



# Macroeconomics II

## Lecture 11

Inequality, measures  
The Kalecki model

## Theoretical Lecture 11

### Inequality and Income Distribution

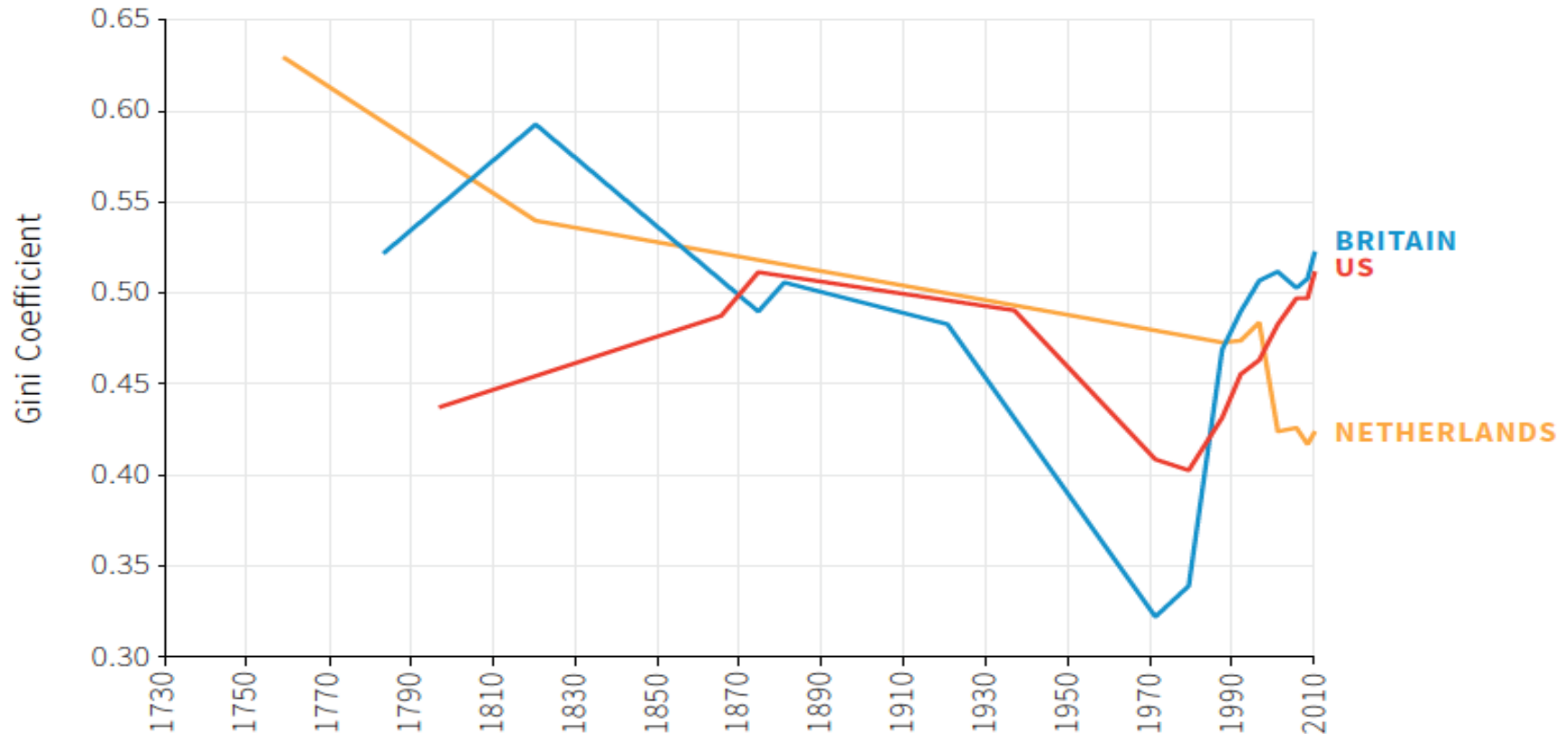
- personal income distribution: forms of representation;
- Lorenz curve; Gini index (concentration; inequality?); S80/S20 and S90/S10;
- relations of economic growth with income distribution: major topics;
- political power, efficiency and distribution;
- a dynamic framework of institutions;
- Gender inequality
- The Kalecki model
- 

### Readings:

Louçã e Ash (2017), *Sombras*, chps 4 and 5;

Data in: World Inequality Database, [online](#)

# Inequality is an old story



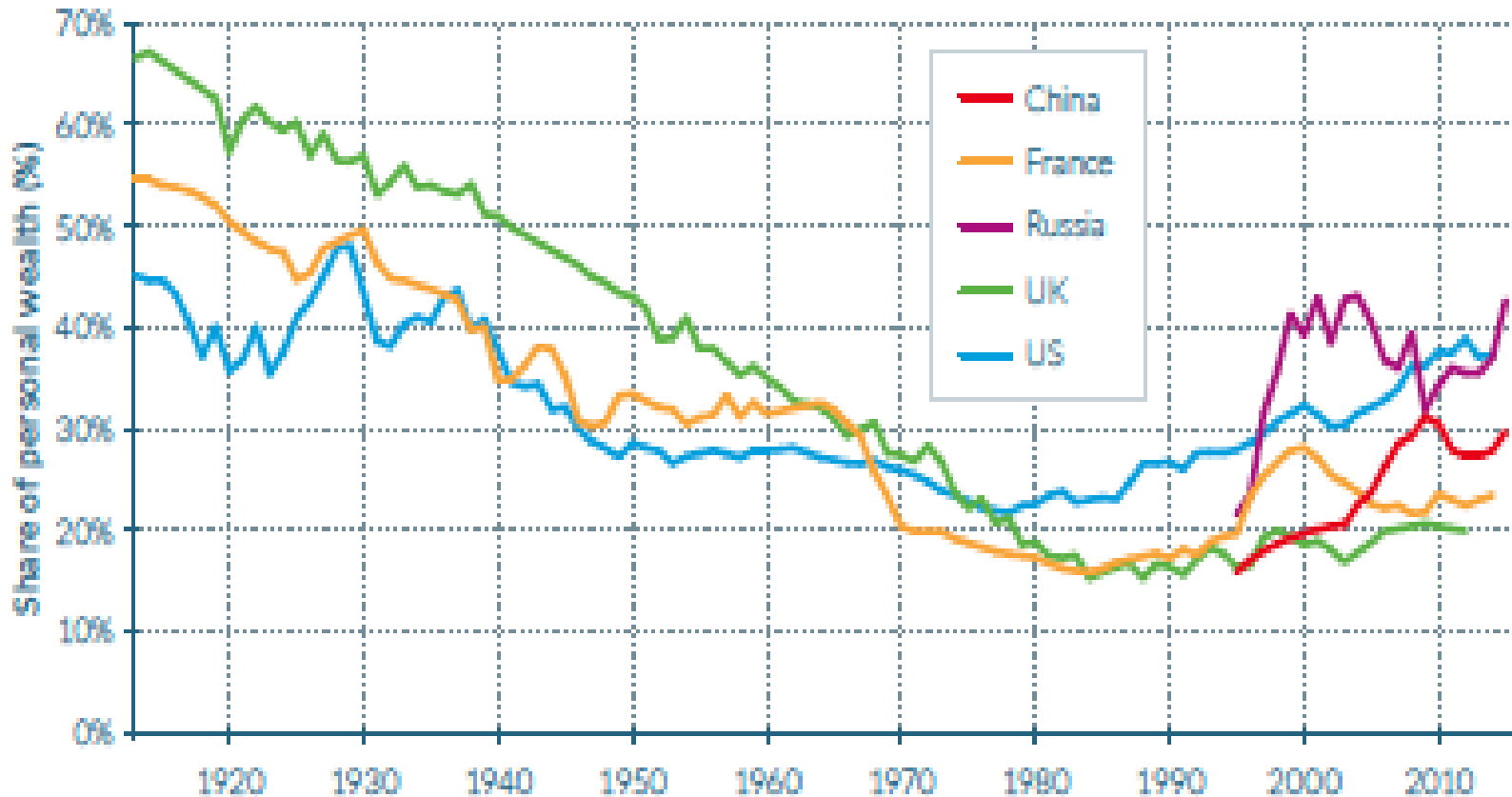
**Figure 1.15** *Income Inequality in the US, Britain and the Netherlands (1730-2010).*

Source: Lindert, Peter, and Jeffrey Williamson. 2103. 'Two Centuries of American Growth and Inequality, 1650-1860.' *Stanford Economic History Seminar*, October. The figure measures inequality of market, not disposable income for which data are not available before recent years, so the effects of taxes and transfers are not included. But prior to 1950 these were of limited importance.

# Ups and downs in the 20<sup>th</sup> and 21<sup>st</sup> centuries

**Figure E8**

**Top 1% wealth shares across the world, 1913-2015: the fall and rise of personal wealth inequality**



Source: WID.world (2017). See [w2018.wid.world](http://w2018.wid.world) for data series and notes.

In 2015, the Top 1% wealth share was 43% in Russia against 22% in 1995.

# The “elephant” of Branko Milosevic

RELATIVE CHANGES IN INCOME FROM 1980 TO 2016

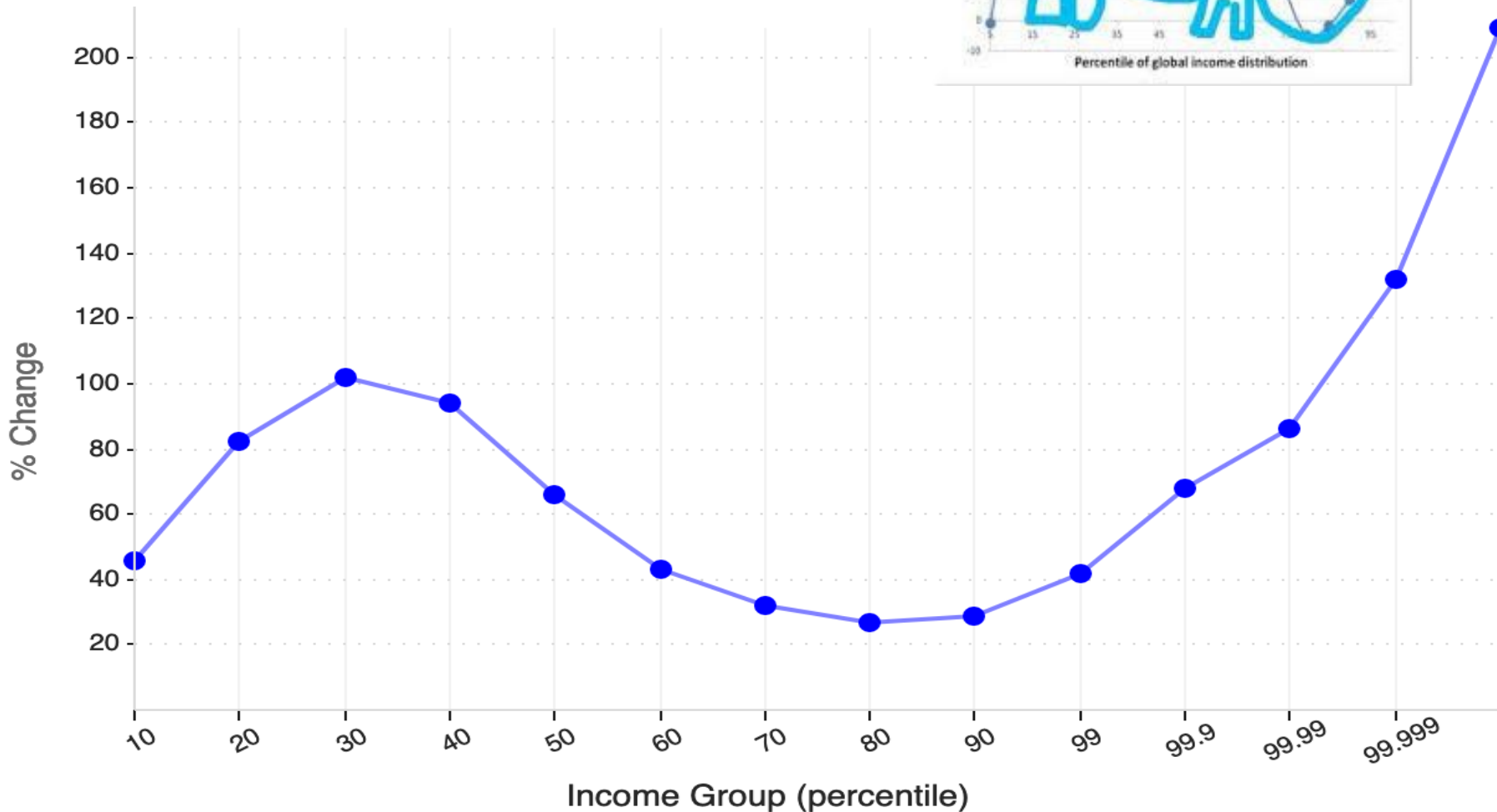
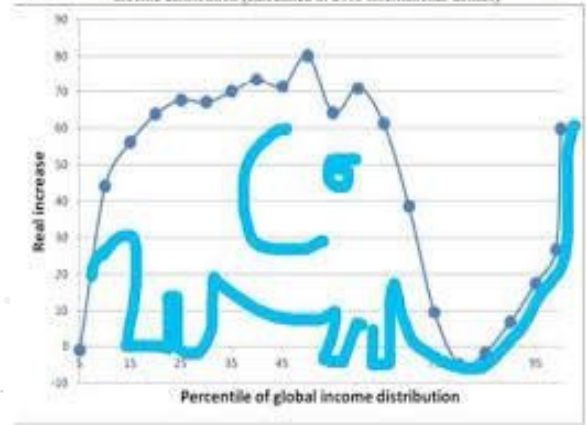
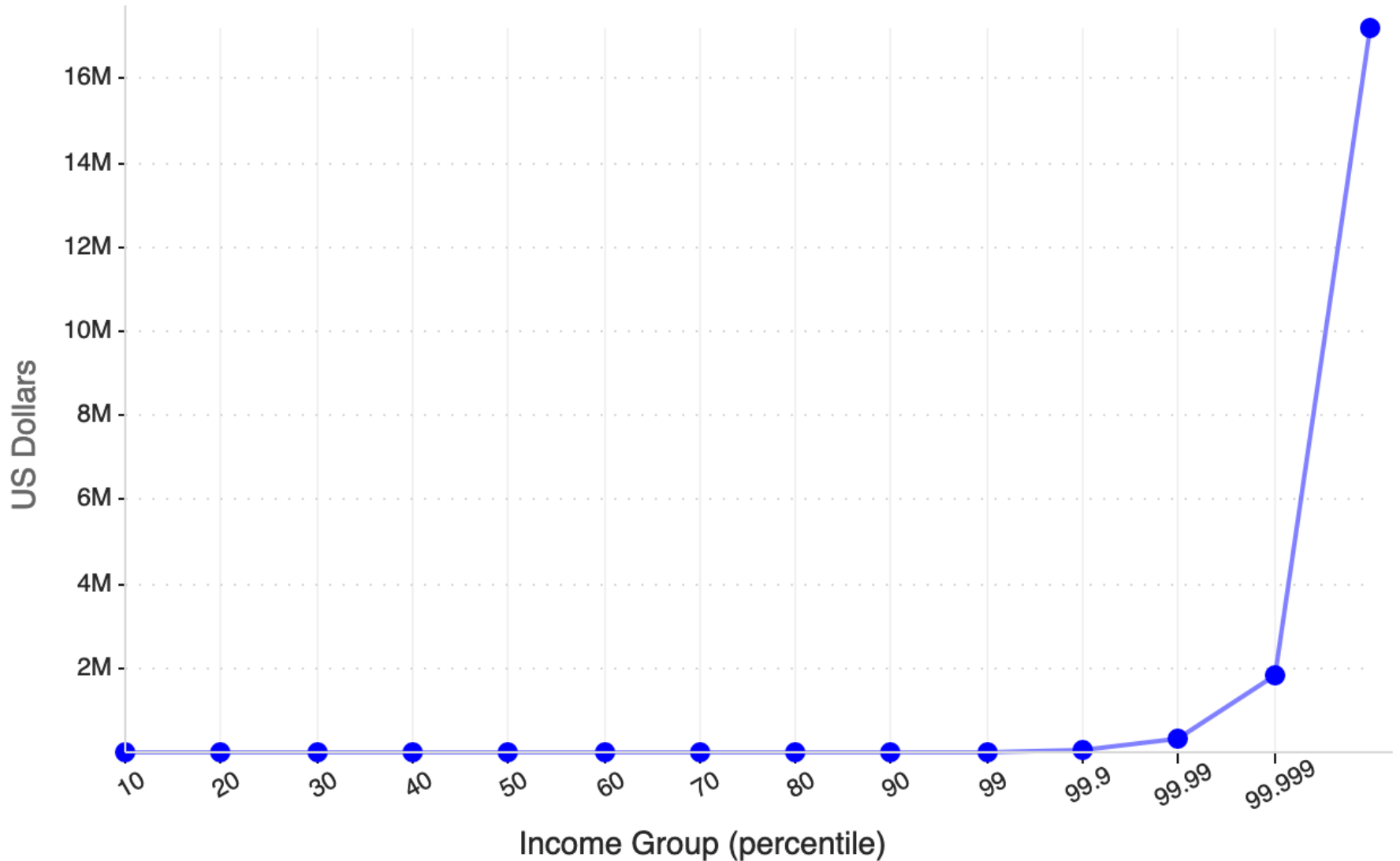


Figure 4. Change in real income between 1988 and 2008 at various percentiles of global income distribution (calculated in 2005 international dollars)

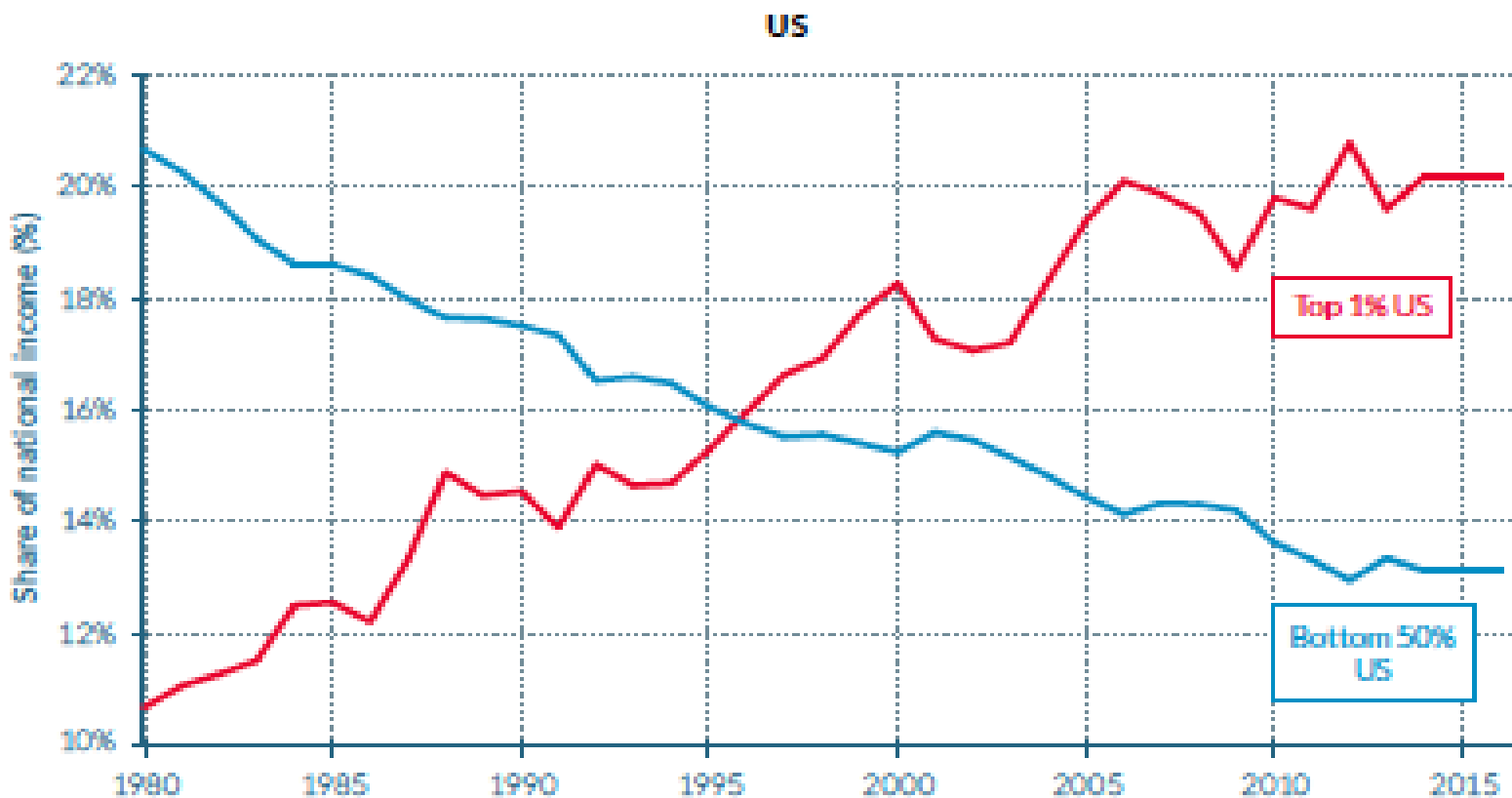


## ABSOLUTE CHANGES IN INCOME FROM 1980 TO 2016



**Figure E3**

**Top 1% vs. Bottom 50% national income shares in the US and Western Europe, 1980-2016:**  
**Diverging income inequality trajectories**

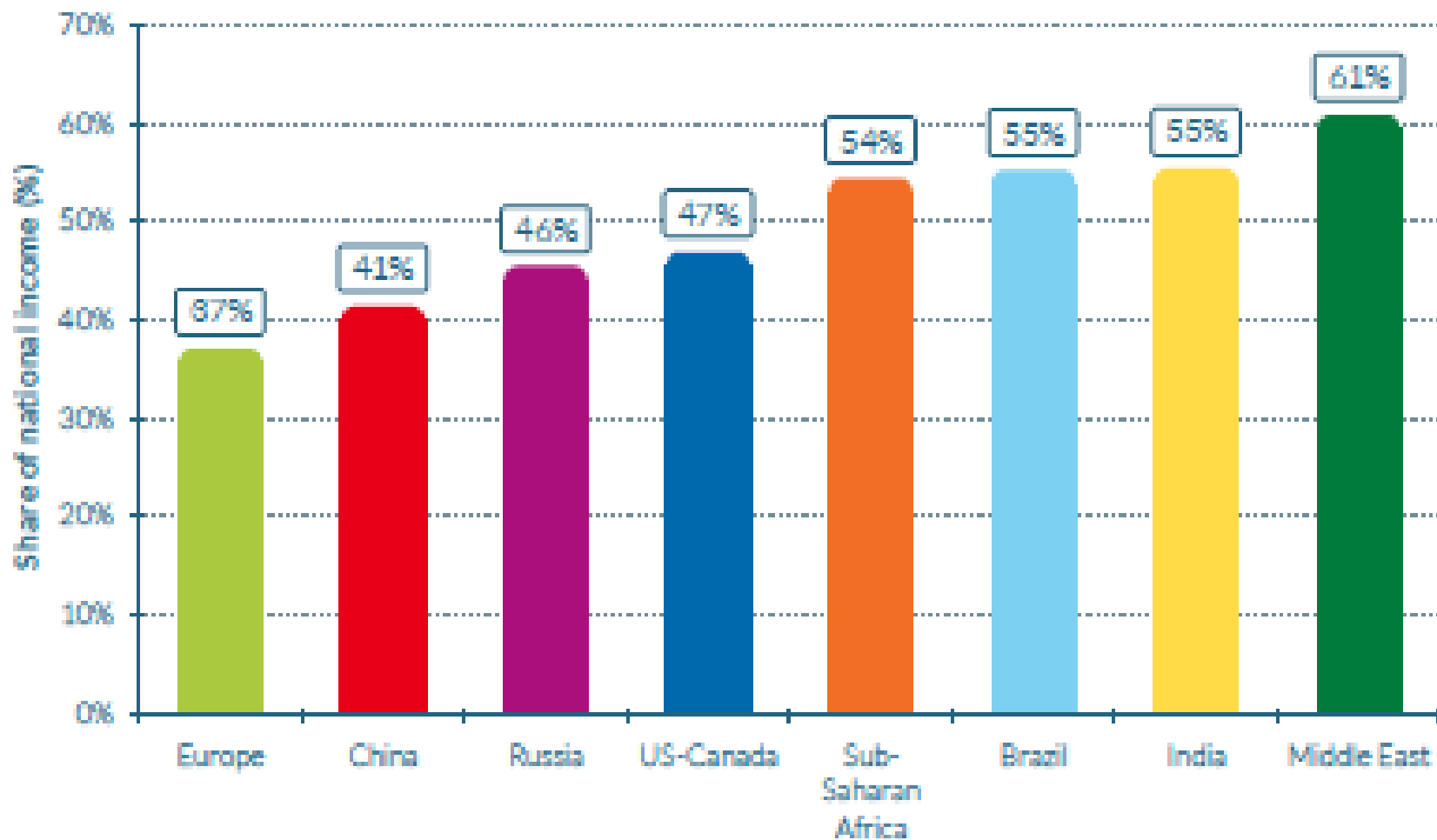


Source: WID.world (2017). See [wii2018](#) and [wid.world](#) for data series and notes.

In 2016, 12% of national income was received by the top 1% in Western Europe, compared to 20% in the United States. In 1980, 10% of national income was received by the top 1% in Western Europe, compared to 11% in the United States.

**Figure E1**

**Top 10% national income share across the world, 2016**



Source: WID.world (2017). See [wlr2018](#) & [wideworld](#) for data series and notes.

In 2016, 37% of national income was received by the Top 10% in Europe against 61% in the Middle-East.



# Personal income distribution: forms of representation

for a given year, how is total disposable income in a country distributed among all the population (individuals, or households) of that country?

## two different procedures:

**method 1:** to divide the population into several equal-sized groups (equal population shares) and to measure how much each income group earns/share of total household income; ex: quintiles, deciles, etc (relevant to compare population shares and income shares: a step towards the “evaluation” of inequality);

**method 2:** to divide income into equal-sized intervals and to ask how much of the population falls into each interval/share of total population (relevant to fit a distribution function: typically a lognormal, and to estimate mean and standard deviation, the parameters of this distribution function);

## method 1:

to divide the population into several equal-sized groups and to measure how much each income group earns/share of total household income; ex: quintiles, deciles, etc

### **Household Income in the United States by Quintiles, 2009**

Quintile	Average Household Income	Share of Total Household Income (%)
1st (Lowest)	\$11,552	3.4
2nd	\$29,257	8.6
3rd	\$49,534	14.6
4th	\$78,694	23.2
5th (Highest)	\$170,844	50.3

*Source: DeNavas-Walt, Proctor, and Smith (2010).*

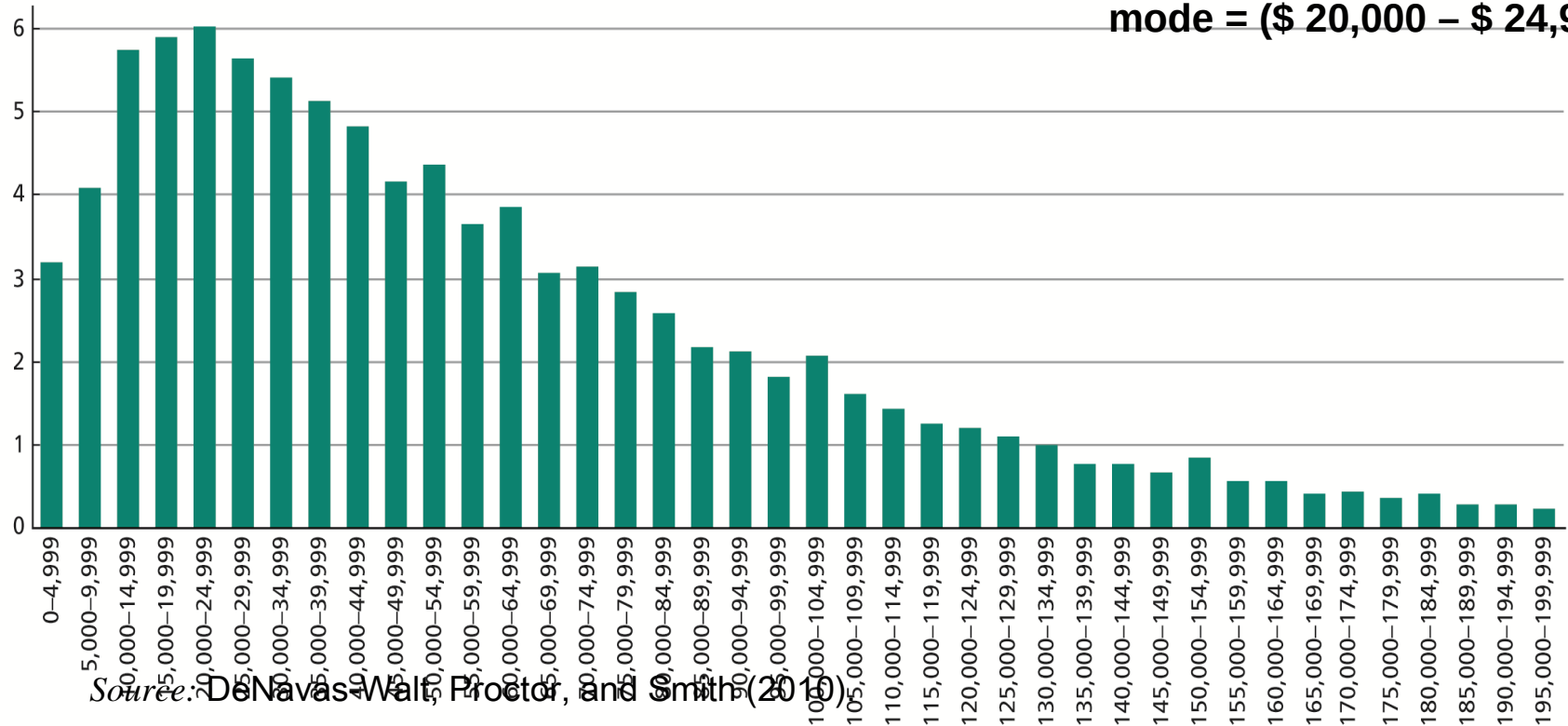
to divide income into equal-sized intervals  
and to ask how much of the population  
falls into each interval/share of total  
population

## method 2:

### Income Distribution in the United States, 2009

mean = \$ 67,976  
median = \$ 49,777  
mode = (\$ 20,000 – \$ 24,999)

Percentage of households



Source: DeNavas-Walt, Proctor, and Smith (2010)

Household income (dollars)

## from income distribution to the inequality of income distribution

from a descriptive (what it is) to a normative approach (what it should be) to income distribution

only makes sense to assess inequality of personal income distribution;

an income distribution is unequal if the differences of income among the individuals/households are greater than what is desirable according to the set of values of that person who evaluates the inequality;

different forms of introducing normative principles into the assessment of income inequality; one of them consists of comparing population shares and income shares (from method 1):

- Lorenz/Gini method;
- S80/S20 or S90/S10 methods;

## The Lorenz curve

Variable  $X$  (income) observed on a population of size  $n$   
let  $x_i$  be the income of person  $i$  of that population

$$(x_1, \dots, x_i, \dots, x_n)$$

and  $x_1 \leq \dots \leq x_i \leq \dots \leq x_n$  ; and let  $x_{tot}$  be the total income of that population

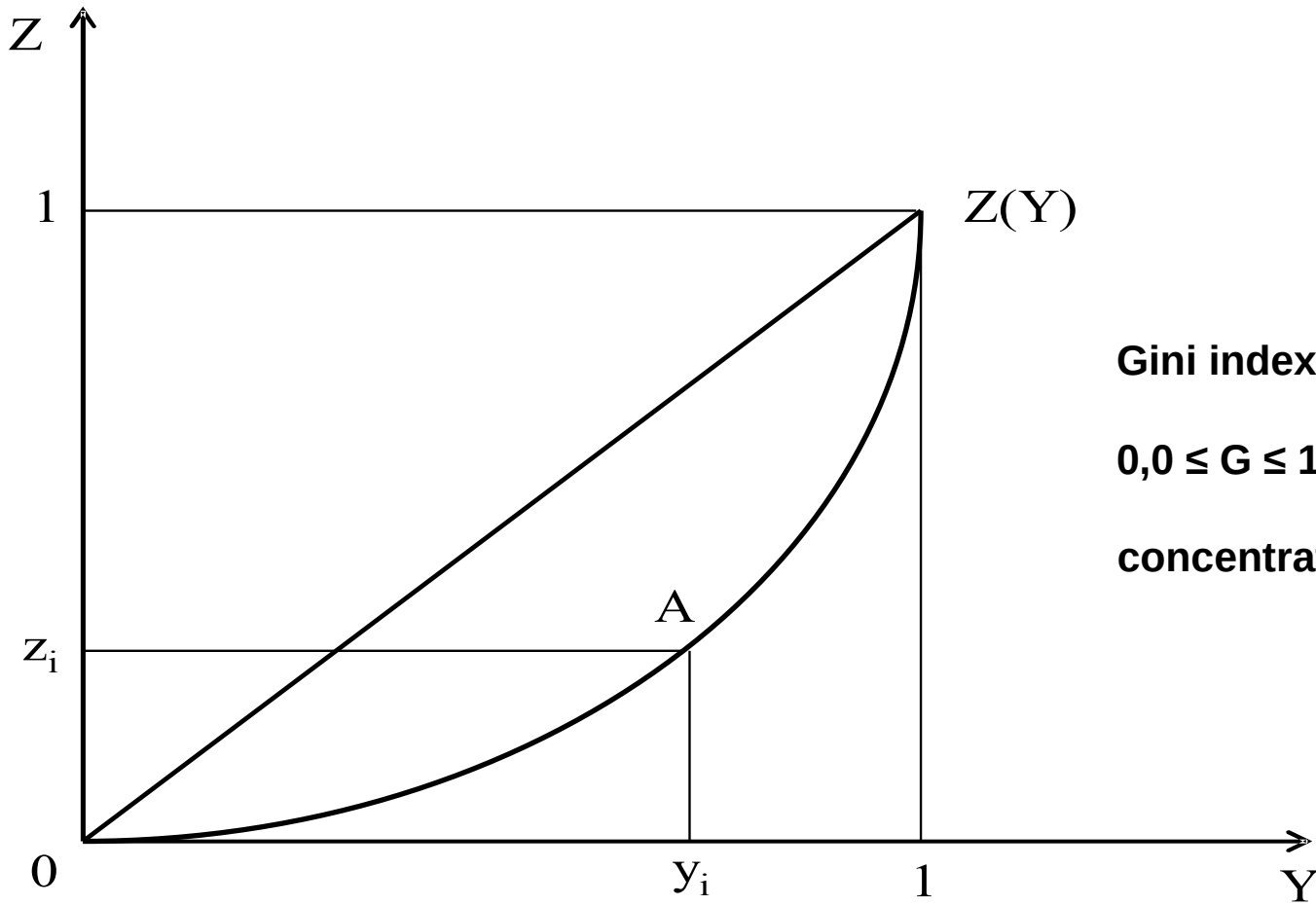
we create two variables:  $Y$  and  $Z$ . Then, for the person  $i$ :

$x_i$  income of person  $i$

$y_i$  proportion of persons with income  $\leq x_i$

$z_i$  proportion of total income,  $x_{tot}$  of the persons with income  $\leq x_i$

let  $Z = z(Y) \rightarrow$  **Lorenz curve** of the concentration of variable  $X$



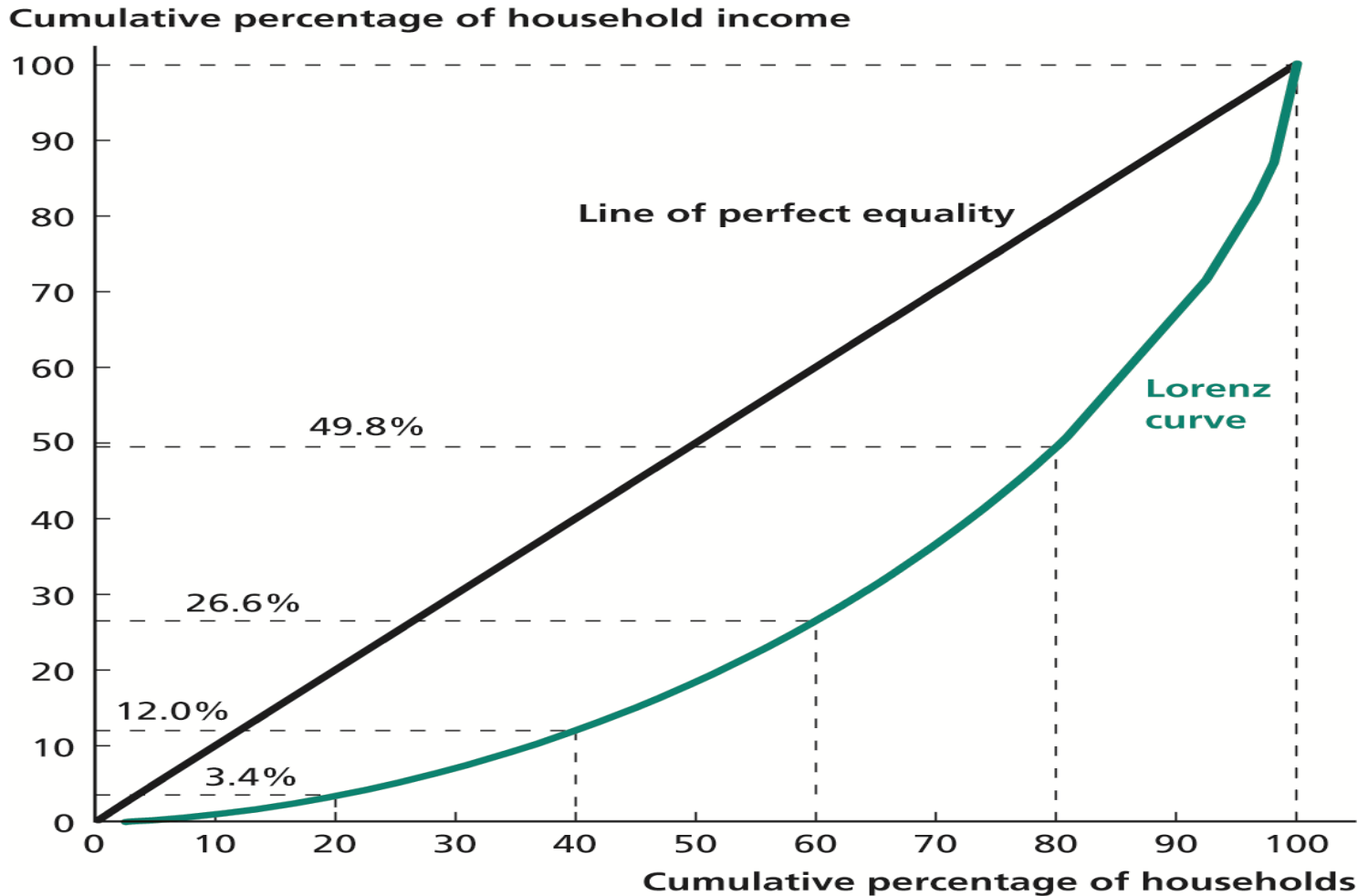
Gini index  $G = (0AZ)/(01Z)$

$0,0 \leq G \leq 1,0$

concentration = inequality?

Figura 7.1

# The Lorenz Curve for the United States, 2009



Source: De Navas-Walt, Proctor, and Smith (2010).

## Gini index (concentration; inequality?) and S80/S20 or S90/S10 Portugal

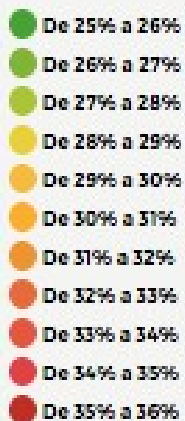
	2009	2010	2011	2012	2014	2016
<b>Gini</b>	0,337	0,342	0,345	0,342	0,339	0,335
<b>S80/S20</b>	5,6	5,7	5,8	6,0	5,9	5,7
<b>S90/S10</b>	9,2	9,4	10,0	10,7	10,1	10

Source: EU-SILC



# DESIGUALDADE NA UNIÃO EUROPEIA

Coeficiente de **Gini** (2015)



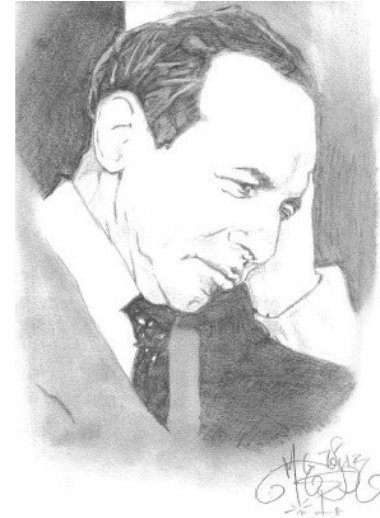
**UE 28**  
30,8%

**Zona Euro**  
30,7%

**Portugal**  
33,9%

Em 2015, Portugal era o sétimo país mais desigual da União Europeia com um coeficiente de Gini de 33,9%, 31 pontos percentuais acima da média da UE (30,8%) e 32 pontos percentuais acima da média dos países da zona euro (30,7%).

# The Kalecki model



- **Elements of a simplified version of the model:**
- 1)  $C_p = \beta + q P$ ,  $C_p$ , consumption of bourgeoisie,  $\beta$  autonomous consumption, part of profit  $P$  that is consumed (and the workers consume all their wages)
- 2)  $P = C_p + I$ , profits are either consumed or invested, and  $S = I$ ; **Consumption** =  $W + C_p$
- 3) therefore,  $P = (\beta + I) / (1 - q)$
- 4) also  $P = k (W + M)$ , where  $k$  is the markup in prices,  $W$  the total wages and  $M$  other spending in inputs

## The Kalecki model (2)

5) as  $P+W = Y = k(W+M) + W$ , we have:

6) the wage share  $\alpha = W/Y = 1/((k+1)+(kM/W))$ , or the wage share decreases with the markup (if there is no change in M and W)

7) also as  $W = \alpha Y$ , then  $Y(1-\alpha)=P$

$$\text{or } Y=(I+\beta) / ((1-q)(1-\alpha))$$

## Conclusion on the Kalecki model

8) assuming, for simplicity,  $\beta$  to be constant, then

$$\Delta Y = \Delta I / (1-q)(1-\alpha)$$

or,

growth **increases** with investment and the part of profits used as consumption by the capitalists  
and **decreases** with the profit's share of output

Evidence for Kalecki: is there market power?  
yes, there is a mark up by the 10% top firms

## A winner's world

Markup over marginal cost\*, 2000=100



Source: IMF

\*Over 900,000 firms in 27 countries

†Ranked by markup