Econ 133 – Global Inequality and Growth

What is Capital?
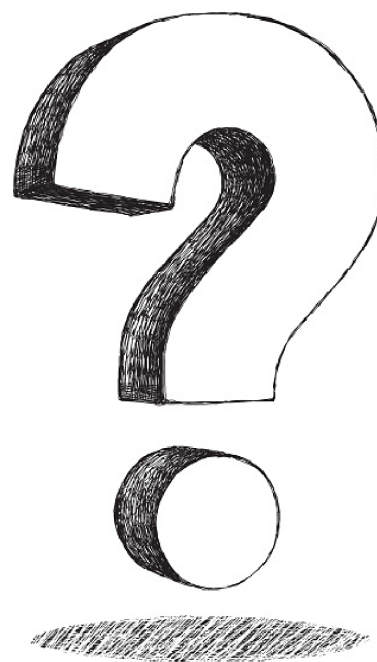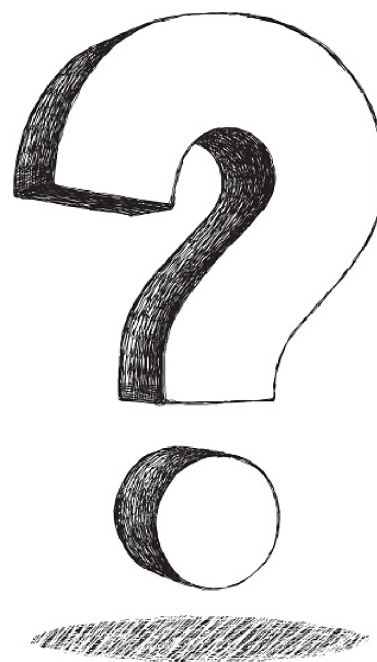
Ludvig Wier

ludvig.wier@berkeley.edu

Roadmap

1. Capital and wealth: definitions

2. The wealth/income ratio in the long-run

3. The link between capital income and wealth

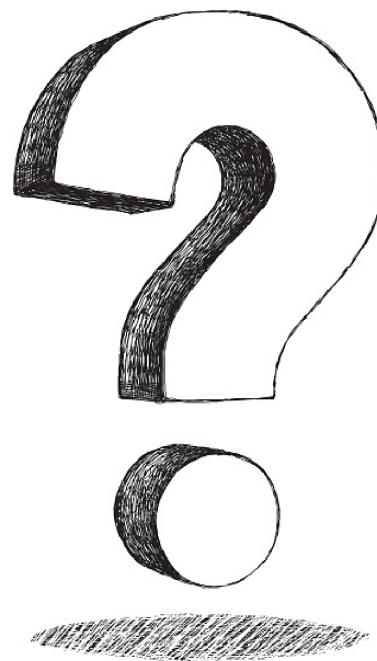# What is wealth?

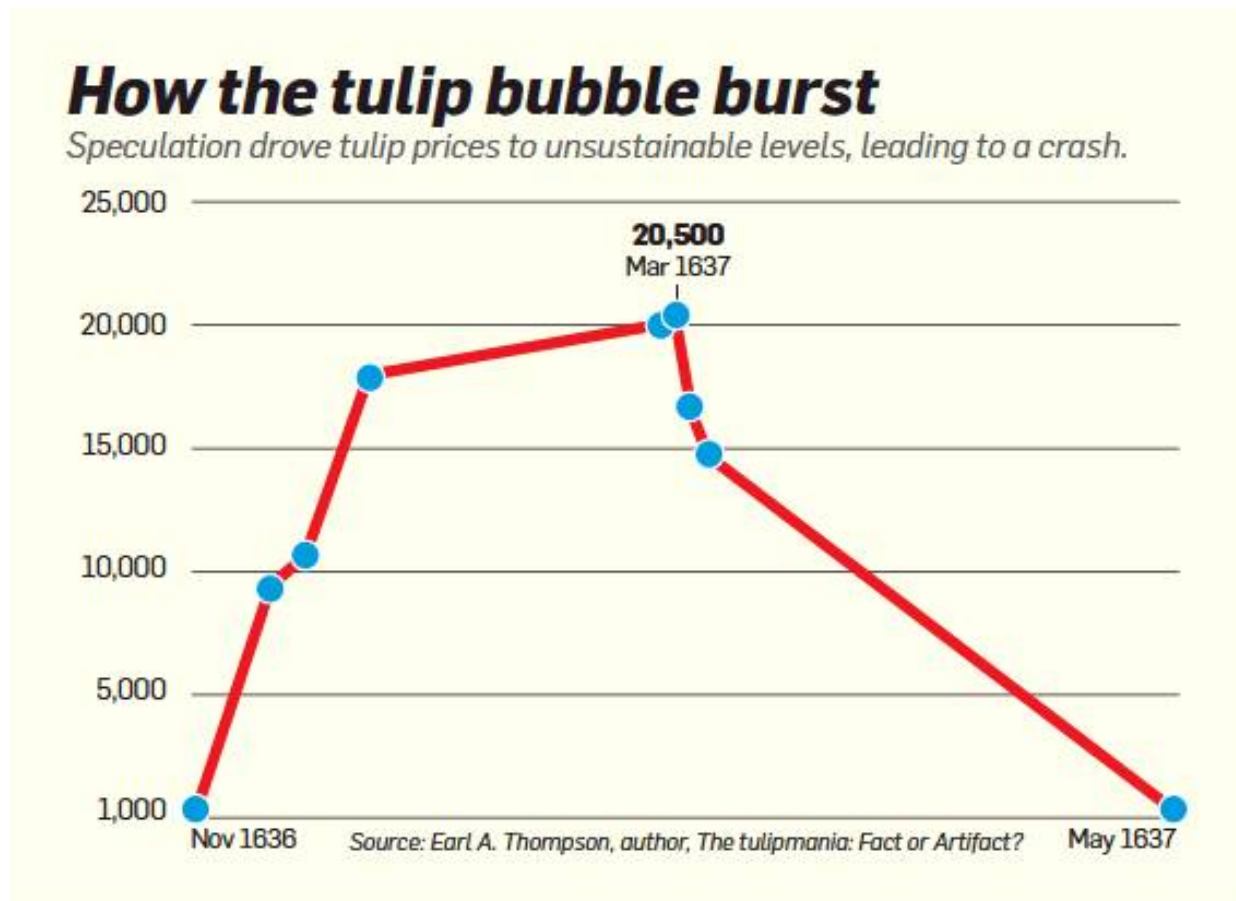# What drives wealth?

Why do we care about wealth and capital?

Why do we care about wealth and capital?

Wealth is not interesting in isolation - but paramount to understand:

- The relative importance capital and labor

- The importance of wealth inequality

- The importance of wealth inequality for income inequality

Why do we care about wealth and capital?

How the tulip bubble burst
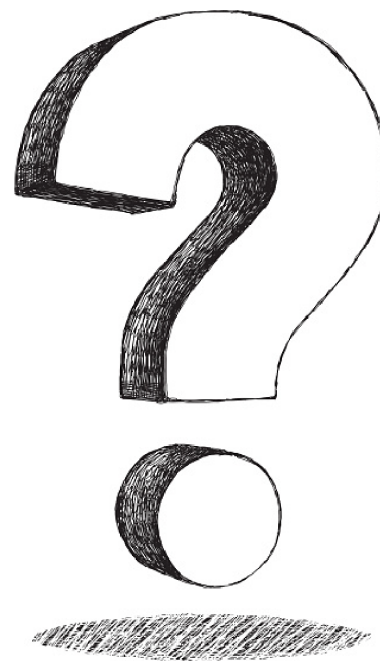Speculation drove tulip prices to unsustainable levels, leading to a crash.

1   Capital and wealth: definition

1.1   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 at *market prices*

What determines market prices?

1.2 Public wealth

- Public wealth = assets − liabilities of the government

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

1.3 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`

2 The wealth/income ratio in the long run

Object of interest $\beta = W/Y$

2.1 Data sources

- Long tradition of national wealth estimates in Britain (Petty, King, Giffen) and France (Vauban, Lavoisier, Colson) in 18th-19th cent.

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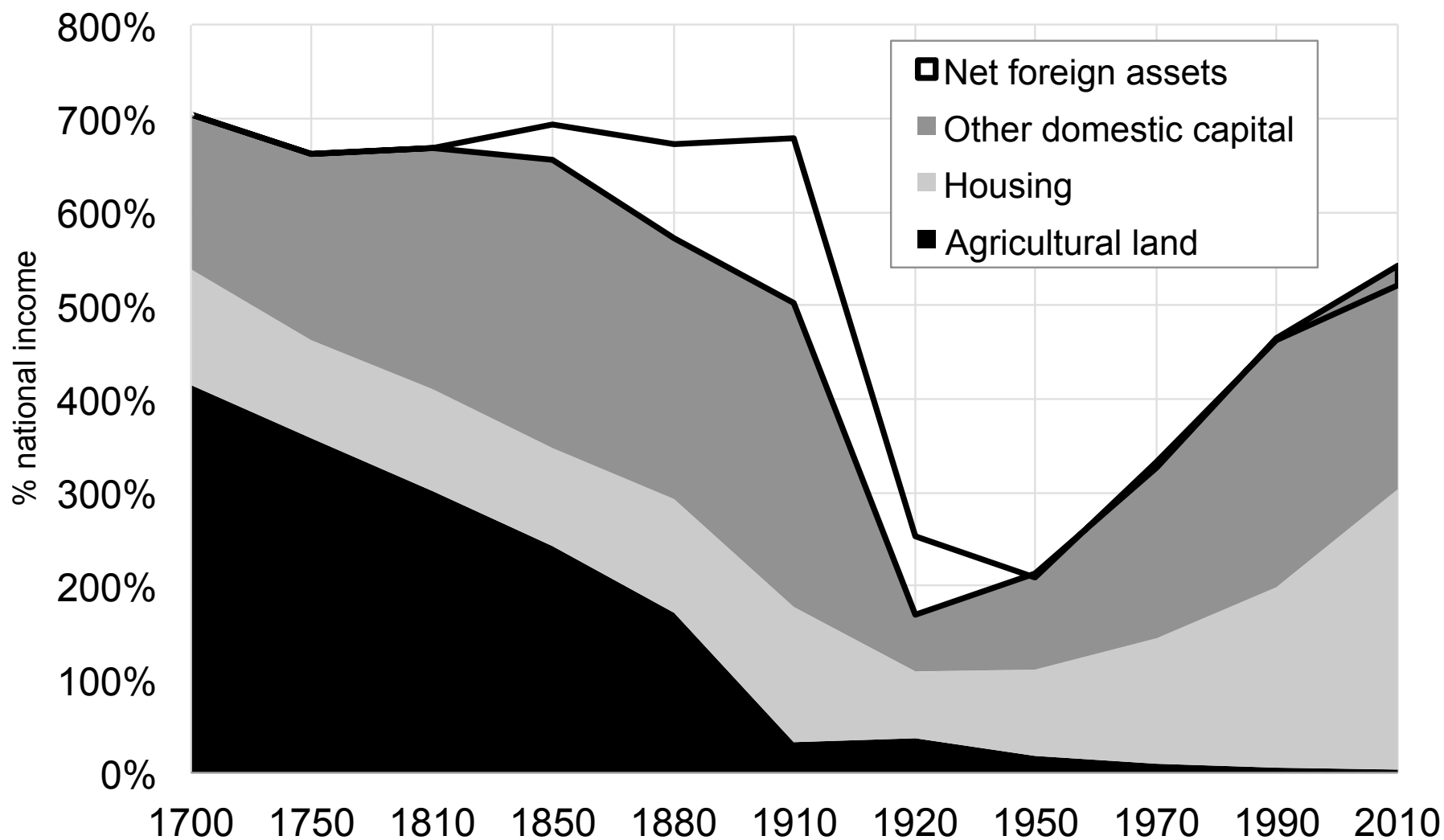
Source: Piketty and Zucman (2014). National wealth = agricultural land + housing + other domestic capital goods + net foreign assets

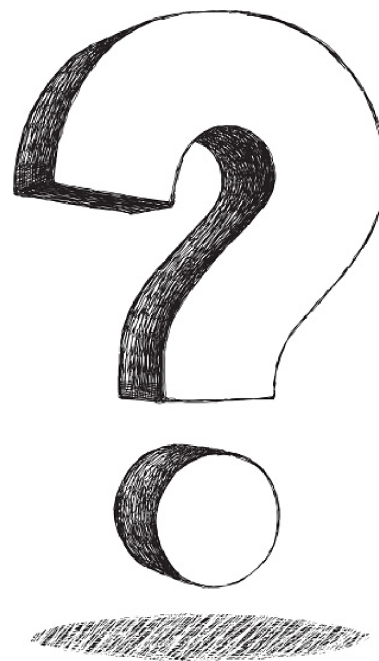# The changing nature of national wealth: France 1700-2010
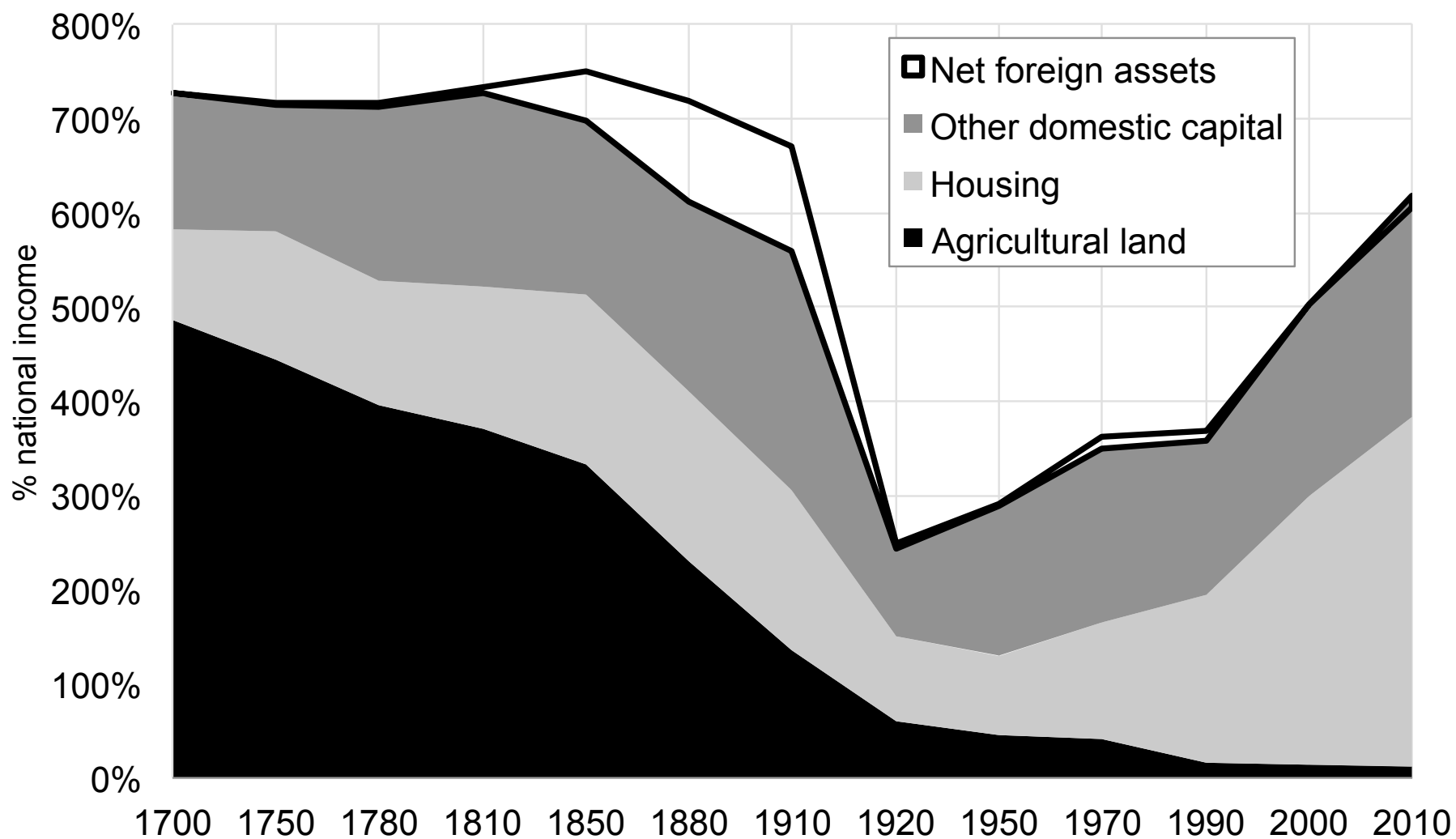
Source: Piketty and Zucman (2014). National wealth = agricultural land + housing + other domestic capital goods + net foreign assets

Why the rapid reduction in wealth from 1910-20?

2.2   The long-run driver of wealth = savings

Price effects (=capital gains) tend to be insignificant in the long run
$\longrightarrow$ savings main driver of wealth

Gross and net saving in rich countries, 1970-2010			
	Gross private savings (% national income)	Minus: Capital depreciation	Equal: Net private saving
U.S.	18.8%	11.1%	**7.7%**
Japan	33.4%	18.9%	**14.6%**
Germany	28.5%	16.2%	**12.2%**
France	22.0%	10.9%	**11.1%**
U.K.	19.7%	12.3%	**7.3%**
Italy	30.1%	15.1%	**15.0%**
Canada	24.5%	12.4%	**12.1%**
Australia	25.1%	15.2%	**9.9%**

A large part of gross saving (generally about half) corresponds to capital depreciation; i.e. it is used solely to repair or replace used capital.

Sources: Piketty and Zucman (2014)

Private and public saving in rich countries, 1970-2010

	National saving (private + public) (net of depreciation) (% national income)	incl. Private saving	incl. Public saving
U.S.	**5.2%**	7.6%	-2.4%
Japan	**14.6%**	14.5%	0.1%
Germany	**10.2%**	12.2%	-2.0%
France	**9.2%**	11.1%	-1.9%
U.K.	**5.3%**	7.3%	-2.0%
Italy	**8.5%**	15.0%	-6.5%
Canada	**10.1%**	12.1%	-2.0%
Australia	**8.9%**	9.8%	-0.9%

A large part (variable across countries) of private saving is absorbed by public deficits, so that national saving (private + public) is less than private saving.

Sources: Piketty and Zucman (2014)

2.3   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 *net* 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 $\beta = s/g$

Intuition?

When savings are large wealth is accumulated $\rightarrow$ wealth divided by income increase

When income growth is large old wealth as a share of income falls
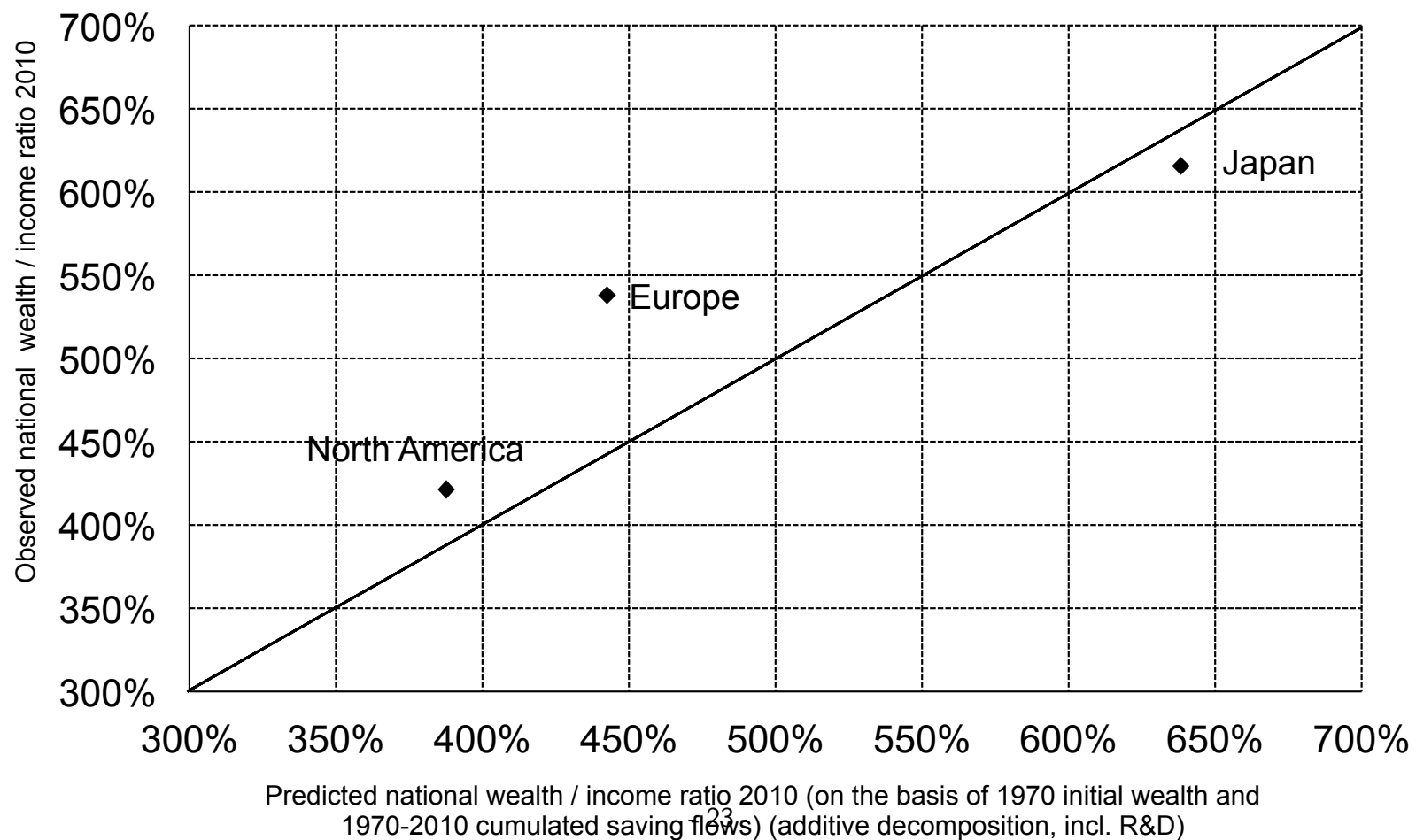
In the long-run the the rate of wealth accumulation s relative to income generation g determines the wealth-to-income ratio

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 price effects

Figure 7b: Observed vs. predicted national wealth / national income ratios (2010)

Predicted national wealth / income ratio 2010 (on the basis of 1970 initial wealth and 1970-2010 cumulated saving flows) (additive decomposition, incl. R&D)

What does this mean for policy?

Imagine a society with 10 percent growth rate versus 0 percent growth: What anti-inequality policies matters the most?
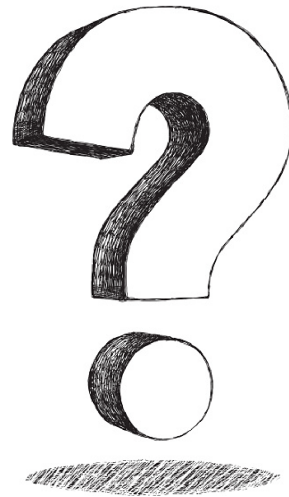
Consider an economy where there is no income growth ($g = 0\%$) and people save at a rate of $s = 1\%$. Then:

A — The wealth-income ratio will tend to 100% in the long-run

B — The wealth-income ratio will tend to 0% in the long run

C — The wealth-income ratio will tend to 1% in the long run

D — The wealth-income ratio will tend to infinity in the long run

2.4 Where does s come from?

Different reasons why people save:

- Precautionary saving

- Life-cycle saving

- Leaving bequests

- Wherever s comes from, $\beta = s/g$ if no price effect

2.5   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

Explains why 18th century economies had high β

Explains Europe vs. US

Explains high Chinese saving rate

## 2.6   What does $\beta = s/g$ not say ?

You have a house - that house is now worth twice as much

2.7   Change in the market power of capital

- So far we assumed perfect competition: capital and labor are paid their marginal product

- What if capital is paid more (or used to be paid less) than its marginal product?

- Possible channels: decline of unions, globalization, rise of network industries (Facebook, Twitter), change of social norms

- Evidence of change in market power for capital: rise of Tobin's Q

Figure 5.6. Market value and book value of corporations
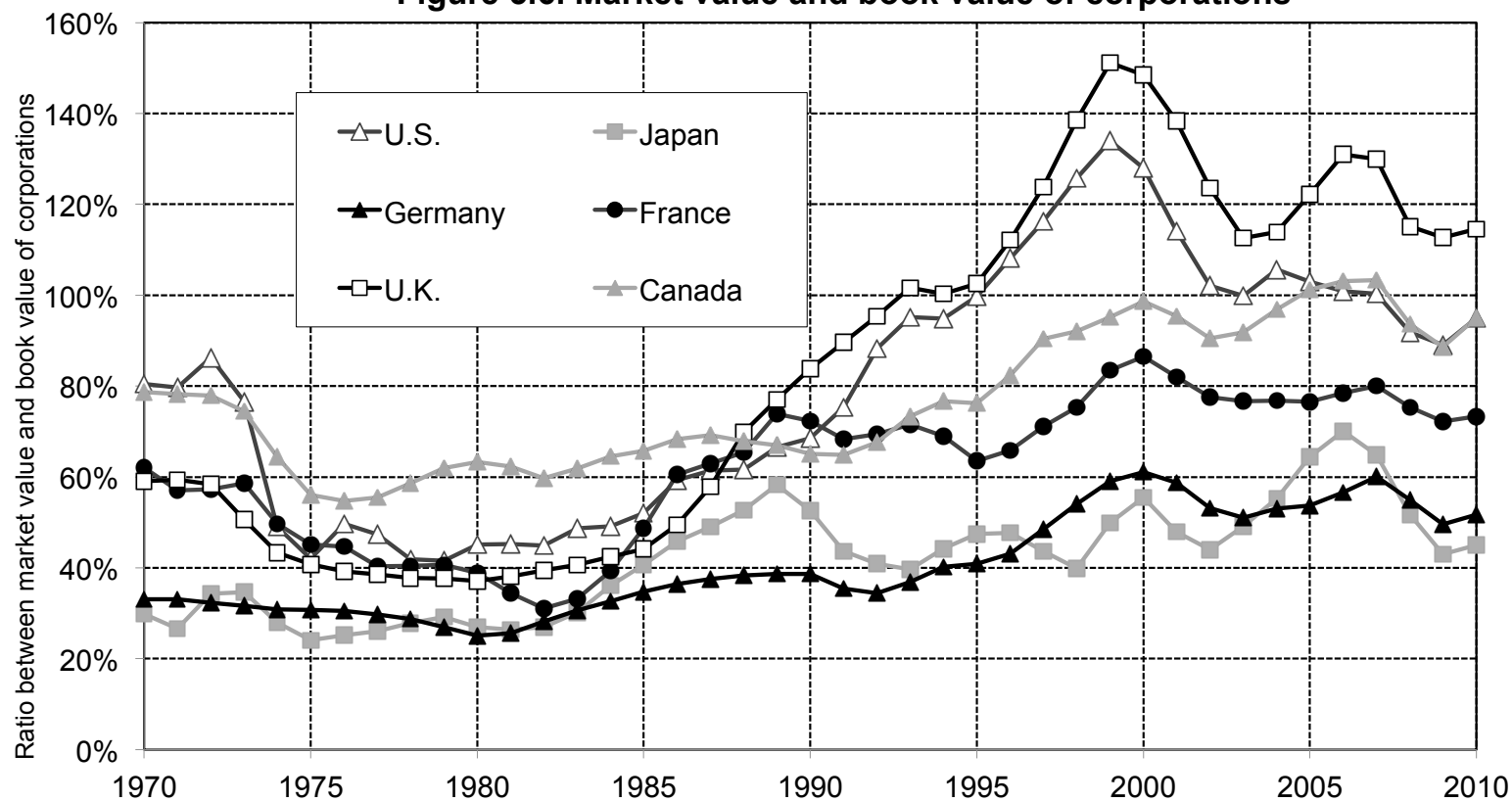
Tobin's Q (i.e. the ratio between market value and book value of corporations) has risen in rich countries since the 1970s-1980s. Sources and series: see piketty.pse.ens.fr/capital21c.
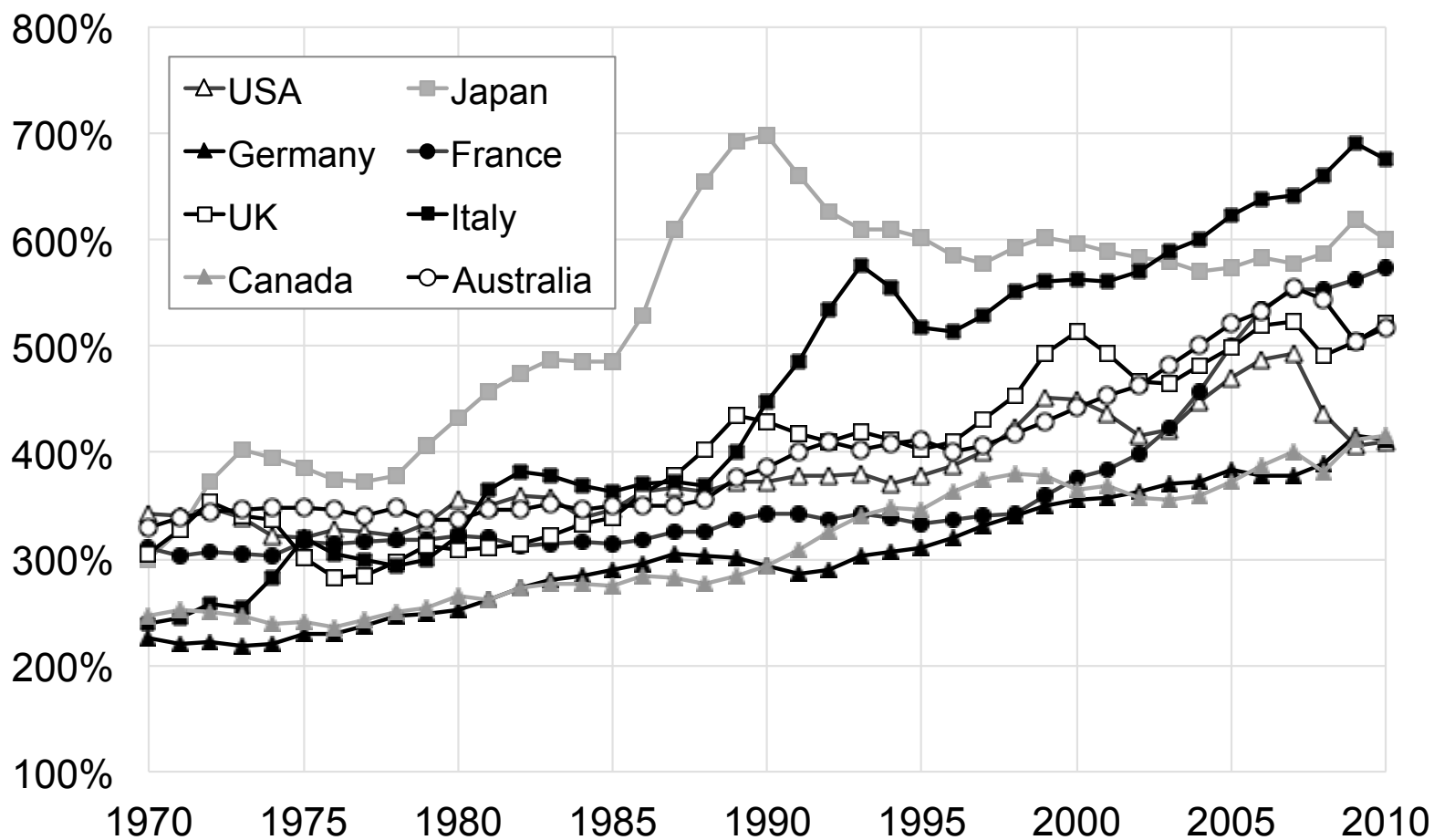
2.8   Lessons of $\beta = s/g$ for the 21st century

Population growth will fall $\to \beta$ 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

Private wealth / national income ratios 1970-2010

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

3   The link between capital income and wealth

- Define r = average rate of return to wealth = Y_K/W

- **Basic accounting law:** $\alpha = r \times \beta$

- Typical values: $\beta =$600%, $r =$5%, $\alpha =$30%

- In practice, average rate of return to capital r varies a lot across assets and over individuals

References

Barro, Robert, "Are government bonds net wealth?", *Journal of Political Economy* 1974 (web)

Lane, Philip and Gian Maria Milesi-Feretti, "The External Wealth of Nations Mark II," *Journal of International Economics*, 2007, 73 (web)

Piketty, Thomas, and Gabriel Zucman, "Capital is back: wealth-income ratios in rich countries 1700-2010", *Quarterly Journal of Economics*, 2014 (web)

Ricardo, David *On the principles of political economy and taxation*, 1817

Knoll, Katharina, Moritz Schularick and Thomas Steger (2014). "No Price Like Home: Global House Prices, 1870-2012", CEPR DP. (web)

Piketty, Thomas, and Gabriel Zucman, "Capital is back: wealth-income ratios in rich countries 1700-2010", *Quarterly Journal of Economics*, 2014 (web)