

# **Capital in the 21<sup>st</sup> century**

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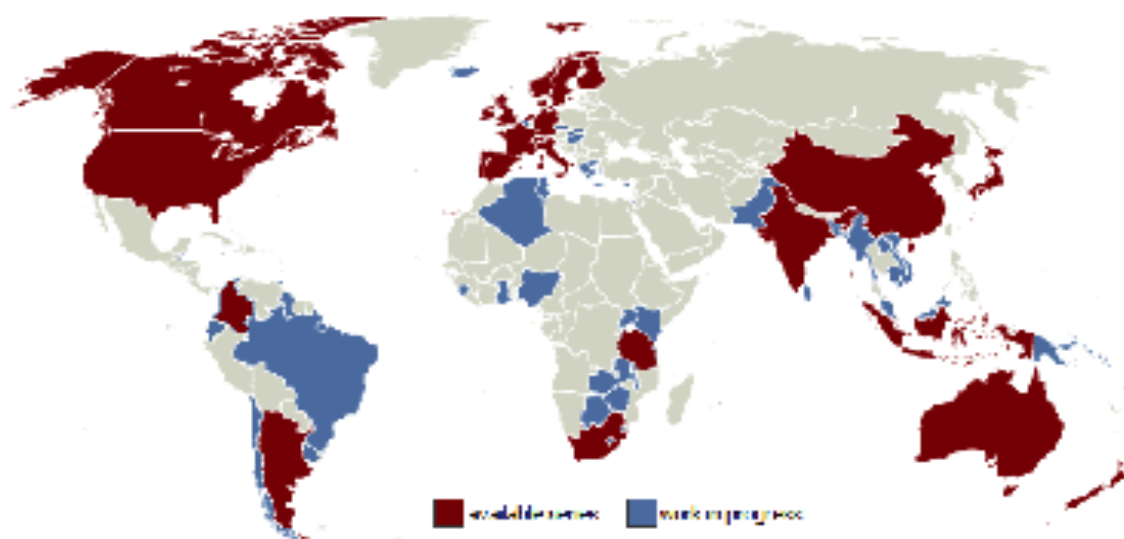
Harvard University, March 6 2015

- This presentation is based upon ***Capital in the 21<sup>st</sup> century*** (Harvard University Press, March 2014)
- This book studies the global dynamics of income and wealth distribution since 18<sup>c</sup> in 20+ countries; I use historical data collected over the past 15 years with Atkinson, Saez, Postel-Vinay, Rosenthal, Alvaredo, Zucman, and 30+ others; I try to shift attention from rising income inequality to rising wealth inequality
- The book includes four parts:
  - Part 1. Income and capital
  - Part 2. The dynamics of the capital/income ratio
  - Part 3. The structure of inequalities
  - Part 4. Regulating capital in the 21<sup>st</sup> century
- In this presentation I will present some results from Parts 2 & 3, focusing upon the long-run evolution of capital/income ratios and wealth concentration (all graphs and series are available on line: see <http://piketty.pse.ens.fr/capital21c> )

## This presentation: three points

- **1. *The long-run dynamics of income inequality.*** *The end of the Kuznets curve, the end of universal laws. Country-specific institutions and policies matter.*
- **2. The return of a patrimonial (or wealth-based) society** in the Old World (Europe, Japan). Wealth-income ratios seem to be returning to very high levels in low growth countries. The metamorphosis of capital.
- **3. The future of wealth concentration:** with high  $r - g$  during 21<sup>c</sup> ( $r$  = net-of-tax rate of return,  $g$  = growth rate), then wealth inequality might reach or surpass 19<sup>c</sup> oligarchic levels. Need for for more transparency.

# THE WORLD TOP INCOMES DATABASE



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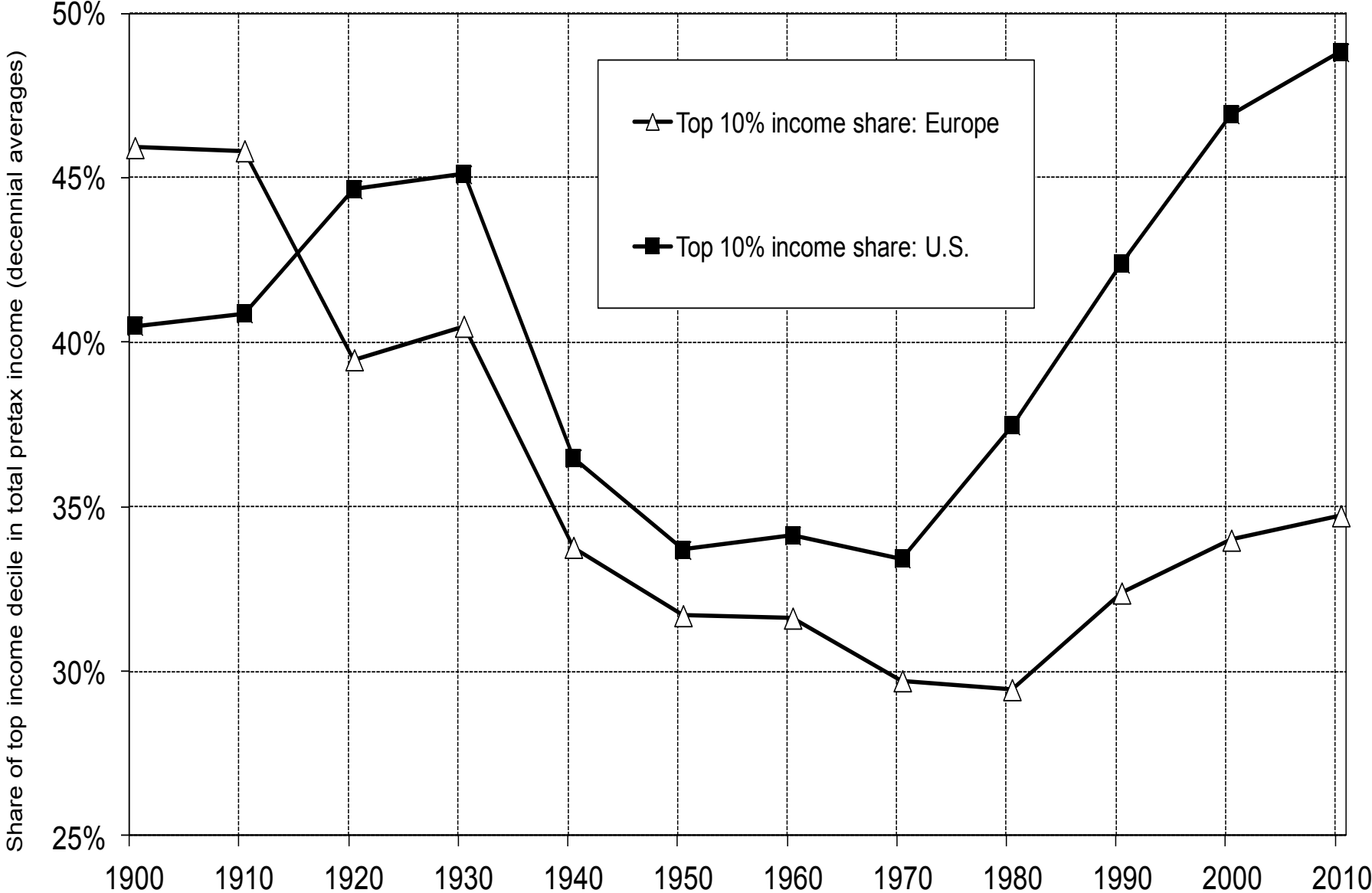


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UNIVERSITY OF CALIFORNIA, BERKELEY



- Three facts about inequality in the long-run: income inequality, wealth-inequality, wealth-income ratios (Piketty-Saez, « Inequality in the long run », Science 2014)
- Fact n°1: in 1900-1910, income inequality was higher in Europe than in the United States; in 2000-2010, it is a lot higher in the United States

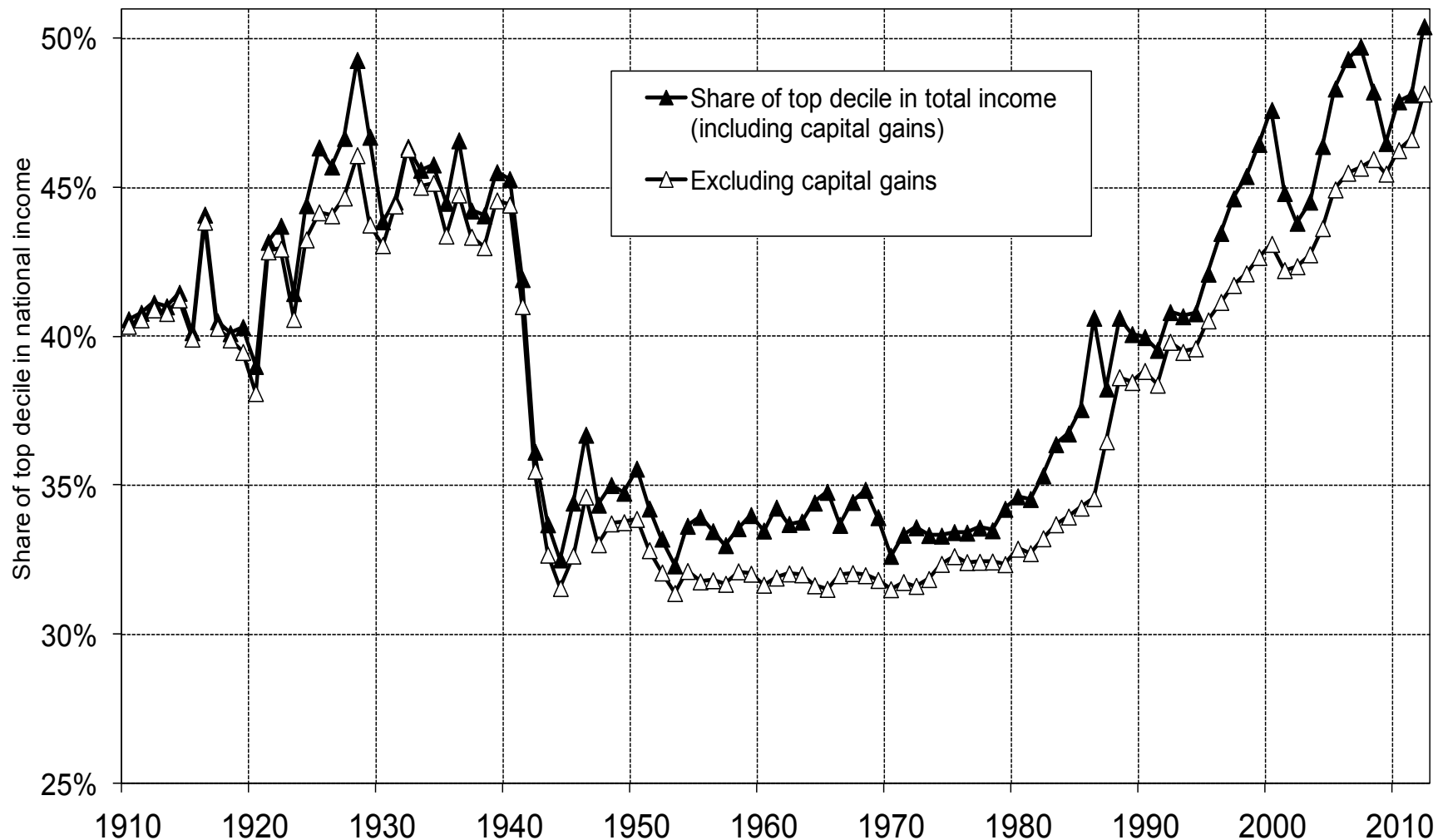
**Figure 1. Income inequality: Europe and the U.S., 1900-2010**



The share of total income accruing to top decile income holders was higher in Europe than in the U.S. around 1900-1910; it is a lot higher in the U.S. than in Europe around 2000-2010.

Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c) (fig.9,8)

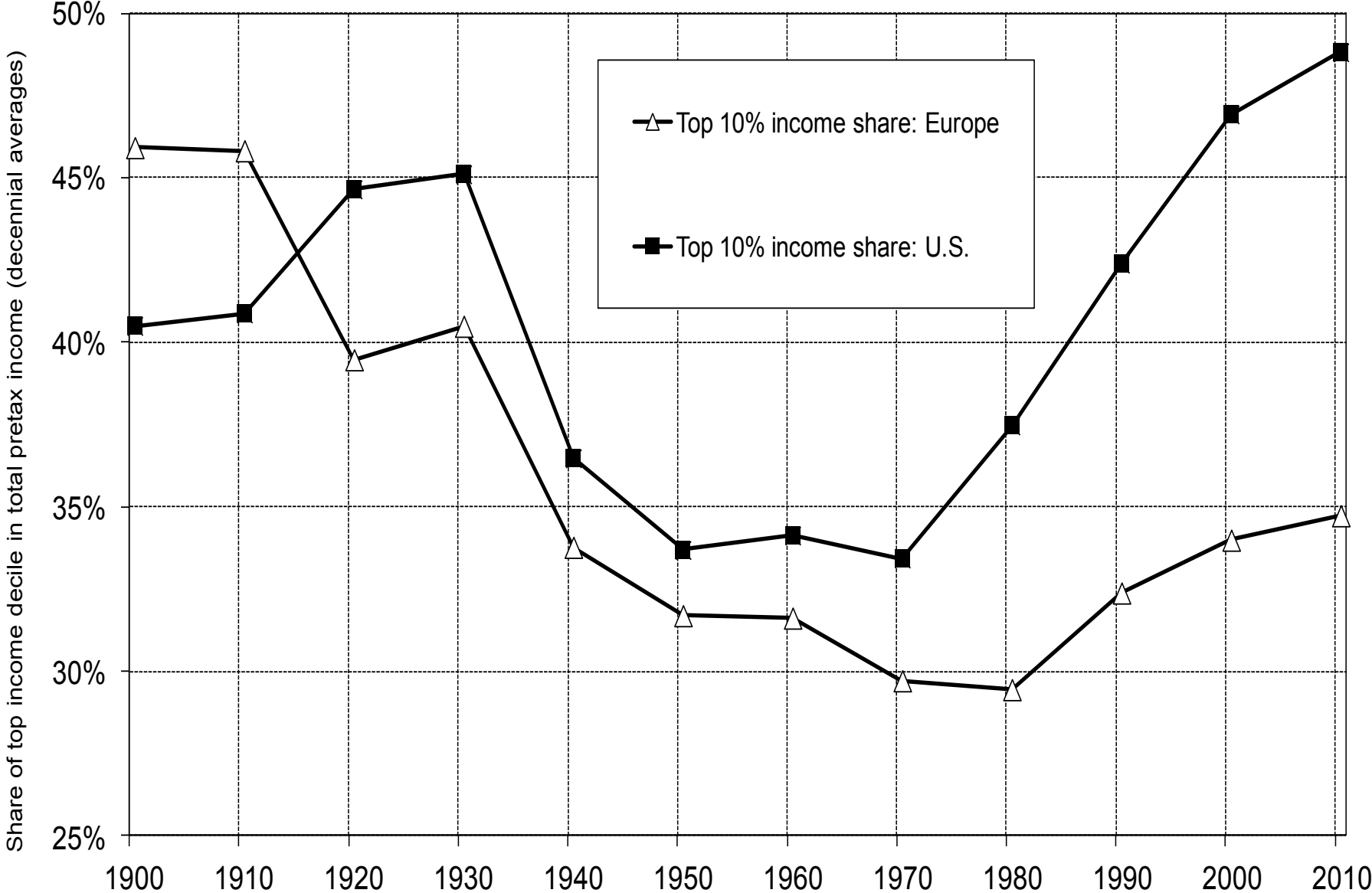
**Figure I.1. Income inequality in the United States, 1910-2012**



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

**Figure 1. Income inequality: Europe and the U.S., 1900-2010**

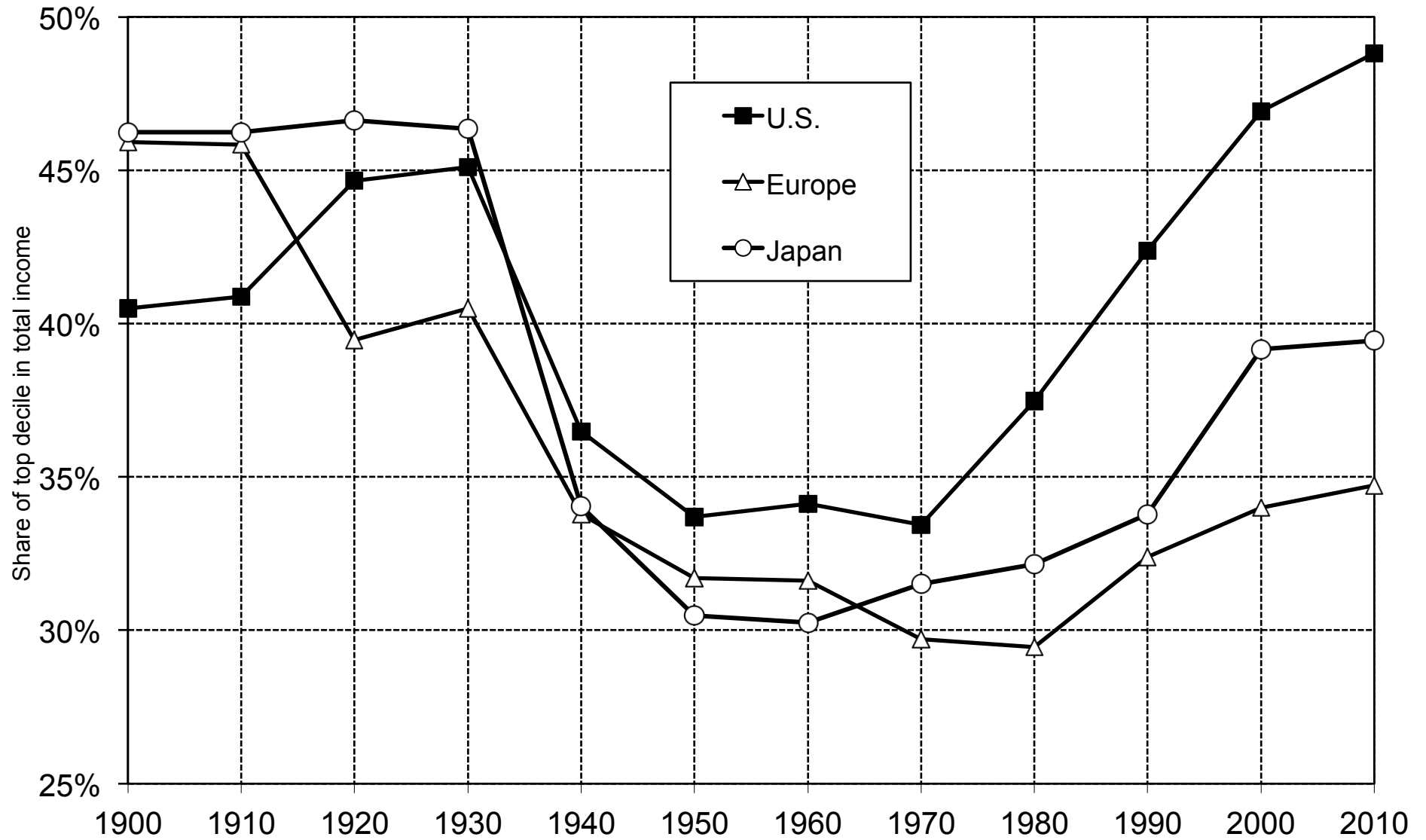


The share of total income accruing to top decile income holders was higher in Europe than in the U.S. around 1900-1910; it is a lot higher in the U.S. than in Europe around 2000-2010.

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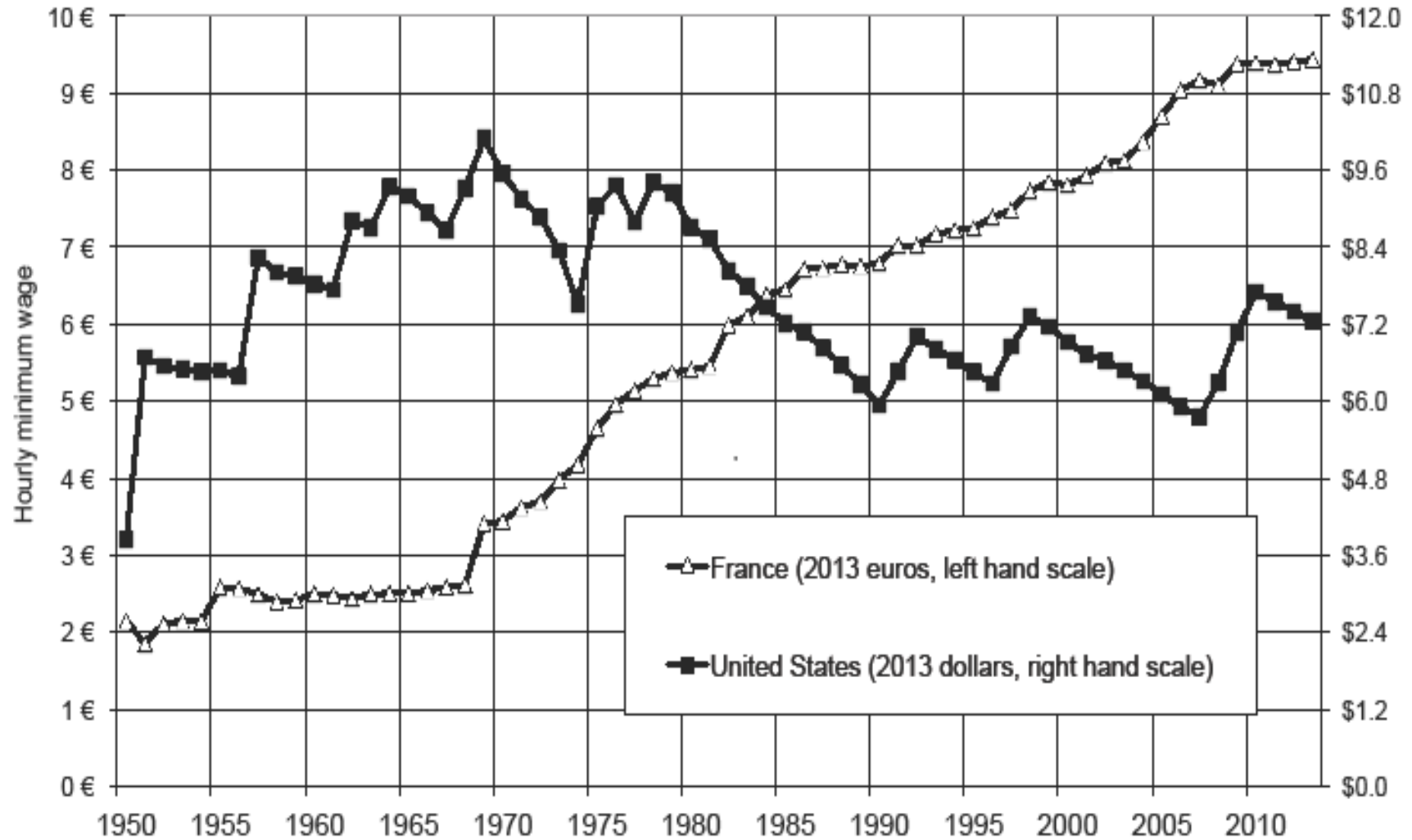
## Top 10% Income Share: Europe, U.S. and Japan, 1900-2010



The top decile income share was higher in Europe than in the U.S. in 1900-1910; it is a lot higher in the U.S. in 2000-2010. Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

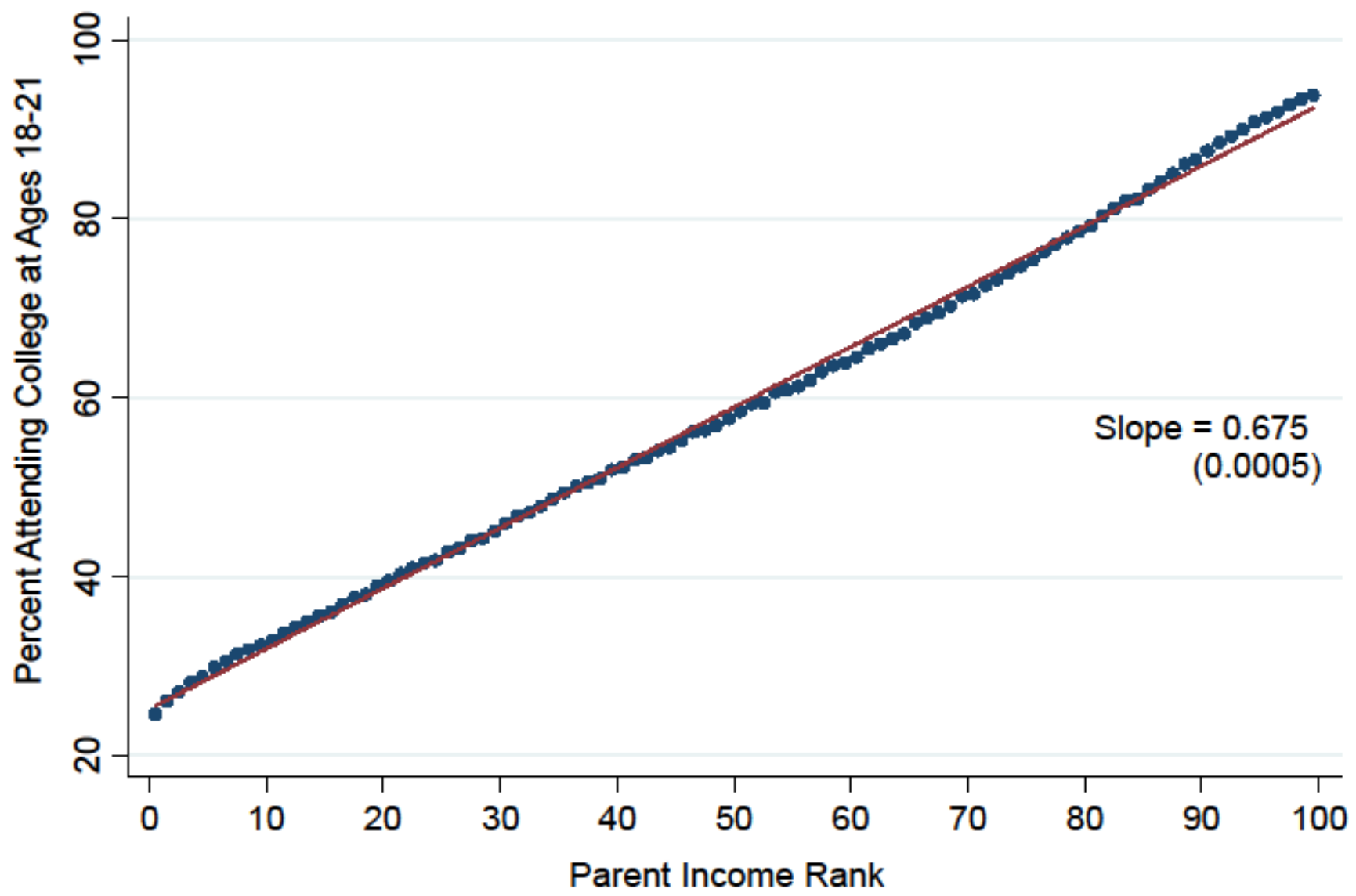
- The rise in US inequality in recent decades is mostly due to rising inequality of labor income
- It is due to a mixture of reasons: changing supply and demand for skills; race between education and technology; globalization; more unequal to access to skills in the US (rising tuitions, insufficient public investment); unprecedented rise of top managerial compensation in the US (changing incentives, cuts in top income tax rates); falling minimum wage in the US  
→ institutions and policies matter

Figure 9.1. Minimum wage in France and the U.S., 1950-2013



Expressed in 2013 purchasing power, the hourly minimum wage rose from \$3.8 to \$7.3 between 1950 and 2013 in the U.S., and from €2.1 to €9.4 in France. Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

### College Attendance Rates vs. Parent Income Rank in the U.S.

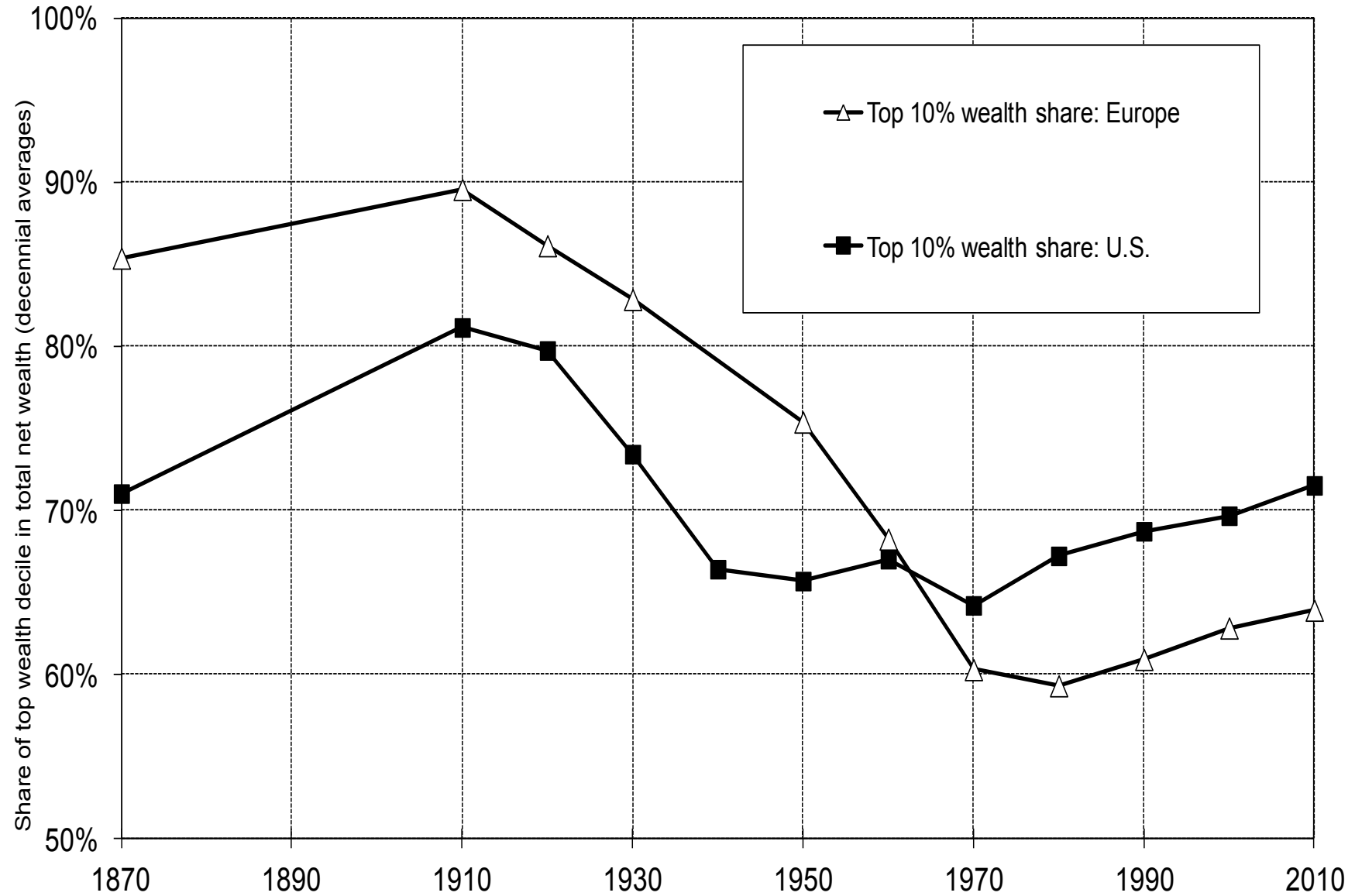


# This presentation: three points

- **1. The long-run dynamics of income inequality.** The end of the Kuznets curve, the end of universal laws.
- **2. *The return of a patrimonial (or wealth-based) society in the Old World (Europe, Japan). Wealth-income ratios seem to be returning to very high levels in low growth countries. Intuition: in a slow-growth society, wealth accumulated in the past can naturally become very important. In the very long run, this can be relevant for the entire world. Not bad in itself, but new challenges. The metamorphosis of capital call for new regulations of property relations.***
- **3. The future of wealth concentration:** with high  $r - g$  during 21<sup>c</sup>, then wealth inequality might reach or surpass 19<sup>c</sup> oligarchic levels.

- Fact n°2: wealth inequality is always a lot higher than income inequality; it is now higher in the US than in Europe
- Fact n°3: wealth inequality is less extreme today than a century ago in Europe, although the total capitalization of private wealth relative to national income has now recovered from the 1914-1945 shocks

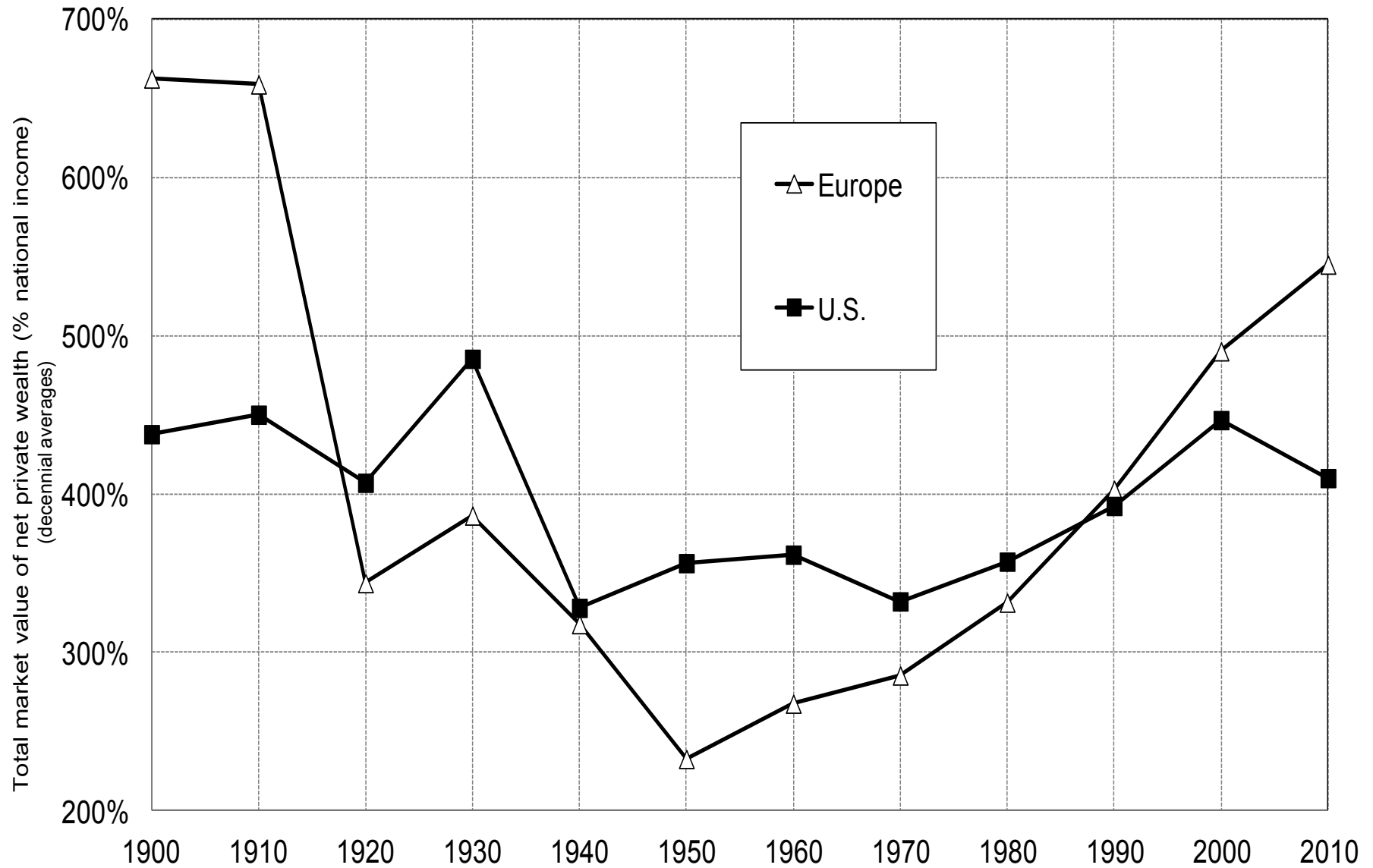
**Figure 2. Wealth inequality: Europe and the U.S., 1870-2010**



The share of total net wealth belonging to top decile wealth holders has become higher in the US than in Europe over the course of the 20<sup>th</sup> century. But it is still smaller than what it was in Europe before World War 1.

Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c) (fig.10,6)

**Figure 3. Wealth-income ratios: Europe and the U.S., 1900-2010**

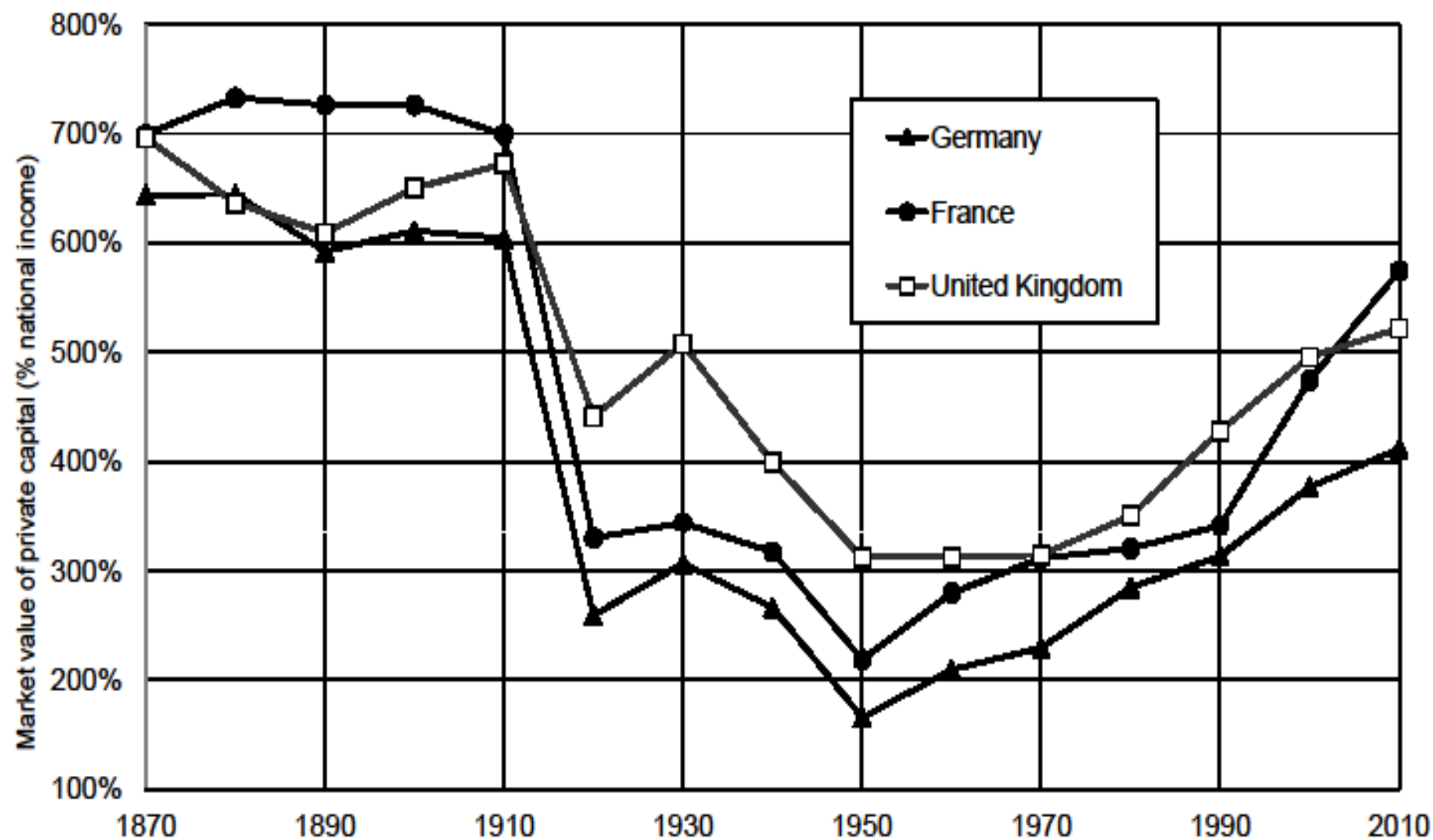


Total net private wealth was worth about 6-7 years of national income in Europe prior to World War 1, down to 2-3 years in 1950-1960, back up to 5-6 years in 2000-2010. In the US, the U-shaped pattern was much less marked.

Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c) (fig.5,1)



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



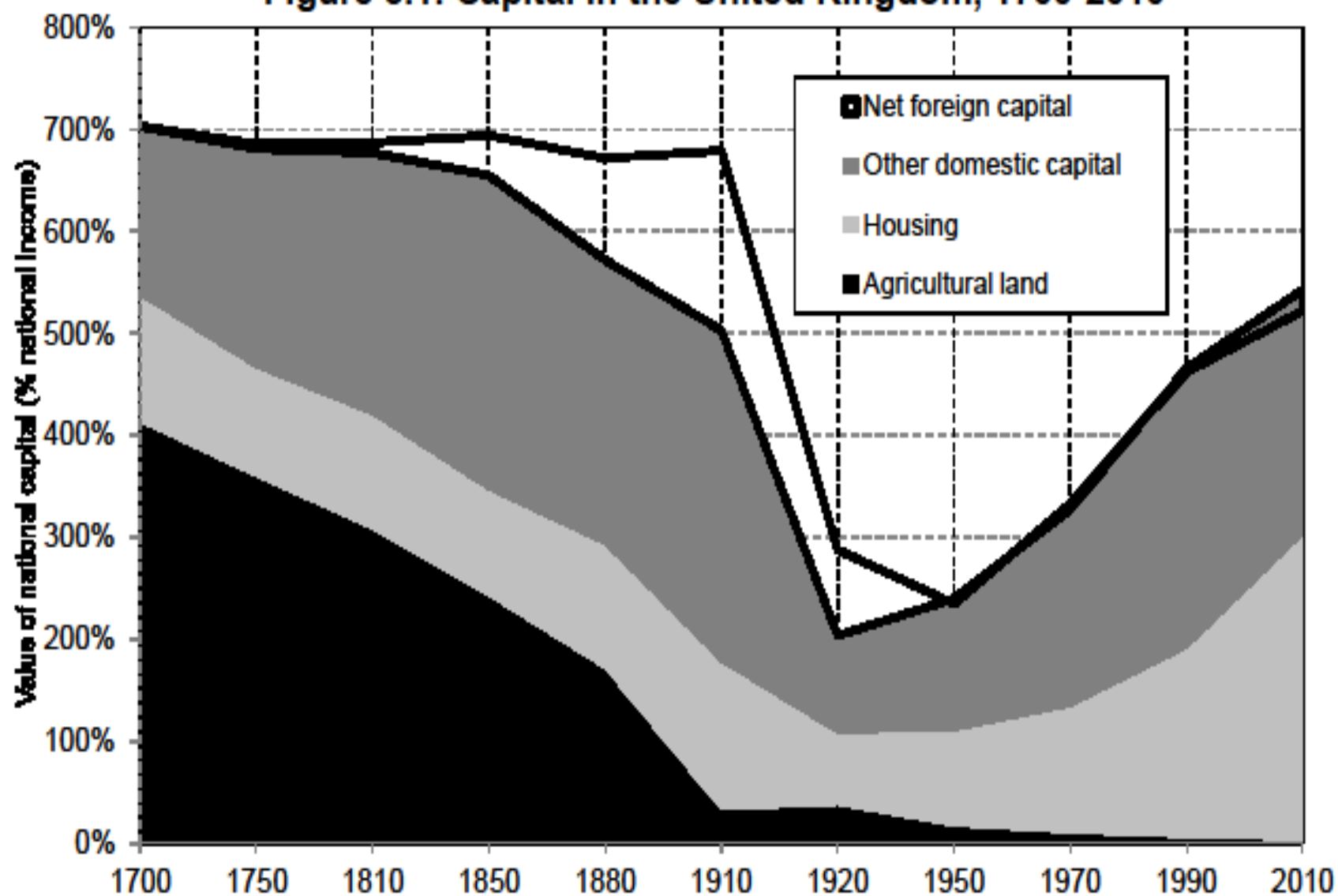
Aggregate private wealth was worth about 6-7 years of national income in Europe in 1910, between 2 and 3 years in 1950, and between 4 and 6 years in 2010. Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

# The metamorphosis of capital

- There's nothing bad with high wealth-income ratios (**postwar reconstruction, growth slowdown**), but this creates new policy challenges: financial regulation, real estate bubbles, return of inheritance

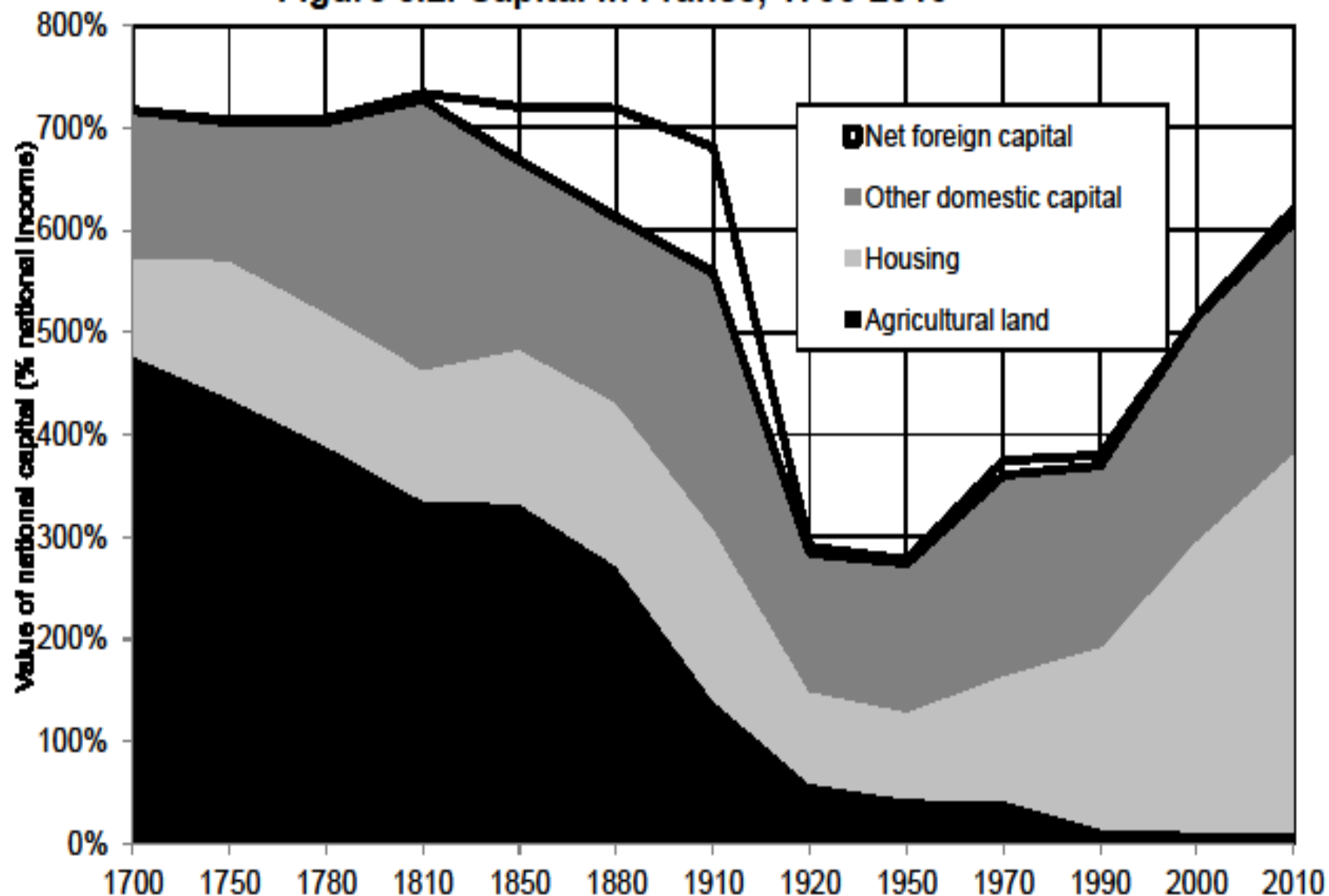
→ **A multidimensional approach to the history of capital and property relations:** from land to business assets, foreign assets, real estate, public debt, immaterial capital, etc.

Figure 3.1. Capital in the United Kingdom, 1700-2010



National capital is worth about 7 years of national income in the United Kingdom in 1700 (including 4 in agricultural land). Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

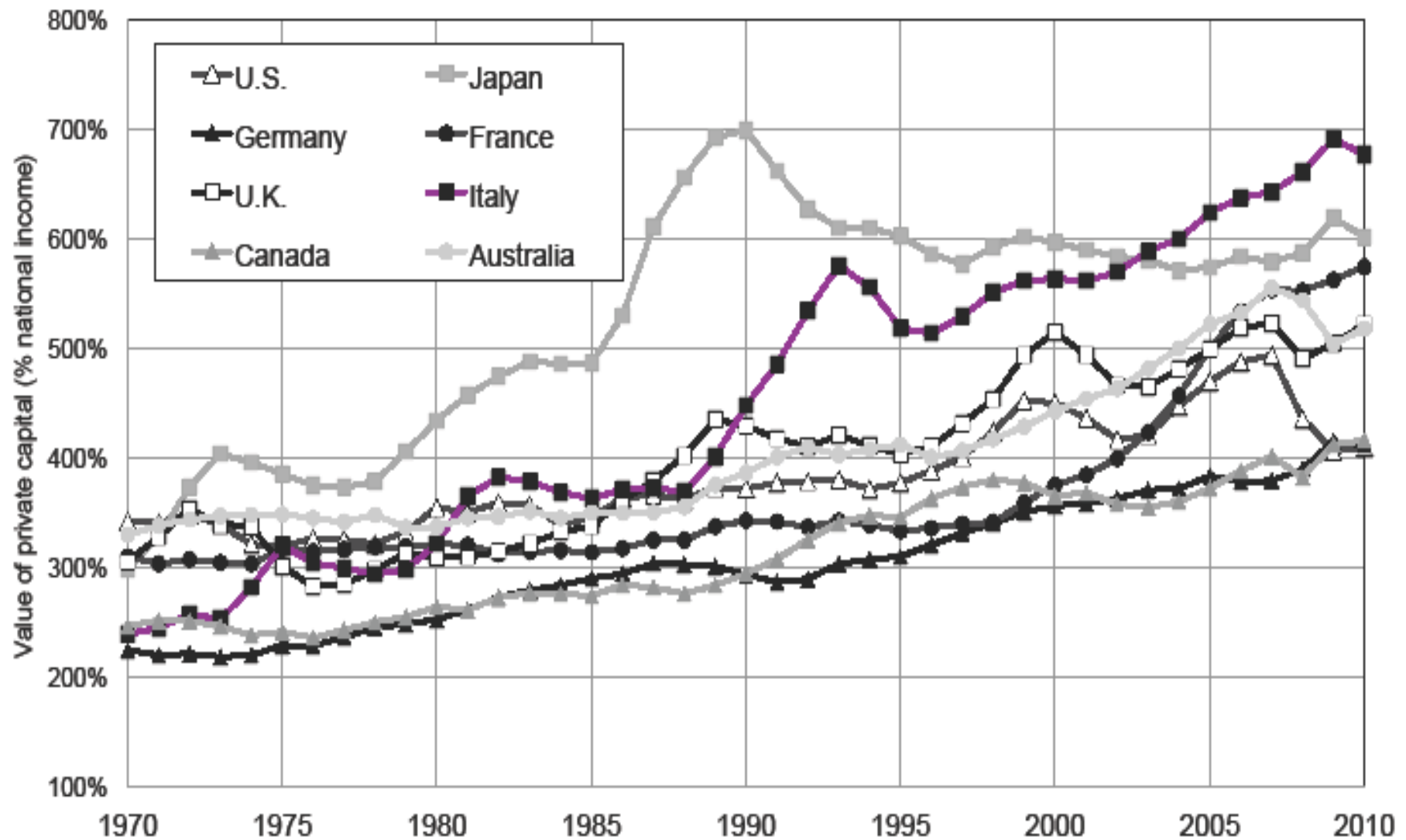
Figure 3.2. Capital in France, 1700-2010



National capital is worth almost 7 years of national income in France in 1910 (including 1 invested abroad).

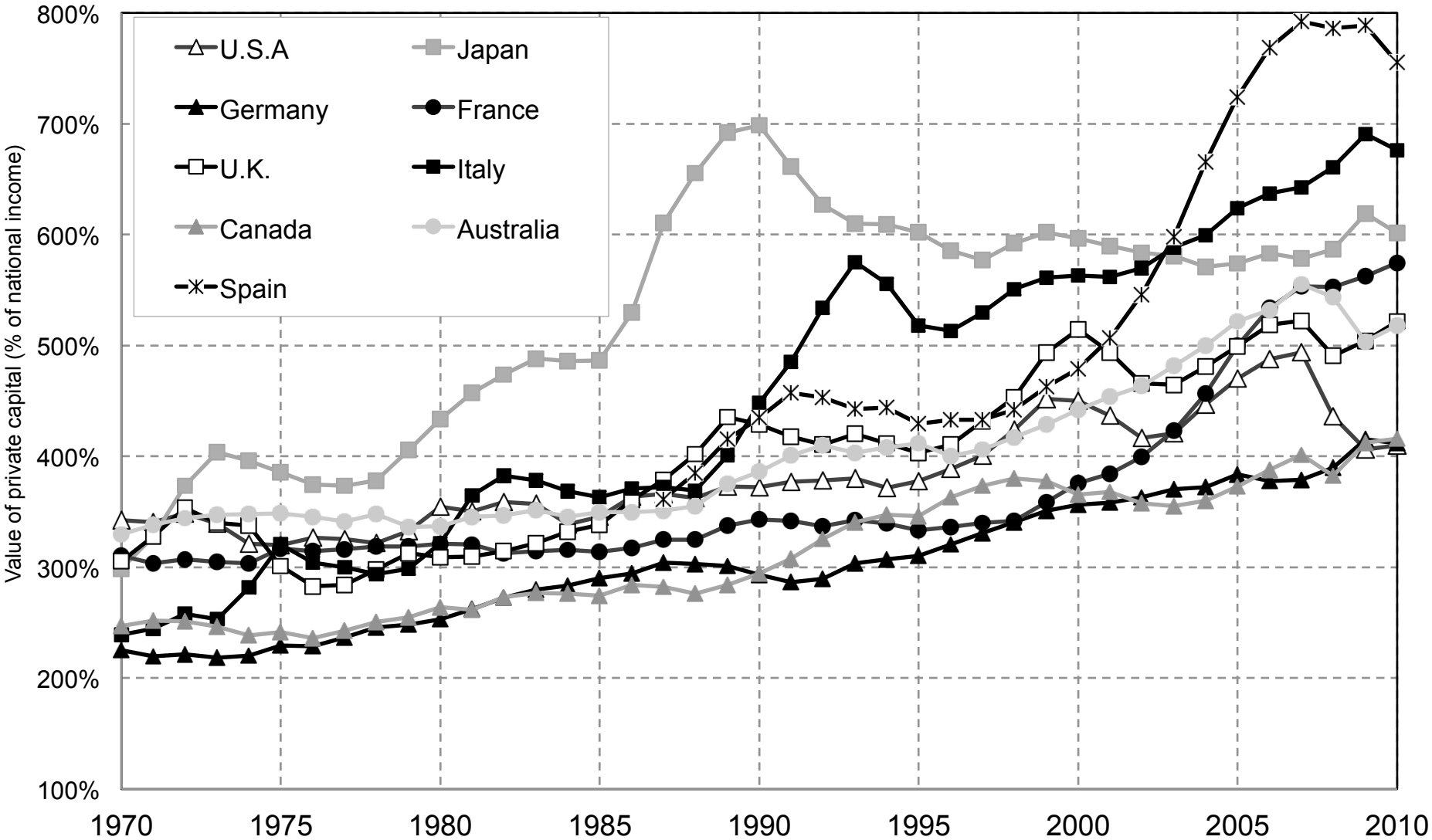
Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

Figure 5.3. Private capital in rich countries, 1970-2010



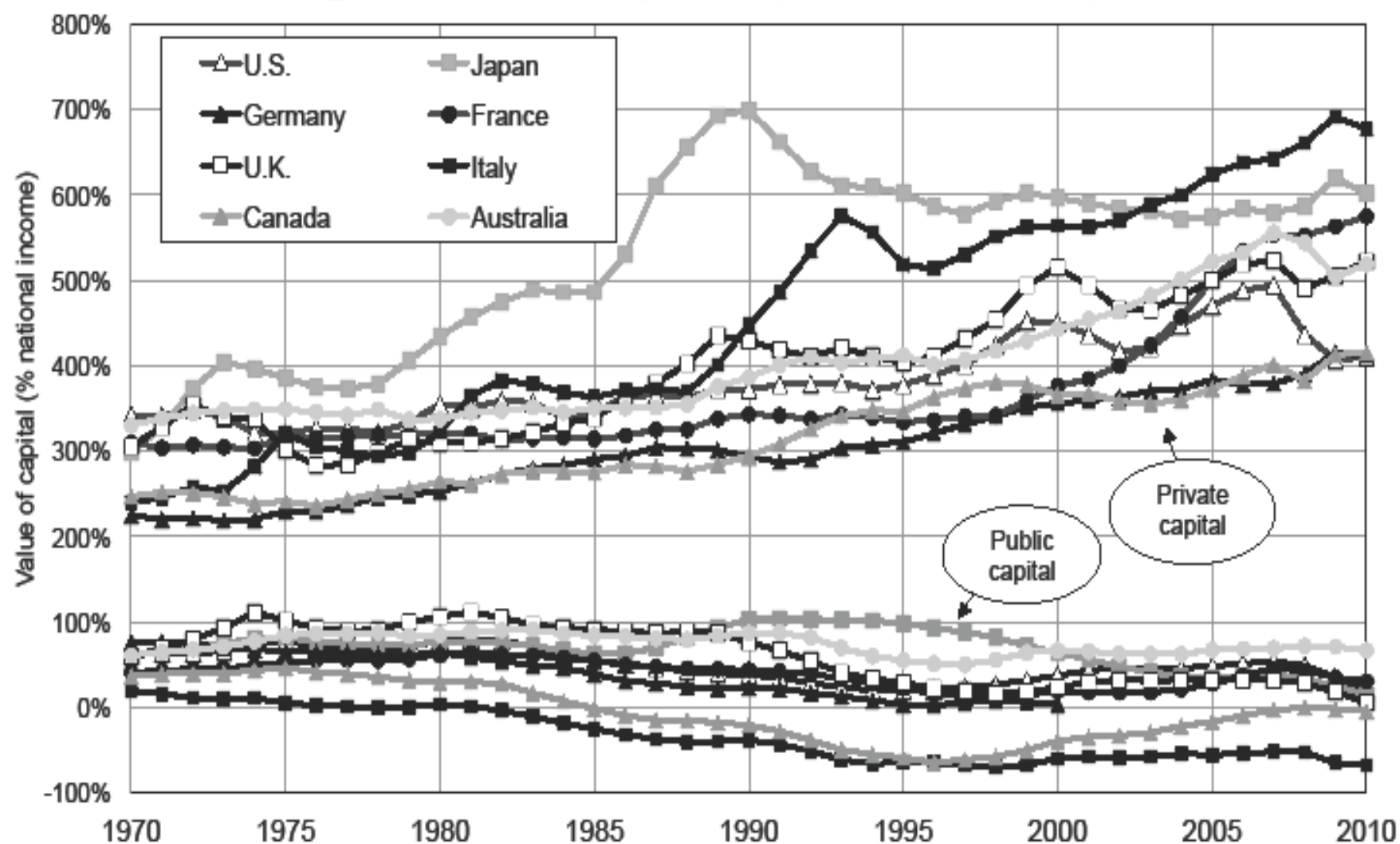
Private capital is worth between 2 and 3.5 years of national income in rich countries in 1970, and between 4 and 7 years of national income in 2010. Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

**Figure S5.2. Private capital in rich countries:  
from the Japanese to the Spanish bubble**



Private capital almost reached 8 years of national income in Spain at the end of the 2000s (ie. one more year than Japan in 1990). Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

Figure 5.5. Private and public capital in rich countries, 1970-2010



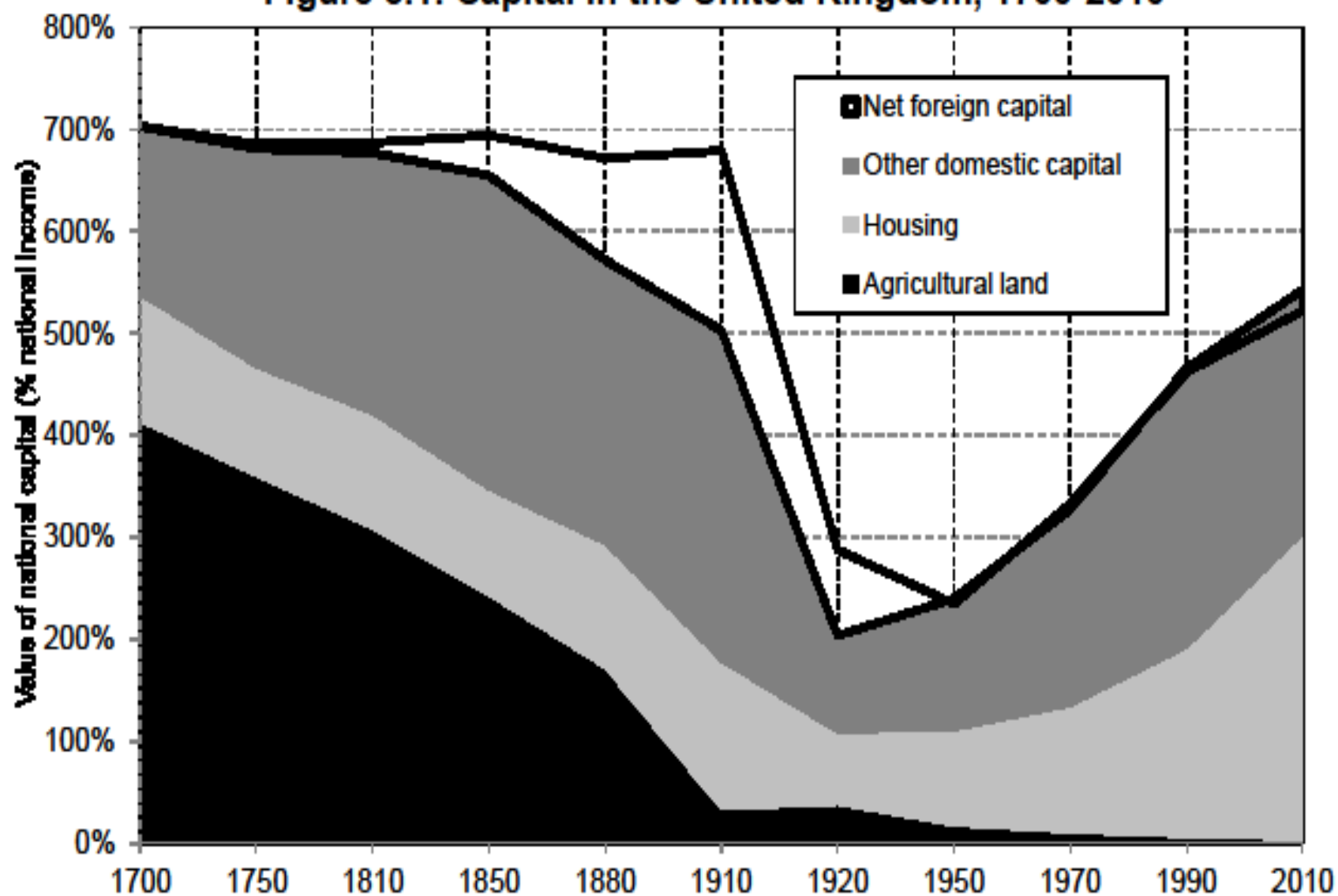
In Italy, private capital rose from 240% to 680% of national income between 1970 and 2010, while public capital dropped from 20% to -70%. Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

# Capital & inequality in America

- Inequality in America = a different structure as in Europe: more egalitarian in some ways, more inegalitarian in others
- The New World in the 19<sup>th</sup> century: **the land of opportunity** (capital accumulated in the past matters less than in Europe; perpetual pop. growth as a way to reduce the level of inherited wealth and wealth concentration)... **and also the land of slavery: extreme form of property relation**
- Northern US were in many ways more egalitarian than Old Europe; but Southern US were more inegalitarian
- We still have the same ambiguous relationship of America with inequality today: in some ways more merit-based; in other ways more violent (« meritocratic extremism »)

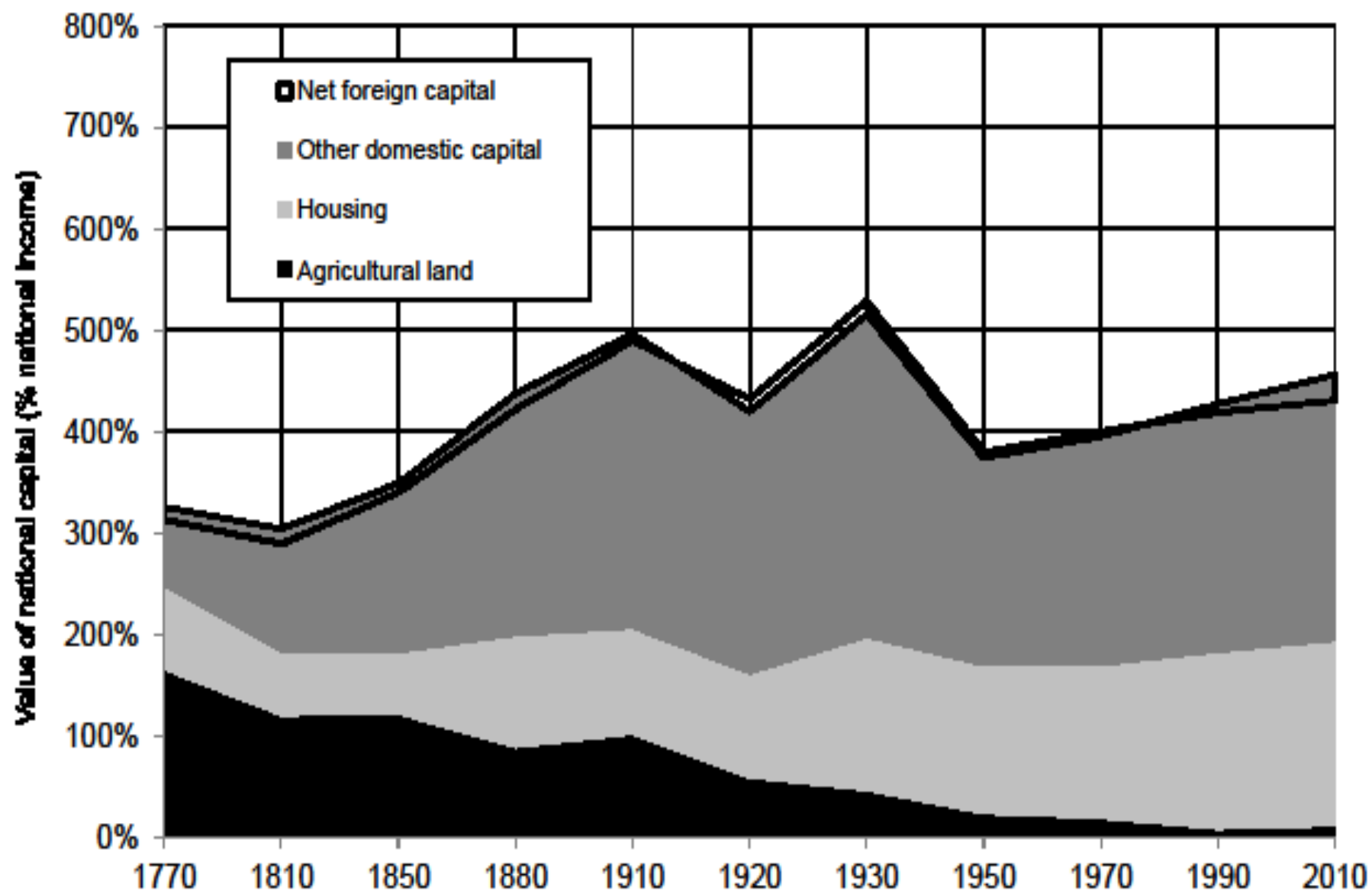


Figure 3.1. Capital in the United Kingdom, 1700-2010



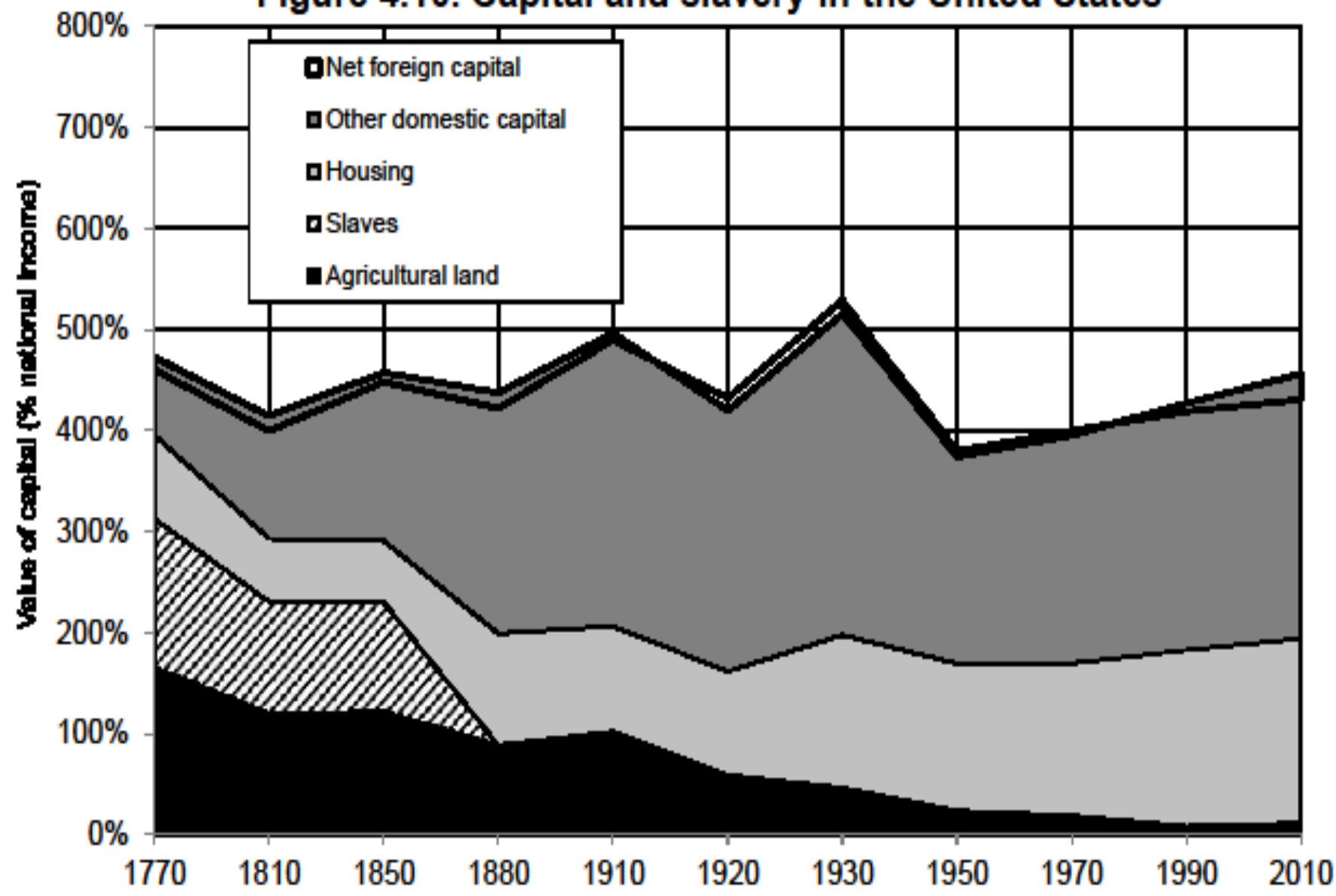
National capital is worth about 7 years of national income in the United Kingdom in 1700 (including 4 in agricultural land). Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

**Figure 4.6. Capital in the United States, 1770-2010**



National capital is worth 3 years of national income in the United States in 1770 (incl. 1,5 years in agricultural land). Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

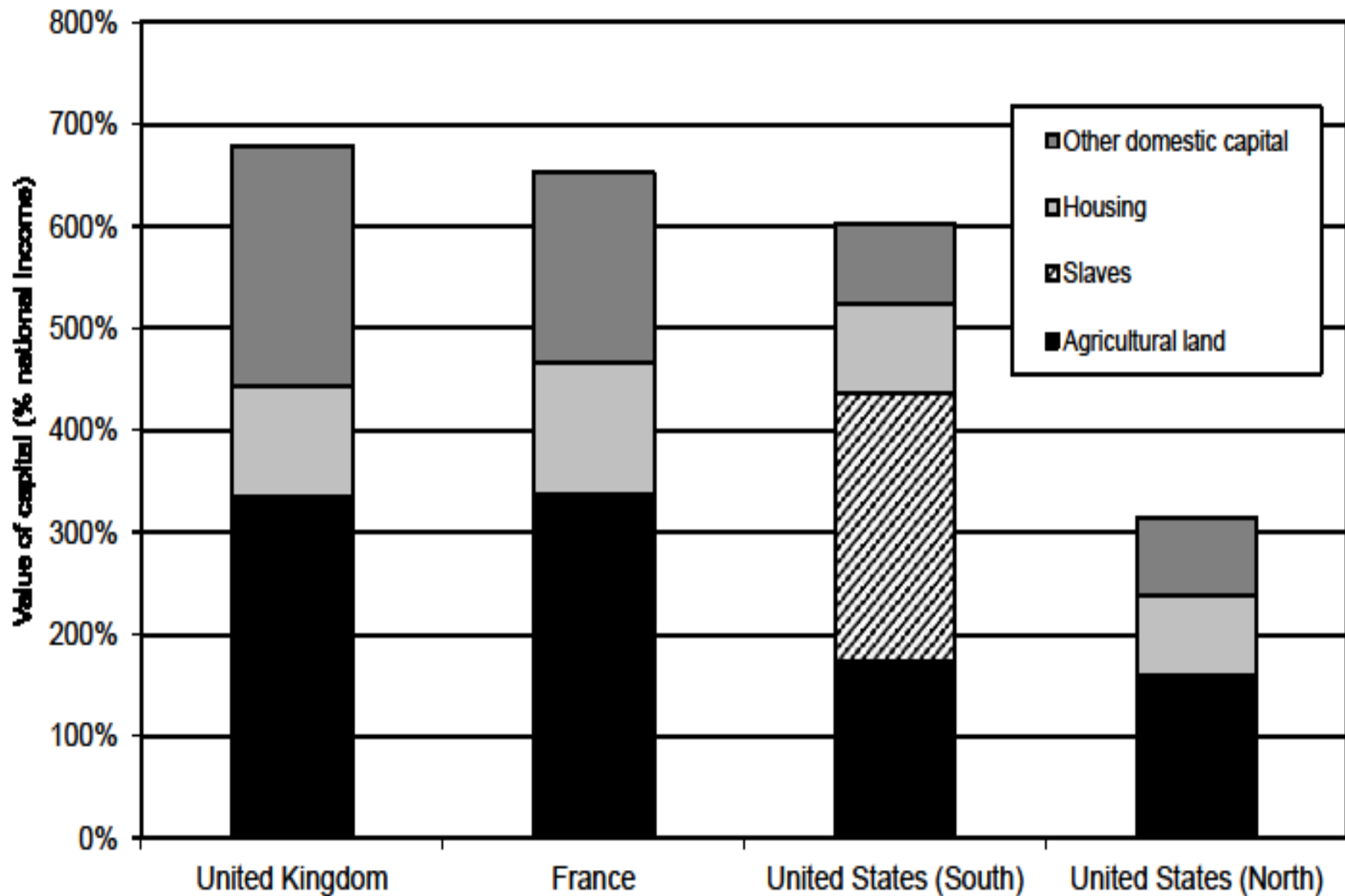
**Figure 4.10. Capital and slavery in the United States**



The market value of slaves was about 1,5 years of U.S. national income around 1770 (as much as land).

Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

Figure 4.11. Capital around 1770-1810: Old an New World

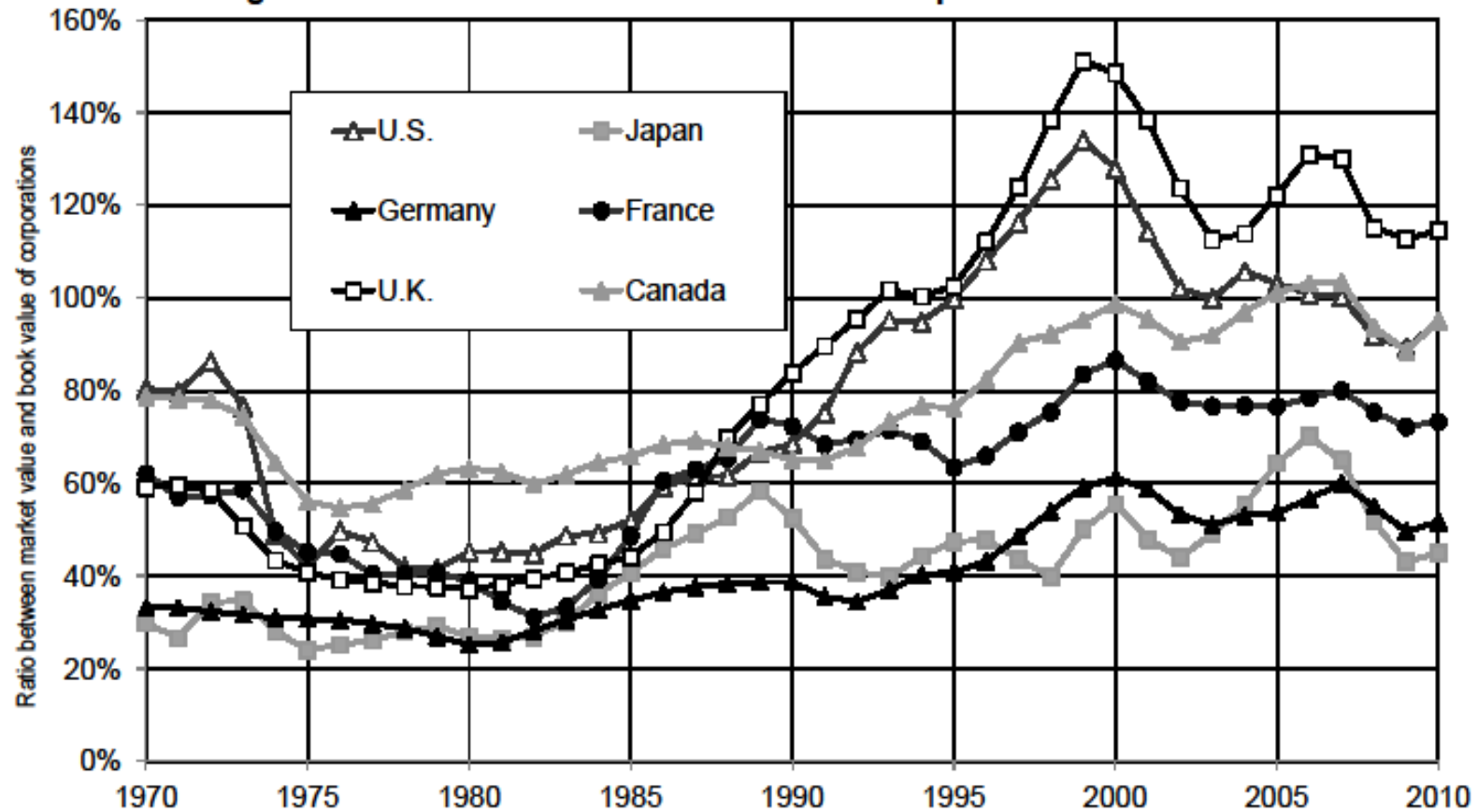


The combined value of agricultural land and slaves in Southern United States surpassed 4 years of national income around 1770-1810. Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

# Capital & inequality in Germany

- Lower market values of capital assets in Germany: lower real estate prices, and lower stock market capitalization of corporations
- Stakeholder capitalism: shareholders have to share power with worker representatives, regional govt, etc., so that the market value is much less than book value of corporation
- Apparently this does not prevent German companies from producing good cars
- **This clearly illustrates that market and social values of capital can differ; property relations are socially, legally and historically determined**

Figure 5.6. Market value and book value of corporations

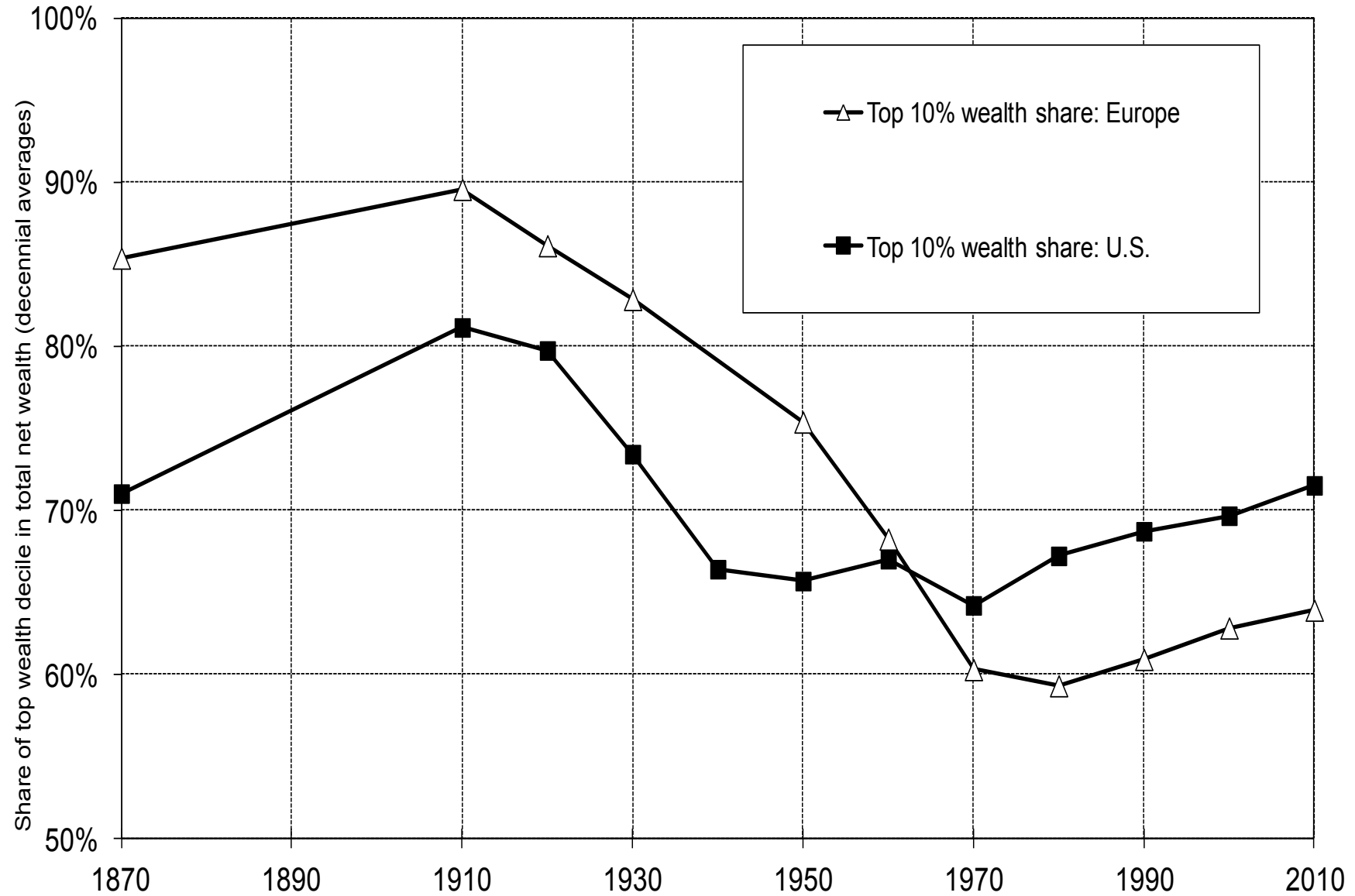


Tobin's Q (i.e. the ratio between market value and book value of corporations) has risen in rich countries since the 1970s-1980s. Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

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- **1. The long-run dynamics of income inequality.** The end of the Kuznets curve, the end of universal laws. Country-specific institutions and policies matter.
- **2. The return of a patrimonial (or wealth-based) society** in the Old World (Europe, Japan). Wealth-income ratios seem to be returning to very high levels in low growth countries.
- **3. *The future of wealth concentration: with high  $r - g$  during 21<sup>c</sup> ( $r = \text{net-of-tax rate of return}$ ,  $g = \text{growth rate}$ ), then wealth inequality might reach or surpass 19<sup>c</sup> oligarchic levels. Conversely, suitable institutions can allow to democratize wealth. Strong need for more transparency about global wealth dynamics and cross-border financial assets, in rich countries as well as in emerging countries (China, Latin America, Africa).***

**Figure 2. Wealth inequality: Europe and the U.S., 1870-2010**



The share of total net wealth belonging to top decile wealth holders has become higher in the US than in Europe over the course of the 20<sup>th</sup> century. But it is still smaller than what it was in Europe before World War 1.

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**Table 12.1. The growth rate of top global wealth, 1987-2013**

<i>Average real growth rate per year (after deduction of inflation)</i>	1987-2013
The top 1/(100 million) highest wealth holders <small>(about 30 adults out of 3 billions in 1980s, and 45 adults out of 4,5 billions in 2010s)</small>	6,8%
The top 1/(20 million) highest wealth holders <small>(about 150 adults out of 3 billions in 1980s, and 225 adults out of 4,5 billions in 2010s)</small>	6,4%
Average world wealth per adult	2,1%
Average world income per adult	1,4%
World adult population	1,9%
World GDP	3,3%

Between 1987 and 2013, the highest global wealth fractiles have grown at 6%-7% per year, vs. 2,1% for average world wealth and 1,4% for average world income. All growth rates are net of inflation (2,3% per year between 1987 and 2013). Sources: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

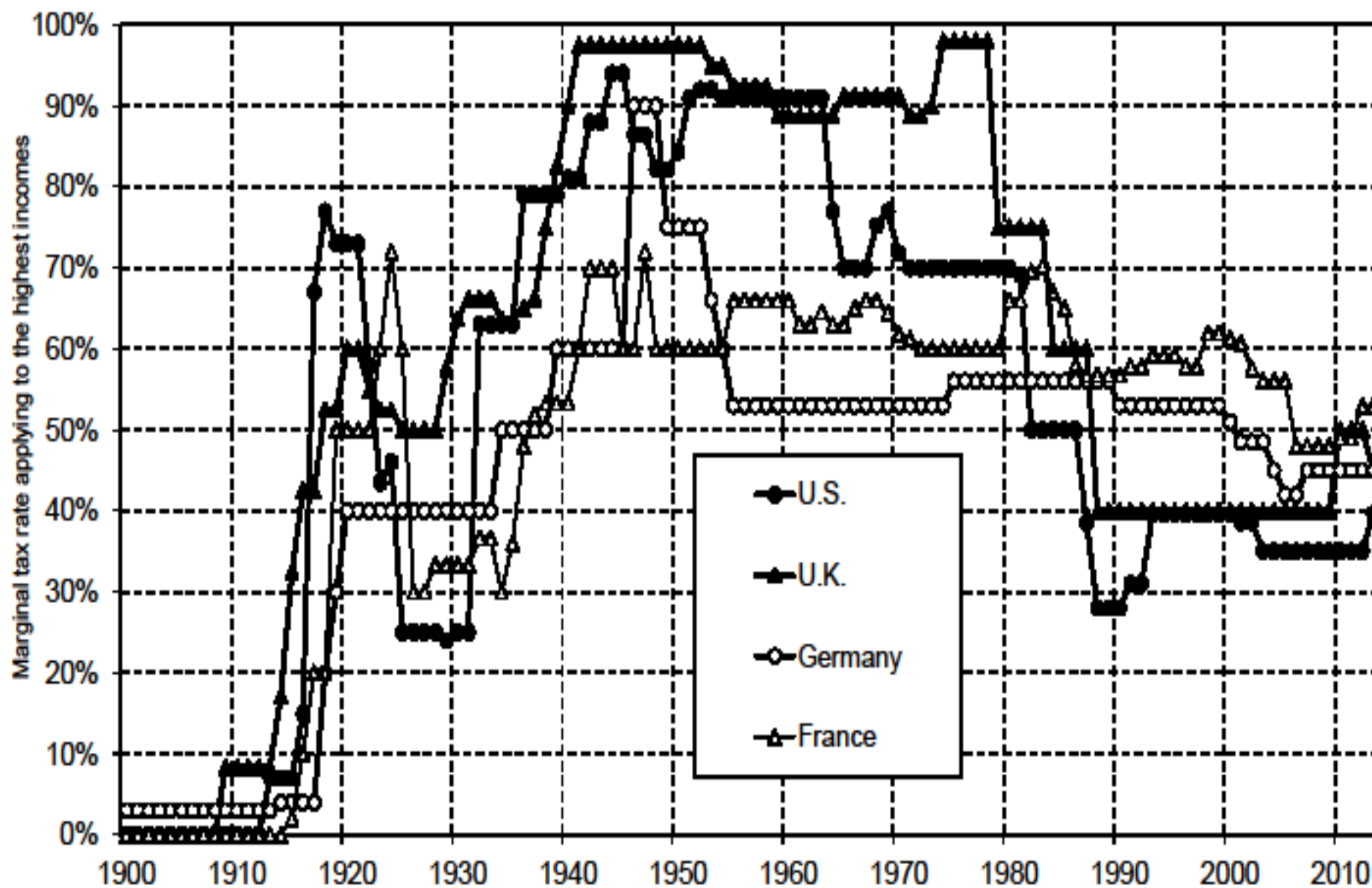
**Table 12.2. The return on the capital endowments of U.S. universities, 1980-2010**

<i>Average real annual rate of return (after deduction of inflation and all administrative costs and financial fees)</i>	Période 1980-2010
All universities (850)	8.2%
incl.: Harvard-Yale-Princeton	10.2%
incl.: Endowments higher than 1 billion \$ (60)	8.8%
incl. Endowments between 500 millions and 1 billion \$ (66)	7.8%
incl. Endowments between 100 and 500 million \$ (226)	7.1%
dont: Endowments less than 100 million \$ (498)	6.2%

Between 1980 and 2010, U.S. universities earned an average real return of 8.2% on their capital endowments, and all the more so for higher endowments. All returns reported here are net of inflation (2.4% per year between 1980 and 2010) and of all administrative costs and financial fees.

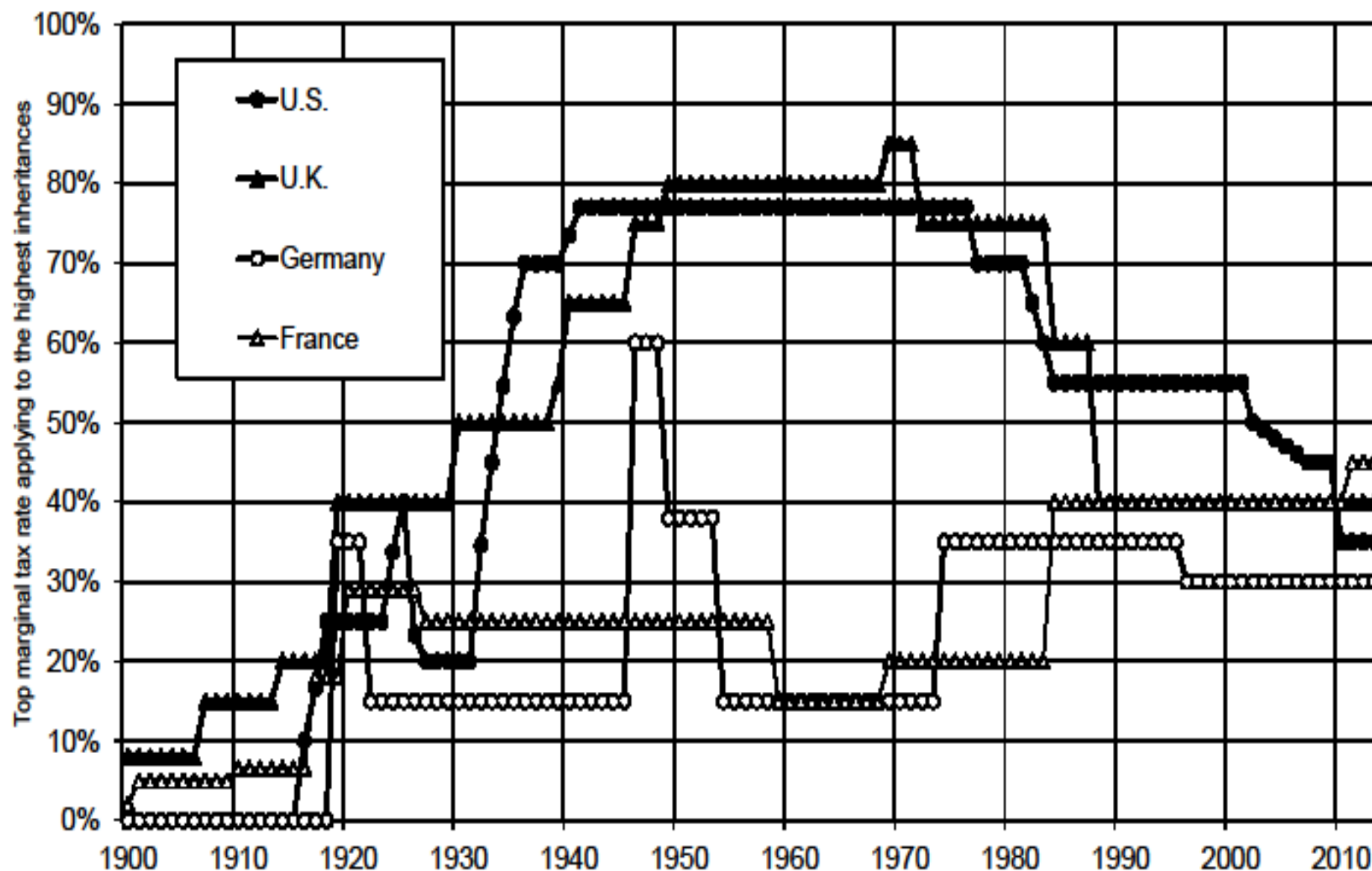
Sources: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

Figure 14.1. Top income tax rates, 1900-2013



The top marginal tax rate of the income tax (applying to the highest incomes) in the U.S. dropped from 70% in 1980 to 28% in 1988. Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

Figure 14.2. Top inheritance tax rates, 1900-2013



The top marginal tax rate of the inheritance tax (applying to the highest inheritances) in the U.S. dropped from 70% in 1980 to 35% in 2013. Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

# Conclusions

- **The history of income and wealth inequality is deeply political, social and cultural; it involves beliefs systems, national identities and sharp reversals**
- In a way, both Marx and Kuznets were wrong: there are powerful forces pushing in the direction of rising or reducing inequality; which one dominates depends on the institutions and policies that different societies choose to adopt
- High  $r-g$  can push toward high wealth concentration, but many other forces are also important
- The ideal solution: progressive taxation, social state, financial transparency, economic democracy
- Other solutions involve authoritarian political & capital controls (China, Russia), or perpetual population growth (US)
- **US high-inequality trap: oligarchic capture, or lack of historical experience with oligarchy ?**

**Supplementary slides**

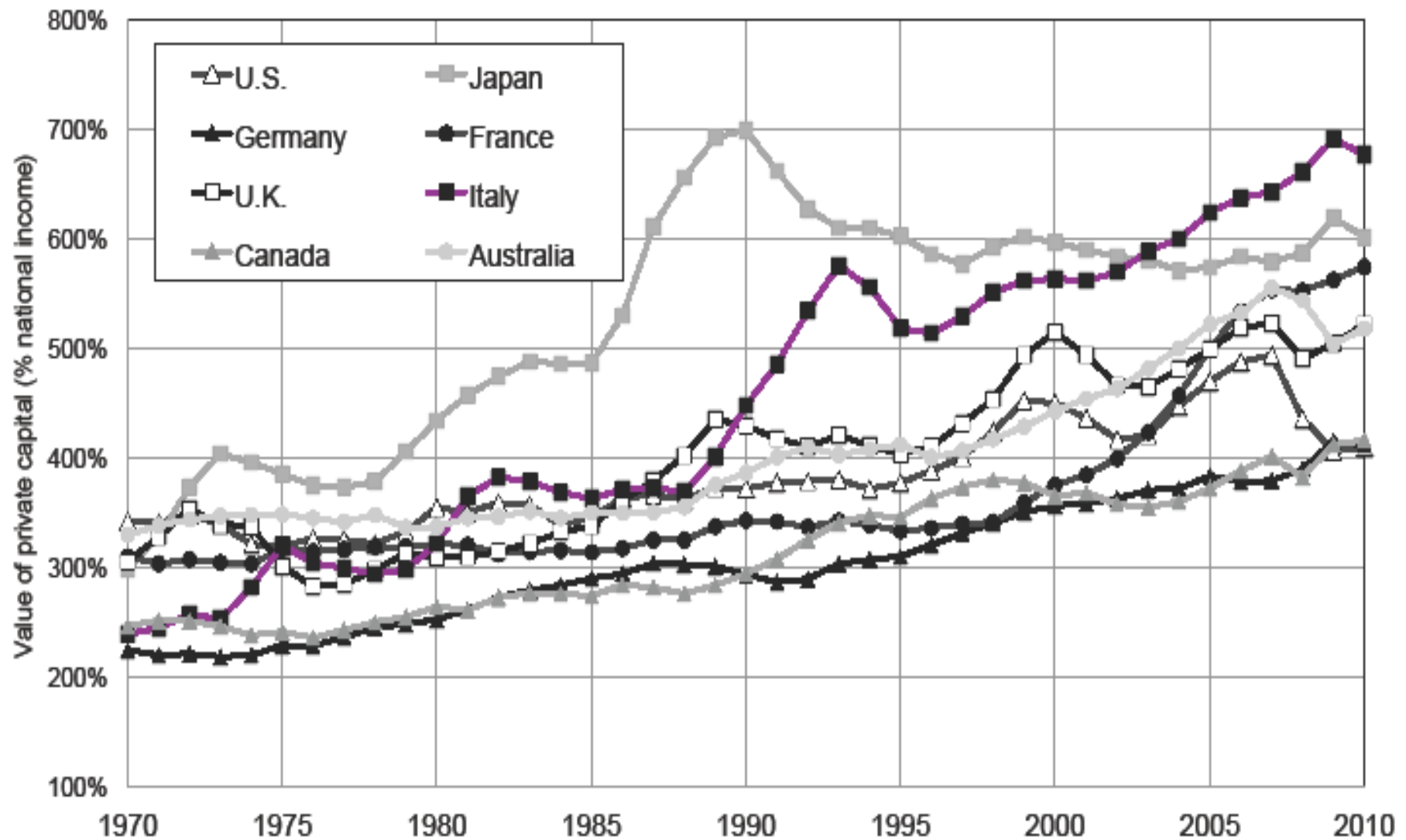
**(long lecture version)**

# The return of a wealth-based society

- Wealth = capital  $K$  = everything we own and that can be sold on a market (net of all debts) (excludes human  $K$ , except in slave societies)
- In textbooks, wealth-income & capital-output ratios are supposed to be constant. But the so-called « Kaldor facts » actually rely on little historical evidence.
- In fact, we observe in Europe & Japan a large recovery of  $\beta=K/Y$  in recent decades:  
 $\beta=200-300\%$  in 1950-60s  $\rightarrow$   $\beta=500-600\%$  in 2000-10s  
(i.e. average wealth  $K$  was about 2-3 years of average income  $Y$  around 1950-1960; it is about 5-6 years in 2000-2010)  
(with  $\beta\approx 600\%$ , if  $Y\approx 30\,000\text{€}$  per capita, then  $K\approx 180\,000\text{€}$  per capita)  
(currently,  $K \approx$  half real estate, half financial assets)

**Are we heading back to the  $\beta=600-700\%$  observed in the wealth-based societies of 18<sup>c</sup>-19<sup>c</sup> ? Or even more?**

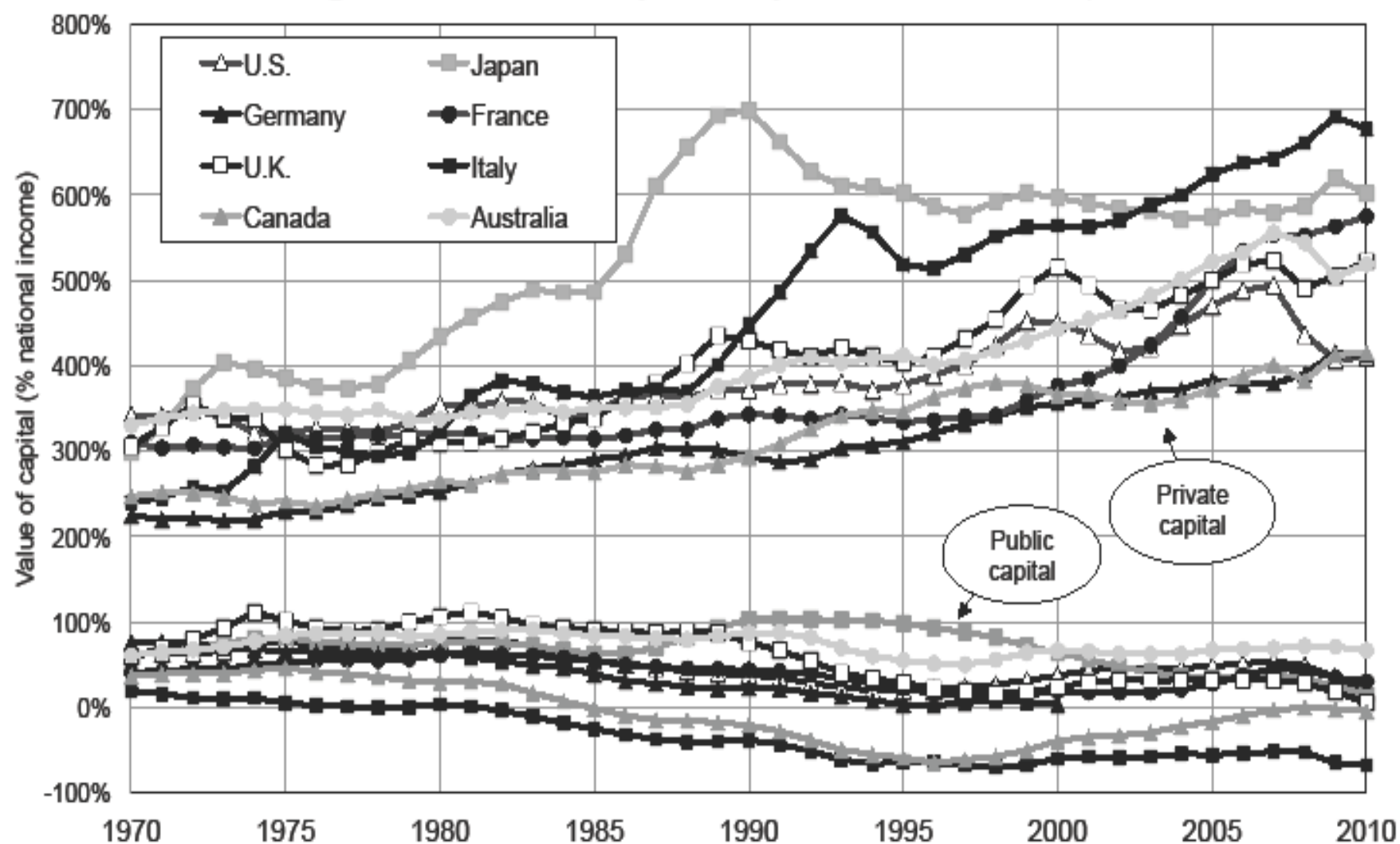
**Figure 5.3. Private capital in rich countries, 1970-2010**



Private capital is worth between 2 and 3.5 years of national income in rich countries in 1970, and between 4 and 7 years of national income in 2010. Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

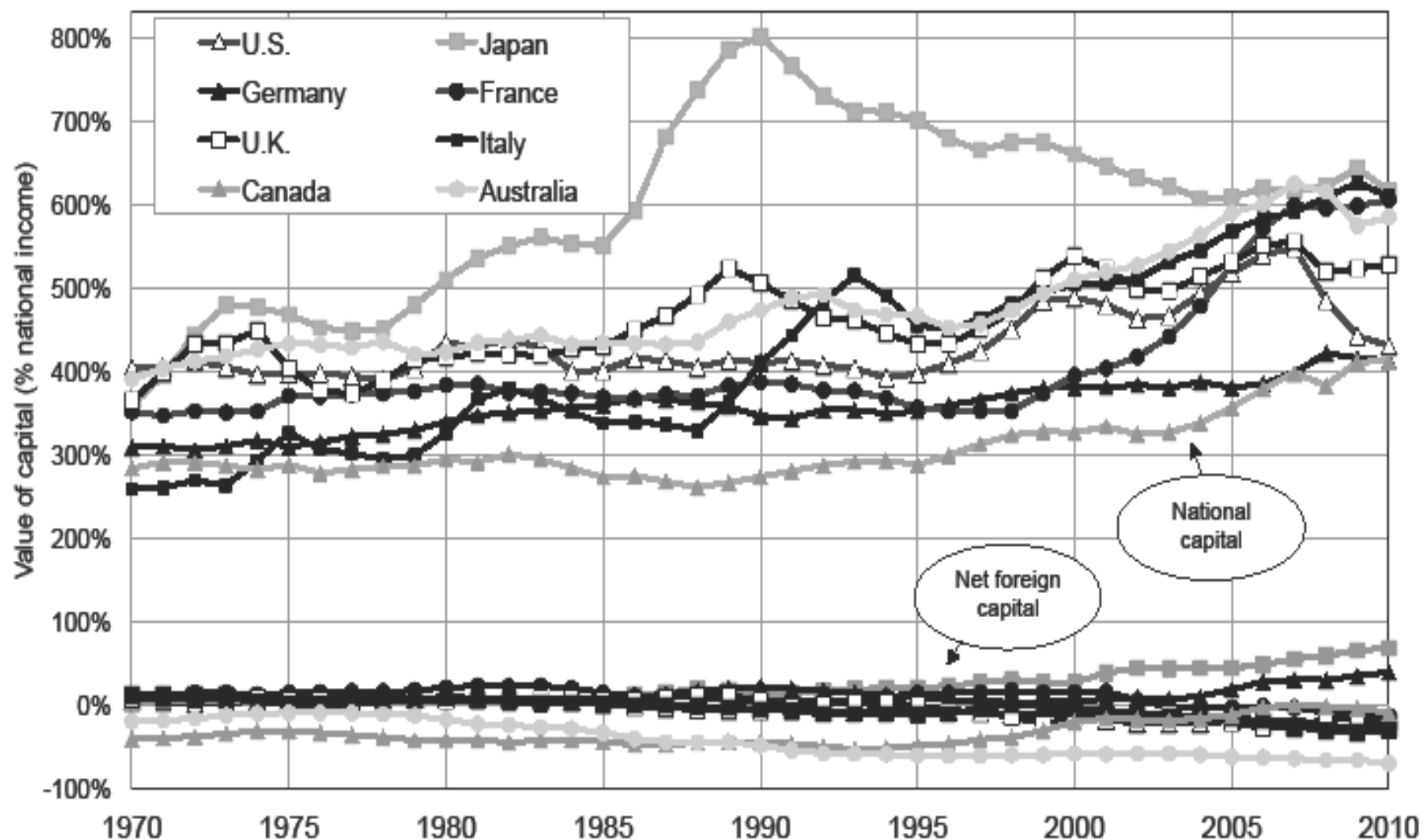


**Figure 5.5. Private and public capital in rich countries, 1970-2010**



In Italy, private capital rose from 240% to 680% of national income between 1970 and 2010, while public capital dropped from 20% to -70%. Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

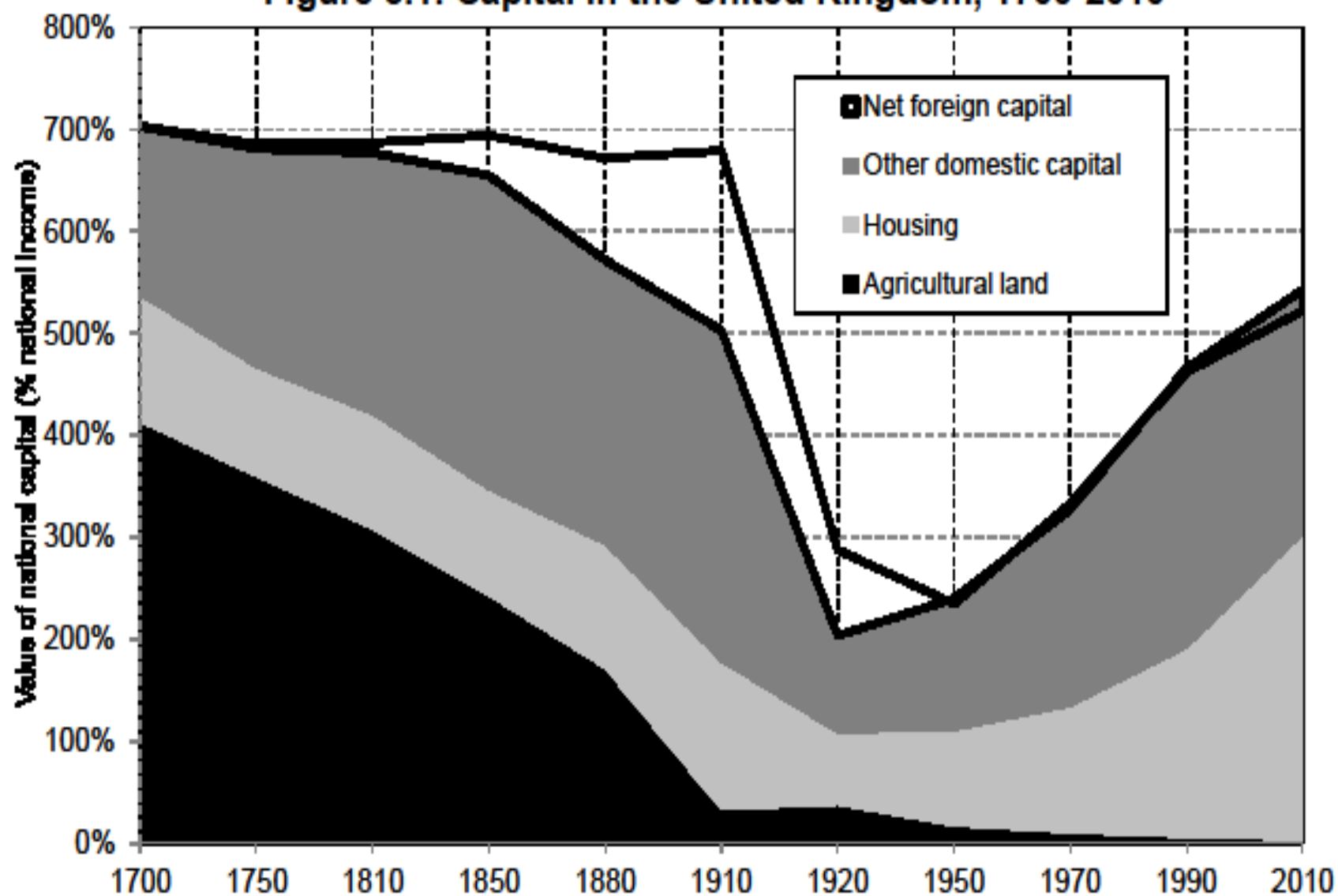
Figure 5.7. National capital in rich countries, 1970-2010



Net foreign assets held by Japan and Germany are worth between 0.5 and 1 year of national income in 2010.

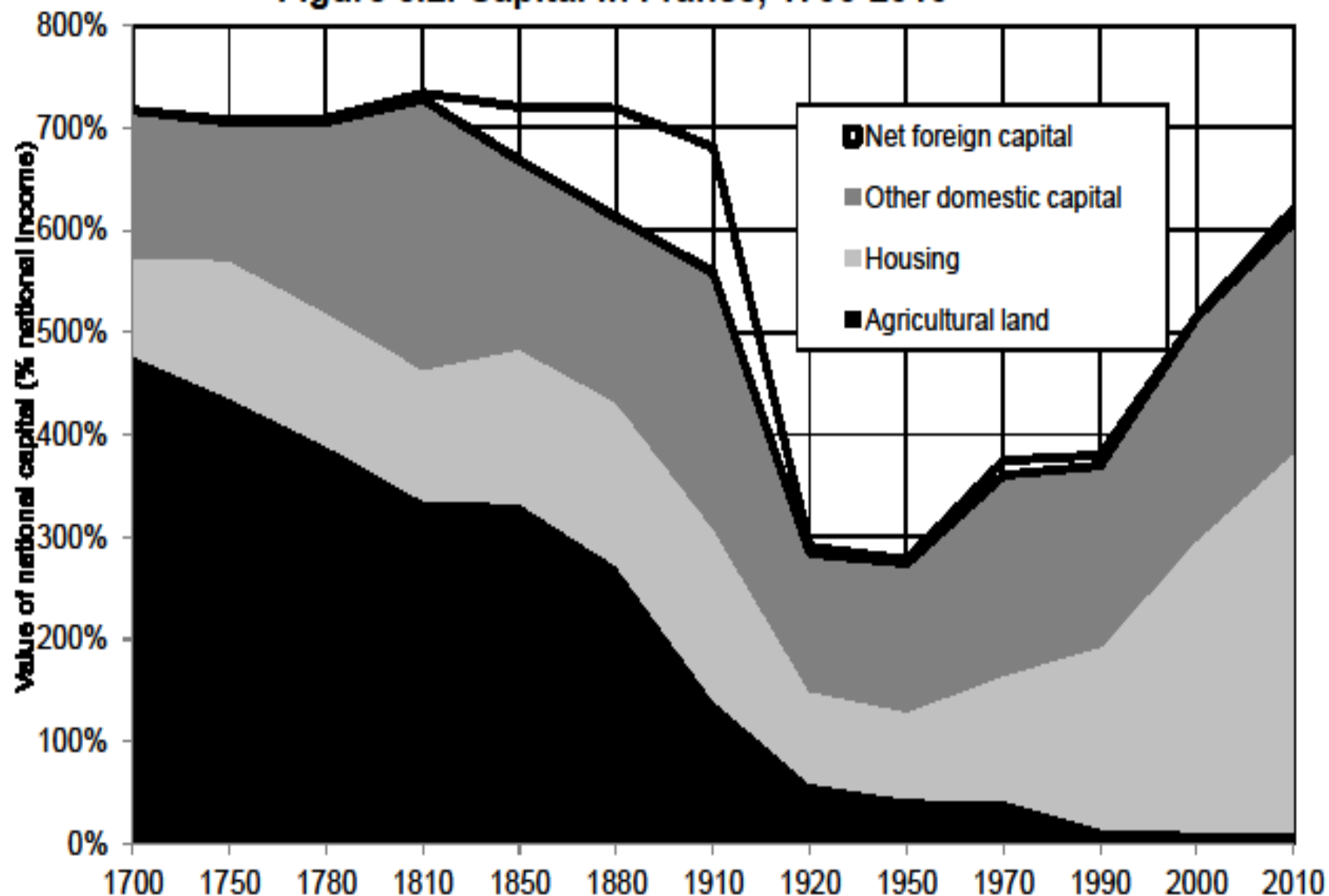
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Figure 3.1. Capital in the United Kingdom, 1700-2010



National capital is worth about 7 years of national income in the United Kingdom in 1700 (including 4 in agricultural land). Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

Figure 3.2. Capital in France, 1700-2010



National capital is worth almost 7 years of national income in France in 1910 (including 1 invested abroad).

Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

- The simplest way to think about this is the following: in the long-run,  $\beta = s/g$  with  $s$  = (net-of-depreciation) saving rate and  $g$  = economy's growth rate (population + productivity)

With  $s=10\%$ ,  $g=3\%$ ,  $\beta \approx 300\%$ ; but if  $s=10\%$ ,  $g=1,5\%$ ,  $\beta \approx 600\%$

**= in slow-growth societies, the total stock of wealth accumulated in the past can naturally be very important**

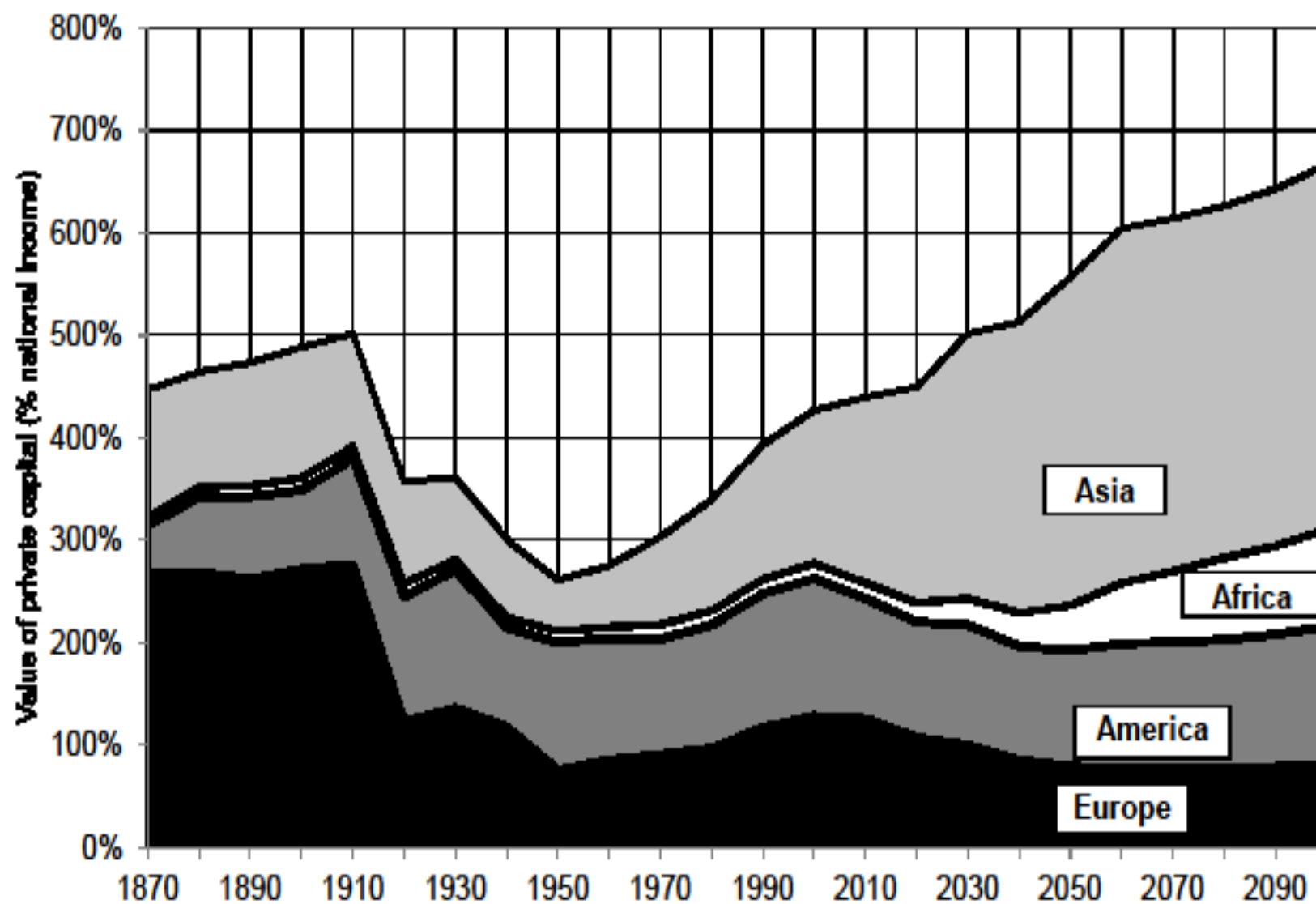
**→ capital is back because low growth is back**

(in particular because population growth  $\downarrow 0$ )

**→ in the long run, this can be relevant for the entire planet**

Note:  $\beta = s/g$  = pure stock-flow accounting identity; it is true whatever the combination of saving motives

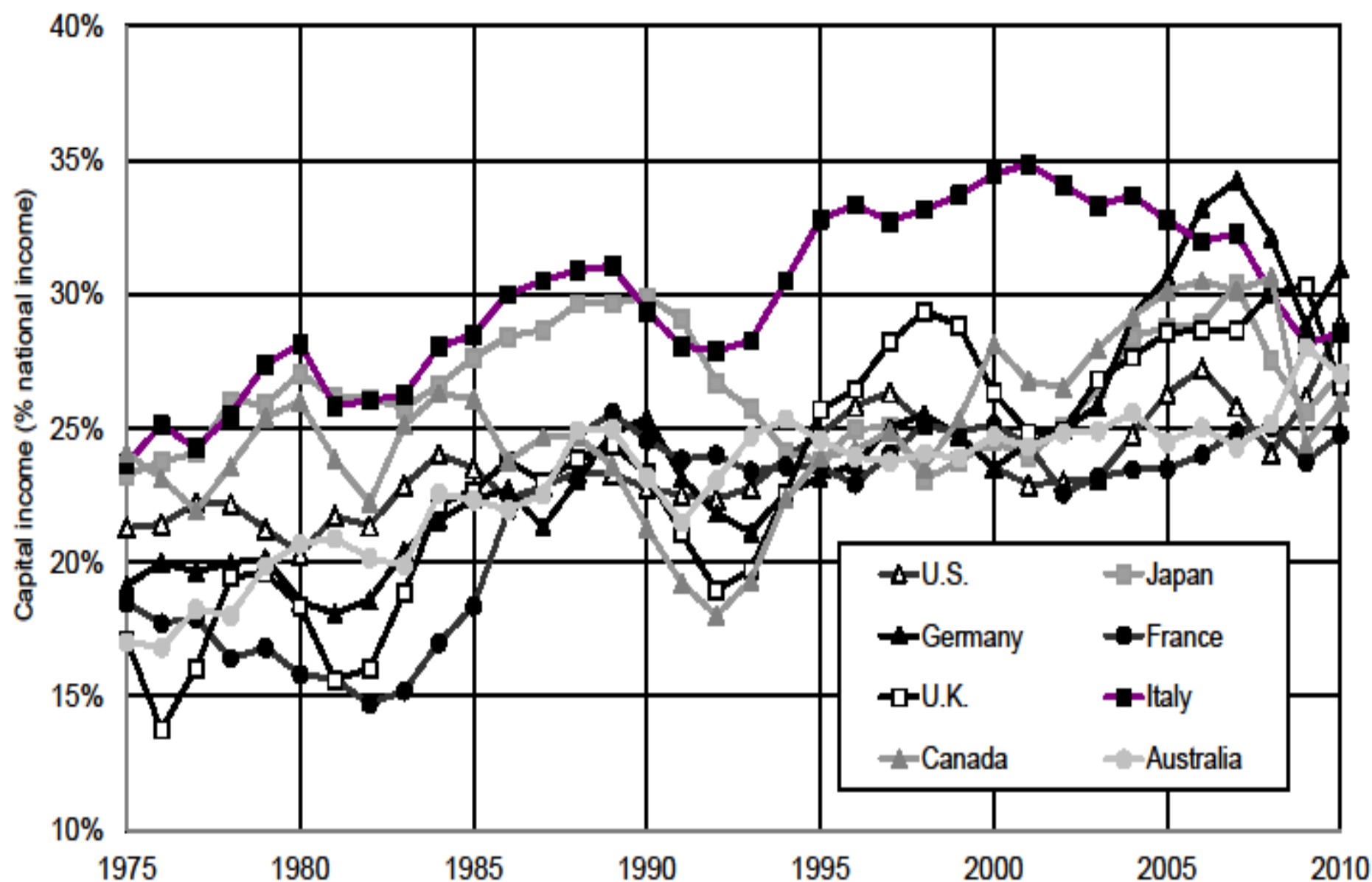
Figure 12.5. The distribution of world capital 1870-2100



According to the central scenario, Asian countries should own about half of world capital by the end of the 21st century. Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

- **Will the rise of capital income-ratio  $\beta$  also lead to a rise of the capital share  $\alpha$  in national income?**
- If the capital stock equals  $\beta=6$  years of income and the average return to capital is equal  $r=5\%$  per year, then the share of capital income (rent, dividends, interest, profits, etc.) in national income equals  $\alpha = r \times \beta = 30\%$
- Technically, whether a rise in  $\beta$  also leads to a rise in capital share  $\alpha = r \beta$  depends on the elasticity of substitution  $\sigma$  between capital K and labor L in the production function  $Y=F(K,L)$
- Intuition:  $\sigma$  measures the extent to which workers can be replaced by machines (e.g. Amazon's drones)
- Standard assumption: Cobb-Douglas production function ( $\sigma=1$ ) = as the stock  $\beta \uparrow$ , the return  $r \downarrow$  exactly in the same proportions, so that  $\alpha = r \times \beta$  remains unchanged, like by magic = a stable world where the capital-labor split is entirely set by technology
- But if  $\sigma > 1$ , then the return to capital  $r \downarrow$  falls less than the volume of capital  $\beta \uparrow$ , so that the product  $\alpha = r \times \beta \uparrow$
- **Exactly what happened since the 1970s-80s: both the ratio  $\beta$  and the capital share  $\alpha$  have increased**

Figure 6.5. The capital share in rich countries, 1975-2010



Capital income absorbs between 15% and 25% of national income in rich countries in 1970, and between 25% and 30% in 2000-2010. Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c)

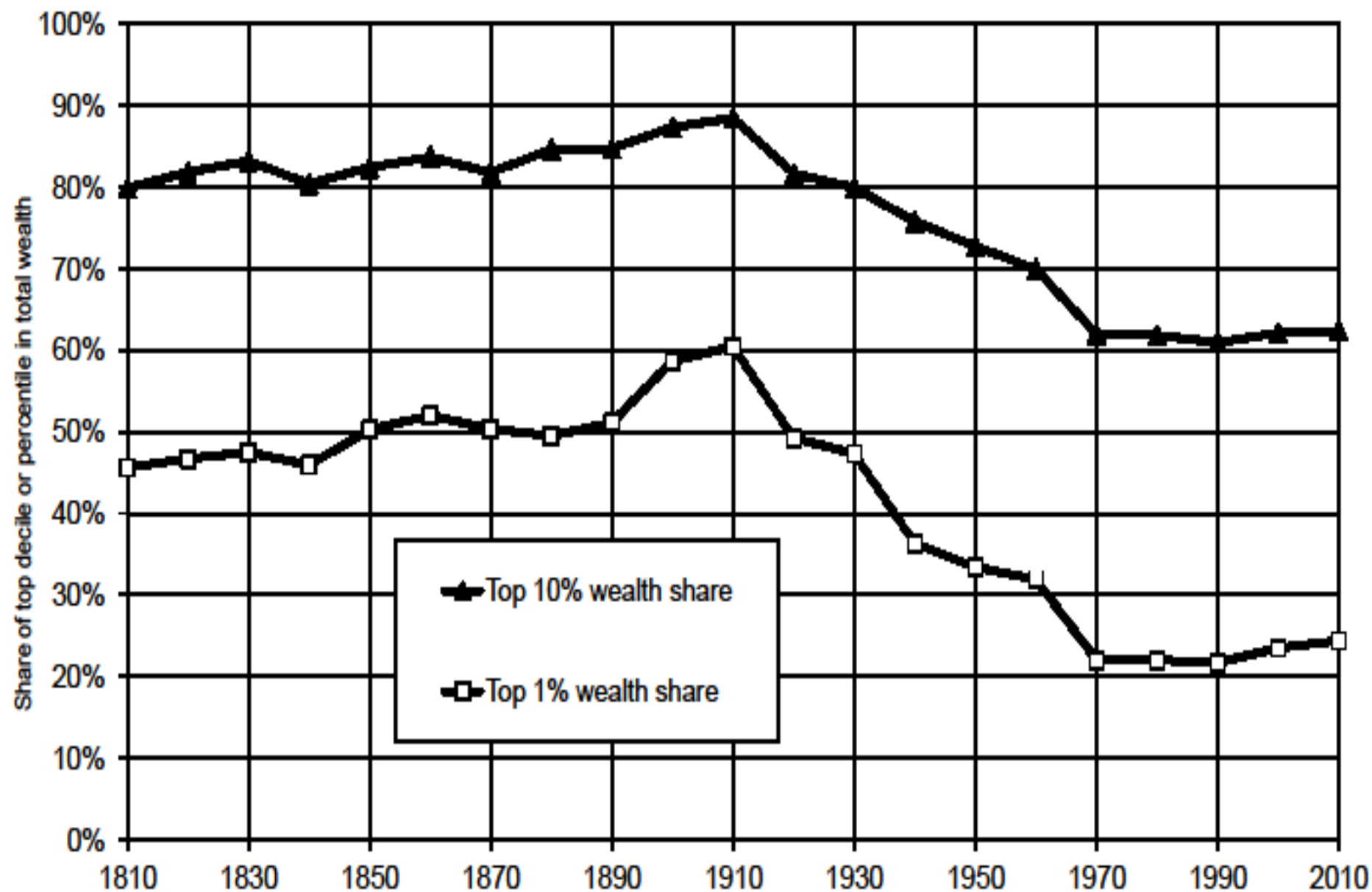


- With a large rise in  $\beta$ , one can get large rise in  $\alpha$  with a production function  $F(K,L)$  that is just a little bit more substitutable than in the standard Cobb-Douglas model (say if  $\sigma=1,5$  instead of 1)
- Maybe it is natural to expect  $\sigma \uparrow$  over the course of history: more and more diversified uses for capital;  
**extreme case: pure robot-economy** ( $\sigma=\text{infinity}$ )
- Less extreme case: there are many possible uses for capital (machines can replace cashiers, drones can replace Amazon's delivery workers, etc.), so that the capital share  $\alpha \uparrow$  continuously; there's no natural corrective mechanism for this
- The rise of  $\beta$  and  $\alpha$  can be a good thing (we could all devote more time to culture, education, health..., rather than to our own subsistence), assuming one can answer the following question: **who owns the robots?**

# The future of wealth concentration

- In all European countries (UK, France, Sweden...), wealth concentration was extremely high in 18<sup>c</sup>-19<sup>c</sup> & until WW1:  
about 90% of aggregate wealth for top 10% wealth holders  
about 60% of aggregate wealth for top 1% wealth-holders  
**= the classic patrimonial (wealth-based) society:** a minority lives off its wealth, while the rest of the population works (Austen, Balzac)
- Today wealth concentration is still very high, but less extreme:  
about 60-70% for top 10%; about 20-30% for top 1%  
the bottom 50% still owns almost nothing (<5%)  
but the middle 40% now owns 20-30% of aggregate wealth  
**= the rise of a patrimonial middle class**
- How did it happen, and will it last? **Will the patrimonial middle class expend, or will it shrink?**

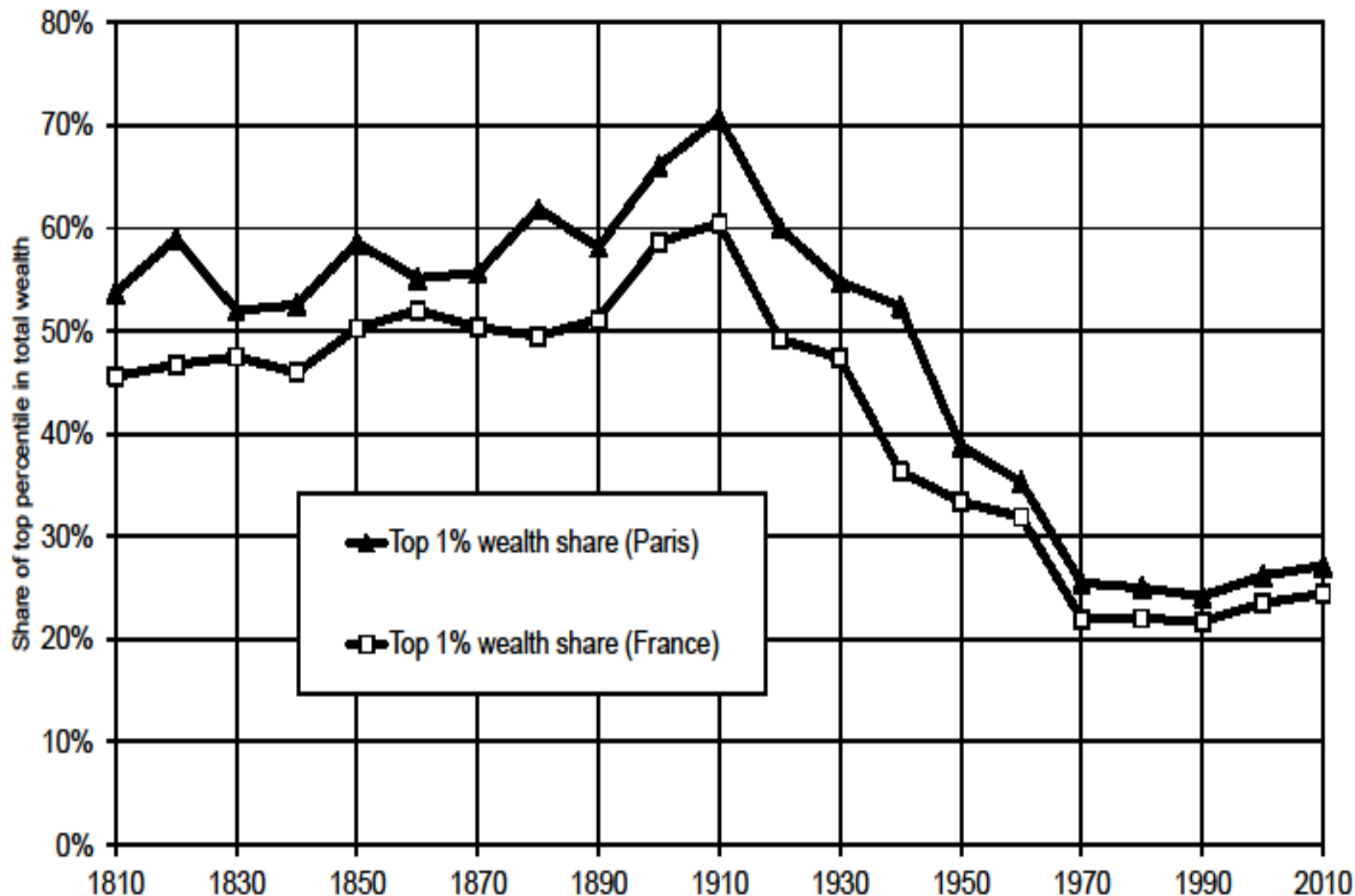
Figure 10.1. Wealth inequality in France, 1810-2010



The top decile (the top 10% highest wealth holders) owns 80-90% of total wealth in 1810-1910, and 60-65% today.

Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

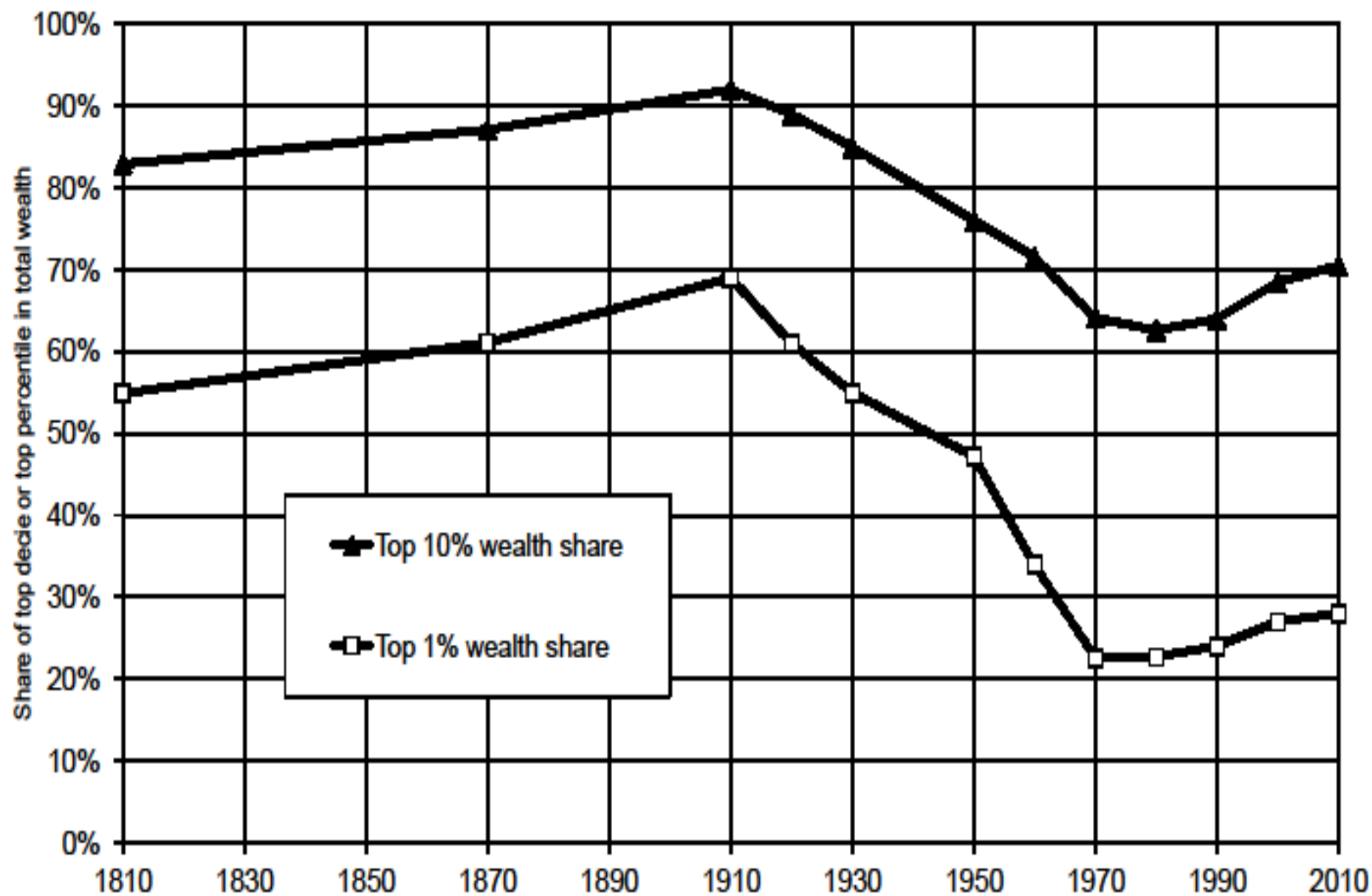
Figure 10.2. Wealth inequality : Paris vs. France, 1810-2010



The top percentile (the top 1% wealth holders) owns 70% of aggregate wealth in Paris at the eve of World War I.

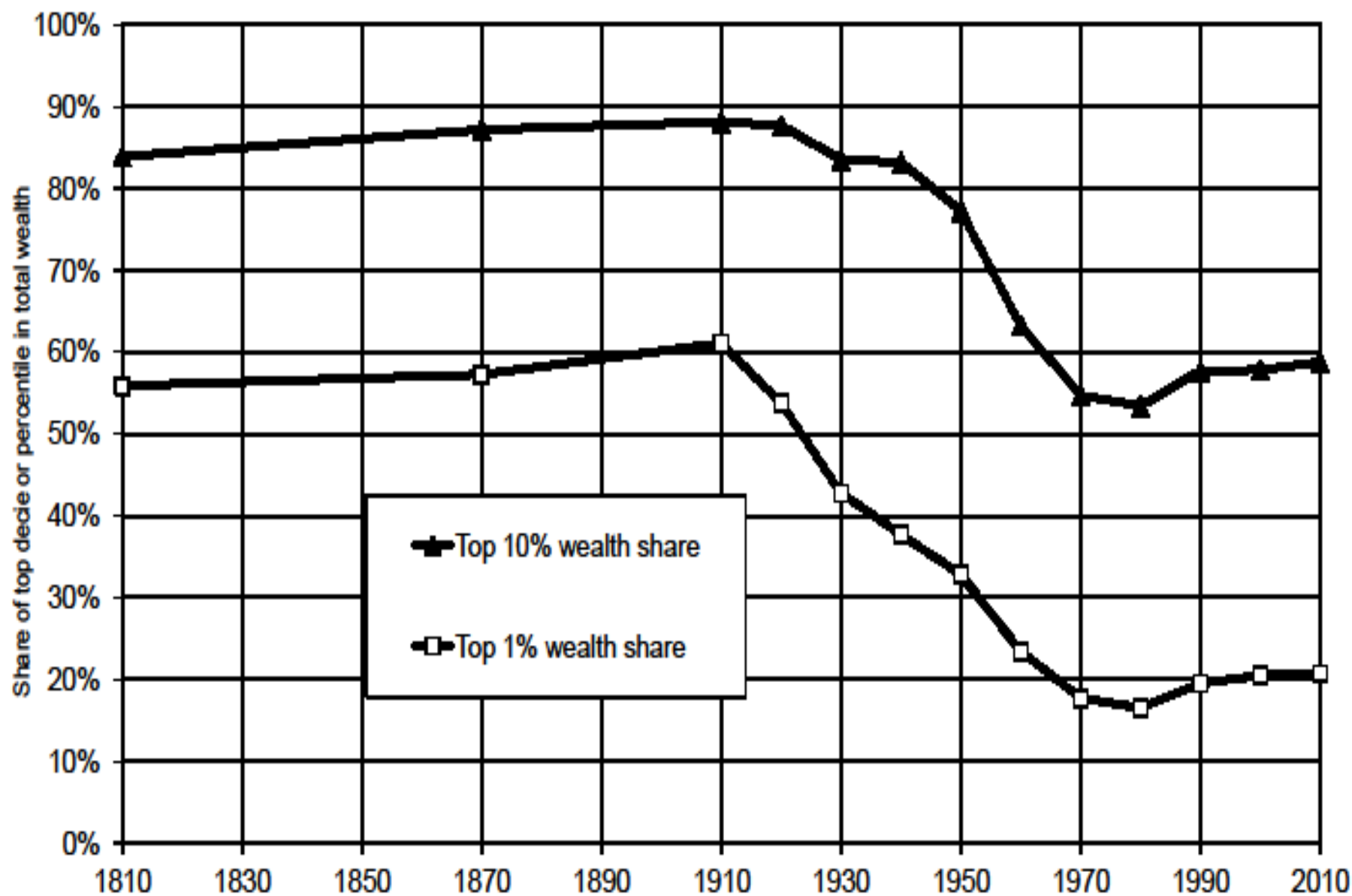
Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c)

Figure 10.3. Wealth inequality in the United Kingdom, 1810-2010



The top decile owns 80-90% of total wealth in 1810-1910, and 70% today.  
Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

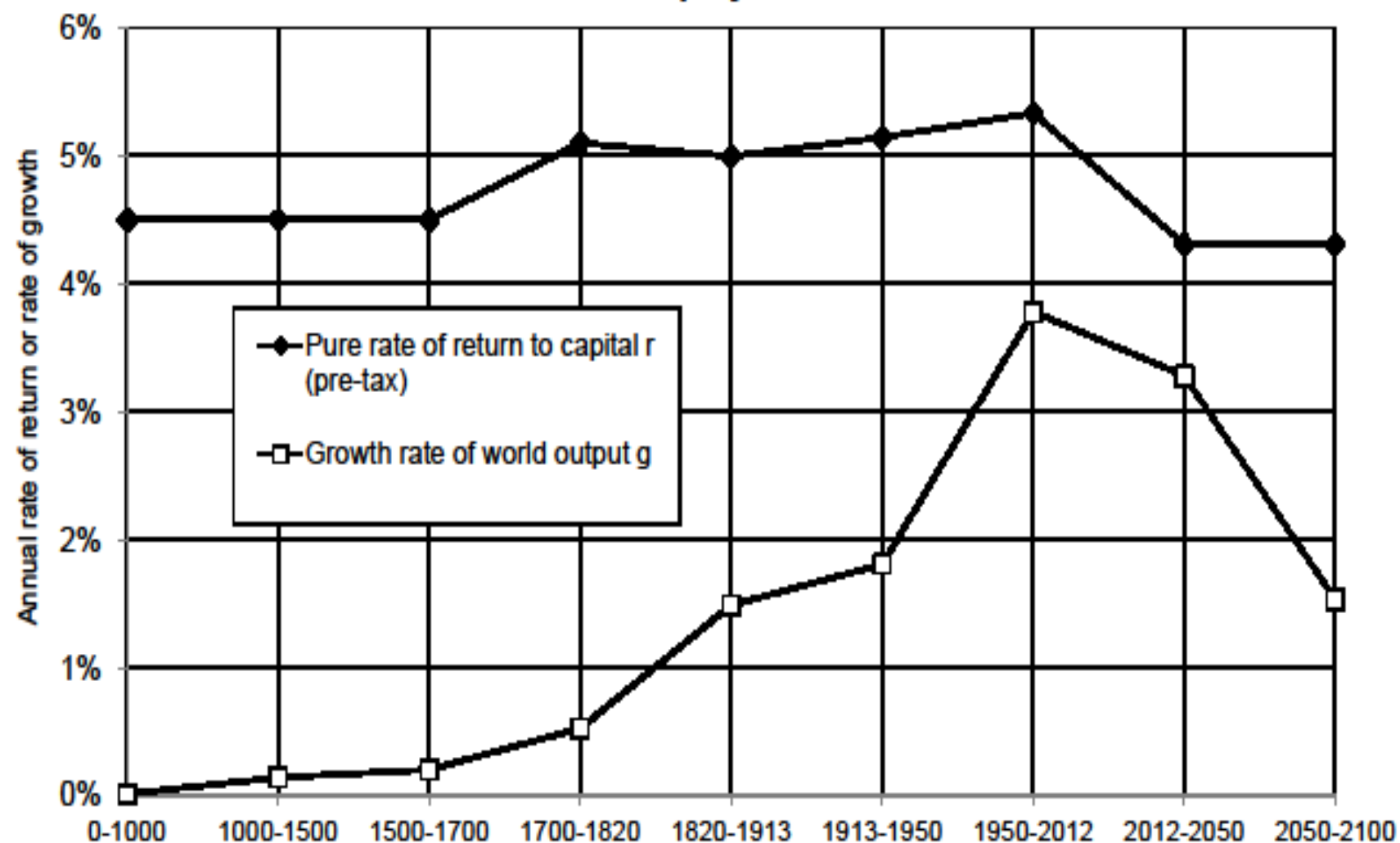
Figure 10.4. Wealth inequality in Sweden, 1810-2010



The top 10% holds 80-90% of total wealth in 1810-1910, and 55-60% today.  
Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

- Key finding: there was no decline in wealth concentration prior to World War shocks; was it just due to shocks?
- Q.: Apart from shocks, what forces determine the long-run level of wealth concentration?
- A.: In any dynamic, multiplicative wealth accumulation model with random individual shocks (tastes, demographic, returns, wages,..), the steady-state level of wealth concentration is an increasing function of  $r - g$   
(with  $r$  = net-of-tax rate of return and  $g$  = growth rate)
- With growth slowdown and rising tax competition to attract capital,  $r - g$  might well rise in the 21<sup>c</sup> → back to 19<sup>c</sup> levels
- Future values of  $r$  also depend on technology ( $\sigma > 1$ ?)
- Under plausible assumptions, wealth concentration might reach or surpass 19<sup>c</sup> record levels: see global wealth rankings

Figure 10.9. Rate of return vs. growth rate at the world level, from Antiquity until 2100

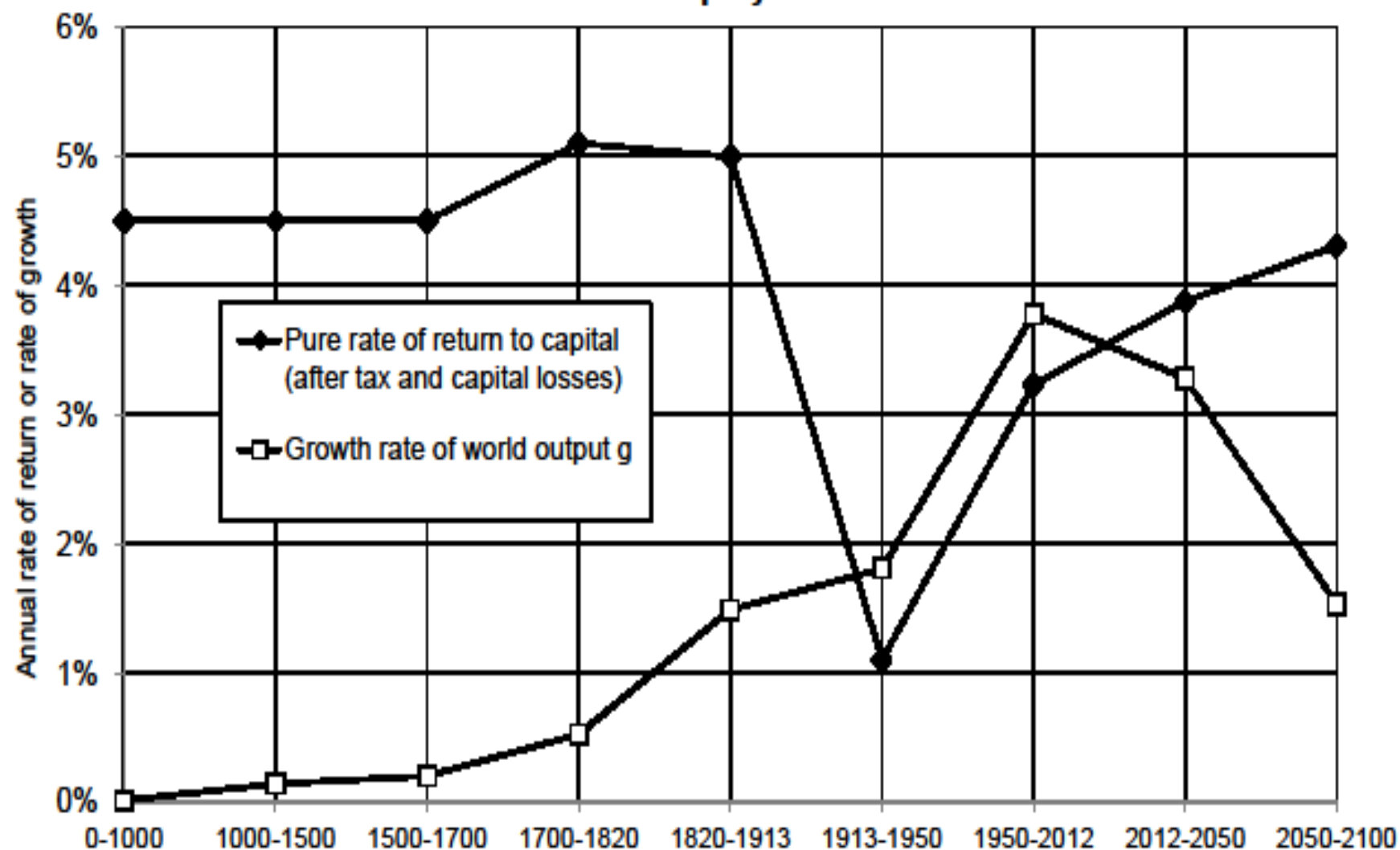


The rate of return to capital (pre-tax) has always been higher than the world growth rate, but the gap was reduced during the 20th century, and might widen again in the 21st century.

Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c)

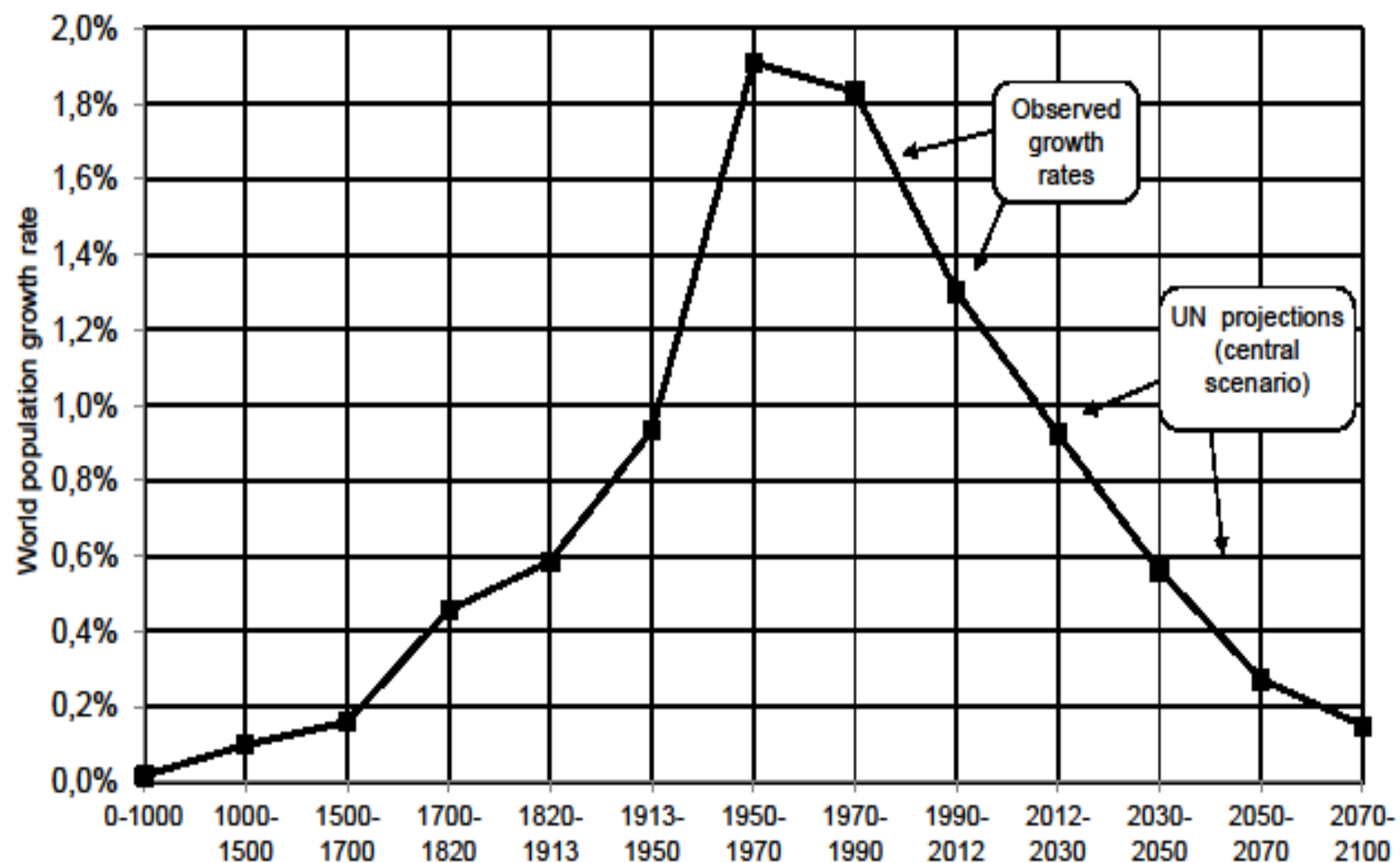


**Figure 10.10. After tax rate of return vs. growth rate at the world level, from Antiquity until 2100**



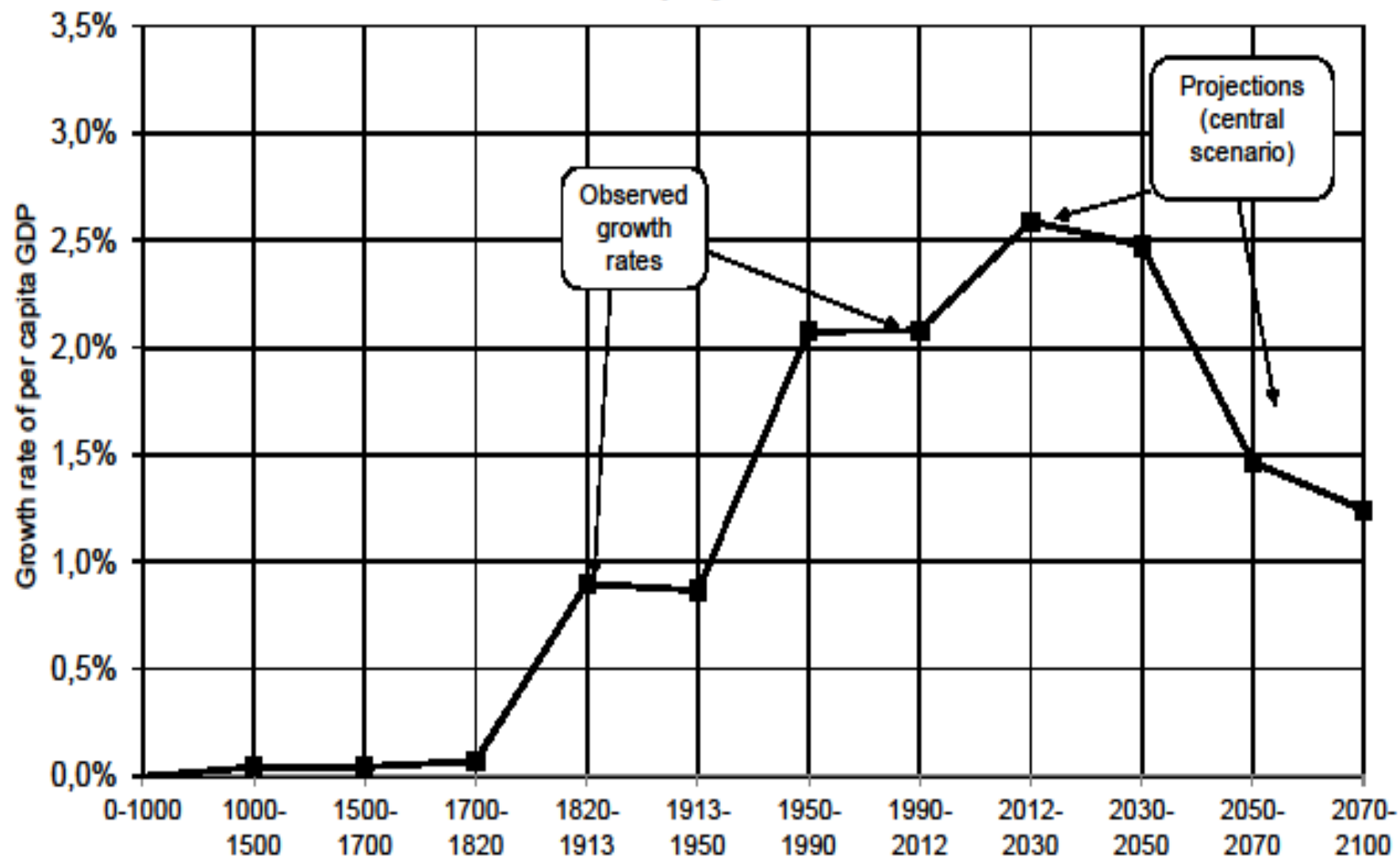
The rate of return to capital (after tax and capital losses) fell below the growth rate during the 20th century, and may again surpass it in the 21st century. Sources and series : see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c)

**Figure 2.2. The growth rate of world population from Antiquity to 2100**



The growth rate of world population was above 1% per year from 1950 to 2012 and should return toward 0% by the end of the 21st century. Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

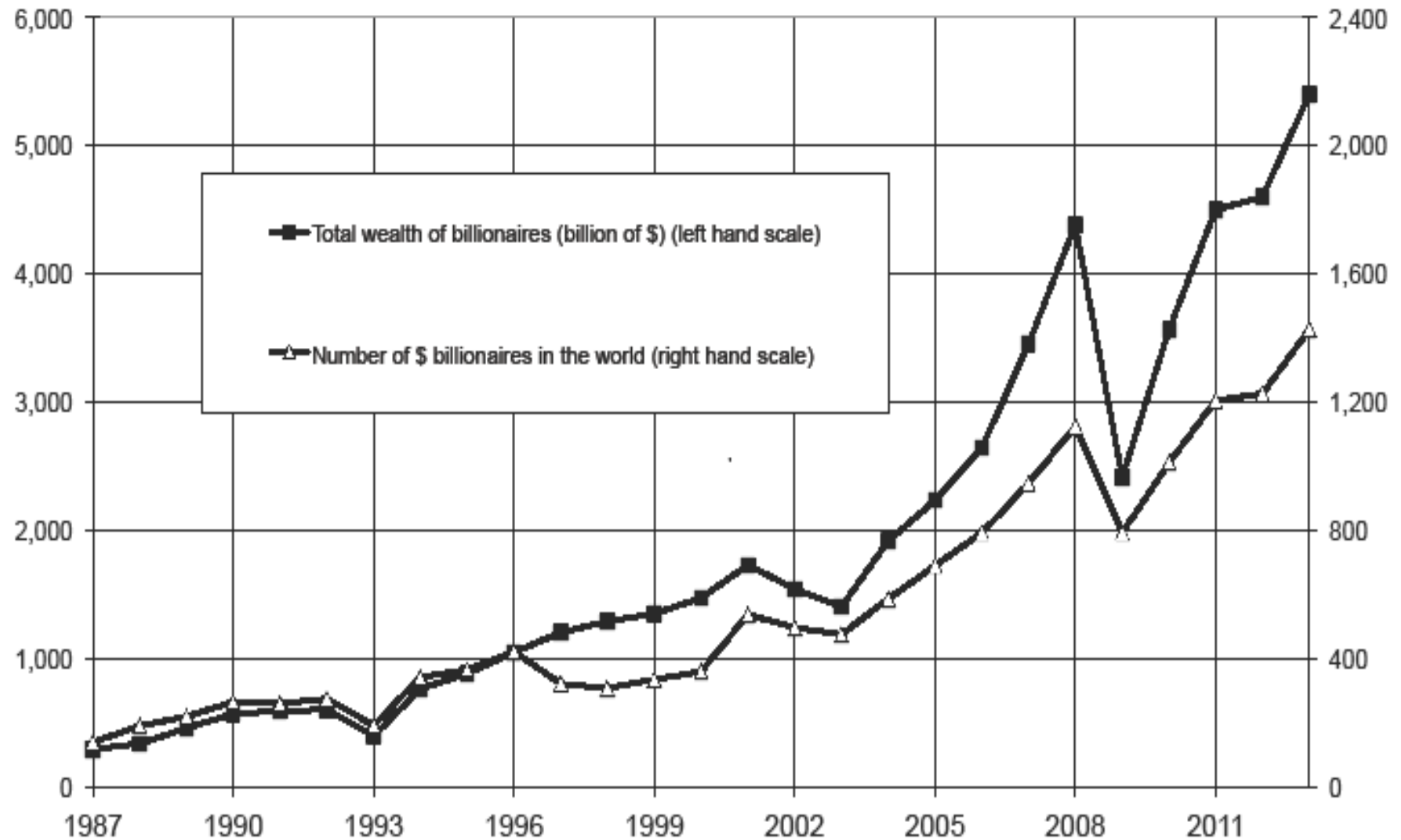
**Figure 2.4. The growth rate of world per capita output since Antiquity until 2100**



The growth rate of per capita output surpassed 2% from 1950 to 2012. If the convergence process goes on, it will surpass 2,5% from 2012 to 2050, and then will drop below 1,5%.

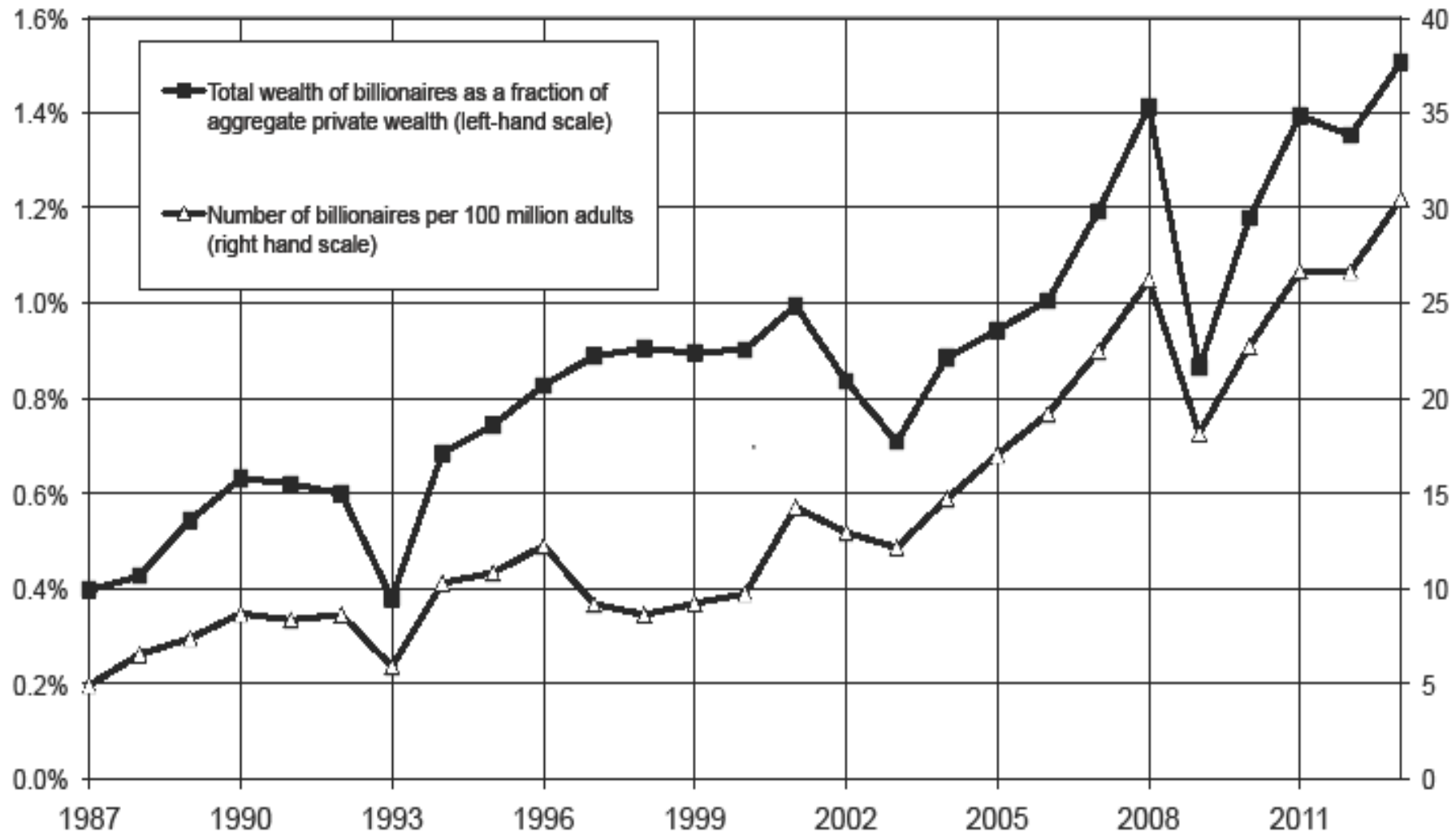
Sources and series : see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

**Figure 12.1. The world billionaires according to Forbes, 1987-2013**



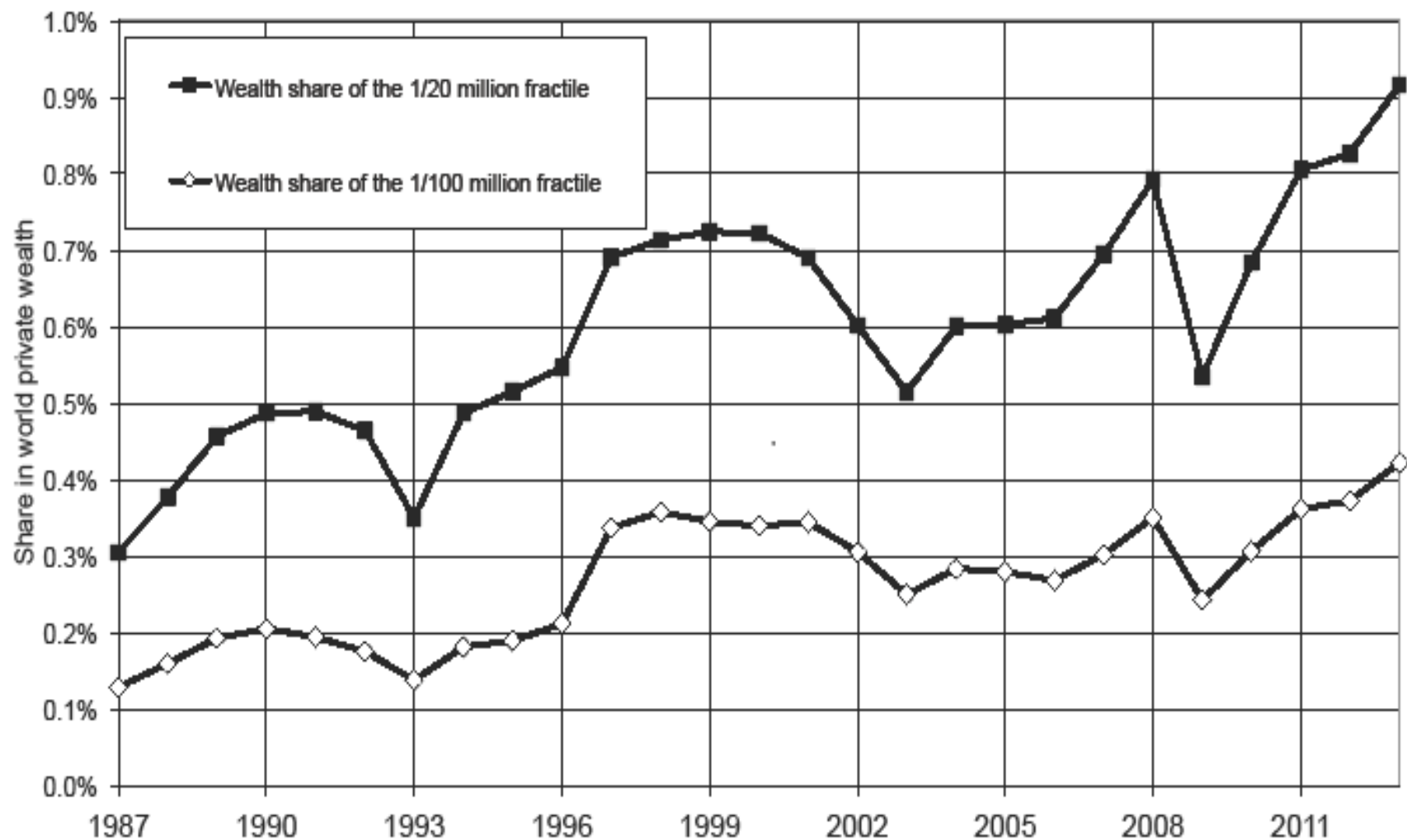
Between 1987 and 2013, the number of \$ billionaires rose according to Forbes from 140 to 1400, and their total wealth rose from 300 to 5 400 billion dollars. Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

**Figure 12.2. Billionaires as a fraction of global population and wealth 1987-2013**



Between 1987 and 2013, the number of billionaires per 100 million adults rose from 5 to 30, and their share in aggregate private wealth rose from 0.4% to 1.5%. Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

Figure 12.3. The share of top wealth fractiles in world wealth, 1987-2013



Between 1987 and 2013, the share of the top 1/20 million fractile rose from 0.3% to 0.9% of world wealth, and the share of the top 1/100 million fractile rose from 0.1% to 0.4%. Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

**Table 12.1. The growth rate of top global wealth, 1987-2013**

<i>Average real growth rate per year (after deduction of inflation)</i>	1987-2013
The top 1/(100 million) highest wealth holders <small>(about 30 adults out of 3 billions in 1980s, and 45 adults out of 4,5 billions in 2010s)</small>	6,8%
The top 1/(20 million) highest wealth holders <small>(about 150 adults out of 3 billions in 1980s, and 225 adults out of 4,5 billions in 2010s)</small>	6,4%
Average world wealth per adult	2,1%
Average world income per adult	1,4%
World adult population	1,9%
World GDP	3,3%

Between 1987 and 2013, the highest global wealth fractiles have grown at 6%-7% per year, vs. 2,1% for average world wealth and 1,4% for average world income. All growth rates are net of inflation (2,3% per year between 1987 and 2013). Sources: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

**Table 12.2. The return on the capital endowments of U.S. universities, 1980-2010**

<i>Average real annual rate of return (after deduction of inflation and all administrative costs and financial fees)</i>	Période 1980-2010
All universities (850)	8.2%
incl.: Harvard-Yale-Princeton	10.2%
incl.: Endowments higher than 1 billion \$ (60)	8.8%
incl. Endowments between 500 millions and 1 billion \$ (66)	7.8%
incl. Endowments between 100 and 500 million \$ (226)	7.1%
don't: Endowments less than 100 million \$ (498)	6.2%

Between 1980 and 2010, U.S. universities earned an average real return of 8.2% on their capital endowments, and all the more so for higher endowments. All returns reported here are net of inflation (2.4% per year between 1980 and 2010) and of all administrative costs and financial fees.

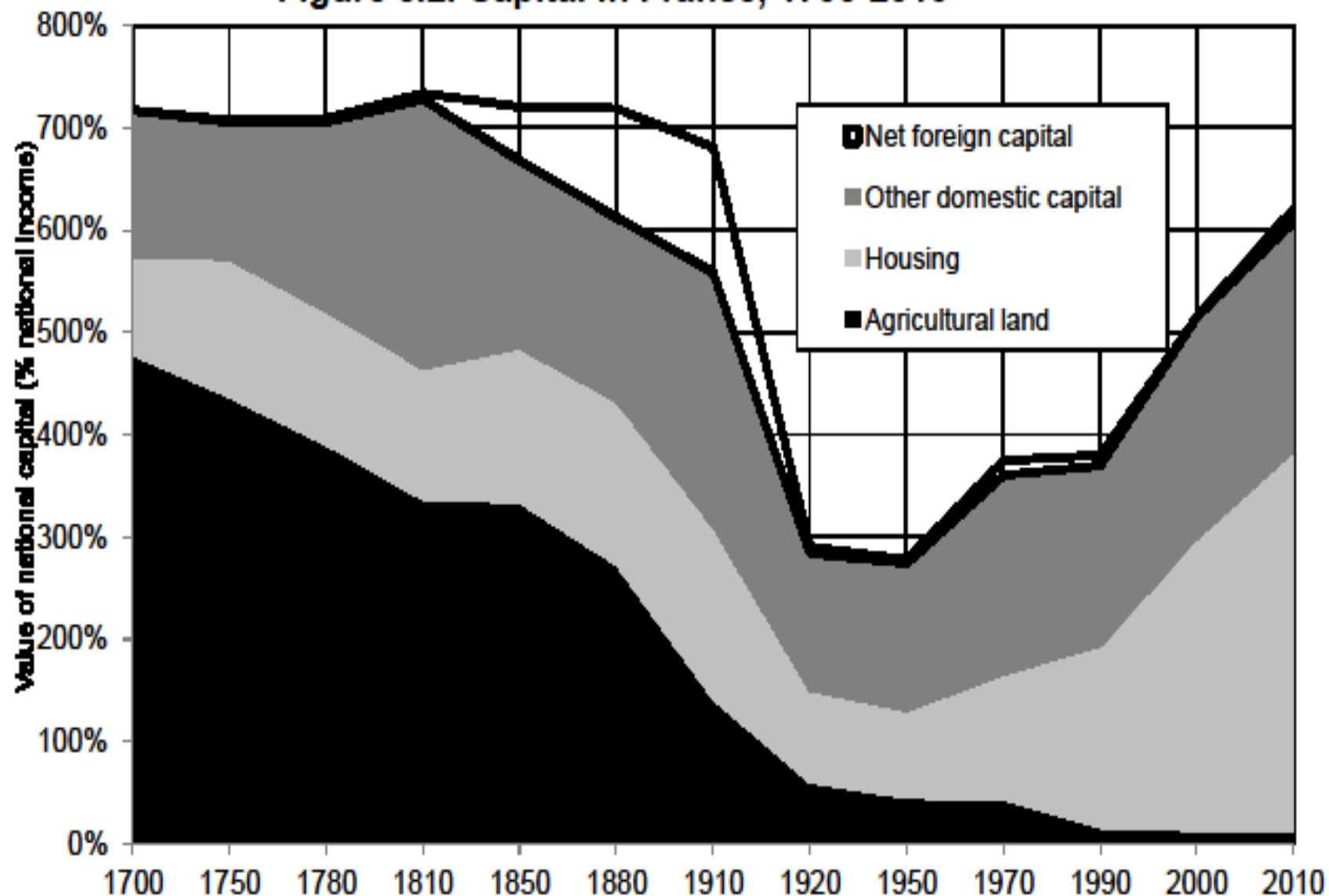
Sources: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).



# Capital & inequality in America

- Inequality in America = a different structure as in Europe: more egalitarian in some ways, more inegalitarian in some other dimensions
- The New World in the 19<sup>th</sup> century: the land of opportunity (capital accumulated in the past mattered much less than in Europe; perpetual demographic growth as a way to reduce the level of inherited wealth and wealth concentration)... and also the land of slavery
- Northern US were in many ways more egalitarian than Old Europe; but Southern US were more inegalitarian
- We still have the same ambiguous relationship of America with inequality today: in some ways more merit-based; in other ways more violent (« meritocratic extremism »)

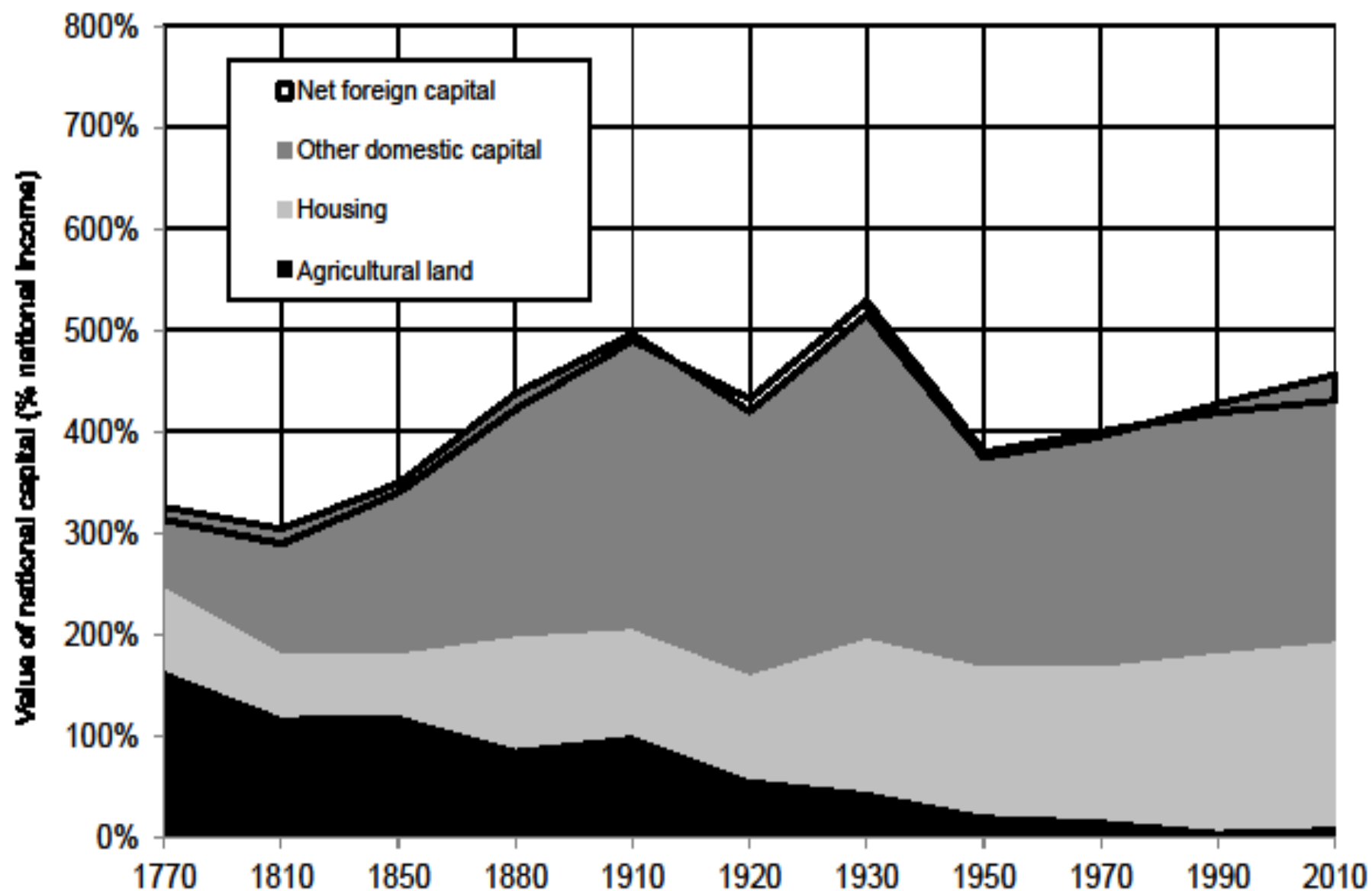
Figure 3.2. Capital in France, 1700-2010



National capital is worth almost 7 years of national income in France in 1910 (including 1 invested abroad).

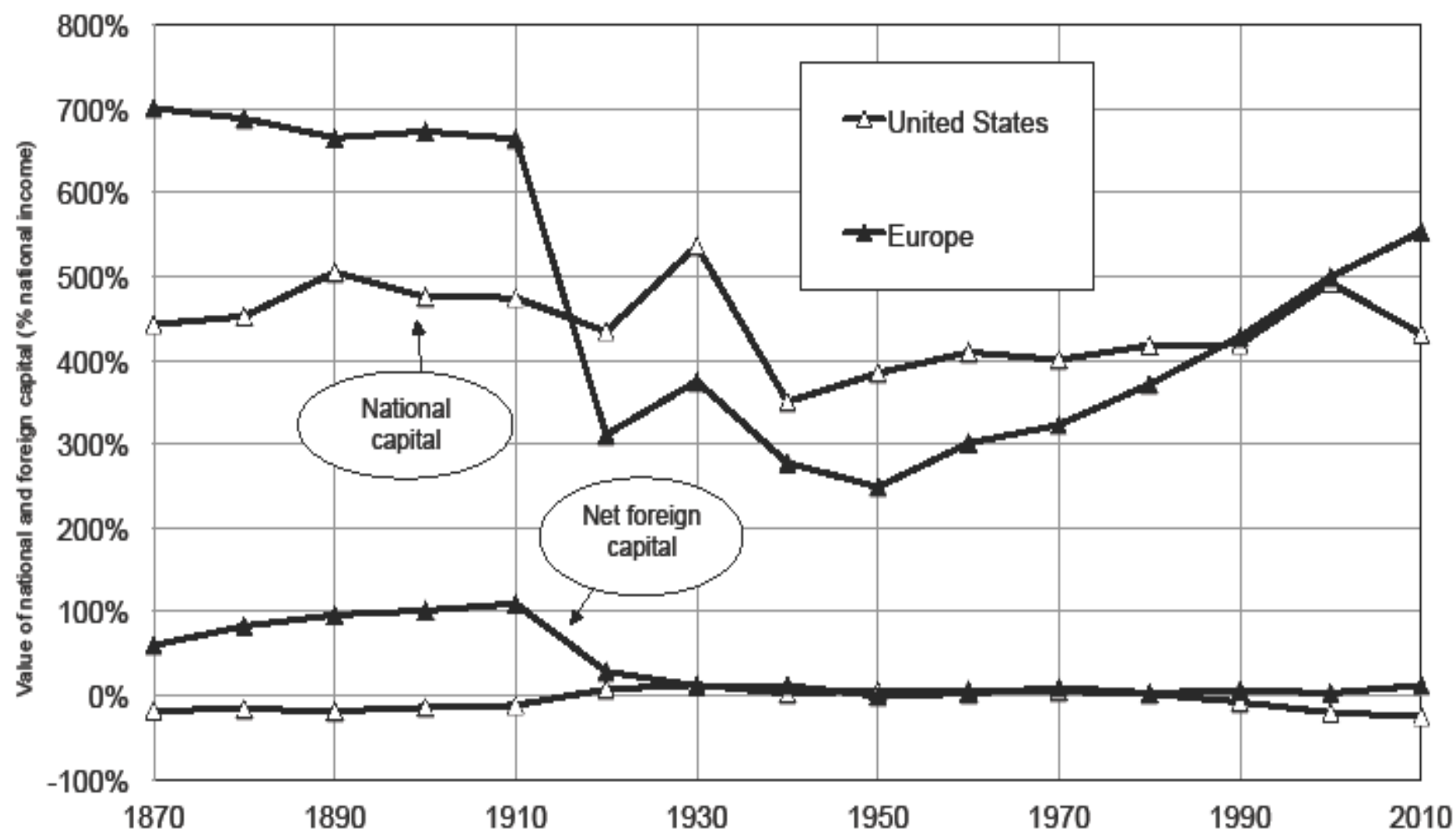
Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

**Figure 4.6. Capital in the United States, 1770-2010**



National capital is worth 3 years of national income in the United States in 1770 (incl. 1,5 years in agricultural land). Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

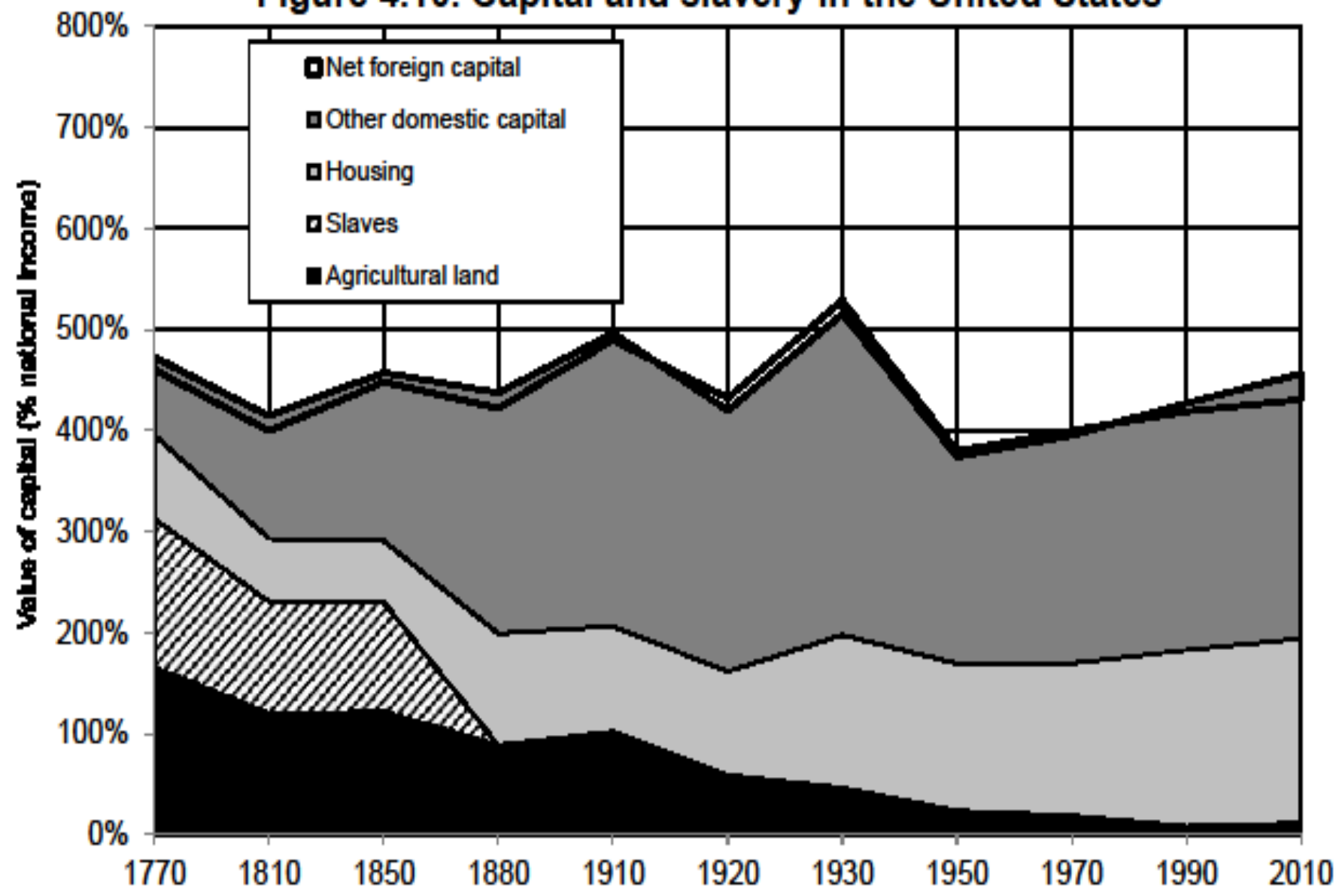
**Figure 5.2. National capital in Europe and America, 1870-2010**



National capital (public and private) is worth 6.5 years of national income in Europe in 1910, vs. 4.5 years in America.

Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

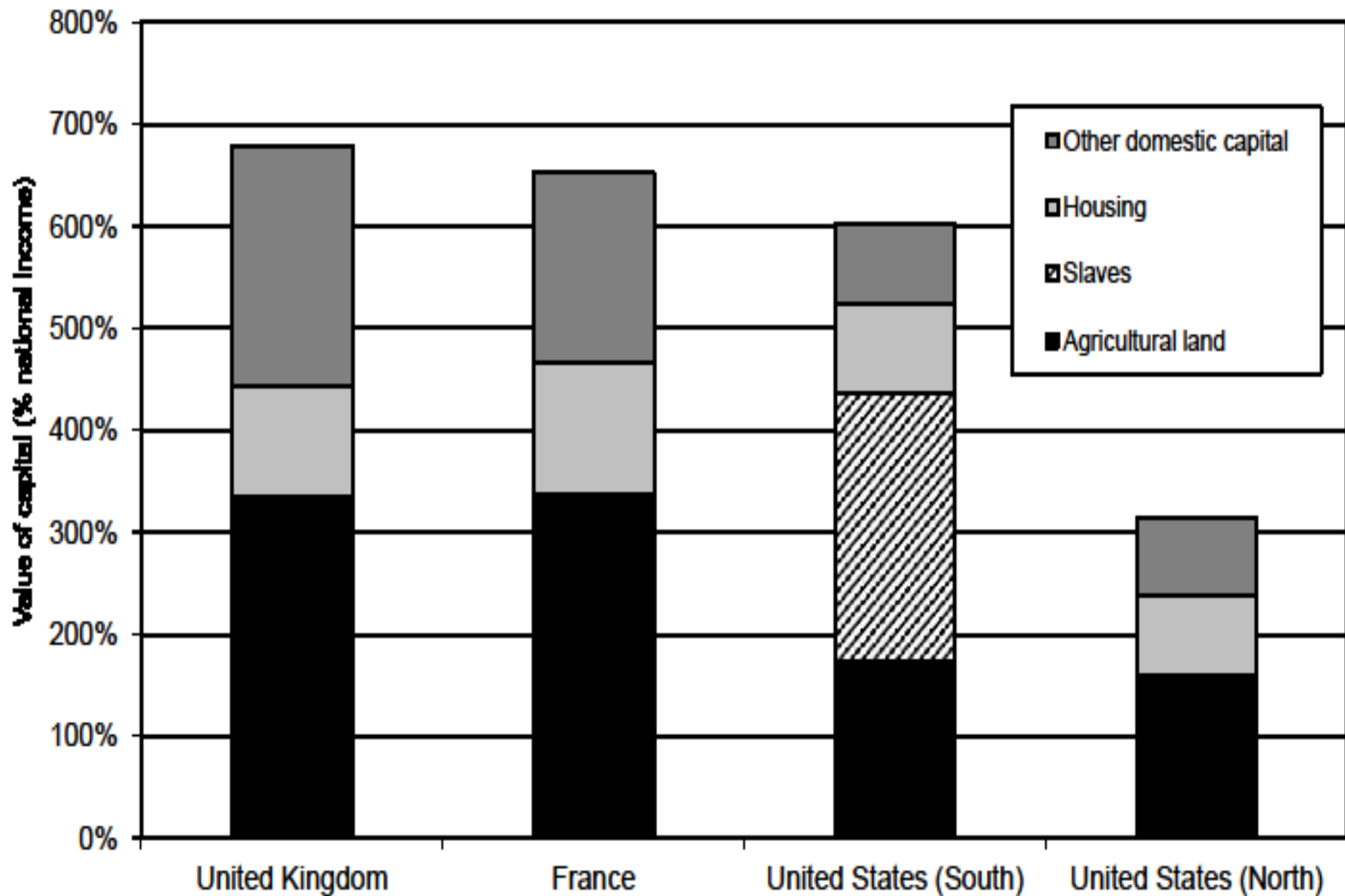
**Figure 4.10. Capital and slavery in the United States**



The market value of slaves was about 1,5 years of U.S. national income around 1770 (as much as land).

Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

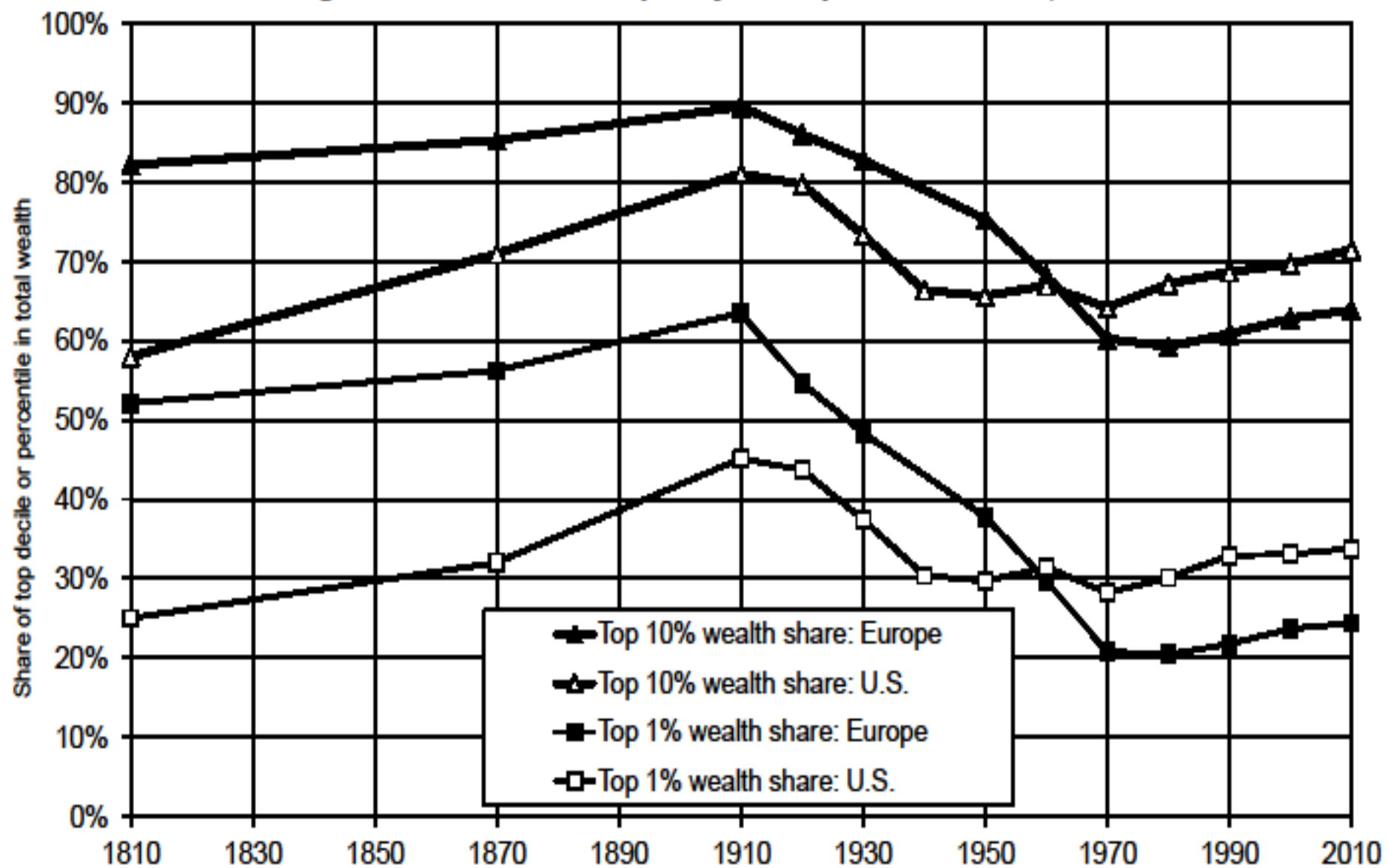
Figure 4.11. Capital around 1770-1810: Old an New World



The combined value of agricultural land and slaves in Southern United States surpassed 4 years of national income around 1770-1810. Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

- The US distribution of income has become more unequal than in Europe over the course of the 20<sup>th</sup> century; it is now as unequal as pre-WW1 Europe
- But the structure of inequality is different: US 2013 has less wealth inequality than Europe 1913, but higher inequality of labor income

Figure 10.6. Wealth inequality: Europe and the U.S., 1810-2010

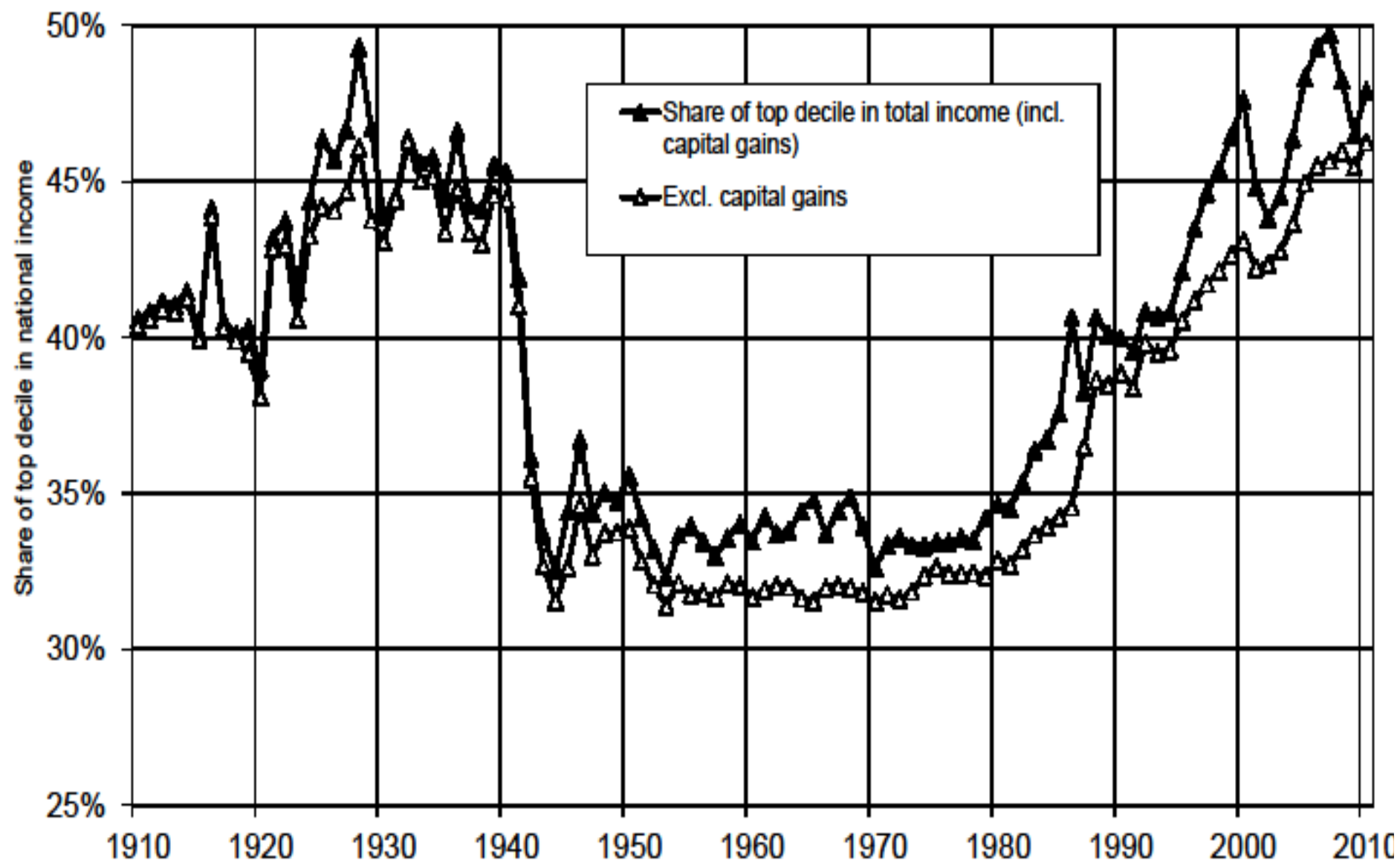


Until the mid 20th century, wealth inequality was higher in Europe than in the United States.

Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

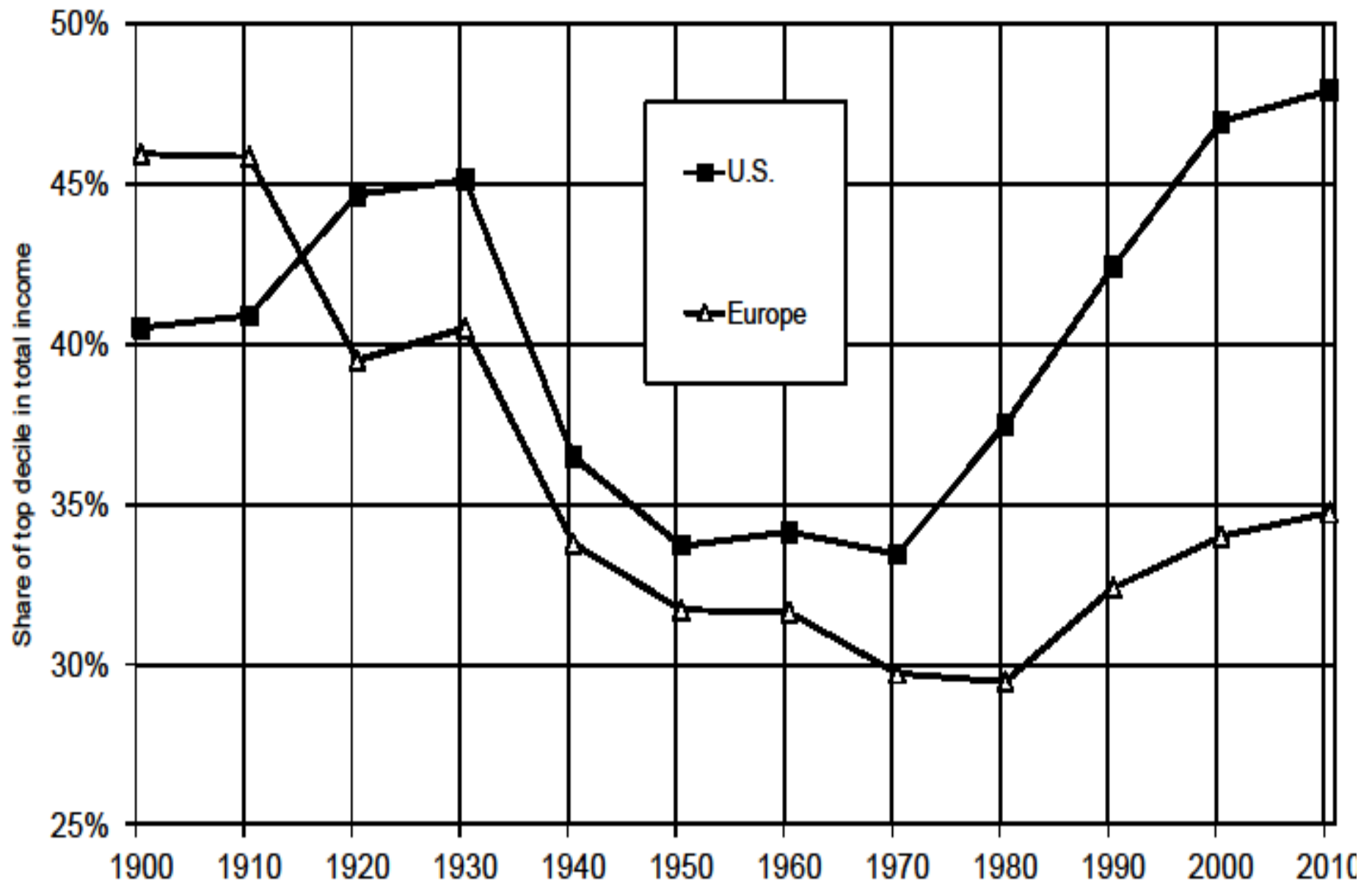


Figure 8.5. Income inequality in the United States, 1910-2010



The top decile income share rose from less than 35% of total income in the 1970s to almost 50% in the 2000s-2010s. Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

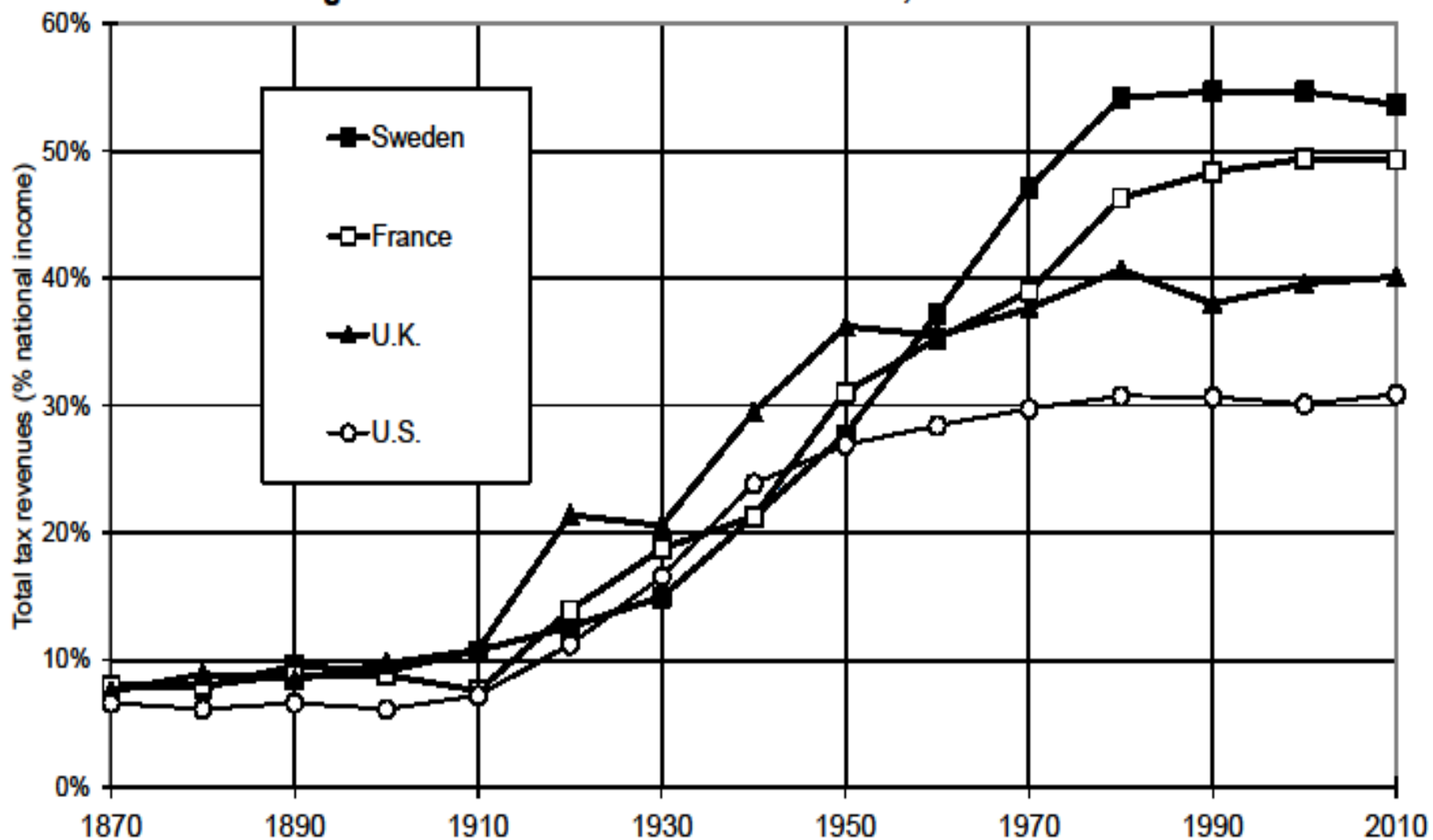
Figure 9.8. Income inequality: Europe vs. the United States, 1900-2010



The top decile income share was higher in Europe than in the U.S. in 1900-1910; it is a lot higher in the U.S. in 2000-2010. Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

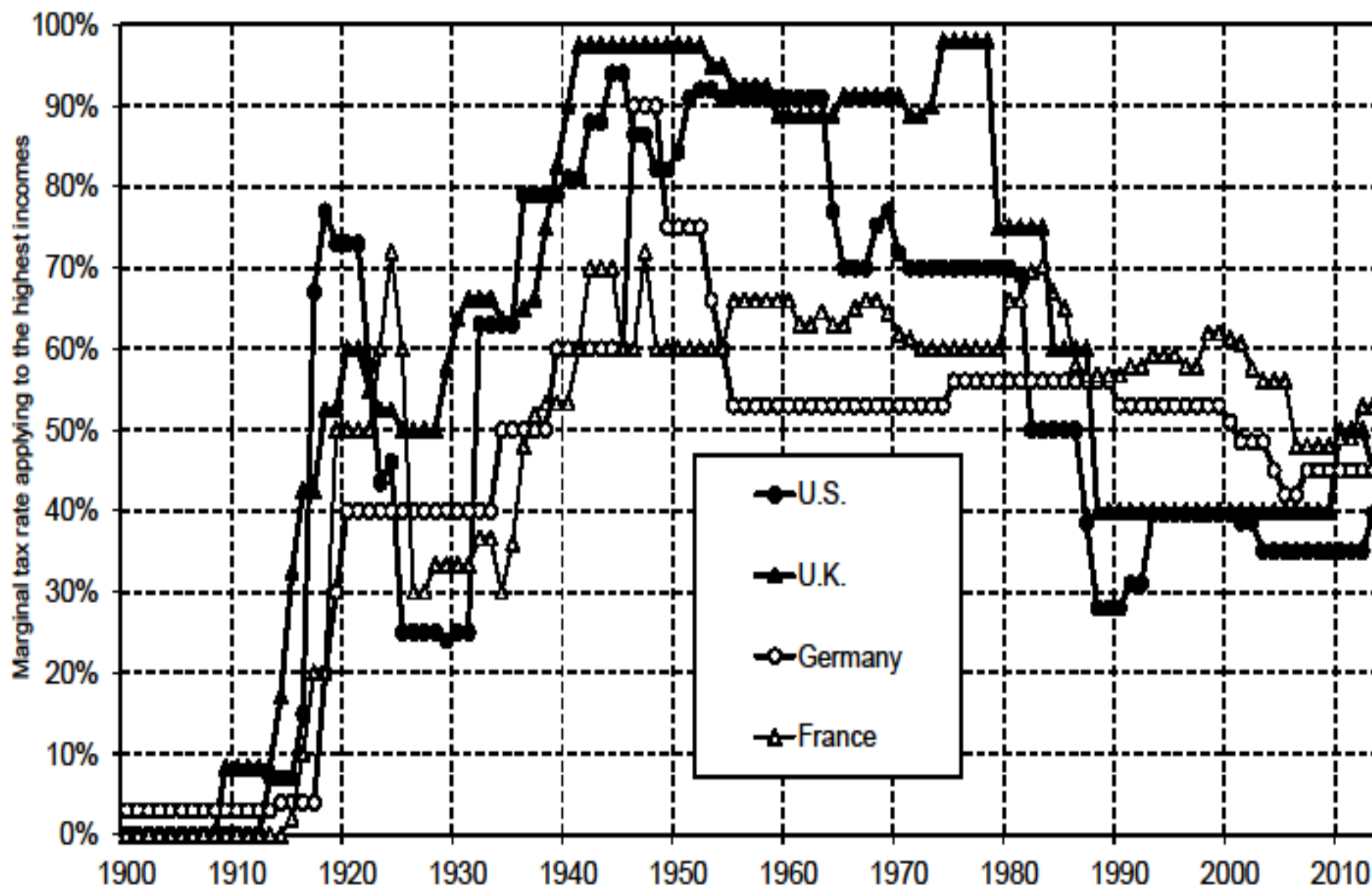
- Higher inequality of labor income in the US could reflect higher inequality in education investment; but it also reflects a huge rise of top executive compensation that it very hard to explain with education and productivity reasoning alone
- In the US, this is sometime described as more merit-based: the rise of top labor incomes makes it possible to become rich with no inheritance (*≈Napoleonic *prefets**)
- Pb = this can be the worst of all worlds for those who are neither top income earners nor top successors: they are poor, and they are depicted as dump & undeserving (at least, nobody was trying to depict Ancien Regime inequality as fair)
- It is unclear whether rise of top incomes has a lot to do with merit or productivity: sharp decline in top tax rates & rise of CEO bargaining power are more convincing explanations; chaotic US history of social norms regarding inequality

Figure 13.1. Tax revenues in rich countries, 1870-2010



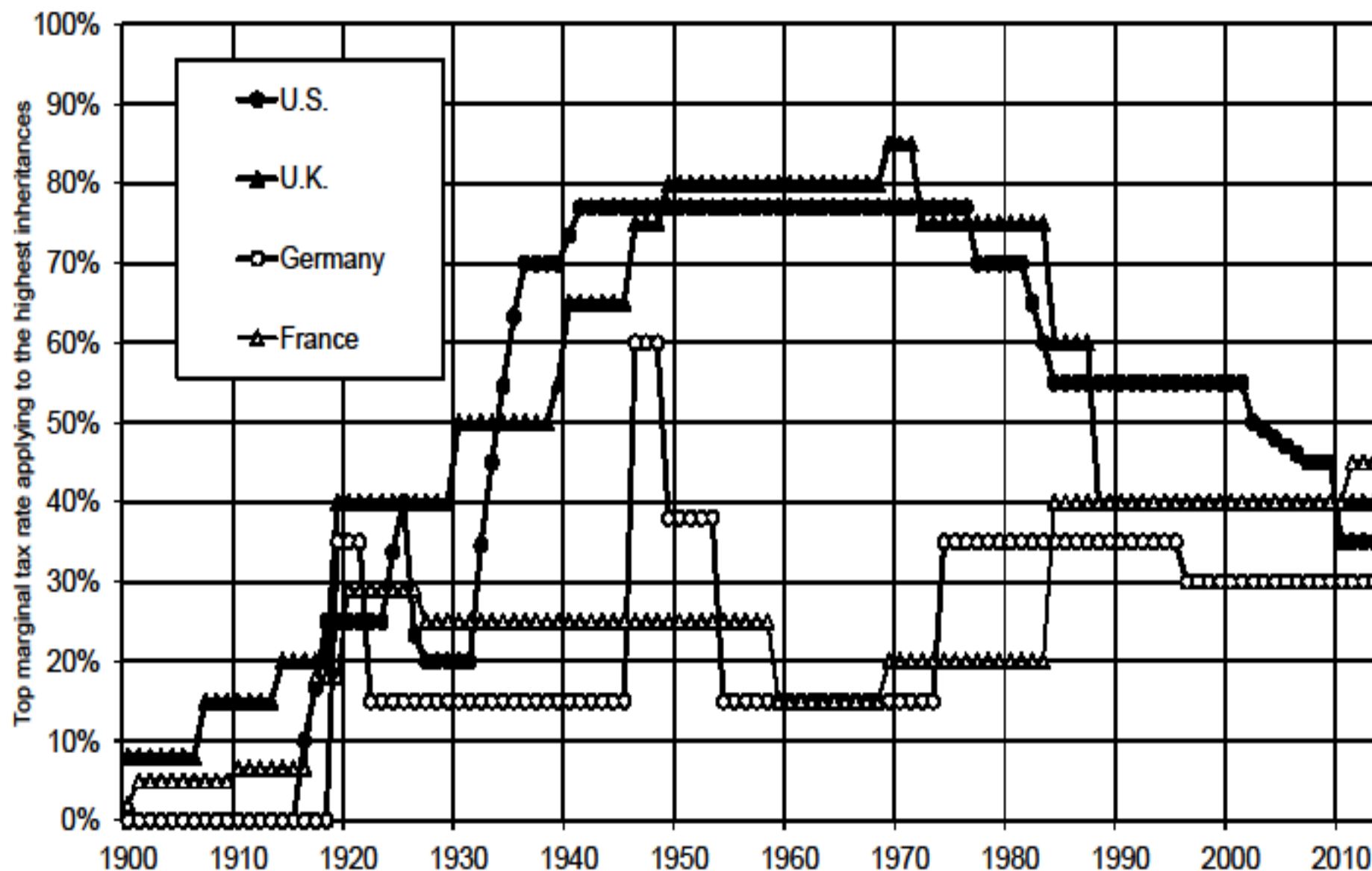
Total tax revenues were less than 10% of national income in rich countries until 1900-1910; they represent between 30% and 55% of national income in 2000-2010. Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

Figure 14.1. Top income tax rates, 1900-2013



The top marginal tax rate of the income tax (applying to the highest incomes) in the U.S. dropped from 70% in 1980 to 28% in 1988. Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

Figure 14.2. Top inheritance tax rates, 1900-2013



The top marginal tax rate of the inheritance tax (applying to the highest inheritances) in the U.S. dropped from 70% in 1980 to 35% in 2013. Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).