"The Metamorphosis of Capital in the 21st Century"

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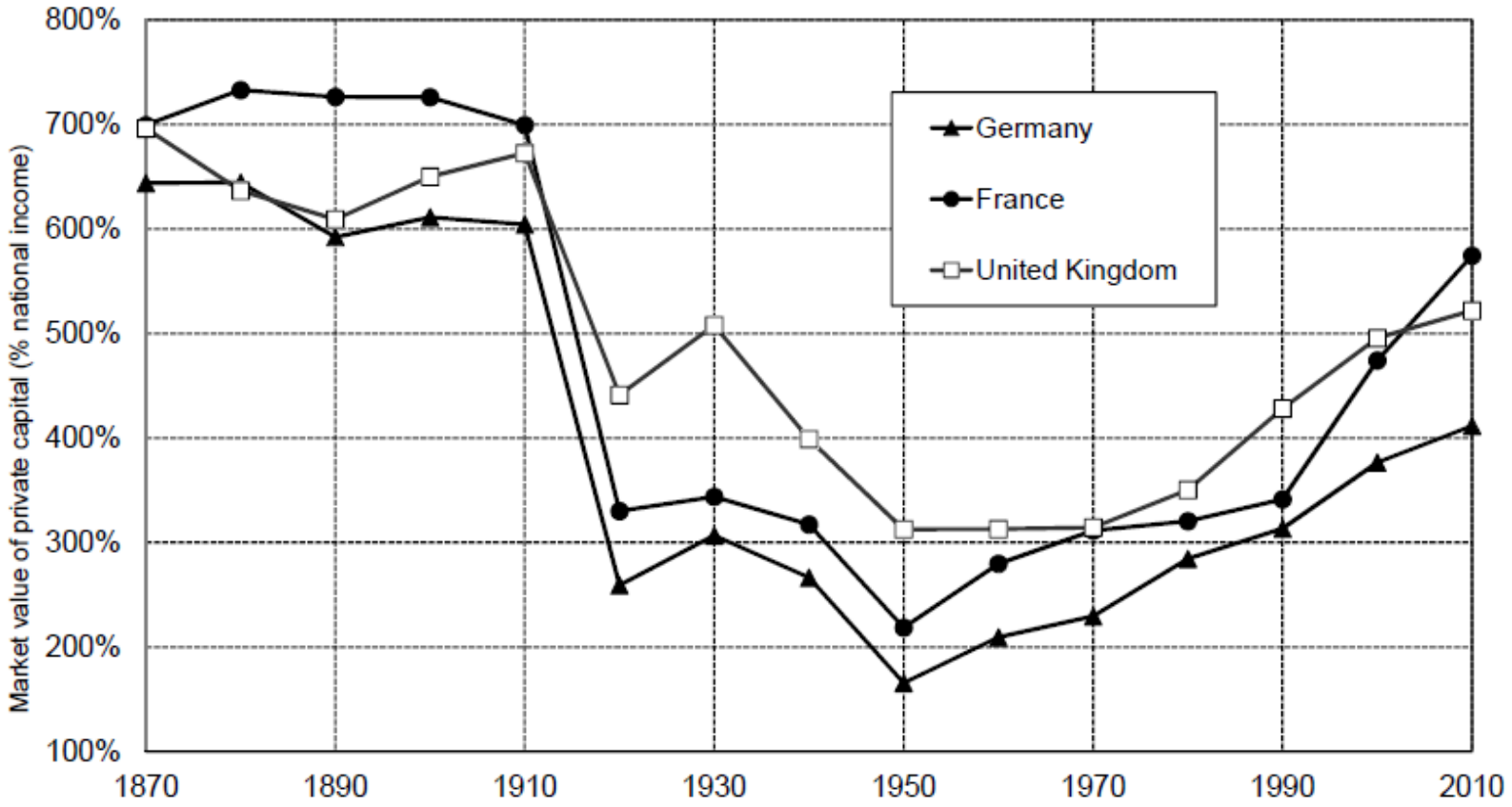
A must-read book!

- What did I like (a lot!) about the book?
  - The sharp long-term view of capitalism with a focus on the evolution of wealth and inequality
    - ⋆ A fantastic complement to Maddison's "The World Economy: A Millenial Perspective"
  - The set of wonderful questions it poses for macroeconomics
- What did I like a bit less about the book?
  - Some of the answers that it provides to these wonderful questions
    - ⋆ Not because these are perturbing or unpleasant
    - ⋆ But because they are a bit too speculative and incomplete

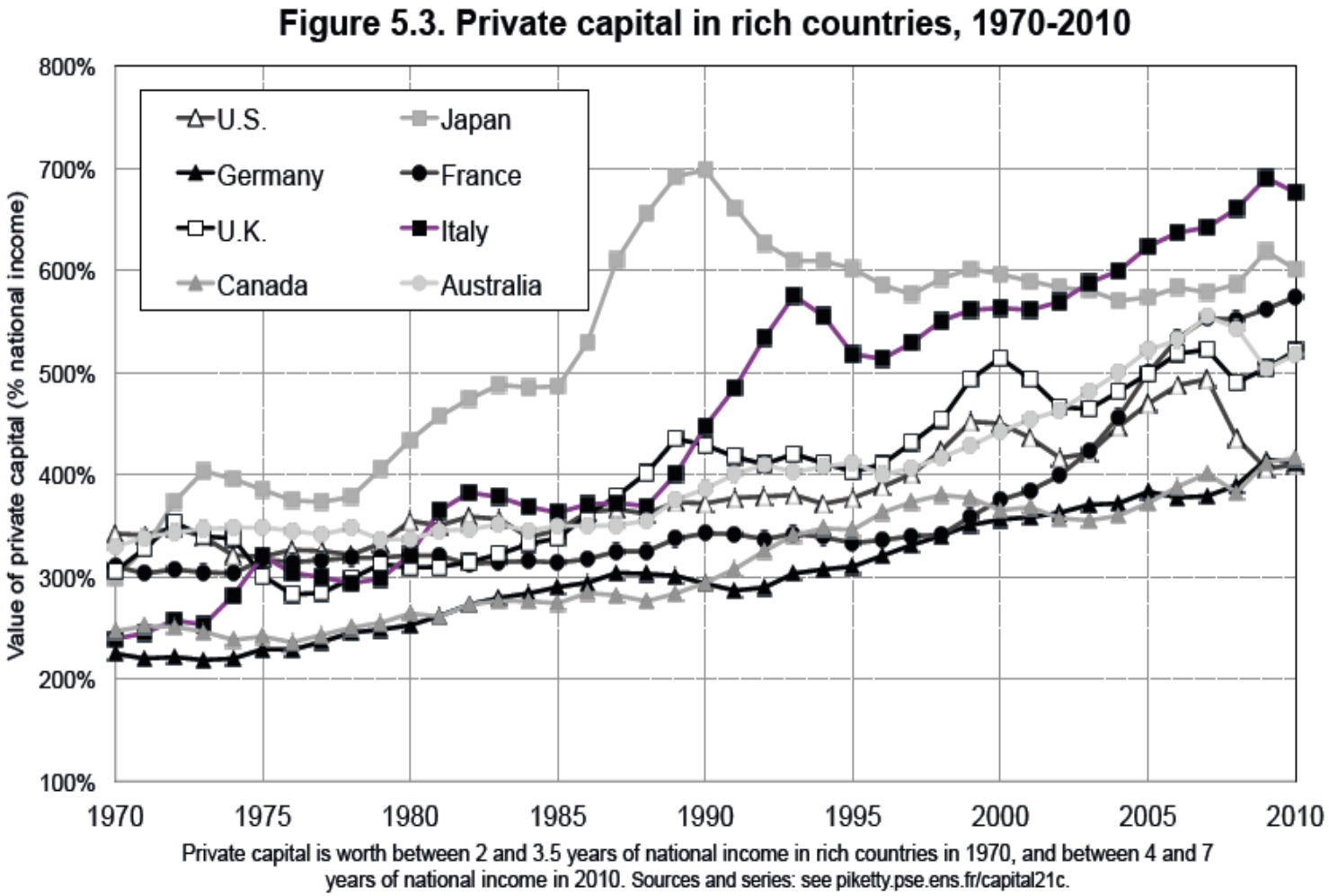
The U-shaped evolution of the wealth-income ratio

Figure I.2. The capital/income ratio in Europe, 1870-2010

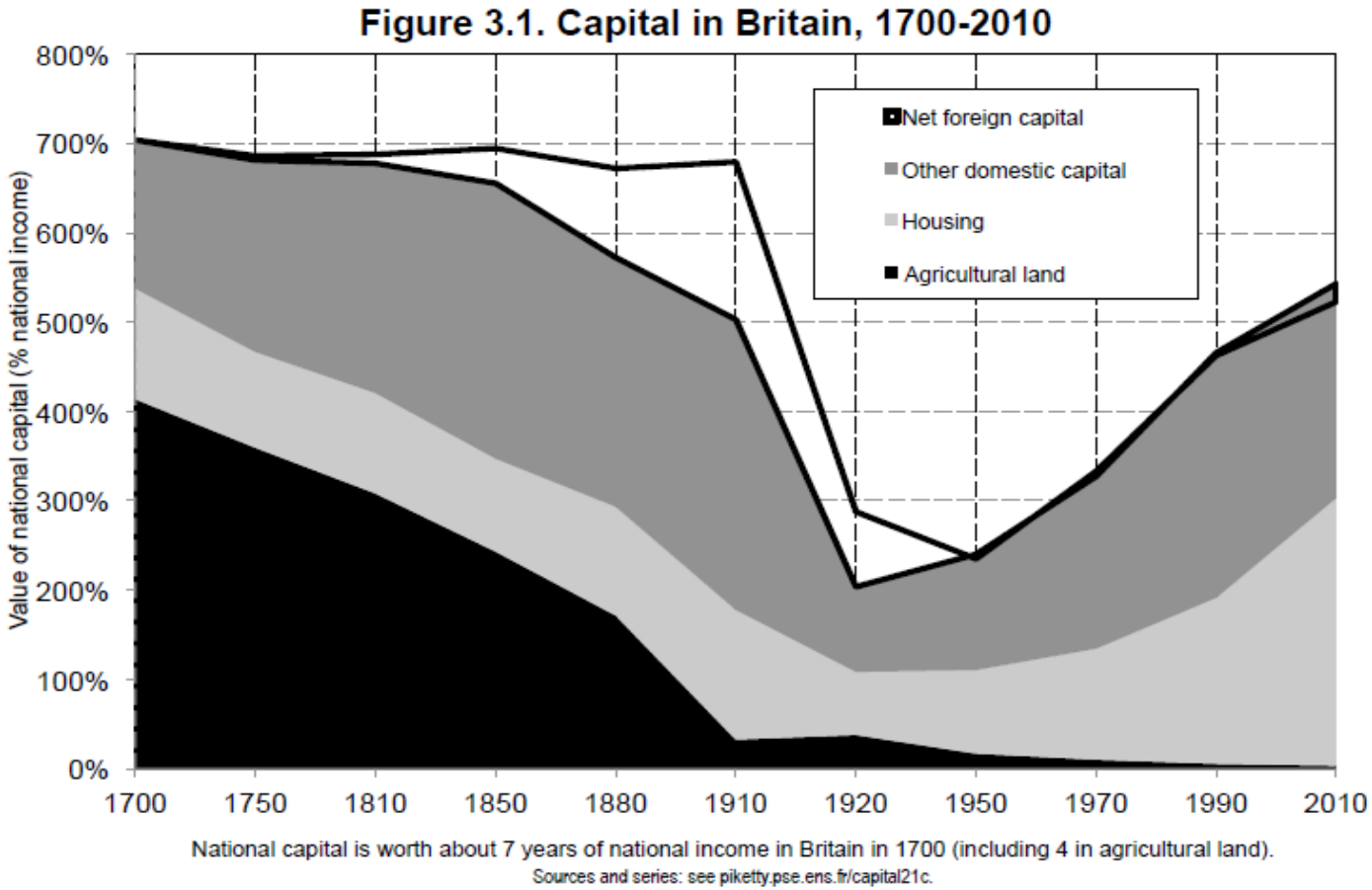


Aggregate private wealth was worth about 6-7 years of national income in Europe in 1910, between 2 and 3 years in 1950, and between 4 and 6 years in 2010. Sources and series: see piketty.pse.ens.fr/capital21c.

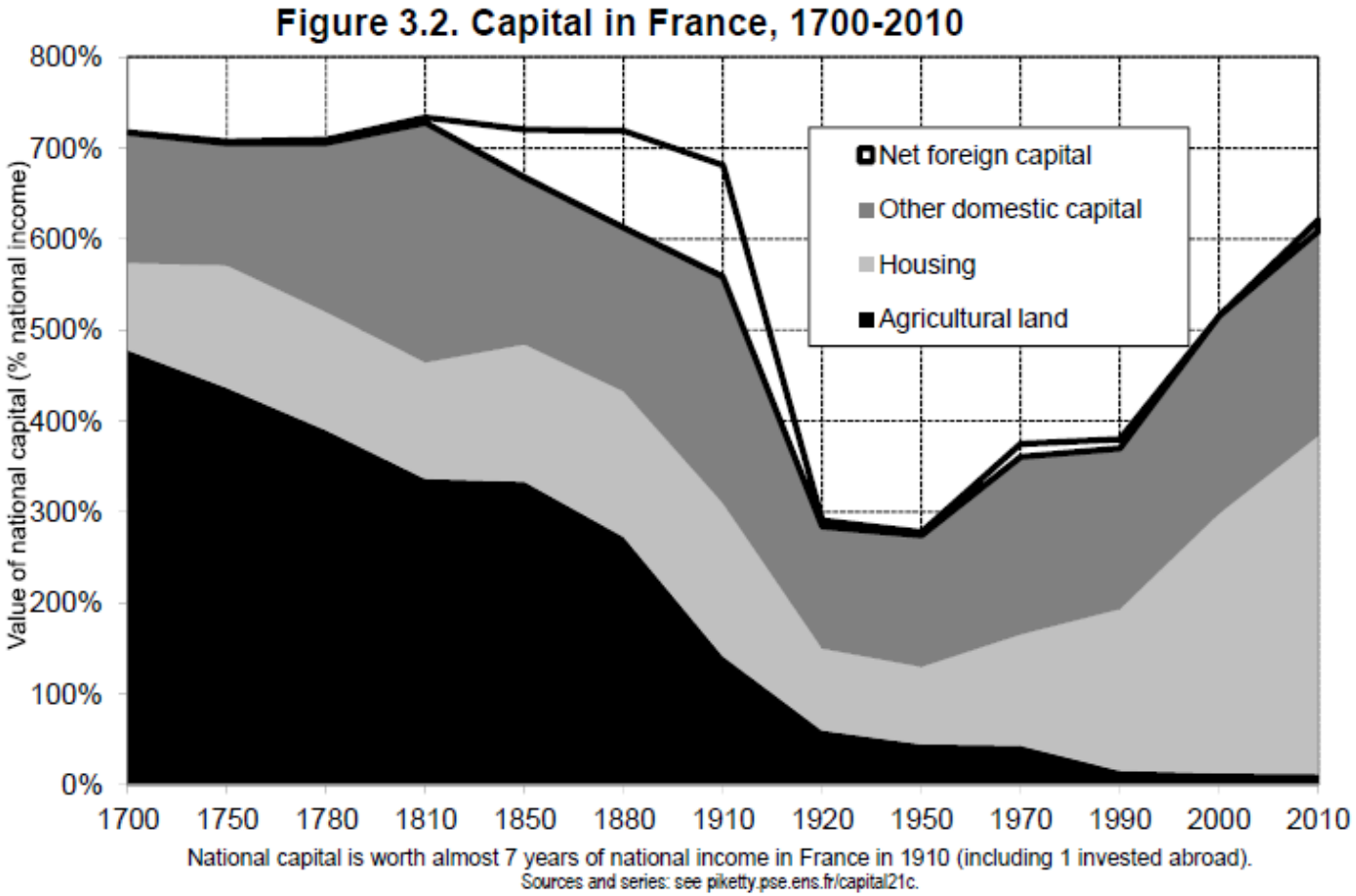
A close-up look of the last few decades for more countries



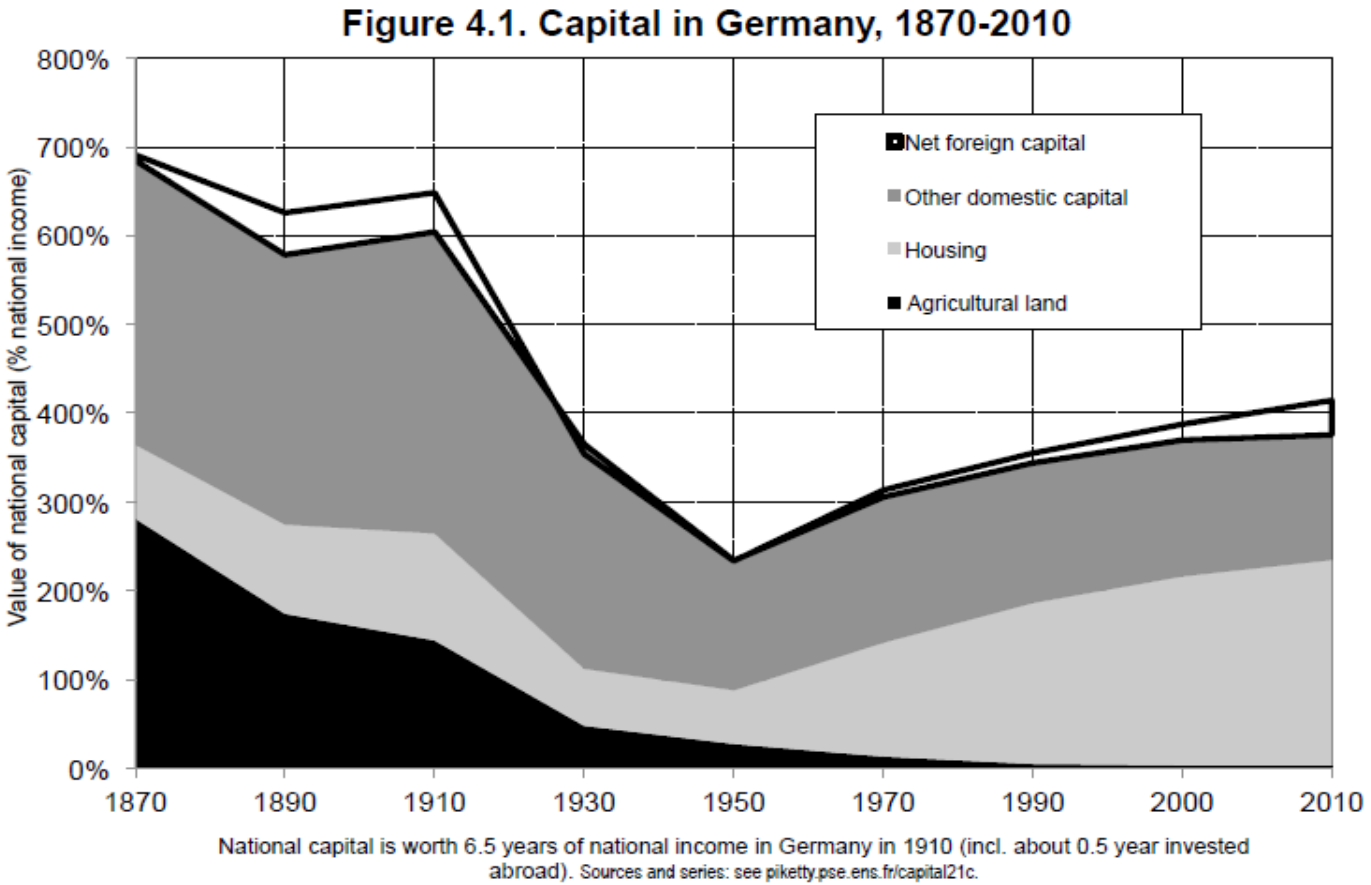
The metamorphosis of capital in Britain



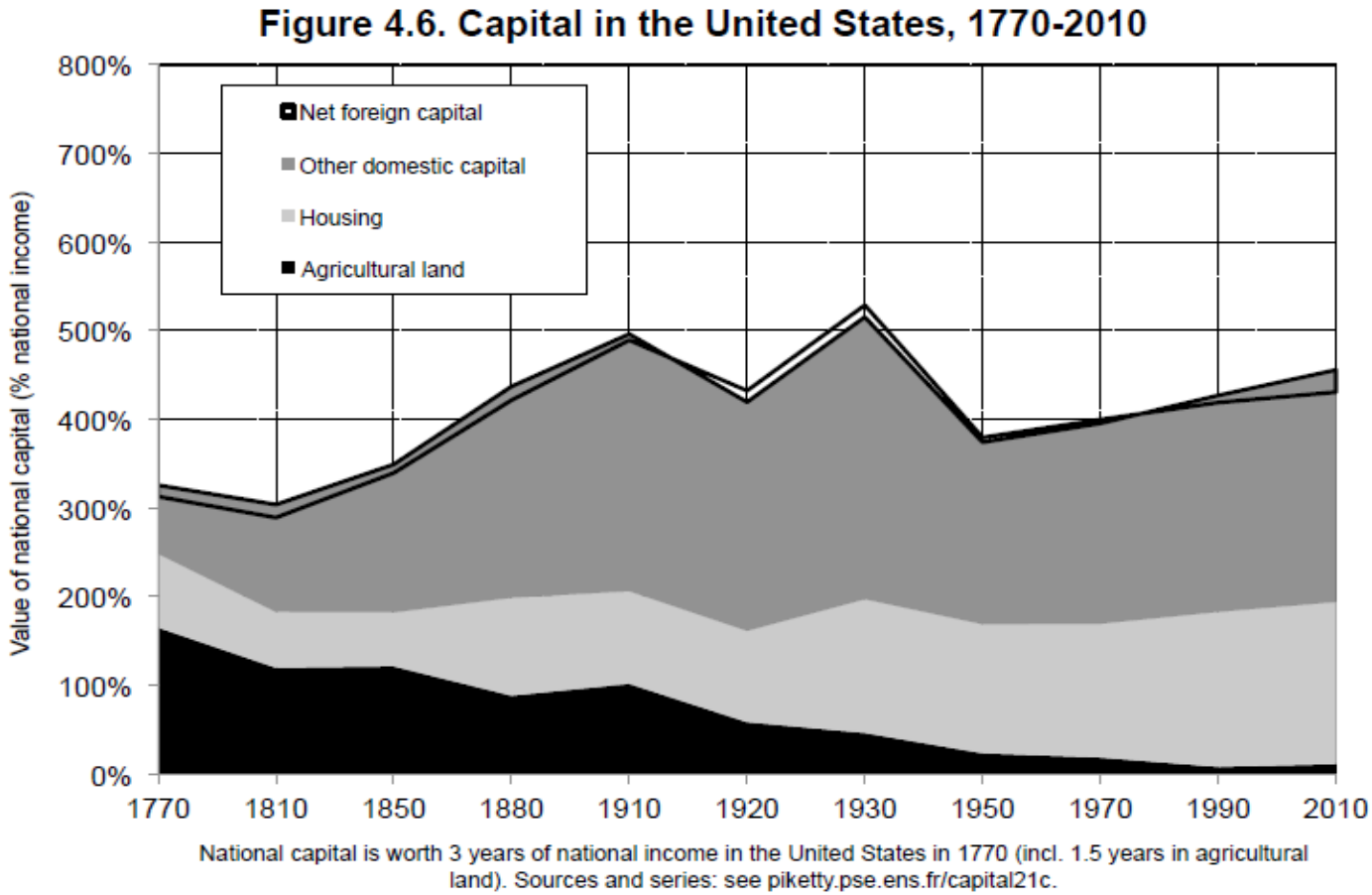
The metamorphosis of capital in France



The metamorphosis of capital in Germany

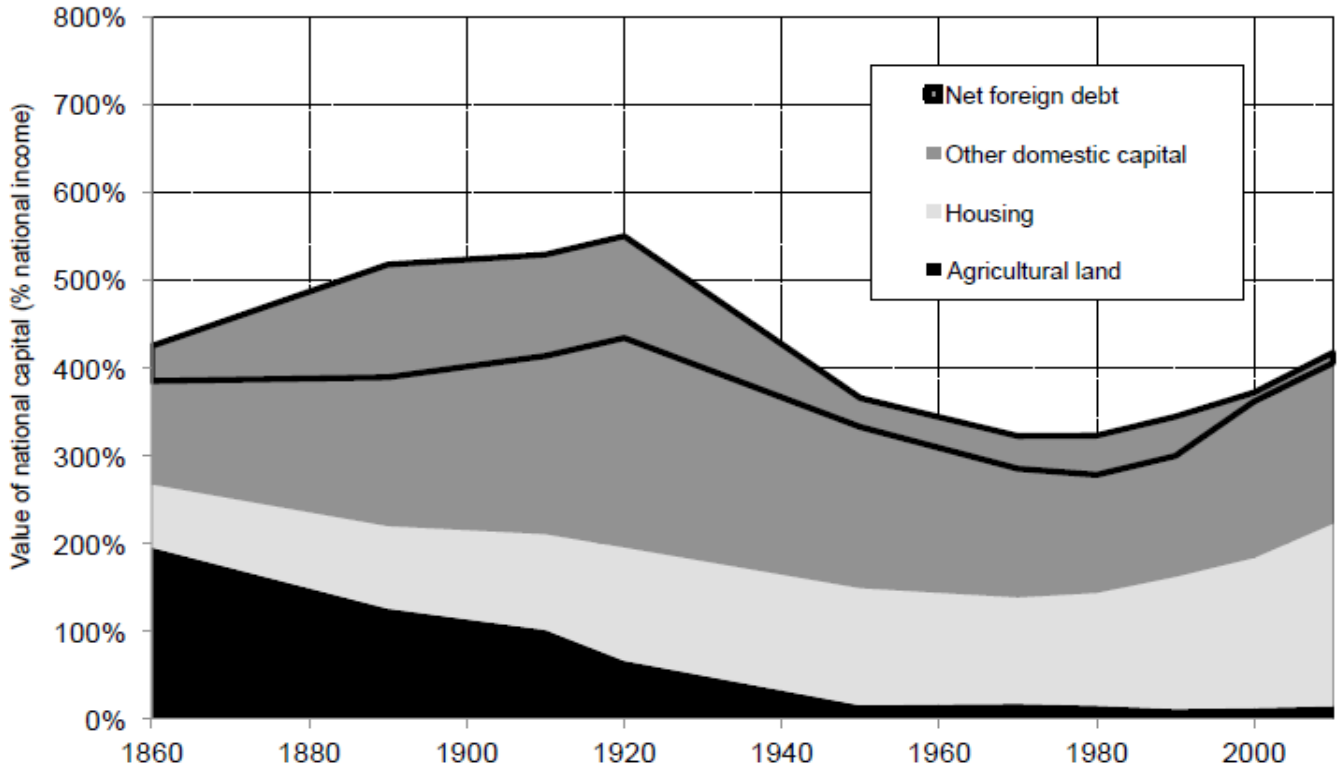


The metamorphosis of capital in the United States



The metamorphosis of capital in Canada

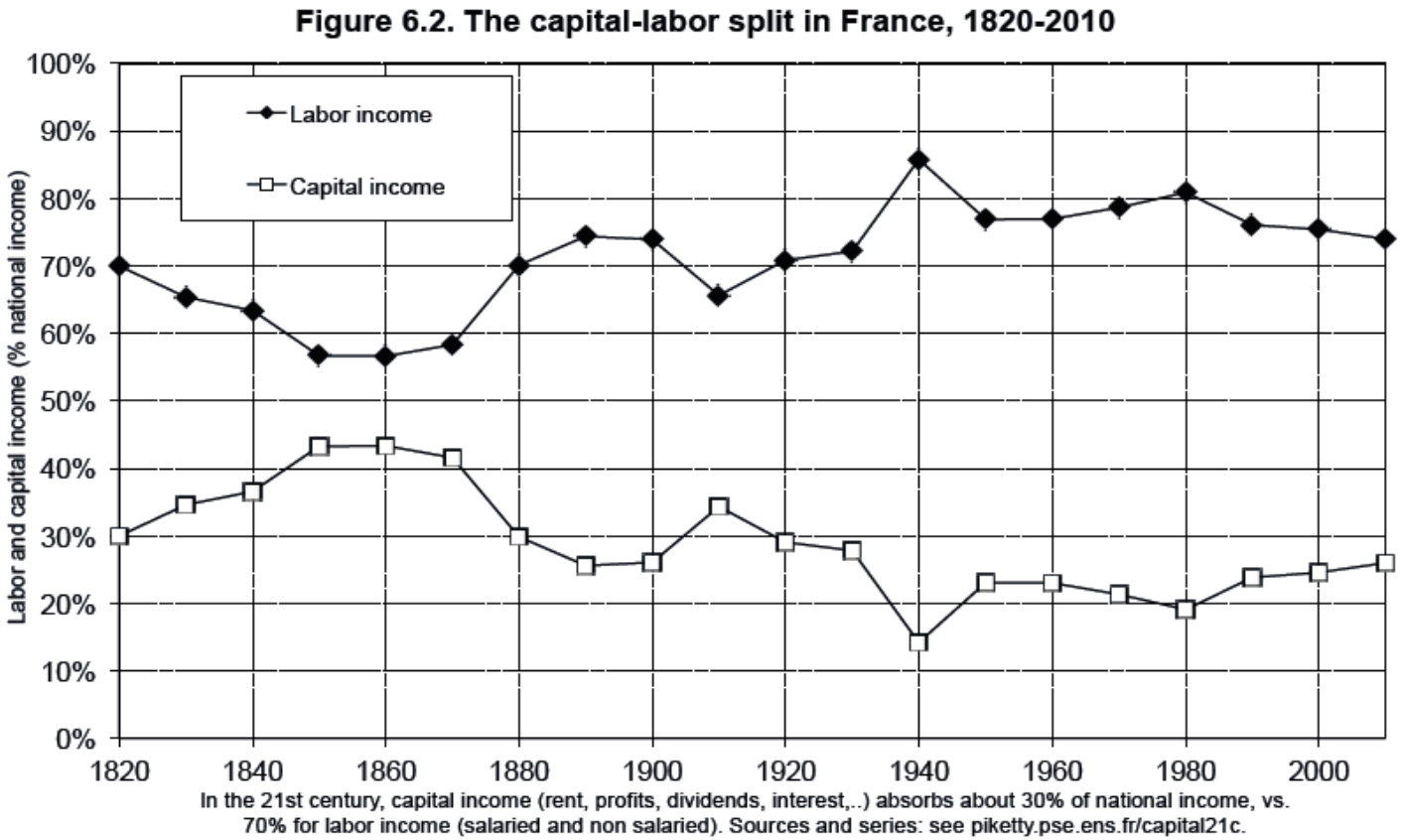
Figure 4.9. Capital in Canada, 1860-2010



In Canada, a substantial part of domestic capital has always been helf by the rest of the world, so that national capital has always been less than domsetic capital. Sources and series: see piketty.pse.ens.fr/capital21c

U-shaped (?) evolution of the capital-labor split in Britain

U-shaped (?) evolution of the capital-labor split in France



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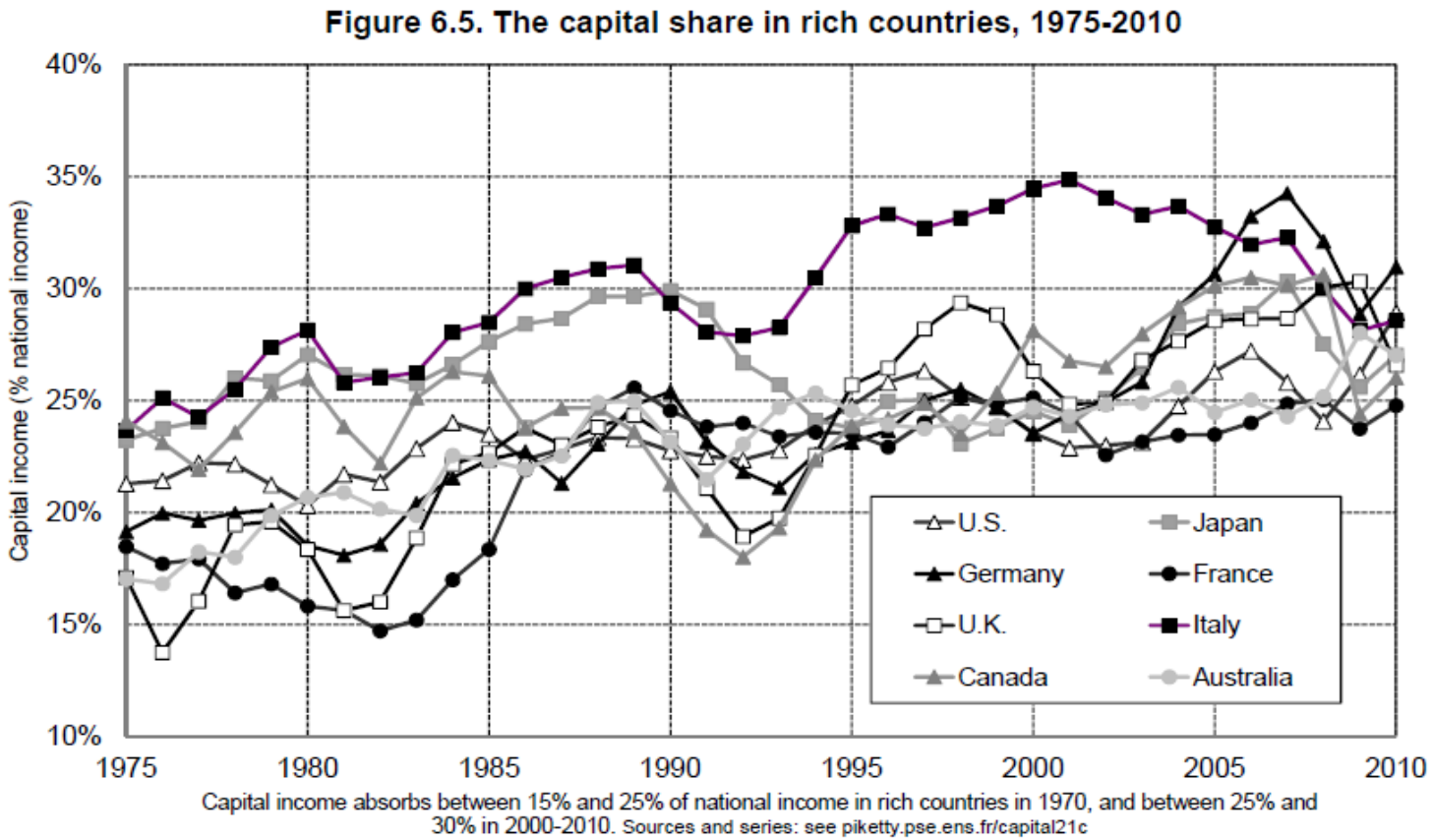
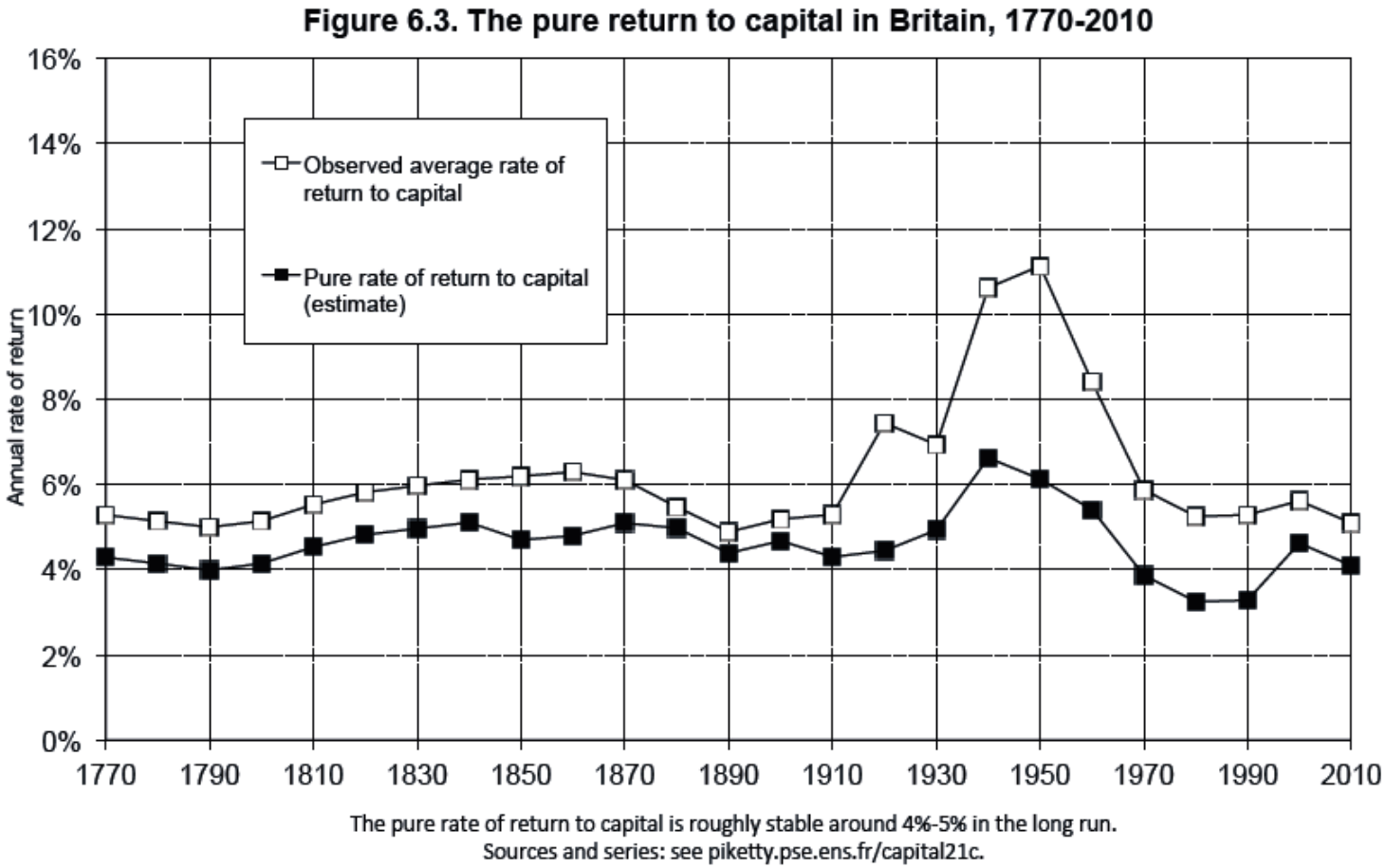
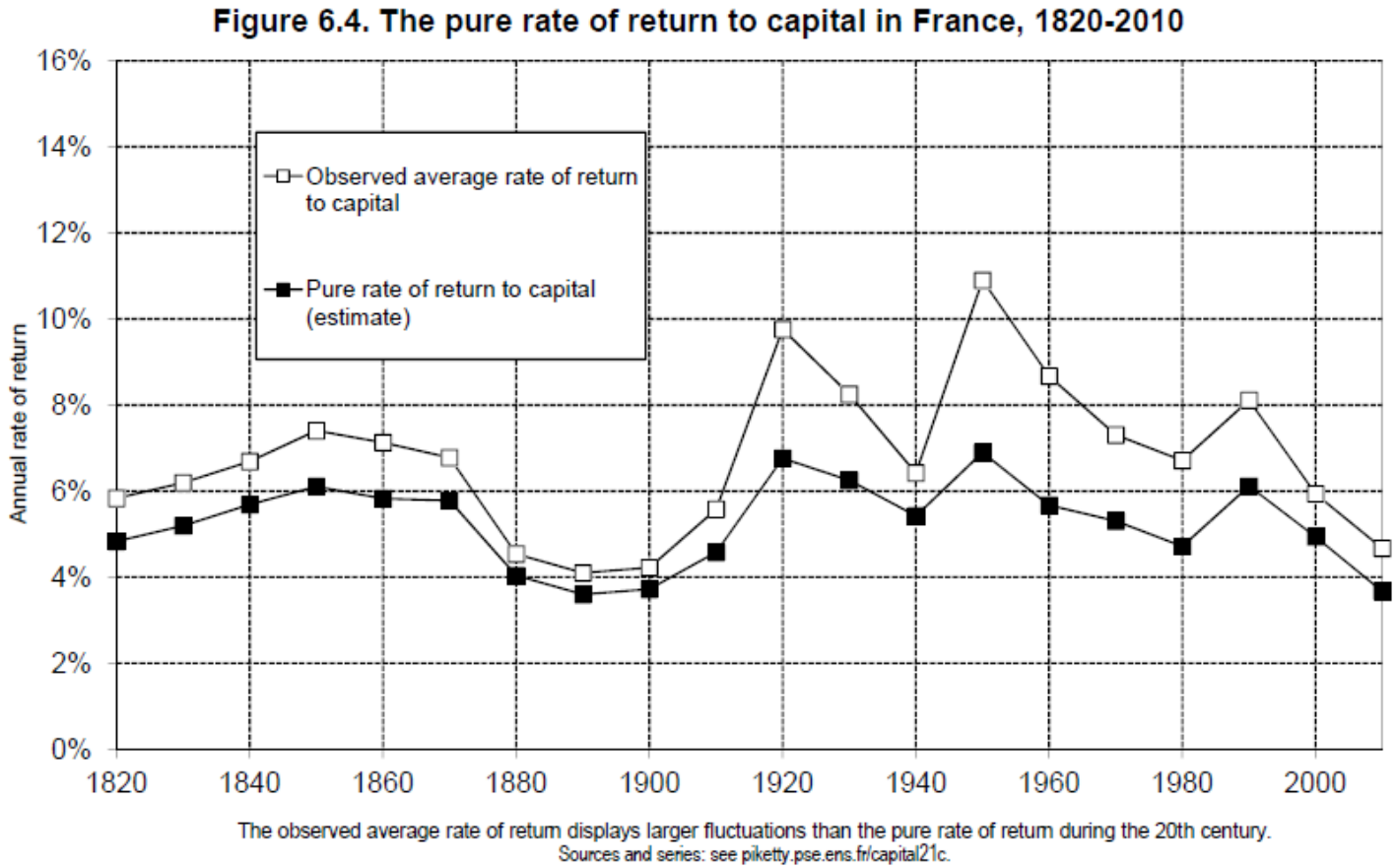


The return to capital in Britain



The return to capital in France

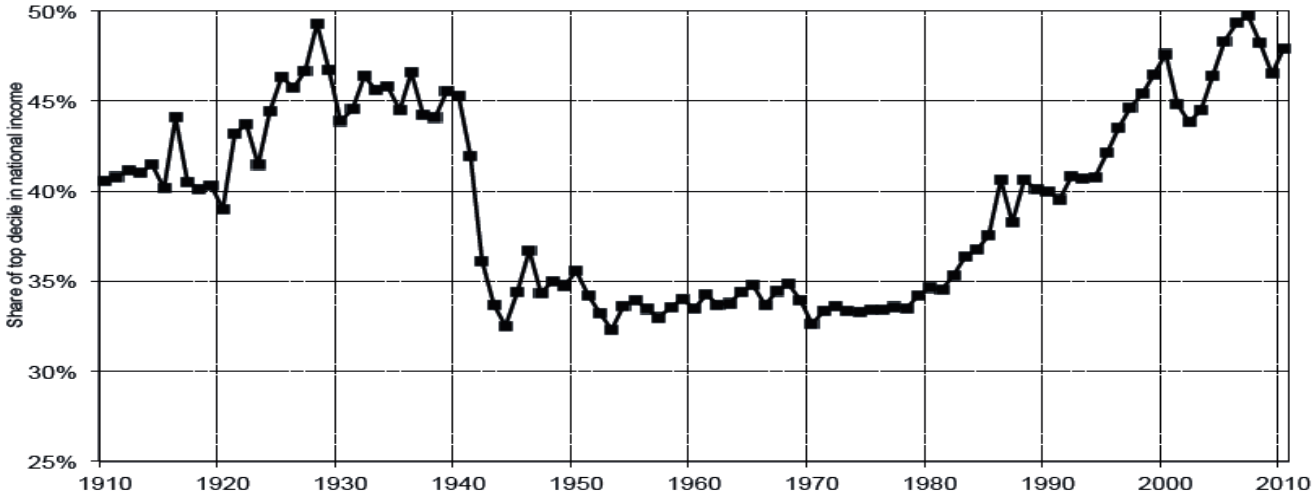


The Piketty challenge for macroeconomics

- What explains the observed fluctuations in the wealth-income ratio?
- What explains the observed fluctuations in the capital-income split?
- What explains the stability of the return to capital?
- What is the connection between these variables and income inequality?

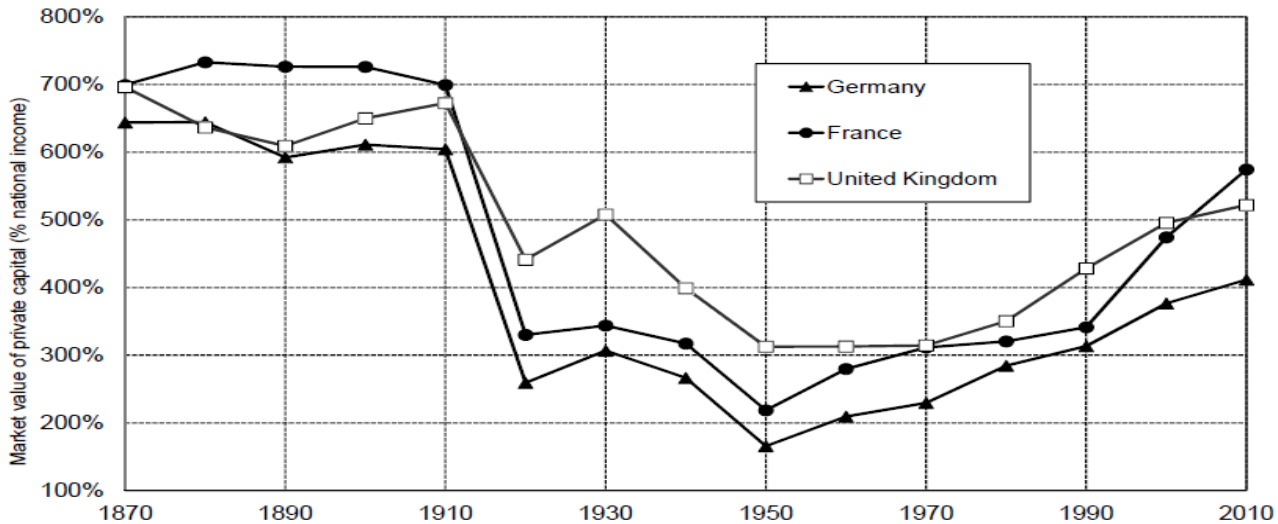
The starting point of the book

Figure I.1. Income inequality in the United States, 1910-2010



The top decile share in U.S. national income dropped from 45-50% in the 1910s-1920s to less than 35% in the 1950s (this is the fall documented by Kuznets); it then rose from less than 35% in the 1970s to 45-50% in the 2000s-2010s. Sources and series: see piketty.pse.ens.fr/capital21c.

Figure I.2. The capital/income ratio in Europe, 1870-2010



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The Piketty view

- What explains the observed fluctuations in the wealth-income ratio?
  - Use the second fundamental law of capitalism: $\beta = \frac{s}{g}$
  - *Prediction*: stable savings and low growth will raise β even further!
- What explains fluctuations in the capital-labor split and the rate of return?
  - Use the first fundamental law of capitalism: $\alpha = r \cdot \beta$
    - ★ *plus* a high elasticity of substitution between capital and labor
  - *Prediction*: increase in β will not affect r much and will raise α even further!
- The combination of low growth and high return to investment, $r > g$, will raise inequality even further

Three points I want to discuss

- The second fundamental law of capitalism: $\beta = \frac{s}{g}$
- The implications of $r > g$
- The matamorphosis of wealth in the 21st century

The second fundamental law of capitalism

- This law is based on the following model:

$$\begin{aligned} k_{t+1} &= (1-\delta)\cdot k_t + i_t \\ i_t - \delta \cdot k_t &= s \cdot y_t \\ y_t &= F(h_t, k_t) \qquad \text{with} \lim_{\frac{k_t}{h_t}\to\infty} F_K\left(1, \frac{k_t}{h_t}\right) = 0 \\ h_t &= (1+g)\cdot h_{t-1} \end{aligned}$$

- This model implies that, in the absence of shocks:

$$\lim_{t\to\infty} \beta_t = \frac{s}{g}$$

- Krusell and Smith (2014) provide a detailed discussion of this model

Are we so sure about this model? Thinking about savings

- Caballero, Farhi and Hammour (AER, 2006) show that the economy exhibits multiple equilibria if:
  - Savings grows with income (growth funding-feedback)
  - Adjustment costs to capital (capital-gains mechanism)
  - Even without shocks, how do we know whether we are going to high or low s equilibria?

- Day (AER, 1982) shows that the economy exhibits cycles of any order and even chaos if:
  - Savings is a fraction of wealth: $i_t - \delta \cdot k_t = s(r_t) \cdot k_t$
  - Substitution effect dominates income effect: $s'(r_t) > 0$
  - Even without shocks, how do we know whether the economy converges to a steady state or just follows cycles of some order?

Are we so sure about this model? Thinking about growth

- Since the 1980s, treating g as an exogenous constant has been considered unsatisfactory
- A rich set of models study the determinants of g and many of them suggest that g is proportional to s, so that β is determined by other factors
- A simple varation of the second law model:
  - Assume now that $\lim_{\frac{k_t}{h_t} \to \infty} F_K\left(1, \frac{k_t}{h_t}\right) = \rho > 0$
  - We have two cases:
    - ★ If $\rho \cdot s < g$ then $\beta_t \to \frac{s}{g}$
    - ★ If $\rho \cdot s > g$ then $\beta_t \to \frac{1}{\rho}$
  - Piketty might argue that the second case is the relevant one!!

What does r>g mean?

- It is unclear to me that the evolution of inequality is related to $r > g$ both theoretically and empirically
- *Theory*: it is as easy to write reasonable models in which inequality bears no relationship with $r - g$ than otherwise
- *Empirics:* Acemoglu and Robinson (2014) who find no correlation between $r - g$ and the evolution of inequality
- Another perspective on $r - g > 0$:
  - $r - g > 0$ in the long run is equivalent to $\alpha - s > 0$ (dynamic efficiency)
  - Abel et al. (REStud, 1989) provided supporting evidence
  - But Geerolf (2013) has challenged this evidence

From r-g>0 to i-g<0

- The 21st century also has brought $i - g < 0$ (secular stagnation?)
- If capital is irreversible ('putty-clay'), another "fundamental" law says:

$$(1+i) \cdot W_t = D_{t+1} + W_{t+1}$$

  - Assume that:
    - *Important*: Some future rents are not capitalized: $D_t = (1+\theta)^{-t} \cdot \alpha \cdot y_t$
    - *Not important*: $y_{t+1} = (1+g) \cdot y_t$

- Then, wealth has two components: $W_t = F_t + B_t$
  - The fundamental or value of physical capital: $F_t = \dfrac{\alpha \cdot y_t}{i + \theta - g}$
  - The bubble or value of financial capital: $B_t = b_t \cdot y_t$

- The capital-income ratio is: $\beta_t = \dfrac{\alpha}{i + \theta - g} + b_t$

The bubbly economy

- Characteristics of the bubbly economy:
  - Fluctuations in β are driven in part by fluctuations in market sentiment
  - Fluctuations in β come in the form of capital gains and not new savings

- Piketty and Zucman (QJE, 2014) find that:

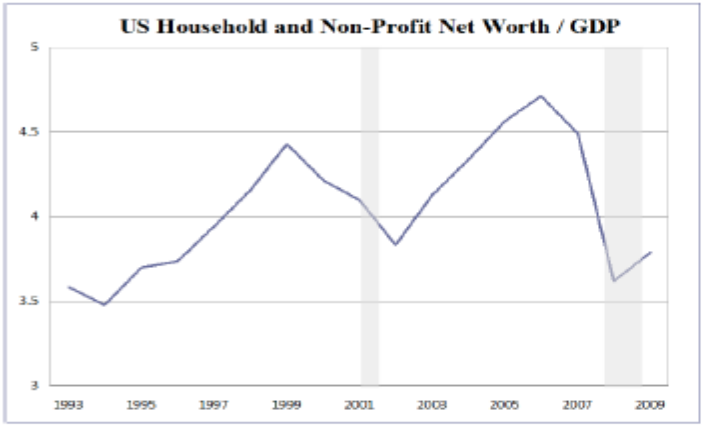
  "...in our preferred specification (...) capital gains account for about 40% on average of the 1970-2010 increase in capital-income ratios (...) with a lot of heterogeneity across countries"

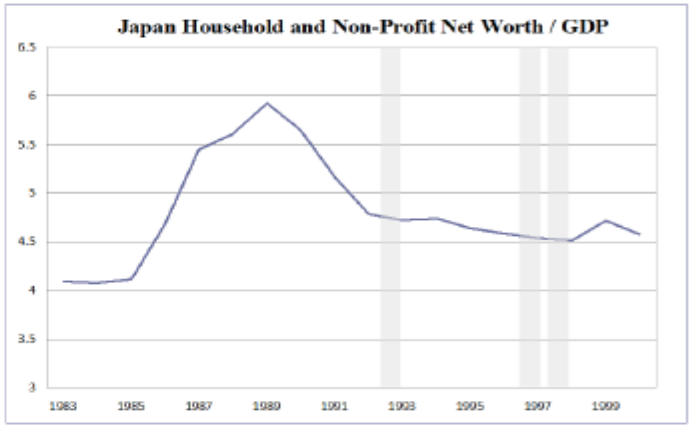
  And then argue:

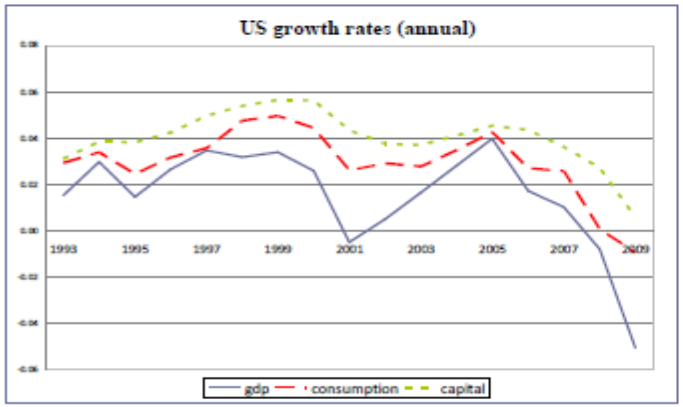
  "This is mostly a recovery effect: the 1970-2010 capital gains largely seem to compensate the capital losses observed in the earlier parts of the 20th century"

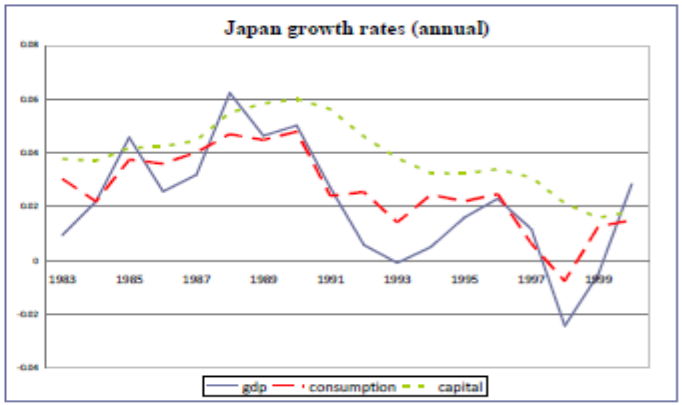
- Two observations:
  - The calculations would have yielded a much higher share for capital gains if they had focused on the 1970-2007 period, rather than 1970-2010
  - How can the experience of the US and Japan be interepreted as a recovery?

A graph from Martin and Ventura (AER, 2012)









Conclusion

- Piketty provides a sharp long-term view of capitalism
- He poses a wonderfully interesting challenge to macroeconomics
- To meet this challenge, we need to look beyond long run determinants of savings and growth
- The deep structure of capital has changed:
  - A new metamorphosis of capital into fundamental and bubble components
  - The fundamental grows with net savings, the bubble grows with capital gains
  - Most of the the fluctuations in the wealth-income ratio in the 21st century are new, due to capital gains, due to the bubble component
- To meet the Piketty's challenge, we need theories of the bubbly economy:
  - What drives the bubble component of wealth?
  - How does the bubble component affect investment, growth and welfare?