Microeconomics: Policy 31E12100
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Return method: through mycourses by the deadline

Problem Set 1: Question 3

Consumer surplus, leakage, and marginal excess tax burden (METB). Taxes are important in policy analysis because governments raise funds for government projects through taxes.

- Sometimes the demand curve is not linear but the analyst knows the price elasticity of demand, let this be e_d. For given initial price p and quantity q, show that the consumer surplus (CS) changes according to

$$\Delta CS = -q\Delta p - \frac{e_d q(\Delta p)^2}{2p}$$

  if price changes by Δp. Hint: assume first that the demand is linear and find ΔCS.

- Taxes result in a reduction in CS. This is an example of deadweight loss. The deadweight loss (DWL) due to a tax is called the deadweight loss of taxation. For a unit tax, like an excise tax, it can be computed using the above formula for ΔCS. For unit tax t on consumption, we see that that $t = \Delta p$. What is then the DWL of the tax? That is, find the expression for DWL.

- Leakage is the ratio of the deadweight loss to the total tax revenue raised by the government. Find the expression for leakage for tax t.

- The deadweight loss that results from raising an additional euro of tax revenue is called the marginal excess tax burden (METB). This is just DWL but economists give this name to the particular DWL arising from taxation. This is an efficiency cost. The social surplus changes with taxation. Quite simply, the social surplus (SS) is $SS = CS + PS + GS$, where we have the producer surplus (PS) and government

surplus (GS) in addition to the consumer surplus. If the government raises one more euro by taxes, all parts of the surplus will change and also METB will enter. Can you see how exactly METB enters?