SCHOOLS BRIEF

Missing markets

Markets can fail to work as well as they should for all sorts of reasons. These briefs have shown, through a series of examples, how too few buyers and sellers, too little information or misguided government interference can be the enemies of economic efficiency. But markets can also fail for a much simpler reason: sometimes, they aren't there when you need them

Suppose you own a semi-detached house in a leafy suburb of London. Last week, your neighbour, a retired civil servant and keen stamp collector, moved to Bournemouth. This week, a gang of Hell's Angels moved in, intending to make the house an all-night bar and motorcycle repair-shop. Your house used to be worth around £120,000. Until your new neighbours move out, it is worth closer to £1.20. Your net worth has been clobbered by an economic externality.

Consider a more general example. A coal-fired power station produces not just electricity but also large quantities of airborne sodium dioxide and nitrogen oxides. These react with water in the air to produce acid that rains back to earth—not, unfortunately, within the boundaries of the plant, or selectively on the gardens of the people who consume the electricity produced, but on everybody else as well.

Market spills

An externality, sometimes called a spillover, happens whenever a transaction delivers costs or benefits to people who were not party to it. That is a broad definition. It covers "goods" as well as "bads". If you live next door to a derelict house, the value of your property goes up when your neighbour decides to restore it; but your neighbour takes no account of that when deciding whether to make the improvements. The definition covers spillovers that happen as a result of production (eg, electricity) as well as those caused by consumption (eg, home-improvement). No category of economic decision is immune.

Spillovers cannot be dismissed as a matter of luck, with little or no economic significance. The fact that they happen strikes at the core of microeconomics. To see why, go back to the electricity example, and suppose that electricity were produced in a competitive market—one that satisfies the standard requirements for economic efficiency. The pattern of costs and demand would then fix the price, in the way described in the first brief of this series. But those costs do not take account of the hidden cost of pollution. Electricity bills therefore ignore it too. If its price reflected that extra cost, electricity would be dearer, and people would consume less of it.

In other words, when spillovers happen, free markets cannot be relied upon to carry out their task of organising the economically-efficient amount of output at the economically-efficient price.

Figure 1 shows how to assess the economic loss that an externality-in-production can cause. The supply curve, familiar from the first brief, shows the marginal cost of production at different levels of output. But it takes account only of private costs—those borne by the producers. The SMC-curve adds on the social cost of pollution, so it is higher. The vertical distance between the curves is equal to the marginal cost of the spillover.

As drawn in figure 1, the SMC-curve has the same slope as the S-curve, implying that each extra unit of output causes the same increase in pollution, and that each extra unit of pollution is as damaging as any other. In many instances, it would be more realistic to assume that (a) the amount of pollution per unit of output, and (b) the damage caused per unit of pollution, both rise along with output. If so, the SMC-curve would be steeper.

The D-curve represents demand for the good which the industry produces. As price falls, output demanded rises, so the curve slopes downwards. Enter market forces. The industry weighs its private costs against the pattern of demand—ignoring the public cost of pollution, which it does not have to bear. It therefore chooses to produce Qp and sell it at a price of Pp. If the market took the true economic costs of production into account, the industry would produce less and charge more—Qs and Ps, respectively.

Now to add up the economic losses. A scientist might estimate them by listing different kinds of damage, and attaching values to them: the cost of stunted trees, dead fish, sick people, corroded buildings and so on. In figure 1, the whole area between the S-curve and the SMC-curve corresponds to this measure of the "costs" of pollution.

That, however, is not the same thing as the economic cost. Remember that as long as the (social) benefit of producing extra output is higher than the (social) cost, it makes sense to increase output. Taking pollution into account adds to the measure of cost, but that rule—raise output until the increase in costs outweighs the increase in benefits—still stands.

Figure 1 shows how to compare these costs and benefits. The SMC-curve shows the social costs of production. The demand curve implicitly measures the benefits of consumption, because it shows the price that consumers are willing to pay. As long as the D-curve is higher than the SMC-curve, therefore, it makes economic sense to expand production—though doing so adds to the costs of pollution. It is only at levels of output higher than Qs that the gap between private cost and social cost (ie, between the curve and the SMC-curve) beg to score as an overall econor loss. The "deadweight lo caused by the spillover is rep sented by the shaded ar XYZ—much less than the sci tist's measure of polluti damage.

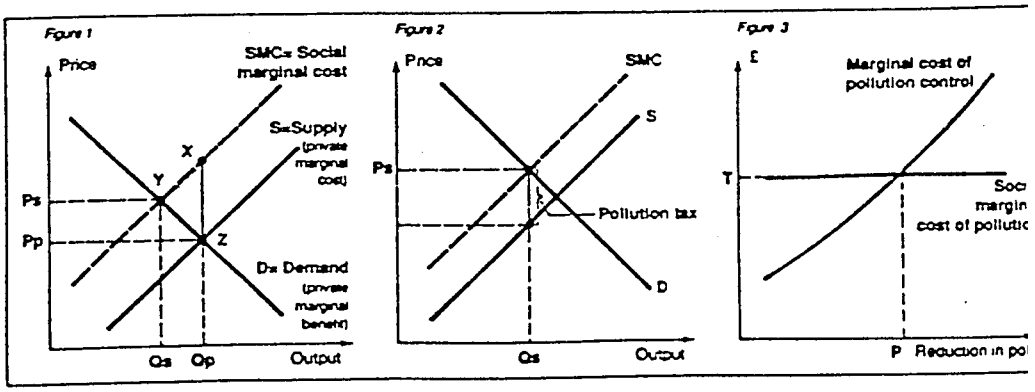
Property wrongs

This way of measuring losses c to spillovers—and especia those caused by pollution—l implications for government pc cy. First, though, pause to cc sider a more fundamental poi Why do externalities happe The examples above give c answer: when social costs a benefits diverge from priv costs and benefits. But that me ly begs another question: wl causes the divergence? What i about these social costs and be fits that prevents markets fr taking them into account?

According to a celebrated p per by Mr Ronald Coase, a B ish economist, the answer is l than you might think. The Co theorem says that whenever ternalities occur, the affect parties can devise institutio arrangements which bring spillovers within the scope market forces—or, as the jarg has it, "internalise" them.

Take the case of noisy nei bours. The noise-makers deriv benefit from playing their reco loudly, while the people who l next door bear a correspond cost. It seems, therefore, tha market solution is possible. T lovers of peace and quiet co pay their neighbours to make l noise. Such a transaction wo leave both sides better off: would therefore bring about unambiguous improvement economic efficiency. Yet such rangements are uncommon: fact, the very idea of brib somebody to keep quiet see bizarre.

On reflection, it is obvious v the market solution—though i sible, as the Coase theor



says—rarely happens. The problem is a gap in property rights. If a person was legally entitled to make as much noise as he wished in his house, it would not seem odd for an outsider to pay him to make less noise. Equally, if a person was legally entitled to suffer no noise from next door, it would make sense for his noisy neighbours to compensate him for that violation of his rights. In fact, these property rights are fuzzy. There is no clear obligation on either side, so an opportunity to achieve economic efficiency is lost in squabbles over who is entitled to what.

This trivial-seeming example highlights two bigger points. First, for economic efficiency, it does not matter who pays whom. The polluter might pay (compensate) the victim for the right to pollute, or the victim might pay (bribe) the polluter to stop. If the output of pollution falls to its optimal level—as it would in either case—then resources are being properly allocated. The argument over who pays whom is a purely distributional one; it has no bearing on efficiency.

Second, people often feel strongly about these questions of distribution. If they think that they are entitled to go about their business unpolluted or to peace and quiet of an evening—even though in law they are not—they will reject the idea of bribery because it seems unfair. In effect, markets in clean air, peace and quiet and so on are needed to ensure economic efficiency. They fail to appear partly because the idea of such markets clashes with notions of fairness.

There are two other, strictly economic, answers to the puzzle of missing markets:

- **Transaction costs.** Theory predicts that where markets already exist they will be unable to achieve the ideal of economic efficiency unless trading is costless. In fact, of course, making markets costs money. As a result, trades which might make everybody better off do not take place.

Financial markets usually come closest to satisfying the conditions for efficiency. Their transaction costs are relatively low—but not zero. Anybody trying to hedge comprehensively against future uncertainty—by trading options and futures contracts, for instance—will find that the costs of carrying out those trades can quickly outweigh the benefits of lower risk.

If transaction costs can hamper markets that are up and running, they can also stop markets from appearing at all. Imagine what would be involved in a free-market solution to the externality of pollution — assuming that there is no generally recognised right to clean air. The pollutees would need to get together to bribe the polluters.

Efficiency would require that whatever system emerged took account of the fact that some people are more averse to pollution than others, and that some polluters could cut their pollution cheaply, while others might struggle to cut it at all. In other words, the system would have to work like a real market. The organisational task of bringing the parties together in a way that would allow such flexibility—in a sort of Pollution Exchange—would be complicated and expensive.

- **Free riders.** Suppose the organisational resources that underpin all markets could be provided for externalities. A bigger obstacle would remain. Take a group of non-smokers, sharing an office with a smoker. They decide to bribe him to stop. Each of them would be willing to pay, say, £10 a week; with five non-smokers, that adds up to a bribe of £50 a week. For such a princely sum, the smoker would be willing to stop poisoning his colleagues. It seems the office has a chance to make everybody better off.

Yet the deal will probably not happen. The reason is that each non-smoker has an incentive to under-declare the value he puts on fresh air. If he refuses to pay up, claiming to be indifferent to the fug, he knows there is a good chance that the other four will raise their bribes to £12.50 each, so that the smoker will stop anyway. And—the key point—the non-payer will still share in the benefits if that happens. (Goods which are impossible to deny to people who refuse to pay for them are called public goods. They include national defence, law and order, street lighting and radio transmissions, as well as clean air.)

Paying to pollute

In a pure market setting, where people show even less altruism towards their fellows than in the office, there is little chance that the problem of free riders can be overcome by goodwill. Whenever they get the chance, rational economic agents try to benefit themselves at the expense of everybody else. So for many kinds of spillover, a market solution is frustrated by the very force that usually makes markets work.

If, for any of these reasons, a market solution to the problem of externalities will not happen by itself, how should governments respond? Most economists would say that the best answer is to fill up gaps in the assignment of property rights—and thereby give market forces the foothold they need. The trouble is that governments cannot blithely revise the entitlements codified in centuries of common law—however vague and ill-adapted to the modern world many of those entitlements may be. In any case, clearer property rights would still leave the difficulties caused by high transaction costs and free riding.

Most governments have therefore chosen to deal with the most obvious and damaging spillovers through direct intervention. This too can take different forms. If there is a fixed link between the amount of a good produced and the amount of pollution caused, one approach is to put a per-unit-of-output tax on the good, setting the tax equal to the social marginal cost of pollution. As figure 2 shows, this would reduce output and raise price to the economically-efficient points.

Usually, though, firms can affect the amount of pollution that goes with a given level of output by varying the amounts they spend on pollution control. Applying, as always, the law of diminishing returns, assume that successive cuts in pollution cost more and more to achieve: in other words, the marginal cost of abatement rises.

The marginal cost of pollution control is plotted in figure 3 against the social marginal cost of pollution (which is assumed, as before, to be constant). At points to the left of P in the chart, the marginal cost of pollution is higher than the marginal cost of abatement. At points to the right of P, the cost of abatement is higher. So it makes sense to spend on pollution control up to, but not beyond, P—the optimal level of pollution control. Left alone, the industry will spend nothing. But if the government sets a tax per unit of pollution, T, equal to the marginal cost of pollution, the firm will spend money on control equipment until the cost of further abatement exceeds the tax. The firm will therefore reduce pollution by P, as required.

Such a tax would work even better (ie, cut pollution by the required amount and at a lower cost) if it were levied in the form of a transferable licence to pollute. The firms that can control their pollution cheaply would then be able to buy licences from those that cannot; market forces would shift the burden of pollution control to the firms which can carry out the task most efficiently.

Second-best theory?

What does this kind of market-sensitive intervention by governments achieve? Some, invoking what is probably the most abused idea in economics, say that the pursuit of efficiency is an illusion. In real economies, many markets are out of kilter all at once. That being so, according to the theory of second best, removing the distortion in one market does not necessarily lead to an overall improvement in efficiency.

For example, using a tax to reduce one kind of pollution may lead to higher demand for another good, which in turn may cause a different, and perhaps more damaging, sort of pollution. Or it may put people out of work in the taxed industry—the cure will be economically damaging unless the rest of the economy's labour market works with perfect efficiency.

From this some have concluded that microeconomics has nothing useful to say about government policy. They are wrong. True, the theory of second best should make people cautious of over-simple economic advice: making one market work better does not guarantee that the economy as a whole will work better. But economics can say, case by case, when a one-market intervention is likely to serve the bigger goal, and when it is not. Applied microeconomics is the hardest branch of the subject—but potentially the most useful.

Others take scepticism further, arguing that markets are not worth having at all unless they can be complete and perfect—which indeed they cannot. This misses the point altogether.

Yes, the theoretical guarantee that free markets can achieve economic efficiency hinges on numerous assumptions which, as these briefs have shown, rarely hold in the real world. But the case for market-based, as opposed to centrally-planned, economies rests securely enough on comparisons of the two systems at work. So the role of economic theory is not to justify an approach to allocating resources which all but fools and liars can see works better than any feasible alternative. Its urgent task is to explore the tricky ways of making the market-based economy work better still.