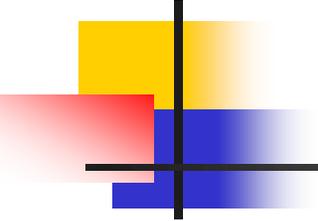# Public Economics and Finance Tutorial 6

Topics:

- Tax incidence: economic and legal
- Tax incidence and excess burden
- Taxes:
  - a) Income Tax (IRS)
- Marginal and Average Rates
- Progressive taxes
- Numerical exercises

- *Readings from lectures Lectures 9-10*

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? Justify.

b) Give examples of how this tax contributes to fulfill horizontal and vertical equity.
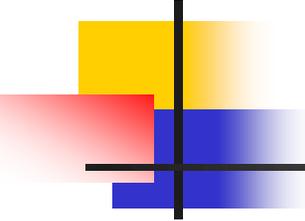
Topics for discussion - 2

In several countries such as Portugal, Germany and France, among others, the tax on personal income is progressive.

However, a few developed countries have chosen to tax individual income on a flat rate basis or on a semi-fixed rate basis.
 For example: - Estonia = 20% - Ireland = 20% up to   an income threshold and 40% for income above that threshold
a)   Justify the option for one or another type of taxation based on the criteria of equity and efficiency
b)   What type of taxation would generate more tax revenue, in your opinion? Summarize briefly.
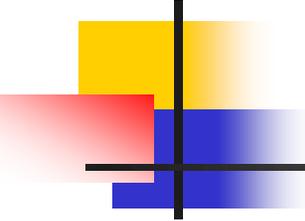
Multiple Choice - 1

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.
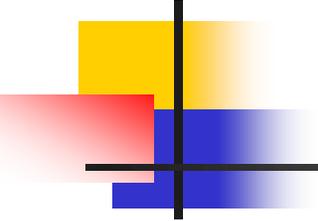
Multiple Choice - 2

Which one is a true sentence. An increase in the tobacco unitary tax

a) Is justified for reasons of efficiency and equity.

b) Is justified for reasons of efficiency but is negative from the point of view of equity.

c) Is not justified neither from the point of view of equity nor efficiency.

d) It is justified on aquity grounds although it generates a loss of efficiency.
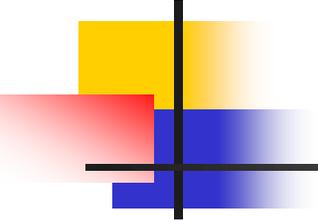
Which of the following statements is false?

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.
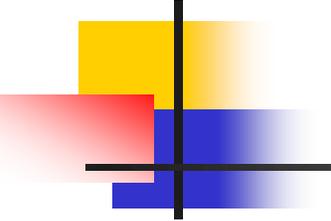
Exercise – 1

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 producers. Compute the tax revenue from this tax.

b) Determine the economic incidence of the tax on consumers and producers and relate the economc incidence with the elasticities of demand and supply.

c) Calculate the excess tax burden (deadweight loss) and comment.

d) Consider two markets A and B, illustrated by the following figure (panels A and B). Explain the incidence of a unitary tax in both markets.
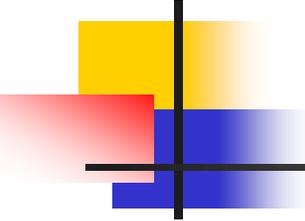
Economic incidence and excess tax burden of unitary taxation: how to compute it

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 (Pp, Pc, Q1). Either (i) (inverse) supply curve shifts upwards <u>or</u> (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 (Pp), consumer's price (Pc), and tax revenue [$TR=t*Q_1=(Pp-Pc)*Q_1$].

5. Determine the economic incidence of the tax revenue on consumers (($Pc-Po)*Q_1$) and on producers (($Po-Pp)*Q_1$).

6. The excess tax burden (EB) or welfare loss is approximately the *Harberger triangle,* that is $EB=0.5*(Pc-Pp)*(Q0-Q1)$.
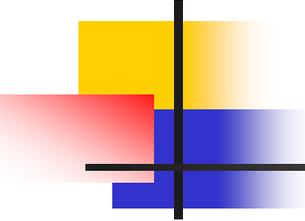
Note: if the supply curve is fully rigid, the demand curve will shift.

Exercise – 1 (concl.)

Limiting cases:
Market A is given by panel A

Market B is given by panel B.
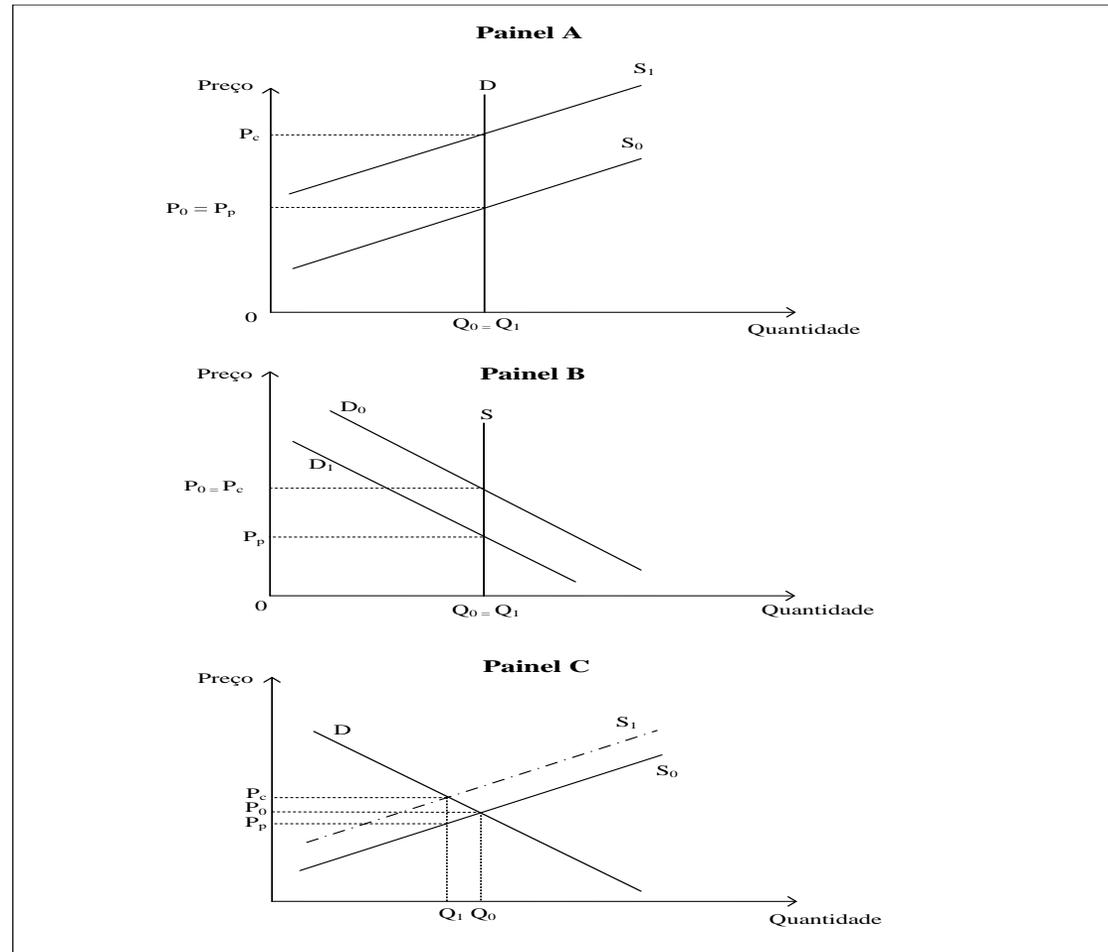
Exercise 2 – Personal Income Tax (IRS)

Consider a couple with two children where **gross income** from one member is 40.000€ and 12.000€ the other.

Specific deductions are 4.104€ per taxpayer. For expenditures in health and education this household can deduct 255€. Additionally for each child can deduct 600€ and 250€ for each member of the household in general expenditures.

Assuming they present a joint IRS tax form, calculate the amount of tax due given the 2026 tax rates (next slide).

Personal Income tax rates (2026) Portugal

	Taxable income (TI)	Tax rates (%)	
	Tax Bracket (euro)	Marginal	Average
1	Up to 8342	12.5	12.5
2	8,342 < TI ≤ 12,587	15.7	13.579
3	12,587 <TI ≤ 17,838	21.2	15.823
4	17,838 < TI ≤ 23,089	24.1	17.705
5	23,089 < TI ≤ 29,397	31.1	20.579
6	29,397 < TI ≤ 43,090	34.9	25.130
7	43,090 < TI ≤ 46,566	43.1	26.472
8	46,566 < TI ≤ 86,634	44.6	34.856
9	TI > 86,634	48.0	-