

Chapter 4

Markets

Just as communities differ from one another, markets differ from one another. Markets come in so many varieties, that it makes good sense to determine their ideal form and examine why and how actual markets differ from the ideal.

Ideal markets

Economists refer to departures of markets from their ideal form as ‘market failure’. Each kind of market failure offers society a reason to explore how other institutions, such as households, communities, and government, could improve matters. The argument works the other way too. Understanding ideal markets enables us to uncover clues as to how markets could improve matters in situations where households, communities, and government don’t work so well. Of course, all this presupposes that ideal markets are a good thing. One of our tasks here is to explore the sense in which they are a good thing.

A single market

It helps to begin the formal study of markets by isolating a commodity and developing the account of an ideal market for it. Let us denote the commodity as X . For concreteness, we will suppose that X is a non-durable consumption good, meant for consumption now. As we are studying ideal markets, I assume that X is a private good, implying that there are no externalities associated with its consumption or production. For convenience I will use X also to denote its quantity.

Imagine that there are many firms that could potentially supply X and many households that are potential consumers of X . Firms are owned by households. By a *market* for X we mean a clearing house for X . Firms bring their supplies of X to the market and households arrive there to make their purchases of X . As the markets for goods and services are interconnected (the demand for tea would be expected to increase if the price of coffee was to increase), we would be justified in studying the market for X in isolation only if (i) the resources devoted to the production of X are small compared to the resources devoted to the production of all the other goods and services in the economy, and (ii) the expenditure on X by each household is but a small fraction of its total budget. We make both assumptions here and suppose in addition that all other goods and services are transacted in their own markets. Assumptions (i) and (ii) imply that the prices of all other goods and services are pretty much uninfluenced by what happens in the market for X . That being so, we can value the remaining goods and services in the economy in terms of their prices and sum them so as to create an aggregate index in terms of which X is priced. Let us call that index *wealth*, expressed in, say, dollars. In the language

of economics, wealth is our *numeraire*. Purchases and sales of X take place at the price quoted in the market for X .

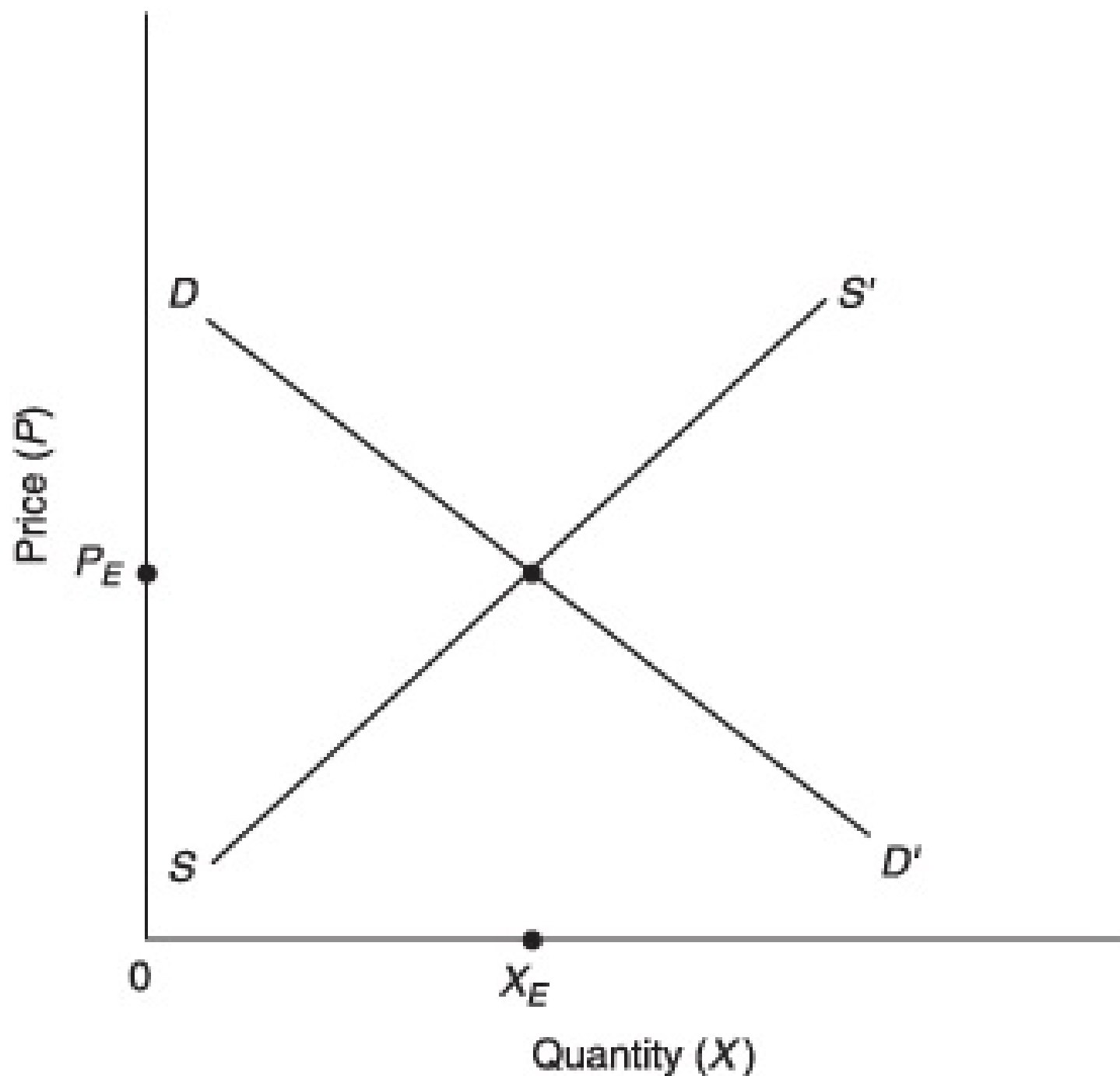
You will no doubt have noticed the circularity in the reasoning I have deployed here. How can we justify assuming in advance of any analysis of the market for X that the production and purchases of X involve, respectively, only a small proportion of the economy's resources and only a small proportion of each household's budget? By now though, you will have grown used to circular reasoning in economics (Chapter 2). Our previous discussions have shown us that it is a powerful method of analysis. Here we have begun by assuming (i) and (ii). If we now were to discover empirically that near an equilibrium of the market for X (defined below) the assumptions are correct, the basis for the analysis will have been justified.

In an ideal market households and firms are all price-takers. We may imagine that an auctioneer cries out the price of X and that firms and households make their respective decisions on the basis of that price. The quantities purchased by each household and sold by each firm are assumed to be verifiable, as is the quality of X . Payments are enforced by an external agency (government). People neither steal X nor renege on their payments for X . If they tried to do either, they would be caught and punished by the enforcer (Chapter 2).

Suppose the price of X is P . By a household's *demand* for X we mean the quantity of the good it would wish to purchase at P . If a household's willingness to pay for each unit of X declines as the number of units it purchases increases, it would demand the good to the point where its willingness to pay for the marginal unit of X equals P . (If it demanded more, the household would have to pay more than it was willing to pay for the last unit demanded, meaning that the household would reduce its demand; whereas, if it demanded less, the household would be paying less than it was willing to pay for the last unit demanded, meaning that it would demand still more.) As X is a private good, the *market demand* for X at price P is the sum of all household demands at P . We have just argued that if P were 'high', market demand would be 'low'; if it were 'low', market demand would be 'high'. This feature gives rise to a downward sloping market demand curve, drawn hypothetically as DD' in Figure 8. Market demand for X is measured along the horizontal axis, while P is measured along the vertical axis.

It can be that firms own different technologies for producing X . We suppose, though, that all technologies display diminishing returns in production, by which I mean that the cost of producing an additional unit of X (the cost being computed at the prices that prevail for all the inputs required to produce X) increases if the quantity produced was to increase. As firms are owned by households, the objective of every firm is to maximize its profit in the market for X . By a firm's *supply* of X at P we mean the quantity it would be willing to sell at P . A firm would produce the good to the point where the cost it incurs for the last unit produced – its *marginal cost of production* – equals P . (If the firm produced more, it would make a loss on the last unit it produced, which means that it ought to reduce production; whereas, if it produced less, the firm could increase its profit by producing a bit more.) In short, each firm would plan to produce to the point where its marginal cost of production equals P . The *market supply* of X at P is the total quantity of X that all the firms in the economy are willing to supply

at P . We have just argued that if P were 'high', market supply would be 'high'; if it were 'low', market supply would be 'low'. This feature gives rise to the upward sloping market supply curve, drawn hypothetically as SS' in Figure 8. Market supply of X is measured along the horizontal axis, while P is measured along the vertical axis.



8. Demand and supply curves

Figure 8, which was the creation of the economist Alfred Marshall, brings together what is probably the most famous pair of curves in all of economics: the demand and supply curves. The curves intersect at a unique point (X_E units of the good, at price P_E), which is an *equilibrium* of the market for X . It is an equilibrium, because at P_E , market demand equals

market supply, implying that the market for X clears. Economists frequently add the adjective ‘competitive’ to the word ‘equilibrium’, because, as the market being studied involves many firms, they are all price-takers. Which is why we say that P_E supports a *competitive equilibrium* in the market for X .

Notice how closely the concept of a competitive equilibrium resembles the notion of an equilibrium in the communities we studied earlier. At P_E , those who wished to be active participants in the market for X – whether as suppliers or purchasers – discover that their intentions can be carried out. Those who chose not to enter the market at that price discover that they were right not to have entered: the market clears at P_E , leaving nothing over which anyone could bargain. P_E enables a set of expectations on the part of households and firms to be fulfilled. Notice too the parsimony of information that households and firms need to have in order to participate effectively in the market for X . A household needs to know its own ‘mind’ (that is, what it is willing to pay for the good) and the price P . It doesn’t need to know anything about other households, nor about the cost conditions facing firms. Similarly, a firm needs only to know the technology available to it, the prices it has to pay for its inputs in production, and the price of X . It doesn’t need to know anything about households’ willingness to pay, nor anything about the technologies of rival firms. The equilibrium price, P_E , acts as a coordinating device for allocating X and the resources needed to produce X . P_E is an emergent feature of the market for X .

In what sense is the market I have just described ‘ideal’? It is ideal in the sense that the equilibrium supplies and demands would have been chosen by a planner (or regulator), whose objective was to promote household interests by maximizing their joint wealth, and who proceeded to do just that by instructing each firm on how much X to produce and each household on how much X to consume. The proof requires a little bit of patience, but is worth rehearsing. Let us suppose first that the plan the regulator proposes is one in which the marginal costs of production of a pair of firms, 1 and 2, differ; say, the marginal cost for firm 1 exceeds that for firm 2. Total wealth could be increased by a slight change in the regulator’s plan: reduce firm 1’s output by one unit and raise firm 2’s output by one unit. Total output would remain the same, but it would be produced more cheaply, thus increasing the total wealth of households. So, the regulator’s best plan – we will call it the *efficient* plan – would involve equality in the marginal cost of production among all those firms that are instructed to produce X .

Turning to households, let us suppose that the plan the regulator proposes is one in which the willingness to pay for the marginal units to be purchased by a pair of households, say 1 and 2, differ. Imagine that household 1’s willingness to pay for the marginal unit it is to consume exceeds that of household 2. Total wealth could be increased by a slight change in the regulator’s plan: reduce household 2’s consumption of X by one unit and raise household 1’s consumption by one unit. No additional resources would be involved in this reassignment; but total wealth of households would increase, because household willingnesses to pay are

measured in terms of wealth. So, we have proved that the efficient plan involves equality in the marginal willingness to pay among all households. A similar argument shows that the efficient plan also has the property that each household's marginal willingness to pay equals each firm's marginal cost of production. But the regulator would want to ensure that the total quantity produced equals the total quantity consumed. (Wealth would be wasted if total production exceeded total consumption; and the whole purpose of the planner would be frustrated if total production fell short of total consumption.) It is simple to confirm that there is a unique plan satisfying each of the above requirements.

Let the common value of the marginal costs of production and the marginal willingnesses to pay be P . The regulator could implement the efficient plan by setting the price of X at P and requiring that households and firms transact on the basis of P . That P is, of course, the P_E of [Figure 8](#). This completes the proof.

Although highly abstract, what I have sketched here was the basis of a far reaching debate that took place among economists during the 1930s: markets versus central planning. Advocates of the institution of central planning, such as Oscar Lange and Abba Lerner, argued that an enlightened planner could help to realize all the virtues of markets while avoiding the weaknesses of actual markets, such as lapses from competition. The term *market socialism* has been associated with the Lange-Lerner vision. Advocates of markets, such as Friedrich von Hayek, argued, on the other hand, that the equivalence in the *outcomes* achieved doesn't amount to an equivalence in the amounts of *information* required in the two systems for achieving the desired outcome. Von Hayek observed that enlightenment on the part of the central planner in market socialism amounts also to omniscience. If the planner is to implement the efficient outcome, he or she needs to know each household's demand curve and each firm's supply curve. That's a lot of information. How is the planner to obtain it? Perhaps by sending polite questionnaires to households and firms. But why should respondents tell the truth about themselves and their circumstances? Even if ingenious mechanisms could be devised for eliciting that information, there are costs involved in collating and transmitting the information. Markets are far more parsimonious in the use of information.

One can argue though that the job of the planner shouldn't be to mimic the market, but to select policy weapons (such as taxes and subsidies) that require less information than is available to an omniscient being. Even with limited knowledge, a planner could help to bring about states of affairs that are superior to those brought about by unbridled markets ([Chapter 8](#)).

Interdependent markets

Marshall's famous demand and supply curves mislead in one important way. [Figure 8](#) could lead one to think that in an ideal market, the equilibrium price of X is unique. We confirmed that it is unique (it was P_E), but we had assumed the prices of all other goods and services in the economy to be given. If those prices were to be different, the demand and supply curves of X would be different, which in turn would imply that the equilibrium price would be different. But all those other prices depend on demand and supply in their respective markets. As

markets are interdependent, we should study them together, not one by one, separately.

We continue to assume that transactions are verifiable, as is the quality of the goods produced, sold, and bought. In other words, ideal markets don't suffer from problems of adverse selection and moral hazard. Moreover, markets open *now* for *every* commodity, including primary factors of production, intermediate goods, and final consumption goods. Most commodities would be future goods, which means that contracts over their purchases and sales are signed in *forward* markets. Contracts in forward markets involve agreements over purchases and sales today for delivery at specified future dates. Saving and investing for the future and borrowing from the future would take place in those markets. Many of the commodities would be contingent goods. Contracts over their purchases and sales would be signed in *contingent* markets. Contracts in contingent markets involve agreements over their purchases and sales today for delivery at specified future dates, *if and only if* certain contingencies arise. The purchase and sale of insurance would take place in contingent markets. There is uncertainty about future events, but in contingent markets people are able to purchase or sell goods and services at quoted prices that are tied to each and every eventuality. As payments have to be made now, no one faces uncertainty over their budget, nor do firms face any uncertainty over their profits.

What is the point of studying a world in which there is a market for every conceivable good? There are three reasons. First, studying it enables us to appreciate that certain features of economic life in the world we live in arise because of missing markets (such as bankruptcy; performance-related pay; limits imposed on you by firms on the amount of insurance or credit you can purchase even if you have the resources to buy more; unemployment (see below)). Second, we can gauge how much societies lose from the fact that there are missing markets. And third, we can explore policies and institutions that could partially compensate for the absence of certain markets. That is why it makes sense to begin the study of interdependent markets in our world by investigating a world where there is a competitive market for every commodity.

We are studying a private ownership economy here. Firms are owned by households. Firms' profits are distributed to households on the basis of the shares they own. Each household has a legal right also to a set of commodities (their human capital). Therefore, for any given set of prices, each household is able to compute its wealth. Households are price-takers and are obliged to purchase goods and services they can afford: their total expenditure must not exceed their wealth. Firms are price-takers and choose their production outlays so as to maximize their profits, which in the present context means the capitalized value of the flow of profits. (Traders can be thought of as firms too. Their purchases can be regarded as 'production' inputs, their sales as outputs.) A *market equilibrium* – economists call it a *competitive equilibrium* – is a set of prices quoted today for each and every commodity, such that the total demand for each equals its total supply. In equilibrium the information households and firms need to have in order to participate effectively is parsimonious. A household needs to know its own 'mind', its endowment of goods and services, and the equilibrium prices – nothing else. Similarly, a firm needs only to know the technology available to it, the prices it has to pay for

its inputs in production, and the prices of whatever it produces – nothing else. Equilibrium prices coordinate the production and allocation of all goods and services (who produces what and who consumes what).

Are there circumstances in which an equilibrium exists? Economists' search for an answer to the question has a history, dating back to the 19th century. The definitive answer was provided in the early 1950s, when several economists identified conditions (on households' and firms' characteristics) under which a competitive equilibrium exists. It was also shown that there is a close, but subtle, connection between the notion of a competitive equilibrium and that of an equilibrium agreement in a community ([Chapters 2–3](#)).

Excepting under very special circumstances, a competitive equilibrium is not unique. It isn't unique for much the same sort of reason as why equilibrium outcomes in communities are not unique ([Chapter 2](#)). Agreements in communities are mutually enforced by the use of social norms. The existence of more than one communitarian equilibrium reflects the fact that there is usually more than one set of self-confirming beliefs that people can harbour about one another's intentions. In ideal markets, agreements between buyers and sellers are enforced by the state exercising the rule of law. The existence of more than one competitive equilibrium reflects the fact that there is usually more than one set of prices at which demands for goods and services equal their supplies. Beliefs in communities and prices in markets are emergent features in two very different types of institutions. In [Chapter 2](#), I explained the sense in which we don't yet have a satisfactory understanding of how beliefs form. You shouldn't be surprised that we don't yet have a satisfactory understanding of how prices would emerge in ideal markets.

The efficiency of ideal markets

Even though equilibrium in a market economy isn't unique, every competitive equilibrium is 'efficient'. As we are now studying all the markets together, the notion of efficiency is not as simple as in the market for a single commodity (X), but it can be stated in words.

By an *allocation* of goods and services we mean a complete specification of who produces what and who consumes what. We say that an allocation is *feasible* if, given the economy's endowments of assets, it can in principle be created in the economy. Let α be a feasible allocation. We say that α is *efficient* if there is no feasible allocation that *all* households would choose over α . The concept was introduced by the economist-sociologist Vilfredo Pareto, which is why efficiency in the above sense is widely known as *Pareto-efficiency*. It can be shown that a competitive equilibrium is Pareto-efficient.

As with households, so with nations. If there were no restrictions in international trade, competitive equilibria of the world economy would be Pareto-efficient. Details aside, this is at the heart of the theoretical case for free trade.

Market failure

Just as communities can fail to advance the interests of their members, markets can fail to allocate resources well. What households are able to achieve even in ideal markets depends on what they bring to the market place. Presumably, some households would be poorly endowed in goods and services, others richly so. Those endowments are inheritances from the past and they influence the outcome in the market place. Even though market allocations in competitive equilibrium are Pareto-efficient, they aren't necessarily equitable or just. It shouldn't be surprising that Pareto-efficiency is silent on distributive justice. Equity and efficiency are different ethical properties of allocations. An allocation of goods and services where one self-regarding household is assigned everything is Pareto-efficient, whereas an allocation in which households have equal shares is more equal. An allocation could be at once egalitarian and not be Pareto-efficient; it could be both egalitarian and Pareto-efficient; and there are allocations that are neither egalitarian nor Pareto-efficient. It is this sort of reasoning, though abstract and technical, that lies at the heart of a widely accepted role for government ([Chapter 8](#)): devising and implementing policies that would be expected to bring about outcomes that are Pareto-efficient (for practical purposes, read 'tolerably non-wasteful') and egalitarian (for practical purposes, read 'free of hunger, ill-health, and illiteracy').

Even if we were to leave distributional issues aside, markets don't operate ideally in the world we know. Why? Three reasons stand out. First, as the production of public goods is vulnerable to the free-riding problem, markets are less than effective in supplying them. That said, there are deeper problems than 'free-riding' in the case of public goods. Take the rule of law, which is a public good. In the absence of the rule of law markets couldn't function ([Chapter 2](#)), which means that it would be absurd to allow it to be a marketable commodity. There are also cases involving environmental services ([Chapter 7](#)), where market transactions create externalities that can't be eliminated no matter how audaciously the state tries to redefine private property rights.

Monopoly

The second reason is that in some industries there is a single producer (monopoly) or at best only a few producers (oligopoly). Firms in an ideal market don't have anything left over after every production input has been paid for (wages, salaries, raw materials, repair and maintenance, charges imputed to machinery and equipment, interest payments on loans, and so on). Because a monopolist doesn't face competition from other firms, it's able to charge a price higher than P_E ([Figure 8](#)) and enjoy a profit.

Monopolists have a bad press in consequence. However, we need monopolists because profits from sales are the incentives firms must have if they are to spend resources in research and development (R&D), so as to create new products and invent cheaper ways of producing old products (which is a good thing). Moreover, monopolists try to maintain their leading position by engaging in R&D, thereby forestalling entry by rivals (a not-so-good thing). Unless they are curbed, though, monopolists would wish to more than just recoup those R&D expenses. In rich countries anti-trust laws have been legislated so as to prevent firms from doing that.

Monopolies are a necessary evil for another reason. There are commodities whose cost of

production per unit produced declines with output. Economists call this phenomenon *economies of scale*.



9. A shopping mall in Becky's world

Infrastructure (road networks, rail tracks, power, sewage systems) provides examples. Communities can't afford to produce them because communities are small. In contrast, the market would produce them if its reach was large enough and the costs of collecting fees from users was small enough. A firm that produces infrastructure has to be large in order to enjoy low production costs. So private producers of infrastructure are often monopolies, or at best oligopolies. As Becky's world has grown richer and the reach of the market has widened, societies there have increasingly relied on private firms to supply infrastructure even as they have directed their governments to regulate producers in order that they don't earn monopoly profits. Transport networks are a case in point. Of course, when households make use of such

infrastructure as a modern sewage system, they confer benefits on others (positive externalities), which may be why in Becky's world the local government usually provides the service. In Desta's world infrastructure, such as durable roads, are often absent because of a vicious causal circle: in the absence of a reliable network of roads, markets can't extend their reach; in the absence of markets, households are unable to engage in anonymous transactions; and because government corruption is rampant in the construction sector, roads that would last don't get built; so households remain in poverty.



10. A market in Desta's world

Macroeconomic fluctuations

The third reason markets are far from ideal arises from a fact we noted earlier, that markets can support transactions only when transactions are verifiable. Markets for different qualities of a product, for example, can form only if quality can be verified. Moral hazard and adverse selection prevent markets from being formed, which is why few forward and contingent

markets exist in the world we know. Households and firms are obliged to make decisions on the basis of the current value of their assets, the spot prices they face for goods and services, and the expectations they harbour about the prices (including wages) they will face when spot markets form in the future. As expectations can be held together by their own bootstraps, there can be more than one set of self-confirming expectations in the short run. Some lead to a reasonable utilization of the economy's productive capacity, others to slumps.

Analyses of slumps are the stuff of *macroeconomics*, which is concerned with the study of (national) economies considered in aggregate terms ([Chapter 1](#)). Historically, though, macroeconomics as a subject was devised to study *short-run* fluctuations in aggregate economic activity as measured in terms of such indices as output (GDP), employment, and the price level (which is the level of commodity prices, in the aggregate, in terms of money).

What are those fluctuations? Consider that since the Second World War, Becky's world has enjoyed improvements in the standard of living in a fairly uninterrupted way ([Chapter 1](#)). But GDP has been periodically less than potential GDP, which is the aggregate output the economy would have produced if all the installed machinery, equipment, and all the available labour force at the time were to have been employed. During the Great Depression of the 1930s, the economic slump in Europe and the US was so deep that not only did factories and equipment lie idle, some 25–30% of the labour force couldn't find a job in the market place. What is the explanation behind slumps and the labour unemployment that can go with them?

Economists have offered many explanations. They are often seen as reflecting different schools of thought: Keynesian, new-Keynesian, Classical, new-Classical, Real Business Cycle theories, and so on; which is as it should be, because it would be most odd if all slumps were the same. Throughout the 1990s that post-war economic miracle, Japan, experienced an economic slump that has only now begun to show signs of ending. Over the past decade the official unemployment rate in France and that other post-war economic miracle, Germany, has been about 10%, while in the UK it has been 4–5%. The unemployment rate in the US has been in the region of 6% for a number of years. As you might expect, the countries differ in regard to labour laws, taxation, unemployment benefits, and social security; and Germany reunified at the beginning of the 1990s. Countries in Becky's world differ also in the mundane matter of what criteria to use for registering someone as unemployed. We should be astonished if one account could cover all slumps. Limitations of space forbid that we discuss macroeconomic fluctuations and the government's potential role in smoothing them at a high level of economic activity. That's a subject deserving of its own very short introduction. Nevertheless, it will be instructive to sketch a model that shows how that ubiquitous mental state, *expectations*, can play a role in bringing about slumps in the market place.

So consider a situation where, for one reason or other (perhaps because of rumours: [Chapter 2](#)), producers believe demand for their products will be low. It would then be in each producer's interest to cut back production, run down inventories, and reduce the demand for labour. If the supply of labour is constant, there would be excess labour in the market place. If adjustments occur quickly, wages would fall. But if wages fall, then incomes fall, which then

leads to a decline in the demand for goods and services at the level of prices with which we began our account. That decline in turn causes the price level to fall. But lower prices lead employers to lower their demand for labour, so that the original short-run expectations on the part of employers are confirmed. To put it another way, when producers expect prices and wages to move together, aggregate output doesn't respond much to a change in the price level. Each producer heaves a sigh of relief that he hadn't made a mistake in his (short-run) economic forecast, but would be justifiably anxious that times were bad.

In contrast, suppose for one reason or other producers believe demand for their products will be high. Then it would be in each producer's interest to maintain (even raise) production and build up inventories. An analogous piece of reasoning suggests that such beliefs could be self-confirming in the short run. Each producer would heave a sigh of relief that he hadn't made a mistake in his economic forecast, and would feel justifiably jubilant that times were good.

Problems are exacerbated if prices or wages are sticky. The economist Joseph Stiglitz has shown that the phenomena of moral hazard and adverse selection in the labour market can create conditions where real wages are rigid in the downward direction. If the real wage for a particular type of work is downwardly rigid and the demand for workers at that wage is less than the supply, obviously some workers will fail to get hired. Those who are fortunate to be hired are better off than those who are rejected. Economists call that state of affairs *involuntary unemployment*, to distinguish the situation from one where, say, someone is temporarily unemployed because he is searching for a better job than the one he had earlier. That wage rigidity will not bite if producers, buoyed by high expectations, demand lots of labour. which is why exuberant expectations can lift an economy by their own bootstraps to full employment.

John Maynard Keynes, Michal Kalecki, and Bertil Ohlin were prominent among those economists who, in the 1930s, recommended active government engagement for reviving depressed economies. Their ideas were extended greatly by the economists James Meade, Paul Samuelson, and James Tobin, among others. One way to interpret the need for fiscal and monetary policies during severe slumps (taxes and subsidies, public investment, interest rates, credit facilities) is that they help to change the expectations people hold about the future. But finding the right combination of public policies can be a nightmare: different slumps require different palliatives, which is why macroeconomic stabilization continues to be a controversial subject.