

# Market Failures, Equity and Government

*The important thing for Government is not to do things which individuals are doing already, and to do a little better or worse; but to do those things which at present are not done at all.*

Maynard Keynes, *The End of Laissez-Faire*

Public Goods ♦ Externalities ♦ Imperfect Competition ♦ Information Failures ♦ Other Market Failures ♦ Equity Issues ♦ Government Functions ♦ Government Instruments

In Chapter 1, we saw that government has four main economic functions. These are establishing a legal infrastructure that enables markets to work, resource allocation functions when there are market failures, provision of social welfare including a fair distribution of income, and macroeconomic management.

As we have seen, an efficient market economy requires a complete set of competitive markets and fully informed buyers and sellers. However, markets may not exist or be incomplete or uncompetitive and economic agents may be imperfectly informed. And there are numerous reasons why markets may not produce equitable, or socially acceptable, income or welfare outcomes.

In this chapter, we discuss the four major forms of market failure: public goods, externalities, imperfect competition and information failures. We also discuss the role of government in providing equity and social welfare. Finally, we bring this together by discuss the main functions of government that arise from the analysis of market failures and equity. We also describe the main instruments available to government to carry out these functions.

## Public Goods

In economics, the term “public good” is a technical term. It refers to a good which is **non-excludable** or **non-rival**, or in some cases both non-excludable and non-rival. When these attributes occur, there is market failure. Markets are unlikely to produce an efficient amount of the good. Hence, government has a responsibility to ensure that an efficient amount is produced. This good may then be produced by the public or private sector. Also, the term ‘public good’ does not describe all goods supplied by government. For welfare reasons, government supplies many goods that provide only private benefits to the recipients, for example some health care services.

A good is **non-excludable** if individuals or firms cannot be excluded from consuming it or, more broadly, cannot be excluded from obtaining any benefit from it. National defence and

---

### A public good

A good that is non-excludable or non-rival in consumption

---

Table 4.1 Public and private goods

	<i>Exclusion not feasible (or is costly)</i>	<i>Exclusion feasible</i>
Consumption non-rival	National defence Law and order services Basic financial services Benefits of basic education Public health services Urban planning and design services	Some economic infrastructure services, such as national highways and ports Fire protection Outputs of research and development Cable TV broadcasts Parks and beaches (until congested)
Consumption rival	Crowded urban roads	Food and clothing Seats at football matches Heart bypass operations

provision of internal security are classic non-excludable public goods. Education may also be viewed as a public good (as well as a private one) because firms and society more generally benefit from the supply of more educated workers although they do not receive the educational services directly. Non-excludability occurs when the supplier cannot charge for a good or benefit. Note that these benefits imply significant positive externalities. A positive externality occurs when an external party to the market transaction benefits from an economic activity but does not pay for it. When the scale of the positive externality is large, economists generally describe the good as a public good.

Competitive markets provide goods efficiently when firms can identify the individuals who benefit from the goods they provide and can charge for consumption of the goods. When consumption is non-excludable, individuals can receive the benefits of the good without paying for it. This is known as **free riding**. A free rider is a person or firm that benefits from a public good but does not contribute to its provision. In such cases, firms cannot receive full or sometimes any payment for the goods provided and *so will under-supply the goods*.

A good is described as **non-rival** when someone's consumption of a good does not prevent someone else from consuming the same good, for example listening to a broadcast weather report. The additional use in this case has zero marginal cost. When consumption of a good is non-rival, the efficient charge is the marginal cost of use, which may be low or even zero. However, if the good is excludable, firms may charge above marginal cost and *there will be under-consumption of the good*.

Public goods are most commonly goods that provide collective benefits to large numbers of people or firms rather than private benefits to individual consumers. As well as national defence, internal security and education, examples include surveying services as the basis for property rights, regulation of the financial system, flood management, public health services, waste collection services (garbage and wastewater) and various forms of economic infrastructure.

Table 4.1 shows examples of public and private goods, classified by their excludability and rivalness characteristics. Note that these are guides, not precise concepts. Excludability depends on technology and can often be achieved at a cost. For example, electronic sensors can be used to collect tolls for most roads. The consumption of some goods, such as roads or parks, is non-rival when demand is low but rival when use and congestion increase.

## Externalities

An **externality** occurs when a cost or benefit arises from an activity that does not accrue to the firm or person carrying on the activity. These effects typically occur because of a lack of enforceable property rights. External impacts may be positive or negative.

When the external impact is positive and widespread, the activity generating it may be viewed as a public good. But smaller positive externalities are not generally classed as public

### Free riding

Consuming a good without contributing to it

### Externality

An impact on an individual or business not associated with carrying on the activity that causes the impact

goods. For example, a household's purchase of waste services or a farmer's property improvements may benefit neighbouring households or properties respectively. However, when the agency creating the positive externality cannot charge for it, the improvements may not be made. More generally, markets tend to under-supply goods with positive externalities.

A negative externality occurs when an activity has an adverse impact on a third party. Examples are industrial air or water pollution, disposal of waste in public places, and traffic congestion. Negative externalities are common and of special concern. In the absence of government regulations of one or another kind, agents have no incentive to prevent negative externalities. Rather, a firm may save expenses while causing a negative externality, as when it discharges untreated wastes. This markets over-supply goods with negative externalities.

Note, however, an important distinction between physical and pecuniary externalities. **Physical externalities** affect the production of firms or the welfare of individuals and are not transmitted by market prices. Such externalities usually involve inefficient use of resources.

On the other hand, **pecuniary externalities** are transmitted through changes in prices. Any change in demand or supply may alter prices and the welfare of a third party. For example, a natural gas discovery may reduce the demand for coal and consequently reduce prices and wages in the coal industry. When prices change, for every loss there is an offsetting gain. Price changes have distributional effects and may be a major social or political concern. But they are not in themselves an inefficient use of resources.

**Effects of negative externalities.** A negative externality implies that the total cost of an activity exceeds the private cost. Consider production of electricity from a coal-fired generator that emits carbon dioxides that cause global warming and sulphur dioxides that harm health. Figure 4.1 shows demand and supply for electricity for a firm in a competitive market. In this market, the price is given and the demand curve for each firm is horizontal. There are two cost schedules. Schedule  $S_P$  is the marginal private cost curve, which shows the firm's marginal cost as a function of output. Given the market price  $P_M$ , a profit-maximising firm will produce  $Q_M$  units of electricity. Schedule  $S_S$  is the marginal social cost curve, which includes the marginal damage costs of the negative externalities (which are assumed here to rise with output). Output is efficient when the benefit of a marginal unit of power equals the marginal social cost. Thus,  $Q_E$  is the efficient level of output. The firm, which ignores the damage costs produces excessive quantities of electricity and air pollution.

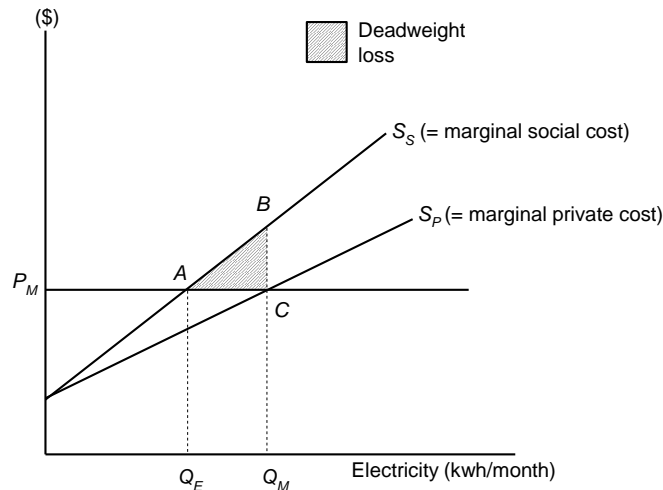


Figure 4.1 Inefficiency with negative externality in a competitive market

The measure of economic inefficiency is known as the **deadweight loss (DWL)**. This is a loss for which there is no offsetting benefit. Identifying and quantifying DWLs due to inefficient use of resources is fundamental to economic analysis. The DWL in this case is the excess of social marginal cost over marginal benefit, i.e. the shaded area *ABC* in Figure 4.1.

In general, because a firm producing a negative externality does not bear the cost, it has no incentive to reduce the damage. Consequently, the product mix is inefficient because the marginal rate at which firms can transform one good into another is inconsistent with the marginal rate at which consumers wish to exchange one good for another. Therefore, the conditions for the First Welfare Theorem are not met. As shown in Figure 4.1, some external cost may be consistent with economic efficiency (at output of  $Q_E$ ). However, unregulated markets generally produce too many goods that cause external damage and deadweight losses.

---

**Deadweight loss**  
A loss for which there is no offsetting benefit

---

## Common property resources

Common property resources are another source of inefficient resource use with externality features. **Common property resources** are resources that are open for free use to all. Examples include local public commons, air and water, some fossil fuel deposits and animal resources such as wildlife and fisheries. Many environmental goods are essentially common property resources. Because use of the common property resource is free and does not reflect the (rival) value of the resource to other users, the resource is likely to be over-utilised.

A classic example is overgrazing of the village commons (Hardin, 1968). When land is plentiful a herder can graze all his or her sheep on it without affecting the productivity of the land for other herders. As the number of sheep on the land increases, the amount of grass per sheep declines and the fertility of the land declines. Each extra sheep on the commons reduces the value of the commons to other herders. Collectively the herders would gain by maintaining the sheep flock at an efficient size, where the marginal benefit of an extra sheep on the commons equals the marginal social cost. But herders do not pay the marginal damage cost of grazing extra sheep and have no incentive to reduce their flock on the commons because the benefits would accrue to other herders. Thus, the commons are overgrazed.

The problem can be illustrated by a prisoner's dilemma game. Table 4.2 shows the benefits, using an arbitrary numeraire, to two herders of two strategies (restricting sheep numbers or placing a large number on the commons). The outcomes depend on both their decision and the decision of the other herder. For each herder, the dominant strategy is to place a large number of sheep on the commons. This maximises their gain whatever strategy the other herder adopts. However, if both herders follow this strategy, both finish up with fewer benefits from the commons than they would with a cooperative strategy! Both herders would gain from an agreement to restrict sheep numbers on the commons.

Similar issues arise with other common property resources. The modern problem of open access fisheries is discussed in Chapter 12. Without appropriate controls on access to the resources, agents have little incentive to use the resources efficiently. Common property resources are likely to be over-exploited. Cooperation is likely to be more efficient than competition. However, the greater the number of agents accessing the common property, the less likely is the emergence of an efficient cooperative strategy.

---

**Common property resource**  
A resource that is open to all for use

---

**Table 4.2 The tragedy of the commons as a gaming problem (benefits of alternative strategies)**

		<i>Strategy of herder 2</i>	
		<i>Restricts sheep numbers</i>	<i>Places large no. on commons</i>
<i>Strategy of herder 1</i>	<i>Restricts sheep numbers</i>	100, 100	20, 130
	<i>Places large no. on commons</i>	130, 20	40, 40

## Imperfect Competition

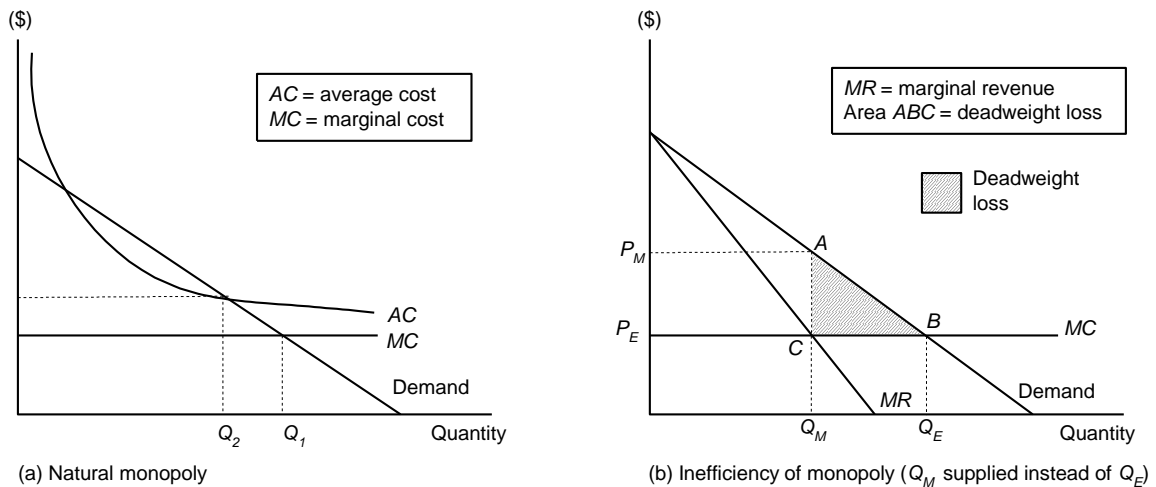
In a competitive market, many firms produce similar goods and all are price takers. Firms charge the market price for their goods and pay the market price for inputs. Each firm faces a horizontal demand curve for their goods and a horizontal supply curve for factors of production. A firm charging an above-market price would obtain no sales. On the other hand, in an imperfectly competitive market, where there are few buyers or suppliers, firms may set prices for their goods above marginal costs and negotiate the prices of inputs.

Imperfectly competitive markets may occur in product or factor markets. The former includes monopolies, oligopolies and monopolistically competitive markets. Imperfect competition occurs for various reasons including economies of scale or scope, differentiated products and competitive advantage due to innovation. When there are economies of scale (due to fixed costs or division of labour), unit costs fall over all or most of the market range of output. Economies of scope occur when one supplier can produce two products more cheaply than can two suppliers. Competition is also limited when firms collude. In all these markets, firms have some control over the price of their products.

Natural monopolies have the greatest potential to control markets and misallocate resources. A natural monopoly exists when a single firm can supply a good to an entire market at a lower cost than can two or more firms. Typically, fixed costs are high and the level of output that minimises long-run average cost is high relative to market demand. Figure 4.2a shows such a market.<sup>1</sup>

Evidently a limited number of large suppliers, even a monopoly, may be more cost-efficient than several smaller suppliers. Moreover, to reward innovation some monopoly profits must be allowed. If market forces lead to the formation of large firms because they are more efficient than small firms, this should not necessarily be discouraged.

However, when firms can set prices, prices are usually set above marginal cost and the quantity of goods supplied is inefficiently low.



**Figure 4.2** Monopoly markets

<sup>1</sup> Strictly, the necessary condition for natural monopoly is cost sub-additivity, not falling long-run average cost. Cost sub-additivity occurs when the costs incurred by one firm at a given level of output are lower than the sum of the costs of a set of competing firms whose combined output is the same as that of the single firm.

As shown in Figure 4.2b, a feature of this market is that, for any quantity supplied, marginal revenue from sale of an extra unit is generally less than the price received. Unless the firm can practise price discrimination, it must lower the price it charges for at least some other units. Thus the marginal revenue curve sits below the downward-sloping demand curve.<sup>2</sup> A firm maximises its profit by supplying output up to the point at which marginal revenue equals marginal cost. In this market, it sets the price at  $P_M$  rather than at the efficient level ( $P_E$ ), where price equals marginal cost.<sup>3</sup> Instead of supplying the efficient amount of output ( $Q_E$ ), the firm supplies only  $Q_M$ . The DWL is given by the area  $ABC$ .

This market power is inconsistent with the condition for overall product mix efficiency. This condition requires that the marginal rate at which two goods can be transformed into each other (MRT) is equal to the marginal rate at which consumers wish to substitute one good for the other (MRS). However, MRT reflects the marginal cost of production while the MRS reflects the relative prices of two goods. When the price of a good exceeds the marginal cost of production, the MRT does not equal the MRS.

Market power occurs in factor markets as well as in product markets. For example, in resource markets a few firms may control the supply of mineral or energy resources or land for urban development. In labour markets, unions may control the conditions under which labour is supplied. Professionals such as doctors or lawyers may combine to restrict entry into their profession and limit the supply of services. Any restriction on the supply of a factor of production tends to raise its price above its marginal opportunity cost and to result in an inefficient under-supply of goods or services.

## Information Failures

Among other conditions, economic efficiency requires a complete set of markets, including markets for future goods and services, and well-informed economic agents.<sup>4</sup> Completeness and information are related. Markets are incomplete when certain goods or services cannot be traded because there is no organised market (Black, 2002). This often reflects poor information. Second, either a buyer or seller may have information that is not available to the other party. This is known as **asymmetric information** and tends to create inefficient outcomes. A third set of issues arises when individuals fail to act in their own best interests because of poor information, perverse preferences or irrational behaviour. In such cases, the assumption that each consumer is the best judge of his or her own interests (consumer sovereignty) is challenged. In this section we discuss incomplete markets, asymmetric information and consumer sovereignty.

Before examining these issues, we should note a related issue, namely that markets tend to under-supply knowledge. Knowledge has strong positive externalities and is often non-excludable or non-rival. Firms under-invest in research when the benefits cannot be fully appropriated. And, once produced, knowledge is non-rival in that consumption by one agent does not reduce the amount of knowledge available to any other agent. Thus, knowledge is often viewed as a public good.

---

### Asymmetric information

Occurs when a seller or buyer has information that is not available to the other party

---

<sup>2</sup> Given a linear demand curve, marginal revenue  $MR = P(1 + 1/\eta_d)$  where  $\eta_d$  is the price elasticity of demand and is negative.

<sup>3</sup> With a linear demand curve, a monopolist maximises profits with a percentage mark-up on marginal cost equal to  $-1/\eta_d$  where  $\eta_d$  is the (negative) demand price elasticity. Thus the mark-up is inversely related to the price elasticity.

<sup>4</sup> Advanced texts, for example Jha (1998), show the conditions required for efficiency in future as well as present markets.

## Incomplete markets

Two main kinds of markets are sometimes said to be incomplete: capital markets and futures or insurance markets. Cited examples of capital market failures are small businesses that cannot raise capital at commercial rates for product development, women who cannot borrow for house purchases and students who cannot borrow for tertiary education against their future earnings. For future goods, markets are required in which the supply of goods is contingent on the state of the world. For example, the ticket price for an open-air concert may be refundable if it rains. Ideally securities would be available for every possible future state of nature. Although markets provide prices for a large range of goods, including many future goods and contingencies such as rain for many events, there are perhaps inevitably many states of nature for which securities are not available.

However, a lack of market transactions is not in itself evidence of market failure. For a market for a service to exist there need to be informed buyers who are willing to pay the marginal cost of supply. Without evidence of consumer demand and costs, it cannot be concluded that a market ought to exist and is incomplete.

Certainly, a lack of information that should readily be available may constitute a market failure. However, markets are inevitably constrained by uncertainty. Insurers cannot assess future risks for all individuals. Other factors that are not necessarily market failures may also contribute to incompleteness. For example, transaction and enforcement costs may limit the reach of capital markets for small loan transactions with a high risk and limit insurance contracts for future contingencies. Thus, incomplete markets do not necessarily indicate market failures.

## Markets with asymmetric information

Asymmetric information occurs in many markets. Sellers often have information about their products that buyers do not have. Unless firms inform consumers accurately about the characteristics of their products, consumers may purchase goods that they do not want. Food products may contain unhealthy ingredients, drugs may not deliver improved health, motor vehicles may be unsafe and so on. In a classic article Akerloff (1970) showed that this asymmetry of information has two sets of costs. Not only are too many poor products consumed, but also good products are driven out of the market. Taking the second-hand car market as his main example, he showed that where buyers cannot tell the difference in quality between a 'lemon' and a good car, they will offer (at best) an average price for a second-hand car. This means that the owners of good cars cannot get true value and there are fewer sales of good cars than would occur in an informed market.

In competitive markets, firms have an incentive to protect their reputation with branding, warranties for their products and other strategies. Nevertheless, without regulations that protect consumers, consumers may be poorly informed, or worse misinformed, and make unwise purchases. Unregulated markets may produce poor or unsafe goods.

However, firms are not always more informed than consumers, especially when the conditions for adverse selection or moral hazard exist. Both phenomena lead to an under supply of some goods, notably of insurance. **Adverse selection** occurs when a firm offers an insurance policy to the market and collects consumers who are most likely to benefit from it. Consumers know more about their risks (e.g. health status) than do insurers, but hide this information because this may increase the price of insurance. If insurers cannot distinguish between low- and high-risk individuals, they provide insurance at one price to all. They provide insurance at unprofitable rates to high-risk individuals and fail to provide insurance at an actuarially attractive rate to low-risk individuals. Consequently, insurance markets offer too few services to low-risk individuals.

**Moral hazard** occurs when a contract promises people payments on certain conditions and people change their conduct in ways that make those conditions more likely to occur. For

example, house and contents insurance may reduce the care that a homeowner takes to prevent burglary or bush fire damages. Insurers must allow for this increased risk even though some people would be willing to take extra care and pay lower premiums. Insurance discourages an efficient amount of risk-avoidance behaviour and insurers provide too few services to careful individuals.

Asymmetric information also occurs in factor markets. Misinformation and inefficient use of resources occur when firms fail to inform capital markets about the true state of their business. Labour resources are employed inefficiently when workers are unaware of the health risks of the work environment and not compensated appropriately. Major issues of adverse selection and moral hazard arise with workers' compensation for workplace injury. Because insurers cannot readily tell the state and cause of an injury and because the availability of income compensation for injury may change a worker's behaviour, markets rarely provide fully efficient insurance for workplace injury.

## Consumer sovereignty and behavioural economics

The idea that individuals are the best judge of their own welfare (a concept described as **consumer sovereignty**) is a critical requirement for the view that competitive markets are efficient. As we saw in Chapter 1, economists have long recognised that there may be exceptions to the principle of consumer sovereignty. These exceptions are traditionally described as merit or demerit goods. **Merit goods** are goods that government considers individuals should consume even if they do not demand them. Examples include compulsory education, safety belts and some major cultural goods such as built heritage. Government may consider that it should provide these goods or compel individuals to consume them. On the other hand, **demerit goods** are goods that the government considers individuals should consume in smaller amounts than they do or possibly not consume at all. Well-known examples are alcohol, tobacco, drugs and gambling.

In recent years there has been a surge of interest and research into these ideas under the label of behavioural economics. As Diamond and Vartiainen (2007) point out, there is accumulating evidence that the standard model of rational and informed consumer decision making is inadequate because it fails to account fully for perverse preferences, notably for incomplete self-control and for bounded rationality. Incomplete self-control occurs when agents make decisions that are contrary to their own best interests. This occurs most prominently with various addictions but also with under-saving and procrastination. Bounded rationality reflects poor information processing ability. There are many features of bounded rationality including use of overly simple decision rules, failure to understand probabilities, over-confidence, the use of irrelevant information and loss aversion. As Kahnemann and Tversky (1979) famously pointed out, with uncertain prospects and especially when probabilities are low, individuals often fail to maximise expected utility.

Technically, incomplete self-control and bounded rationality are not market failures in the sense that the market creates, or is responsible, for these problems. However, in so far as markets do not produce welfare enhancing outcomes, government has a potential role in responding to these issues. In such cases, it may be argued that government knows better than the individual what is good for him or her. This argument may be used to promote compulsory education, to require members of society to save for retirement, to prevent households living in flood-prone areas or to subsidise high arts such as opera and ballet. It may also be used to discourage demerit goods such as drugs and gambling. These policies may be contentious because they over-ride individual liberties. Moreover, if they are applied generally, the benefits of correcting the behaviours of the target group need to be weighed against any costs to the non-target group. However, as we will see in Chapter 15 and elsewhere, many public policies reflect merit or demerit good assumptions.



## Other Market Failures

As we have seen, public goods, externalities, imperfect competition and information failures are potential major causes of market failure. Are there other significant market failures? We review below issues relating broadly to transaction costs and the assumption of market equilibrium and the special case of second-best conditions. some possible candidates.

**Transaction costs.** The efficient operation of markets requires that factors of production are mobile, transaction costs are low and enforcement costs are low. If factors are not mobile, factor prices vary by location and do not equalise for similar levels of productivity. If transaction costs are high, exchange becomes costly and marginal rates of substitution vary by location and opportunity. If contract enforcement costs are high, property rights are devalued and exchange is diminished. All this is true, but it does not necessarily make markets inefficient compared with other means of resource allocation. Zero mobility, transaction and enforcement costs are unrealistic. As a practical matter, markets can be described as inefficient only if mobility, transaction and enforcement costs are significantly higher than they should be given the state of technology in the economy.

**Equilibrium and disequilibrium.** Efficient markets also require that markets are in a state of equilibrium, where all willing buyers and sellers can conduct their trades and the number of willing trades are maximised. There are no excess unsold stocks and there is no unfulfilled demand with long queues for a good.

In practice, markets are often in disequilibrium, with excess demand or supply because the price fails to clear the market. Thus, the labour market is sometimes described as being in disequilibrium because wages do not fall to equate the demand and supply of labour, so that there is unemployment. A market may also be described as in disequilibrium if the current price diverges markedly from the expected long-run equilibrium price. For example, the current price of housing may be considered high relative to some modelled equilibrium price because of speculative demand or slow supply response to a real increase in demand. Indeed, due to speculative demand, unconstrained lending and borrowing and deceitful securitisation practices in the United States, house prices around 2005 to 2008 rose wildly out of line with real long-term values and were a major cause of the global financial crisis (GFC).

Similar disequilibria can occur in commodity markets. A rise in demand for a commodity may cause prices to rise and farmers to respond with such an increase in output that prices then fall below the initial price! But this lower price is not sustainable. At this low price, output is now cut back so hard that the price shoots even higher than in the initial case! When supply curves are more elastic than demand curves, and firms have unrealistic expectations, a shock to the system can lead to unstable outcomes rather than a return to equilibrium. These kinds of market reactions are known as the Cobweb Theorem.

Disequilibria result from both imperfect foresights of buyers and sellers and lags in responses to exogenous events. Current prices then fail to reflect underlying demand and supply conditions and there is excess demand or supply along with associated deadweight costs. Arguably these failures may be described as information failures. However they are labelled, recent experience indicates that such disequilibria are not always self-correcting, at least in the short term.

**In conclusion,** immobility of labour, transaction and enforcement costs, faulty expectations and slow or excessive responses to exogenous events may cause markets to work less efficiently than is desirable. They may also contribute to incomplete markets.

To some extent these failures may be viewed as information failures of markets rather than as separate issues. Moreover, markets do provide incentives for economic agents to reduce

transaction and enforcement costs, to invest in profitable transactions and to correct over-reactions. Nevertheless, the global financial crisis provided strong lessons about the frailty of unregulated markets to self-correct mistakes and the need for government regulation.

## The special case of second best

As we saw in Chapter 3, a Pareto-efficient economy is often described as a ‘first best’ economy and the efficiency conditions required in each industry for achievement of such an economy are ‘first-best’ conditions. It would be natural therefore to suppose that, the closer that an economy is to meeting these conditions, the more efficient it will be. Conversely, the more market failures there are, the greater would be the inefficiency and the deadweight loss. But this is not necessarily the case. Suppose that smoking creates negative externalities and that oligopolistic tobacco firms exploit their market power (as they do) to sell cigarettes at prices well above marginal cost. Tobacco consumption and the consequential negative externalities will be less than would occur in a more competitive industry. In such cases one market failure may partly offset another.

**The Second-Best Theorem** (Lipsey and Lancaster, 1957) states that, in the presence of any departure from the first-best conditions, implementing first-best conditions in all other markets is not necessarily efficient. The most efficient outcome may be achieved by a departure from the first-best conditions in another market. Suppose that a tax is imposed on a good such as beer which creates a wedge between the price of the good and its marginal cost and hence a deadweight loss. Then a tax on a substitute good, say wine, which increases the consumption of beer, may have a net positive economic impact rather than a deadweight loss. Given the prevalence of market failures, and indeed the departures from competitive conditions in many publicly controlled sectors, this theorem has important implications for public policy (see further discussion in Chapter 17). While it is generally sensible to aim to achieve the first-best conditions, it is often necessary rather to determine the second-best policy. This is the set of departures from perfectly competitive conditions that collectively results in the least misallocation of resources.

---

### Second-Best Theorem

When there is more than one market distortion, correcting one distortion may make the allocation of resources more inefficient

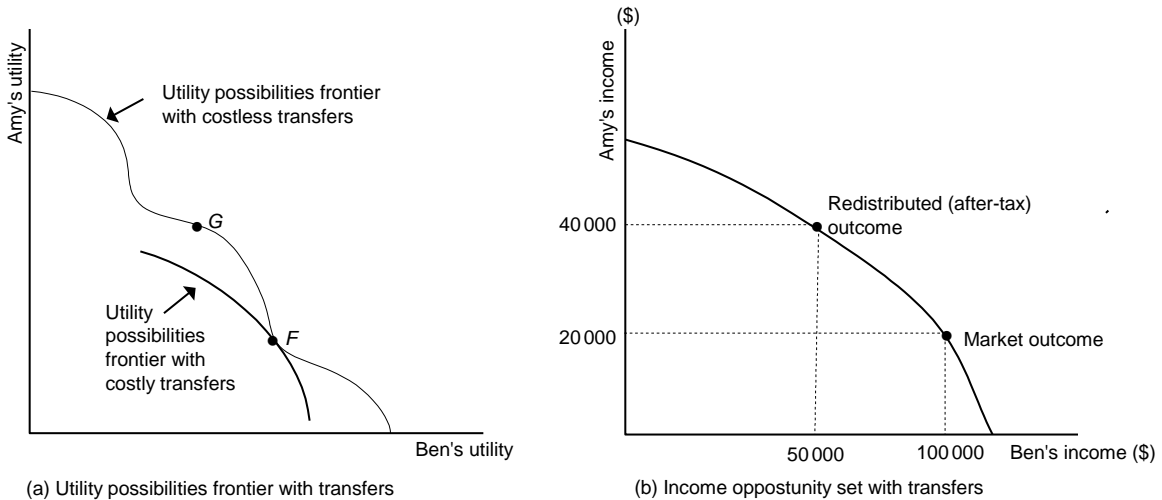
---

## Equity Issues

Of fundamental concern, efficient markets often produce highly unequal outcomes. In competitive labour markets workers are paid the value of their marginal product. However, this product and the related wage depend individual productivity. Such a wage may be inadequate to support an individual or household according to the norms of the society. Moreover, productivity may be a function of numerous factors, including genetics, upbringing and social context, which have no immediate connection to market conditions.

As discussed in Chapter 3, in principle the Second Welfare Theorem shows that any desired distribution of outcomes can be achieved given an appropriate initial distribution of endowments brought about by individualised lump sum transfers. This is a tax that is not affected by behaviour. Given this new set of endowments, a perfectly competitive economy with no market failures would then produce efficient and equitable outcomes.

However, the Second Welfare Theorem has little practical relevance. Ability to earn is not itself readily observable. Thus, it is impossible to identify the economic capacity of individuals without observing behaviour. But once taxes are levied on behaviour, behaviour may change. Suppose that half the members of a community can produce output valued at \$100 000 a year and the other half can produce output worth only \$20 000. If government knew ex-ante the income earning ability of persons in each group, it could achieve equality by a lump transfer of \$40 000 from each member of the first group to each member of the second group. However, if government redistributes income after it is earned, the tax depends on income and everyone has an incentive to join the low-output group.



**Figure 4.3 Opportunity sets in utility and income space**

Figure 4.3a shows a utility possibilities frontier (UPF) for Amy and Ben. If transfers are costless, any point on the UPF can be obtained. Suppose that point *F* on the UPF represents the initial distribution of welfare, then any redistribution of income away from the competitive market output is likely to reduce the quantity of value of output. This restricts the actual social choice to any point along the feasible UPF. The feasible frontier shows the actual set of utility outcomes between which society can choose, given the costs of redistributing resources.

The feasible outcomes can be drawn more practically in income space. Figure 4.3b shows an income opportunity set—how income might be distributed between Amy and Ben. In this example, the market provides Amy and Ben with a total income of \$120 000, of which Ben receives \$100 000 and Amy gets \$20 000. If government transfers \$20 000 from Ben to Amy, Ben obtains \$50 000 (after reducing his work hours) and Amy gets \$40 000 (assuming the transfer does not change Amy's work hours). Total income falls from \$120 000 to \$90 000.

Given that market incomes are almost always inequitable, government must aim to distribute the benefits of economic activity fairly in accordance with some ethical view of welfare (which may be miserly or generous). If individualised lump sum taxes were possible, the outcome could be efficient and fair. Because they are not feasible, governments must use a combination of distortionary taxes and social grants to achieve distributional objectives. Because taxes and grants generally change behaviour, redistribution almost always reduces the income available for redistribution. The trade-off between efficient and socially fair allocations of resources is at the heart of many public policy decisions.

## Government Functions

Each of the major economic functions of government (establishing a legal infrastructure, addressing market failures, providing social welfare and macroeconomic policy) represents a substantial task. Government would be responsible for establishing and protecting property rights and the commercial system of contracts and exchange. It would provide a wide range of public goods, develop policies for externalities and common resources, regulate uncompetitive markets, develop information and regulate misinformation. Also, it may be responsible for a substantial redistribution of income.

However, conclusions about the roles of markets and government should be drawn cautiously for two main reasons. First, the efficiency of markets does not depend on complete fulfilment of the first-best conditions in a static model. The real world is too complex to be fully represented by a mathematical model, even such a complex model as the Arrow–Debreu general equilibrium model which underlies the First and Second Welfare Theorems. In practice, economists often rely on the concept of workable rather than perfect competition. Workable competition is the practical amount of competition between firms required for efficient exploitation of product and process technologies. Admittedly this is a loose definition, but so long as markets are generally competitive and new entrants to markets are feasible, competition encourages firms to produce what people want with efficient low-cost methods. Also, as discussed in the next chapter, competitive economies are usually more innovative and generally produce higher rates of economic growth than less competitive economies.

Second, market failures indicate only a *prima facie* role for government. Government should determine how resources are used only if it can do so better than can markets. There can be no general presumption that this is the case. An advantage of markets is that prices convey a great deal of information about the value of the goods to consumers. The idea that government is better informed about the needs of individuals than are private firms or individuals themselves, and should therefore over-ride market transactions, should be treated with caution. In the words of Pigou:

The case (for intervention), however, cannot become more than a *prima facie* one until we have considered the qualifications which government may be expected to possess for intervening advantageously. It is not sufficient to contrast the imperfect adjustments of unfettered private enterprise with the best adjustment that economists in their studies can imagine. For we cannot expect that any public authority will attain, or will even wholeheartedly seek, that ideal. Such authorities are liable alike to ignorance, to sectional pressures and to personal corruption by private interests. A loud voiced part of their constituents, if organised for votes, may easily outweigh the whole.<sup>5</sup>

**Summarising government functions.** Table 4.3 overleaf summarises the main resource allocation and social welfare functions of government—along with some examples. In addition, activities are classified as basic, intermediate and activist government functions. The economic and social arguments for undertaking the basic and intermediate functions are generally strong. However, there is much discussion about where precisely the lines should be drawn, especially for the more activist activities. It should also be noted that some goods are provided for both efficiency and equity reasons. Thus health and education services appear under both addressing market failure and improving equity functions.

## Government Instruments

So far we have focused mainly on *when* government should intervene in the economy. We now briefly discuss *how* government should intervene. Government can carry out policies in six main ways by:

1. Low intervention methods: creating markets, facilitation and provision of information.
2. Regulating markets: by establishing the main rules for markets and in some cases by regulating the quantities that firms should produce or the prices they may charge.

---

<sup>5</sup> Pigou (1920) p. 332.

**Table 4.3 Functions of government with examples**

<i>Functions</i>	<i>Creating markets and addressing market failure</i>				<i>Social welfare</i>	
<b>Basic</b>	<i>Providing pure public goods:</i> Defence Provision of property rights Provision of currency Primary education Basic economic infrastructure Basic communications				<i>Protecting the poor:</i> Poverty relief programs Disaster relief Alleviating major inequities	
<b>Intermediate</b>	<i>Providing other public goods:</i> Secondary and tertiary education Health services Other transport and communication services	<i>Addressing externalities:</i> Environmental protection Regulating common property resources	<i>Regulating market power:</i> Competition policy Utility regulation	<i>Overcoming imperfect information:</i> Consumer protection Financial regulation Occupational health and safety	<i>Providing social assistance and equity:</i> Unemployment benefits Family allowances Pensions for retirees Progressive taxation Health services Education services	
<b>Activist</b>	<i>Coordinating private activity:</i> Fostering markets Providing merit goods				<i>Supporting industries or firms</i> Supporting industries or firms	<i>Redistribution:</i> Wealth redistribution

Source: Adapted from World Bank (1997).

3. Influencing markets with fiscal instruments: employing taxes to raise prices and discourage consumption or subsidies to do the reverse.
4. Funding the provision of goods and services by private firms.
5. Producing goods, either by government agencies or through public trading enterprises.
6. Redistribution: income transfers or transfers-in-kind.

Table 4.4 shows these general strategies and various other instruments available to government. It also distinguishes between low, medium and high-intervention instruments. Low intervention includes market creation where no market exists, moral exhortation, for example, to encourage public health practices and facilitation of development projects. More active intervention includes financial incentives to firms or households and payments for goods provided by private firms. High intervention instruments include binding regulations on firms, direct provision of services and redistributive activities.

Critically, the effectiveness of government policies depends not only on the choice of policy *but also on how policy is implemented*. In this book there are many examples of the importance of instrument choice, for instance in the discussions of environmental policy, the delivery of publicly funded services, the provision of education, transport and health services and the delivery of income transfers and social assistance policies.

Table 4.4 Main instruments of government

<i>General approach</i>	<i>Possible Instrument</i>	<i>Comments</i>
<i>Low intervention methods</i>		
Do nothing		This is often an option Allows markets to determine outcome
Create markets	Auctions for common resources	Has environmental applications
Provision of information and moral exhortation	Public announcements	For example information on public health Exhortation to conserve water
Facilitation	Non-financial assistance to industry	Assistance with project development
<i>Medium intervention methods</i>		
Provision of incentives to markets or individuals	Financial instruments (taxes or subsidies)	May encourage or discourage activities For example, subsidies for health insurance Has environmental applications
Provision of public funding for services	Public payment for services provided by private sector	For example, payments for doctors May include user payments
<i>High intervention methods</i>		
Regulations of firms and households	Legislation Subordinate regulations	Includes general administration under statutes
Provision of services through public trading enterprises	Public production of goods with user charges	PTEs have some operating independence from government, but not policy independence May include some subsidies to consumers
General government supply of services	Public funding and production of services	Usually essential services May include user payments
Redistributive activities	Taxation and cash benefits Provision of benefits in kind	Income transfers are a high proportion of GDP Benefits may include food, housing, public health services
Institute fundamental change	Constitutional changes	Rare in Australia

## Summary

- The main market failures are public goods, externalities, imperfect competition and information failures.
- Public goods are typically characterised by large positive externalities. Formally they are non-excludable and non-rival goods. Private firms under-supply non-excludable goods and over-charge for non-rival goods.
- Markets can produce negative externalities, especially environmental costs.
- Private firms are also likely to over-exploit common property resources.
- In imperfectly competitive product markets, firms tend to charge prices above marginal cost and to supply too few goods. Uncompetitive factor markets may also lead to an under-supply of goods and services.
- Many economic agents are poorly informed. There is over-consumption of poor products and failures in insurance markets. The global financial crisis was an extreme manifestation of information failures.
- Also markets, including efficient ones, can produce large income inequalities.
- The allocative role of government is to establish the conditions for efficient markets, provide public goods and develop policies for externalities, imperfectly competitive markets and poor information.
- However, government should act only if it can improve on market outcomes. This depends on the extent of market failure and the efficiency or otherwise of government.
- Government also has a major responsibility for income distribution and for social welfare generally.
- However, income redistribution in any form nearly always changes behaviour and causes some inefficient outcomes. Hence there is invariably a policy trade-off between efficiency and provision of social welfare grants and programs.
- Policy instruments include regulating markets, use of taxes and subsidies, funding the private supply of goods, public production of goods and income redistribution.
- Government effectiveness depends on the choice of instrument as well as on choice of policy.

## Questions

1. Design a two-person gaming model as in Table 4.2 in which the strategies are to steal or not to steal. Show how both parties can gain from rules protecting private property and that laws against stealing are a public good.
2. Major sporting events like the Olympic Games often have physical and pecuniary external effects. Give examples of both kinds of externality and show why physical externalities may have efficiency and equity effects whereas pecuniary externalities have only equity effects.
3. Figure 4.2 shows the misallocation of resources with a monopoly supplier. Is a similar misallocation likely to occur in an oligopolistic market or with monopolistic competition?
4. Suppose that a monopolist's total cost is  $C = 12 + 6Q$  and that the demand curve is given by  $Q^d = 25 - P$ .
  - i. What is the price set and quantity sold by a profit-maximising monopolist?
  - ii. What price should be set, and what quantity sold, to maximise the benefits to society?
  - iii. What is the deadweight loss in this example?
5. Suppose a vaccination program reduces the spread of infectious disease and contains a positive externality equivalent to \$50 per vaccination. The marginal cost of supplying vaccinations is constant at \$60. The annual demand for vaccinations in the market is given by  $Q^d = 1\,000\,000 - 10\,000P$ . Determine the following:
  - i. The number of vaccinations that would be provided by a competitive market.
  - ii. The socially efficient number of vaccinations given the positive externality
6. Is the Cobweb Theorem of market prices and quantities an example of market failure?
7. Does heavy smoking exhibit both lack of self-control and bounded rationality?
8. What are incomplete markets? Can they be described as market failures?
9. Are insurance markets likely to provide inefficient insurance for unemployment or disability?
10. Do university student services have public good characteristics? Can compulsory student fees to fund these services be justified?

11. Why is an unequal distribution of income not necessarily described as a market failure?
12. Why does a failure to maximise expected utility reflect bounded rationality?
13. What economic costs occur when government redistributes income? Is it possible to redistribute income without economic cost?
14. Give an example of a second-best policy with an explanation.

### Further Reading

- Akerloff, G. (1970) 'The market for lemons: Quality uncertainty and the market mechanism', *Quarterly Journal of Economics*, 80, 488–500.
- Arrow, K.J. (1963) 'Uncertainty and the welfare economics of medical care', *American Economic Review*, 53, 942–73.
- Coase, R.H. (1974) 'The lighthouse in economics', *Journal of Law and Economics*, October, 357–376.
- Dixit, A. (2009) 'Governance institutions and economic activity', *American Economic Review*, 99, 5–24.
- Hardin, G. (1968) 'The tragedy of the commons', *Science*, 162.
- Kahneman, D. and Tversky, A. (1979) 'Prospect theory: an analysis of decisions under risk', *Econometrica*, 47, 263–291.
- Lipsey, R. and Lancaster, K. (1957) 'The general theorem of second best', *Review of Economic Studies*, 24, 11–32.