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CHAPTER 1

The State and the Market

This chapter sets the scene by considering one of the fundamental issues in public policy economics: What are the relative roles of the government and the private sector, or market, in the economy? Economic theory provides some tools for analyzing the question, so the chapter sets out some of the basics of what is known as welfare economics—in other words, the analysis of economic efficiency and the criteria for assessing whether something makes a society better off or not. (Readers who have previously taken microeconomics courses will be familiar with this.) The theory, taken literally, implies that competitive markets will deliver the highest social welfare; but there are two pitfalls in taking too simplistic a view of economic theory, based as it is on some strong assumptions. One pitfall is concluding that the more markets can be relied on the better; in fact, there are pervasive "market failures." The opposite one is concluding that it is possible for the government to work out how to correct all market failures; for government failure is widespread too. In fact, practicing economists use the theory as a framework for analyzing policy problems rather than as a guide to solving them. Besides, when it comes to policy choices, economic analysis alone is not enough, or there would be none of the familiar political debate about the proper roles of state and market. So the chapter also discusses the way political or historical events and economic thinking influence each other, helping to explain the variations in government interventions in the economy over time and across countries. It concludes by looking, in the light of this context, at the examples of specific types of market failure: externalities and public goods.

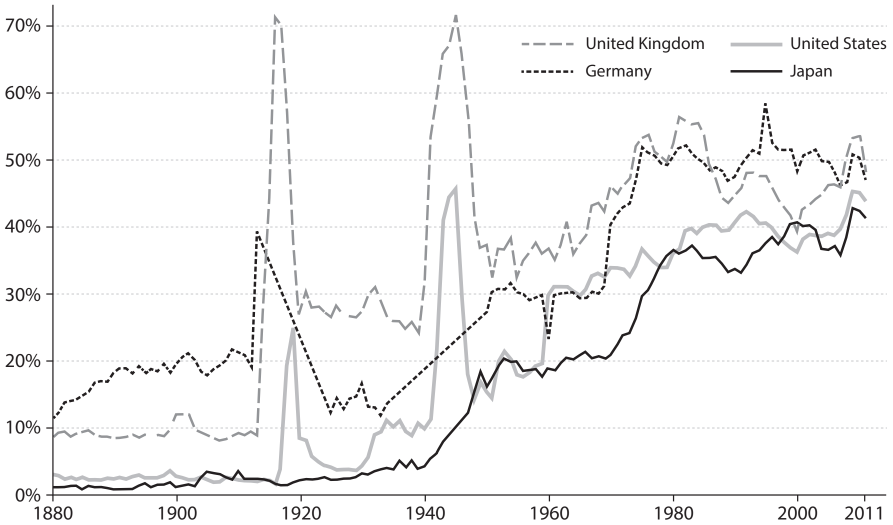

Figure 1.1. Total government spending, including interest government expenditures, as percentage of GDP. *Source*: IMF Fiscal Affairs Departmental Data, based on graph at https://ourworldindata.org/public-spending.

Governments intervene in the economy in many ways. For instance, government spending is a reasonably high share of national income in all developed economies, between 28.7% (Ireland) and 57% (Finland) in 2015, while the size of this expenditure relative to the economy has trended up over time, as well as moving up and down in business cycles (figure 1.1). The spending goes on many services: defense, the legal system, police, education, health, pensions, local government services, roads and infrastructure, state pensions, welfare or social security benefits, subsidies for certain activities or industries, and more. Almost as much (although usually less, as budget deficits are the norm) is raised in revenue through a wide range of taxes, licenses, and charges. All these ways of raising revenue affect the choices individual households and businesses make because they affect people's incentives. Some of the taxing and spending is intended to redistribute money from rich to poor. The excess of expenditure over revenue is paid for by money borrowed in the financial markets, and this government borrowing can affect interest rates paid by private sector borrowers for their loans.

To focus just on the government's taxing and spending is to miss a huge part of its intervention in the economy, though. Governments also write and enforce laws and regulations that govern how businesses are run and how consumers are protected. Competition policy aims to stop businesses from growing too powerful at the expense of consumers, or regulators. Employment law is intended to protect workers from exploitation or discrimination. Government bodies enforce technical and safety standards. Professionals of many kinds are required to hold licenses to operate their practices, in the interest of consumer protection. Therefore, governments can affect when and how people work, who businesses employ, what we can buy and the prices we pay, how goods are manufactured, what information has to be handed over to the authorities, and much more. Box 1.1 lists many of the ways the government influences the economy. It is not easy to measure the scope of all these kinds of intervention, or compare countries, but examples such as the length of the rule book for financial services or the tax code in many countries suggest it has been steadily increasing. In any case, the government is deeply involved in economic activity.

Sometimes economic policies seem intrusive, and people often react in unanticipated ways to specific government actions. High taxes are never popular and have in the past been far higher than now. In 1966 the highest (marginal) rate of income tax was 91% in the United States and 98% in the United Kingdom. No surprise the Beatles wrote their song "Taxman" (on the 1966 album *Revolver)* complaining about the tax burden. Swedish pop star Abba's Björn Ulvaeus revealed (in a 2014 book) that they wore such outrageous costumes because the cost of their clothes could be set against their tax due as long as the outfits could not be worn in everyday life. "In my honest opinion we looked like nuts in those years. Nobody can have been as badly dressed on stage as we were," he wrote. Businesses constantly complain about the burden of regulation, but also constantly call for more government investment in research or in infrastructure such as bridges and roads or subsidies for innovative products. Sometimes policies are entirely counterproductive while other policies are astonishingly effective: see box 1.2.

Box 1.1. Examples of the scope of government involvement in the economy

Spending on services such as health, education, housing, defense, policing, pensions, waste collection, lighting, parks, social services, roads, justice, prisons, and much more
Taxation/licensing—multiple taxes, fees, auctions
Subsidies and tax incentives for specified activities
The “welfare state”—benefits, pensions, income redistribution
Regulation—of many activities
Competition policy—merger control, market investigations, antitrust
Public ownership, and also privatization of public corporations, contracting out of public activities, private finance initiatives
Shaping markets—legal frameworks, takeover rules, intellectual property law
Granting patents, copyright
Setting technical standards
Persuasion and “choice architecture”—public health information campaigns
Investment (infrastructure, research)

Box 1.2. Policy failures and successes

The Cash for Clunkers scheme was introduced in the US in 2008, intended to boost the revenues of the struggling auto manufacturers by encouraging Americans to trade in their old cars for environmentally cleaner new models. It cost $3 billion in subsidies of up to $4,500 to people who traded their “clunker” for a new fuel-efficient auto. In theory, the program would hit two targets: a stimulus for the manufacturers and a contribution to combating climate change and pollution by getting older gas-guzzlers off the road.

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However, the program led to people bringing forward the purchase of a new car—and trading down to a cheaper model, due to the weak state of the economy at the time. The scheme actually reduced the industry's revenues by an estimated several billion dollars compared to what they would have been without it. The new cars were less damaging environmentally, but as a "green" policy Cash for Clunkers was not cost-effective. It was without question a policy failure.*

On the other hand, small taxes on plastic carrier bags seem like a highly effective policy. Even when low, they dramatically reduce the quantity of single-use bags shoppers use, many of which otherwise end up as landfill. The taxes also raise revenues for the government in an uncontroversial way. In Washington, DC, a 5 cent tax reduced the use of carryout bags by 60%. Ireland introduced a 22 (euro) cent tax in 2002, which almost eliminated their use. A 5 pence charge in the UK reduced usage by 85% and encouraged the government to propose doubling the fee to 10 pence. The aim of the charges is to reduce this non-biodegradable source of waste, often harmful to wildlife, and the policy is highly effective in this respect. However, the substitute canvas and other bags have an environmental impact, too, in their production and disposal; there may be trade-offs even between environmental aims.**

* Mark Hoekstra, Steven L. Puller, and Jeremy West (2017), "Cash for Corollas: When Stimulus Reduces Spending," *American Economic Journal: Applied Economics* 9, no. 3: 1–35.

** The UK's experience (https://www.gov.uk/government/news/plastic-bag-sales-in-big-seven-supermarkets-down-86-since-5p-charge) is similar to Ireland's (https://www.dccae.gov.ie/en-ie/environment/topics/waste/litter/plastic-bags/Pages/default.aspx) and to US cities such as Washington, DC (https://doee.dc.gov/sites/default/files/dc/sites/ddoe/documents/0%20BL%20Survey%20Overview%20Fact%20Sheet.pdf).

In traditional public economics courses, government activities are divided into three “branches”: stabilization, allocation, and distribution. The first of these concerns macroeconomic policy, aiming for a high and stable level of employment and steady growth and inflation. This book does not cover macroeconomic stabilization. Nor does it cover much of another staple of traditional courses, the structure of taxation and sources of tax revenues, which are at the heart of fiscal policy analysis. Instead, the focus here is on allocation and distribution: What is produced, how, and by whom? And how is what is produced distributed among different members of society? The fundamental issue here is therefore the collective use and consumption of resources by large numbers of individuals in society—how is the economy organized? Economics poses these as questions of efficiency and equity (or, in other words, fairness). Often economists focus on the efficiency questions, acting as if they can be analyzed in isolation from judgments about distribution or fairness, but it is impossible in practice to draw any policy conclusions without making value judgments. Almost any policy change creates winners and losers.

The starting point here is therefore to ask how a society can organize production and consumption—the economy—in the best way. This might seem to be a factual kind of question, but in many countries it is of course politically contested. People have conflicting views at any moment in time, and the modes of economic organization societies choose vary at different points in history and in different countries.

Which activities should be done by the government, which by the market, or in some other way? (And, by the way, what do we mean by “the government” or “the market,” and what other ways are there? These questions will be explored further.) If the government is involved, what is the best way for it to try to achieve some socially desirable outcome: public ownership, public provision of services, regulation, taxes, subsidies, or some other policy instrument? (And is it clear what outcome is desired, or are there competing, even conflicting, aims?) The way economists have answered these questions has changed considerably over time. This is due to significant events, such as financial crises or wars, and because politics responds to events. It is also because economic thinking changes, as ideas respond to events and to political trends, too. Tracking changes in economic thinking is important because the reasons for change illustrate some fundamental dilemmas in determining public policies. It is also important because a key message in this book is that, on many policy issues, economics does not have answers that are right for all time. The right answer is, ultimately, it depends—on context and on political choices. At the same time, economic analysis can provide analytical and empirical insights to inform these contingent choices. The aim of public policy economics is to combine this technical rigor with sensitivity to the specific context.

Social Aims

Evaluation of success and failure in policy has to begin with its ultimate aims. Societies are driven by different aims or values at different times. Some of these, such as patriotism, national power, or honor, have little relation to economics, and might even damage the economy. The aims where economists can contribute something to the discussion are *efficiency*, *equity* or *fairness*, and *mutual insurance against life's uncertainties*; and perhaps also *social cohesion* or *civic participation*, and *freedom*.

These aims can conflict with each other. Clearly, some of them are not only economic but also ethical questions. Economics has tended to assume that answers to the ethical or political questions, requiring value judgments, can largely be separated from answers to the purely technical economic ones. The assumption is not always justified, although it is surely desirable to conduct economic policy analysis in as impartial a manner as possible.

One important potential trade-off between social aims, the one most often discussed in economics texts, is between efficiency and equity. If the government wants to redistribute income from rich to poor by taxing the former, it can bring about a more equal society but perhaps at the cost of discouraging some people from working as hard, or discouraging some investment, and so shrinking the size of economic output and incomes compared to what they would otherwise have been. The tax causes some loss of efficiency. But many other things influence effort and output. So alternatively, it might be that a very unequal society discourages work effort by the poor—why bother to be productive if most of the gain goes to someone else? In which case, there is no simple trade-off between efficiency and equity.

Efficiency and equity are two key rationales for much state intervention in private economic activities ("the market"):

- *efficiency* whenever either individual or *market failures* occur—"failures" meaning sub-optimal decisions because of externalities, natural monopolies, public goods, or simply non-rational choices (all explored below);
- *equity* whenever enough people in society have a preference for redistributing resources—redistribution that can be either monetary payments or the provision of public services, such as education, health, or housing.

Much of the analysis in public policy economics sets aside the distribution question to start with, asking: For a given income distribution, what is the most *efficient* way for society to use its resources? What will deliver the greatest *social welfare*? This book starts the same way, returning to distributional questions in chapter 6. Framing the analysis like this also begs the question about the efficiency of government intervention. Chapter 7 focuses on government failure. While there are many examples throughout the book (as in life) of government policies gone wrong, one of the themes is that there are inherent difficulties in organizing an economy to achieve broad and possibly conflicting aims, and in some contexts both government and market solutions will "fail." Another theme, following from this, is that it is a mistake to think of "the government" and "the market" as alternatives. Societies have a range of organizational structures involving a mixture of private and collective choices, the latter sometimes taken by "official" public sector bodies and sometimes by "unofficial" community agreement; chapter 4 explores this further.

The rest of this chapter covers the question of the appropriate roles of the government and the private sector (state and market) in the economy, the main issue in so much political debate about economic policies. On certain assumptions, economic theory justifies the competitive market as the "best" way of organizing production and consumption. The next sections consider what "best" means and what assumptions lead to the presumption in favor of markets. It is worth emphasizing here that although economists working on public policy have this theoretical equipment at the back of their minds, all are aware that it provides no more than a useful framework for organizing their thoughts. No one thinks consumers and producers behave in reality as they do in these abstract models. Critics of economics often mistakenly think practitioners take the abstract theory at face value, whereas public policy economics in practice is firmly rooted in empirical reality. With that warning in mind, the next sections introduce the theoretical basics of what is referred to (somewhat confusingly) as *welfare economics*.

Efficiency

The first question is the criterion for preferring one way of organizing production and consumption in the economy over another: What does it mean to say an activity is *efficient*? The specific meaning used in economics is known as *Pareto efficiency* (after the Italian economist Vilfredo Pareto, 1848–1923).

> An allocation of resources is *Pareto efficient* if nobody can be made better off without somebody else becoming worse off.
>
> A *Pareto improvement* is a change that makes some people better off without making anyone else worse off.

This requires a definition of "worse off" or "better off." The criterion used is each individual's own evaluation of their welfare. *Social welfare* must then in some way be the aggregate of the welfare of the individuals in the society—a question discussed below. For now it seems reasonable to agree that a change helping someone and harming no one is an improvement.

Note that a Pareto improvement might—or might not—lead to a Pareto efficient outcome; but if the economy is at a Pareto efficient point, there is no possibility of a Pareto improvement. What's more, the criterion is agnostic about the distribution of resources; even in a very unequal society, it insists that it is not an improvement to make one rich person worse off even if many poorer people are better off.

Pareto efficiency is related to key concepts in microeconomic theory. The annex to this chapter sets out some of this background, which is covered in all the standard microeconomics textbooks; it will be familiar to anybody who has already studied economics, and rather mysterious to anybody who has not yet become familiarized with some of these nuts and bolts of economic theory. It does not help that different textbooks give slightly different definitions. Here I try to make the ideas as intuitive as possible.

Pareto efficiency consists of the following:

- *Productive efficiency*: Given the kind of resources available (such as land or minerals, labor, machines) and their relative prices, and given the state of technology, is output as high as it can be? Is the economy operating on its *production possibilities frontier*?
- *Allocative* (or *consumption* or *exchange*) *efficiency*: Given the production of different goods and their relative prices, are the goods produced going to the people who most value them? Are people on their highest possible *indifference curve*?

The definition used sometimes focuses on allocative efficiency alone, sometimes both allocative and productive; and sometimes it adds a third element:

- *Product mix* (or *output*) *efficiency*: Do the goods being produced correspond to the goods people want to buy, or is there another combination of goods produced with the same resources that would make people better off (put them on a higher indifference curve)?

Together the three components cover how effectively resources are turned into products, whether the products correspond to people's preferences, and whether, through exchange, they go to the people who value them most. If any of the three is not satisfied, then at least one person could be made better off (through use of resources in production, mix of goods being produced, or exchange of products) without making anyone else worse off. This seems reasonably intuitive as a concept of efficiency.

It is important to note that the terminology can mislead people into thinking Pareto efficiency is only a technical concept. After all, it is silent on questions we would think of as ethical issues, particularly the distribution of resources. This is correct in the case of productive efficiency but not entirely when it comes to allocative efficiency, which assumes that "better" means satisfying people's preferences, whatever they are (and also that it is possible to aggregate up from individual preference satisfaction to *social welfare*). "Efficiency" sounds like it is only about *positive* questions, matters of fact; but Pareto efficiency is *normative*, involving a value judgment in assuming the satisfaction of individual preferences is the right criterion for assessing economic policy outcomes.

Pareto Efficiency and the Competitive Market

Equipped with the notion of Pareto efficiency and a set of assumptions, it is possible to prove two fundamental theorems of welfare economics.

The first theorem states that if a competitive market equilibrium exists, then it is Pareto efficient. Otherwise people would be able to undertake exchanges that increased their utility—so it could not have been an equilibrium to start with. The competitive prices measure the (marginal) increase in welfare for one more unit of each good. As long as market exchange is possible, people can trade with each other until all the potential improvements in their welfare have been captured. This theorem is the underpinning of the instinct in favor of competitive markets as a benchmark, although this depends on the validity of the assumptions, which are discussed further below.

The second theorem says that given an initial allocation of resources, there is a set of competitive prices that support the Pareto efficient outcome. It implies that efficiency can be achieved by the price mechanism in competitive markets, and can be separated from the question of the preferred distribution of resources: exchanges at market prices will deliver a Pareto efficient outcome, whatever the distribution. If society wants to redistribute resources to begin with, the competitive market can again deliver a Pareto efficient outcome.

The theorems rely on certain assumptions, however; some are obvious, others subtler (box 1.3).

To list these is to see that they often do *not* hold in reality, and economists are well aware of this. Even Paul Samuelson, who did more than anyone to embed the grand theory sketched above in the way economics is learned and practiced, was explicit about this: "The above does not happen in real life." The Pareto efficiency approach and welfare theorems nevertheless hold powerful sway in the worldview of economics in offering a conceptual framework for thinking about why, in any particular real-world context, competition and market exchange are *not* the social welfare–maximizing approach. The theorems organize ideas rather than dictating recommendations. The nature of government interventions is assessed in light of how these correspond to the way reality departs from the

Box 1.3. Assumptions for welfare theorems to hold

Consumers and producers are rational and self-interested
They have fixed preferences
There is perfect competition with no economies of scale and no barriers to entry (or exit)
Individuals have full information, and it is symmetric (the same) for all
Goods are rival—if I consume or use it, you can't
Private and social benefits are equal
Private and social costs are equal
There are complete markets (including markets for all future goods)
Goods are owned and able to be exchanged—there are property rights and effective contract law

assumptions. And even though there is limited hope in reality of a Pareto improvement in public policy—as there are so often losers as well as winners—the evaluation of public policy is often made in terms of specific market failures as departures from Pareto efficiency. Otherwise economists would constantly need to make explicit judgments about the distributional questions, something they understandably hesitate to do.

Departures from the assumptions behind the welfare theorems also form the organizing principle for the rest of this chapter, and the book. First, though, there are some other issues relating to the theorems to touch on: the problem of the "second best" world, questions of distribution, and how to aggregate individual welfare into social welfare.

The Second Best Theorem

One issue is how useful the Pareto efficiency criterion is when the economy is not in a competitive equilibrium, and there are multiple market failures or departures from competition and free exchange. The *second best theorem* (proved by Richard Lipsey and Kelvin Lancaster in 1956) shows that a change that would be a Pareto improvement in a first best world will rarely be so in a second best world. For instance, if European tariffs on high-cost imports from the US are abolished, making their purchase price lower, but there are still tariffs on imports from low-cost Asian producers, then Europeans switching to buying American goods produced at higher cost will not increase social welfare. Another example is a monopolist polluting the atmosphere. Ending the monopoly—removing one market failure—makes another market failure, the pollution externality, worse because prices will fall and output will increase in a more competitive market.

The second best theorem makes formally the important point that it is not possible to take a pick-and-mix (or *partial equilibrium*) approach to evaluating society's economic welfare, considering policy changes in isolation. For example, imperfect information often leads to *moral hazard* in insurance markets: if I have insurance on my house, I might not take enough care about fire safety, with more careful householders subsidizing my insurance premium. One solution might be to subsidize the price of smoke alarms. However, that fixes a problem in one market but creates a distortion in another, leading to more-than-efficient production of smoke alarms relative to, say, bicycle lights. Ideally, there should be a policy to correct for that distortion, but the real-world analysis of such connections is challenging to say the least. These complexities gave rise to a *third best* theory, which says that as governments cannot have all the empirical evidence they need to make general equilibrium assessments, they should just address the problems they do know enough about.

Again, the second best theorem is a formal exercise, but one that underlines a key message of this book, which is that neither "the market" nor "the government" is the solution to economic problems. The second best theorem explains why in any context where one thing diverges from Pareto efficiency, the competitive market outcome for everything else need not be the most efficient. However, it also explains why so many government policy interventions have unintended consequences, a key form of "government failure." In both cases, there is a failure to take on board this lesson that everything in the economy is connected.

Distributional Questions

The definition of Pareto efficiency puts questions of distribution or fairness to one side. As it requires that nobody be made worse off, the initial distribution of resources is a given. The second welfare theorem formalizes the separation between distribution and efficiency. It implies that if the initial distribution is undesirable a society should make a lump-sum redistribution, and then the market process of exchange at prevailing prices will bring about a Pareto efficient outcome. This led economists to argue for a principle of compensation (first discussed in 1939 papers by John Hicks and Nicholas Kaldor, and so sometimes referred to as Kaldor-Hicks compensation). If a particular policy would make someone worse off, could the winner simply pay the loser a suitable amount in compensation?

The answer (pointed out almost immediately in a 1941 journal article by Tibor Skitovsky and several times subsequently) was no, because the amount of compensation required would need to be valued at the prevailing prices for the goods in the economy, and a policy change would change these relative prices. Should compensation be calculated at winners' prices or losers' prices? Depending on the choice, a policy and its reversal could *both* look like Pareto improvements. It depends whose perspective you take. This debate about deep issues in theoretical welfare economics makes little difference to practical policy questions, which quite often involve compensation to losers—such as payments to households having a new rail track laid at the end of their garden, or to private shareholders being bought out if a company is nationalized. However, it underlines the point that the theory is for all practical purposes a framework for organizing concepts.

Social Welfare

There is also the question of how to aggregate from individuals' welfare to society. Is it possible to calculate aggregate social welfare by adding up individuals' utilities? Kenneth Arrow's famous 1951 impossibility theorem proved it is not possible to aggregate individual preferences into social preferences without breaching some reasonable-seeming assumptions—including the Pareto efficiency criterion. Social welfare can be defined, however, by allowing interpersonal comparisons of welfare, for example. (There is more detail in the annex to this chapter.)

In this case, the government, or its economists, can define a social welfare function incorporating specific value judgments about distribution. A simple one would be basic utilitarianism, the arithmetic sum of individual utilities. The aim is to maximize the total sum of individual utilities; as long as there are enough gainers, or the gains are large enough, losses to other individuals are acceptable. As Mr. Spock put it, sacrificing his life for others in *Star Trek II: The Wrath* *of Khan*, "The needs of the many outweigh the needs of the few. Or the one." Other options would include giving different weights to the utility of different groups or putting a floor on the outcome for any individual. Typically, the judgments economists express about social welfare (i.e., whether a policy is desirable or not) have a social welfare function implicitly in mind, and it is also typically a utilitarian or consequentialist one. For example, cost-benefit analysis, widely used in policy appraisal, weighs costs borne by some people against benefits gained by others. Utilitarianism is woven into the fabric of economics, as indeed is indicated by the use of "utility" as the criterion for judging policy success or failure.

Market Failure and Government Failure

As already noted, in practice a polite veil is drawn over the theoretical issues with welfare economics, but the theory shapes a useful conceptual framework for analyzing market failures. The competitive market benchmark means economic policies are typically often evaluated in terms of specific market failures corresponding to failures of the assumptions for the fundamental welfare theorems (box 1.4).

This framework for considering the rationale for policy interventions is used in this book because it helps to clarify what kinds of policy might be best suited to a particular problem. However, the "market failure" approach can often fall into one of two opposing traps. The first is to assume, perhaps because of the terminology or the elegance of the economic proofs, that market failures are exceptional, and there is therefore a presumption in favor of "free markets." Yet the assumptions are an idealized benchmark and clearly never hold in practice, as practicing economists are well aware. On the other hand, this does not mean that there should be an opposite presumption in favor of the government correcting (frequent) market failures by some kind of intervention. For "government" consists of people who might have their own motivations or incentives, and who are acting as "agents" for the rest of the population—questions chapter 7 returns to. Economists have often underestimated the limits on state capacity in analyzing policy

Box 1.4. Market failures

Assumption	*"Market failure" when it does not hold*
A1 Consumers and producers are rational and self-interested A2 They have fixed preferences	"Non-rational" choice, social influence
A3 There is perfect competition with no economies of scale and no barriers to entry (or exit)	Natural monopoly
A4 Individuals have full information, and it is symmetric (the same) for all	Information asymmetries
A5 Private and social benefits are equal; private and social costs are equal	Externalities
A6 There are complete markets (including for all future goods)	Adverse selection; tragedy of the commons
A7 Goods are owned and able to be exchanged—there are property rights, and people obey the law	Transaction costs
A8 Goods are rival—if I use it, you can't	Public goods/free riding

choices. Hence, as well as frequent market failure, there is also frequent government failure, and it is just as important not to contrast market failure against an idealized perfect state as the other way around.

In fact, markets and governments often fail in the same contexts and for the same reasons. This is why the structures of economic organization have varied so much over time and between countries.

It is why different societies end up with different mixes of "state" and "market," and there is never either a pure state-run or a pure free market economy.

The Historical Ebb and Flow of "Market" and "State"

Earlier, this chapter referred to the links between historical events, political trends, and economic ideas. Having now set out the basics of the theoretical economic framework to provide a classification of policy challenges, this section briefly locates this modern framework in its broad historical context. Later chapters also include relevant economic history. This is a UK- and to some extent US-centric account, not only because I am British but also because US and UK economists and universities have been so dominant in the discipline, meaning the experience of those two countries has had a disproportionate effect on economics. However, although the historical narrative is different for other countries, the issues and analytical principles are more universal.

The dominant view in economics concerning the role of government has shifted over time. In *The Wealth of Nations* (published in 1776), Adam Smith was advocating a greater role for market exchange because there were then many government restrictions on activity, favoring established interests, at a time when the economy was on the cusp of the huge technological and social changes of the Industrial Revolution. He set the dial in favor of markets being the preferred means of coordinating economic activity in society—hence the first welfare theorem is sometimes described as the invisible hand theorem. But modern free market advocates have often caricatured his views, omitting his emphasis on the importance of ethical values and social bonds in making markets function effectively.

Thanks to Smith and other classical economists, as economics was formalized in the late nineteenth and early twentieth century, and the theoretical welfare economics framework described above developed, the role for government came to be seen as fixing market failures in some specific ways. If you could identify an externality or a natural monopoly, then the government could in theory calculate how to fix it, although preferably in a way that would distort private choices as little as possible. For example, in his 1920 book *The Economics of Welfare* Pigou recommended a flat rate tax to raise the private cost of selling alcohol until it matched the social cost (of rowdy behavior, crime, illness). This approach is how alcohol is still taxed in many countries (see box 1.5).

Box 1.5 Pigouvian taxes on alcohol

Applying a Pigouvian tax on alcohol, to correct for externalities associated with drinking, is appealing but involves practical difficulties, including how to measure the size of the externalities and the appropriate tax rate. One challenge is that the ideal tax rate will vary between individuals, and ought to be much higher for heavy drinkers. For instance, in the US only 7% of the population are frequent binge drinkers, but they account for around 75% of the costs of excessive alcohol use. A "second best" policy would set a tax equal to the average external marginal cost across all drinkers. However, if heavy drinkers tend to choose different drinks than light drinkers (say, whiskey rather than wine), a better policy would set a higher tax on the form of alcohol preferred by the heavy drinkers. One study found that in the UK heavy drinkers indeed prefer drinks with a higher alcohol content, and are also more than three times as likely as light drinkers to switch to a cheaper type of drink (rather than drinking less) when the price goes up.* Using these differential preferences and these differential *price elasticities of demand*, it is possible to show there would be a big increase in social welfare from introducing higher taxes on high-strength spirits. The researchers also point out that this is a second best world (i.e., the optimal Pigouvian alcohol taxes could have distributional consequences); that the alcoholic beverage industry might have some monopoly power; and that government regulation is an alternative to using Pigouvian taxation.

* R. Griffith, M. O'Connell, and K. Smith (2017), "Design of Optimal Corrective Taxes in the Alcohol Market," IFS Working Paper No. 17/02.

Before the twentieth century, state capacity was more limited than it is now. Governments collected taxes, fought wars, and administered some justice, and perhaps set some standards for weights and measures. But beyond these basics most policies (including enforcement of justice, or policing of standards, but also poverty relief) operated at the local level if at all. This limited capacity is still the reality in many low-income economies. In the industrialized economies, though, the early part of the twentieth century saw a big expansion in the role of government. The Wall Street crash of 1929 and the Great Depression, combined with the steady expansion of the vote from the mid-nineteenth century on, led to growing demands for the government to manage the economy, given the dramatic demonstration of how badly things could go if left to the market.

Indeed, central planning looked rather attractive at that stage—more rational and efficient—to some economists on both left and right of the political spectrum. From the communism of the USSR to the corporatist economic policies of fascist Germany and Italy, there were many examples in the early 1930s of increasingly extensive state involvement in production and allocation. A vigorous debate took place among economists at this time, known as the "socialist calculation" debate, which explored whether a centrally planned economy could substitute for the competitive market, delivering as much social welfare. Some economists who opposed socialism on the grounds that it would reduce liberty nevertheless thought socialism would prove a more attractive and successful option than capitalism—famously, Joseph Schumpeter in his 1942 book *Capitalism, Socialism and Democracy.* On the other hand, Friedrich Hayek argued that the market is a means of decentralized information processing far superior to any possible centralized approach. In a famous 1945 article, he argued that prices are a uniquely elegant way of summarizing information and coordinating the choices of many individual consumers and producers with different preferences, or facing different costs and conditions of supply. It is impossible for any centralized planning authority to handle so much information, he argued—probably even now with vastly greater computer power and online information—but the market discovers and coordinates so that the myriad everyday goods and services are available to consumers when they want them.

This period also saw the development of national accounting in the form still in use today, in parallel with John Maynard Keynes's macroeconomics in his famous book *The General Theory of Employment, Interest and Money*. Measurement of total economic activity had begun before the Second World War with the efforts of Simon Kuznets and Colin Clark, and became imperative during the war so governments could know what resources were available for wartime production and what consumption sacrifice their populations would have to make. The construction of national accounts—including GDP/GNP—continued in the postwar era, becoming an international standard. As well as the creation of this key data, macroeconomic management was also made possible by the work on business cycles (pioneered by Ragnar Frisch) and macroeconometric models (by Jan Tinbergen and his followers). All of this important intellectual activity in economics, which later made possible macroeconomic management and the postwar welfare state, had poignantly overlapped with the rising tide of tragedy and conflict from the mid-1930s to mid-1940s.

The demands of the Second World War, when wartime needs had priority, followed by the scale of reconstruction required after the conflict ended, involved governments ever more heavily in economic planning. Many Western economies, such as France and the Netherlands, and also Japan set up planning agencies after the war in part to manage their use of the generous Marshall Plan funds provided by the United States to rebuild their damaged economies. These countries still have a strong legacy of state involvement in the economy.

Through the 1940s and into the 1950s, the scope of government economic intervention in most of the rich industrialized economies grew. The welfare state expanded, including state pensions and unemployment insurance. The state undertook house-building programs and funded more public services, such as education and health. Governments intervened more in production, nationalizing industries or individual firms, to a greater or lesser degree. The post office and communications had been government-owned in most countries from the early twentieth century or even earlier, governments always having a particular interest in what citizens were saying to each other. Many municipalities either provided utilities such as gas and electricity, water and sewage services, and local transport themselves, or privatized these essential services very early, too. However, across Europe (but not the US) the big wave of nationalization of business occurred in the 1940s through the 1970s. The UK government, for instance, nationalized car manufacturer British Leyland in 1973 and aircraft and shipbuilding companies as late as 1977.

The dominant philosophy regarding ownership of the means of production, and more broadly the economic role of the state, changed after the late 1970s. This was partly political, driven by the election of Margaret Thatcher in the UK and Ronald Reagan in the US, but events played a role. Economic thinking evolved alongside the political changes.

The ideas of market-oriented economists like Hayek had gradually become more influential over time because some of the problems with government ownership or production were growing more apparent. Thirty years of extensive state ownership in the European nations provided many examples of government failure. Chapter 3 looks at this in detail. For now it is enough to note that the profit motive in a competitive market gives private firms a strong incentive to keep costs down and to innovate. The postwar experience of nationalized industries showed they were indeed not as efficient or as innovative as private sector equivalents. Partly due to strong public sector unions or professional bodies, too, many services were run more in the interest of producers than consumers. Managers in the government sector are not held accountable by the profitability of their enterprise, and tend to get bailed out by finance ministries if they are losing money.

Right-wing politicians and think tanks promoted Hayek's approach for ideological reasons. Yet in academic economics at the same time the leading areas of research emphasized individual rational, maximizing behavior in line with the invisible hand theorems described above. What's more, one increasingly influential branch of economics, public choice theory, rightly insisted it was essential to take into account the motives and incentives of public policymakers and public sector employees. Earlier economic analysis assumed "the government" was benevolent and objective, acting in a disinterested manner to maximize social welfare. But public choice theorists (such as James Buchanan) argued that the lens of economic analysis should be applied to the incentives public sector officials and workers face and assume that, like anyone else, they respond to those incentives, acting in their own interest. This could be financial (promotion, or even corruption), or it could be growing their bureaucratic empire or getting re-elected.

Events in the 1970s helped make this case. It was a troubled decade for all the advanced economies, with OPEC increasing the price of oil dramatically, inflation trending up at the same time that many countries experienced a recession, and a sense by mid-decade that there was a crisis of capitalism. In the UK, the decade saw a growing number of strikes and pay increases and an upward wage-price spiral, culminating in the so-called Winter of Discontent in 1978–79, when a Labour government presided over rubbish piling up in the streets, power cuts, and even the dead lying unburied because of strikes by municipal workers. Mrs. Thatcher, elected in 1979, and Mr. Reagan, in office from 1981, adopted Hayek's arguments for the market and the public choice arguments against government intervention. The collapse of communism in 1989 seemed to set the seal on their economic philosophy. Soviet communism was revealed to have been an economic as well as a political and moral disaster. The fall of the Berlin Wall in 1989 underlined the point in a dramatic way: East Germans, free for the first time since the Second World War to cross the border to the west, came face-to-face with the reality that they were poorer, with less choice of shoddier products, than their compatriots in West Germany.

The 1990s and 2000s were decades of strong economic growth, technological innovation, and financial market booms. Some important low-income countries, above all China, embraced market economics and the philosophy of liberalization. This choice helped China achieve the biggest reduction in poverty the world has ever experienced. But the pendulum—in politics and in economic thinking—will swing again, and might already be doing so. The Great Financial Crisis of 2008 was not a good advertisement for the market. For one thing, real median personal income declined by about

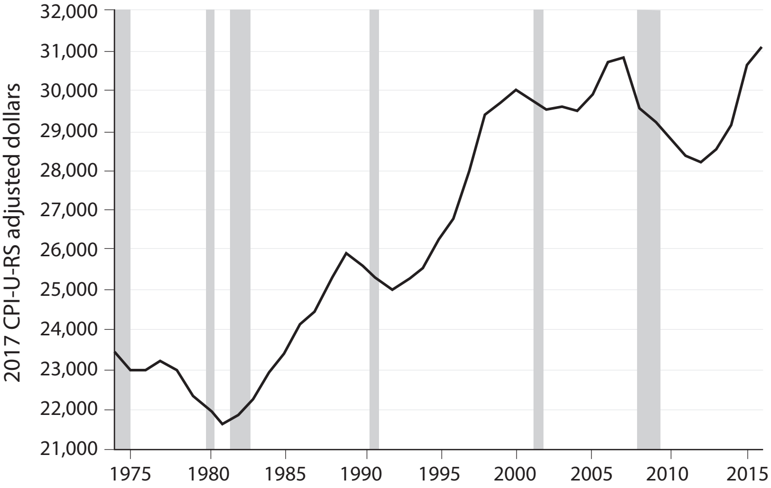

Figure 1.2. Real median personal income in the United States. Shaded areas indicate US recessions. *Source*: US Bureau of the Census.

a tenth in the US during and after the crisis, the biggest proportionate fall since the 1970s crisis (figure 1.2). Incomes also stagnated or declined significantly in many other member countries of the Organization for Economic Cooperation and Development (OECD), including those affected by the subsequent Euro area crisis.

In recent years, attention has also focused on the dramatic increase in inequality since 1980; although the rise in inequality occurred mainly in the 1980s, the fact that living standards have not improved for many people in most Western countries since (at least) 2008 has done a lot to undermine support for "free markets" (in quotes because it is an abstraction that does not exist in reality). Chapter 6 returns to the question of distribution. The discontent being expressed in elections in many countries recently is prompting some politicians to think more favorably again about state involvement in the economy. Meanwhile, in economic thought the tide some time ago turned toward emphasizing the failures of the list of assumptions set out above, with much research now looking at externalities, information asymmetries, or "non-rational" decision-making.

The moral is that the boundary between state and market has constantly ebbed and flowed, with events, political trends, economic ideas, and policy choices inextricably linked, evolving together.

Externalities and Public Goods

The swing of the pendulum can be illustrated by looking at some of the most frequently encountered market failures: the existence of externalities (assumption A5 of the fundamental theorems in box 1.4 does not hold) and public goods (when A8 is not valid). Although the analysis seems straightforward, views about what policies best tackle these market failures can vary, and for illuminating reasons.

An *externality* exists when one person's or firm's choice affects others in such a way that private and social costs or benefits diverge. Examples include pollution or CO_2 emissions from a factory, affecting the air everyone breathes and the climate; my disturbing the neighbors by holding a noisy party; a radio station whose transmissions interfere with those of another station; learning a skill that makes it more likely employers who want to hire skilled workers will locate in town; getting your children vaccinated, increasing the likelihood of "herd immunity" in the area as well as improving their own resistance to disease; joining a social network so it becomes more interesting or useful to other members. The fact that we live in societies or communities, not as hermits, means that externalities are pervasive.

One way for the government to tackle externalities is to use taxes or subsidies to equalize the private and social costs and benefits. In figure 1.3, the supply curve shows the private marginal cost of a product. As mentioned earlier, Alfred Pigou introduced the idea of a lump-sum tax (the same amount per unit of output)—known as a Pigouvian tax—to increase the private cost to equal the social cost and reduce the amount of the good consumed. It is not straightforward to calculate what the best tax rate might be, but the principle applies to "sin taxes" on alcohol and tobacco, or to a carbon tax.

A *public good* is one whose consumption is non-rival (one person consuming it does not stop others doing so too) and also non-excludable (people cannot be prevented from consuming it) (figure 1.4). Examples of public goods include clean air, street lighting, national defense, the police and justice system, public parks, roads, and public transport. Some of these are non-excludable (street lighting and defense, for example). They are sometimes referred to as

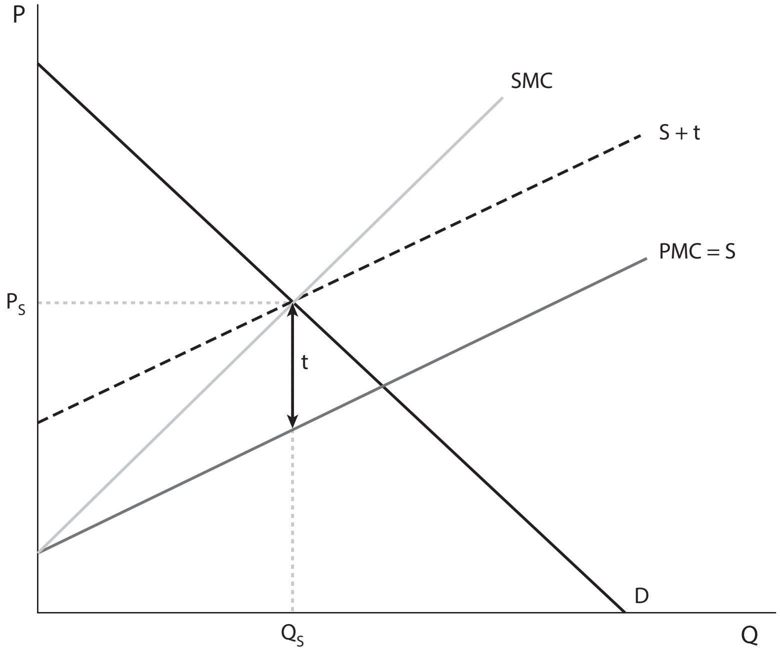

Figure 1.3. A Pigouvian tax correcting an externality. There is a negative externality, so social marginal cost (SMC) exceeds private marginal cost (PMC, the supply curve S). The Pigouvian tax t raises the supply curve to the point where it meets SMC. The price is higher and quantity produced and consumed lower than without the tax.

pure public goods. Others are excludable, although the providers might not bother to control access to them. For example, a park can be fenced in and an entry fee charged, but most towns and cities provide at least some free access to green spaces and playgrounds. Non-rival goods with limited access like this are sometimes called *club goods*: once you have paid a fee to join the club, consumption is non-rival (table 1.1). Conversely, although public goods are normally non-rival, they can become congested; roads are an example where for the most part nobody is excluded (toll roads excepted), but beyond a certain point the amount of traffic means my driving limits your ability to travel.

Public goods will be under-provided by the market: at any given quantity produced (where supply equals the first person's demand,

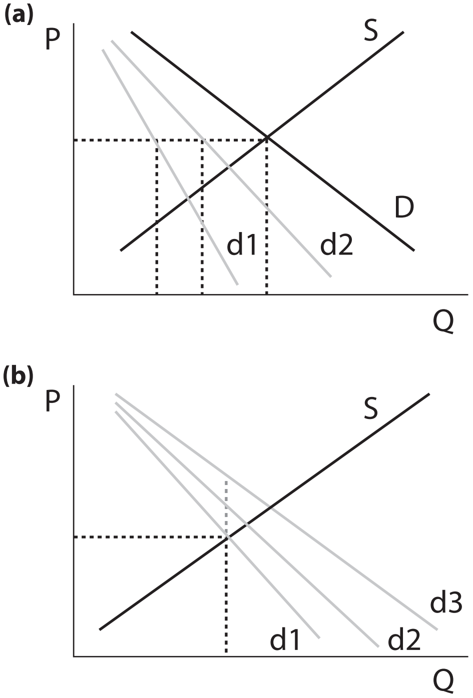

Figure 1.4. Private (a) and public (b) goods. Private goods are rival in consumption, and market demand is the (horizontal) sum of individual demand curves. Public goods are non-rival, so once the first individual demand is met, others can free ride, consuming the same output.

in figure 1.4b), additional demand could be satisfied with no adverse effect on previous users or consumers. This non-rival character means it can be difficult to finance public goods (box 1.6). There is a great temptation to *free ride*, in other words, use them without paying for them. This is why many public goods are tax-financed or at least partly subsidized or provided by the state.

The idea that the government must provide all public goods, because otherwise the free riding problem will mean they are under-

Table 1.1. Types of Goods

	Rival	*Non-rival*
Excludable	Private goods (e.g., clothes, food)	Club goods (e.g., toll roads, entry fees)
Non-excludable	Commons (e.g., fish in the sea)	Public goods (e.g., national defense, streetlights)

Box 1.6 Public goods

Public goods are non-rival (zero marginal cost of additional consumption). There is a problem of "free riding": people consuming for free the output others have paid for. Financing public goods is therefore often difficult. The classic policy is to pay for public goods from tax revenues. Textbooks often say public goods are also non-excludable—but this is misleading as excludability can take many forms, including legal enforcement. Many public goods are excludable, by various means—park gates, road tolls, license fees, spectrum licenses—and are then often called club goods. A lot of digital goods are (privately provided) public goods because of their zero marginal cost and non-rivalry, but can be excludable (passwords). If free riders are not excluded, their providers (for example, newspapers) face the problem of how to finance them now.

supplied, has been challenged, however. There are examples of public goods being financed in different ways. Lighthouses were often used as an example of a pure public good because their warning light is visible to any passing ship. Historically, however, the payment of harbor dues often financed lighthouses. Although some ships were surely free riders, any whose captain wanted to put in at the nearby port would be contributing to the cost. Some pro-market economists argue this shows private funding of a public good is often possible; examples like these are considered club goods because they are financed by a subscription-type arrangement. What is notable about this example, however, is that local authorities or institutions arranged the financing of this non-rival good. It was not exactly a free market outcome, but rather a collective arrangement—just not one involving a decision by a government official and funded by general taxes. So the debate about whether public goods must be publicly provided, or whether instead the private sector can provide them, is partly a question of what "private" means.

Another example of collective but not government provision of a non-rival good is the investment in Britain's nineteenth-century road system. This public good was organized by "turnpike trusts"—bodies composed of local dignitaries who had the right to collect tolls and the responsibility to maintain stretches of road. These were privately organized entities but supported by the government in terms of their legal basis. In a way, they foreshadowed the public-private partnerships of the late twentieth and twenty-first century. The private provision of roads is more common in some countries than others (box 1.7). Chapter 4 looks more closely at collective institutions that are neither private nor public.

It is worth mentioning, too, some special cases of public goods, known as *merit goods* and *experience goods*. Rather than being under-supplied, these goods are under-demanded. Merit goods are those considered to be good for people although they do not realize it. Party political broadcasts (note that in countries other than the US paid political advertising on television is generally restricted or banned) are one example. Nobody wants to watch them, but it is good for voters to be informed about rival parties' policies. Experience goods are those people do not know whether they will enjoy or benefit from until they try them—novels, movies, music, and other cultural experiences are obvious examples. Some such goods might require policies to encourage their use—for example, getting more reluctant people to try taking part in sports (to help tackle obesity), which leads them to discover they enjoy the activity.

There is less of a difference between public goods and externalities than it seems at first sight. To say goods are non-rival is equivalent to saying social benefits exceed private benefits. Public goods are a special case of externalities.

The same point could be made of natural monopoly industries (i.e., assumption A3 is not valid—see box 1.4), discussed further in chapter 3. Some products are referred to as *natural monopolies*, with increasing returns to scale due to high fixed costs (economies of scale in supply) or network externalities (economies of scale in demand), because there tends to be just one (or at most a small number) producing them. (Strictly, an industry is a natural monopoly when average cost declines over the entire range of output levels.

Box 1.7. Private road provision

There is great variation between countries in the private sector's role in what could be seen as a classic public good, namely, major roads or highways. In Europe, thirteen nations (mainly small ones such as Estonia and Liechtenstein) have no toll roads, and eight charge only for crossing certain bridges or tunnels. (The latter group include the Netherlands and also Sweden, whose famous 8 km Oresund Bridge—state-owned—between Malmö and Copenhagen was featured in the TV series *The Bridge*.) Among those countries with tolls, the UK has very few—one motorway and a small number of ferry or bridge crossings)—while others such as France and Italy have extensive toll road networks. Across the Atlantic, the United States has many privately owned and run roads and bridges and has recently been privatizing state-owned and -run ones—to take one instance, the Indiana Toll Road is now operated by an Australian-Spanish consortium on a 75-year lease. Such roads can be run by the government or one of its agencies, or entirely by a private operator, or privately financed and operated with a government guarantee of minimum revenues, or in some form of public-private partnership. There is a trend at present toward public-private partnerships to share risks and also overcome tight government budgets.

Crossing the Oresund Bridge. Photograph by Luc De Cleir/Pexels.

One firm producing all output is the least-cost solution. If the government doesn't provide these products itself (as many do with highways or water and sewage systems), it regulates them strictly (all utilities are regulated). Increasing returns to scale are also a special case of an externality, because when one firm increases its production other firms in the industry can benefit from the increased scale of the market.

Pigou and Coase

The "Pigouvian" way of thinking about social welfare involves the government identifying a market failure, such as the presence of externalities or public goods, and correcting it with a specific policy, such as a tax or subsidy. Other direct policy approaches to either correct externalities or provide public goods include allocating licenses (to control radio spectrum used for broadcasts and telephony, or to constrain individuals from flying drones near airports); government provision of services, such as health and education (to encourage take-up of vaccinations or other public health measures, or increase demand for educational qualifications to the benefit of employers and other workers); and regulation (to limit activities such as noisy late-night parties or dumping waste in rivers), enforced either through fines or legal action. This interventionist perspective on government actions to solve specified market failures held sway for much of the twentieth century, and of course all these types of policies are still widely deployed by many governments.

There is an influential alternative way of thinking about externalities in general and the special case of public goods in particular. This approach, associated with Ronald Coase, helped tilt policy in the direction of market solutions to market failures such as externalities and public goods.

Coase pointed out that in theory externalities are reciprocal. Take the noisy late-night party, a negative externality for the neighbors (presumed not to be invited). That could equally be seen as the stick-in-the-mud neighbors imposing their desire for quiet as an externality on people wanting to have a bit of fun. The example Coase gives in a famous 1960 paper is cattle straying onto the neighboring farm and eating the crop. The intuitive presumption is that the cattle rancher should be fined through police or courts, but this is because we are assuming the farmer has an inviolable property right to the fruits of his land. Coase asked, What if the benefit of fatter cows to the rancher outweighs the lost revenue from the corn? Why should the rancher and the farmer not privately negotiate a payment that would effectively mean the rancher renting the right for his cattle to eat corn? This could be a mutually beneficial deal. Similarly, if a factory pollutes a stream and kills the fish, we should ask whether the value of the dead fish is more or less than the cost of lost production if the factory has to stop polluting. There is theoretical symmetry in all externalities. They become asymmetric in practice when a property right is assigned to one party, and even then a private deal may be possible depending on the transaction costs of reaching the deal.

Coase therefore went on to say that if people could negotiate freely, and if transaction costs were not too high, they would sort out the allocation of the costs by themselves through market transactions, with no need for the government to step in and fix the "externality" with a Pigouvian tax or regulation. Many market-oriented economists took this to heart and have argued that there is far less of a case for government policy than implied by the assumption that market failures need fixing. Indeed, there are big variations between countries in the extent of taxes and subsidies on different products or the provision of public goods, so this is self-evidently a matter of debate.

However—as his Nobel Prize speech makes clear—Coase recognized that people would often *not* be able to negotiate, because the transaction costs of doing so are too high. What are the transaction costs? Essentially, the time and effort needed to find out the information for the transaction to go ahead. Is it easy to identify who the straying cows belong to (or which factory dumped the toxins in the river)? Could the corn farmer be lying about how much of his crop was damaged—is it easy to monitor what is happening? Are there few enough people involved that negotiation is feasible (since in life there are rarely just two parties)? It is also sometimes the case that property rights are unclear. When two airline passengers fought over the use by one of a "knee defender," preventing the other from tilting his seat backward, it might have been the case that the transaction costs of negotiating a fee with your neighbor for the right to recline—$5? $50?—are too high; but it is also surely the case that it is not clear who owns the right to the space in dispute. It is not clear, unfortunately, whether your ticket entitles you to the bit of space in front of you—which would justify your use of a knee defender—or the bit of space behind you—which would entitle you to recline your seat (although one imagines that the kind of person who would use a knee defender might imagine themselves entitled to both).

Nevertheless, the Coaseian approach has had great impact on some economists and underpins the school of economic thought emphasizing the role of the legal system in resolving externalities, or rather the disputes to which they give rise. Courts had long been the means of handling civil claims based on common law (economic torts), but the influential school of law and economics deriving from Coase's arguments emphasizes the allocation of property rights (property law) and the efficient resolution of disputes (contract law).

Coase's work underlines two key points, fundamental to public policy economics. One is the importance of the clear definition and assignment of property rights. In his example, the farmer has a property right to the land and its produce, although the rancher might be able to make him an offer that makes it worth letting the cattle eat the corn. Similarly, in the Vittel case in box 1.8, the property rights belonged to the landowners. In other circumstances, like the knee space in an airplane, a Coaseian negotiation might not be possible if it is not clear who owns the property in question.

Mostly, we take the prevailing assumptions about property rights as part of the natural order of things, yet they are entirely determined by the political and legal system, as well as by custom. For instance, when you buy a meal in a restaurant, you assume that you are buying the food, and renting the space to sit there for an hour or two, but not that you can walk out with the plates and glasses you use. The law enforces the norm, as the restaurant could call the police were you to do so. Technology often disrupts assumptions about property rights, however. The claims so often made in today's

Box 1.8. A Coaseian bargain in practice

The mineral water Vittel is bottled from springs in the Vosges region of France. From the 1970s, farming in the region became more intense and the quality of the natural spring water started to deteriorate. The presence of nitrates in the water threatened the business, but Vittel's owner, Nestlé, successfully negotiated with the forty farmers involved to pay them compensation to change their farming practices and limit the runoff that was threatening water quality. A study of the negotiation concluded that there were some important reasons for its success. There were relatively few farmers involved, and Vittel itself had bought some land upstream. Research had established that it would be more cost-effective for the company to improve upstream land management than to build a new filtration plant, so it was willing to compensate the farmers with income support, equipment subsidies, and technical training.

C. Déprés, G. Grolleau, and N. Mzoughi, "On Coasean Bargaining with Transaction Costs: The Case of Vittel," Centre d'Economie et Sociologie appliquées à l'Agriculture et aux Espaces Ruraux, Working Paper No. 2005/03, https://www2.dijon.inra.fr/cesaer/wp-content/uploads/2012/11/WP2005_3.pdf.

economy to "intellectual property" are always contentious (because, consisting of ideas, it is a public good, non-rival in consumption, costless to copy). Digital technology has made possible vast new swathes of intellectual property and a sort of gold rush to lay claim to it. Although it has sometimes been controversial, the law and economics approach inspired by Coase gives a useful perspective on the importance of intellectual property in increasingly intangible and digital modern economies, and the relative paucity of preexisting norms and case law about ownership of intellectual property. Chapter 4 returns to these questions.

Coaseian bargaining, solving through negotiation or legal action the problems created by externalities, also requires the transaction costs involved to be not too high. These include the time it takes to negotiate with all the parties involved, and the difficulty of finding out all relevant information and monitoring everyone's actions. In principle, people boarding a flight could negotiate with the people in front of and behind them to figure out who values the space more, but in practice the hassle would be too great. In his Nobel Prize lecture, Coase himself said he thought the transaction costs would often be prohibitive. He added, though: "If we move from a regime of zero transaction costs to one of positive transaction costs, what becomes immediately clear is the crucial importance of the legal system."

The presence of transaction costs is thus key in determining what arrangements a society makes for producing goods and services, and allocating resources to different uses. For instance, as discussed in chapter 7, it is relevant to the question of whether the public sector should undertake an activity or contract it out to private providers (or for that matter whether a private business should keep an activity in house or contract it out to a supplier). Is it possible to spell out in a contract or service agreement exactly what a private provider has to deliver, and monitor whether or not the contract is being fulfilled? For some activities—such as payroll, or waste collection—this is straightforward. It is hard for others, especially where there are information asymmetries—for example, it is difficult to monitor the quality of many services, such as health provision or social care, and the temptation for the supplier to cut costs (having bid for a competitive contract) will be strong.

Thinking about transaction costs also underlines that the world is not neatly and comprehensively divided into markets and government. Indeed, the idea of a "market" is somewhat ill defined in economic theory (never mind a "free" one). Microeconomic theory concerns individual consumers and producers. Yet there are plenty of organizations that are neither a private profit-making business nor a government entity. Unions, mutuals, collectives and cooperatives, parent-teacher associations, voluntary groups, non-profit corporations—all engage in some economic activities, often alongside either government bodies or private firms, or both. There is a rich array of organizations involved in collective economic outcomes, and all need to be taken into account in public policy. Much of the insight in economics into why activities are organized in one way rather than another depends on transaction costs and asymmetries of information. In another classic paper, Coase used the transaction cost approach (rather than assuming all the activities occur through market exchange) to explain why firms exist; this approach has formed the basis for much subsequent work looking at the organization of businesses and industries, and also at economic institutions in general.

Conclusion

This chapter has described the approach economics takes to assessing public policies: Do they contribute to social welfare (in the very specific sense used in economics, encompassing Pareto efficiency)? Despite the word *efficiency* and despite putting to one side distributional considerations as well as other ethical criteria, such as freedom or national pride, this is a normative standard. It takes preference satisfaction, or individual utility, aggregated in some way, as the criterion for assessing social welfare. No economist takes the standard welfare economic theorems as a realistic description, and yet this framework has set the benchmark of a competitive market as the way to think about government and market interaction. Even so, there has been considerable debate ever since Adam Smith as to the shape and scope of public policies. The next chapter looks in more detail at the government-market relationship and in particular the balance between competition and government regulation.

Annex to Chapter 1

This annex briefly describes—in non-technical form—the microeconomic theory underpinning welfare economics. Standard microeconomics textbooks (such as H. Varian, *Microeconomic Analysis*) present the technical detail. *An Introduction to Modern Welfare Economics* by P. O. Johansson focuses on the theory of welfare

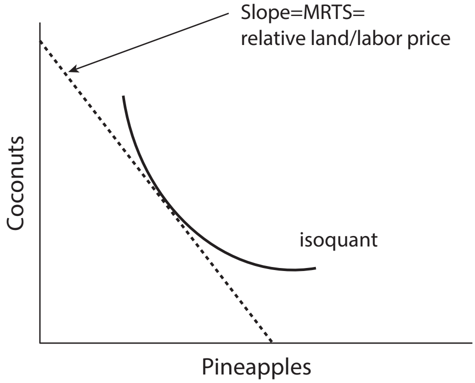

Figure 1.5. Production: isoquants.

economics in far more detail than here, in a non-technical fashion. There is a vast specialist literature on welfare economics and social choice. For those interested in how economic thought in this area has changed, Roger Backhouse surveys the evolution of welfare economics in a recent paper, “The Origins of the New Welfare Economics” (http://www.ier.hit-u.ac.jp/extra/10.Backhouse.pdf).

Here, consider a simple Robinson Crusoe economy, where the producers and consumers are the same two individuals, Robinson and Friday; there are two production factors, land and labor, and two products, coconuts and pineapples. Starting with production, *isoquants* are curves describing the mix of land and labor needed, given the production technology, to produce each output. Figure 1.5 shows the isoquant for coconuts, and there is a similar one for pineapples. Isoquants are assumed to have nice mathematical properties and are drawn as smooth curves.

Productive efficiency requires the rate land and labor substitute for each other in production be equal for both coconuts and pineapples. Otherwise more of at least one of the crops could be produced by changing the mix of inputs. This rate (known as the *marginal rate of technical substitution*, MRTS) is equal to relative factor prices, or the price of land relative to labor. The *Edgeworth box diagram* draws the two sets of isoquants with origins in opposite corners from each other (figure 1.6).

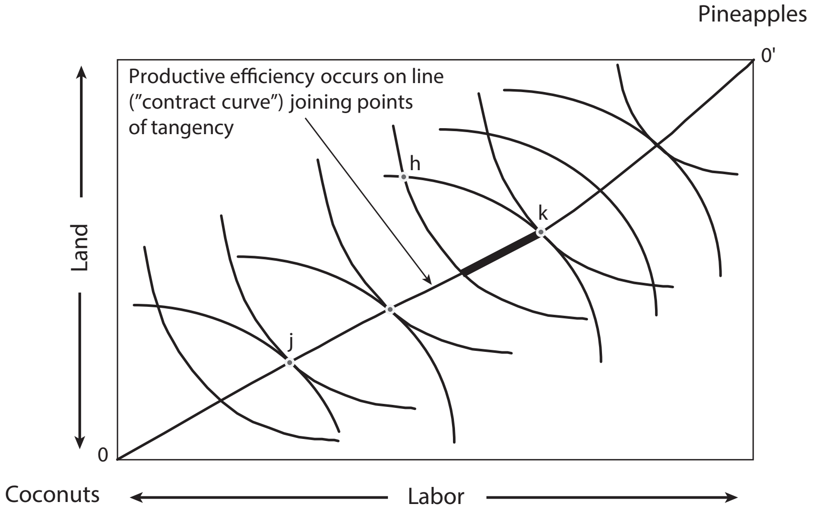
Pineapples
0'
Productive efficiency occurs on line ("contract curve") joining points of tangency
h
k
j
Land
0
Coconuts
Labor

Figure 1.6. Productive efficiency.

The curves represent isoquants showing a constant level of output of coconuts (origin at the bottom left corner) and pineapples (origin at top right corner), respectively, for varying combinations of land and labor. Productive efficiency occurs when the two sets of isoquants are tangent to each other and the tangent is equal to the marginal rate of technical substitution (and to the factor price ratio). Otherwise it would be possible to produce more of at least one output for given levels of land and labor. The line joining the points of tangency is known as the *contract curve*. Suppose the economy is starting at a point off the contract curve, such as h, which represents an initial combination of land and labor use. Any move from h toward the heavily shaded segment of the contract curve (known as the *core*) is more efficient—a Pareto improvement.

An analogous story can be told for consumption (figure 1.7). The preferences of Robinson and Friday can each be represented by indifference curves, tracing the mixes of coconuts and pineapples that deliver them a constant level of utility.

There is also an analogous Edgeworth box diagram representing allocative efficiency (figure 1.8). For any initial level and distribution of the products, the two individuals can increase their utility by

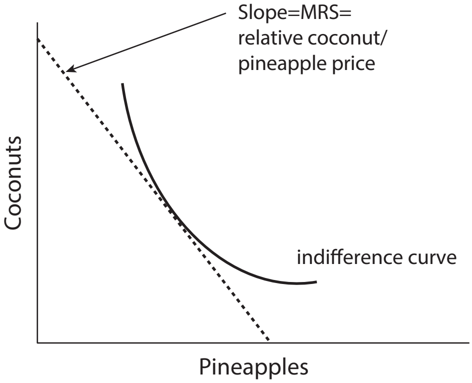
Slope=MRS=
relative coconut/
pineapple price
Coconuts
indifference curve
Pineapples

Figure 1.7. Consumption: Friday's indifference curves.

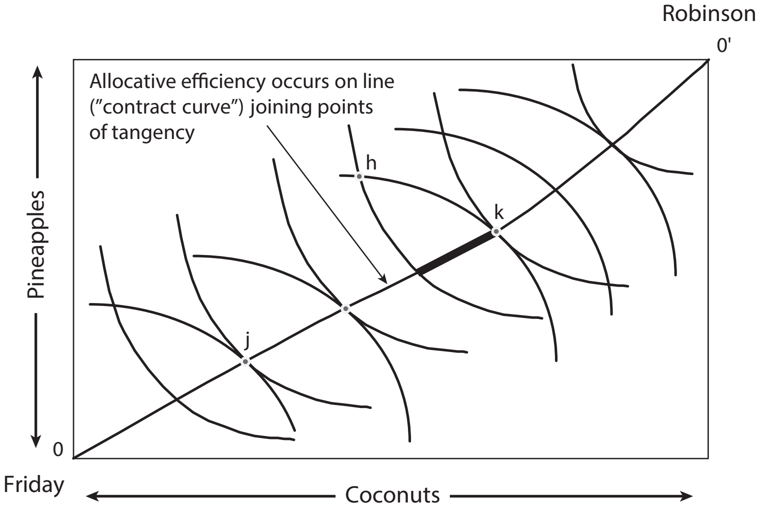
Robinson
0'
Allocative efficiency occurs on line ("contract curve") joining points of tangency
h
k
j
Pineapples
0
Friday
Coconuts

Figure 1.8. Allocative efficiency.

trading with each other, exchanging coconuts for pineapples, to the point where the *marginal rate of substitution* (MRS)—the number of pineapples per coconut they will trade—is equal for both of them.

In figure 1.8 the curves represent indifference curves showing a constant level of utility for Friday (origin at the bottom left corner) and Robinson (origin at top right corner), respectively, for varying combinations of coconuts and pineapples. Allocative efficiency occurs when the two sets of indifference curves are tangent to each other and the tangent is equal to the marginal rate of substitution (and to the relative price of pineapples and coconuts). Otherwise it would be possible increase at least one person's utility given the output of the two foods by exchanging coconuts for pineapples. Suppose the initial endowment of coconuts and pineapples is point h. Then at least one of them can be made better off by trading coconuts for pineapples until a point on the core is reached, the part of the contract curve lying between the two people's initial indifference curves. At a Pareto efficient point, this also equals the marginal rate of technological substitution of coconuts for pineapples in production.

Finally, the product mix efficiency requirement says that the rate at which coconuts can be turned into pineapples (the marginal rate of transformation, or slope of the production possibility frontier) must also equal the marginal rate of substitution in consumption.

This chapter also touched on the question of how to aggregate from individual outcomes to social outcomes. Arrow's impossibility theorem establishes that for any general possible sets of preferences, there is no way of aggregating individual utilities into social welfare while satisfying all of the following assumptions:

Pareto efficiency—nobody can be made better off without at least one other becoming worse off
Independence of irrelevant alternatives—an individual's preference between alternatives A and B is not affected by the introduction of C (so if I prefer apples to coconuts, introducing grapes does not make me prefer coconuts to apples)
Non-dictatorship—if people in the society have different preferences, there is no individual whose preferences always prevail
Unrestricted domain or universality—individuals' preferences can be specified over all the goods available

A large technical literature on social choice has probed the theorem, and a comprehensive presentation of the results is the expanded (2017) edition of Amartya Sen's classic, *Collective Choice and Social Welfare*. Sen argues in particular that aggregation can be sensibly achieved if the aggregate social welfare function does not need to

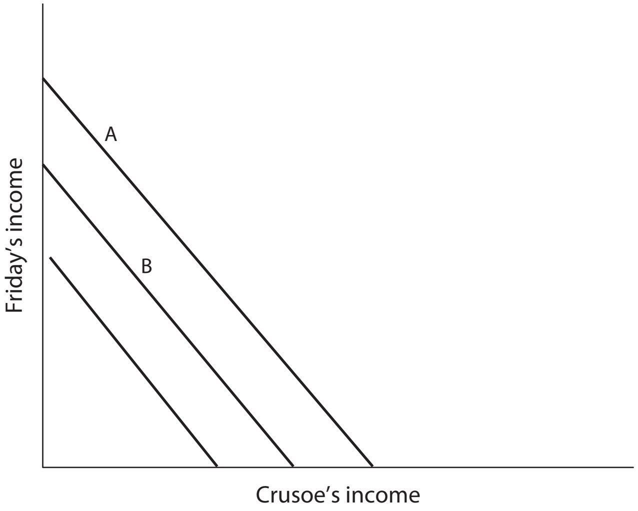

Figure 1.9. Strict utilitarian social welfare. In strict utilitarianism, people's incomes are perfect substitutes: more A is better than less B no matter what the distributional implications.

rank comprehensively *all possible* collections of individual preferences, but can confine its attention to specific issues.

Public policy economics assumes a social welfare function does exist, often implicitly and usually a variation of utilitarianism. However, different perspectives on equity can be represented by different *social welfare functions.* For example:

$$\text{Rawlsian maximin SWF} = \min(u_1, u_2, \ldots u_n)$$

$$\text{Strict utilitarian SWF} = \sum(u_1, u_2, \ldots u_n)$$

$$\text{Moderate egalitarian SWF} = \sum(u_1, u_2, \ldots u_n) - \lambda\sum[(u_1, u_2, \ldots u_n) - \min(u_1, u_2, \ldots u_n)]$$

These could be represented on a social indifference map; for instance, figure 1.9 shows the strict utilitarian set of social indifference curves.

As pointed out earlier, the often complicated theoretical apparatus of welfare economics does not stop public policy economists from a pragmatic, more or less utilitarian, approach to social welfare in their empirical work.

Further Reading

Technical Follow-Up

Ethan Bueno de Mesquita (2016), *Political Economy for Public Policy*, Princeton University Press, chapters 1–3.

Lee Friedman (2002), *The Microeconomics of Public Policy Analysis*, Princeton University Press.

Bruce C. Greenwald and Joseph E. Stiglitz (1986), "Externalities in Economies with Imperfect Information and Incomplete Markets," *Quarterly Journal of Economics* 101, no. 2 (May 1): 229–264.

P. O. Johansson (1991), *An Introduction to Modern Welfare Economics*, Cambridge University Press.

Kevin W. S. Roberts (1980), "Possibility Theorems with Interpersonally Comparable Welfare Levels," *Review of Economic Studies* 47, no. 2: 409–420.

Amartya Sen (2017), *Collective Choice and Social Welfare*, expanded ed., Penguin.

Hal Varian (2014), *Intermediate Microeconomics: A Modern Approach*, 9th ed., W. W. Norton.

Classics

Kenneth Arrow (1951), *Social Choice and Individual Values*, Wiley.

Ronald Coase (1960), "The Problem of Social Cost," *Journal of Law and Economics* 3: 1–44.

Ronald Coase (1937), "The Nature of the Firm," *Economica* 4: 386–405.

Friedrich A. Hayek (1945), "The Use of Knowledge in Society," *American Economic Review* 35, no. 4: 519–530.

R. G. Lipsey and Kelvin Lancaster (1956), "The General Theory of Second Best," *Review of Economic Studies* 24, no. 1: 11–32.

Paul Samuelson (1947), *Foundations of Economic Analysis,* Harvard University Press, chapter 9.

Joseph Schumpeter (1942), *Capitalism, Socialism and Democracy*, 5th ed., Harper. (1976 edition, George Allen and Unwin.)

On the Scale of Government Intervention in the Economy

Wilfred Beckerman (1986), "How Large a Public Sector?" *Oxford Review of Economic Policy* 2, no. 2: 7–24.

On Welfare Economics

Sam Bowles, Alan Kirman, and Rajiv Sethi (2017), "Friedrich Hayek and the Market Algorithm," *Journal of Economic Perspectives* (Summer).

Francis Spufford (2011), *Red Plenty*, Faber. (A novel comparing the planned economy USSR and the free market USA in the 1950s.)

On Historical and Political Forces

Daron Acemoglu and James Robinson (2013), "Economics versus Politics: Pitfalls of Policy Advice," *Journal of Economic Perspectives* 27, no. 2: 173–192.

Diane Coyle (2015), *GDP: A Brief but Affectionate History*, revised ed., Princeton University Press.

Wayne Leighton and Edward Lopez (2012), *Madmen, Intellectuals, and Academic Scribblers: The Economic Engine of Political Change*, Stanford University Press, chapters 1–3.

On Externalities and Public Goods

Ronald Coase (1991), Nobel Prize lecture, "The Institutional Structure of Production," http://www.nobelprize.org/nobel_prizes/economic-sciences/laureates/1991/coase-lecture.html.

Ronald Coase (1974), "The Lighthouse in Economics," *Journal of Law and Economics* 17, no. 2 (October): 357–376.

Tyler Cowen, "Public Goods," http://www.econlib.org/library/Enc/PublicGoods.html.

Timothy Tayor, "Pigouvian Taxes and Bounties," http://conversableeconomist.blogspot.com/2017/03/pigouvian-taxes-and-bounties.html.

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