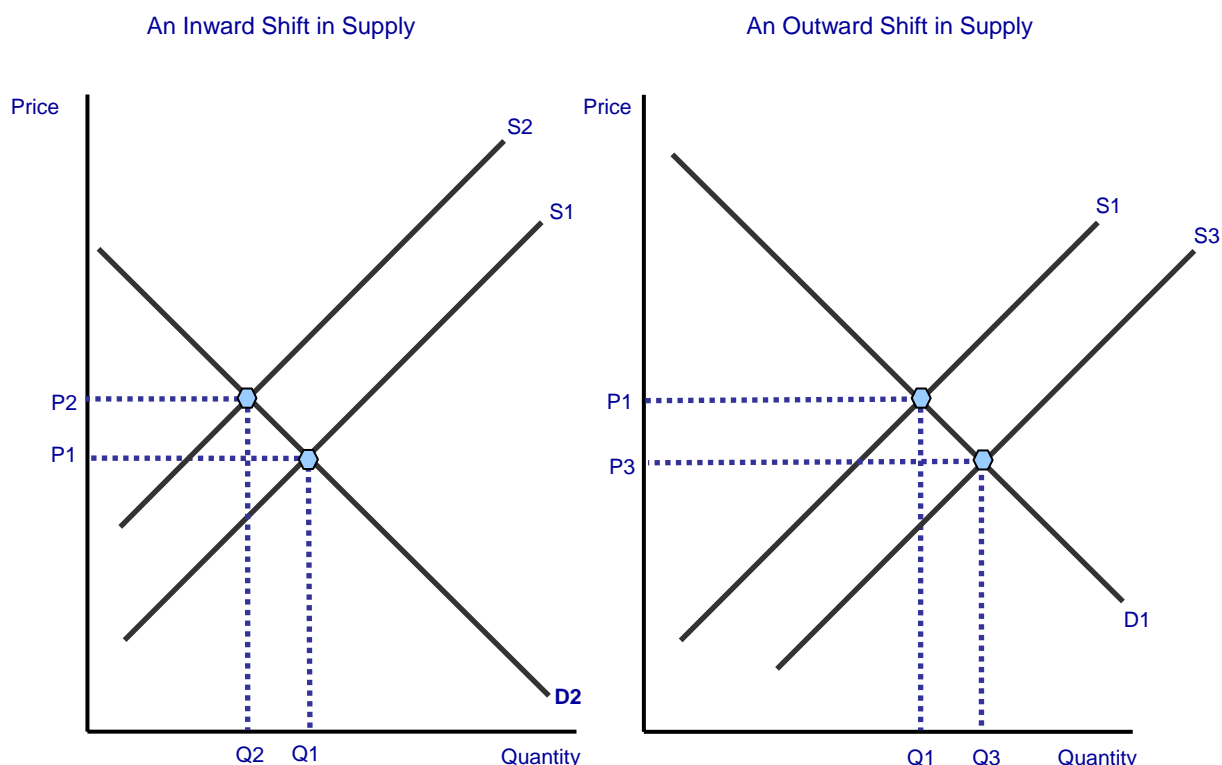
The demand curve may shift to the right (increase) for several reasons:

1. A rise in the price of a substitute or a fall in the price of a complement
2. An increase in consumers' income or their wealth
3. Changing consumer tastes and preferences in favour of the product
4. A fall in interest rates (i.e. borrowing rates on bank loans or mortgage interest rates)
5. A general rise in consumer confidence and optimism

The outward shift in the demand curve causes a movement (expansion) along the supply curve and a rise in the equilibrium price and quantity. Firms in the market will sell more at a higher price and therefore receive more in total revenue.

The reverse effects will occur when there is an inward shift of demand. A shift in the demand curve does not cause a shift in the supply curve! Demand and supply factors are assumed to be independent of each other although some economists claim this assumption is no longer valid!

Changes in Market Supply and Equilibrium Price



The supply curve may shift outwards if there is

1. A fall in the costs of production (e.g. a fall in labour or raw material costs)
2. A government subsidy to producers that reduces their costs for each unit supplied
3. Favourable climatic conditions causing higher than expected yields for agricultural commodities
4. A fall in the price of a substitute in production
5. An improvement in production technology leading to higher productivity and efficiency in the production process and lower costs for businesses
6. The entry of new suppliers (firms) into the market which leads to an increase in total market supply available to consumers

The outward shift of the supply curve increases the supply available in the market at each price and with a given demand curve, there is a fall in the market equilibrium price from P1 to P3 and a rise in the quantity of output bought and sold from Q1 to Q3. The shift in supply causes an expansion along the demand curve.

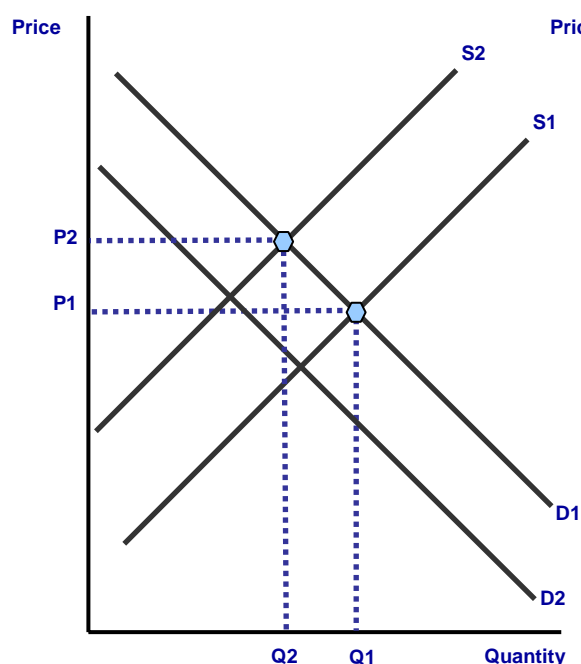
Important note for the exams:

A shift in the supply curve does not cause a shift in the demand curve. Instead we move along (up or down) the demand curve to the new equilibrium position.

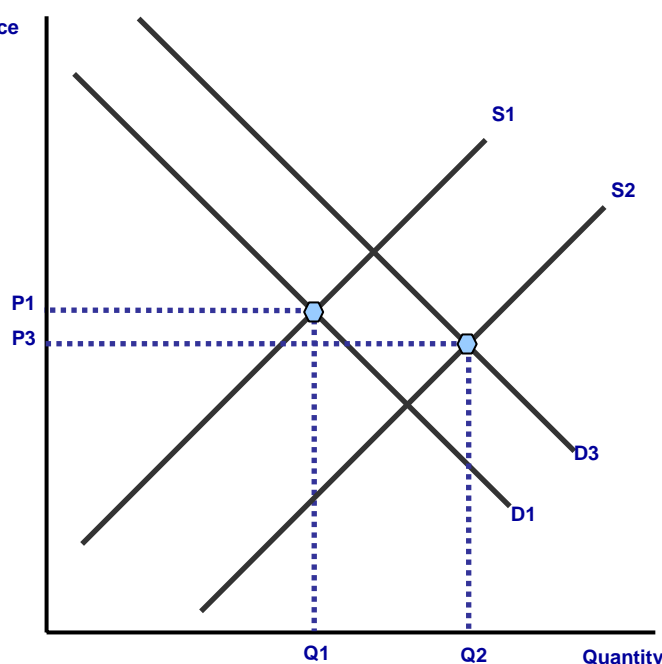
A fall in supply might also be caused by the **exit of firms from an industry** perhaps because they are not making a sufficiently high rate of return by operating in a particular market.

The equilibrium price and quantity in a market will change when there shifts in both market supply and demand. Two examples of this are shown in the next diagram:

An Inward Shift in Demand and a fall in Supply



An Outward Shift in Demand and a Rise in Supply



In the left-hand diagram above, we see an inward shift of supply (caused perhaps by rising costs or a decision by producers to cut back on output at each price level) together with a fall (inward shift) in demand (perhaps the result of a decline in consumer confidence and incomes). Both factors lead to a fall in quantity traded, but the rise in costs forces up the market price.

The second example on the right shows a rise in demand from D1 to D3 but a much bigger increase in supply from S1 to S2. The net result is a fall in equilibrium price (from P1 to P3) and an increase in the equilibrium quantity traded in the market.

Moving from one market equilibrium to another

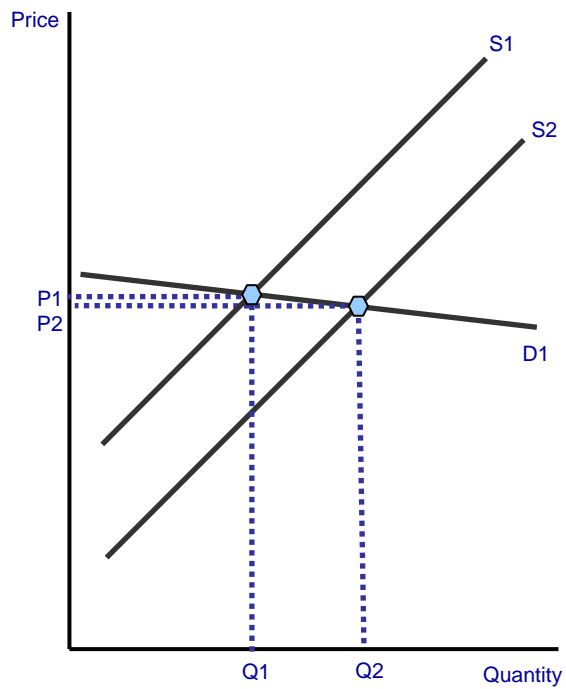
Changes in equilibrium prices and quantities **do not happen instantaneously!** The shifts in supply and demand outlined in the diagrams in previous pages are reflective of changes in conditions in the market. So an outward shift of demand (depending upon supply conditions) leads to a short term rise in price and a fall in available stocks. The higher price then acts as an incentive for suppliers to raise their output (termed as an expansion of supply) causing a movement up the short term supply curve towards the new equilibrium point.

We tend to use these diagrams to illustrate movements in market prices and quantities – this is known as **comparative static analysis**. The reality in most markets and industries is much more complex. For a start, many firms have imperfect knowledge about their demand curves – they do not know precisely how demand reacts to changes in price or the true level of demand at each and every price level. Likewise, constructing accurate supply curves requires detailed information on production costs and these may not be available.

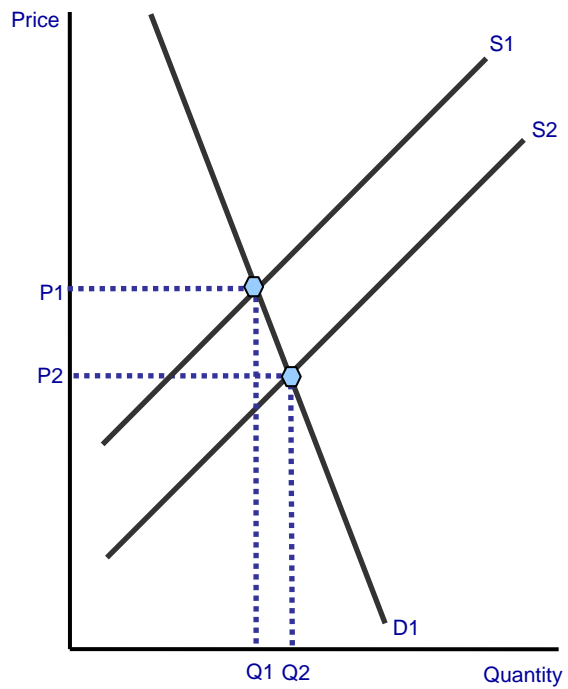
The importance of price elasticity of demand

The price elasticity of demand will influence the effects of shifts in supply on the equilibrium price and quantity in a market. This is illustrated in the next two diagrams. In the left hand diagram below we have drawn a highly elastic demand curve. We see an outward shift of supply – which leads to a large rise in equilibrium price and quantity and only a relatively small change in the market price. In the right hand diagram, a similar increase in supply is drawn together with an inelastic demand curve. Here the effect is more on the price. There is a sharp fall in the price and only a relatively small expansion in the equilibrium quantity.

An outward shift of supply when demand is price elastic ($P_{ed} > 1$)



An outward shift of supply when demand is price inelastic ($P_{ed} < 1$)



9. Price Elasticity of Demand

In this chapter we look at the idea of elasticity of demand, in other words, how sensitive is the demand for a product to a change in the product's own price. You will find that elasticity of demand is perhaps one of the most important concepts to understand in your AS economics course

Defining elasticity of demand

Ped measures the **responsiveness of demand** for a product following **a change in its own price**.

The formula for calculating the co-efficient of elasticity of demand is:

Percentage change in quantity demanded divided by the percentage change in price

Since changes in price and quantity nearly always move in opposite directions, economists usually do not bother to put in the minus sign. We are concerned with the **co-efficient** of elasticity of demand.

Understanding values for price elasticity of demand

1. **If $Ped = 0$** then demand is said to be **perfectly inelastic**. This means that demand does not change at all when the price changes – the demand curve will be vertical
2. **If Ped is between 0 and 1** (i.e. the percentage change in demand from A to B is smaller than the percentage change in price), then **demand is inelastic**. Producers know that the change in demand will be proportionately smaller than the percentage change in price
3. **If $Ped = 1$** (i.e. the percentage change in demand is exactly the same as the percentage change in price), then demand is said to be **unit elastic**. A 15% rise in price would lead to a 15% contraction in demand leaving total spending by the same at each price level.
4. **If $Ped > 1$** , then demand responds more than proportionately to a change in price i.e. **demand is elastic**. For example a 20% increase in the price of a good might lead to a 30% drop in demand. The price elasticity of demand for this price change is -1.5

What Determines Price Elasticity of Demand?

1. **The number of close substitutes for a good / uniqueness of the product** – the more close substitutes in the market, the more elastic is the demand for a product because consumers can more easily switch their demand if the price of one product changes **relative** to others in the market. The huge range of package holiday tours and destinations make this a highly competitive market in terms of pricing – many holiday makers are price sensitive
2. **The cost of switching between different products** – there may be significant **transactions costs** involved in switching between different goods and services. In this case, demand tends to be relatively inelastic. For example, mobile phone service providers may include penalty clauses in contracts or insist on 12-month contracts being taken out
3. **The degree of necessity or whether the good is a luxury** – goods and services deemed by consumers to be necessities tend to have an inelastic demand whereas luxuries will tend to have a more elastic demand because consumers can make do without luxuries when their budgets are stretched. I.e. in an economic recession we can cut back on discretionary items of spending
4. **The % of a consumer's income allocated to spending on the good** – goods and services that take up a high proportion of a household's income will tend to have a more elastic demand than products where large price changes makes little or no difference to someone's ability to purchase the product.

Demand for rail services

At peak times, the demand for rail transport becomes inelastic – and higher prices are charged by rail companies who can then achieve higher revenues and profits



5. **The time period allowed following a price change** – demand tends to be more price elastic, the longer that we allow consumers to respond to a price change by varying their purchasing decisions. In the short run, the demand may be inelastic, because it takes time for consumers both to notice and then to respond to price fluctuations
6. **Whether the good is subject to habitual consumption** – when this occurs, the consumer becomes much less sensitive to the price of the good in question. Examples such as cigarettes and alcohol and other drugs come into this category
7. **Peak and off-peak demand** - demand tends to be price inelastic at peak times – a feature that suppliers can take advantage of when setting higher prices. Demand is more elastic at off-peak times, leading to lower prices for consumers. Consider for example the charges made by car rental firms during the course of a week, or the cheaper deals available at hotels at weekends and away from the high-season. Train fares are also higher on Fridays (a peak day for travelling between cities) and also at peak times during the day
8. **The breadth of definition of a good or service** – if a good is broadly defined, i.e. the demand for petrol or meat, demand is often fairly inelastic. But specific brands of petrol or beef are likely to be more elastic following a price change

Wi-fi prices and price elasticity of demand

From airports to hotels to conference centres. From inter-city rail services to sports stadiums and libraries, more and more people are demanding wireless internet connections for personal and business use. But demand is being constrained by the limited availability of services and, in places, high user charges. However the [price of connecting to the internet through wi-fi services is set to fall](#) as competition in the sector heats up. Nearly 90 per cent of laptops now come with wi-fi connections as standard and many public areas are being equipped with hotspots, but users often complain about the high price of accessing the internet. At present airports and hotels can charge high prices because in many cases a wi-fi service provider has exclusivity on the area. However the supply of wi-fi services is more competitive on the high street and prices are falling rapidly as restaurants and coffee shops are using low-priced wi-fi access as a means of attracting customers. The more wi-fi providers there are in the market-place, the higher is the price elasticity of demand for wi-fi connections.

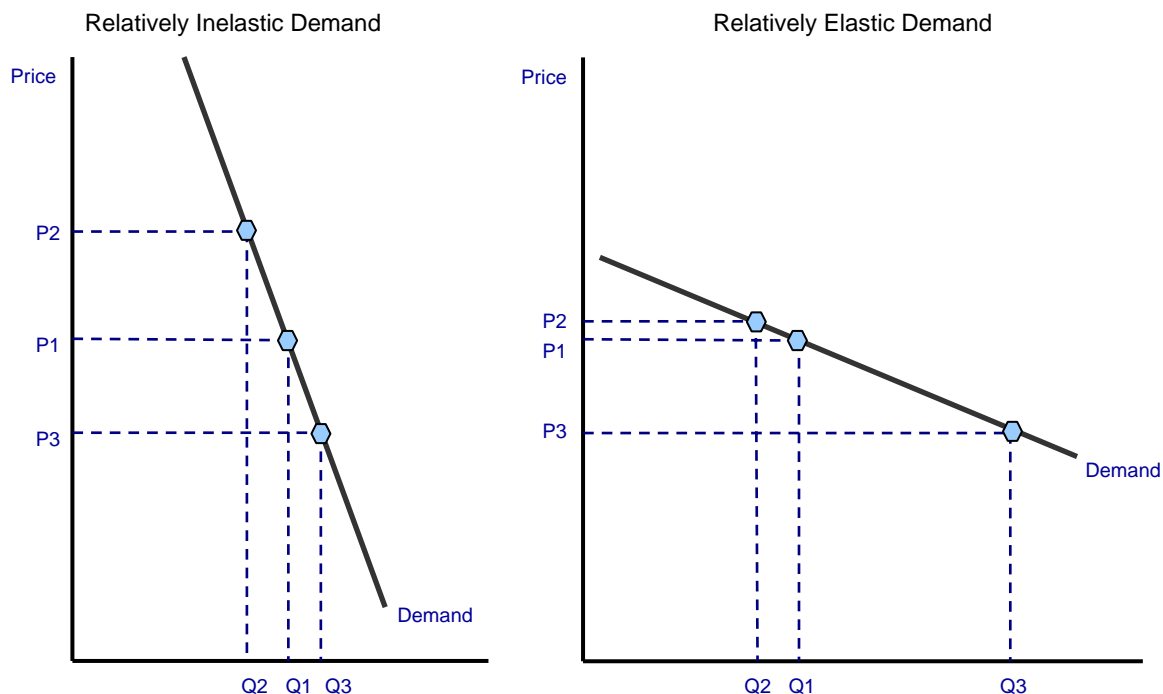
Wireless usage is growing across the UK with sales of 3G cards growing by 475%; these are mostly through business channels. In the consumer market, sales of Wi-Fi routers for the home have grown by 77% many broadband providers are now providing free wireless routers with each new broadband subscription.

Note: WiFi stands for Wireless Fidelity

Source: [The Cloud](#) and GFK UK Technology Barometer, 2006

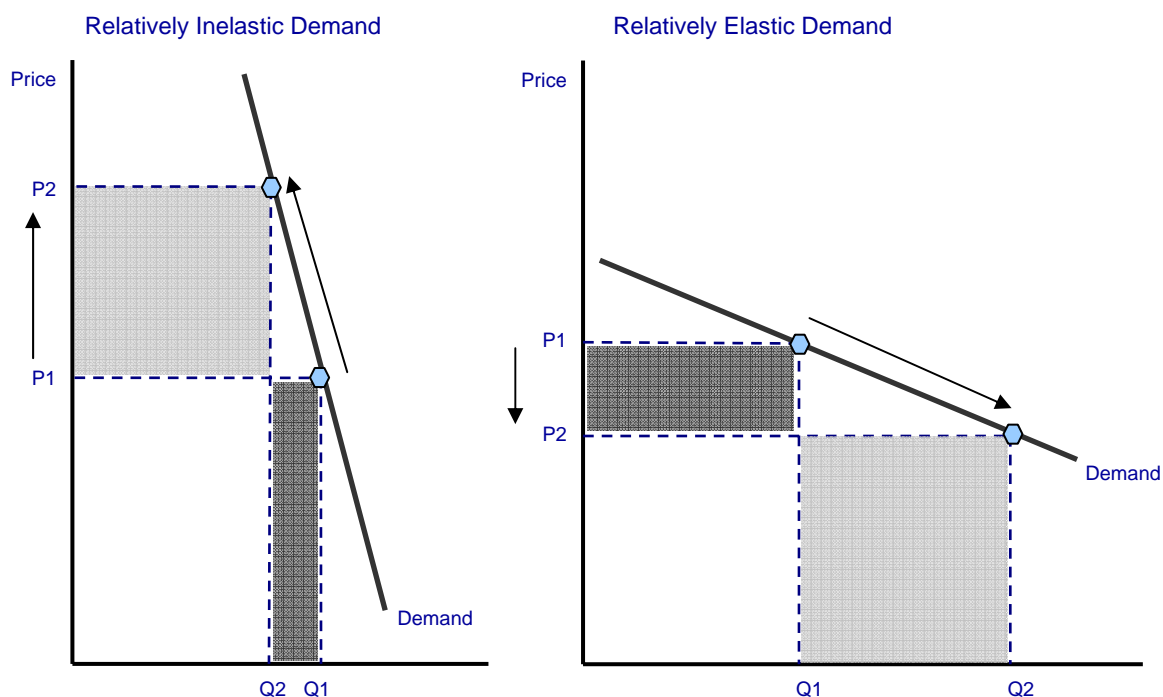
Demand curves with different price elasticity of demand

Elasticity of demand measures the responsiveness of demand to changes in price
 Where the % change in demand is greater than % change in price – demand is elastic
 Where the % change in demand is less than % change in price – demand is inelastic



Elasticity of demand and total revenue for a producer

The relationship between price elasticity of demand and a firm's total revenue is a very important one. The diagrams below show demand curves with different price elasticity and the effect of a change in the market price.



- When demand is inelastic – a rise in price leads to a rise in total revenue – for example a 20% rise in price might cause demand to contract by only 5% ($P_{ed} = -0.25$)
- When demand is elastic – a fall in price leads to a rise in total revenue - for example a 10% fall in price might cause demand to expand by only 25% ($P_{ed} = +2.5$)

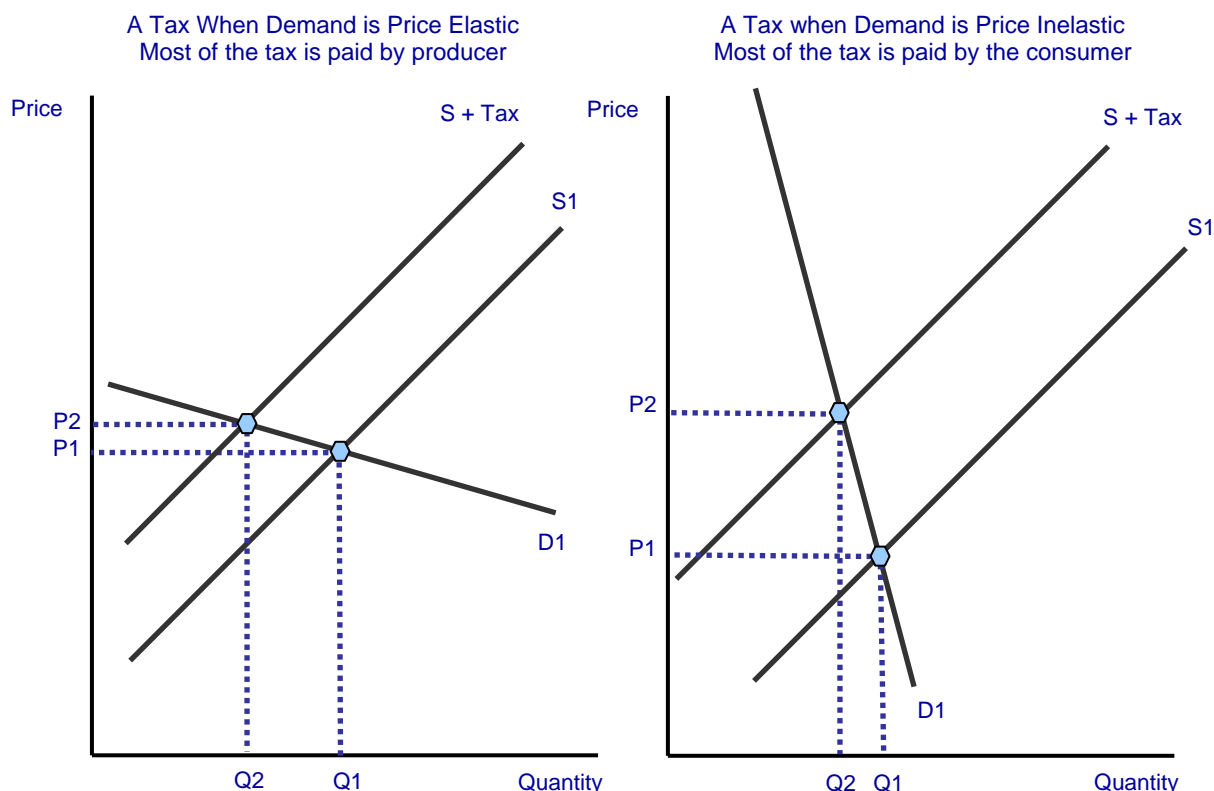
The table below gives a simple example of the relationships between market prices; quantity demanded and total revenue for a supplier. As price falls, the total revenue initially increases, in our example the maximum revenue occurs at a price of £12 per unit when 520 units are sold giving total revenue of £6240.

Price	Quantity	Total Revenue	Marginal Revenue	
£ per unit	Units	£s	£s	
20	200	4000		Consider the price elasticity of demand of a price change from £20 per unit to £18 per unit. The % change in demand is 40% following a 10% change in price – giving an elasticity of demand of -4 (i.e. highly elastic). In this situation when demand is price elastic, a fall in price leads to higher total consumer spending / producer revenue
18	280	5040	13	
16	360	5760	9	
14	440	6160	5	Consider a price change further down the estimated demand curve – from £10 per unit to £8 per unit. The % change in demand = 13.3% following a 20% fall in price – giving a co-efficient of elasticity of - 0.665 (i.e. inelastic). A fall in price when demand is price inelastic leads to a reduction in total revenue.
12	520	6240	1	
10	600	6000	-3	
8	680	5440	-7	
6	760	4560	-11	

Change in the market	What happens to total revenue?
Ped is inelastic and a firm raises its price.	Total revenue increases
Ped is elastic and a firm lowers its price.	Total revenue increases
Ped is elastic and a firm raises price.	Total revenue decreases
Ped is -1.5 and the firm raises price by 4%	Total revenue decreases
Ped is -0.4 and the firm raises price by 30%	Total revenue increases
Ped is -0.2 and the firm lowers price by 20%	Total revenue decreases
Ped is -4.0 and the firm lowers price by 15%	Total revenue increases

Elasticity of demand and indirect taxation

Many products are subject to indirect taxation imposed by the government. Good examples include the excise duty on cigarettes (cigarette taxes in the UK are among the highest in Europe) alcohol and fuels. Here we consider the effects of indirect taxes on a producers costs and the importance of price elasticity of demand in determining the effects of a tax on market price and quantity.



A tax increases the costs of a business causing an inward shift in the supply curve. The vertical distance between the pre-tax and the post-tax supply curve shows the tax per unit. With an indirect tax, the supplier may be able to pass on some or all of this tax onto the consumer through a higher price. This is known as **shifting the burden of the tax** and the ability of businesses to do this depends on the price elasticity of demand and supply.

Consider the two charts above. In the left hand diagram, the demand curve is drawn as price elastic. The producer must absorb the majority of the tax itself (i.e. accept a lower profit margin on each unit sold). When demand is elastic, the effect of a tax is still to raise the price – but we see a bigger fall in equilibrium quantity. Output has fallen from Q to Q1 due to a contraction in demand. In the right hand diagram, demand is drawn as price inelastic (i.e. $Ped < 1$ over most of the range of this demand curve) and therefore the producer is able to pass on most of the tax to the consumer through a higher price without losing too much in the way of sales. The price rises from P1 to P2 – but a large rise in price leads only to a small contraction in demand from Q1 to Q2.

The usefulness of price elasticity for producers

Firms can use price elasticity of demand (PED) estimates to predict:

- The effect of a change in price on the total revenue & expenditure on a product.
- The likely **price volatility** in a market following unexpected changes in supply – this is important for commodity producers who may suffer big price movements from time to time.
- The effect of a **change in a government indirect tax** on price and quantity demanded and also whether the business is able to pass on some or all of the tax onto the consumer.
- Information on the price elasticity of demand can be used by a business as part of a policy of **price discrimination** (also known as yield management). This is where a monopoly supplier decides to charge different prices for the same product to different segments of the market e.g. peak and off peak rail travel or yield management by many of our domestic and international airlines.

Habitual spending on cigarettes remains high but sales are falling

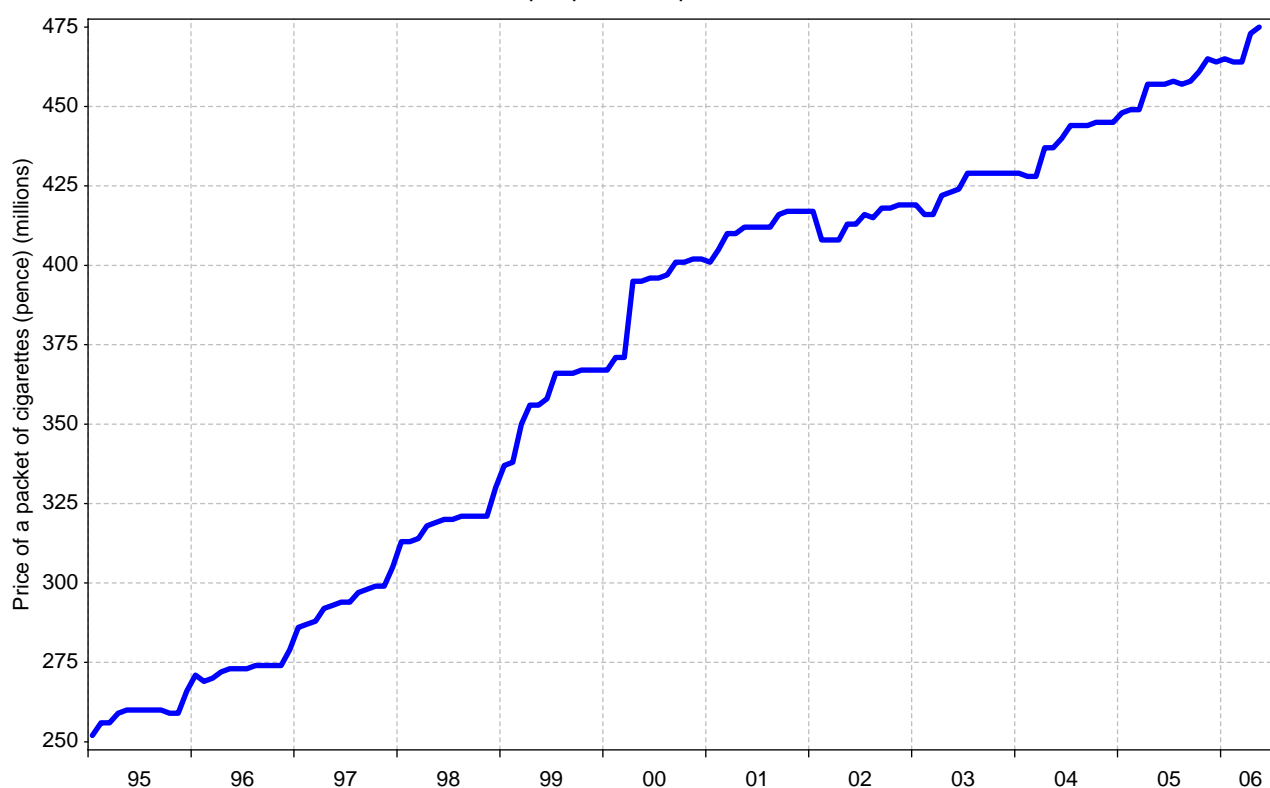
Sales of cigarettes are falling by the impact of higher taxes mean that smokers must spend more to finance their habits according to new research from the market analyst Mintel. Total sales of individual sticks for the UK in 2006 are forecast to be 68 billion, eleven billion lower than in 2001. Over a quarter of cigarettes are brought into the UK either duty free or through the black market. Total consumer spending on duty-paid cigarettes is likely to exceed £13 billion, 13% higher than in 2001. In the past, increases in the real value of duty (taxation) on cigarettes **has had had little effect on demand** from smokers because demand has been inelastic. But there are signs that a tipping point may have been reached. Sales of nicotine replacement therapies such as patches, lozenges and gums have boomed by nearly 50% over the past five years to around £97 million. But for every £1 spent on nicotine replacement, over £130 is spent on cigarette sticks.

Nearly half of smokers tried to kick the habit last year. According to the Mintel research, smokers under the age of 34 are the most likely to stop smoking, with people aged 65 and over the least likely to try quitting. A ban on smoking in public places comes into force in England, Northern Ireland and Wales in the spring of 2007, the same ban became law in Scotland in March 2006.

Sources: Adapted from Mintel Research, the Guardian and the Press Association

Average price of cigarettes (20 king size filter)

Price per packet in pence, source: ONS



Source: Reuters EcoWin

10. Price Elasticity of Supply

In this chapter we consider elasticity of supply. Students should understand how to calculate elasticity of supply and understand some of the factors that influence the elasticity of supply for different products.

Definition of price elasticity of supply

Price elasticity of supply measures the relationship between change in quantity supplied and a change in price.

- If supply is elastic, producers can increase output without a rise in cost or a time delay
- If supply is inelastic, firms find it hard to change production in a given time period.

The formula for price elasticity of supply is:

Percentage change in quantity supplied divided by the percentage change in price

1. When $P_{es} > 1$, then supply is price elastic
2. When $P_{es} < 1$, then supply is price inelastic
3. When $P_{es} = 0$, supply is perfectly inelastic
4. When $P_{es} = \text{infinity}$, supply is perfectly elastic following a change in demand

Factors that Affect Price Elasticity of Supply

(1) Spare production capacity

If there is plenty of **spare capacity** then a business should be able to increase its output without a rise in costs and therefore supply will be elastic in response to a change in demand. The supply of goods and services is often most elastic in a recession, when there is plenty of spare labour and capital resources available to step up output as the economy recovers.

(2) Stocks of finished products and components

If stocks of raw materials and finished products are at a high level then a firm is able to respond to a change in demand quickly by supplying these stocks onto the market - supply will be elastic. Conversely when stocks are low, dwindling supplies force prices higher and unless stocks can be replenished, supply will be inelastic in response to a change in demand.

(3) The ease and cost of factor substitution

If both capital and labour resources are **occupationally mobile** then the elasticity of supply for a product is higher than if capital and labour cannot easily and quickly be switched

(4) Time period involved in the production process

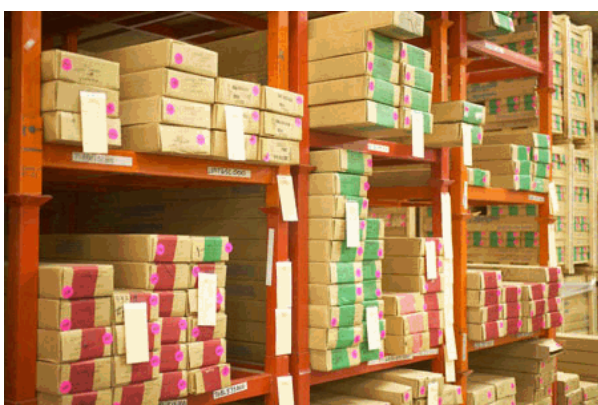
Supply is more price elastic the longer the **time period** that a firm is allowed to adjust its production levels. In some agricultural markets for example, the **momentary supply** is fixed and is determined mainly by planting decisions made months before, and also climatic conditions, which affect the overall production yield.



An empty restaurant – plenty of spare capacity to meet any rise in demand!



When telecommunications networks get congested at peak times, the elasticity of supply to meet rising demand may be low



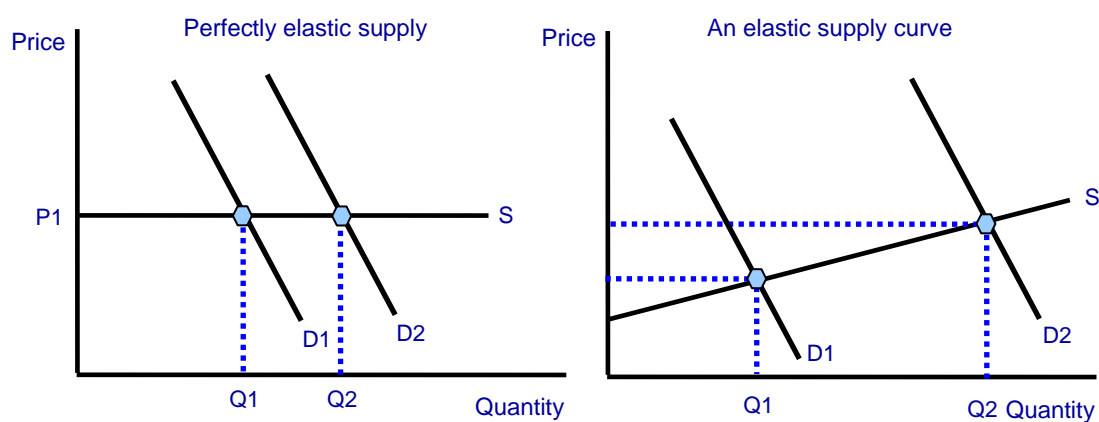
Stocks in a warehouse – businesses with plentiful stocks can supply quickly and easily onto the market when demand changes



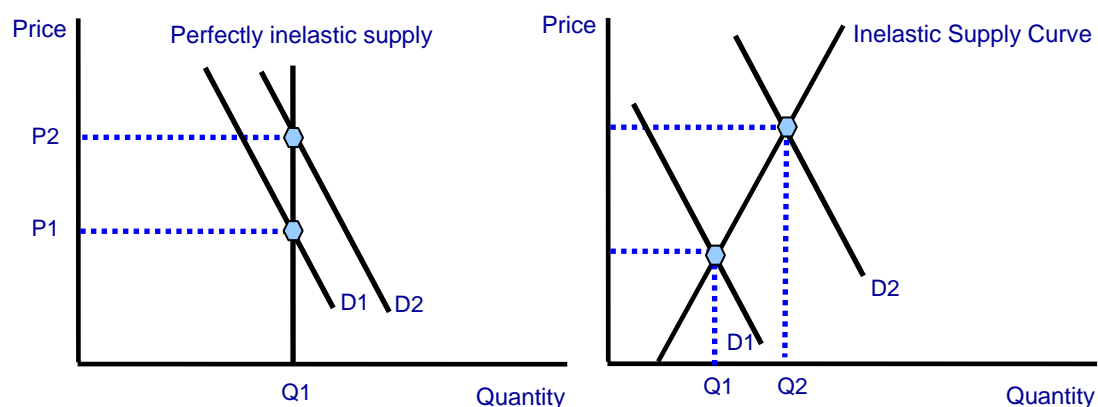
For many agricultural products there are time lags in the production process which means that elasticity of supply is very low in the immediate or momentary time period

Supply curves with different price elasticity of supply

If P_{es} is inelastic: it will be difficult for suppliers to react swiftly to changes in price
 If P_{es} is elastic – supply can react quickly to changes in price

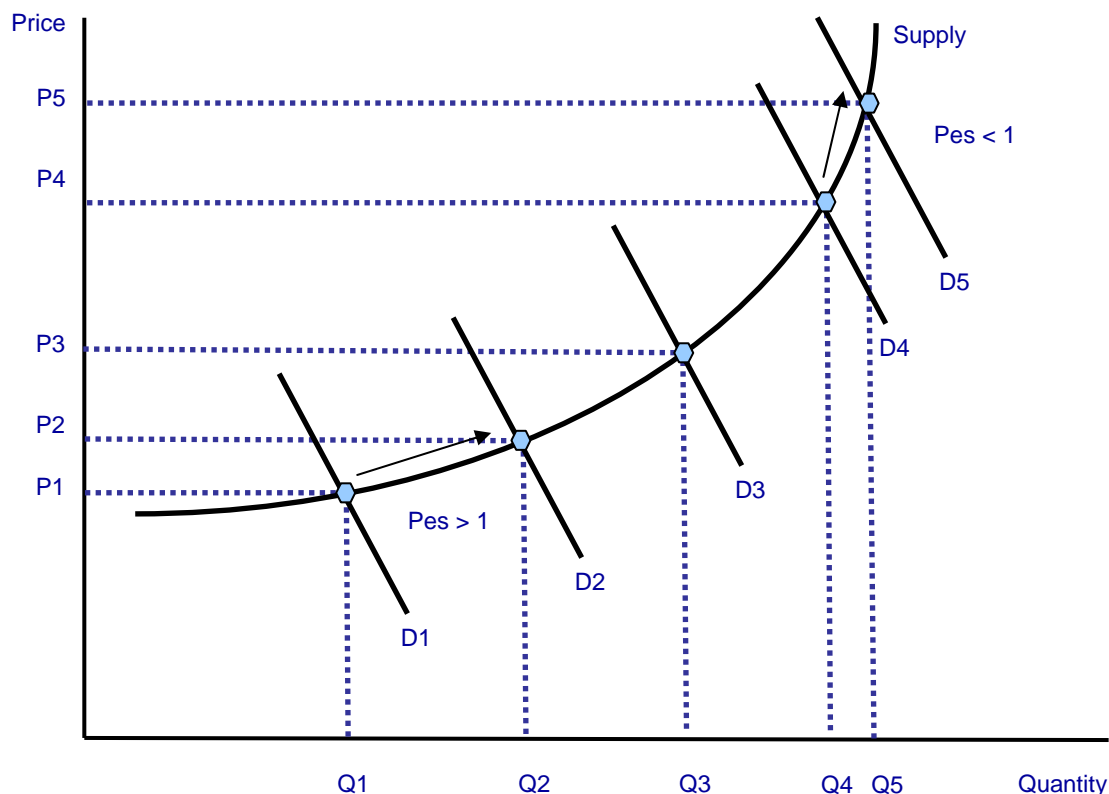


Perfectly inelastic supply: $P_{es} = \text{zero}$ (supply cannot respond to a change in demand / price) – often associated with the momentary period with agricultural products



The non-linear supply curve

A non linear supply curve has a changing price elasticity of supply throughout its length. This is illustrated in the diagram below.



Useful applications of price elasticity of demand and supply

Elasticity of demand and supply is tested in virtually every area of the AS economics syllabus. The key is to understand the various factors that determine the responsiveness of consumers and producers to changes in price. The elasticity will affect the ways in which price and output will change in a market. And elasticity is also significant in determining some of the effects of changes in government policy when the state chooses to intervene in the price mechanism.

Some relevant issues that directly use elasticity of demand and supply include:

1. **Taxation:** The effects of indirect taxes and subsidies on the level of demand and output in a market e.g. the effectiveness of the congestion charge in reducing road congestion; or the impact of higher duties on cigarettes on the demand for tobacco and associated externality effects
2. **Changes in the exchange rate:** The impact of changes in the exchange rate on the demand for exports and imports
3. **Exploiting monopoly power in a market:** The extent to which a firm or firms with monopoly power can raise prices in markets to extract consumer surplus and turn it into extra profit (producer surplus)
4. **Government intervention in the market:** The effects of the government introducing a minimum price (price floor) or maximum price (price ceiling) into a market

Elasticity of demand and supply also affects the operation of the price mechanism as a means of **rationing scarce goods and services** among competing uses and in determining how producers respond to the incentive of a higher market price.

11. Income Elasticity of Demand

*How sensitive is the demand for a product to a change in the real incomes of consumers? We use income elasticity of demand to measure this. The results are important since the values of income elasticity tell us something about the **nature of a product** and how it is perceived by consumers. It also affects the extent to which changes in economic growth affect the level and pattern of demand for goods and services.*

Definition of income elasticity of demand

Income elasticity of demand measures the relationship between a change in quantity demanded for good X and a change in real income.

The formula for calculating income elasticity: *% change in demand divided by the % change in income*

Normal Goods

Normal goods have a **positive income elasticity of demand** so as consumers' income rises, so more is demanded at each price level i.e. there is an outward shift of the demand curve

1. **Normal necessities** have an income elasticity of demand of between 0 and +1 for example, if income increases by 10% and the demand for fresh fruit increases by 4% then the income elasticity is +0.4. Demand is rising less than proportionately to income.
2. **Luxuries** have an income elasticity of demand $> +1$ i.e. the demand rises more than proportionate to a change in income – for example a 8% increase in income might lead to a 16% rise in the demand for restaurant meals. The income elasticity of demand in this example is +2.0. Demand is highly sensitive to (increases or decreases in) income.

Inferior Goods

Inferior goods have a **negative income elasticity of demand**. Demand falls as income rises. Typically inferior goods or services tend to be products where there are **superior goods available** if the consumer has the money to be able to buy it. Examples include the demand for cigarettes, low-priced own label foods in supermarkets and the demand for council-owned properties.

The income elasticity of demand is usually strongly positive for

- Fine wines and spirits, high quality chocolates (e.g. Lindt) and luxury holidays overseas.
- Consumer durables - audio visual equipment, 3G mobile phones and designer kitchens.
- Sports and leisure facilities (including gym membership and sports clubs).

In contrast, income elasticity of demand is lower for

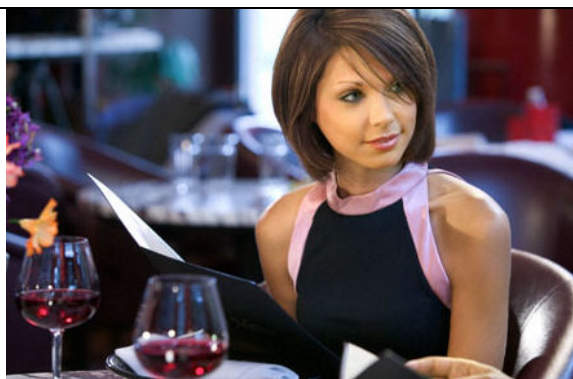
- Staple food products such as bread, vegetables and frozen foods.
- Mass transport (bus and rail).
- Beer and takeaway pizza!
- Income elasticity of demand is negative (inferior) for cigarettes and urban bus services.

Product ranges: However the income elasticity of demand varies *within* a product range. For example the Yed for **own-label foods** in supermarkets is probably less for the high-value “finest” food ranges that most major supermarkets now offer. You would also expect income elasticity of demand to vary across the vast range of vehicles for sale in the car industry and also in the holiday industry.

Long-term changes: There is a general downward trend in the income elasticity of demand for many products, particularly foodstuffs. One reason for this is that as a society becomes richer, there are **changes in consumer perceptions** about different goods and services together with changes in consumer tastes and preferences. What might have been considered a luxury good several years ago might now be regarded as a necessity (with a lower income elasticity of demand).

Consider the market for foreign travel. A few decades ago, long-distance foreign travel was regarded as a luxury. Now as real price levels have come down and incomes have grown, so millions of consumers are able to fly overseas on short and longer breaks. For many an annual holiday overseas has become a necessity and not a discretionary item of spending!

Estimates for income elasticity of demand



How high is the income elasticity for fine wines?



Income elasticity for baked beans? Likely to be low but positive as beans are a staple food



Income elasticity for cigarettes? According to some estimates, cigarettes are inferior goods



What of the income elasticity of demand for private executive air travel?

Product	Share of budget (% of household income)	Price elasticity of demand (Ped)	Income elasticity of demand (Yed)
All Foods	15.1	n/a	0.2
Fruit juices	0.19	-0.55	0.45
Tea	0.19	-0.37	-0.02
Instant coffee	0.17	-0.45	0.16
Margarine	0.03	n/a	-0.37

Source: DEFRA www.defra.gov.uk

The income elasticity of demand for most types of food is pretty low – occasionally negative (e.g. for margarine) and likewise the own price elasticity of demand for most foodstuffs is also inelastic. In other words, the demand for these products among consumers is not sensitive to changes in the product's price or changes in consumer income.

How do businesses make use of estimates of income elasticity of demand?

Knowledge of income elasticity of demand for different products helps firms predict the effect of a business cycle on sales. All countries experience a **business cycle** where actual GDP moves up and down in a regular pattern causing booms and slowdowns or perhaps a recession. The business cycle means incomes rise and fall.

Luxury products with high income elasticity see greater sales volatility over the business cycle than **necessities** where demand from consumers is less sensitive to changes in the economic cycle

The UK economy has enjoyed a period of economic growth over the last twelve years. So average real incomes have increased, but because of differences in income elasticity of demand, consumer demand for products will have varied greatly over this period.

Income elasticity and the pattern of consumer demand

Over time we expect to see our real incomes rise. And as we become better off, we can afford to increase our spending on different goods and services. Clearly what is happening to the relative prices of these products will play a key role in shaping our consumption decisions. But the income elasticity of demand will also affect the pattern of demand over time. For **normal luxury goods**, whose income elasticity of demand exceeds +1, as incomes rise, the proportion of a consumer's income spent on that product will go up. For **normal necessities** (income elasticity of demand is positive but less than 1) and for inferior goods (where the income elasticity of demand is negative) – then as income rises, the share or proportion of their budget on these products will fall

UK Consumer Spending Shares by Volume

(%)			1980	1990	2003
Food			14.5	11.5	9.6
Alcohol & tobacco			7.8	5.0	3.5
	Of which	Alcohol	2.1	1.8	1.8
		Tobacco	6.0	3.3	1.7
Clothing & footwear			4.8	5.2	8.1
Household goods, etc			5.4	5.4	6.0
Health			1.5	1.6	1.3
Transport			13.9	15.3	14.0
	Of which	Cars	4.1	5.8	6.5
		Travel	3.6	3.4	3.1
		Of which	1.0	1.2	1.3
		Air	1.4	1.6	3.1
Communications			1.4	1.6	3.1
Recreation & culture			7.8	10.0	15.5
Travel		Other, including package holidays	2.0	2.7	4.5
Education			1.4	1.1	1.2
Restaurants & hotels			12.7	12.6	9.3

Source: Family Expenditure Survey

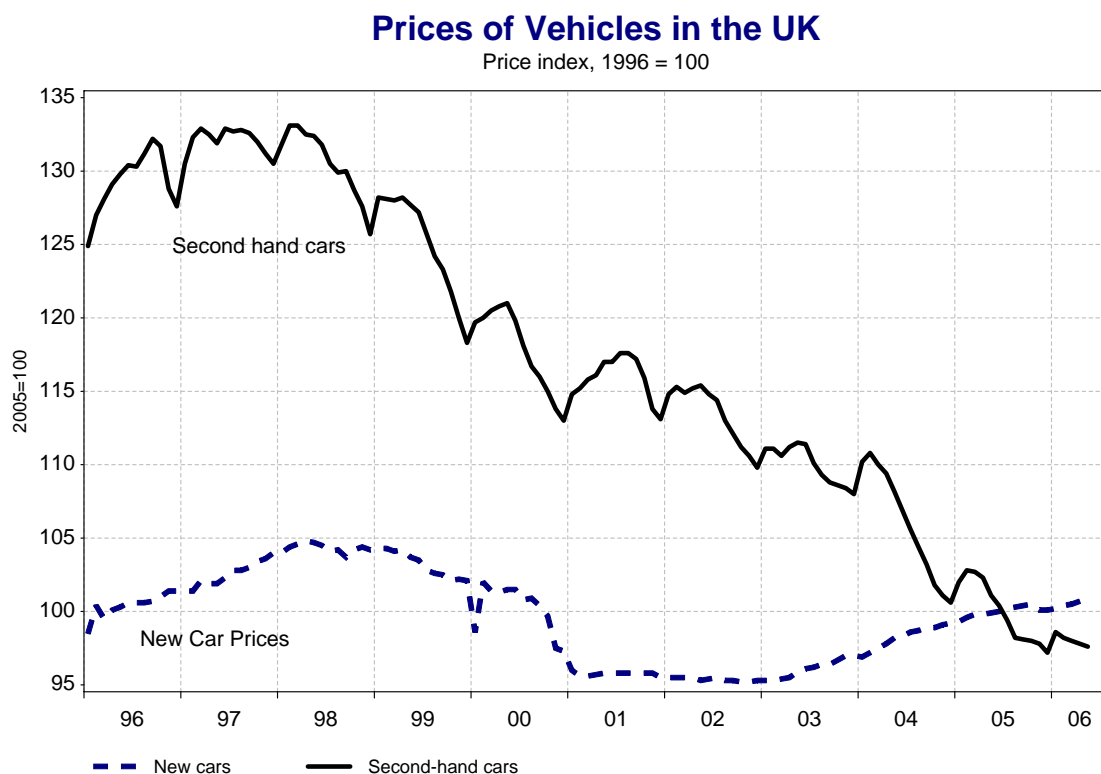
12. Cross Price Elasticity of Demand

Very often, a change in the price of one product leads to a change in the demand for another, economists call this the cross-price effect and this is the focus of this chapter.

Cross price elasticity (CPed) measures the responsiveness of demand for good X following a change in the price of good Y (a related good). We are mainly concerned here with the effect that **changes in relative prices within a market** have on the pattern of demand.

With cross price elasticity we make an important distinction between **substitute products** and **complementary goods and services**

Substitutes: With substitute goods such as brands of cereal or washing powder, an increase in the price of one good will lead to an increase in demand for the rival product. Cross price elasticity for two substitutes will be positive. For example, in recent years, the prices of new cars have been either falling or relatively flat. [Data on price indices for new cars and second hand cars](#) is shown in the chart below. As the price of new cars relative to people's incomes has declined, this should increase the market demand for new cars and (ceteris paribus) reduce the demand for second hand cars. We can see that there has been a very marked fall in the prices of second hand cars.



Complements: With goods that are in complementary demand, such as the demand for DVD players and DVD videos, when there is a fall in the price of DVD players we expect to see more DVD players bought, leading to an expansion in market demand for DVD videos. The cross price elasticity of demand for two complements is negative

The stronger the relationship between two products, the higher is the co-efficient of cross-price elasticity of demand. For example with two close substitutes, the cross-price elasticity will be strongly positive. Likewise when there is a strong complementary relationship between two products, the cross-price elasticity will be highly negative. Unrelated products have a zero cross elasticity.

Complementary goods - the UK IT market

The value of the UK IT market was estimated to be worth £3.9 billion in the first six months of 2006. It provides a good example of complementary products since a rise in the demand for one product such as a new personal computer will frequently be associated with an increase in demand for related goods and services. The IT market is usually split into seven sectors and their estimated value measured by the level of total sales revenue in the first half of 2006 is shown below

Personal Computers (desktops and laptops) (£1,443m)
 Printing devices (£303m)
 Monitors (£343m)
 Consumables such as ink cartridges (£813m)
 Hard disk drives (£130m)
 Communication devices (£122m)
 Computer software (£239m)

Source: GFK report on Consumer Spending Trends, July 2006

How can businesses make use of the concept of cross price elasticity of demand?

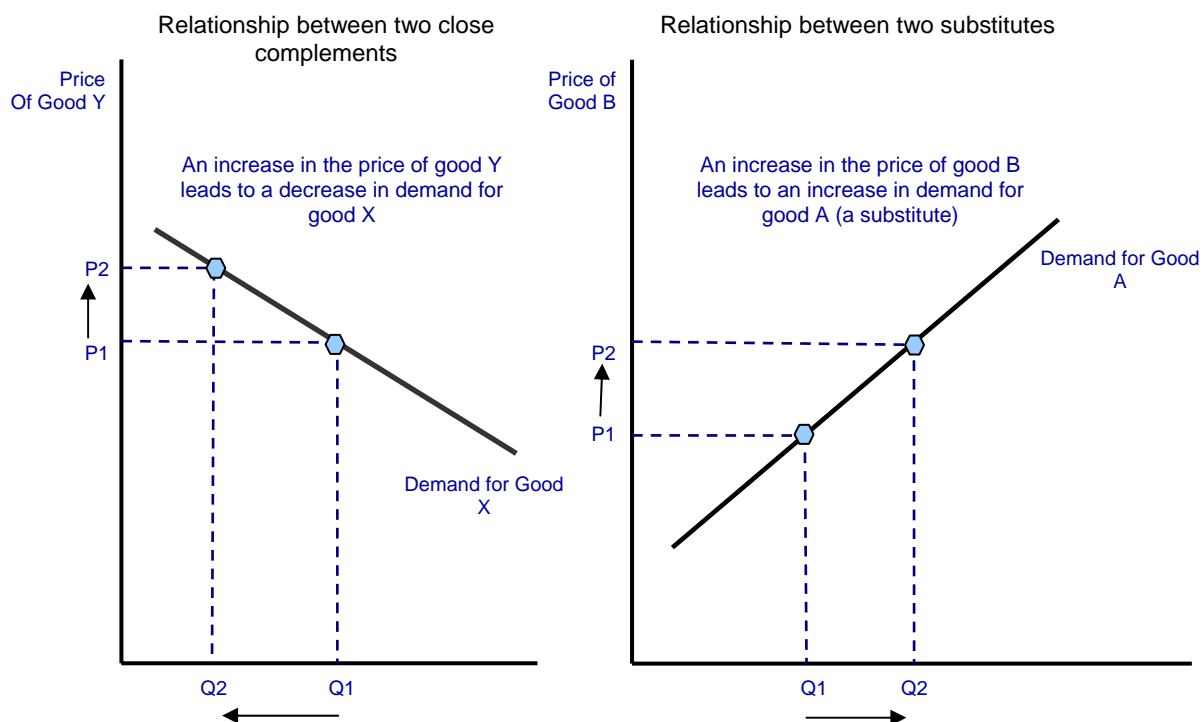
Pricing strategies for substitutes: If a competitor cuts the price of a rival product, firms use estimates of cross-price elasticity to predict the effect on the quantity demanded and total revenue of their own product. For example, two or more airlines competing with each other on a given route will have to consider how one airline might react to its competitor's price change. Will many consumers switch? Will they have the capacity to meet an expected rise in demand? Will the other firm match a price rise? Will it follow a price fall?

Consider for example the cross-price effect that has occurred with the rapid expansion of [low-cost airlines](#) in the European airline industry. This has been a major challenge to the existing and well-established national air carriers, many of whom have made adjustments to their business model and pricing strategies to cope with the increased competition.

Pricing strategies for complementary goods: For example, popcorn, soft drinks and cinema tickets have a high negative value for cross elasticity– they are strong complements. Popcorn has a high mark up i.e. popcorn costs pennies to make but sells for more than a pound. If firms have a reliable estimate for C_{ped} they can estimate the effect, say, of a two-for-one cinema ticket offer on the demand for popcorn. The additional profit from extra popcorn sales may more than compensate for the lower cost of entry into the cinema.

Advertising and marketing: In highly competitive markets where **brand names** carry substantial value, many businesses spend huge amounts of money every year on **persuasive advertising** and marketing. There are many aims behind this, including attempting to shift out the demand curve for a product (or product range) and also build **consumer loyalty** to a brand. When consumers become habitual purchasers of a product, the cross price elasticity of demand against rival products will decrease. This **reduces the size of the substitution effect** following a price change and makes demand less sensitive to price. The result is that firms may be able to charge a higher price, increase their total revenue and turn consumer surplus into higher profit.

Cross price elasticity: Responsiveness of demand of one good to changes in the price of a related good
 Goods which are complements: C_{ped} will have negative sign
 Goods which are substitutes: Cross elasticity will have a positive sign



13. The Functions of the Price Mechanism

The invisible hand – the workings of the price mechanism



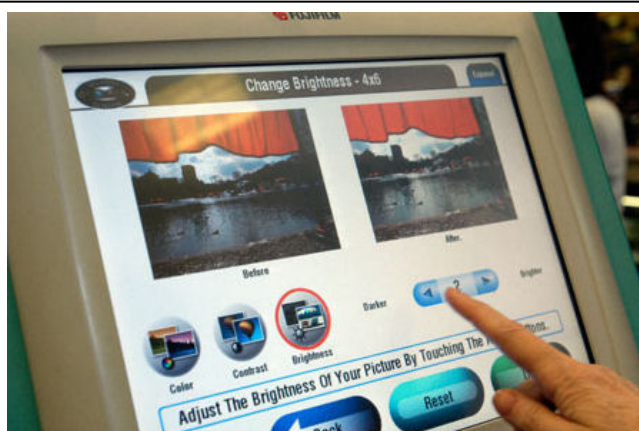
Adam Smith

Adam Smith, one of the Founding Fathers of economics famously wrote of the “invisible hand of the price mechanism”. He described how the invisible or hidden hand of the market operated in a competitive market through the pursuit of self-interest to allocate resources in society’s best interest. This remains the central view of all free-market economists, i.e. those who believe in the virtues of a free-market economy with minimal government intervention.

The **price mechanism** is a term used to describe the means by which the many millions of decisions taken each day by consumers and businesses interact to determine the allocation of scarce resources between competing uses. This is the essence of economics!

The **price mechanism** plays **three important functions** in any market-based economic system:

The signalling function

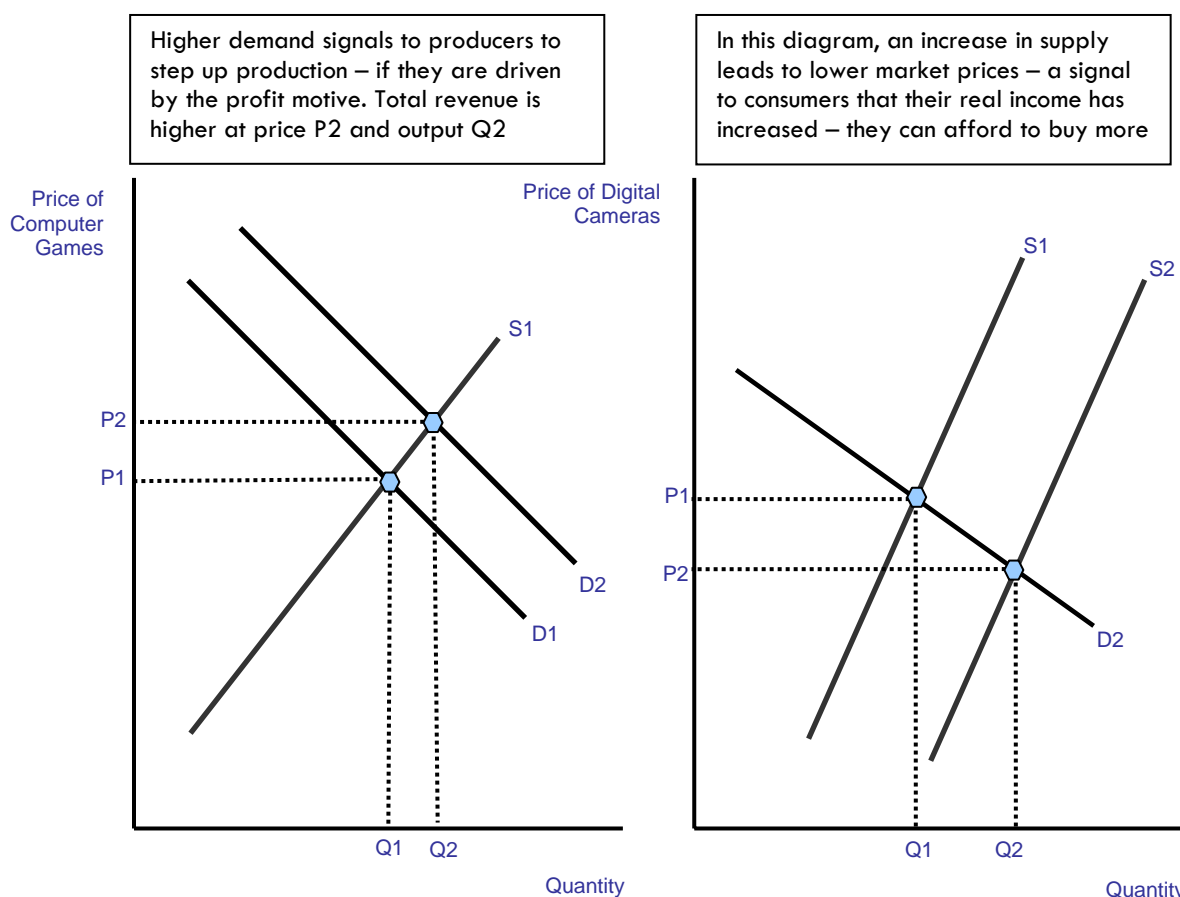


The price of digital printing is coming down – this will have an effect on the demand for substitute forms of image printing. How will traditional photo imaging retailers respond?

Firstly, prices perform a **signalling function**. This means that market prices will adjust to demonstrate where resources are required, and where they are not.

Prices rise and fall to reflect scarcities and surpluses. So, for example, if market prices are rising because of high and rising demand from consumers, this is a signal to suppliers to expand their production to meet the higher demand.

Consider the left hand diagram on the next page. The demand for computer games increases and as a result, producers stand to earn higher revenues and profits from selling more games at a higher price per unit. So an outward shift of demand ought to lead to an expansion along the market supply curve.



In the second example on the right, an increase in market supply causes a fall in the relative prices of digital cameras and prompts an expansion along the market demand curve

Conversely, a rise in the costs of production will induce suppliers to decrease supply, while consumers will react to the resulting higher price by reducing demand for the good or services.

The transmission of preferences

Through the signalling function, consumers are able through their **expression of preferences** to send important **information to producers** about the **changing nature of our needs and wants**. When demand is strong, higher market prices act as an incentive to raise output (production) because the supplier stands to make a higher profit. When demand is weak, then the market supply contracts. We are assuming here that producers do actually respond to these price signals!

One of the features of a free market economy is that decision-making in the market is **decentralised** in other words, the market responds to the individual decisions of millions of consumers and producers, i.e. there is no single body responsible for deciding what is to be produced and in what quantities. This is a remarkable feature of an **organic market system**.

The rationing function

Prices serve to **ration scarce resources** when demand in a market outstrips supply. When there is a **shortage** of a product, the price is bid up – leaving only those with sufficient **willingness and ability to pay** with the effective demand necessary to purchase the product. Be it the demand for tickets among England supporters for the 2006 World Cup or the demand for a rare antique, the market price acts a **rationing device** to equate demand with supply.

The prices for using the [M6 Toll Road](http://www.tutor2u.net) are a good example of the rationing function of the price mechanism. A toll road can exclude those drivers and vehicles that are not willing or able to pay the current toll charge. In this sense, motorists and road haulage businesses and other road users are paying for the right to use the road, road space has a market price instead of being regarded as something of a free good. The current charges are below:

Prices on the M6 Toll Road June 2006	Day (06:00 - 23:00)	Night (23:00 - 06:00)
Class 1 (e.g. motorbike)	£2.50	£1.50
Class 2 (e.g. car)	£3.50	£2.50
Class 3 (e.g. car & trailer)	£7	£6
Class 4 (e.g. van/coach)	£7	£6
Class 5 (e.g. HGV)	£7	£6

What would happen if the day-time charges increased to £5 for cars?

The growing popularity of **auctions** as a means of allocating resources is worth considering as a means of allocating resources and clearing a market. The phenomenal success of EBAY is testimony to the power of the auction process as a rationing and market clearing mechanism as internet usage has grown.

The price mechanism is the only allocative mechanism solving the economic problem in a free market economy. However, most modern economies are **mixed economies**, comprising not only a market sector, but also a **non-market sector**, where the **government** (or state) uses the **planning mechanism** to provide public goods and services such as police, roads and merit goods such as education, libraries and health.

In a state run **command economy**, the price mechanism plays little or no active role in the allocation of resources. Instead government planning directs resources to where the state thinks there is greatest need. The reality is that state planning has more or less failed as a means of deciding what to produce, how much to produce, how to produce and for whom. Following the collapse of communism in the late 1980s and early 1990s, the market-based economy is now the dominant economic system – even though we are increasingly aware of **imperfections in the operation of the market** – i.e. the causes and consequences of market failure.

Prices and incentives

- **Incentives** matter enormously in our study of microeconomics, markets and instances of market failure. For competitive markets to work efficiently all economic agents (i.e. consumers and producers) must respond to **appropriate price signals** in the market.
- **Market failure** occurs when the signalling and incentive function of the price mechanism fails to operate optimally leading to a loss of economic and social welfare. For example, the market may fail to take into account the **external costs and benefits** arising from production and consumption. Consumer preferences for goods and services may be based on **imperfect information** on the costs and benefits of a particular decision to buy and consume a product. Our individual preferences may also be distorted and shaped by the effects of persuasive advertising and marketing to create artificial wants and needs.

Government intervention in the market

Often the incentives that consumers and producers have can be changed by **government intervention** in markets. For example a change in relative prices brought about by the introduction of **government subsidies and taxation**.

Suppose for example that the government decides to introduce a new tax on aviation fuel in a bid to reduce some of the negative externalities created by the air transport industry.

1. How will airlines respond?
 - a. Will they pass on the tax to consumers?
 - b. Can they absorb the tax and seek cost-savings elsewhere in their operations?
2. If the tax raises price for air travellers, will they change their behaviour in the market?

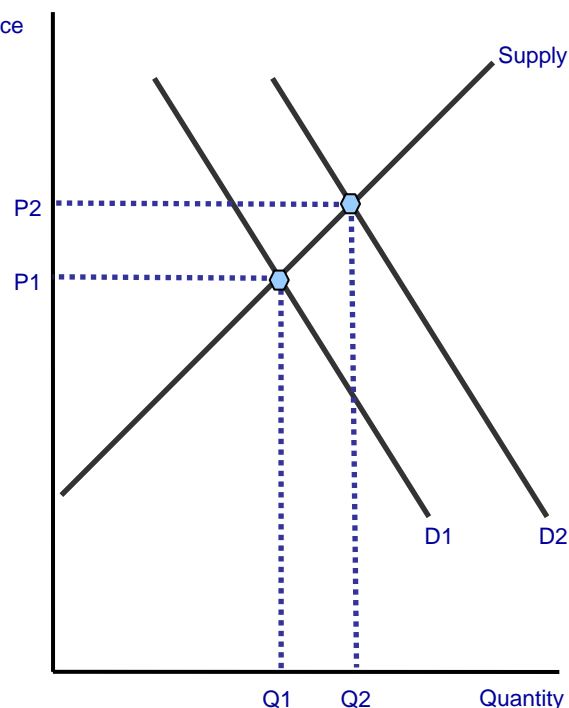
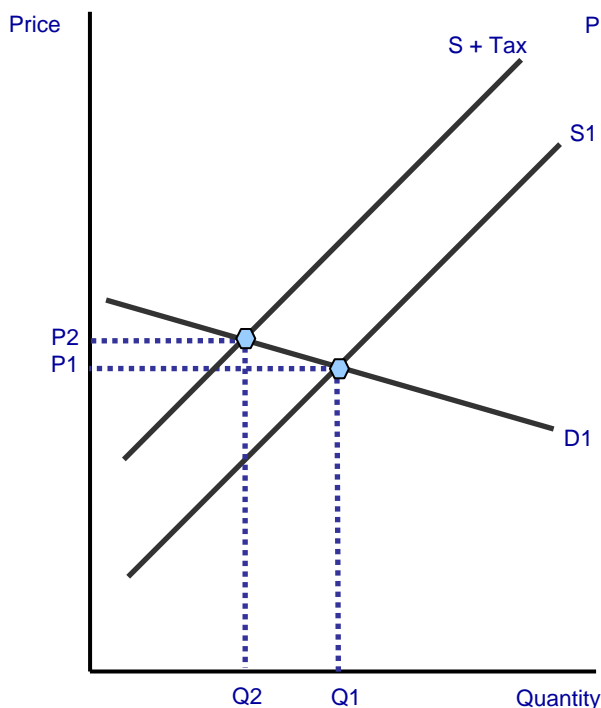
3. Is an aviation tax the most effective way of controlling pollution? Or could incentives for producers and behaviour by consumers wanting to travel by air be changed through other more effective and efficient means?

Indirect Taxes

An indirect tax increases the relative price of a product and should cause a contraction of demand. The government is intervening in the market because it wants to change the price signals and incentives of producers and consumers. In this case the justification may be a desire to correct for negative externalities

Government Subsidies

A government subsidy to consumers to cover some of the costs of buying child care or employing nannies is designed to reduce the relative cost of this and therefore increase demand. The justification could be to encourage more young mothers to actively seek work, expand the labour supply and contribute to the country's productive potential



Agents may not always respond to incentives in the manner in which textbook economics suggests. The "[law of unintended consequences](#)" encapsulates the idea that government policy interventions can often be misguided or have unintended consequences! See the revision focus article on government failure.

14. Price volatility in markets

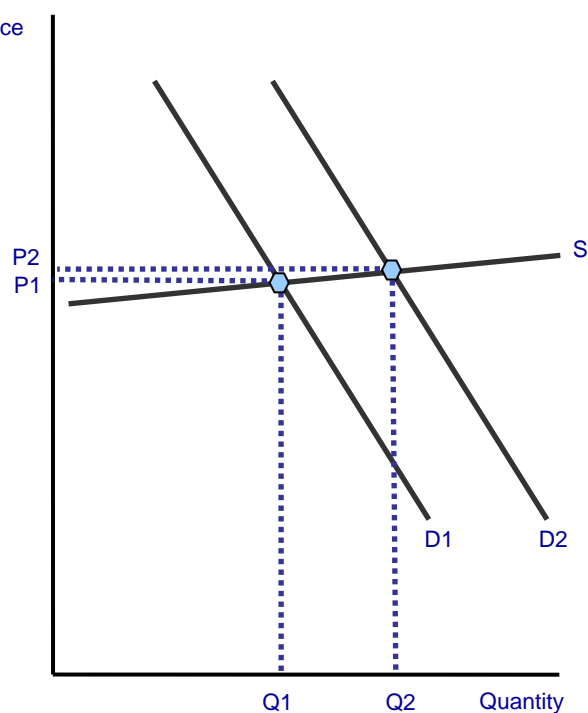
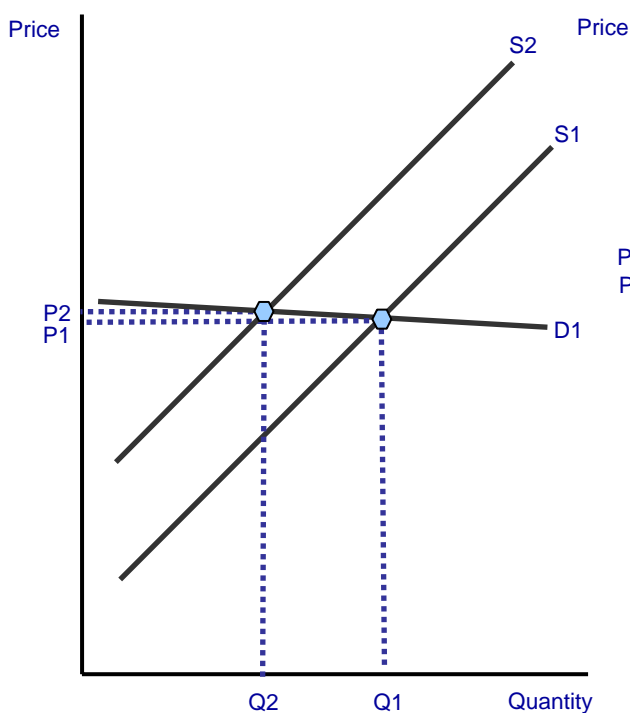
We often find that prices in markets rise and fall by large amounts over a short time period. They display a high level of volatility which directly affects both consumers and producers. In this chapter we look at some of the reasons for fluctuating prices and consider some real-world examples.

Price stability

Not all markets experience volatile prices. They tend to be markets with products where the conditions of supply and demand are relatively stable from year to year and where the elasticity of demand and the elasticity of supply are both high. We can see this in the diagram below.

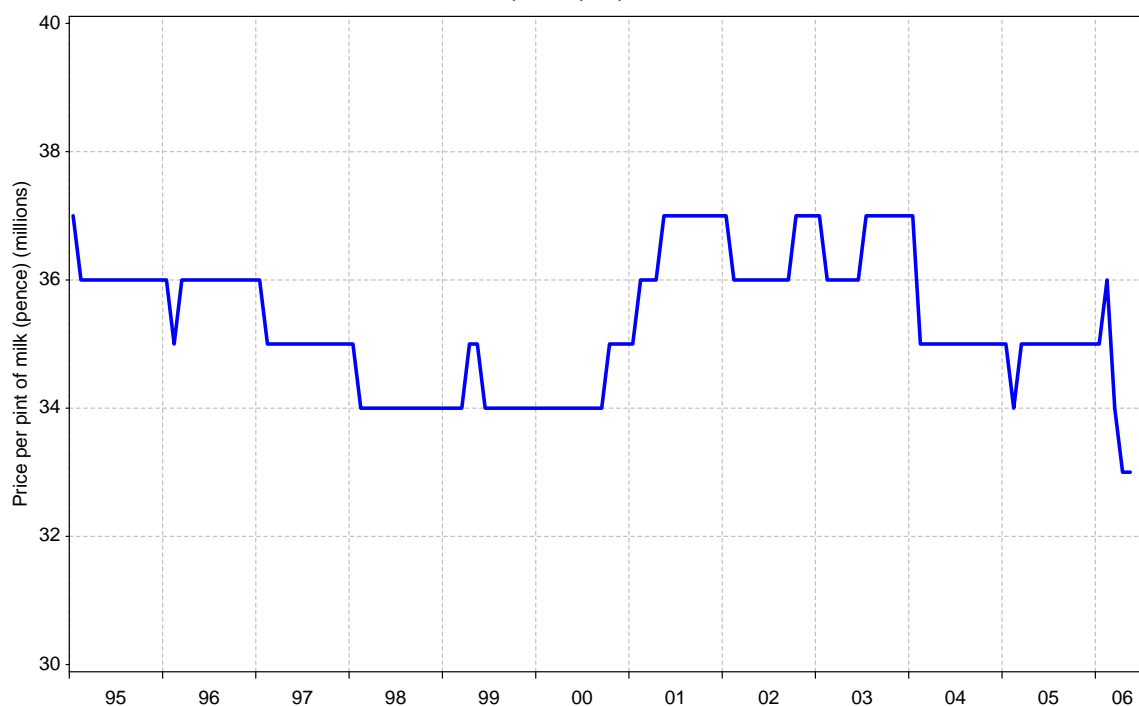
When demand is highly elastic, shifts in the supply curve have little effect on the market equilibrium price, although market quantities will change. In the example below, there is a fall in market supply with conditions of demand remaining unchanged.

When supply is highly elastic, shifts in demand again have little impact on the market equilibrium price. In the example below we see the effects of an outward shift in the market demand curve.



Average Price of a Pint of Pasteurised Milk

Price in pence per pint, source ONS



Source: Reuters EcoWin

The price of milk is pretty stable over time. Partly this is due to intense competition between the leading supermarkets but the conditions of market demand and supply are also relatively stable and predictable.

Price volatility

Products with unstable conditions of supply and demand will experience price fluctuations from year to year. For example, for many products there are large seasonal variations in market demand which cause prices to rise sharply at peak times and then fall back during the off-peak periods. Seasonal demand is particularly strong in the tourism and leisure industries. The cost of hotel rooms and the prices of package holidays are always higher during the school holidays because hoteliers and travel businesses know that, at times of peak demand, the demand for holidays is price inelastic and that families will have to pay higher prices because they are limited to when they can take their holidays.

Agricultural prices and prices of other traded commodities

Agricultural prices tend to be volatile (unstable) because:

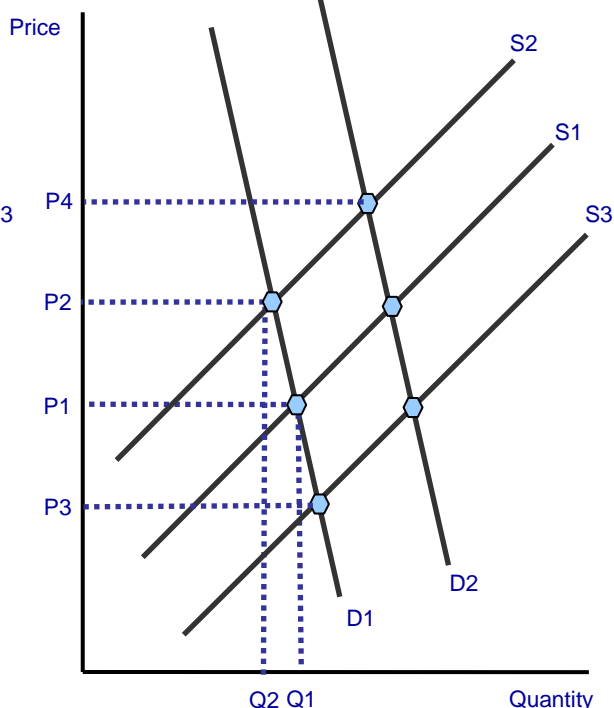
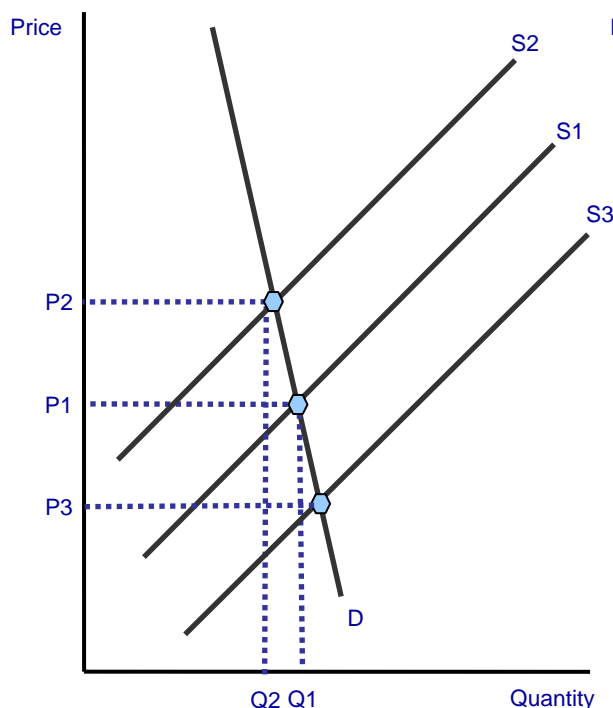
- Supply changes from one time period to the next because of variable weather conditions which affect the size of the harvest
 - When actual output falls short of planned output, for a given level of demand, price will rise
 - When actual output is in excess of planned output, for a given level of demand, market price will fall
- The effects of changes in supply can be amplified by a price-inelastic demand, for example in markets for raw materials and components where the buyer regards them as essential to their production processes, they must buy at whatever the prevailing market price is.
- Price volatility can be magnified because of the activity of **speculators** in markets who are betting on future price changes. We have noticed this in many of the world's commodity markets during the recent boom in international commodity prices. Hedge funds and pension funds together with other speculators have been buying into "hard commodities" such as copper, nickel, tin and also "softs" such as rubber and coffee because they expect market prices to remain high. Their demand has the effect of driving prices higher at times when stocks of these commodities are low.

Inelastic demand and shifts in supply

When the price elasticity of demand is low, volatile shifts in market supply causes large changes in the market equilibrium price, although the equilibrium quantity traded may not change that much.

Inelastic supply and demand

We then consider shifts in demand when the price elasticity of demand is low. If P_{ed} and P_{es} are both low then the scene is set for big changes in the market equilibrium price. E.g. a fall in supply from S_1 to S_2 and an increase in demand from D_1 to D_2 causes market price to jump from P_1 to P_4



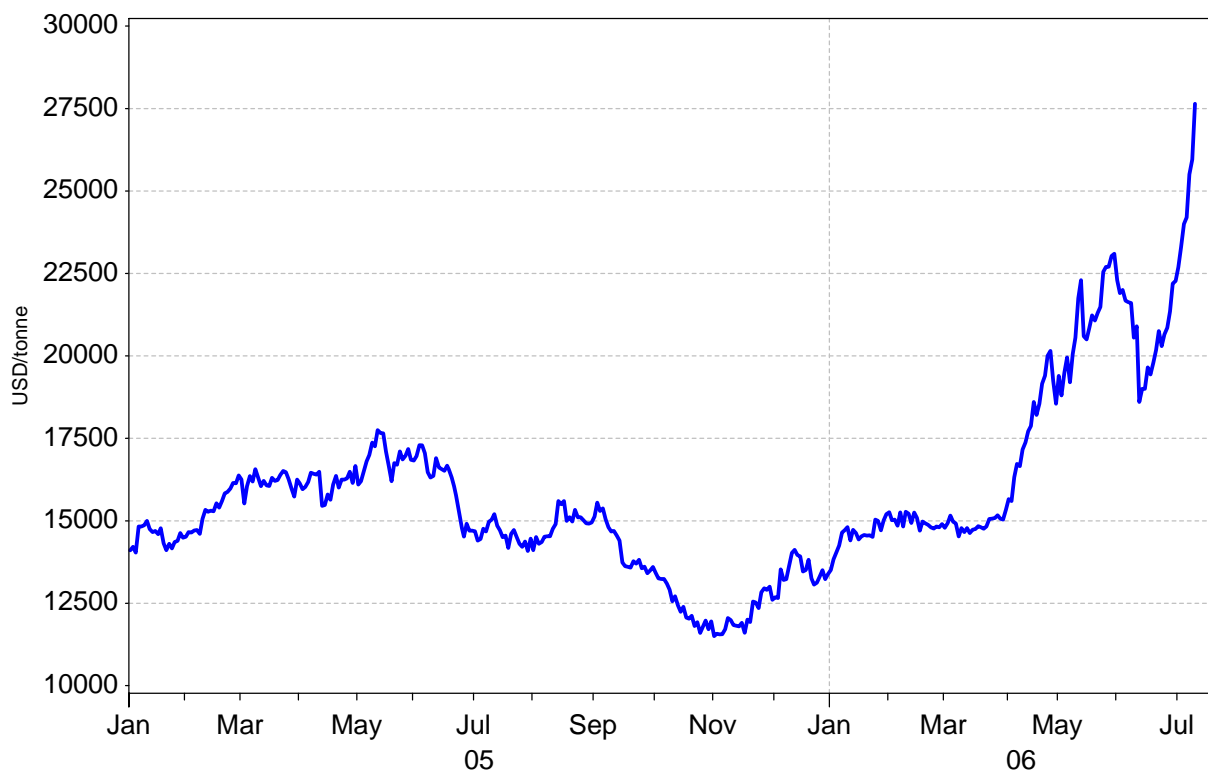
Example of price volatility – the market for nickel

In July 2006 nickel prices climbed to a record high capping a near 50 per cent rise in less than a month and a 90 per cent rise within the space of nine months!. The price increases were down to two fundamental market forces - demand is strong but stocks or inventories of the metal are low. If there isn't enough nickel in the market, the price can only head in one direction!

By the middle of July, stockpiles of [Nickel](#) held at [London Metal Exchange](#) registered warehouses were the equivalent to just two days' worth of demand. Only about 1.3 million tonnes of Nickel is produced each year. But industrial demand from countries such as China has been rising strongly, especially because many industrial users are demanding nickel for stainless steel production having switched from alternative metals such as manganese. China has been responsible for nearly half the increase in global demand for nickel this year.

World Price of Nickel

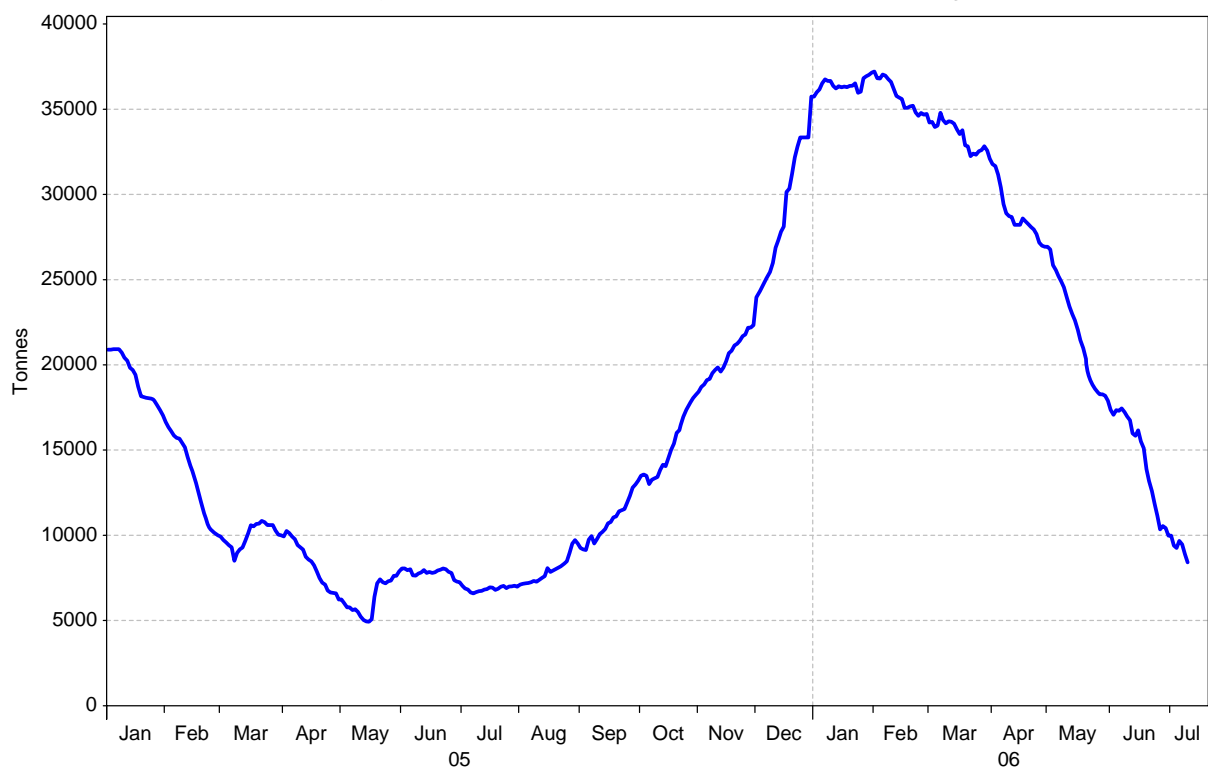
Spot price, London Metal Exchange, Daily Closing Price, US dollars per ton



Source: Reuters EcoWin

World Stock Levels of Nickel

Daily stock levels in tonnes, Source: London Metal Exchange

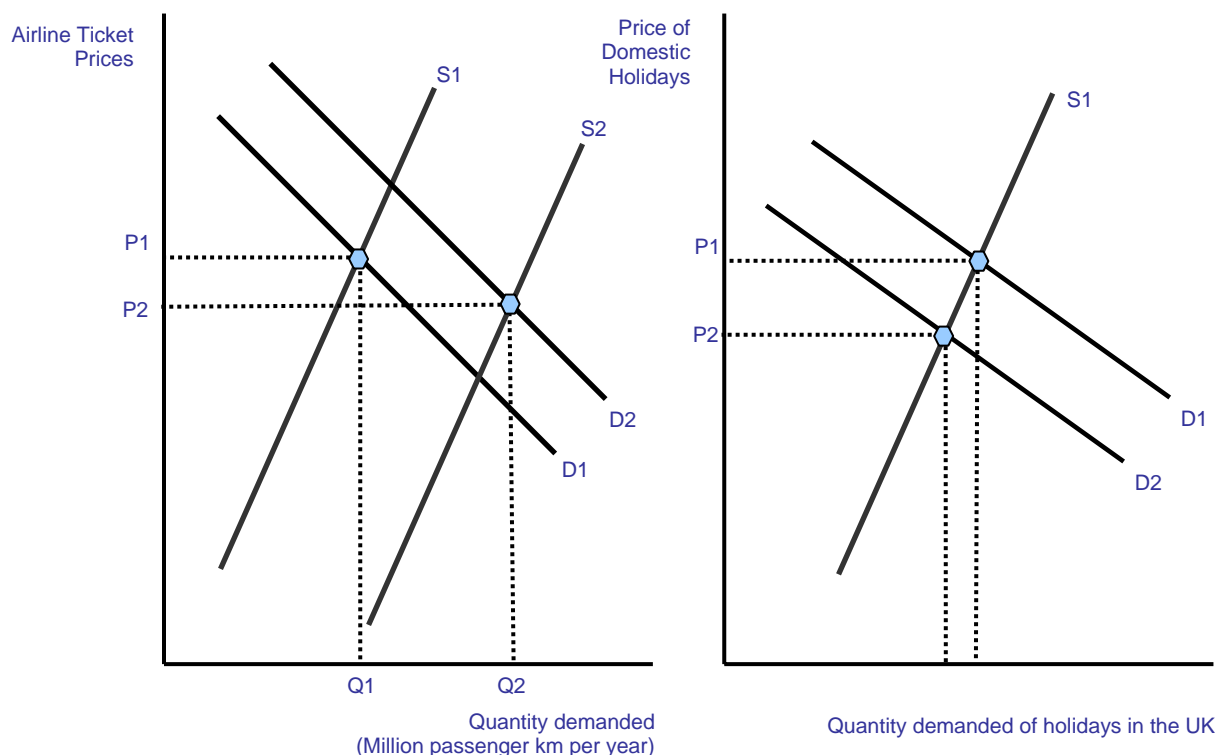


Source: Reuters EcoWin

15. Inter-relationships between Markets

Supply and demand analysis can be used to explain and **inter-relationships between different markets and industries**. For example, fluctuations in supply and demand conditions in one market change the incentives and the decisions made by producers and consumers in other markets.

A change in market supply and demand in two markets



In the first example we consider the huge increase in the market supply of low-cost flights available from airports across the United Kingdom. The market supply of flights has shifted out to the right, probably by far more than the increase in market demand. (New low cost airlines have entered the market and existing airlines have expanded their route network and fleet capacity). The net result is a reduction in the average real price of flights to short-haul destinations in Europe.

Consider the possible effect on the UK tourist industry. Assuming other factors remain constant (for example the exchange rate and the growth of incomes in other countries whose tourists might choose the UK as a venue for a holiday). A fall in the relative price of airline flights increases the market demand for overseas holidays (short city breaks, package holidays for example). Assuming that British tourists can choose to holiday at home or overseas and regard the two products as substitutes, then the effect is to reduce the demand for holidays in the UK – putting downward pressure on prices, profit margins and leading to the risk of excess capacity in the UK tourist industry.

The growth of market demand for digital cameras

Global demand for digital cameras continues to be strong. Industry analysts IDC forecast that 110 million digital cameras will be shipped in 2008, but a slowdown in market demand is on the horizon. The industry is already worth \$33 billion in annual sales. The Asian/Pacific region is emerging as the powerhouse for rising demand as incomes continue to rise in emerging market economies. By 2010, these two regions will account for over 40% of total global shipments of digital cameras. The major suppliers are Canon, Fuji, HP, Kodak, Konica Minolta, Nikon, Olympus, Pentax Technologies, Samsung and Sony.

What are the inter-relationships between markets in this example?

1. **Substitute products:** The growing demand for digital cameras is causing a fall in demand for analogue cameras that rely on taking film to developers – some producers including Eastman Kodak have stopped producing traditional film cameras due to falling demand. If others follow suit, then market supply will also shift inwards
2. **Complementary products:** As demand for digital cameras increases, so too does demand for printing paper, inks and other accessories used by people who want to print out their favourite images from their desktop or notebook PC
3. **Demand-side threat to other markets:** The change in consumer demand represents a competitive threat to mobile phone manufacturers – they are having to respond by becoming more innovative in terms of what their mobile phone handsets can do

High gas prices cause shut-downs in UK brick production

Steep rises in the price of oil and gas is causing problems for the [British brick-producing industry](#) and is likely to lead to a fall in output and loss of jobs. It is a stark example of how the changing prices of essential inputs into the production process can filter through to affect many related industries.

[Baggeridge Brick](#), the fourth-biggest brick maker in the UK has announced that it plans to shut down two of its seven factories over Christmas and extend the closedown throughout January. The business has been hit by a double-whammy. Firstly the slowdown in the housing market and a trend towards building smaller properties has prompted a decline of 200 million in the market demand for bricks. Demand has also declined because of a reduction in spending on housing repairs, maintenance and improvement. Output in the industry has fallen by around ten per cent in 2005.

Secondly the rise in the market price of gas has meant that the brick-producer is now paying double for its gas compared with this time last year. Gas is a major input into production because brick manufacturing is a very energy-intensive business.

Higher brick prices will cause an increase in the cost of building new properties and in renovating existing buildings. Industry analysts forecast that planned price increases by the major brick suppliers will add around £150 - £200 to the cost of each new residential property depending on its size. Because all of the brick producers in the UK have experienced much the same rise in their energy costs, they are all expected to try to pass on these costs to final customers through higher prices. This is not collusion, merely an inevitable response to an industry-wide rise in production costs.

Macroeconomics and market effects

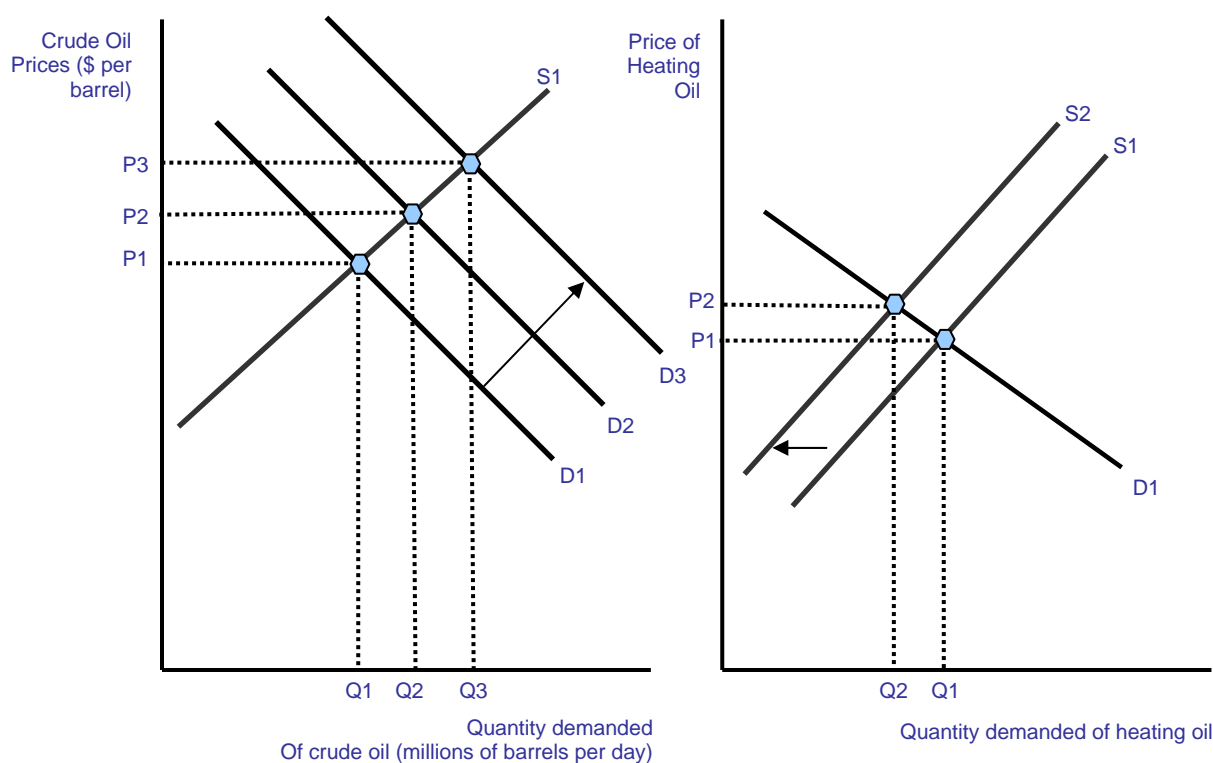
Another good example of inter-relationships is how macroeconomic developments in one country affect the prices of goods and services that we consume in our own economy. Consider the recent phenomenal growth of the **Chinese economy** and the impact that it has had on demand for and prices of many important internationally-traded raw materials and commodities

Chinese growth drives up world commodity prices

China's [explosive economic growth](#) voracious appetite for [raw materials and energy](#) has driven up prices worldwide and created shortages. In 2005, China consumed over 50 percent of the world's cement, 40 percent of its steel and 25 percent of its aluminium. China's growing demand for oil has been one reason crude prices are so high. Talk of an economic slowdown engineered by the Chinese government is pricking up ears from Chilean copper mines to Minnesota soybean fields. China has 4,813 cement plants - more than the rest of the world combined - and they still aren't enough to supply the cement for projects such as the [Three Gorges Dam](#) or the stadiums and housing for the 2008 Beijing Olympic Games.

Consider how rising oil prices can feed through to related markets

Increasing demand for crude oil forces up the world market price ($P1 - P2 - P3$)
Crude oil is used as a raw material in producing heating oil for central heating systems – the higher price of crude causes an increase in costs and reduction in the market supply of heating oil at each price level (shown in the right hand diagram)



Derived demand

The demand for a product X might be strongly linked to the demand for a **related product** Y. For example, the demand for steel is strongly linked to the market demand for new cars, the construction of new buildings and many manufactured products. The **demand for labour** is derived from the final demand for the goods and services that we employ labour to produce.

So when the economy is enjoying a strong upturn in aggregate demand, so too the demand for labour increases. Conversely in a recession, as real national output declines, so we see a fall in the demand for labour at each prevailing wage rate.

Composite demand

Composite demand exists where **goods or services have more than one use** so that an increase in the demand for one product leads to a fall in supply of the other. The most commonly quoted example is that of **milk** which can be used for cheese, yoghurts, cream, butter and other products. If more milk is used for manufacturing cheese, other things remaining the same, there is less available for butter. Another good example is **land** – land can be developed in many different ways – for commercial property, residential properties, leisure facilities, farming, common land and so forth. Likewise **oil** has numerous alternative uses – for heating oil, petrol fuel, use in petrochemicals etc.

Joint supply

Joint supply describes a situation where an increase or decrease in the supply of one good leads to an increase or decrease in supply of another. For example an expansion in the volume of beef production will lead to a rising market supply of beef hides. A contraction in supply of lamb will reduce the supply of wool.

Orange Juice Squeezed by Nature

Frozen Orange Juice, Futures Price

Futures price for delivery in three months time, US cents per lb





Britain's daily dose of Vitamin C may be about to get a lot more expensive. The price of frozen orange juice hit a 14-year high last week, pushed up by speculators betting that market supply would remain tight this year after hurricanes and dry weather had reduced growing in the world's leading orange-producing countries.

"Mother Nature has certainly done a job on the Florida citrus industry," said a spokesman for [Tropicana](#), the world's biggest orange juice seller. Florida is the world's number-two orange producer behind Brazil, where total juice production was also down last year.

The price for [orange juice futures](#) - the price of frozen juice to be delivered at a date in the future - has nearly trebled since the beginning of 2005 partly because of predictions of another heavy hurricane season in Florida. Florida will produce 153 million boxes of juice this year, one-fifth less than earlier predicted.

Consumption, meanwhile, is on the rise. According to the [British Soft Drinks Association](#), Britons guzzled 1.4 billion litres of fruit juice in 2005, an increase of 6.8 per cent over the year before. Orange juice accounts for about 70 per cent of fruit juices consumed in the UK. Tropicana has already passed some of the higher cost along to customers, hiking its juice prices by 7 per cent last year. Where the cost crunch will be most acute, however, is in "ambient" juice - the cheap supermarket branded juices stored at room-temperature, said a BSDA spokesman. "The **profit margins** [for ambient juices] are razor thin, so any squeeze has got to happen there," he said.

Sources: Adapted from the Independent, 14th May 2006 and data from EcoWin

16. Consumer Surplus

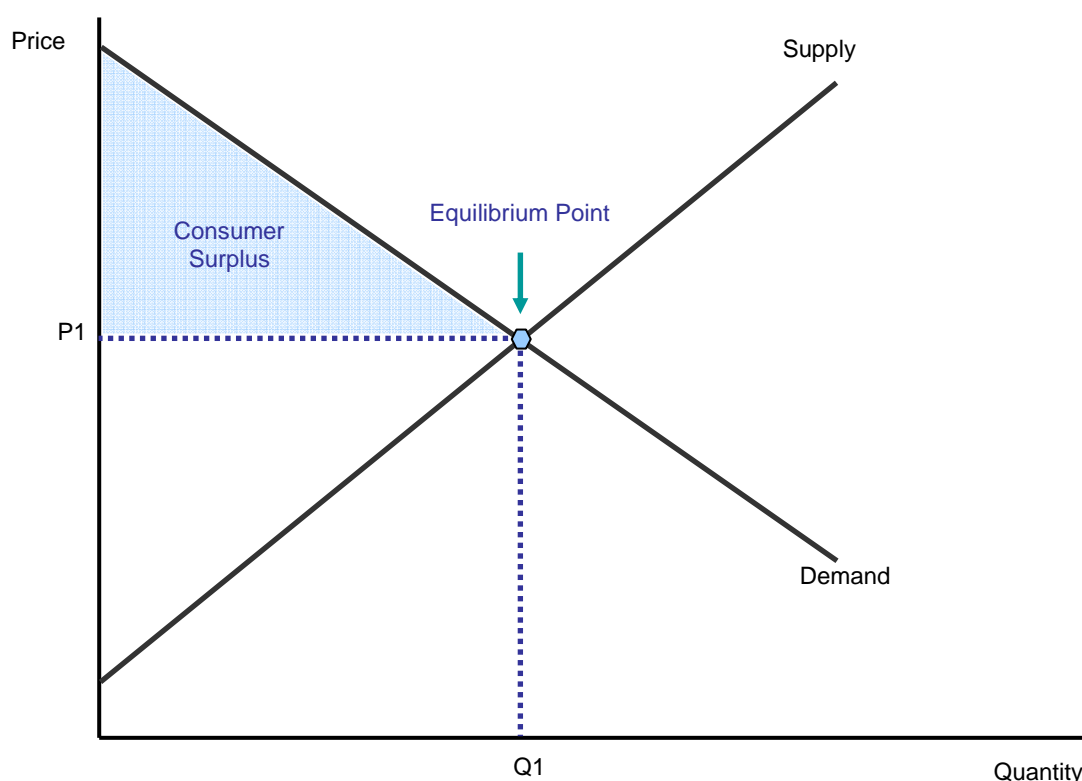
In this chapter we look at the importance of willingness to pay for different goods and services. When there is a difference between the price that you actually pay in the market and the price or value that you place on the product, then the concept of consumer surplus becomes a useful one to look at.

Defining consumer surplus

Consumer surplus is a measure of the **welfare** that people gain from the consumption of goods and services, or a measure of the benefits they derive from the exchange of goods.

Consumer surplus is the difference between the total amount that consumers are **willing and able to pay** for a good or service (indicated by the demand curve) and the total amount that they actually do pay (i.e. the market price for the product). The level of consumer surplus is shown by the area under the demand curve and above the ruling market price as illustrated in the diagram below

Consumer surplus is the difference between the price that a consumer is prepared to pay and the actual price paid

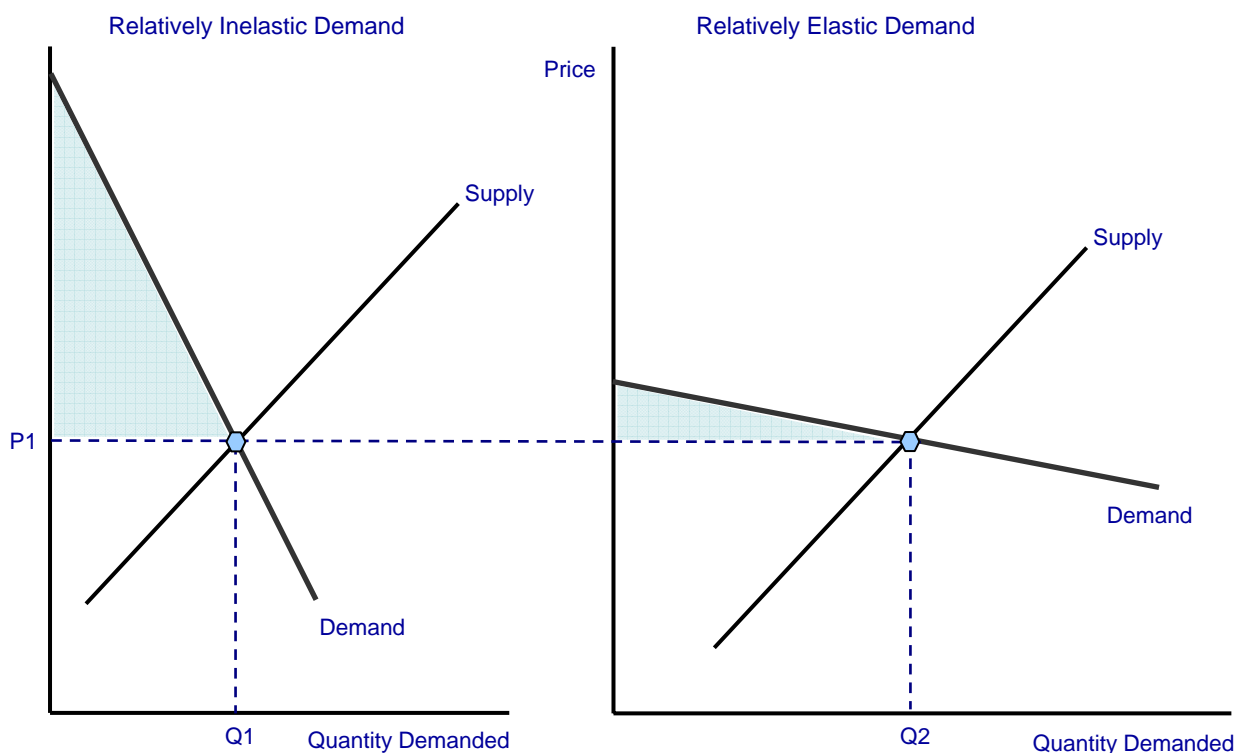


Consumer surplus and price elasticity of demand

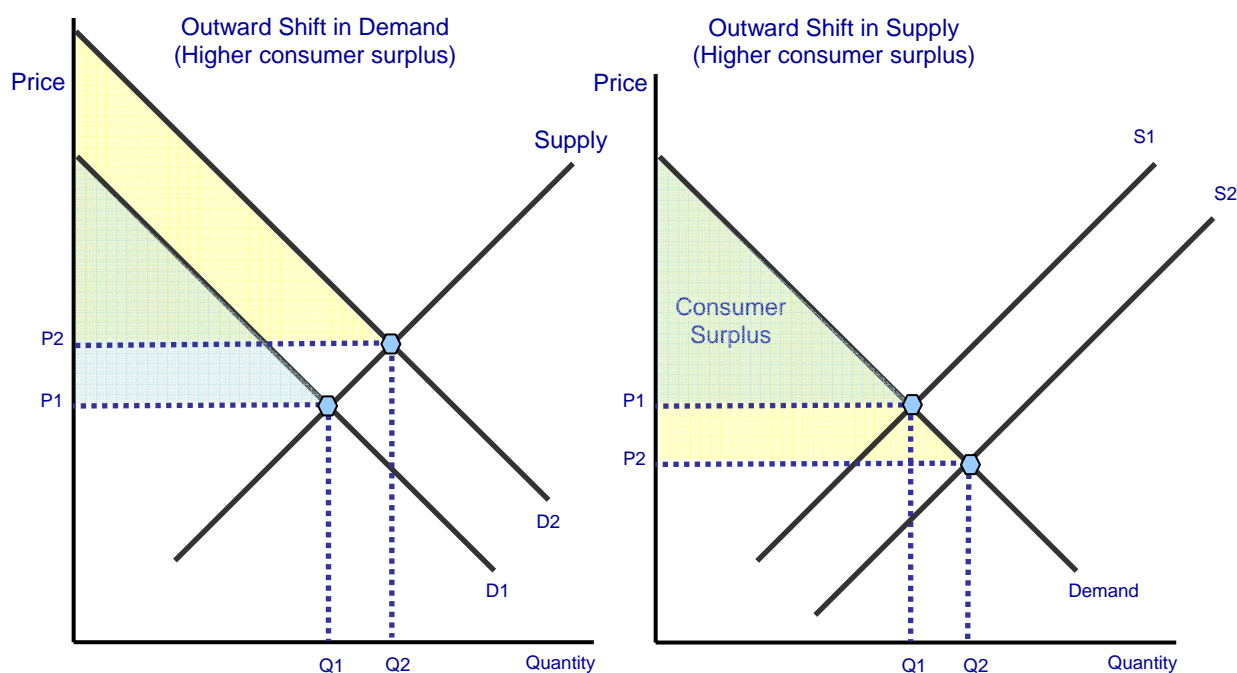
When the demand for a good or service is perfectly elastic, consumer surplus is zero because the price that people pay matches precisely the price they are willing to pay. This is most likely to happen in highly competitive markets where each individual firm is assumed to be a '**price taker**' in their chosen market and must sell as much as it can at the ruling market price.

In contrast, when demand is perfectly inelastic, consumer surplus is infinite. Demand is totally invariant to a price change. Whatever the price, the quantity demanded remains the same. Are there any examples of products that have such a low price elasticity of demand?

The majority of demand curves are downward sloping. When demand is inelastic, there is a greater potential consumer surplus because there are some buyers willing to pay a high price to continue consuming the product. This is shown in the diagram below.



Changes in demand and consumer surplus



When there is a shift in the demand curve leading to a change in the equilibrium market price and quantity, then the level of consumer surplus will alter. This is shown in the diagrams above. In the left hand diagram, following an increase in demand from D_1 to D_2 , the equilibrium market price rises to from P_1 to P_2 and the quantity traded expands. There is a higher level of consumer surplus because more is being bought at a higher price than before.

In the diagram on the right we see the effects of a **cost reducing innovation** which causes an outward shift of market supply, a lower price and an increase in the quantity traded in the market. As a result, there is an increase in consumer welfare shown by a rise in consumer surplus.

Consumer surplus can be used frequently when analysing the impact of government intervention in any market – for example the effects of indirect taxation on cigarettes consumers or the introducing of road pricing schemes such as the London congestion charge.

Paying for the right to drive into the centre of London

In July 2005, the congestion charge was raised to £8 per day. How has the London congestion charge affected the consumer surplus of drivers?



[Transport for London](#) has details on the impact of the congestion charge

Applications of consumer surplus

Consider the entry of Internet retailers such as Last Minute and Amazon into the markets for travel and books respectively. What impact has their entry into the market had on consumer surplus? Have you benefited from you perceive to be lower prices and better deals as a result of using e-commerce sites offering large discounts compared to high street retailers?

Price discrimination and consumer surplus

Producers often take advantage of consumer surplus when setting prices. If a business can identify groups of consumers within their market who are willing and able to pay different prices for the same products, then sellers may engage in **price discrimination** – the aim of which is to extract from the purchaser, the price they are willing to pay, thereby turning consumer surplus into extra revenue.

Airlines are expert at practising this form of **yield management**, extracting from consumers the price they are willing and able to pay for flying to different destinations at various times of the day, and exploiting **variations in elasticity of demand** for different types of passenger service. You will always get a better deal / price with airlines such as EasyJet and RyanAir if you are prepared to book weeks or months in advance. The airlines are prepared to sell tickets more cheaply than because they get the benefit of cash-flow together with the guarantee of a seat being filled. The nearer the time to take-off, the higher the price. If a businessman is desperate to fly from Newcastle to Paris in 24 hours time, his or her demand is said to be price inelastic and the corresponding price for the ticket will be much higher.

One of the main arguments against firms with **monopoly power** is that they exploit their monopoly position by raising prices in markets where demand is inelastic, extracting consumer surplus from buyers and increasing profit margins at the same time. We shall consider the issue of monopoly in more detail when we come on to our study of markets and industries.

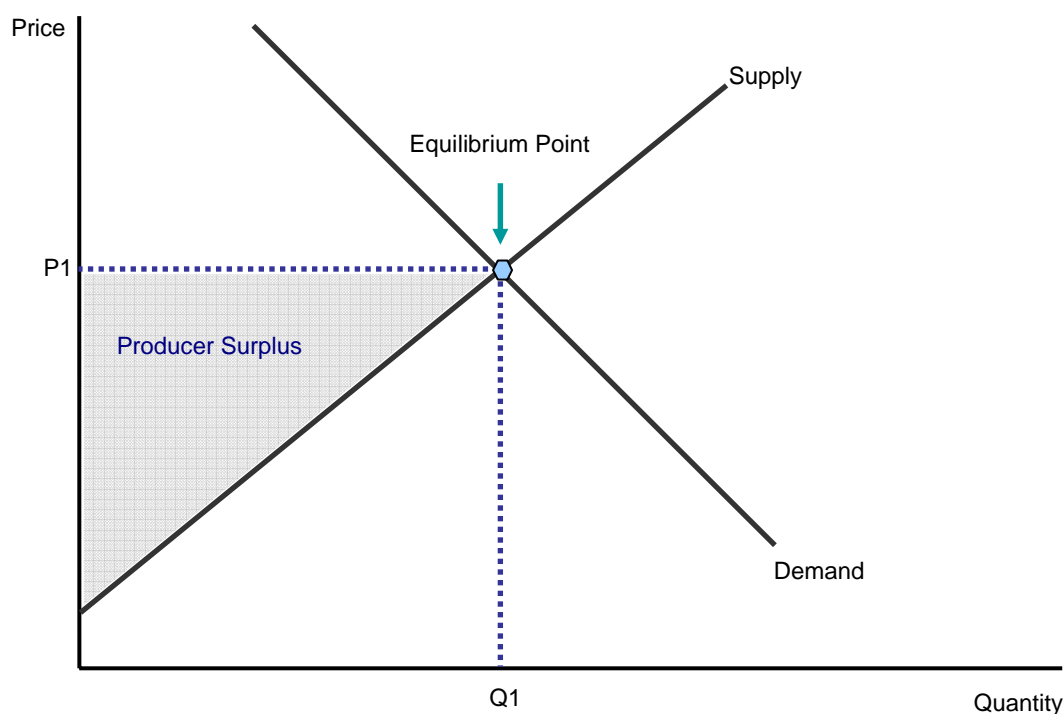
17. Producer Surplus

Producer surplus relates to the welfare that businesses can achieve by supplying products to the market.

Defining producer surplus

Producer surplus is a measure of **producer welfare**. It is measured as the difference between what producers are willing and able to supply a good for and the price they actually receive. The level of producer surplus is shown by the area above the supply curve and below the market price and is illustrated in the diagram above.

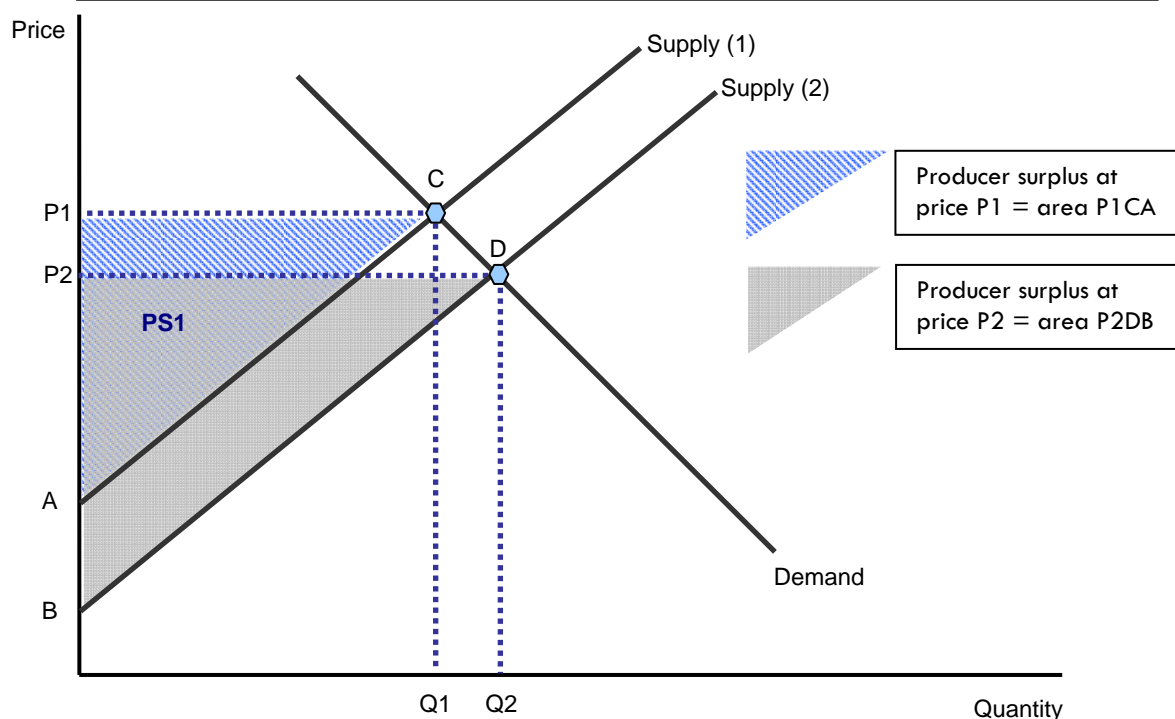
Producer surplus is the difference between the market price received by the seller and the price they would have been prepared to supply at



Producer surplus and changes in demand and supply

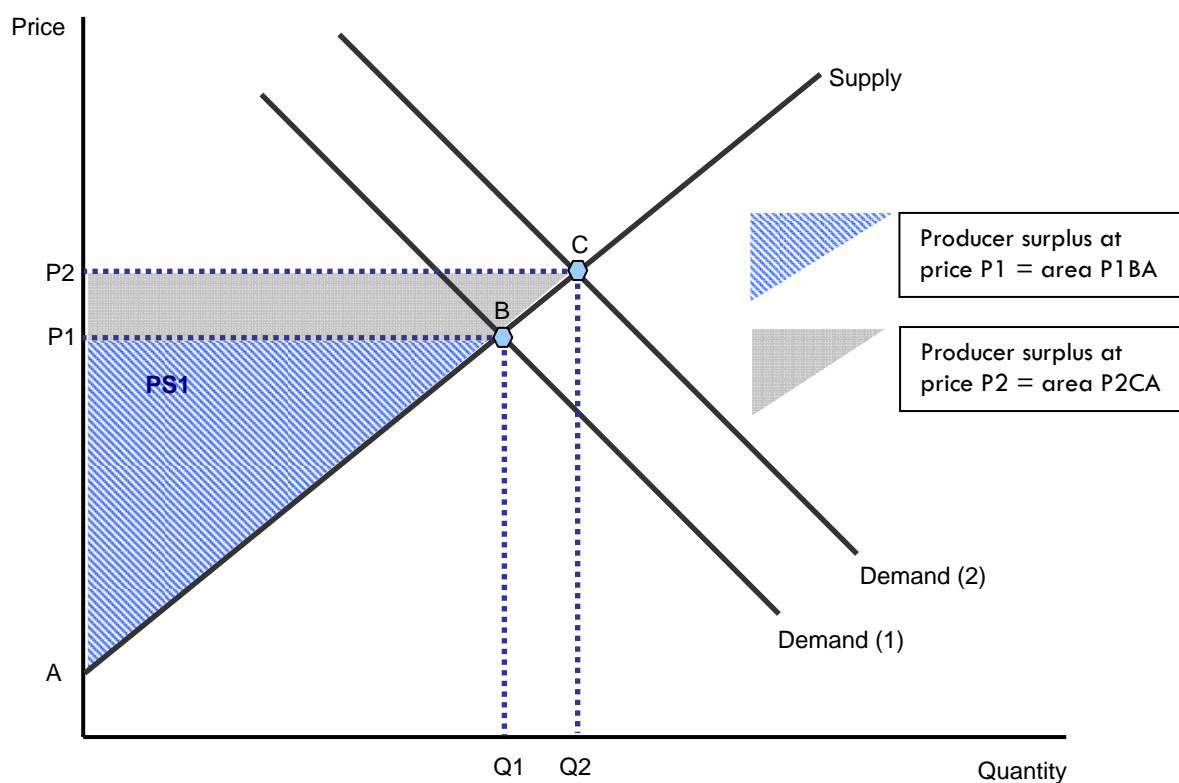
We first consider the effects of a change in market supply – for example caused by an improvement in production technology or a fall in the cost of raw materials and components used in the production of a good or service

An outward shift of supply causes a fall in market price and a rise in equilibrium quantity
The result is an increase in the total level of producer surplus



We now consider the effects on producer surplus of a rise in market demand

An outward shift in demand causes a rise in both equilibrium price and quantity
The result is an increase in the total level of producer surplus



18. The Market for Oil

*The effects of changes in the price of crude oil **traded on the international petroleum exchanges** can be far-reaching, not just for the British economy but for the global economy too. A basic study of the oil market is a useful application of the principles of supply and demand analysis and a way of understanding the interconnections between the microeconomics of the oil market and their macroeconomic consequences.*

Market theory in action - what determines crude oil prices?

Oil is one of the most heavily traded commodities in the world. Fluctuating prices have important effects for oil producers/exporters and the many countries that remain dependent on oil as a key input in their energy, manufacturing and service industries.

The demand for oil

1. **Cyclical demand:** There is a strong link between the demand for oil and the rate of global economic growth because oil is an essential input into many industries – when the economy is expanding, the demand for oil rises. The best recent example of this is the growth of the Chinese economy. Fast growth of national output in energy-intensive sectors has led to a surge in demand for crude oil into the Chinese economy.
2. **Prices of substitutes:** Demand for crude oil affected by the relative prices of oil substitutes (e.g. the market price of gas). If, in the longer term, reliable and relatively cheaper substitutes for oil can be developed, then we might expect to see a shift in demand away from crude oil towards the emerging substitutes. The high price of oil during 2004-2006 seems to have led to a rise in research and development into non-oil substitutes. These can take several years to come through to affect the market for energy.
3. **Changes in climate** – e.g. affecting the demand for heating oil. It is often said that if the winter in North America is fierce, then the price of crude rises as the USA and Canadian economies raise their demand for oil to fuel household heating systems and workplaces
4. **Market speculation:** There is always a **speculative demand** for oil (i.e. purchasers hoping for a rise in prices on world markets). Indeed one of the features of the most recent spike in oil prices has been the high level of demand by hedge funds and other investors pouring into the **international petroleum exchanges** to buy up any surplus oil futures contracts. They hope that by the time the contracts are ready to be fulfilled, they will have made a large profit. Speculation involves risk, prices can do down as well as up.

Who are the main consumers of oil? Nearly two thirds of global crude oil production is consumed by the leading industrialised nations – i.e. the nations that make up the Organisation of Economic Cooperation and Development. But a rising share of oil demand is coming from the emerging market economies including China, Brazil, Russia and India.

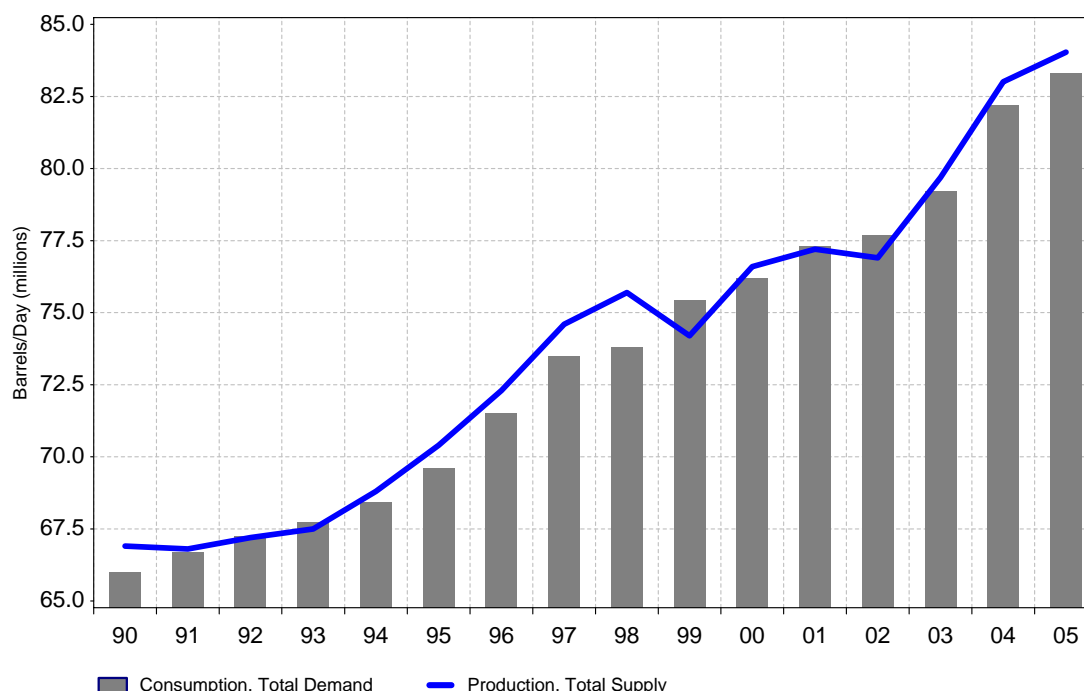
The world's largest consumers of oil

	Consumption of oil in 2005 Thousand barrels daily	Share of total consumption %
USA	20655	24.6%
China	6988	8.5%
Japan	5360	6.4%
Russian Federation	2753	3.4%
Germany	2586	3.2%
India	2485	3.0%
South Korea	2308	2.7%
Canada	2241	2.6%
France	1961	2.4%
Mexico	1978	2.3%
Saudi Arabia	1891	2.3%
Italy	1809	2.2%
Brazil	1819	2.2%

United Kingdom	1790	2.2%
Spain	1618	2.1%

World Oil Consumption (Demand)

Barrels of oil per day, billions, source: International Energy Agency, data for 2005 is a forecast



Source: Reuters EcoWin

The supply of oil

When we consider the global supply of oil we need to make a distinction between short-term and longer-term supply to the international markets. The short run supply curve is normally drawn on the basis of a given state of production technology and fixed use of capital inputs (i.e. the oil industry is supplying from a known level of oil reserves and a given stock of capital machinery used to extract that oil). There is inevitably a short-run limit on daily oil supply and, as production gets close to capacity limits, so the short run supply of oil becomes more inelastic.

One possible way of modelling this is to assume the market supply curve for oil **is non-linear** (shown in the left hand diagram below). An alternative is to suggest that more oil can be supplied elastically at a fairly constant price until the capacity limit is reached, when the short run supply curve becomes vertical.

In short, the short-run supply of crude oil is affected by a series of different factors

1. **Profit motive:** The production decisions of [OPEC](#) and Non-OPEC countries (see revision notes on OPEC below)
2. **Spare capacity:** The level of spare production capacity in the oil sector
3. **Stocks:** The current level of crude oil stocks (inventories) available for immediate supply from the major oil refineries – i.e. a high level of stocks means that extra oil supplies can be released onto the market quickly when demand fluctuates
4. **External shocks:** The effects of production shocks (e.g. loss of output from rig closures or disruption of oil supplies due to war and terrorist attacks)

Taking a longer-term perspective, the long run world oil supply is linked to

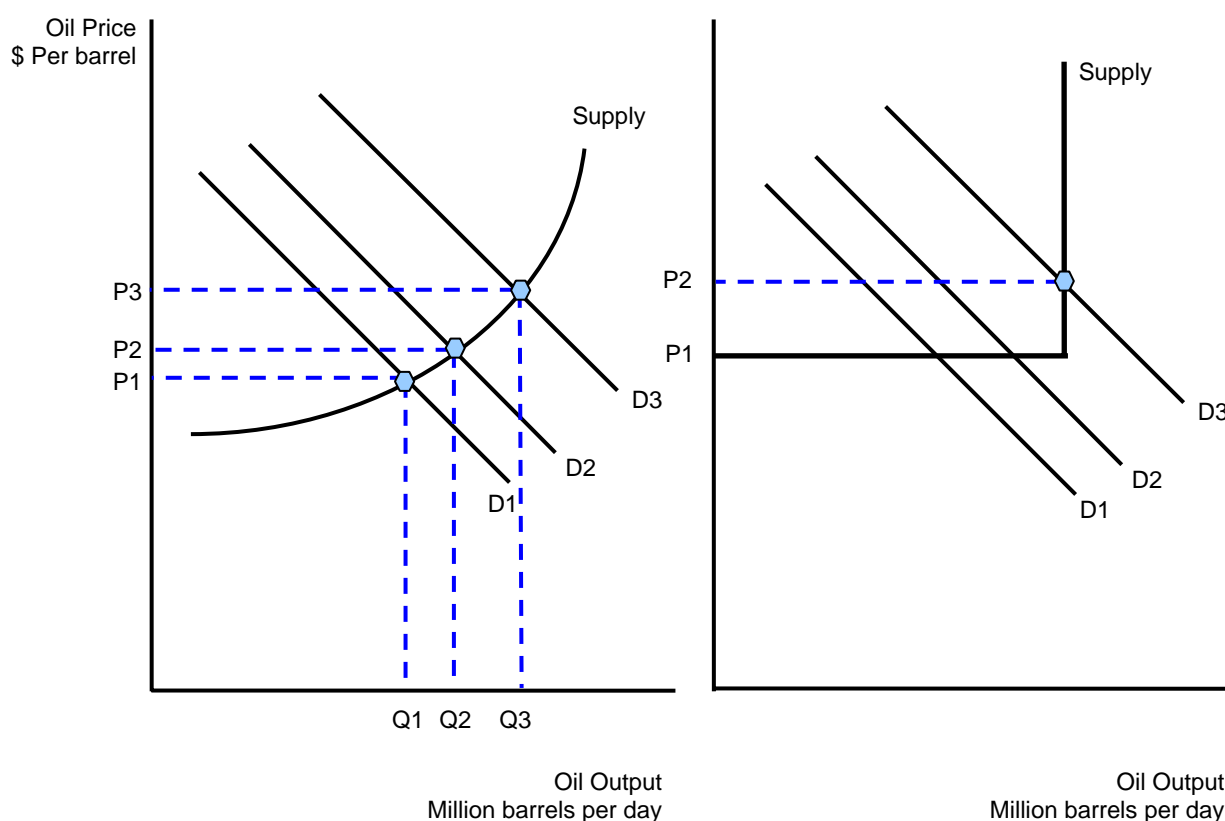
1. **Reserves:** Depletion of proven oil reserves – the faster that demand grows, the quicker the expected rate of depletion
2. **Exploration:** Investment spending on exploring, identifying and then exploiting new oil reserves. When oil prices are rising and are expected to stay strong for the foreseeable future, it makes financial sense to invest more resources in exploring for new reserves, even though these may not come on stream for some years.

3. **Technology:** Technological change in oil extraction (which affects the costs of extraction and the profitability of extracting and then refining the oil)

The interaction between oil demand and supply in the short run

Higher oil demand matched against an inelastic short run supply of oil invariably drives market prices higher – this is shown in the diagram below. An increase in demand causes a fall in oil stocks at the major international refineries and pushes prices higher. This acts as a signal to suppliers to expand production. However there are time lags between a change in price and extra supplies coming on stream.

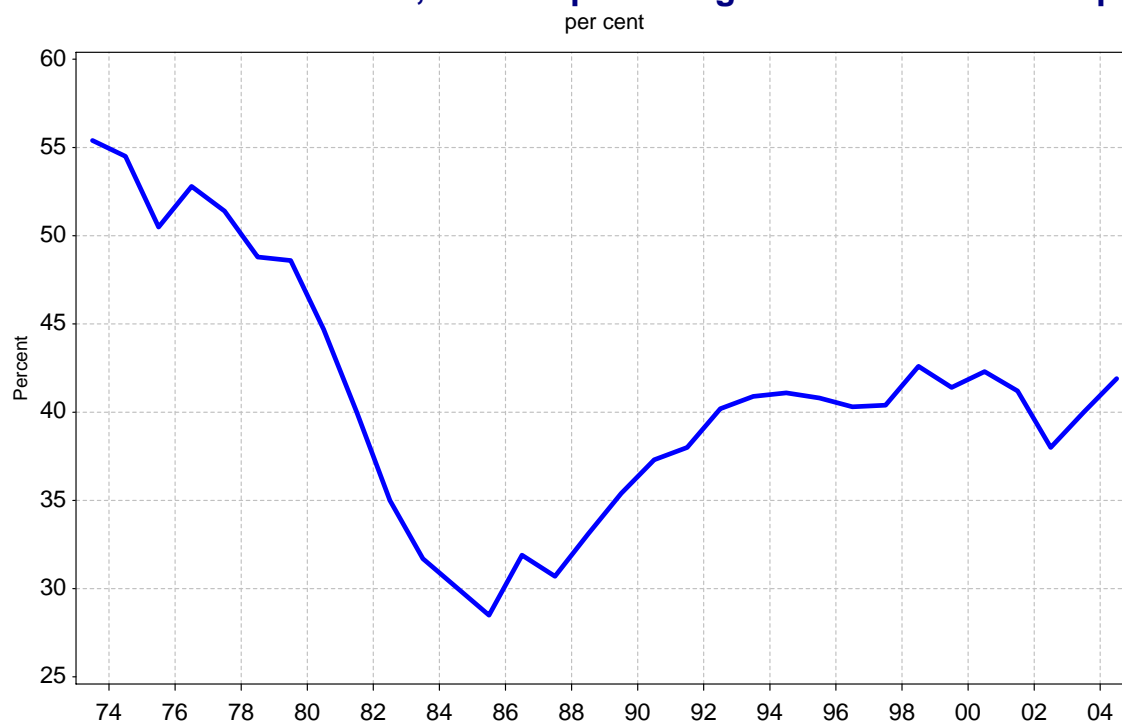
The demand for oil is also price inelastic. This combination of an inelastic demand and supply helps to explain some of the volatility in world oil prices.



The role and impact of the OPEC cartel

The [Organization of Petroleum Exporting Countries](http://www.tutor2u.net) (OPEC) accounts for around 40% of current world supply. This gives OPEC a pivotal influence in shaping the direction of oil prices – but only when the cartel acts together to control production and balance supply and demand in the international market. Non-OPEC countries account for the largest portion of total supply. Oil is produced in nearly every corner of the world, and nearly every region has been expanding oil production in the last decade. This includes Europe, where Norwegian oil companies are achieving a rapid increase in oil extraction and also Russia now one of the world's largest oil suppliers.

OPEC Oil Production, OPEC's percentage of total world oil output



Source: Reuters EcoWin

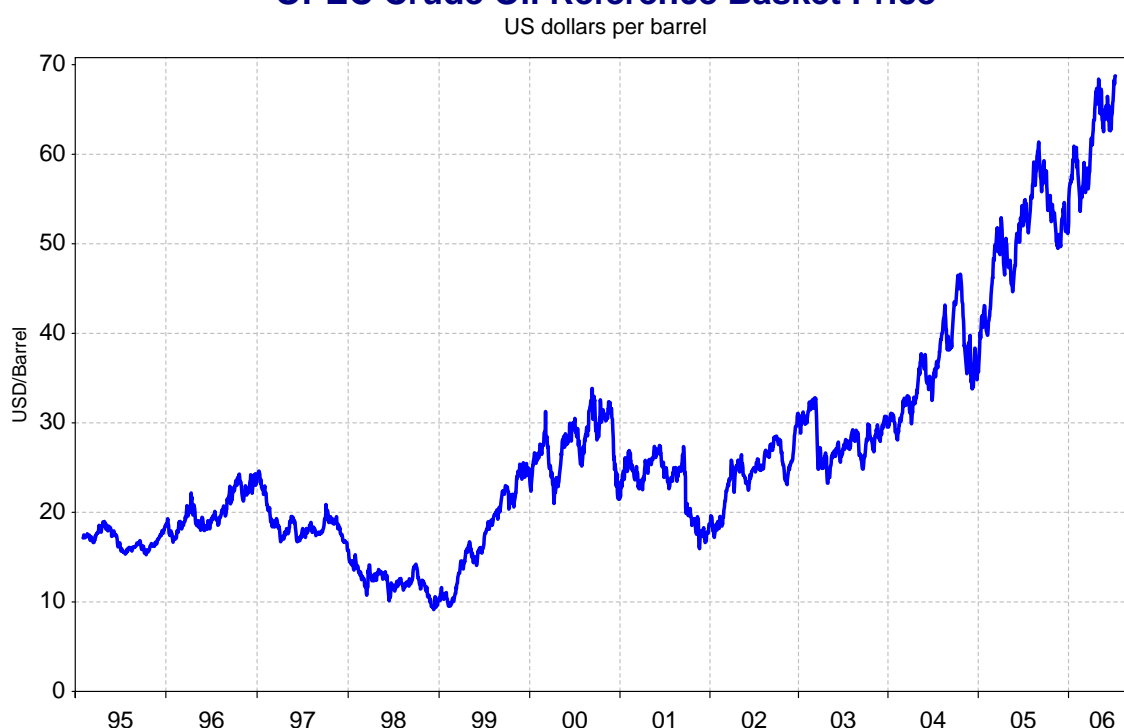
World Oil Production

	Production on oil Thousand barrels daily	Output as a share of world total
Saudi Arabia	11035	13.5%
Russian Federation	9551	12.1%
USA	6830	8.0%
Iran	4049	5.1%
Mexico	3759	4.8%
China	3627	4.6%
Venezuela	3007	4.0%
Canada	3047	3.7%
Norway	2969	3.5%
Kuwait	2643	3.3%
United Arab Emirates	2751	3.3%
Nigeria	2580	3.2%
Iraq	1820	2.3%
Algeria	2015	2.2%
Brazil	1718	2.2%
United Kingdom	1808	2.2%

	Total production 000 barrels daily	Output as a percentage of total world output
Total World Oil Production in 2005	81088	100.0%
Of which		
OPEC countries	33836	41.7%
Non-OPEC	35408	43.4%
Former Soviet Union	11844	14.8%

OPEC sets **quotas** for how much crude oil they want to produce with the aim of stabilising the price at a target level. There are always major doubts about OPEC's ability to keep to output limits. Basically, OPEC acts as the swing producer in the world oil market. It controls that part of the world supply curve which is easiest to change and if it wants to keep oil prices high, then it can keep tight control on short run production so that supply does not run too far ahead of demand. OPEC has to tread a fine line, because if prices remain too high for a long period, then oil consumers have a clear incentive to look for alternative sources of energy or other non-oil substitutes in production.

OPEC Crude Oil Reference Basket Price



Source: Reuters EcoWin

The microeconomic consequences of higher oil prices

Crude oil has many uses in many different markets and industries. So changes in the global price of oil inevitably have an effect on the microeconomics of particular sectors of the economy. The main uses for crude oil are as follows:

1. Gasoline: motor spirit/petrol
2. Middle Distillates:
 - a. Diesel - vehicles and other motors/engines
 - b. Jet fuel
3. Kerosene – cooking/heating
4. Heating Oil
5. Fuel Oil: boiler fuel for industry, power and shipping
6. Other: lubricants, bitumen etc

The economic effects of high oil prices



After a long period of relatively low oil prices, in the last few years, the world economy has had to come to terms with the [prospect that the era of cheap oil is now over](#). This affects many industries in the UK economy and has direct and indirect effects on consumers.

For those industries that use oil as a key input into their production process, then a rising price acts as a **supply-side shock** – leading to higher input costs i.e. a rise in their variable costs of production. The more an industry relies on oil, the bigger will be the impact of a rise in oil prices on its costs and profitability, and hence the bigger the fall in its production is likely to be in the long run.

The increase in costs causes a profit maximising firm to increase price and reduce the equilibrium level of output. The extent to which a business is able to pass on an increase in costs depends on the price elasticity of demand for their products. If demand is price inelastic, then the supplier may choose to pass on some or all of any rise in variable costs to the consumer of the final product. For example, a controversial issue has been the decision by many (although not all) of the airlines to increase their [fuel surcharges to customers](#).

For consumers, higher oil prices has led directly to more [expensive fuel at the pumps](#), higher gas and electricity bills and a reduction in their real incomes.

Although oil and gas prices have been very high, so far we have not seen a dramatic rise in inflation – other factors have helped to keep inflation under control.

19. The Market for Copper

The market for copper has hit the headlines in the last two years as a price boom has occurred.

The [world price of copper](#) nearly trebled between the start of 2005 and the summer of 2006, one of the most remarkable booms in commodity markets in many years. Much of the steep rise in price has been due to demand-side factors. World **demand for copper** has been rising much faster than the growth in market supply that result from new discoveries of copper and increased **extraction** rates of known reserves. In 2004, world copper consumption exceeded production by 843,000 tons and a similar demand-supply imbalance occurred in 2005 and the early months of 2006.

World Price of Copper since 2005

Spot price each day on the London Metal Exchange



According to a recent study from geologists at Yale University, new discoveries of copper have raised global reserves by just 0.63 per cent a year since 1925 but usage (final demand) has risen at 3.3 per cent per annum. And now demand is growing strongly on the back of phenomenal growth in China, India and other emerging market economies. **Stocks of copper** have been in sharp decline in the last few years and it is this **scarcity** that has driven prices higher as commodities traders out-bid each other as they scramble for available supplies. Supply has fallen behind the growth of demand and prices can move in only one direction when this happens!

The world supply of and demand for copper

Most copper ore is mined or extracted as copper sulfides from large open pit mines in copper porphyry deposits that contain 0.4 to 1.0 percent copper. Over 40 per cent of world copper supply comes from North and South America; 31 per cent from Asia and 21 per cent from Europe. Chile is the world's biggest supplier of copper (it provided 35 per cent of the total in 2003 with Indonesia and the USA each contributing 8 per cent).

Copper – an example of derived demand

Because [copper](#) is malleable and ductile, there is a huge **industrial demand for copper**. Like most metals the demand for it is derived in part from the final demand for products that use copper as an important component or raw material. Nearly 50 per cent of the demand for copper comes from the **construction**

industry, and 17 per cent is from the **electrical sector**. Copper is also used extensively in heavy and light engineering and in transport industries. From copper wire to copper plumbing, from the use of copper in integrated circuits to its value as a corrosive resistant material in shipbuilding and as a component of coins, cutlery and to colour glass, copper has a huge array of possible industrial uses.

A good example of where demand for copper comes from is the **automobile industry**. The average new car contains 27.6kg of copper. And hybrid cars which incorporate electric motors in conjunction with combustion engines could lead to further rises in copper demand. A typical electric hybrid car might use around 2 times the current usage of copper in extra cabling and windings for electric motors."



Higher copper prices should encourage an expansion of supply

Incremental demand – the China and India effect

Recent data suggests that the incremental growth in world demand for copper has come almost exclusively from China and other Asian economies. HSBC analysts calculate that between the years 2000-04, the compound annual growth in copper consumption from North America has fallen by 3 per cent and by 1.8 per cent from Western Europe and 2 per cent from Japan. In contrast, demand from Asian countries other than Japan has increased by 8.6 per cent each year whilst in China the growth has been a staggering 15 per cent per year.

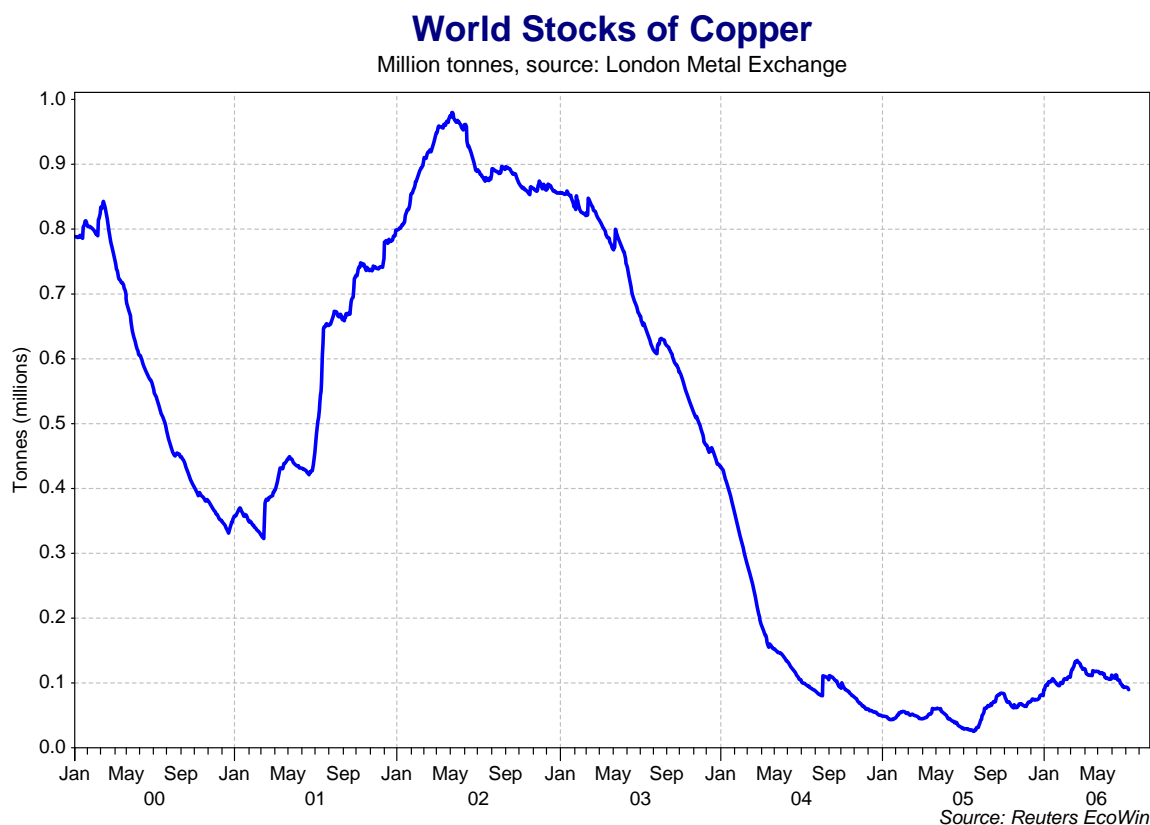
There has also been a noticeable **speculative demand for copper** as investment funds around the world have started to track commodity prices. In the case of copper, thus far, the market has been a one way street for financial investors, although you may have heard about the rogue copper trader from China who a fortune betting that the market price of copper would fall back in November 2005!

The volatility of commodity prices

As we have seen, price volatility stems from a lack of responsiveness of both demand and supply in the short term, i.e. both demand and supply are assumed to be **inelastic** in response to price movements.

The **low price elasticity of demand** for copper usually stems from a lack of close substitutes in the market. For some products and processes, aluminium or plastic may act as a substitute to copper for some uses, but there are costs and delays involved in switching between them.

The **elasticity of supply** is also low. Supply is usually unresponsive to price movements in the short term because of the **high fixed costs** of developing new extraction plants which also involve lengthy **lead-times**. If existing copper mining businesses are working close to their **current capacity** then a rise in world demand will simple lead to a reduction in available stocks. And as stocks fall, so buyers in the market will bid up the price either to finance immediate delivery (the spot price) or to guarantee delivery of copper in the future (reflected in the futures price). It can take huge price swings in the market for supply and demand to respond sufficient to bring the market back to some sort of **equilibrium**.



The effects of rising copper prices

The demand for copper will continue to remain strong provided that the global industrial sectors continue to expand production. But if price remain high then we can expect to see some shifts occurring. For a start, copper can be **recycled** although the costs of doing so are often high and there are fears concerning the negative externalities arising from the pollution created by trying to recycle used copper. These external costs include atmospheric emissions from recycling plants and waste products dumped into rivers.

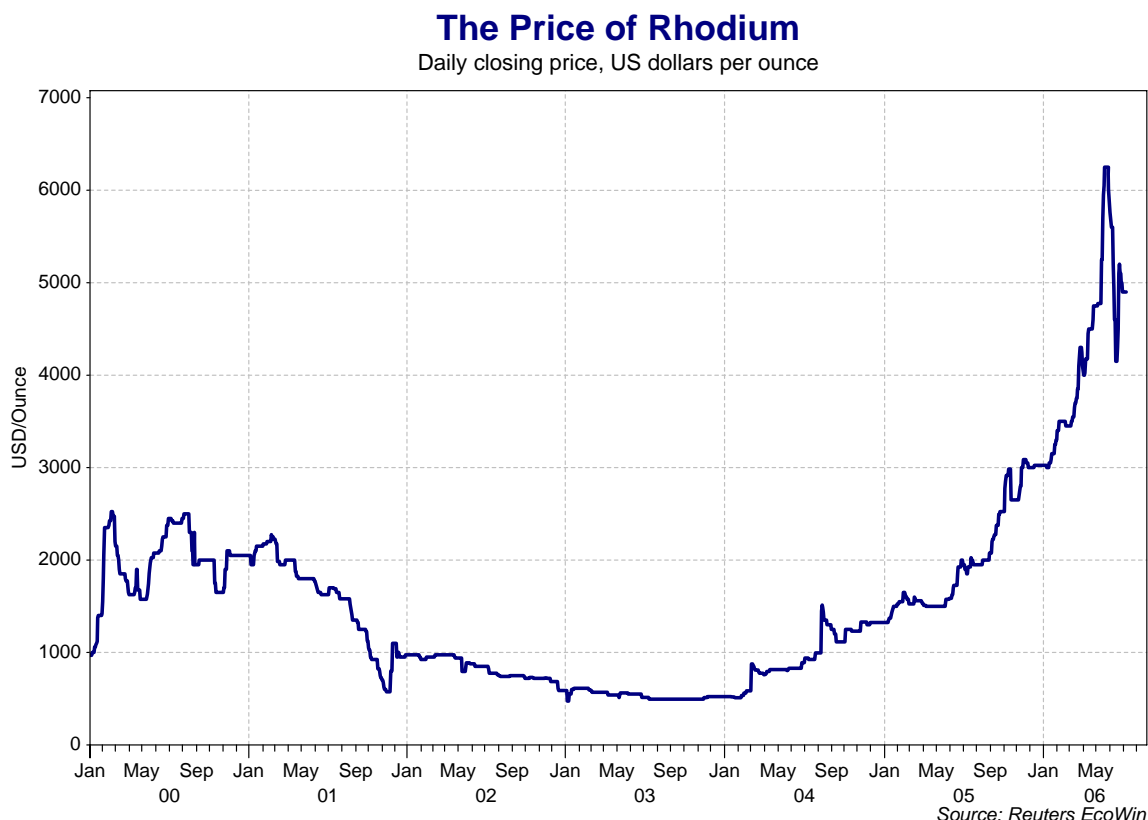
Nonetheless price theory would predict an **increase in demand for scrapped copper** and perhaps a substitution effect away from copper towards aluminium. And in the medium term high prices and **emerging new technologies** may cause an even bigger shift in demand away from copper based products. Plastics provide lower material and installation costs for businesses. And the take off in **wireless technology and fibre optics** will also have an impact.

And higher prices might also be the stimulus required for an expansion of copper ore production as supply responds to the incentives of increased potential revenues and profits. In recent years, copper mining production has fallen short of expectations. But as with any market, if the price is high enough suppliers will eventually respond!

20. The Market for Rhodium

The Market for Rhodium

Something rather exceptional has been happening in the international markets for niche rare metals. Take the little known metal rhodium as an example. As the chart demonstrates, the world price measured in US dollars per ounce has climbed to unprecedented heights during the first half of 2006, indeed by the end of May this year the spot price had reached nearly \$6,300 per ounce, more than seven times the average price at the start of 2004 before falling back from these high levels. Commodity markets around the world have seen super-spikes in prices and they provide economists with a terrific window on what can happen to the prices of commodities when the conditions of demand and supply move in particular directions.



Consumers who have bought a new LCD flat-screen television or a fibre glass yacht will have indirectly contributed to the boom in rhodium prices over the last couple of years. Rhodium is a silvery-white hard **transition metal** and it has a solid claim to be among the world's most expensive precious metals. The primary use of rhodium is as an **alloying agent** for hardening platinum and palladium and these alloys are used in electrodes for items such as aircraft spark plugs, precision optical instruments and in jewellery. Missile technology, LCD television screens and catalytic converters all make use of rhodium as a key component. Purchases worldwide of rhodium expanded by 11 per cent to 812,000 oz in 2005, equalling the previous high recorded in 2000.

On the supply side, South Africa accounts for the majority of the world's rhodium supply, in fact in 2005, the South Africans contributed over 83% of total output. Russia is the second largest producer although its output, subject to the vagaries of political control, tends to be more volatile, production in Russia dipped by ten per cent last year.

The market for rhodium really is small, to put it into perspective, the value of the commodity bought and sold is around a tenth of the size of platinum and palladium. But limited supply and strong market demand means that the world price of rhodium can move in only one direction. Although there has been some speculative element to the recent price surge, the fundamental reasons lie firmly in the changing balance between demand and supply. After several years of surplus with short run supply exceeding demand, the rhodium market moved into heavy deficit in 2005 and in the early months of 2006.

Prices are starting to fall back from their stratospheric highs as speculators take profits, and some car producers start to look at ways of taking rhodium out of the production of catalytic converters. But such changes in production techniques can take years to show through and, for the moment, the world price of one of our scarcest precious metals looks set to remain as hard and durable as the commodity itself.

A simple question of market supply and demand

Rhodium Supply and Demand 000 ounces	2004	2005	% change on the year
Supply			
South Africa	587	627	6.8
Russia	100	90	-10
North America	17	20	15
Others	16	17	6.25
<i>Total Supply</i>	<i>720</i>	<i>754</i>	<i>4.7</i>
Demand			
Auto-industry	618	684	10.7
Chemical	43	47	9.3
Electrical	8	9	12.5
Glass	46	55	19.6
Other	14	17	21.4
<i>Total Demand</i>	<i>729</i>	<i>812</i>	<i>11.4</i>
Supply versus Demand	Supply deficit of 9	Supply deficit of 58	

21. The Market for Coffee

Each day nearly 2.5 billion cups of coffee are consumed. It is the 5th most widely traded commodity in the world and millions of people depend directly or indirectly on the production and sale of coffee for their livelihoods. The global market for coffee is characterised by volatile prices and production levels which impacts directly on the incomes of producers and prices facing consumers.

The World Coffee Market

Experts on the world coffee market often make reference to the “coffee paradox”.

- A **coffee crisis in producing countries** with a trend towards lower prices, declining producer incomes and profits with important consequences for the export revenues of leading coffee exporting countries and the living standards of millions of people in developing nations
- A **coffee ‘boom’ in consuming countries** with rising retail sales and profits for coffee retailers
- A **widening gap** between producer and consumer prices

Coffee production and developing countries

The [World Bank](#) estimates that out of the total 141 developing countries, 95 depend on exports of commodities for at least 50 percent of their total **export earnings**. Coffee is a very good example of such “commodity-dependency” representing, for example, 75% of the total exports of Burundi and 54% in Uganda, and about 22% in the case of Honduras. About 20 to 25 million families produce and sell coffee for their livelihood and most of them are **small-scale farmers** with limited financial resources and scope to diversify out of coffee production.

Globally, **coffee sales** each year exceed \$70 billion, but coffee producing countries only capture \$5 billion of this value, with the bulk of revenues from the coffee trade retained by developed countries. Coffee farmers in producing countries only obtain a fraction of the **final retail price of coffee**. A recent [Oxfam research report](#) showed that Ugandan coffee farmers only get about 2.5 percent of the final retail price of their coffee in the UK market. One strongly positive sign has been the surge in demand for [FairTrade coffee](#) in the UK and other countries. The [FairTrade organisation](#) claimed in July 2006 that one in five cups of filter coffee drunk in the UK are now being supplied from a “fair” source. Sales of Fairtrade coffee in the UK totalled £65.8m on 2005, up from £34.3m in 2003 (5 % of the UK market) although FairTrade coffee sales account for only 0.5% of the global market

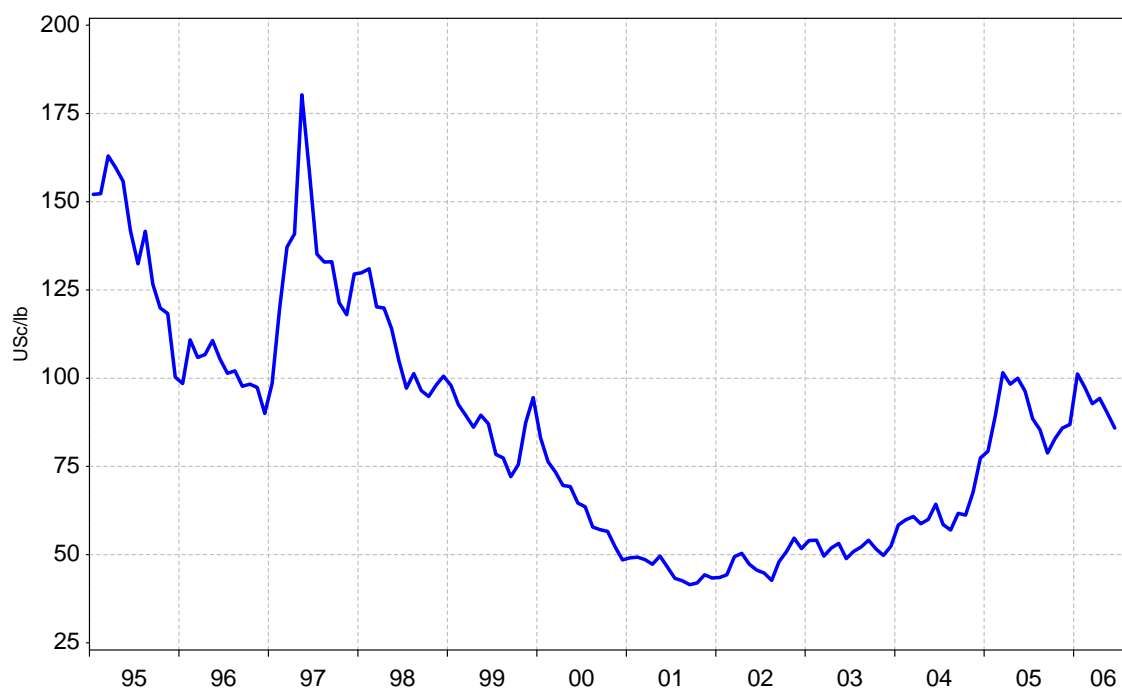
Coffee prices

There have been no price controls in the global coffee trade since 1989, when the **buffer-stock system** run by the [International Coffee Agreement](#) broke down.

The main reason for the decline in prices in the early years of the current decade was a gradual and continuous **increase in coffee production** throughout the world, particularly the new coffee exporting countries entering the international market, a good example being Vietnam. Global coffee production grew faster than demand leading to large surpluses of production. Our chart below shows the average monthly price for coffee in the world markets. The price chart shows a composite price for the different grades of coffee such as Robusta and Arabica beans. From the second half of 1997 through to the trough of prices in 2001, the average price of coffee collapsed from \$180 per lb to less than \$40 per lb. Prices remained very low until 2004 since when there has been some recovery in prices, but they remain well below the levels witnessed in the mid 1990s.

World Coffee Price

Monthly average composite price, US dollars per lb. Source: International Coffee Organisation



Source: Reuters EcoWin

Consumption of coffee and price elasticity of demand

World coffee consumption is estimated at 114.7 million bags in 2005. Domestic consumption in exporting countries in 2005 was just over 30 million bags and in importing countries consumption was estimated at just fewer than 85 million bags. The main buyers of raw coffee beans are the largest multinational buyers, dominated by four firms: Nestlé, Kraft, Procter & Gamble and Sara Lee.



A coffee roasting plant

According to recent [Cecafé](#) estimates, the value of retail sales of **processed coffee** (roasted and soluble) is in the order of US\$35 billion, while the **retail value of coffee** sold by the cup in places such as Costa Coffee and Starbucks (accounting for 20% to 30% of world coffee consumption outside the home) is estimated at over US\$120 billion.

Coffee consumption has been growing at a steady rate of between 1 and 1.5 % per year; a growth rate is well below that for food products as a whole which is closer to 4% per annum. Changes in eating habits and increased demand for alternative drinks to coffee are largely behind this relatively slow growth of global

market demand. Even the sharp fall in coffee prices during 2000 - 2004 seemed to have little impact on world demand, suggesting that coffee has a very low price elasticity of demand.

Employment in coffee producing countries

Coffee production employs a labour force estimated at around 25 million families by the ICO and accounts for more than 50% of export earnings in many countries, an increase in consumption favouring a gradual rise in world prices would be a positive factor for economic growth and increased per capita incomes in these countries. In Brazil alone more than a million jobs are generated by the coffee industry.

The International Coffee Organisation (ICO)

The [International Coffee Organization](#) (ICO) is the main intergovernmental organization for coffee, bringing together 74 producing and consuming countries to tackle the challenges facing the world coffee sector through international cooperation. It makes a practical contribution to the world coffee economy and to improving standards of living in developing countries by helping to increase world coffee consumption through innovative market development activities and improving coffee quality through the Coffee Quality-Improvement Programme.

Leading coffee producers and exporters in 2005

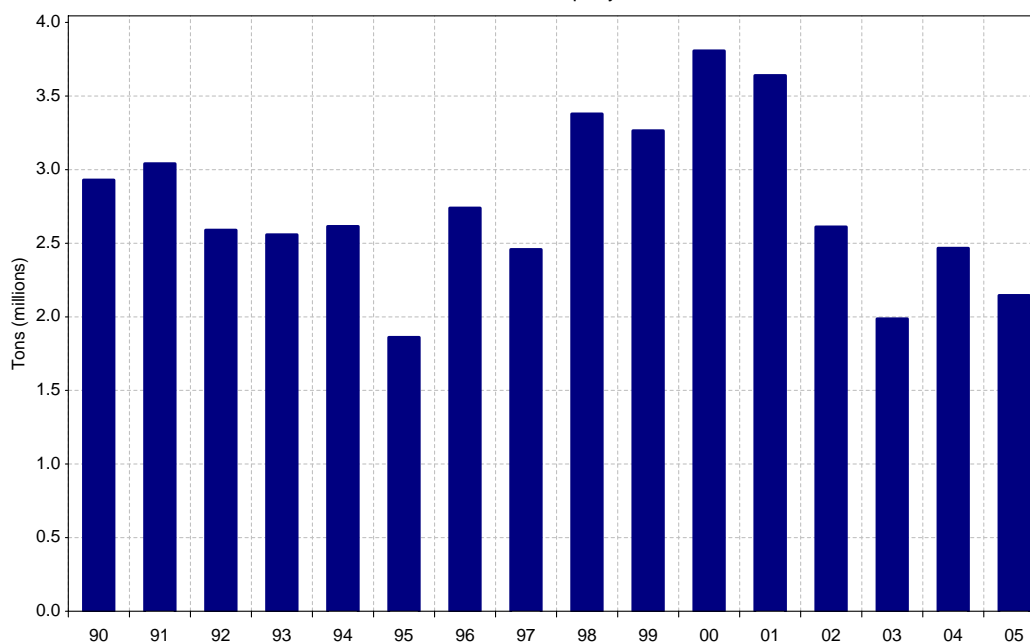
The main coffee producers and exporters are shown in the table below. The data comes from the annual reports on the world coffee industry produced by the International Coffee Organisation. Brazil is far and away the biggest supplier of coffee beans in the global economy although nations such as Vietnam, India and Mexico have been gaining ground in recent years.

Production of 60kg bags per year	2004	2005	% change 2004-05
Brazil	39272000	32944000	-16
Colombia	11405000	11550000	1
Vietnam	13844000	11000000	-21
Indonesia	7386000	6750000	-9
India	3844000	4630000	20
Ethiopia	5000000	4500000	-10
Mexico	3407000	4200000	23
Guatemala	3703000	3675000	-1
Honduras	2575000	2990000	16
Peru	3355000	2750000	-18
Uganda	2750000	2750000	0
Cote d'Ivoire	1750000	2500000	43
Costa Rica	1720000	2157404	25
Nicaragua	1127000	1400000	24
El Salvador	1447000	1371700	-5
Papua New Guinea	1002000	1232000	23
Kenya	709000	1002000	41
Cameroon	727000	1000000	38

Brazil is effectively the "swing producer" for the global coffee markets, in other words, since Brazil is the largest coffee producer, changes in Brazil's supplies of coffee account for a large portion of the change in the world total supplies of coffee which then directly affects the prevailing international price. Brazilian coffee production peaked at 3.75 million tons in the year 2000 but fell into a steep recession from 2001 onwards as producers cut back supply in the wake of the collapse in coffee prices. Supply has stabilised in 2004 and 2005 with prices recovering ground.

Coffee production in Brazil

Million tons per year

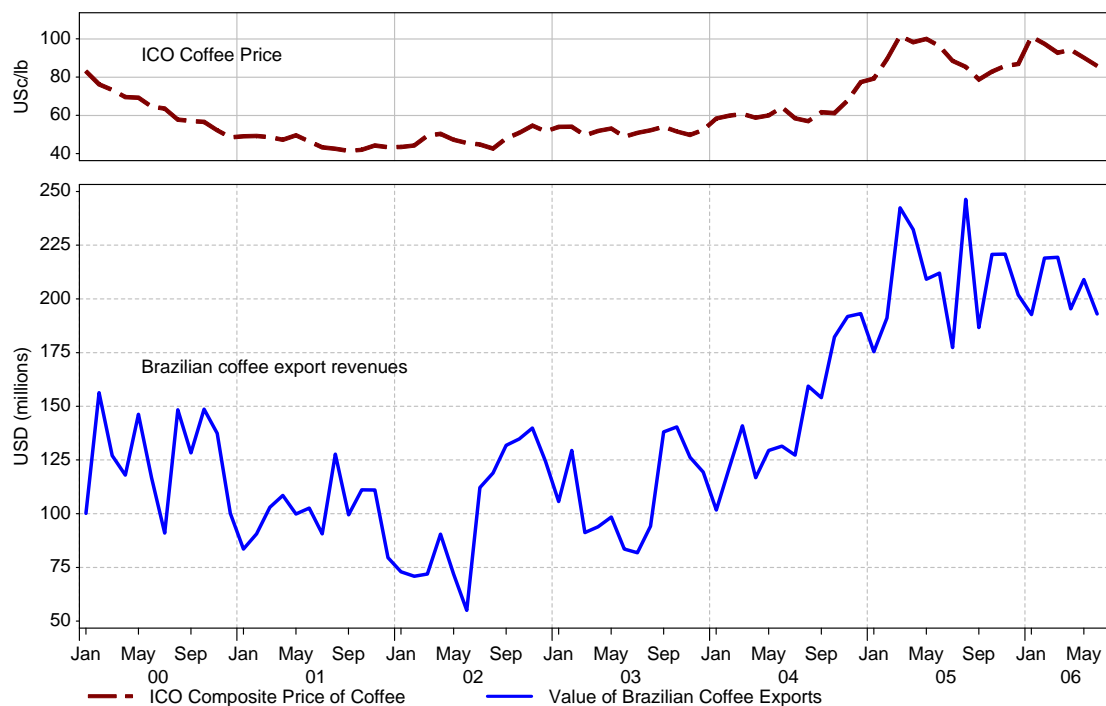


Source: Reuters EcoWin

As we can see there is a direct relationship between the current world price and the value of exports of coffee from nations such as Brazil. Factors such as changes in the exchange rate can influence the income that coffee exporting countries will generate from their overseas sales. But for Brazil, the recovery in prices since 2004 has been important in boosting for their export incomes.

Coffee Prices and the value of Exports of Brazilian Coffee

Monthly exports, \$ millions



Source: Reuters EcoWin