Government Intervention

AP Microeconomics | Unit 6 | corrective taxes, subsidies, regulation

1. A tax that removes deadweight loss

Corrective (Pigouvian) tax

For a **negative** externality, a **per-unit tax equal to the external cost**. It raises the firm's marginal cost, so supply shifts up onto MSC and the market reaches the socially optimal quantity.

Example. Demand $P = 12 - Q$, supply $P = Q$, external cost \$4 per unit ($MSC = Q + 4$). Without the tax: $Q = 6$. With a \$4 tax: $12 - Q = Q + 4$, so $Q = 4$.

- Buyers pay \$8; sellers keep \$4 after the tax.
- Tax revenue: $\$4 \times 4 = \$16$.
- The deadweight loss of the externality is **gone**.

In unit 2 a tax *created* deadweight loss because the market was already efficient. Here the market was wrong to begin with, and the tax corrects it.

2. A subsidy for a positive externality

Corrective subsidy

For a **positive** externality, a **per-unit subsidy equal to the external benefit**.

Example. Supply $P = Q$, demand $P = 10 - Q$, external benefit \$4 ($MSB = 14 - Q$). Without the subsidy: $Q = 5$. With a \$4 subsidy: $14 - Q = Q$, so $Q = 7$. Sellers receive \$7, buyers pay \$3; the \$4 gap is the subsidy.

3. Rules instead of prices

- **Regulation:** a legal limit on output or on pollution.
- **Tradable permits:** a fixed total of pollution permits that firms can buy and sell. Firms that can cut pollution cheaply do so and sell permits, so the target is met at the lowest cost.
- **Property rights:** if someone owns the resource, the polluter must pay to use it, and the external cost becomes a private cost.

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4. Per-unit or lump-sum

	per-unit tax	lump-sum tax
paid	on every unit	a fixed amount
changes	marginal cost	fixed cost only
output and price	**change**	**do not change**
profit	falls	falls

The same holds for subsidies. To change a *quantity*, the tax or subsidy must be per unit.

5. Who pays, and where to measure

Who pays a tax. The less elastic side of the market pays more of it. With perfectly elastic supply the price buyers pay rises by the *full* tax; with very inelastic demand buyers pay most of it and the quantity falls only a little; with inelastic supply sellers pay most. The market still clears: quantity demanded equals quantity supplied, both lower than before.

Where to measure the tax. When the external cost changes with output, the tax equals the gap $MSC - MPC$ *at the optimum*. With $D : P = 12 - Q$, $MPC : P = Q$, $MSC : P = 1.5Q$, the market makes 6 and the optimum is 4.8; the right tax is \$2.40 (the gap at 4.8), not \$3 (the gap at 6), which would cut output to 4.5. A constant external cost gives the same gap everywhere; a smaller external cost calls for a smaller tax.

Externalities in consumption. Second-hand smoke: MSB lies below MPB (the demand curve). With $MPB : P = 12 - Q$, $MSB : P = 9 - Q$, $S : P = Q$, the market makes 6, the optimum (where MSB meets S) is 4.5, and the tax is $MPB - MSB = \$3$ at the optimum. A positive consumption externality (MSB above MPB) calls for a subsidy.

The wrong tool. Subsidizing a negative externality pushes output further above the optimum; taxing a positive one pushes it further below.

Where students lose points

1. Wrong size: the tax equals the external cost, the subsidy the external benefit.
2. Reversing the tools: tax a negative externality, subsidize a positive one.
3. Saying a corrective tax creates deadweight loss: it removes it.
4. Letting a lump-sum tax change output: marginal cost has not moved.
5. Mixing up the two prices: what buyers pay and what sellers keep.

Now practise it

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