Eco L3 - Globalization, Inequality, and Redistribution

Lecture 1: What is Income? What is Capital?

Gabriel Zucman

gabriel.zucman@psemail.eu

Roadmap

1. Income = domestic output + net foreign income

2. Income = labor income + capital income

3. Functional vs. personal income distribution

4. What is capital

5. The capital/income ratio in the long run

1 Income = domestic output + net foreign income

National income Y of a country = net domestic output Y_d + net foreign income

At world level: $Y = Y_d$

1.1 Net domestic output Y_d

- Net domestic output $Y_d = F(K, L)$

- Net domestic output Y_d = GDP minus capital depreciation

- GDP = gross domestic product = economy-wide value-added = the value of all goods and services sold to final users = C + I

- Depreciation: loss in the value of capital due to passing of time

- Depreciation is $\approx$ 10-15% of GDP $\approx$ 2-3% of capital stock K

- Depreciation varies with asset mix (buildings vs. software)

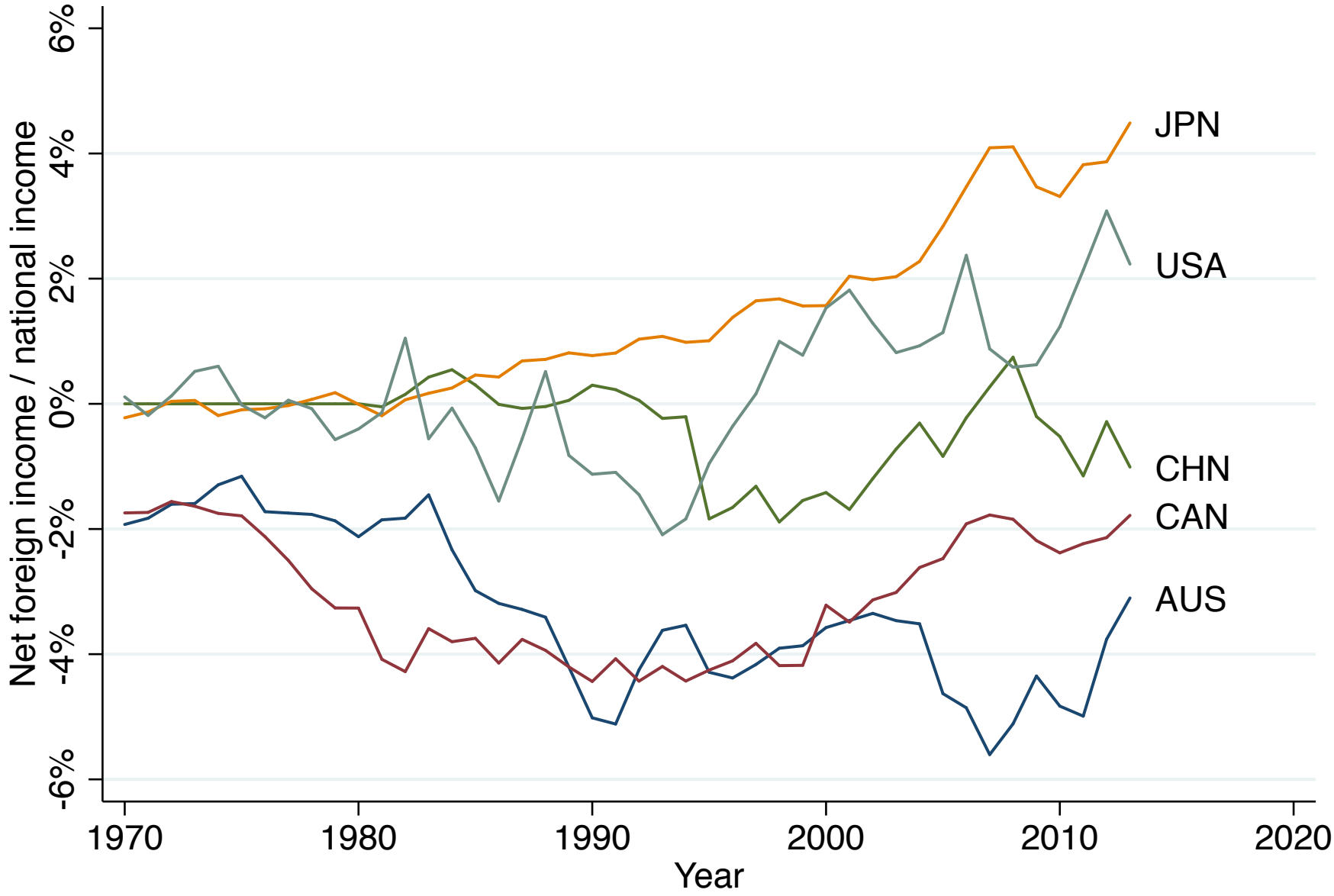
- Depreciation varies with geography $\rightarrow$ harder to accumulate K in humid countries, exposed to cyclones. See Hsiang and Jina (2015)

1.2 Net foreign income

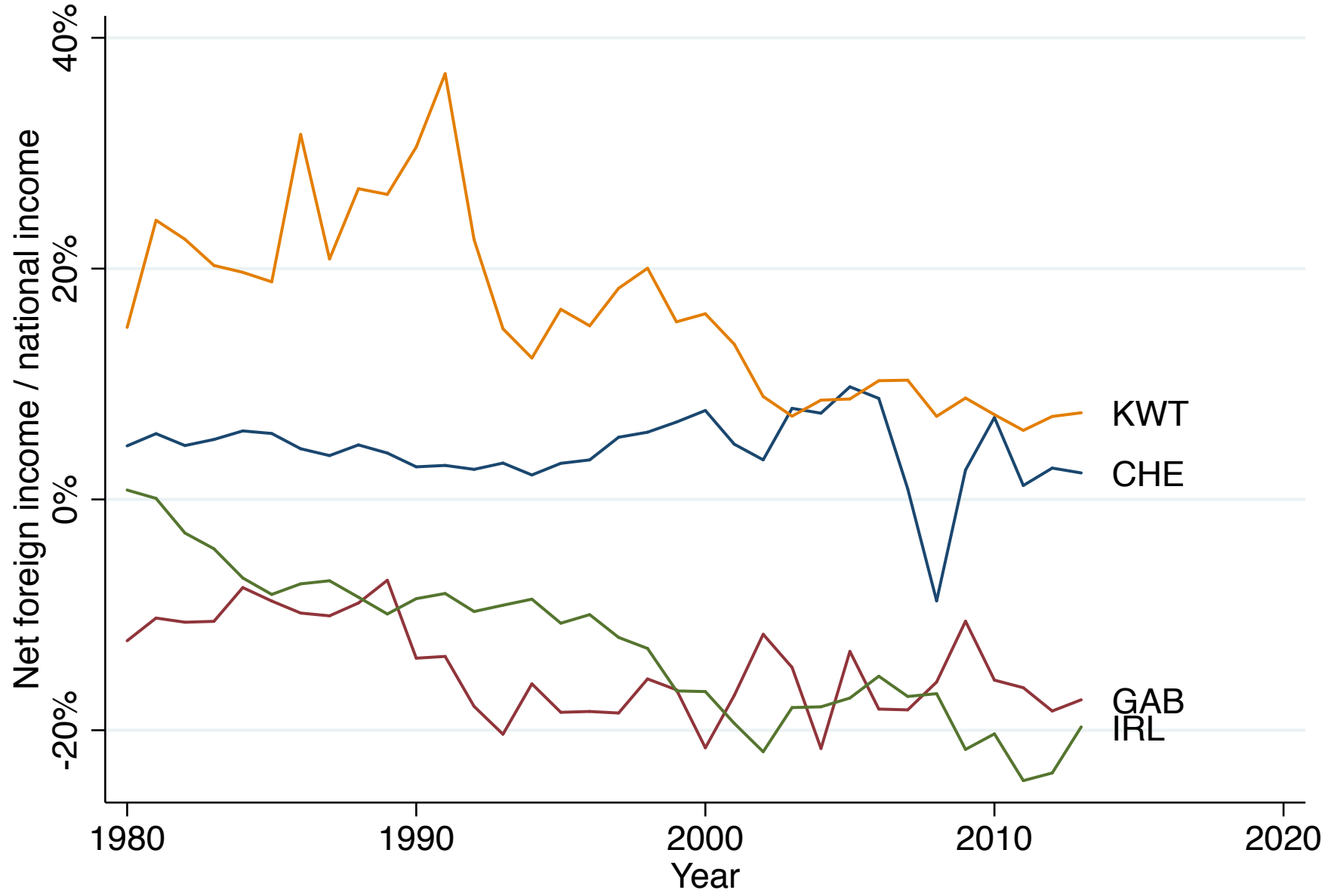
- Net foreign income = net foreign labor income + net foreign capital income

- Net foreign labor income: wages of cross-border workers. Typically negligible (except in tiny countries like Luxembourg)

- Net foreign capital income: dividends, interest, rents generated by cross-border assets. Can be large (and either > 0 or < 0)



Data source: World Bank's World Development Indicators



Data source: World Bank's World Development Indicators

1.3 What determines net foreign income?

- Net foreign capital income $= FA \times r_A - FL \times r_L$

- FA – FL = foreign assets minus foreign liabilities = net foreign asset position (NFA)

- FA, FL: depends on stage of development; demography; home bias; financial account policies

- r_A, r_L: depends on composition of external assets; exorbitant privilege; tax avoidance. See Gourinchas and Rey (2007)

2 Income = labor income + capital income

- $Y = F(K, L) +$ net foreign income $= Y_K + Y_L$
- $Y_K =$ capital income (domestic + foreign) = corporate profits + rents + interest + K component of mixed income
- $Y_L =$ labor income (domestic + foreign) = wages + supplements to wages + labor component of mixed income
- $\alpha = Y_K/Y =$ share of capital in national income $\approx$ 25-30%
- $1 - \alpha = Y_L/Y =$ share of labor in national income $\approx$ 70-75%

3 Functional vs. personal income distribution

- Functional income distribution: distribution of $Y = Y_K + Y_L$ across factors of production K and L

- What classical economists were mostly interested in

- Personal income distribution: distribution of $Y = \sum_i y_i$ across individuals i

- What today's economists are mostly interested in

- Both are related, since y_i depends on:
  - Distribution of y_{Li} across individuals i
  - Distribution of y_{Ki} across individuals i
  - Relative size of $Y_K = \sum_i y_{Ki}$ and $Y_L = \sum_i y_{Li}$
  - Correlation between y_{Li} and y_{Ki}

4 Capital and wealth: definition

4.1 Private wealth

- Private wealth W = assets – liabilities of households

- Assets = all non-financial (housing, land...) and financial assets (equities, bonds, bank deposits...)

- Recorded in national balance sheets

4.2 Public wealth

- Public wealth = assets – liabilities of the government

- Liabilities = public debt; assets = schools, roads, barracks...

4.3 National wealth

- National wealth = private wealth + public wealth

National wealth can be decomposed as follows:

- National wealth = domestic capital K + net foreign assets
- K = domestic capital = land + housing + other domestic capital
- At world level: wealth = capital
- Key reference for data on wealth and its composition: World Inequality Database, `http://wid.world`

5 The capital/income ratio in the long run

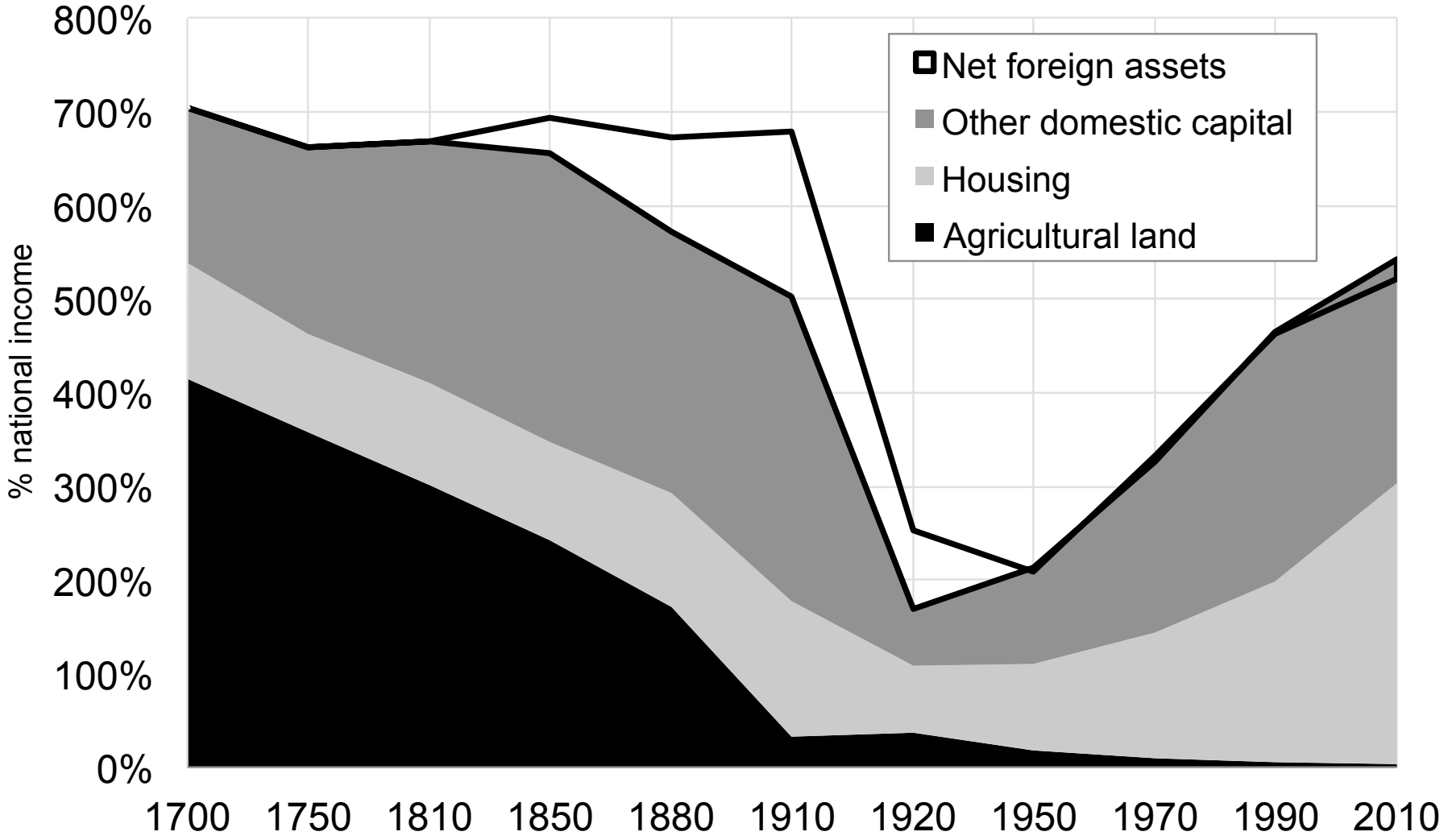
Object of interest $\beta = W/Y$

5.1 Data sources

- Long tradition of national wealth estimates in Britain and France in 18th-19th centuries

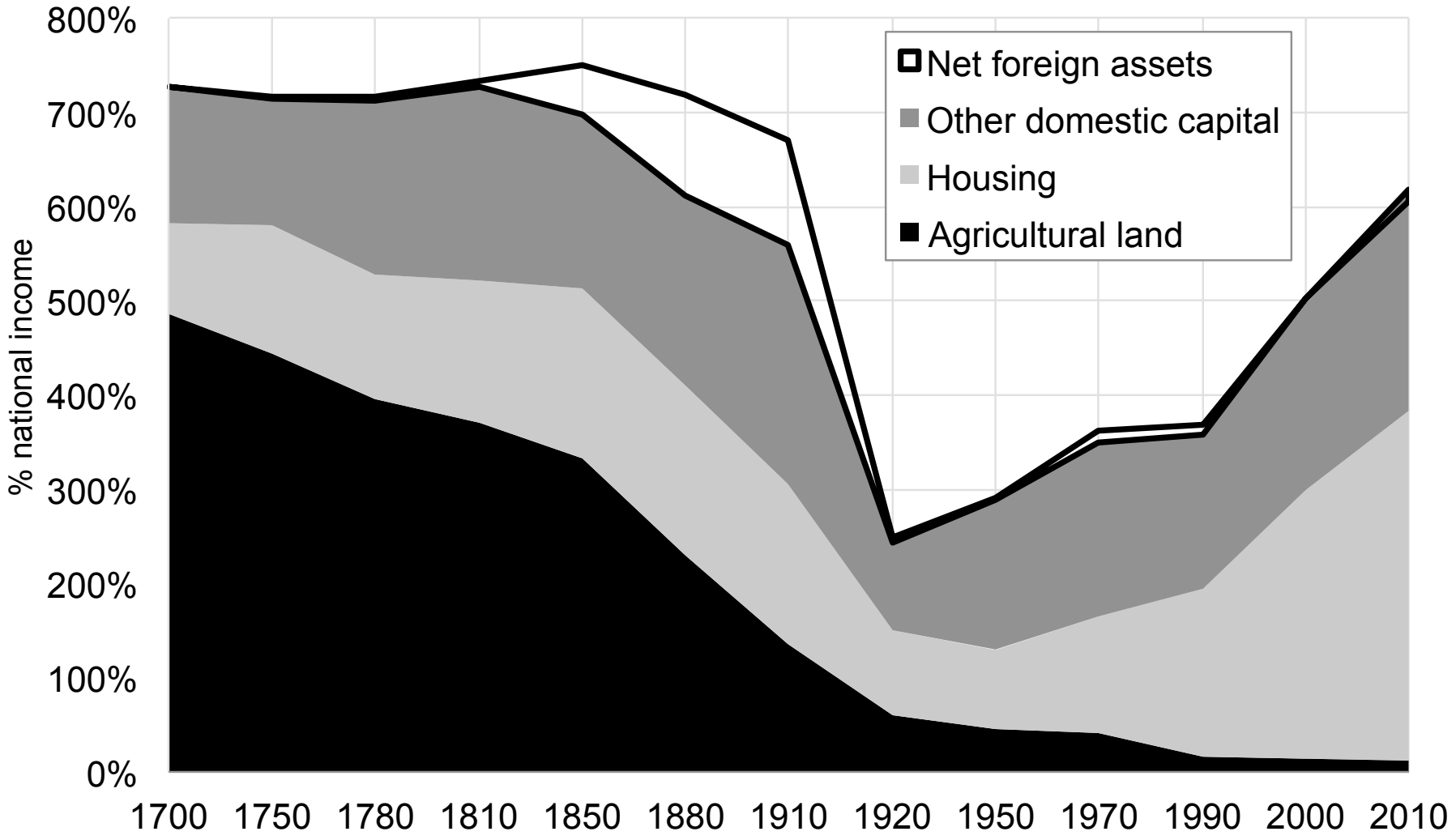
- Not sufficiently precise to study short-run fluctuations; but fine to study broad orders of magnitudes and long-run evolutions

The changing nature of national wealth: UK 1700-2010



Source: Piketty and Zucman (2014). National wealth = agricultural land + housing + other domestic capital goods + net foreign assets

The changing nature of national wealth: France 1700-2010



Source: Piketty and Zucman (2014). National wealth = agricultural land + housing + other domestic capital goods + net foreign assets

5.2 The long-run wealth-income ratio: $\beta = s/g$

In the long-run, the wealth to income ratio β is equal to the ratio of the saving rate s by the growth rate g

Proof of the formula $\beta = s/g$:

- $W_{t+1} = W_t + s_t Y_t$
- Divide both sides by $Y_{t+1} = Y_t(1 + g_t)$ to get:

$$\beta_{t+1} = \frac{W_t + s_t Y_t}{Y_t(1 + g_t)} = \frac{\beta_t + s_t}{1 + g_t}$$

In steady state:

- $\beta_t = \beta_{t+1}$, $s_t = s$, $g_t = g$
- Plug in above equation, solve for β, and get $\beta = s/g$

Ex: if $s = 10\%$ and $g = 3\%$ then $\beta = 333\%$

Ex: If $s = 10\%$ and $g = 1.5\%$ then $\beta = 666\%$

Only assumption: $W_{t+1} = W_t + s_t Y_t$, i.e., no capital gains or losses (a.k.a. "asset price effects")

5.3 Where does s come from?

Different reasons why people save:

- Precautionary saving
- Life-cycle saving
- Leaving bequests
- Wherever s comes from, $\beta = s/g$ absent capital gains/losses

5.4 What does the $\beta = s/g$ formula say?

Any β possible in steady-state, as s and g vary for lots of reasons

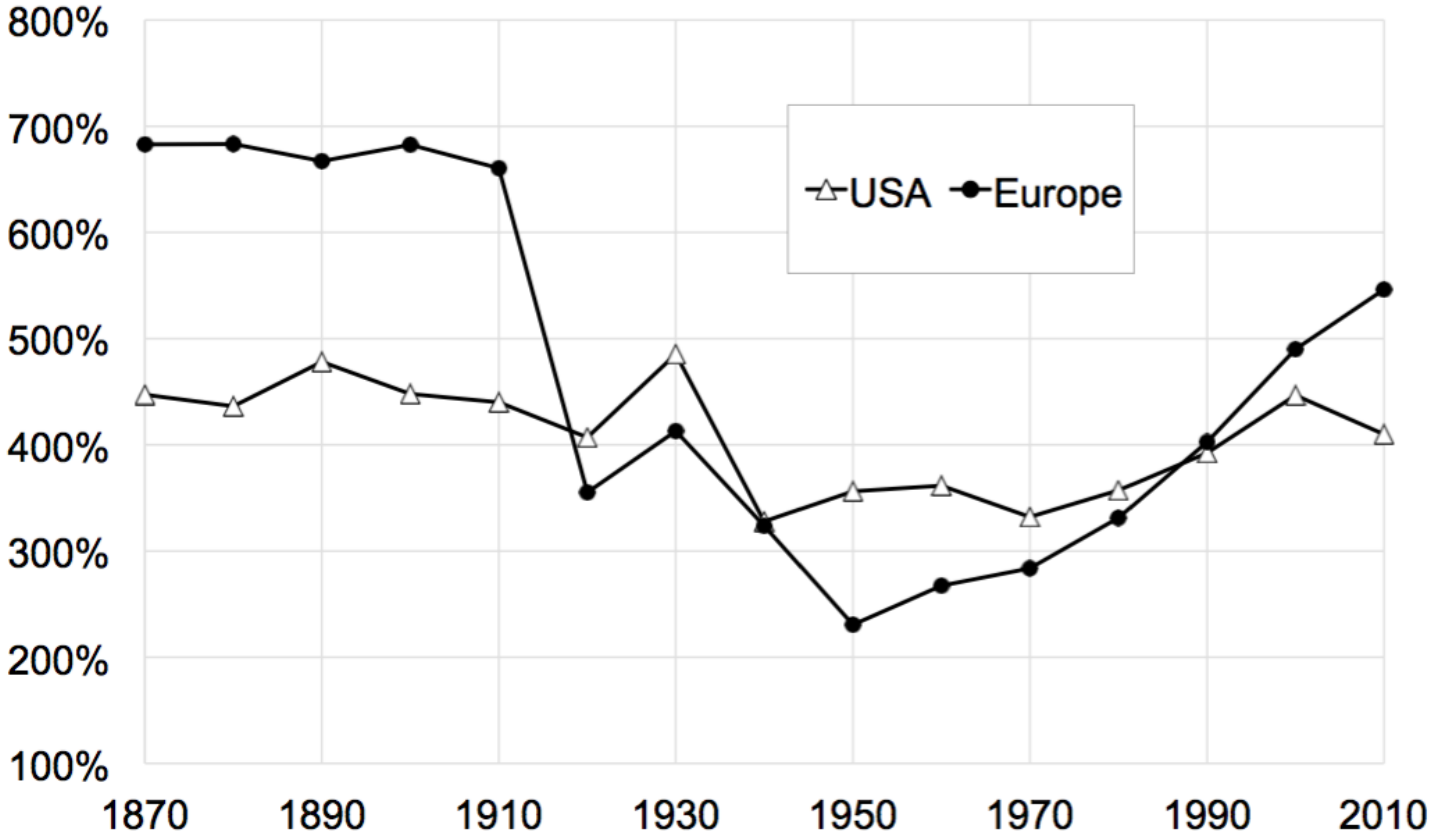
Countries with low g tend to have high β

Can explain why 18th century economies had high β

Can explain some of the differences Europe vs. US

Can explain high Chinese saving rate

Figure 4: Private wealth / national income ratios 1870-2010: Europe vs. USA



Authors' computations using country national accounts. Private wealth = non-financial assets + financial assets - financial liabilities (household & non-profit sectors). Data are decennial averages (1910-1913 averages for Europe)

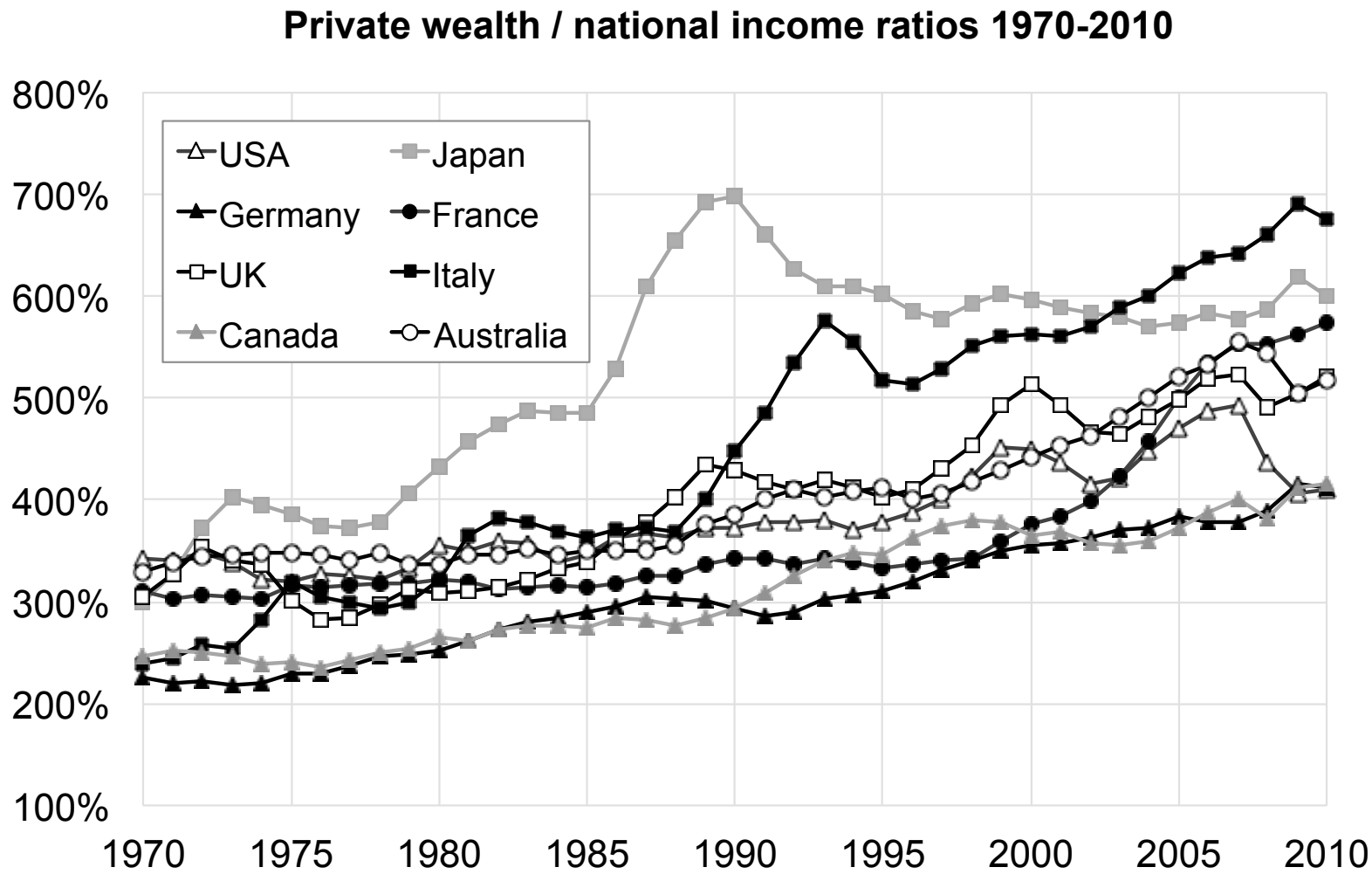
5.5 Lessons of $\beta = s/g$ for the 21st century

Population growth will fall $\rightarrow \beta$ might become high at global level

If in addition productivity growth falls, β might become very high

Are high β a good thing or a bad thing?

- Good: capital is useful (e.g., infrastructure, houses, etc).
- Problem: might exacerbate inequality



Source: Piketty and Zucman (2014). Authors' computations using country national accounts. Private wealth = non-financial assets + financial assets - financial liabilities (household & non-profit sectors)

5.6 The link between capital income and wealth

- Define r = average rate of return to wealth = Y_K/W
- **Basic accounting relatinoship:** $\alpha = r \times \beta$
- Typical values: β =600%, r =5%, α =30%
- In practice, average rate of return to capital r varies a lot across assets and over individuals