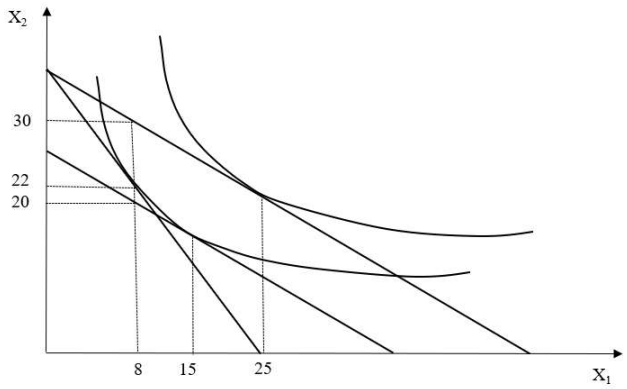
Issues in international taxation (Prof. Parisi, academic year 2023-24)

Exercises: commodity taxation.

1. The graph below represents the effects of a specific tax on X_1. Indicate:
   a) the quantity of X_1 purchased before tax and after the tax;
   b) the overall change in the quantity of X_1 due to the tax;
   c) the change in the quantity of X_1 due to the income effect induced by the tax;
   d) the change in the quantity of X_1 due to the substitution effect induced by the tax;



   Results: discussion in class

2. Consider again the graph reported above. The graph illustrates the effects of a lump-sum tax on consumption along with the effects of the specific tax on X_1. Calculate (in units of the good X_2):
   a) the lump-sum tax revenue;
   b) the specific tax revenue;
   c) the deadweight loss of the specific tax

   Moreover, discuss to which of the two effects induced by the specific tax is associated the deadweight loss.

   Results: Discussion in class.

3. Discuss the following statements.
   a) A lump-sum tax on consumption is efficient and therefore has no effect on consumption.
   b) Consider two complementary goods, *A* and *B*. A lump-sum tax on consumption and a specific tax on *A* generate the same tax revenue.
   c) Refer again to the previous case. The specific tax on *A* generates a higher deadweight loss than in the case the two goods are substitutes.
   d) An increase in the tax rate of an ad-valorem tax of say 10 percentage points increases the deadweight loss in the same proportion.

4. Consider a specific tax on firms' output in a competitive market and assume the tax is partly shifted on consumers. Will the deadweight loss of the tax be borne by consumers? Explain with the help of a graph.

5. Consider a firm producing one good in a perfectly competitive market where the price is 10. Demand is given by the function $q = 50 - p$. Now assume the government introduces a specific tax of 2 euros on producers. Represent the situation graphically and calculate:
    a) the before tax equilibrium price and quantity;
    b) the after tax equilibrium price and quantity;
    c) the before tax and after tax consumer's surplus
    d) tax revenue;
    e) the deadweight loss of the tax

    Results: (a) q=40, p=10; (b) q=38, p=12; (c) tax revenue=76; (d) S^C_{pre}=800; S^C_{post}=722; (e) DWL=2

6. Consider the previous exercise but now assume that supply is given by the following function: $q = 2p$ and that the specific tax is on consumers rather than producers. Represent the situation graphically and calculate:
    a) the before tax equilibrium price and quantity;
    b) the price paid by consumers and the price received by producers after the tax;
    c) tax revenue.
    d) the deadweight loss of the tax.

    How can you interpret the magnitude of the deadweight loss over tax revenue? Discussion in class.

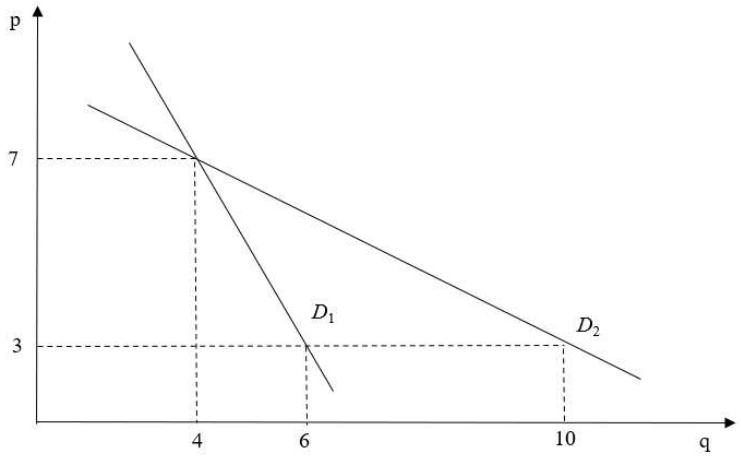
    Results: (a) q=33,3, p=16,7; (b) q=32, p_c=18 and p_p=16; (c) tax revenue=64; (d) DWL=1,3

7. Consider a competitive industry where the direct demand function is given by $q = 20 - p$ and the supply function is perfectly elastic: $p = 2$. Now consider the introduction of a specific tax of 2 Euros on producers. Represent the situation graphically and calculate:
    a) the before tax and the after tax quantity and price;
    b) the elasticity of the demand function in relation to the after tax equilibrium;
    c) the deadweight loss of the tax using the formula that relate the deadweight loss with the elasticity of demand (in absolute values)., calculate the deadweight loss.

    Result: (a) q=18, p=2; q=16, p=4; (b) elasticity=1,1; (c) DWL=2

8. The following graph reports the effects of a specific tax on producers on two different (compensated) demand curves. Calculate (using the usual method) the deadweight loss for the two demand curves. In which case the deadweight loss is higher? Interpret the results.

    Results: (a) DWL_1=4; DWL_2=12



9. Assume the government introduces a specific tax on a necessary good which demand is perfectly inelastic. Assume supply is upward sloping. With the help of a graph illustrate the distortionary effects of the tax.

10. Consider again the previous exercise and discuss the following statement: if the government wants to minimize the distortions of commodity taxes, it should tax more heavily necessary goods.