Lisbon School of Economics & Management
Universidade de Lisboa

Macroeconomics 1

AT2.1:
Inequality: general concepts and analysis within the WS–PS model

2025-2026

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Theory 2.1

Class Outline:

- Desigualdade: conceitos gerais
- Desemprego e desigualdade no modelo WS-PS.

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Theory 2.1

Readings:

- The CORE Team. (2023). *The Economy 2.0: Macroeconomics* (módulos 2.1-2.3)

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Inequality: general concepts

Inequality

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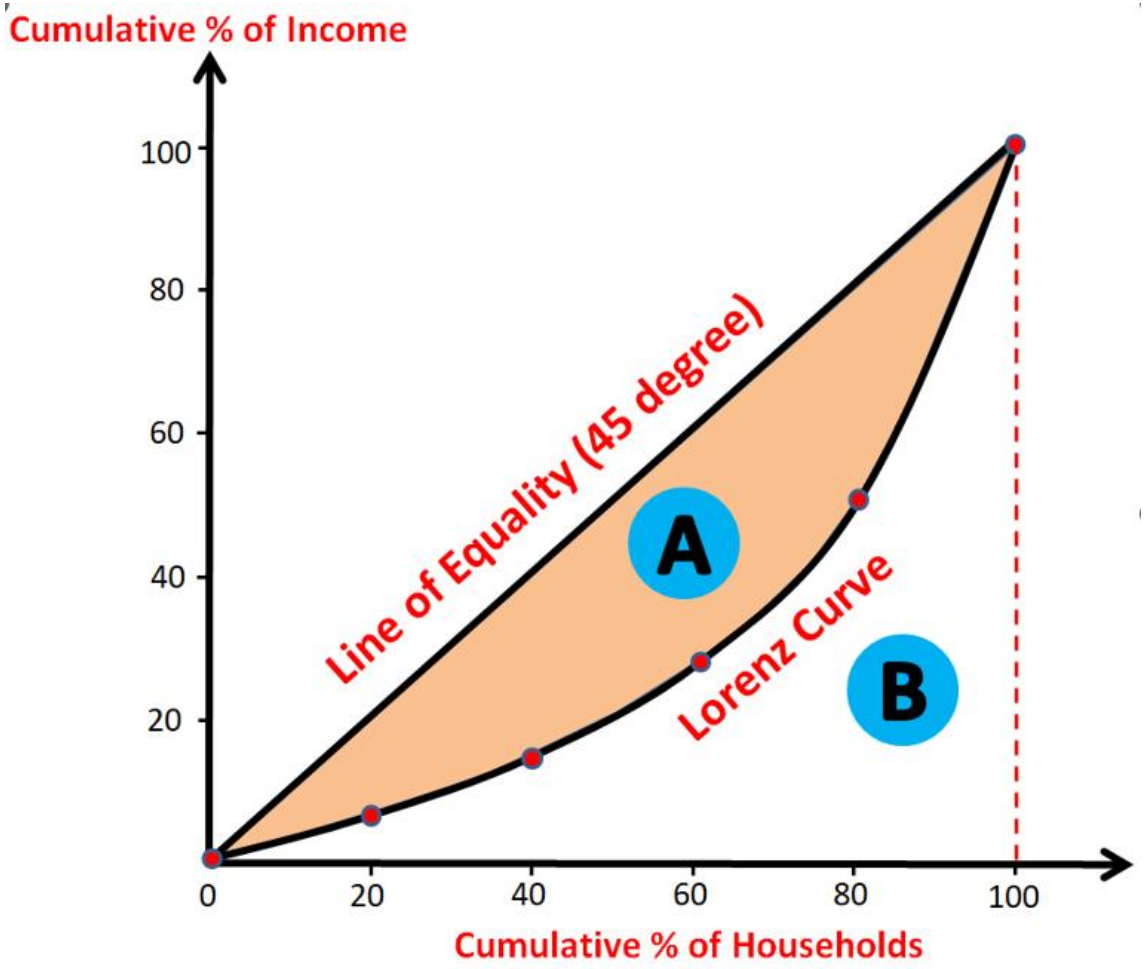
Inequality concerns the way in which **income, wealth**, or other economic variables are **distributed among individuals** or groups within an economy.

More specifically, it refers to the **degree of concentration or dispersion of income**, wealth, or economic opportunities among individuals or across segments of the population.

Inequality is a **relevant macroeconomic** issue because, beyond its intrinsic importance (social justice), it has systemic effects **on economic growth, levels of consumption and investment, social cohesion, political stability**, and more.

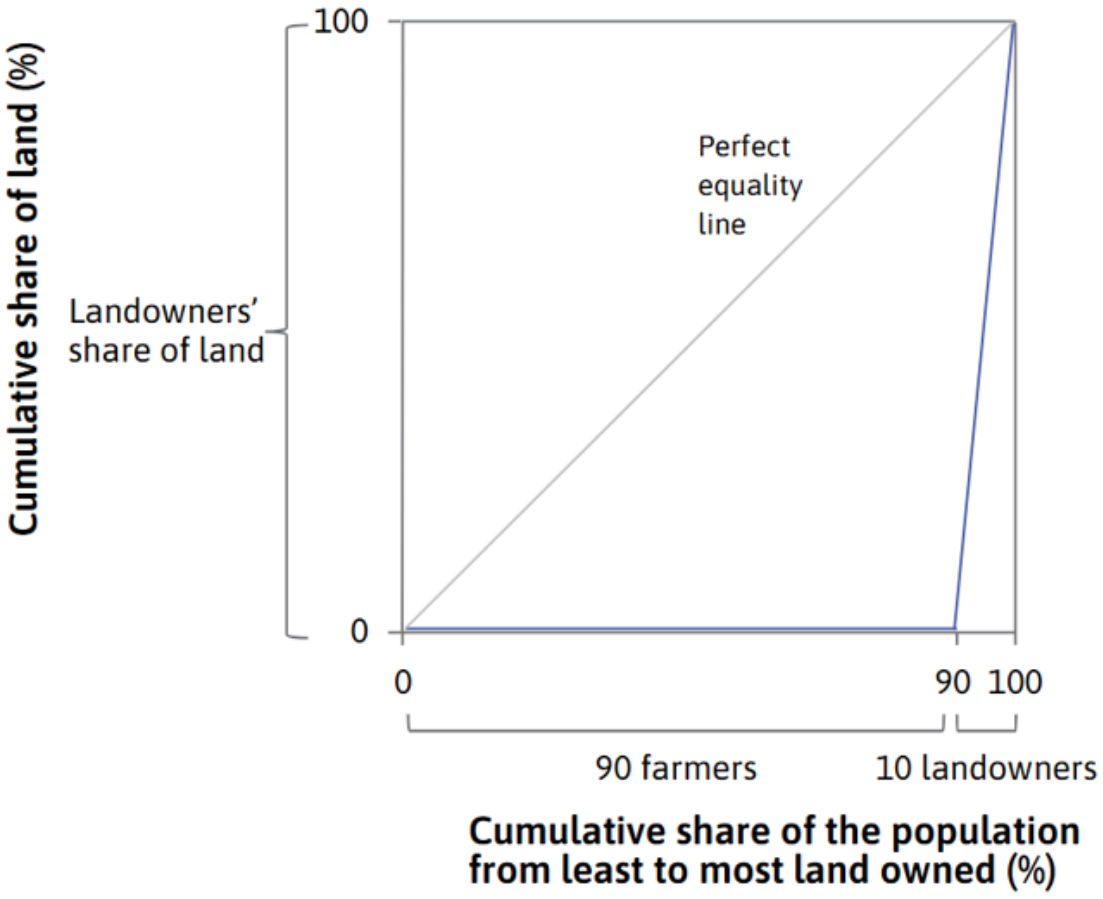
The Lorenz curve



The **Lorenz curve** is a graphical representation of (in)equality in a distribution. It is obtained by ordering the population (or its percentiles, deciles, quintiles, etc.) in ascending order of the variable in question (income, wealth, etc.), and then plotting the cumulative percentages or shares of that variable corresponding to each cumulative percentage or share of the population.

In the example shown, the bottom 20% of the population earn about 70% of total income, while the bottom 40% earn about 17%. The curve always starts at (0,0) and always ends at (100,100), since the entire population earns the entire income (or holds all the wealth, etc.).

The Lorenz Curve



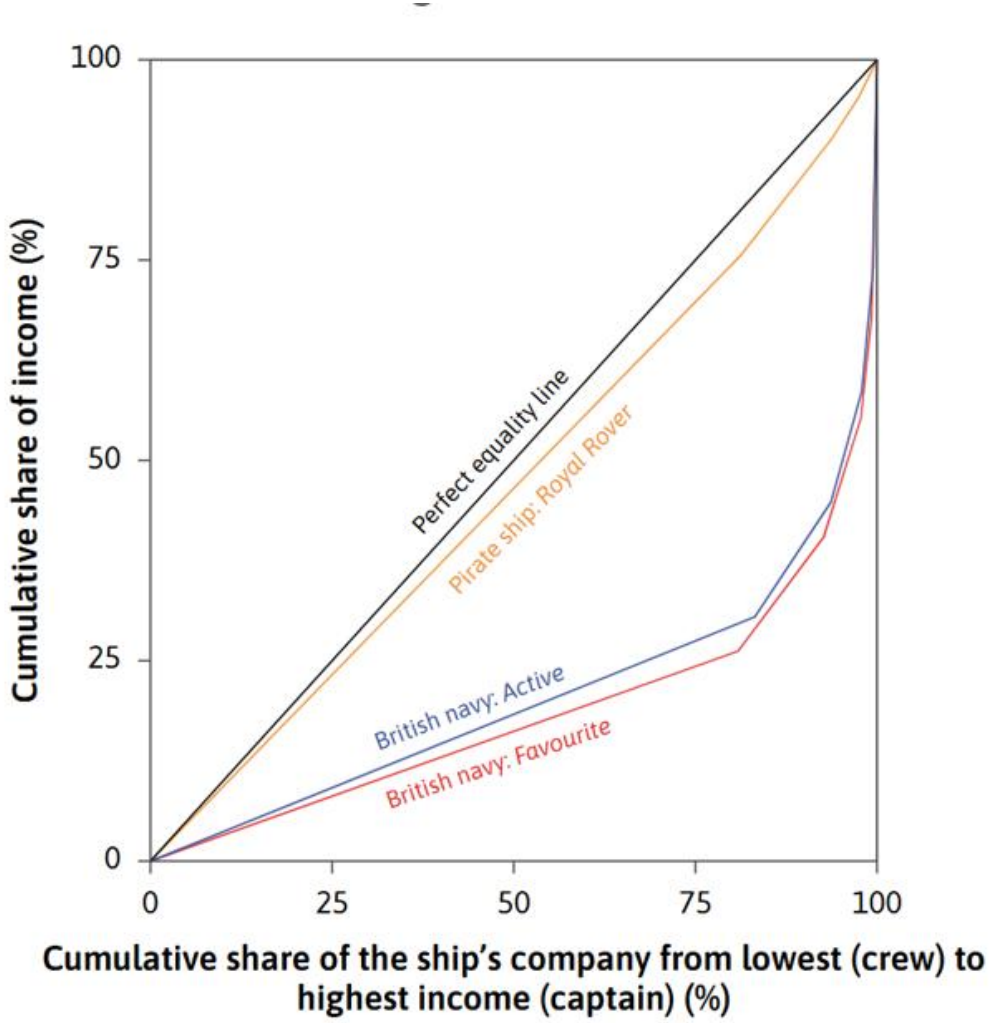
The Lorenz curve shown on this slide represents an **extremely unequal distribution**: in a population of 100 individuals, 90 own no land at all, while the remaining 10 own all the land in equal proportions.

When a distribution is **perfectly equal**, the Lorenz curve **coincides with the diagonal** (the hypotenuse of the figure).

When it is **perfectly concentrated** (in a single individual/household, etc.), the Lorenz curve coincides with **the legs of the triangle**.

The **more equal**/unequal the distribution, the **closer to**/further from the **line of perfect equality** (the diagonal/hypotenuse) the Lorenz curve lies.

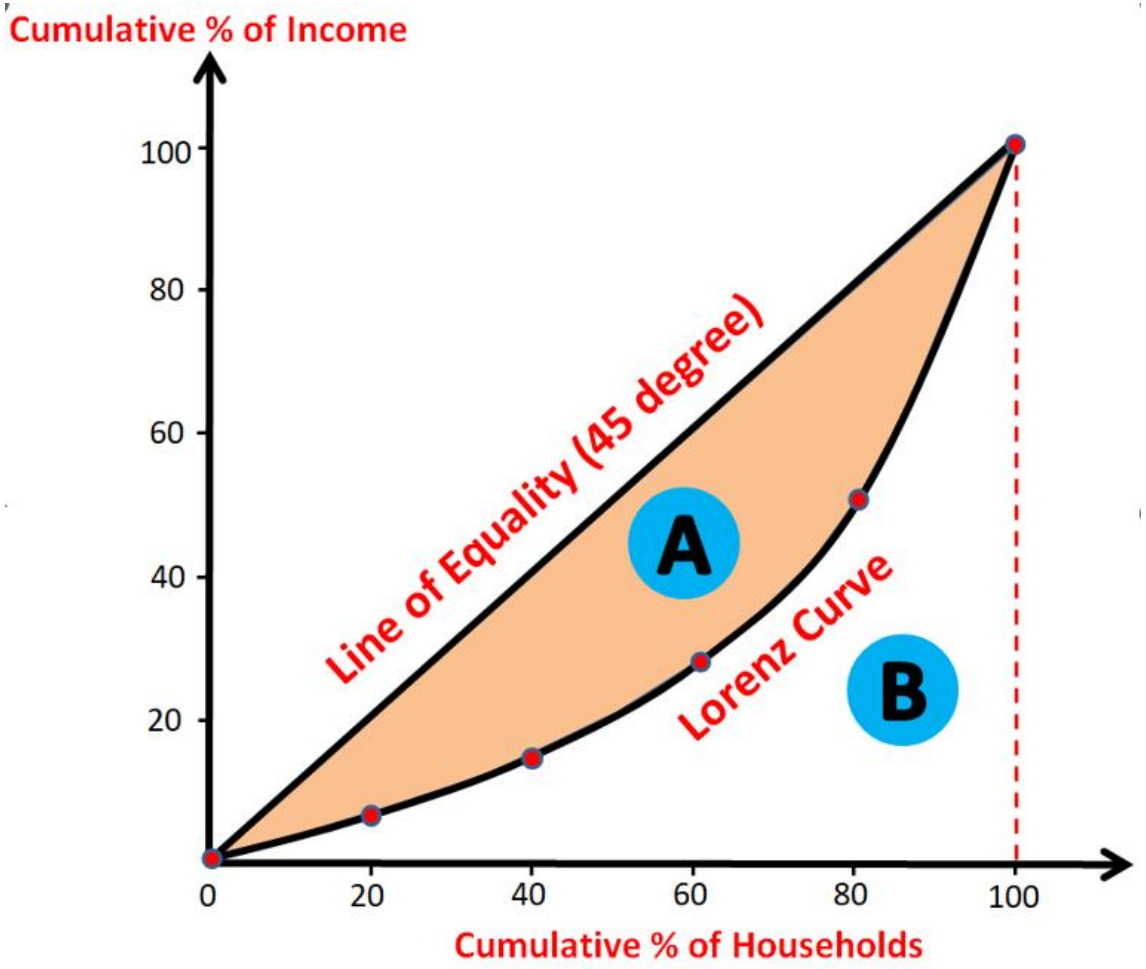
The Lorenz Curve



More examples of Lorenz curves (from the CORE textbook): the distribution among crews of the spoils obtained by an 18th-century pirate ship (*Royal Rover*), and of the spoils obtained by two ships of the British Royal Navy from the same period (*Active* and *Favourite*).

The distribution of spoils among pirates was much more egalitarian; in the British Navy, it was more concentrated.

The Gini Coefficient



Since the distance from the line of perfect equality depends on the degree of (in)equality of the distribution, the relationship between areas **A** and **B** in the figure (or the share of area **A** in the total triangle **A + B**) also constitutes a measure of that (in)equality. This is the (approximate) graphical interpretation of the **Gini coefficient**:

$$G = \frac{A}{A + B}$$

It ranges from **0 (perfect equality)** to **1 (maximum inequality)**

Some examples:

UK EUtime EUcross

Primary income vs. disposable income

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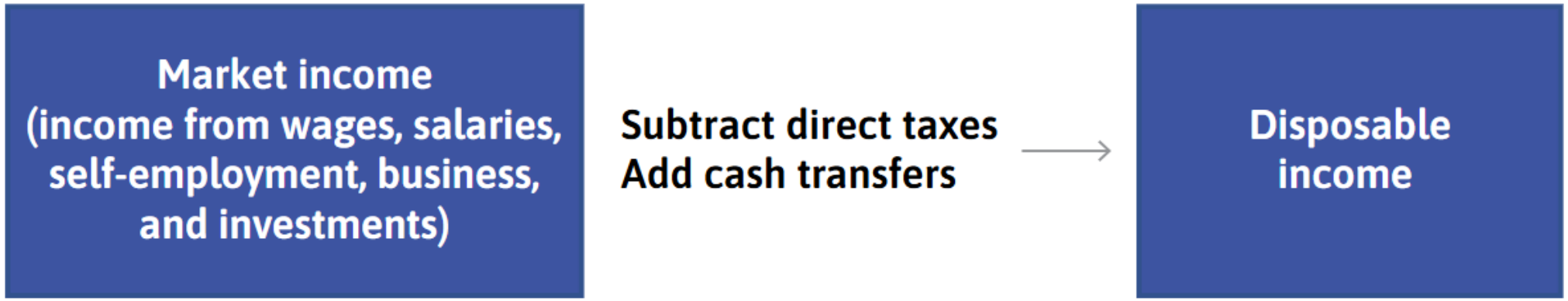
To **analyze the distribution of a variable such as income**, we must distinguish between two ways of measuring it:

Primary (market) income: this is the income (**wages, profits, rents, interest**) earned over a given period, before the payment of taxes and contributions and without taking into account social transfers and benefits received from the state.

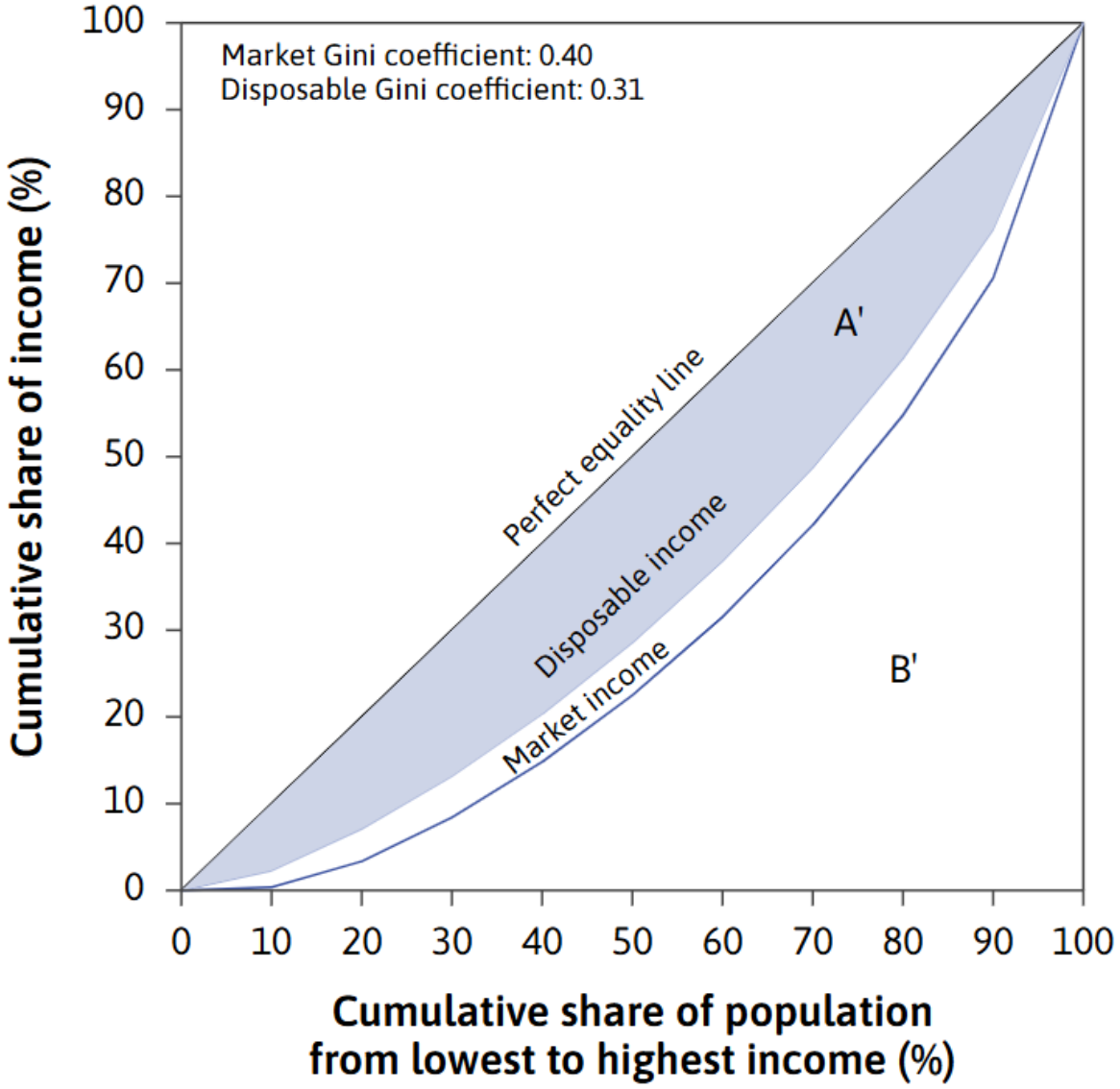
Disposable income: this is the income that each individual/household earns over a given period and **that is effectively available for spending** (without resorting to savings or credit). It already takes into account taxes and contributions paid (to be subtracted) and social transfers and benefits received (to be added).

For most individuals, **market income differs from disposable income**: for some, the former is higher; for others, the latter is higher.

Primary income vs disposable income



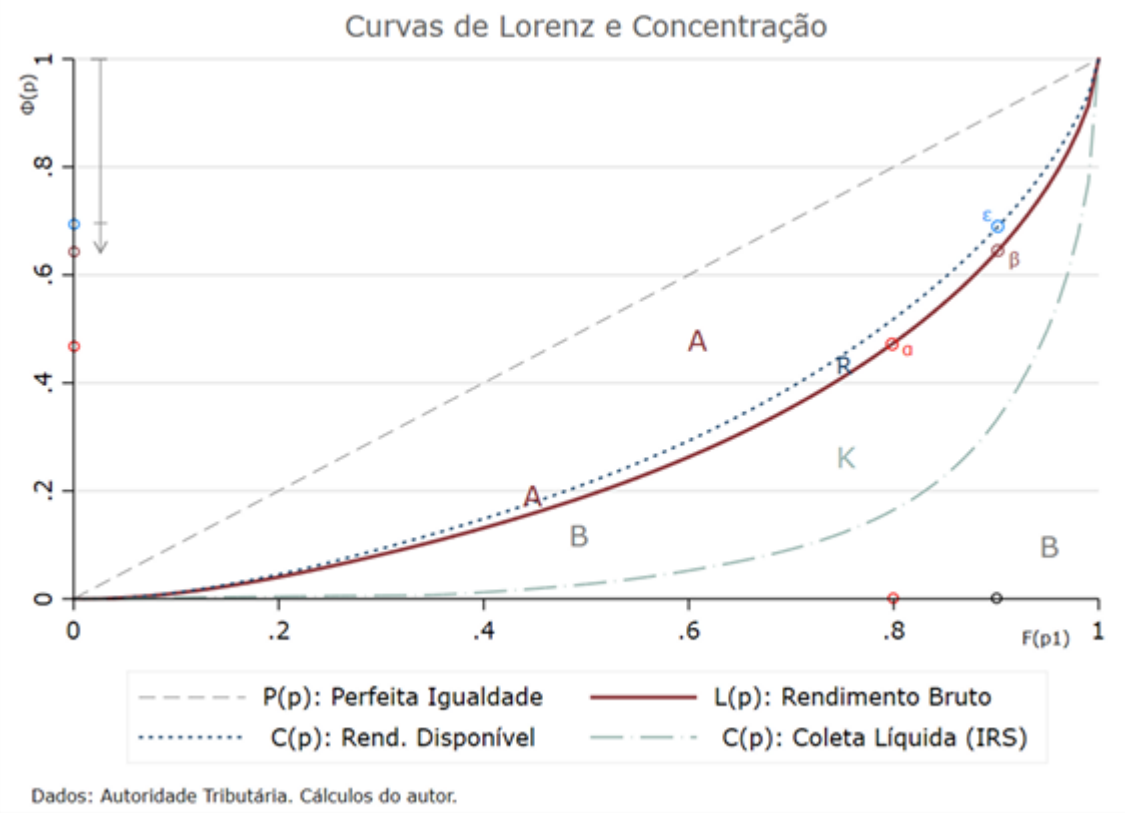
Primary income vs disposable income



The Netherlands (2020).

Source: CORE.

Rendimento primário vs. disponível



Portugal (year not specified).

Note: only the effect of personal income tax (IRS, a direct tax) is considered, excluding transfers and other taxes/contributions.

Source: GPEARI / GEE (2020).

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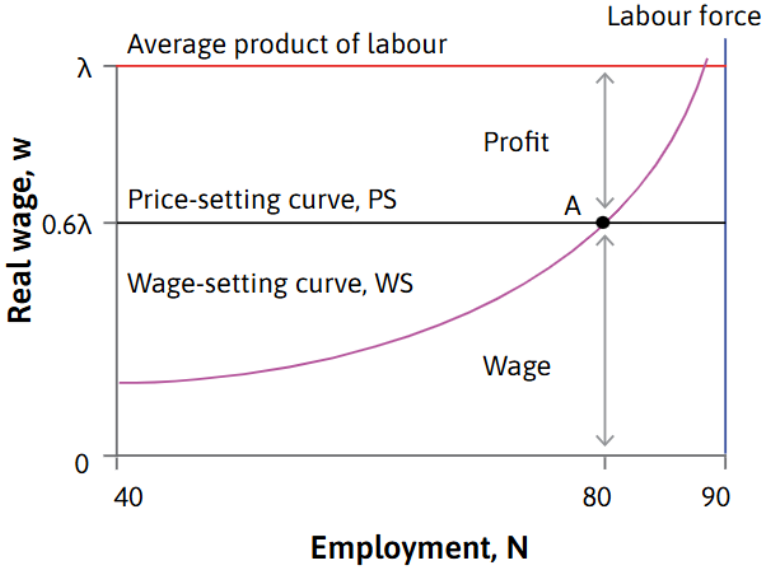
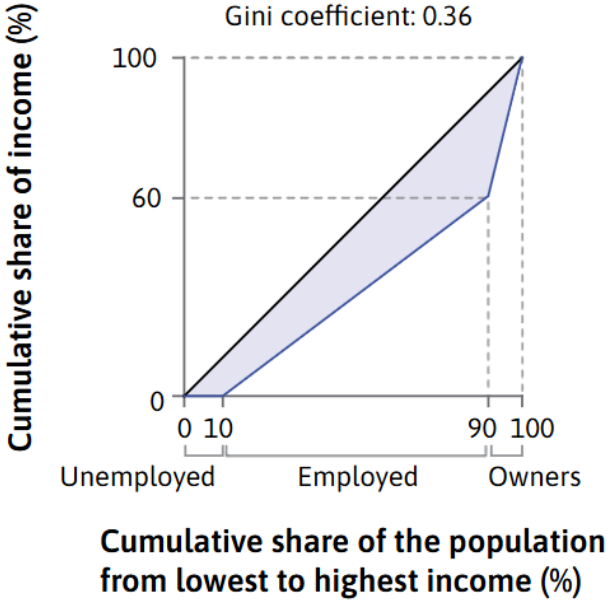
Unemployment and inequality in the WS–PS model

Inequality in the WS-PS model

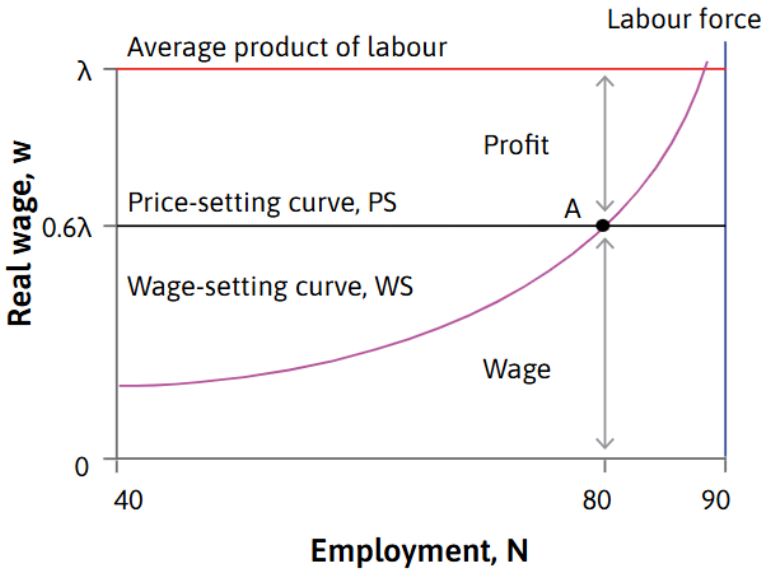


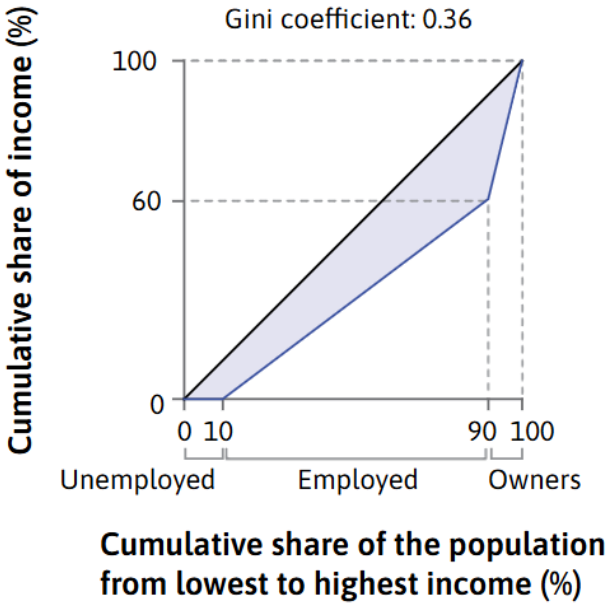


The **WS–PS model** endogenously **determines** the level of employment/unemployment, as well as **real wages and real profits** (under a given set of assumptions), at equilibrium.

These elements also allow us to draw conclusions about the **income distribution** associated with equilibrium in the model.

Inequality in the WS-PS model





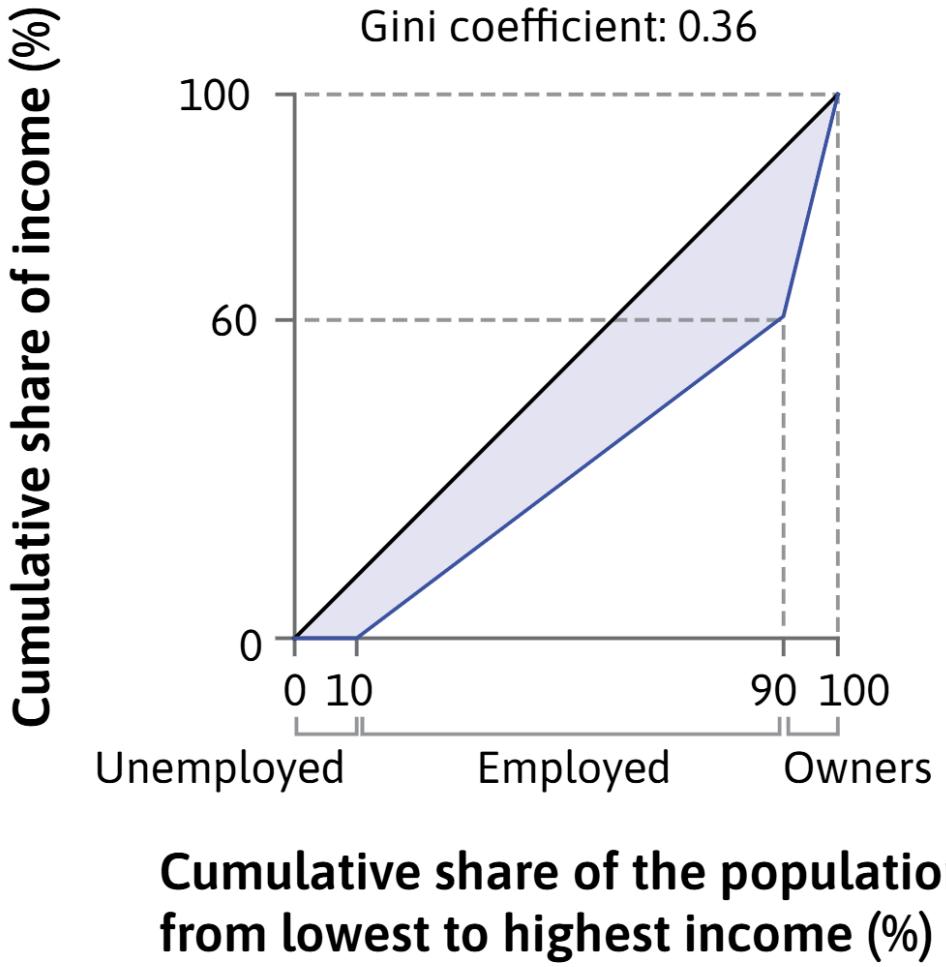
Suppose an economy with **90 workers** and **10 employers** (firm owners).

If the WS–PS equilibrium corresponds to point **A** we will have:

- **10 unemployed workers** (with no income);
- **80 employed workers** (each earning **0.6·λ**);
- **10 employers** (each earning **8·0.4·λ**).

Under these conditions, the income distribution is that represented by the **Lorenz curve** shown in the panel on the right.

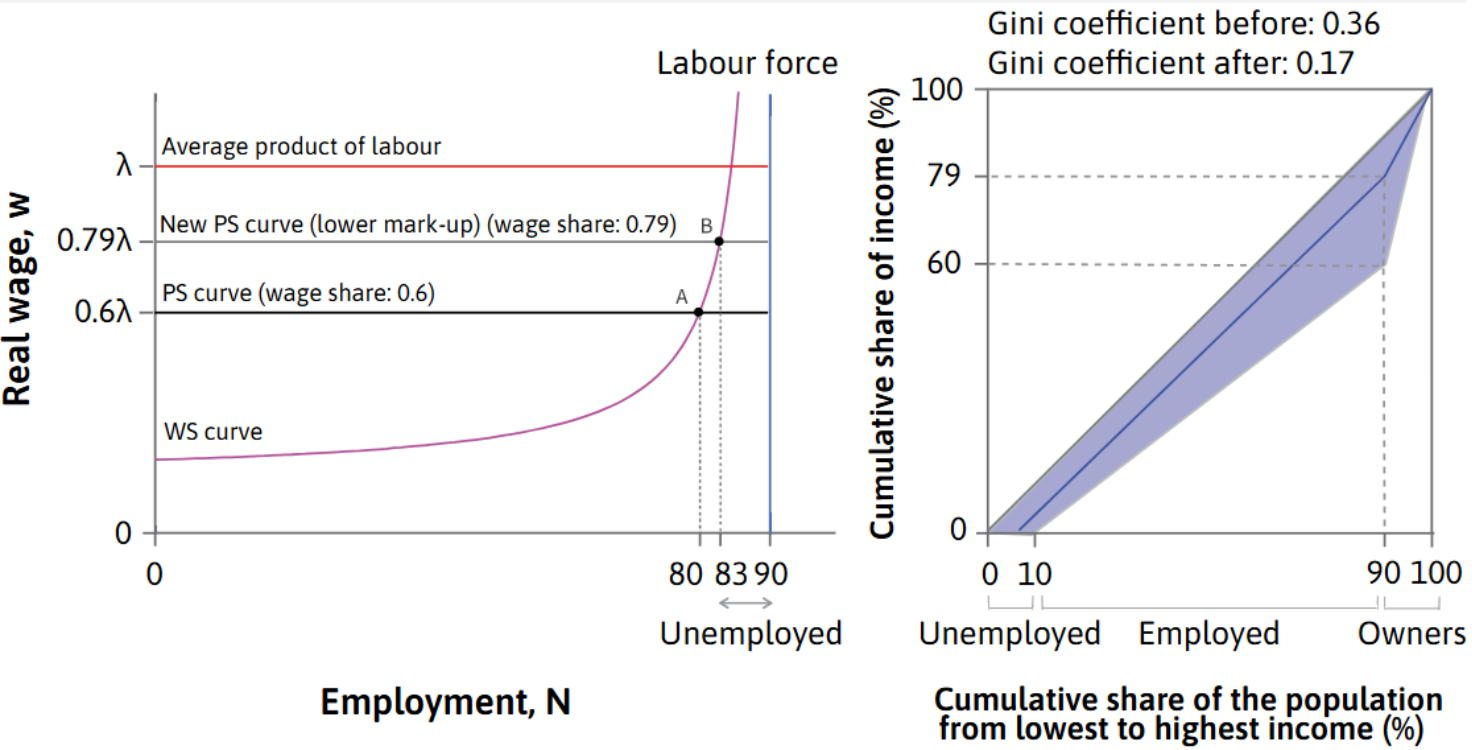
Inequality in the WS-PS model



In this representation, the shaded area (and therefore inequality) will tend to increase if:

- the share of **unemployed workers increases** (the first vertex shifts to the right);
- the **real wage w decreases** (or the markup increases) and, consequently, the **wage share of total income (1 – σ)λ decreases** (the second vertex shifts downward);
- **productivity increases but real wages** do not keep pace with that increase (as in the previous case, the second vertex shifts downward).

The effect of increased competition in the goods market



Ceteris paribus, an increase in competition in the goods market (a reduction in the markup) leads to:

- the **PS curve shifting upward**;
- in the new equilibrium **B**, a **higher level of employment**, lower unemployment, **a higher real wage**, and **a higher wage share of income** (left panel);
- for all these reasons, **inequality decreases** (in the right panel, the Lorenz curve moves closer to the diagonal and the Gini coefficient is lower).

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Additional readings:

"Great Economists: Michał Kalecki". *In* The CORE Team. (2023). *The Economy 2.0: Macroeconomics* (final do módulo 2.3)