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

Exercises: tax incidence.

1. Consider a firm producing one good in a perfectly competitive market where the price is 10. Demand is given by the function $p = 75 - 5q$. Now assume the government introduces a specific tax of 2 euros on output. Also with the help of a graph, calculate:
   a) the before tax price and quantity;
   b) the after tax price and quantity;
   c) tax revenue.
   d) Moreover, discuss the incidence if the tax.

   Results: (a) q=13, p=10; (b) q=12,6, p=12; (c) tax revenue=25,2; (d) discussion in class.

2. Consider the previous exercise but now assume that supply is given by the following function: $p = 0{,}4q$. As in the previous exercise, assume the government introduces a specific tax of 2 euros on output. Also with the help of a graph, calculate:
   a) the before tax price and quantity;
   b) the price paid by consumers and the price received by producers after the tax;
   c) tax revenue.
   d) Discuss the incidence of the tax.

   Results: (a) q=13,8, p=5,5; (b) q=13,5, p_c=7,4 and p_p=5,4; (c) tax revenue=27; (d) discussion in class.

3. Consider a competitive industry where the inverse demand function is given by $p = 15 - q$ and the inverse supply function by $p = q$. Now consider the introduction of an ad valorem tax with a rate of 20%. Calculate:
   a) the before tax price and quantity;
   b) the price paid by consumers and the price received by producers after the tax;
   c) tax revenue.

   Represent the situation graphically and discuss the incidence of the tax.
   Results: (a) q=7,5, p=7,5; (b) q=6,8, p_c=8,2 and p_p=6,8; (c) tax revenue=9,5.

4. Consider a monopolistic market where the demand function is given by $q = 10 - p$ and the marginal cost is constant and equal to 2 Euros. Then, consider the introduction of a specific tax of 2 Euros. Calculate:
   a) the before tax price and quantity;
   b) the after tax price and quantity;

   Then, discuss the actual incidence of the tax. Represent the pre-tax and the post-tax equilibrium graphically.
   Results: (a) q=4, p=6; (b) q=3, p=7; (c) the incidence is half on consumers and half on the monopolist.

5. Consider a monopolistic market where the demand function is given by $q = 10 - p$ and the marginal cost is given by MC = q. Consider the introduction of an ad valorem tax with a statutory rate of 20%. Calculate:
   a) the before tax price and quantity;
   b) the after tax price and quantity;
   c) tax revenue.

Discuss the incidence of the tax. Represent the pre-tax and the post-tax equilibrium graphically.
Results: (a) q=3,3, p=6,6; (b) q=3,1, p=5,7; (c) tax revenue=3,72.

6. Consider the labour market where demand is given by the function $w = 30 - L$ and supply by the function $w = 5 + L$, where w is the wage rate and L the units of labour (in thousands). Assume the Government introduces a specific tax of 2 Euros on the use of labour. Calculate:
   a) the before tax wage and labour units;
   b) the after tax wage and labour units;
   c) the tax inclusive wage rate.

   Moreover, represent the pre-tax and the post-tax equilibrium graphically and discuss the incidence of the tax.

   Results: (a) w=17,5, L=12,5; (b) w=16,5, L=11,5; (c) w=18,5.

7. Consider the previous exercise and assume the Government introduces a reform that lowers the labour tax by 1 Euro. Which group will benefit from the reform? Discussion in class.

8. Consider again data of exercise 6 and assume the demand for labour is given by the following function: $L = 12{,}5$.
   a) What is the difference with the demand function considered in exercise 8? Discussion in class.
   b) Discuss the incidence of the tax. Discussion in class.

9. Consider a small open economy where demand for capital (in the direct form) is given by the function $K = 100 - 2r$ and supply by the function $r = 5$, where K are the units of capital and r is the interest rate (in percentage terms). Assume the Government introduces a specific tax of 5 Euros on the use of capital. Provide and interpretation of the shape of the supply function and calculate:
   a) the before tax units of capital and interest rate;
   b) the after tax units of capital;
   c) the interest rate paid capital users (firms);
   d) the interest rate received by capital owners

   Results: (a) K=90, r=5; (b) K=80; (c) r=10; (c) r=5.

10. Refer back to the previous exercise. Provide an interpretation of the shape of capital supply and discuss the incidence of the tax on capital.