

Chapter 6

Evaluating perfect competition and monopoly

Evaluation is the most demanding of the four skills tested in the Unit 3 and 4 examinations. Evaluation is tested when answering part (c) of your chosen question in the exam paper, and part (b) of the essay questions. In the context of perfect competition and monopoly, Unit 3 essay questions are likely to ask: which is the best market structure? To answer this question you need to be able to apply efficiency and welfare criteria. This chapter explains how.

Learning outcomes

This chapter will:

- explain the meaning of economic efficiency and of efficiency concepts such as allocative efficiency and dynamic efficiency
- ask whether perfect competition is more efficient than monopoly
- introduce two welfare criteria: consumer surplus and producer surplus
- use these criteria to evaluate perfect competition and monopoly

What you should already know

Monopoly, but not perfect competition, is introduced in Unit 1. This means that, although you should be able to evaluate one weakness and one strength of monopoly, you cannot at this point in the course do the same for perfect competition.

Although the idea of improving economic welfare is in the Unit 1 specification, welfare concepts such as consumer surplus and producer surplus are not in the AS specification.

How do economists evaluate perfect competition and monopoly?

Economists use two sets of concepts to answer questions such as: is perfect competition preferable to monopoly? First, they apply efficiency concepts, such as productive efficiency, X-efficiency, allocative efficiency, and static and dynamic efficiency. Second, they ask how perfect competition and monopoly affect the consumer surplus and producer surplus that households and firms respectively enjoy, and hence the effect on general economic welfare.

Examiner's voice

You must learn to evaluate in order to display the skills needed to achieve an A grade.

Examiner's voice

Economic efficiency is a key concept that can be used in the analysis of a wide range of economic topics, for example taxation and market failures.

Economic efficiency

I have already stated several times in previous chapters that a fundamental purpose of any economic system is to achieve the highest possible state of human happiness or welfare. Within a market economy, perfect competition and monopoly must ultimately be judged on the extent to which they contribute to improving human wellbeing, while remembering of course, that perfect competition is an abstract and unreal market structure.

Key term

Economic efficiency, in general terms, minimises costs incurred, with minimum undesired side effects.

In order to judge the contribution of a market structure to human welfare, we must first assess the extent to which the market structure is efficient or inefficient. In terms of private self interest, any decision made by an individual, a firm or by a government is economically efficient if it achieves the economic agent's desired objective at minimum cost to the agent itself, and with minimum undesired side effects. However, in terms of the whole community, the social costs incurred and the social benefits received need also to be considered.

Before discussing the extent to which perfect competition and monopoly can be considered efficient or inefficient, below are some of the meanings economists attach to the word efficiency.

Technical efficiency

A production process is technically efficient if it maximises the output produced from the available inputs or factors of production. Alternatively, we may say, that at any level of output, production is technically efficient if it minimises the inputs of capital and labour needed to produce that level of output.

Key term

Technical efficiency maximises output from the available inputs.

Productive efficiency or cost efficiency

To achieve **productive efficiency**, a firm must use the techniques and factors of production which are available, at lowest possible cost per unit of output. In the short run, the lowest point on the relevant short-run average total cost curve locates the most productively efficient level of output for the particular scale of operation. Short-run productive efficiency is shown in Figure 6.1.

However, *true* productive efficiency is a long-run rather than a short-run concept. A firm's long-run average cost curve shows the lowest unit cost of producing different levels of output at all the different possible scales of production. The most productively-efficient of all the levels of output occurs at the lowest point on the firm's *long-run* average cost curve. This is shown at output Q_N in Figure 6.2. Output Q_1 is also productively efficient, but only for the short-run cost curve $SRATC_1$.

Key term

Productive efficiency involves minimising the average costs of production.

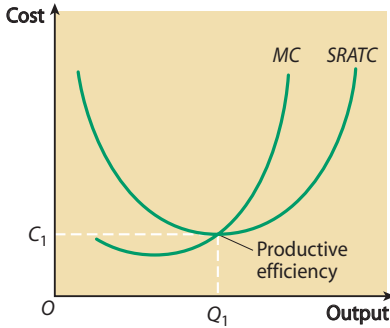


Figure 6.1 Productive efficiency in the short run

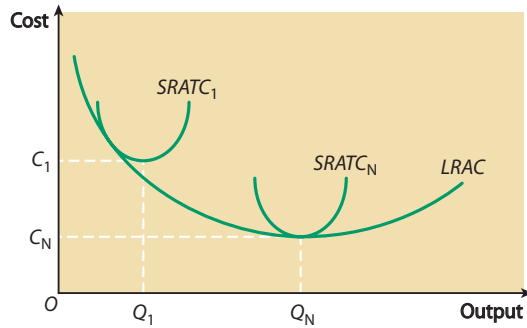


Figure 6.2 Short-run and long-run productive efficiency

Figure 6.3 illustrates another application of the concept of productive efficiency which you came across at AS. All points such as A and B on the production possibility frontier drawn for the whole economy are productively (and also technically) efficient. When the economy is on its production possibility frontier, it is only possible to increase output of capital goods by reducing output of consumer goods (and vice versa). By contrast, a point such as C inside the frontier is productively and technically inefficient. Output of capital goods could be increased by using inputs in a technically more efficient way, without reducing output of consumer goods.

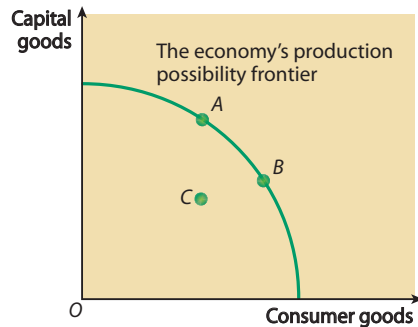


Figure 6.3 Productive and technical efficiency illustrated on a production possibility frontier

X-efficiency

In the 1960s, the American economist Liebenstein argued that, due to organisational slack resulting from the absence of competitive pressures, monopolies are always likely to be technically and productively inefficient. This happens at all levels of output. Liebenstein introduced the term X-inefficiency to explain organisational slack.

Consider the short-run average total cost curve illustrated in Figure 6.4, which shows the lowest possible unit costs of producing various levels of output, given such conditions of production as the scale of the firm's fixed capacity and the prices of the factors of production used to produce the good. According to the cost curve, it is impossible for the firm to produce output Q_1 at a level of unit costs or average costs below C_1 e.g. at a point such as A, cannot be reached, unless of course the cost curve shifts downward over time. Conversely, if factors of production are combined in a technically inefficient way, unit costs greater than C_1 would be incurred when producing output Q_1 . In this case, the firm would be producing off its cost curve, at a point such as X, at which average costs are C_3 rather than C_1 . Point X, and indeed any point above the cost curve, is said to be X-inefficient. All points on the cost curve (including the productively-efficient point where unit cost is lowest) are X-efficient. X-inefficiency occurs whenever, for the level of output it is producing, the firm incurs unnecessary production costs i.e. if the firm wished, it could reduce its costs.

There are two main causes of X-inefficiency. First, a firm may simply be technically inefficient, for example, employing too many workers (over-manning) or investing in machines it never uses. Second, X-inefficiency can be caused by the firm paying its workers or managers unnecessarily high wages or salaries, or by buying raw materials or capital at unnecessarily high prices. X-efficiency requires that the lowest possible prices are paid for inputs or factors of production.

Allocative efficiency

This rather abstract concept is of great importance to the understanding of economic efficiency. **Allocative efficiency** occurs when $P = MC$ in all industries and

Key term

Productive efficiency for the economy as a whole can also be defined in terms of producing on the economy's production possibility frontier.

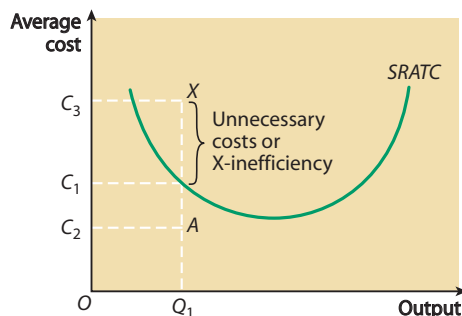


Figure 6.4 X-inefficiency occurring when a firm incurs unnecessary costs

Examiner's voice

While X-efficiency is not in the AQA specification, it is an extremely useful concept to apply when analysing and evaluating market structures.

Key term

Allocative efficiency occurs when it is impossible to improve overall economic welfare by reallocating resources between industries or markets (assuming an initial distribution of income and wealth). For resource allocation in the whole economy to be allocatively efficient, price must equal marginal cost in each and every market in the economy.

markets in the economy. To explain this further, we must examine closely both P and MC . The price of a good, P , is a measure of the value in consumption placed by buyers on the last unit consumed. P indicates the utility or welfare obtained at the margin in consumption. This is the good's opportunity cost in consumption. For example, a consumer spending £1 on a bar of chocolate cannot spend the pound on other goods. At the same time, MC measures the good's opportunity cost in production; i.e. the value of the resources which go into the production of the last unit, in their best alternative uses.

Suppose that all the economy's markets divide into two categories: those in which $P > MC$ and those in which $P < MC$. In the markets where $P > MC$, households pay a price for the last unit consumed, which is greater than the cost of producing the last unit of the good. The high price discourages consumption, so we conclude that at this price the good is under-produced and under-consumed. Conversely, in the second set of markets in which $P < MC$, the value (P) placed on the last unit consumed by households is less than the MC of the resources used to produce the last unit. The price is too low, encouraging too much consumption of the good; thus at this price the good is over-produced and over-consumed.

Suppose resources can be taken from the second group of markets where $P < MC$ and re-allocated to the former group of markets in which $P > MC$. Arguably, total consumer welfare or utility will increase as re-allocation of resources takes place. As the re-allocation proceeds, prices tend to fall in those markets *into which* resources are being shifted and prices tend to increase in the markets *from which* resources are being moved. Eventually, as prices adjust, P equals MC in all markets simultaneously. Beyond the point at which $P = MC$ in all markets, no further re-allocation of resources between markets can improve consumer welfare (assuming of course that all the other factors which influence welfare such as the distribution of income, remain unchanged). The outcome in which $P = MC$ in all markets is allocatively efficient.

In summary, allocative inefficiency occurs when $P > MC$ or $P < MC$. For any given employment of resources and any initial distribution of income and wealth amongst the population, total consumer welfare can increase if resources are re-allocated from markets where $P < MC$ into those where $P > MC$, until allocative efficiency is achieved when $P = MC$ in all markets.

Box 6.1 Microsoft's pricing policy, allocative efficiency and resource allocation

Economists often judge the monopoly power of a firm by the extent to which the price of the product is above marginal cost. The greater the gap between the marginal cost of production and the price, they argue, the greater the monopoly power. They also argue that when prices exceed marginal costs, economic inefficiency and resource misallocation occur.

It can readily be conceded that the price of Windows, whether \$40 or \$89, is substantially above the marginal cost of producing an extra copy of Windows, and that this makes Microsoft's operating system very profitable. The marginal cost of producing and supplying one extra copy of Windows is very close to zero, but the price charged must be higher so that Microsoft can recover the very significant development cost of Windows. Much of the price of a copy of Windows is unrelated to the marginal cost of

producing an extra copy. But the price is still substantially below the price Microsoft could and would charge if it had the vast monopoly power the US Justice Department has claimed Microsoft possesses.

From *Trust on Trial* by Richard McKenzie, 2001



Microsoft's Redmond campus

Follow-up questions

- 1 Explain the meaning of marginal cost.
- 2 Explain the statement: 'Much of the price of a copy of Windows is unrelated to the marginal cost of producing an extra copy'.

Dynamic efficiency

All the forms of efficiency so far considered are examples of **static efficiency**, i.e. efficiency measured at a particular point in time. By contrast, **dynamic efficiency** measures improvements in technical and productive efficiency that occur over time. Improvements in dynamic efficiency result from the introduction of better methods of producing existing products, including firms' ability to benefit to a greater extent from economies of scale and also from developing and marketing completely new products. In both cases, invention, innovation and research and development (R&D) improve dynamic efficiency. (**Invention** refers to advancements in pure science, whereas **innovation** is the application of scientific developments to production.)

Key terms

Static efficiency measures technical, productive, X and allocative efficiency at a particular point in time.

Dynamic efficiency measures the extent to which various forms of static efficiency improve over time.

Perfect competition and economic efficiency

Figure 6.5 shows the long-run equilibrium of a perfectly competitive firm. The diagram clearly shows that a perfectly competitive firm achieves both productive and allocative efficiency in the long run, provided there are no economies of scale. The firm is productively efficient because it produces the optimum output at the lowest point on the *ATC* curve, and it is allocatively efficient because $P = MC$. (Strictly, I should qualify this conclusion by stating that the firm is allocatively efficient only if all markets in the economy are perfectly competitive and in long-run equilibrium, which means that every firm in every market is producing where $P = MC$.)

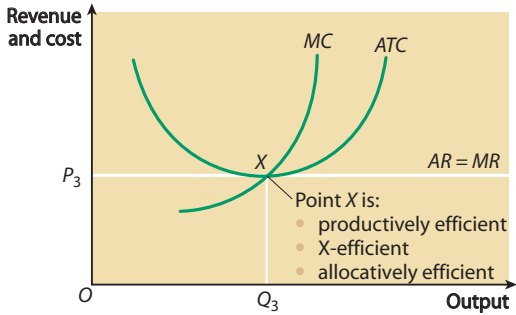


Figure 6.5 In the long run a perfectly competitive firm is productively, allocatively and X-efficient

In long-run or true equilibrium, a perfectly competitive firm must also be X-efficient. The reason is simple. If the firm is X-inefficient, producing at a level of unit costs above its *ATC* curve, the firm could not make normal profits in the long-run. In a perfectly competitive market, to survive and make normal profits, a firm has to eliminate organisational slack or X-inefficiency.

Monopoly and economic efficiency

In contrast to perfect competition – and once again assuming an absence of economies of scale – monopoly equilibrium is both productively and allocatively inefficient. Figure 6.6 shows that at the profit-maximising level of output Q_1 , the monopolist's average costs are above the minimum level and that $P > MC$. Thus, compared to perfect competition, a monopoly produces too low an output which it sells at too high a price.

The absence of competitive pressures, which in perfect competition serve to eliminate supernormal profit, mean that a monopoly is also likely to be X-inefficient, incurring average costs at a point such as X which is above the average cost curve. A monopoly may be able to survive, perfectly happily and enjoying an 'easy life', incurring unnecessary production costs and making satisfactory rather than maximum profits. This is because **barriers to entry** protect monopolies. As a result, the absence or weakness of competitive forces means there is no mechanism in monopoly to eliminate organisational slack.

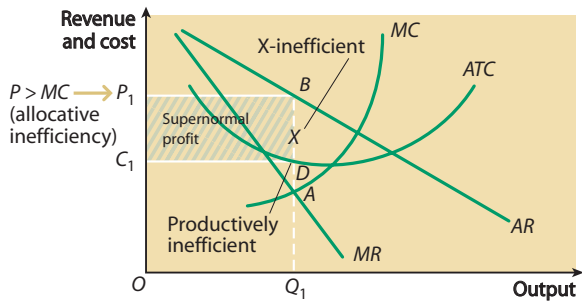


Figure 6.6 A monopoly is productively and allocatively inefficient, and it is likely to be X-inefficient

Natural monopoly and economies of scale

On the basis of the above analysis, it seems we can conclude that perfect competition is both productively and allocatively efficient whereas monopoly is neither. Monopoly is also likely to be X-inefficient. However, the conclusion that perfect competition is productively more efficient than monopoly depends on an assumption that there are no economies of scale. When substantial economies of scale are possible in an industry, monopoly may be more productively efficient than competition.

Figure 6.7 illustrates a natural monopoly where, because of limited market size, there is insufficient room in the market for more than one firm benefiting from full economies of scale. The monopoly may of course be producing above the lowest point on short-run average cost curve $SRATC_N$, hence exhibiting a degree of productive inefficiency. However *all* points on $SRATC_N$ incur lower unit costs – and are productively *more* efficient – than any point on $SRATC_1$, which is the relevant cost curve for each firm if the monopoly is broken into a number of smaller competitive enterprises.

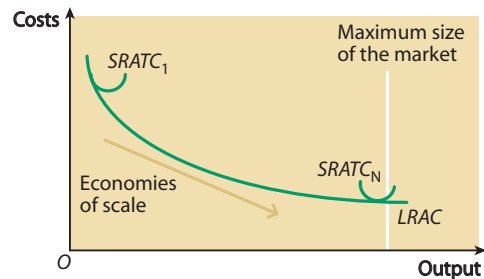


Figure 6.7 The justification of monopoly when economies of scale are possible

Dynamic efficiency in monopoly

Under certain circumstances, monopolies may also be more *dynamically efficient* than a perfectly competitive firm. Protected by entry barriers, a monopoly earns monopoly profit without facing the threat that the profit disappears when new firms enter the market. This allows an innovating monopoly to enjoy, in the form of monopoly profit, the fruits of successful R&D and product development. By contrast, in perfect competition, there is little or no incentive to innovate because other firms can free-ride and gain costless access to the results of any successful research. This argument justifies patent legislation, which grants a firm the right to exploit the monopoly position created by innovation for a number of years before the patent expires.

However, there is a counter-argument that monopoly reduces rather than promotes innovation and dynamic efficiency. Protected from competitive pressures, as I have noted, a monopoly may *profit-satisfice* rather than *profit-maximise*, content with satisfactory profits and an easy life.

Evaluating perfect competition and monopoly in terms of economic welfare

In order to analyse how market structures affect economic welfare, I must first explain the concepts of **consumer surplus** and **producer surplus**. These are both measures of **economic welfare**, as their names imply respectively for consumers and firms. Both are illustrated in Figure 6.8.

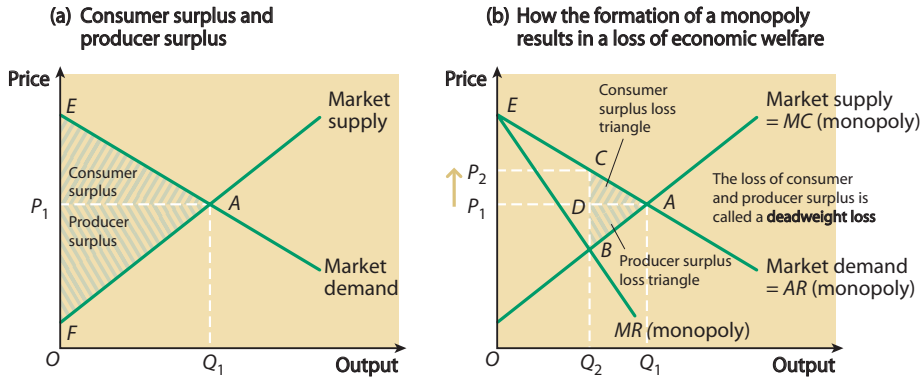


Figure 6.8 How monopoly reduces economic welfare

Consumer surplus is the difference between the *maximum price* a consumer is prepared to pay and the *actual price* he or she need pay. In a competitive market such as Figure 6.8 (a), the total consumer surplus enjoyed by all the consumers in the market is measured by the triangular area P_1EA . Consumer welfare increases whenever consumer surplus increases, for example when market prices fall. Conversely, however, higher prices reduce consumer surplus and welfare.

examiner's voice

It is important to understand consumer surplus and producer surplus in order to analyse how economic welfare may be affected by events that raise or lower the price of a good. The next chapter and Chapter 20 apply the concepts in the analysis of price discrimination, free trade and the effect of tariffs.

Key terms

Consumer surplus is a measure of the economic welfare enjoyed by consumers: surplus utility received over and above the price paid for a good.

Producer surplus is a measure of the economic welfare enjoyed by firms or producers: the difference between the price a firm succeeds in charging and the minimum price it would be prepared to accept.

Economic welfare is human happiness or utility.

Producer surplus, which is a measure of producers' welfare, is the difference between the *minimum price* a firm is prepared to charge for a good and the *actual price* charged. In Figure 6.8 (a), the producer surplus enjoyed by all the firms in the market is measured by the triangular area FP_1A .

Figure 6.8 (b) illustrates what happens to economic welfare when monopoly replaces perfect competition (again, assuming there are no economies of scale). Market equilibrium in perfect competition is determined at point A; output is Q_1 and price is P_1 . However, monopoly equilibrium is determined at point B where $MR = MC$. (Note that the marginal cost curve in monopoly is the same curve as market supply in perfect competition.) The diagram illustrates the standard case against monopoly, namely that compared to perfect competition, monopoly restricts output (to Q_2) and raises price (to P_2).

But I can take the analysis one stage further and investigate how consumer surplus and producer surplus (and hence economic welfare) are affected. If a monopoly raises the price from P_1 to P_2 it gains the consumer surplus equal to the rectangular area $P_1 P_2 CD$. This means that producer surplus (in the form of monopoly profit) increases at the expense of consumer surplus. Over and above this transfer however, there is a net loss of economic welfare caused by the fact that the amount bought and sold falls to Q_2 . The welfare loss or **deadweight loss** is shown by the two shaded triangular areas in Figure 6.8 (b), which respectively depict the loss of consumer surplus (the top triangle) and the loss of producer surplus (the bottom triangle).

Consumer sovereignty and producer sovereignty

Arguably, perfect competition has the advantage of promoting **consumer sovereignty**, in the sense that the goods and services produced are those that consumers have voted for when spending the pounds in their pockets. When consumer sovereignty exists, the 'consumer is king'. (However, the extent to which consumer choice exists in a perfectly competitive world would be extremely limited. All the firms in a particular market would sell identical goods at an identical price, namely the ruling market price.) Firms and industries that produce goods other than those for which consumers are prepared to pay, do not survive in perfect competition.

By contrast, a monopoly may enjoy **producer sovereignty**. The goods and services available for consumers to buy are determined by the monopolist rather than by consumer preferences expressed in the market place. Even if producer sovereignty is not exercised on a 'take-it-or-leave-it basis' by a monopoly, the monopolist may still possess sufficient market power to manipulate consumer wants through such marketing devices as persuasive advertising. In these situations, the 'producer is king'.

Why firms like to become monopolies

Economists generally regard perfect competition as more desirable than monopoly. However, the desirable properties of perfect competition (namely economic efficiency, welfare maximisation and consumer sovereignty) do not result from any assumption that businessmen or entrepreneurs in competitive industries are more highly motivated or public-spirited than monopolists. Economic theory assumes that everyone is motivated by self-interest and by self-interest alone. This applies just as much to firms in competitive markets as it does to monopolies. Entrepreneurs in competitive industries would very much like to become monopolists, both to gain an easier life and also to make bigger profits. Indeed, from a firm's point of view, successful competition means eliminating competition and becoming a monopoly. But in perfect markets, market forces (Adam Smith referred to the *invisible hand* of the market) and the absence of barriers to entry and exit, prevent this happening.

Imagine for example, a situation in which a firm in a perfectly competitive industry makes a technical break through which reduces production costs. For a short time

the firm can make supernormal profits. But because in perfect competition, perfect market information is available to all firms, other firms within the market and new entrants attracted to the market can also enjoy the lower production costs. A new long-run equilibrium will soon be brought about – at the lower level of costs resulting from the breakthrough – with all firms once again making normal profits only.

Ultimately of course, consumers benefit from lower prices brought about by technical progress and the forces of competition, but it is market forces, and not some socially-benign motive or public spirit assumed on the part of entrepreneurs, that accounts for the optimality of perfect competition as a market structure.

How competitive is perfect competition?

Although perfect competition is an abstract and unreal market structure, it is interesting to consider the forms competition might take in a perfectly competitive market economy. The first point to note is that price competition, in the form of price wars or price-cutting by individual firms, would not take place. In perfect competition, all firms are passive price-takers, able to sell all the output they produce at the ruling market price determined in the market as a whole. In this situation, firms cannot gain sales or market share by price cutting. Other forms of competition, involving the use of advertising, packaging, brand-imaging or the provision of after-sales service to differentiate a firm's product from those of its competitors simply destroy the conditions of perfect competition. These are the forms of competition which are prevalent, together with price competition, in the imperfectly competitive markets of the real economy in which we live.

So the only form of competition, both available to firms and also compatible with maintaining the conditions of perfect competition, is cost-cutting competition. Cost-cutting competition is likely in perfect competition because each firm has an incentive to reduce costs in order to make supernormal profit. But even the existence of cost-cutting competition in a perfect market can be questioned. Why should firms finance research into cost-cutting technical progress when they know that other firms have instant access to all market information and that any supernormal profits resulting from successful cost-cutting can only be temporary?

Think also of the nature of competition in a perfect market, from the perspective of a typical consumer. The choice is simultaneously very broad and very narrow. The consumer has the doubtful luxury of maximum choice in terms of the number of firms or suppliers from whom to purchase a product. Yet each firm is supplying an identical good or service at exactly the same price. In this sense, there is no choice at all in perfect competition.

Summary

- Economists evaluate perfect competition and monopoly using efficiency and welfare criteria.
- The main efficiency concepts are technical efficiency, productive efficiency, X-efficiency, allocative efficiency and static and dynamic efficiency.

- Providing we ignore dynamic efficiency considerations, perfect competition wins over monopoly in terms of being productively and allocatively efficient, and also X-efficient.
 - However, monopoly can be justified by dynamic considerations, particularly through its ability to reduce prices over time as a result of benefiting from economies of scale and innovation in new products and methods of production.
 - By restricting output and raising prices, monopolies transfer consumer surplus to producer surplus, and also trigger a net welfare loss.
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Questions

- 1 Briefly explain the main types of economic efficiency.
 - 2 Is perfect competition efficient?
 - 3 Is monopoly efficient?
 - 4 How do economies of scale affect productive efficiency?
 - 5 How does monopoly affect consumer surplus?
 - 6 Is monopoly necessarily more dynamically efficient than perfect competition?
-