Tax Incidence

- Tax incidence is the study of the effects of tax policies on prices and the distribution of utilities. Simply put, tax incidence is the study of assessing who's going to bear the true burden of a tax by how much.
- What happens to market prices when a tax is introduced or changed?
- Suppose, for example, that the government imposes additional tax of 1 euro per pack on cigarettes.
- Expected effects: distributional effects on smokers, profits of producers, shareholders, and farmers, etc.

Partial Equilibrium Incidence

- We look at only one isolated market, just to show the main results.
- Government levies an excise tax on good x. An excise or specific tax is levied on a quantity, typically fixed in nominal terms, t per unit of x.
- (Partial equilibrium: Ignore how the tax revenue is used, or assume that it is thrown away.)
- (Ad-valorem tax is a fraction of prices. Sales tax (say, 8% of the unit price) is an example.)
- Let p denote the pretax price of x (producer price), and $q = p + t$ denote the tax inclusive price of x (consumer price).

Tax Incidence

- Demand for good x is $D(q)$ decreases with $q = p + t$.
- Supply for good x is $S(p)$ increases with p.
- Equilibrium condition: $S(p) = D(p + t)$
- When t is imposed, how does the producer price p change? Having in mind the equilibrium price is a function of t,

$$\frac{\partial p}{\partial t} = \frac{\partial D}{\partial p} \frac{1}{\frac{\partial S}{\partial p} - \frac{\partial D}{\partial p}} = \frac{\partial D}{\partial p} \frac{p}{D} \frac{1}{\frac{\partial S}{\partial p}\frac{p}{D} - \frac{\partial D}{\partial p}\frac{p}{D}} \approx \frac{\varepsilon_D}{\varepsilon_S - \varepsilon_D},$$

  where $\varepsilon_D = \frac{\partial D}{\partial p}\frac{p}{D}$ is the price elasticity of demand, and $\varepsilon_S = \frac{\partial S}{\partial p}\frac{p}{S}$ is the price elasticity of supply.
- When the demand and supply functions are log-linear, then those elasticities are unit free, that is, constant.
- how does the consumer price q change? $\frac{\partial q}{\partial t} = \frac{\partial p}{\partial t} + 1 = \frac{\varepsilon_S}{\varepsilon_S - \varepsilon_D}$.

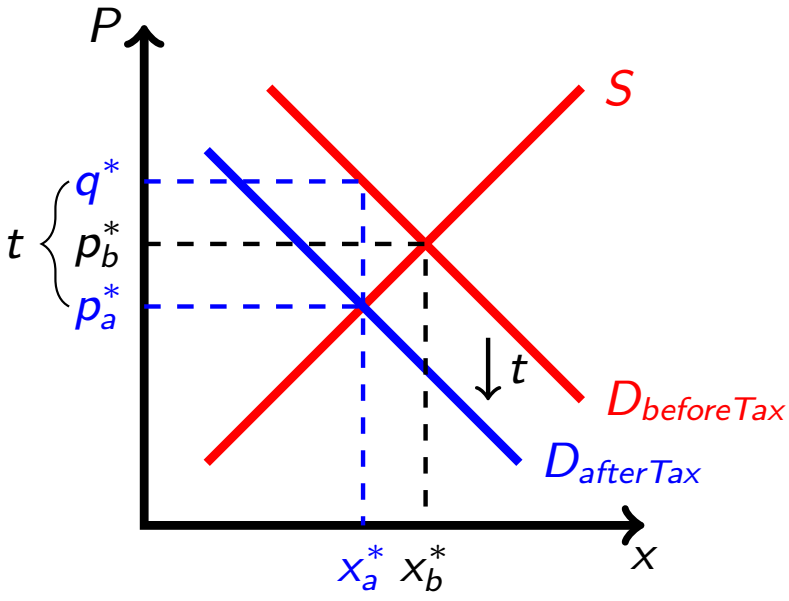
Tax Incidence

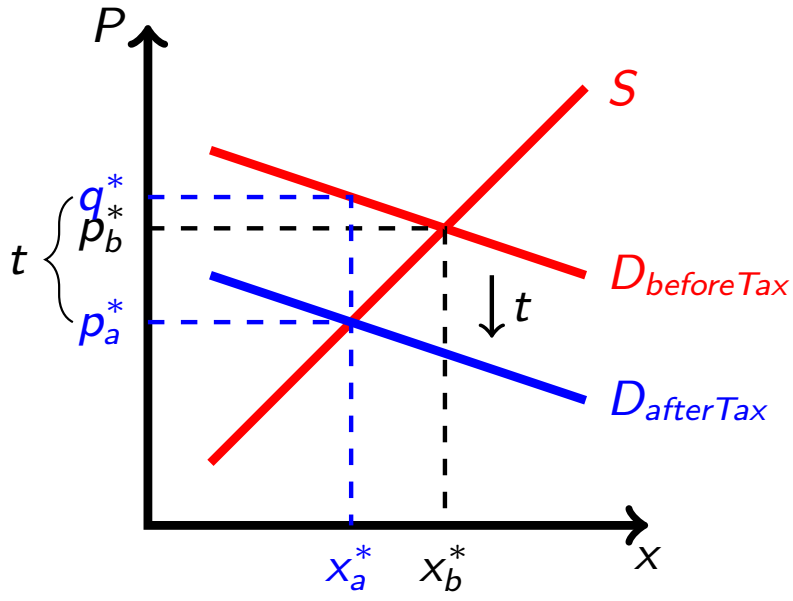
- In summary,

$$\frac{\partial p}{\partial t} = \frac{\varepsilon_D}{\varepsilon_S - \varepsilon_D} \qquad \frac{\partial q}{\partial t} = \frac{\varepsilon_S}{\varepsilon_S - \varepsilon_D}$$

- Who bears the burden of a tax by how much? Depends on elasticities.
- You can verify that those results are the same if the tax is imposed to the producer. Statutory incidence is not equal to economic incidence.

Graphs: tax on consumers





- $q^* - p_b^*$=consumer incidence
- $p_b^* - p_a^*$=producer incidence
- Demand elasticity $\Uparrow \Rightarrow$ Consumer incidence $\Downarrow$
- The triangle: efficiency cost of the tax, or deadweight loss.

Further things to explore

- General equilibrium tax incidence (Harberger, 1962): Consider related markets/factors of a tax imposed on one market/factor. Profit shifting, tax competition, long-run effects can be considered together.
- Behavioral responses: Theoretically $\frac{\partial x}{\partial p}$ must be equal to $\frac{\partial x}{\partial t}$, because the consumer price is $p + t$. People respond to them differently (Chetty, Looney, Kroft, 2009).