

Public Economics and Finance

Tutorial P6

Topics:

- Taxes:
 - a) Income Tax (IRS)
 - b) VAT
- Marginal and Average Rates
- Excise taxes
- Progressive taxes
- Numerical exercises



Topics for discussion - 1

Given the characteristics of the personal income tax (IRS) answer the following questions:

- a)** Which of the tax principles is mostly considered in the specification of the personal income tax?
- b)** Give examples of how this tax contributes to fulfill horizontal and vertical equity.



Topics for discussion - 2

Taking into account the desirable characteristics of a tax system, efficiency, equity and transparency, compare the personal income tax (IRS) and VAT.



Topics for discussion - 3

In several countries, the personal income tax scale is sometimes increased by an additional tax bracket, with a higher top marginal rate. Discuss this policy measure from an equity and efficiency perspective.



Multiple Choice - 1

The economic incidence of a tax is higher for consumers if, and only if:

- a) The legal incidence is only for consumers.
- b) The elasticity of supply is twice the elasticity of demand (in absolute value).
- c) The elasticity of supply is higher than the elasticity of demand (in absolute values).
- d) Rises the price for the consumer and lowers it for the producer.



Multiple Choice - 2

When the Government decides to reduce the social security contribution (SSC) rate of workers for Social Security, which of the statements is always true?

- a) Increases the legal incidence of SSC for the employers.
- b) Decreases the economic incidence of SSC for the employers.
- c) Decreases the legal incidence of SSC for the workers.
- d) Decreases the economic incidence of SSC for the workers.



Multiple Choice - 3

Which of the following statements is false?

The “Dupuit-Laffer” curve depicts:

- a) That an eventual increase in tax revenues is lower than the increase in the tax rate.
- b) That there is an upper limit for the tax revenues for a certain level of taxes that is not maximum.
- c) That for a certain level of tax revenues there is only one corresponding tax rate.
- d) A non-linear relation between tax revenues and tax rates.



Exercise – 1

Consider the following demand and supply functions for a good in a competitive market:

- Demand: $Q=130-2P$ for $P<65$
 - Supply: $Q=-20+4P$ for $P>10$
- a)** Compute the equilibrium in the market, before and after the imposition of a unitary tax of 9 euros on consumers and producers. Compute the tax revenue from this tax.
- b)** Determine the economic incidence of the tax on consumers and producers and relate the economic incidence with the elasticities of demand and supply.
- c)** Calculate the excess tax burden (deadweight loss) and comment.

Economic incidence and excess tax burden of unitary taxation: how to compute it

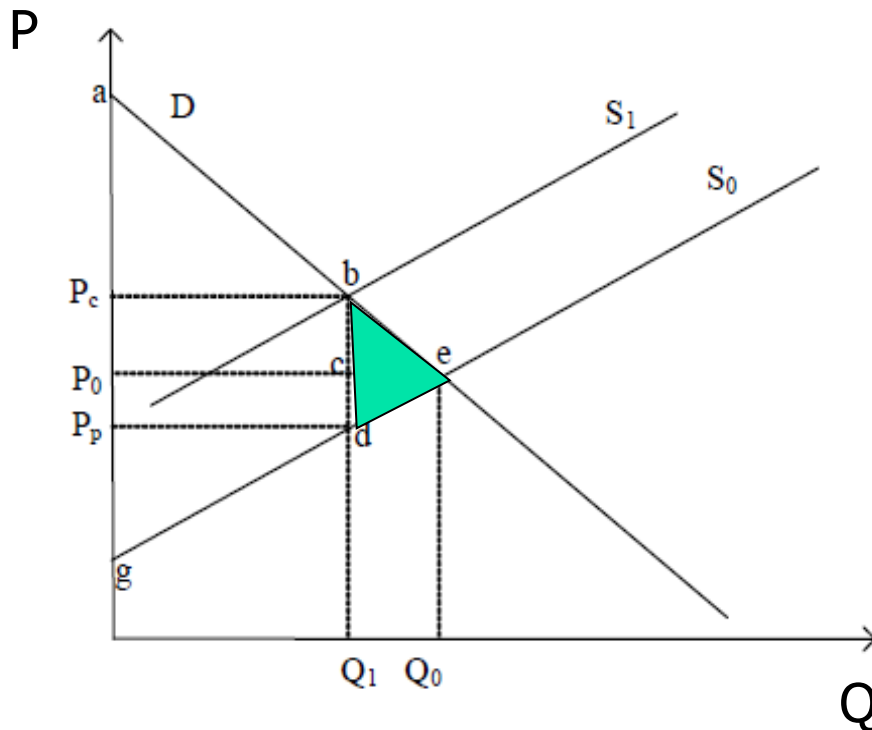
The economic incidence and the excess tax burden of a unitary tax can be approximately computed with the ex ante and ex post tax equilibria:

1. For the initial position compute P and Q (P_0 ; Q_0).
2. After the tax we have a new equilibrium (P_p , P_c , Q_1). Either (i) (inverse) supply curve shifts upwards or (ii) (inverse) demand curve shifts downwards.
3. Compute new (inverse) supply curve, after tax: $S_1 = S_0 + t$.
4. Calculate after tax equilibrium Q_1 , producer's price (P_p), consumer's price (P_c), and tax revenue [$TR = t * Q_1 = (P_p - P_c) * Q_1$].
5. Determine the economic incidence of the tax revenue on consumers ($(P_c - P_0) * Q_1$) and on producers ($(P_0 - P_p) * Q_1$).
6. The excess tax burden (EB) or welfare loss is approximately the *Harberger triangle*, that is $EB = 0.5 * (P_c - P_p) * (Q_0 - Q_1)$.

Note: if the supply curve is fully rigid, the demand curve will shift.

Exercise – 1, graphical analysis

- **General case:** demand and supply elasticities are normal.
- **Output:** excessive burden shared between producers and consumers.



$$EB = (1/2)\partial Q / \partial P \\ = (1/2)(Q_0 - Q_1)(P_c - P_p)$$

Q₀: pre-tax equilibrium
Q₁: after-tax equilibrium

Harberger triangle [bcde]

Personal Income tax rates (2015) Portugal

Taxable income (€)	A) Marginal rates (%)	B) Average rates at the top of each bracket (%)
Up to 7 000	14,5	14,500
> 7 000 up to 20 000	28,5	23,600
> 20 000 up to 40 000	37,0	30,300
> 40 000 up to 80 000	45,0	37,650
> de 80 000	48,0	-



Exercise 2 – Personal Income Tax (IRS)

Based on the marginal income tax rates (table in next slide) calculate:

- a) the average tax rate for taxpayers with an annual taxable income of € 18,000.
- b) the average tax rate for taxpayers with an annual taxable income of € 50,000.

Note: Consider that this is a single taxpayer, and the calculation is made before any deductions to the tax (gross average rate).



Exercise 3 - VAT

Consider a producer of footwear that purchases raw material worth €50,000+VAT, and sells footwear in the amount of €80,000+VAT. Applicable VAT tax rate (purchase, sale): 23%. Determine the VAT to be delivered to the State:

- a) By the indirect subtractive method (VAT received and paid).
- b) By the direct method (Value added at the producer).*

* We can only use the value added procedure if the rates on inputs and outputs are the same.