

Tax Facts

A knowledge-based series by the
Tax and Transfer Policy Institute

Good Tax Policy: Taxing Negative Externalities

For most taxes, a government's goal is to raise revenue while changing people's behaviour as little as possible. This increases the revenue that can be collected and minimises the loss of well-being in society caused by the tax [see our tax fact on [deadweight loss](#)]. But some taxes are deliberately designed to encourage or discourage certain behaviours. Why are these taxes different and why are they a good way to raise revenue?

Externalities

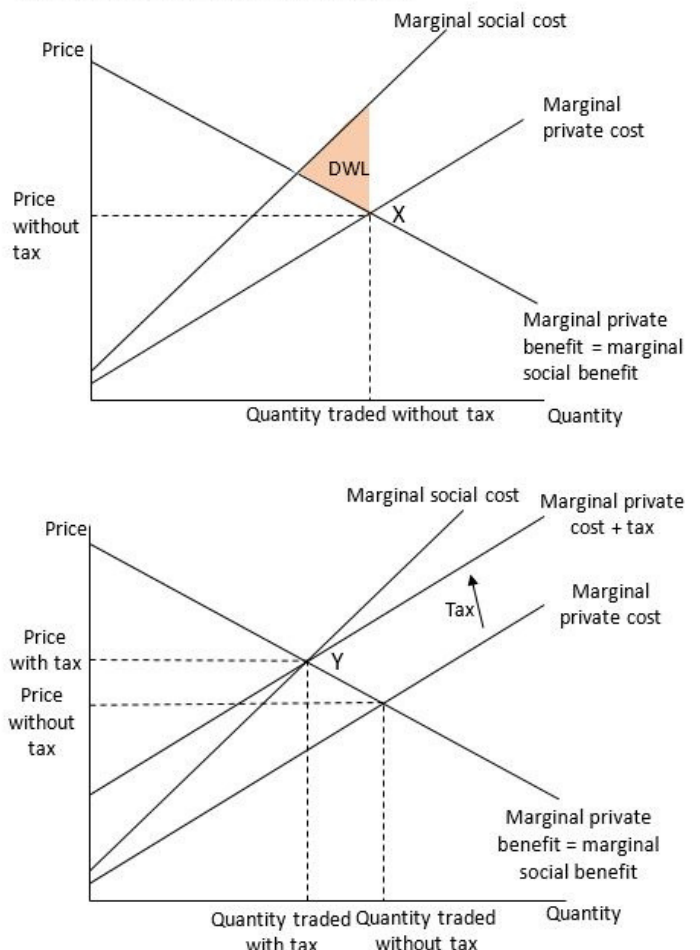
The concept of externalities is central to understanding why some taxes are designed to change behaviour. There are some goods and services in the economy that have a market price that does not capture their full value or full cost. Some products benefit more than just those who buy and sell them.

For example, if one company funds basic research, other companies may be able to copy the results without making any contribution towards research costs. Other products harm people who are not involved in the trade. For instance, a farmer selling extra wheat might start using water that previously flowed down to another farm. Pollution, created by private companies, can damage the environment in ways that affect many people. These effects on outsiders, who are not party to the trade, are called *externalities*.

Goods or services with externalities will be traded in amounts that reduce (or fail to maximise) the level of social well-being, because not all relevant effects of the trade are included in the price. The societal costs and benefits of the trade (referred to as the social cost and social benefit) differ from those of the individuals involved in the trade (referred to as the private cost and private benefit). This results in a deadweight loss if the good or service is traded at its market price.

The effects of trading a good with a negative externality (such as electricity generation which produces pollution) are shown graphically in Figure 1, with point X showing the price and quantity of the good that will be traded if only private costs and benefits are considered. The orange triangle shows the area where the marginal social cost exceeds the marginal social benefit, meaning that the trades are, on balance, detrimental to society.

Figure 1. Effect of a tax on the deadweight loss associated with a good that has negative externalities



In the example of electricity, the gap between the marginal social cost and marginal private cost represents the cost to society arising from pollution.

Taxing externalities

Taxing externalities is highly efficient because it aligns the social and private costs and benefits. This reduces or eliminates deadweight loss, makes the economy more efficient, and allows the government to raise revenue and the level of social well-being. This situation is also shown in Figure 1. Point Y represents the price (including the tax) and quantity of the good that will be traded if a tax is used to align the marginal private cost with the marginal social cost. Taxation usually increases **deadweight loss**, but taxing externalities results in the exact opposite effect.

In summary, a tax can be used to align the private and social costs and benefits in the presence of externalities. While this may seem abstract, in practice it is simply a way of ensuring that prices fairly reflect the costs and benefits of a trade for the whole of society. For example, many governments have introduced taxes on tobacco. Tobacco use increases the strain on the health system because smokers have higher health risks and non-smokers are affected through second-hand smoke. If a tax is set at an appropriate level, it would correct for these social costs and help the government to fund appropriate health services. However, determining the appropriate level is no simple matter. For instance, while smokers increase strain on the health system, their shorter lives, on average, also mean that they require less government support as they age. This is clearly a bad thing for smokers, but working out the overall cost to society is complex. Given the complex nature of this problem, many governments have also introduced regulations to reduce harm from second-hand smoke.

Governments also provide tax incentives for basic research to reflect the benefits research provides to other companies and consumers. This is the rationale behind Australia's [Research and Development Tax Incentive](#). Such incentives reflect the spillover benefits afforded to other companies and consumers in the Australian economy when companies conduct more basic research than would otherwise be profitable. As with the smoking example, it is difficult to quantify and estimate the spillover effects of research. This means that it is difficult to work out how heavily a government should subsidise research to correct for the positive externalities.

What does it mean if the private and social benefits do not align?

It is worth noting that in Figure 1 the marginal private and social benefits are equal both before and after the tax is introduced. This is not always the case. Sometimes consumption externalities exist, meaning the social benefit of a good may differ from the private benefit. For example, the social benefits of cycling to work are greater than the private benefits. The private benefits include reduced transportation costs, an enjoyable commute and improved health outcomes, but the social benefits also include less pollution, less congestion on the roads, and potentially lower government health expenditure. In cases like this, where a positive production externality exists, there may be merit in the government incentivising this activity to maximise overall social well-being.

Looking back at the example of electricity generation, the marginal private and social benefits are equal because there are no externalities associated with using electricity. Generating electricity in a power station creates pollution, but using the electricity to power a heater in a person's home only benefits the individual household.

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