

Macroeconomics and Inequality

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Why should macroeconomists care about inequality?

- **1. Inequality and macro volatility.** Rising income inequality can contribute to financial instability and crisis. But rising wealth-income ratios are even more important.

(see Piketty-Zucman, « Capital is back: wealth-income ratios in rich countries 1700-2010 », QJE 2014)

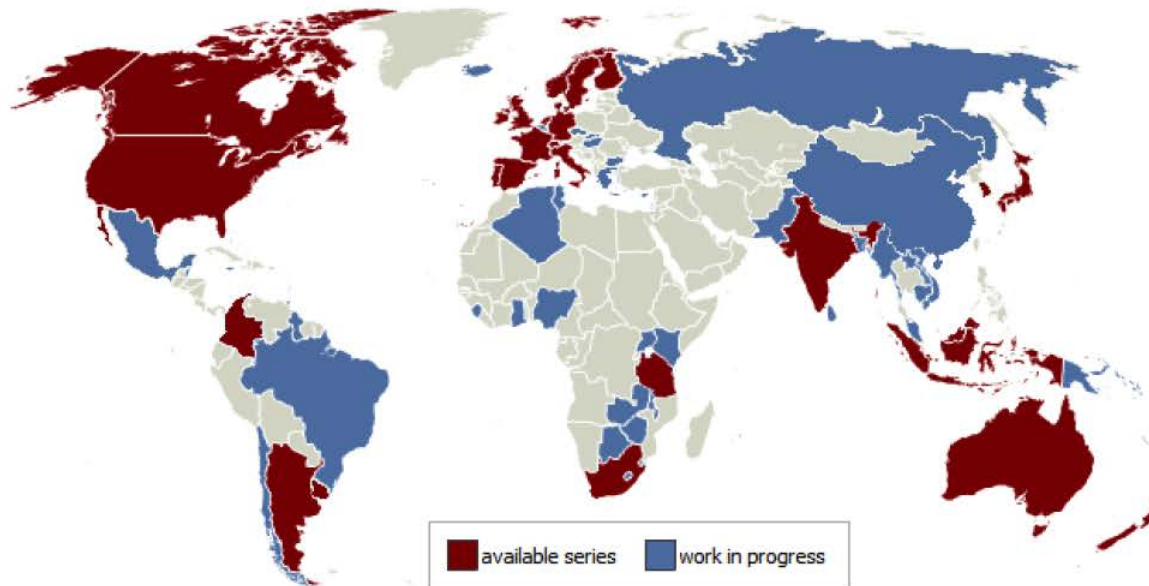
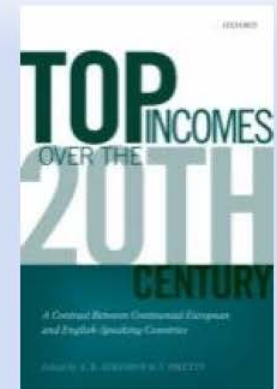
- **2. Inequality and wealth.** Core macro issues about capital accumulation or public debt cannot be properly understood in representative agent models.

(see Garbinti-Goupille-Piketty, « Accounting for wealth inequality dynamics: France 1800-2014 », PSE 2016, in progress)

- **3. Inequality and welfare.** GDP levels and growth rates can differ enormously for bottom 50% vs top 10%.

(see Piketty-Saez-Zucman, « Distributional National Accounts (DINA): U.S. 1913-2014 », PSE and Berkeley 2016, in progress)

THE WORLD WEALTH AND INCOME DATABASE



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- Acknowledgments



PARIS SCHOOL OF ECONOMICS
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CENTER FOR EQUITABLE GROWTH
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KEY INDICATORS

INCOME INEQUALITY

- top 0.1%
- top 1%
- top 10%
- bottom 50%

WEALTH INEQUALITY

- top 0.1%
- top 1%
- top 10%
- bottom 50%

INCOME AVERAGE

- Per adult pretax income
- Fiscal income

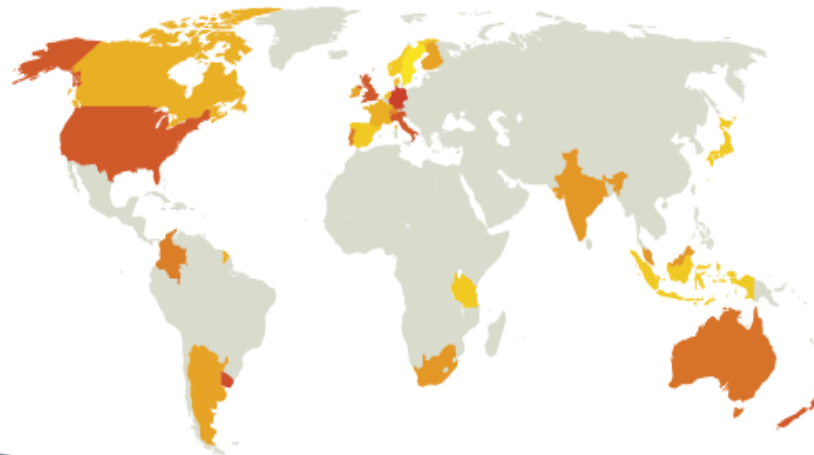
WEALTH AVERAGE

- Wealth-Income ratio
- Per adult personal wealth
- GDP

ALL INDICATORS

SEARCH

ADD A GEO ZONE



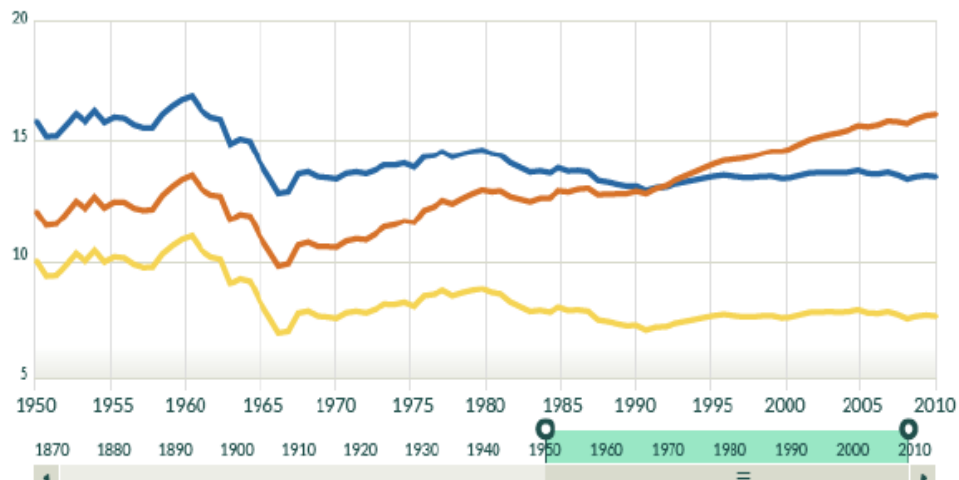
2013

Navigation icons: globe, refresh, zoom in (+), zoom out (-), grid, help (?).



Evolution of per adult personal wealth

France United States United-Kingdom



absolute base 100
yearly decennial

Navigation icons: refresh, grid, help (?).

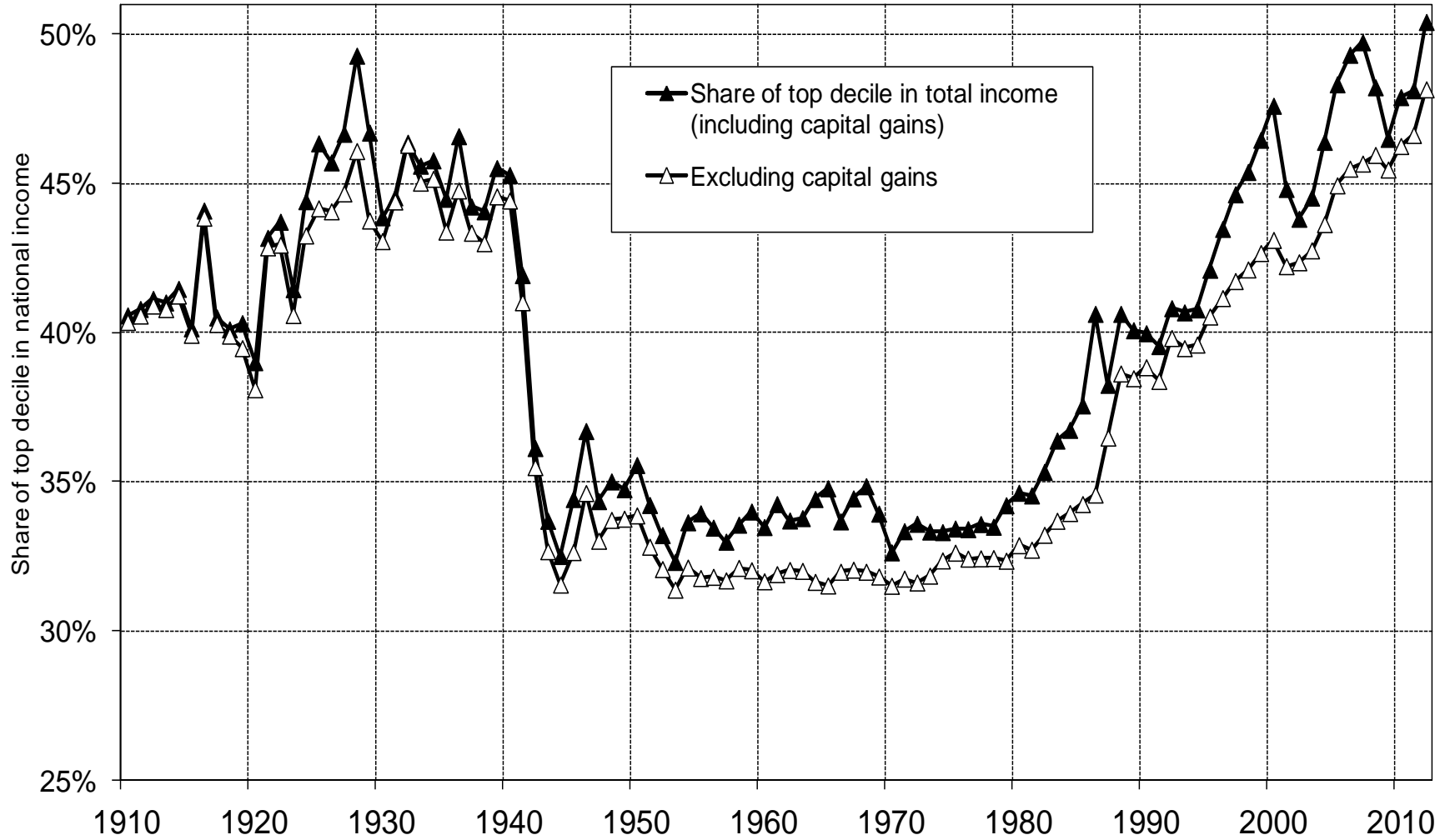
1. Inequality and macro volatility.

- Rising income inequality can contribute to financial instability and crisis, e.g. 2008 financial crisis.
- But rising wealth-income ratios probably have an even bigger impact on financial instability. Rise of net wealth-income ratios, and even bigger rise in gross financial asset-income ratios.

(see Piketty-Zucman, « Capital is back: wealth-income ratios in rich countries 1700-2010 », QJE 2014)

- Post-2008 central banks balance sheet size should be compared to national balance sheets, not to GDP.

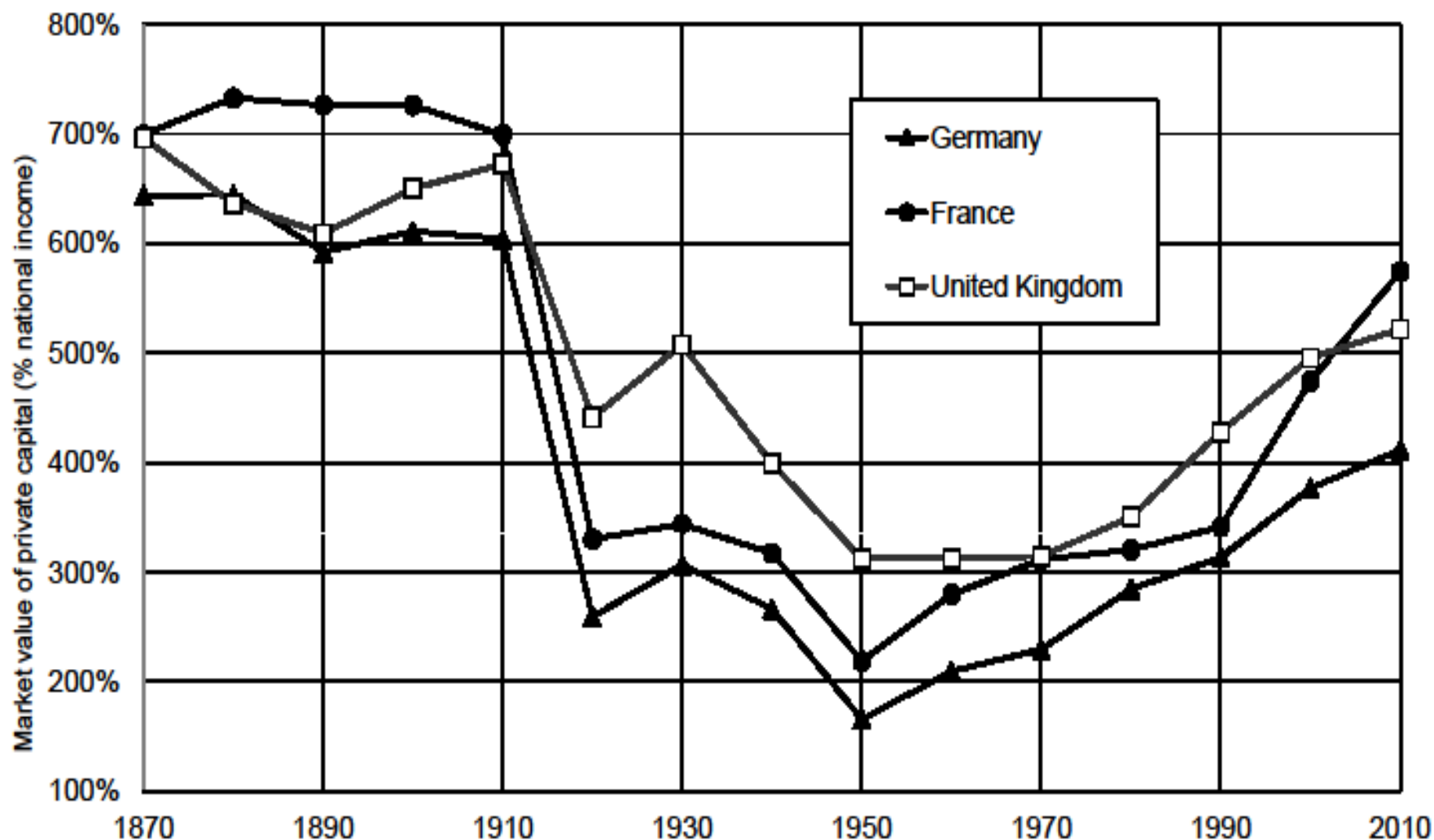
Figure I.1. Income inequality in the United States, 1910-2012



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.

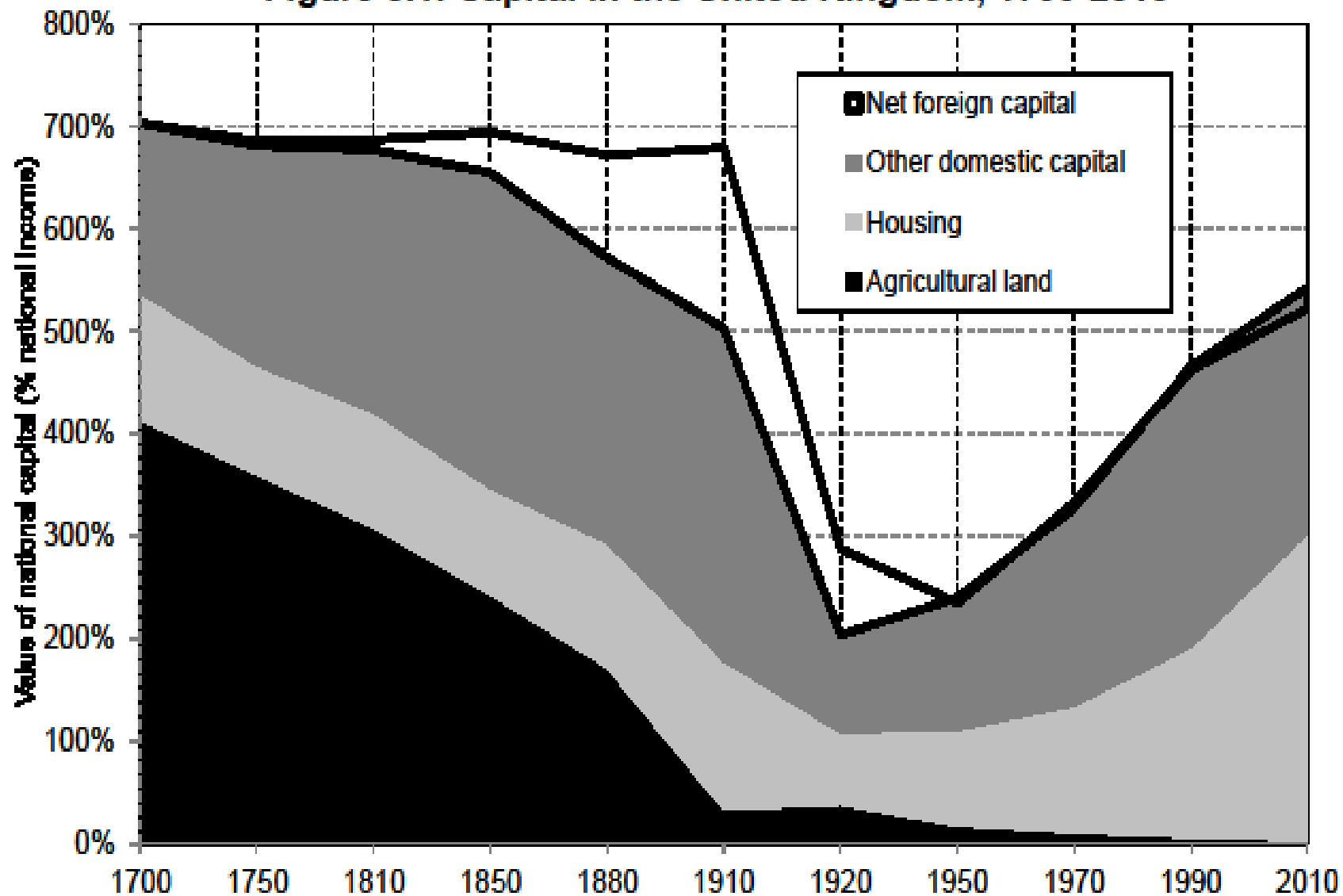
Sources and series: see

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



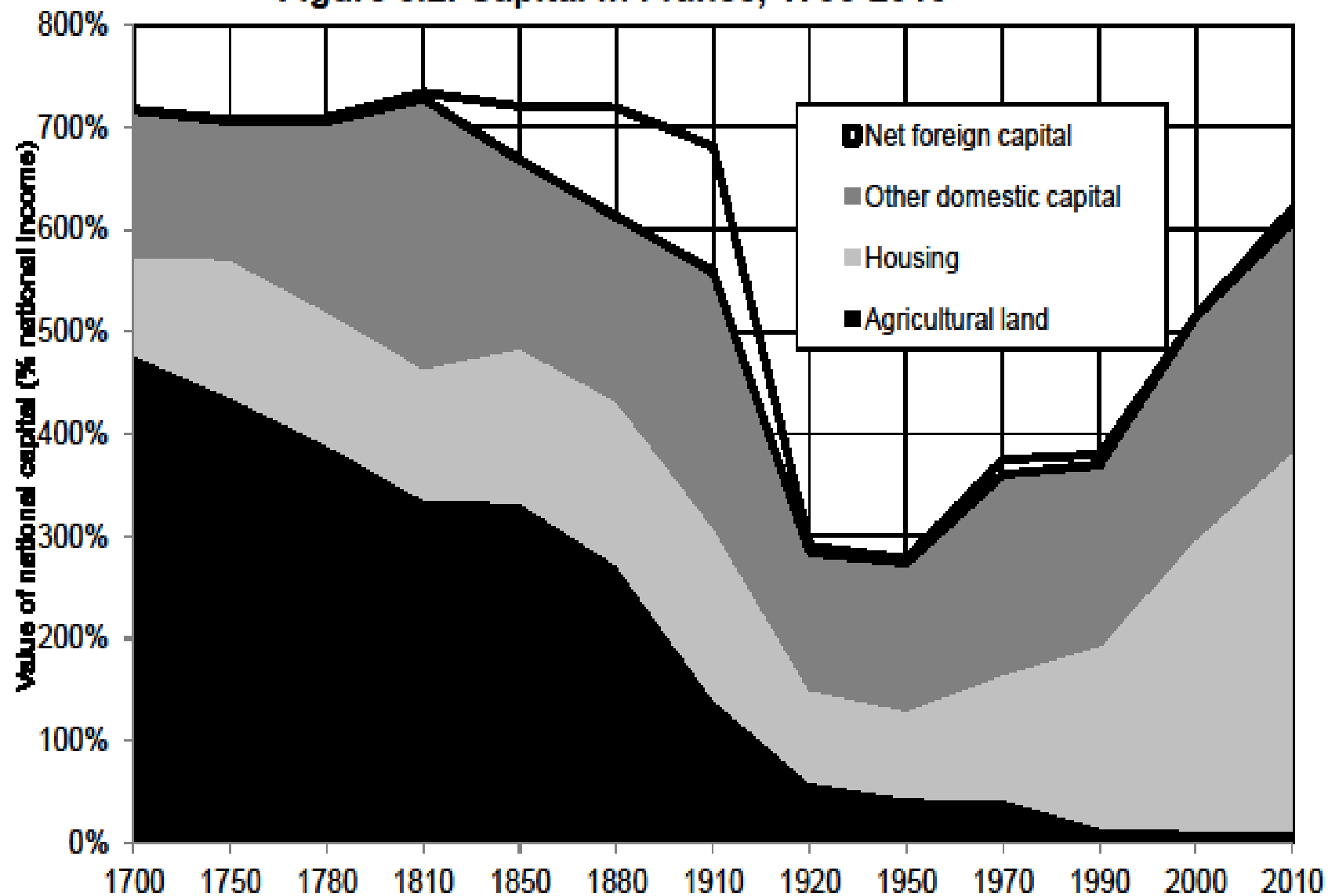
Aggregate private wealth was worth about 6-7 years of national income in Europe in 1910, between 2 and 3 years in 1950, and between 4 and 6 years in 2010. Sources and series: see piketty.pse.ens.fr/capital21c.

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.

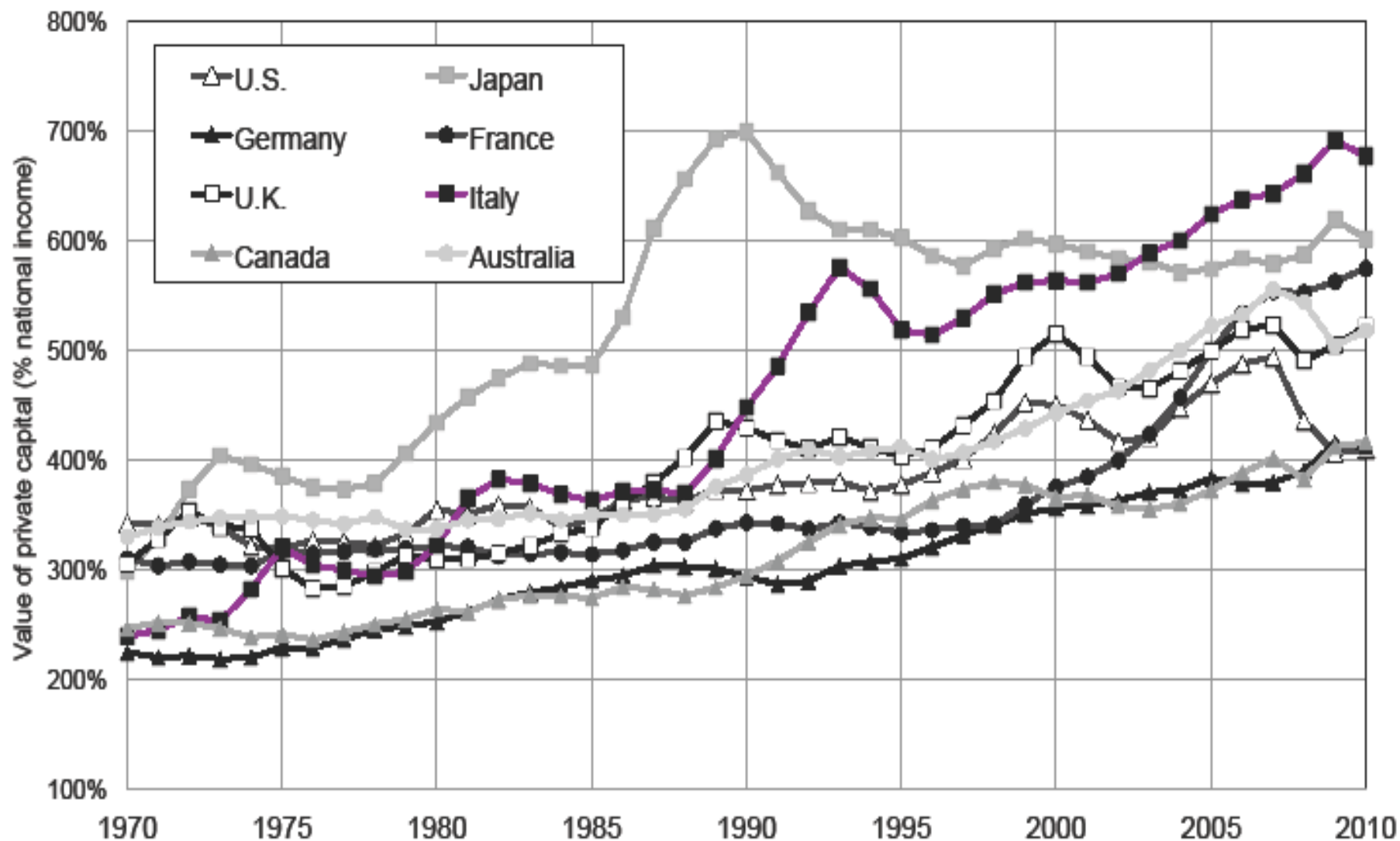
Figure 3.2. Capital in France, 1700-2010



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

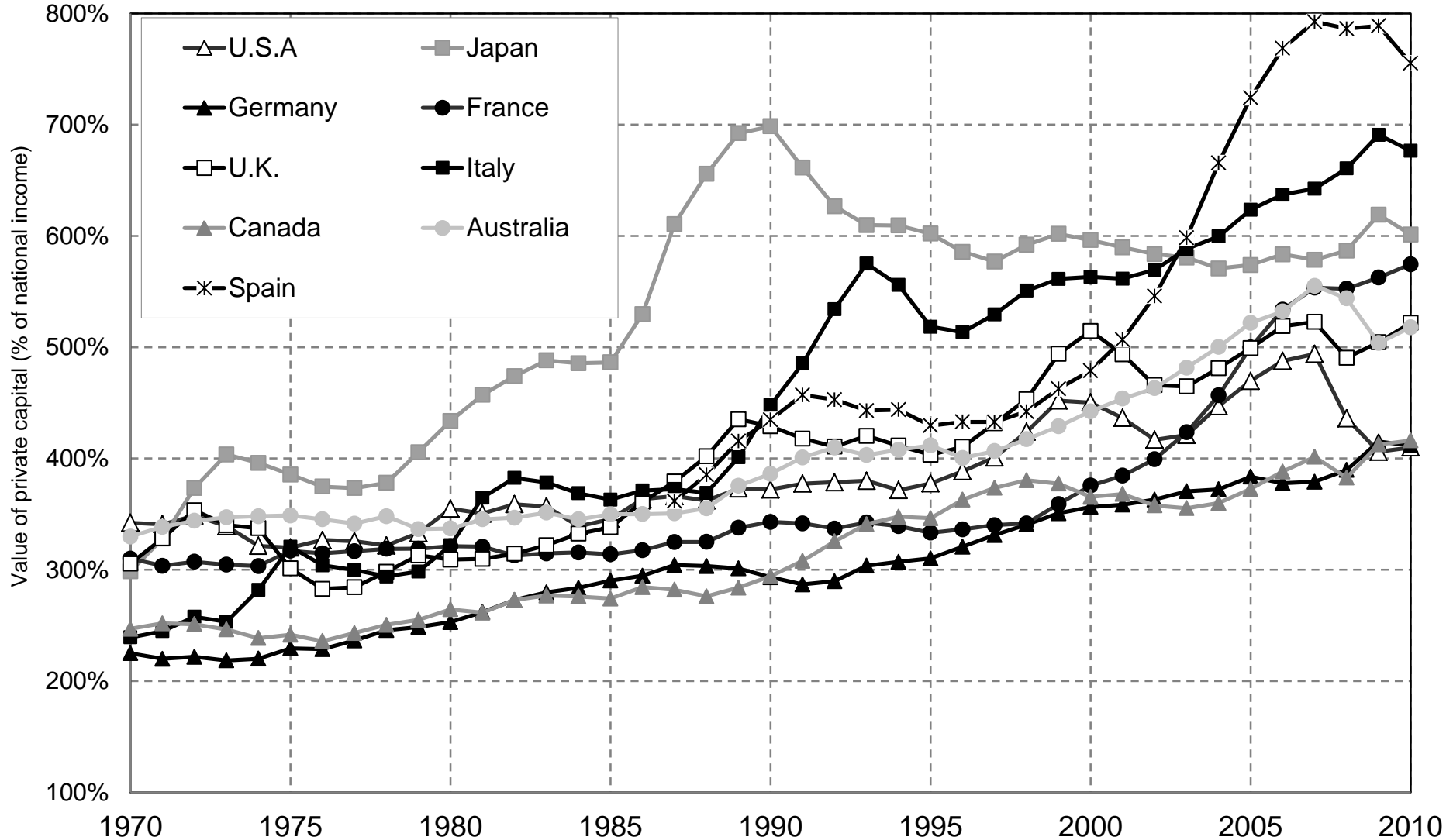
Sources and series: see piketty.pse.ens.fr/capital21c.

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



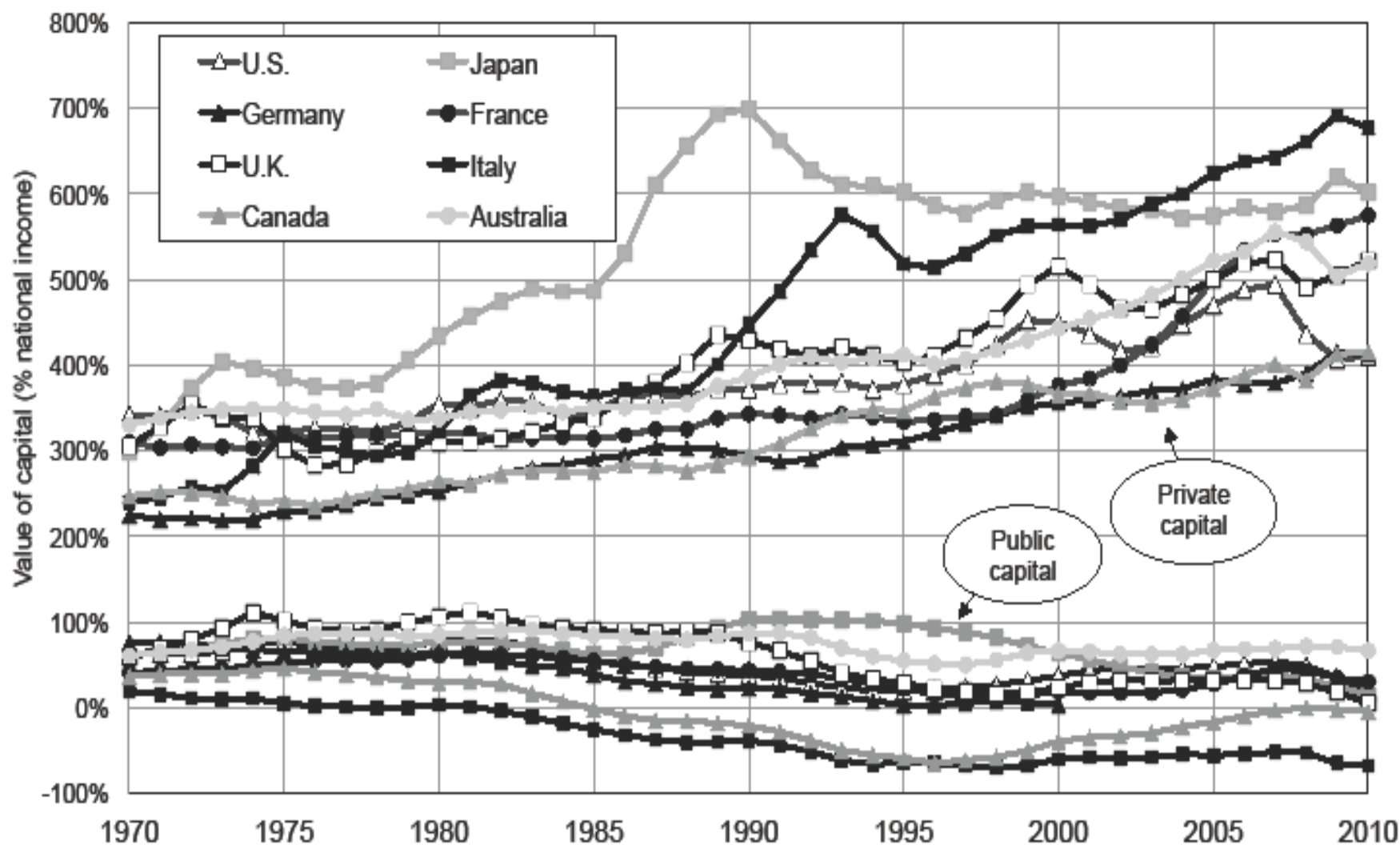
Private capital is worth between 2 and 3.5 years of national income in rich countries in 1970, and between 4 and 7 years of national income in 2010. Sources and series: see piketty.pse.ens.fr/capital21c.

**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.

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.

Table 3.1: Public wealth and private wealth in France in 2012

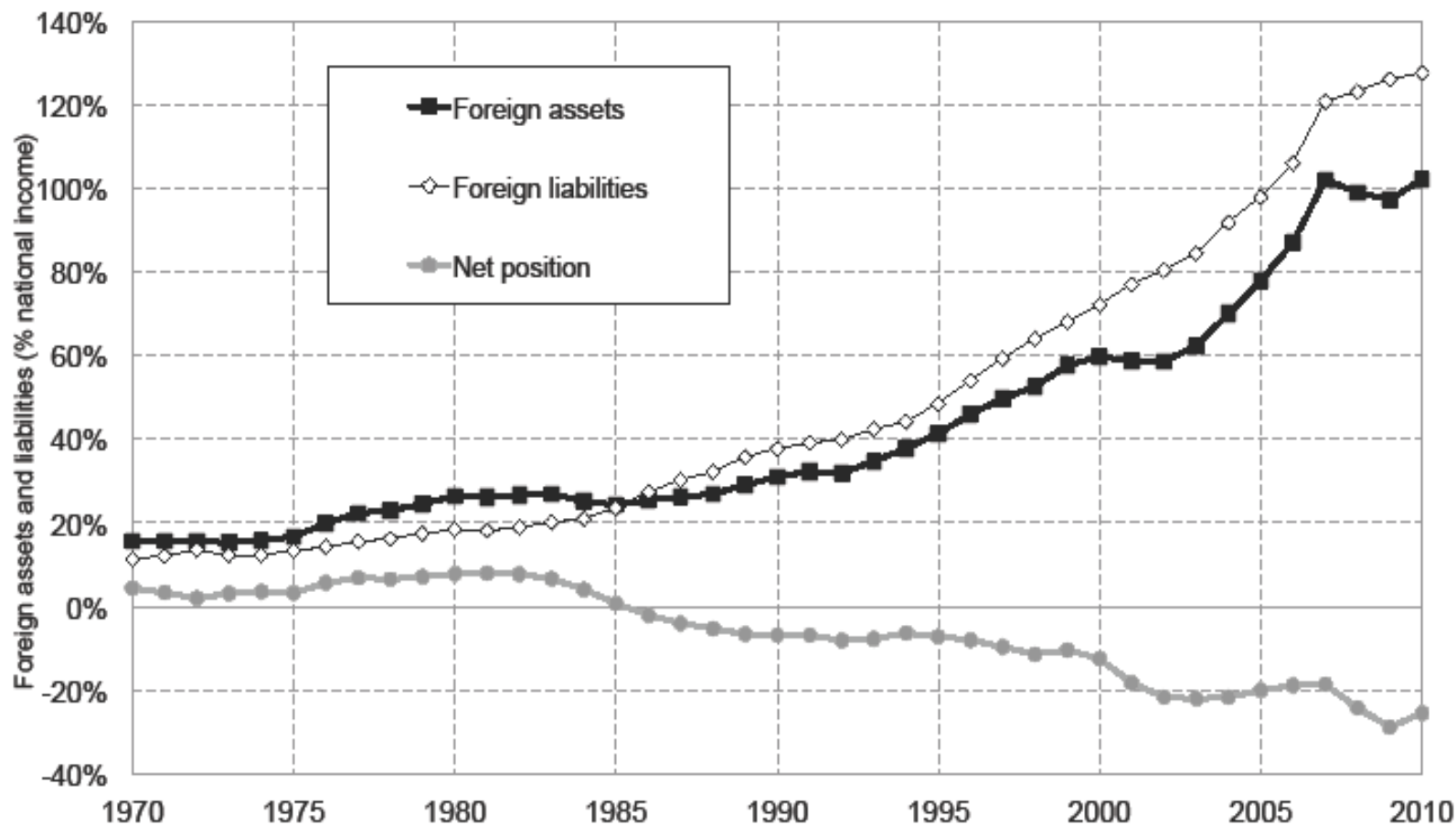
	Value of capital (% national income)		Value of capital (% national capital)	
National capital (public capital + private capital)	605%		100%	
Public capital (net public wealth: difference between assets and debt held by government and other public agencies)	31%		5%	
	Assets 145%	Debt 114%	Assets 24%	Debt 19%
Private capital (net private wealth: difference between assets and debt held by private individuals (households))	574%		95%	
	Assets 646%	Debt 72%	Assets 107%	Debt 12%

In 2012, the total value of national capital in France was equal to 605% of national income (6,05 of national income), including 31% for public capital (5% of total) and 574% for private capital (95% of total).

Sources: see piketty.pse.ens.fr/capital21c.

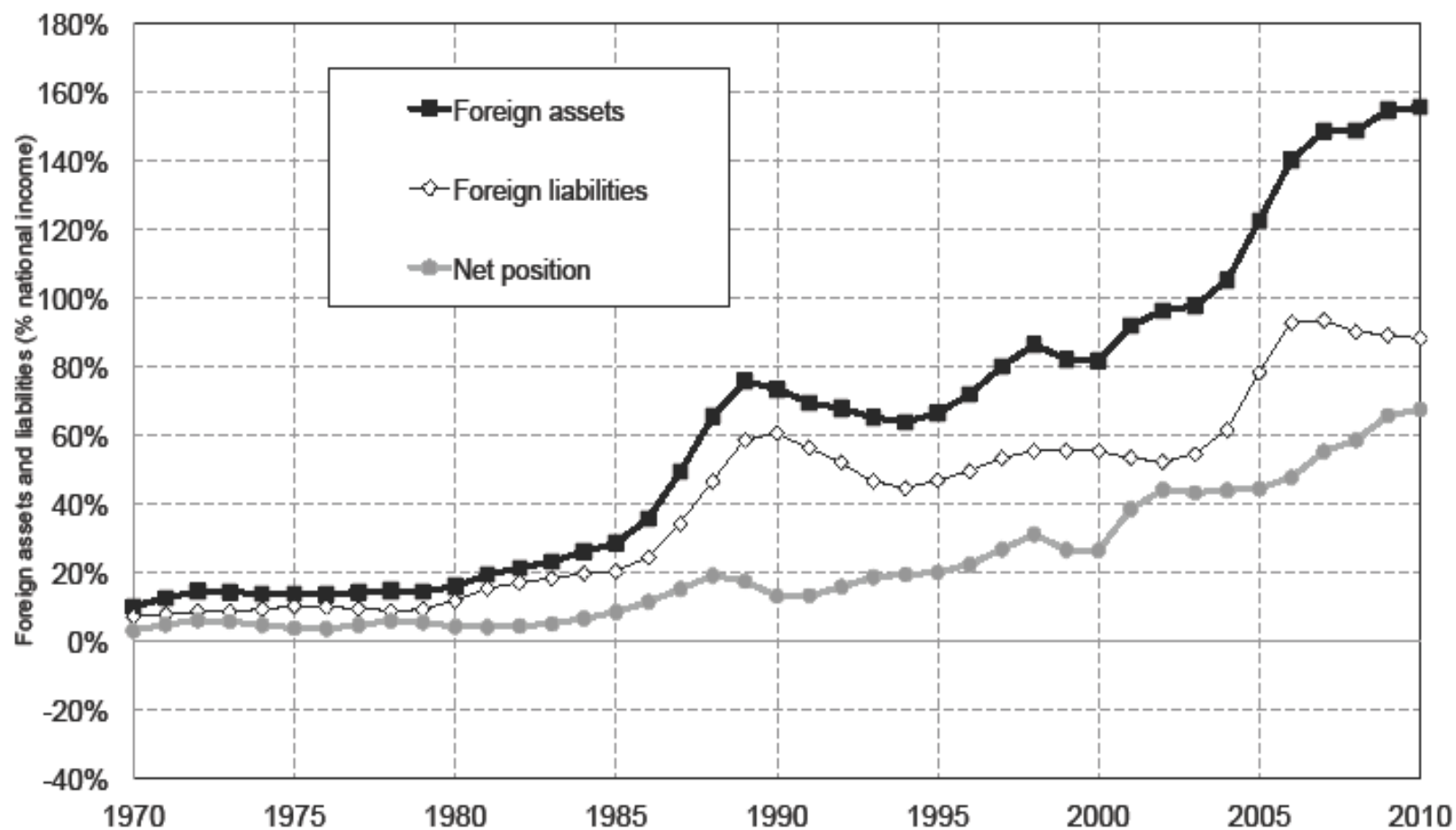
Note: national income is equal to gross domestic product (GDP), minus capital depreciation, plus net foreign income; in practice, it is typically equal to about 90% of GDP in France in 2012; see chapter 1 and technical appendix.

Figure S5.6. Foreign assets and liabilities in the U.S.A. 1970-2010



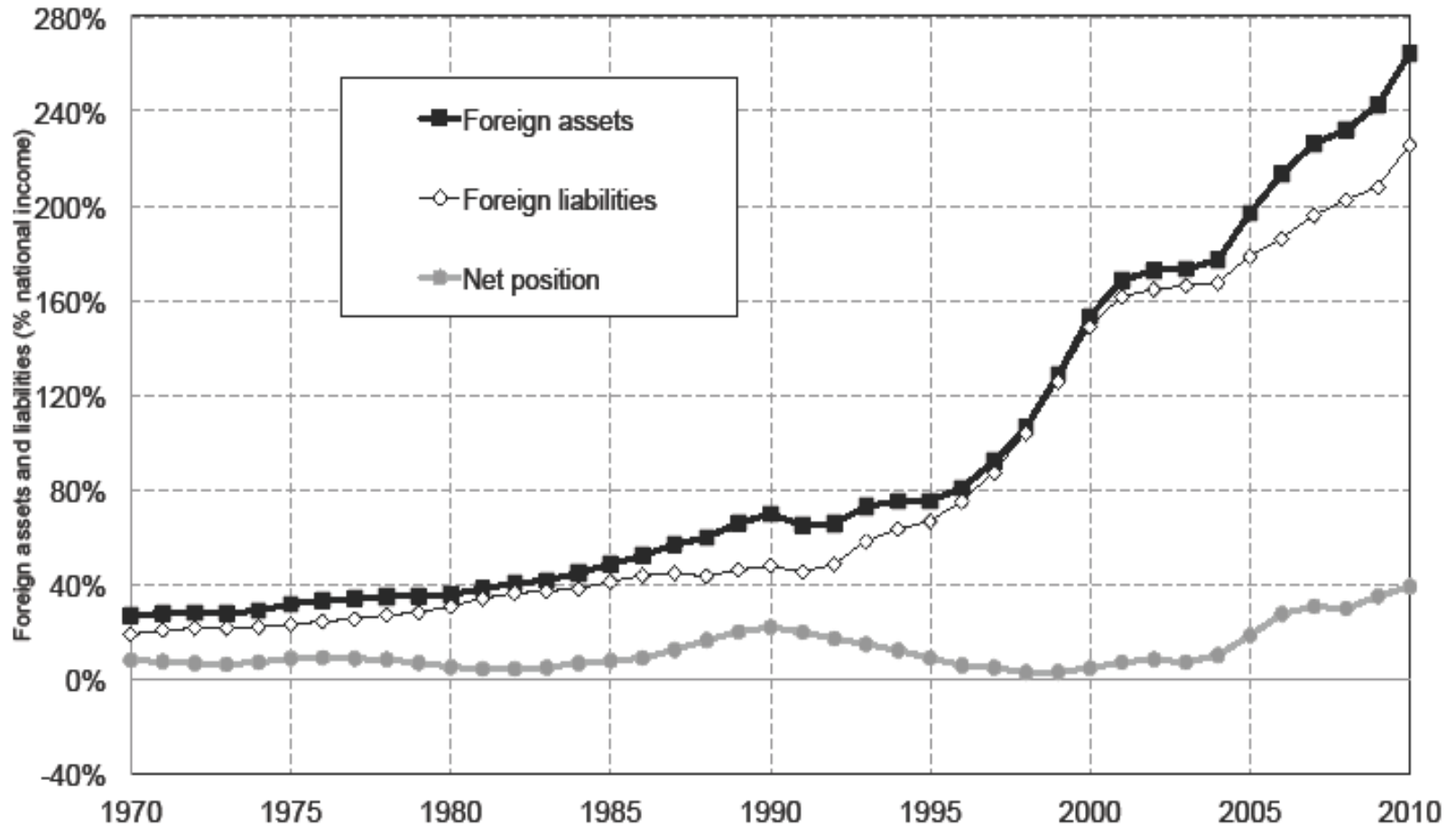
Foreign liabilities (what the rest of the world owns in the US) has outweighed foreign liabilities (what the US own in the rest of the world) since 1985-1986. Sources et series: see piketty.pse.ens.fr/capital21c.

Figure S5.7. Foreign assets and liabilities in Japan 1970-2010



Foreign assets (what Japan owns in the rest of the world) are almost twice bigger than foreign liabilities (what the rest of the world owns in Japan) in 2010. Sources et series: see piketty.pse.ens.fr/capital21c.

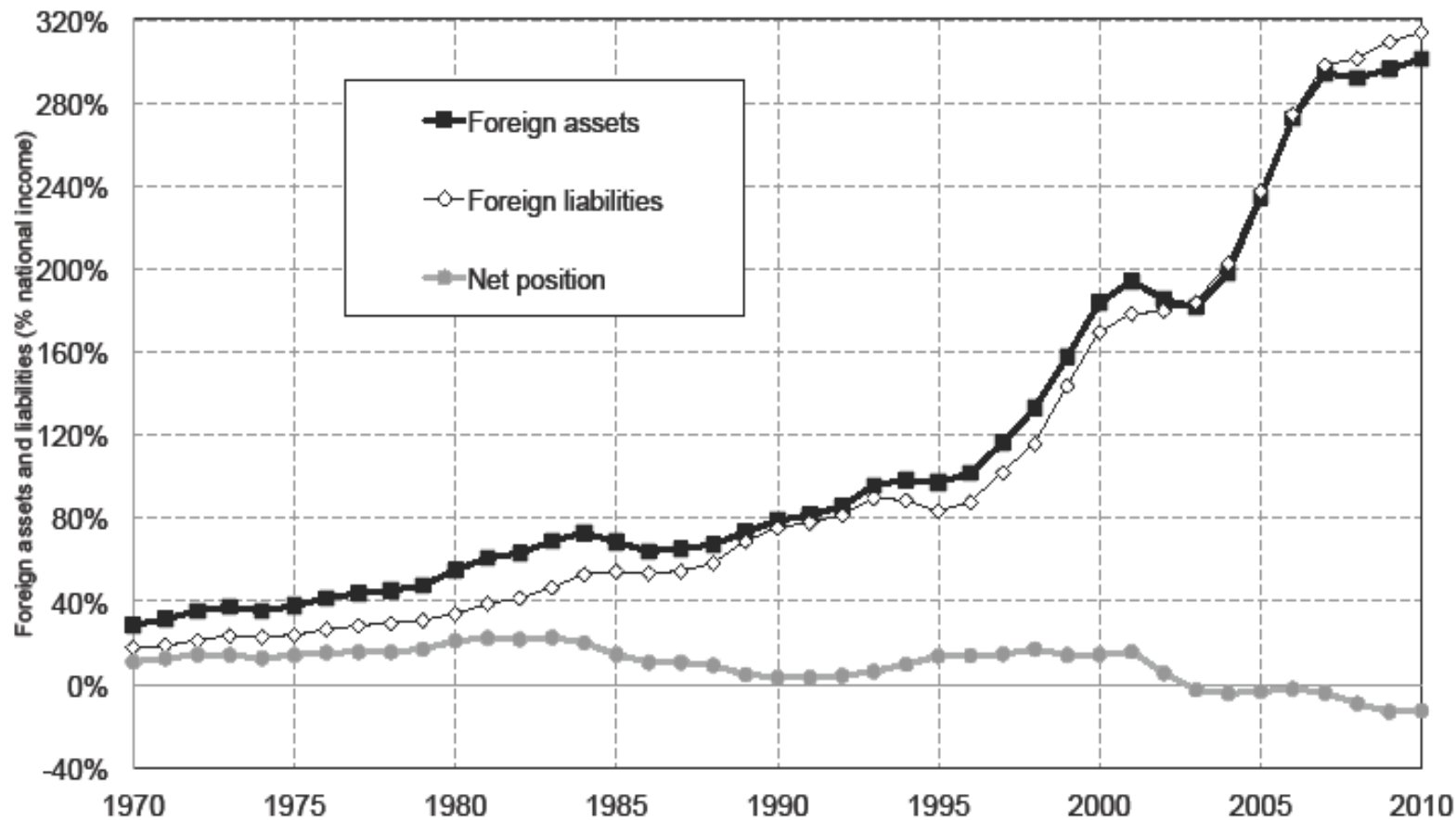
Figure S5.8. Foreign assets and liabilities in Germany, 1970-2010



Foreign assets and liabilities in Germany have risen a lot since the 1980s-1990s.

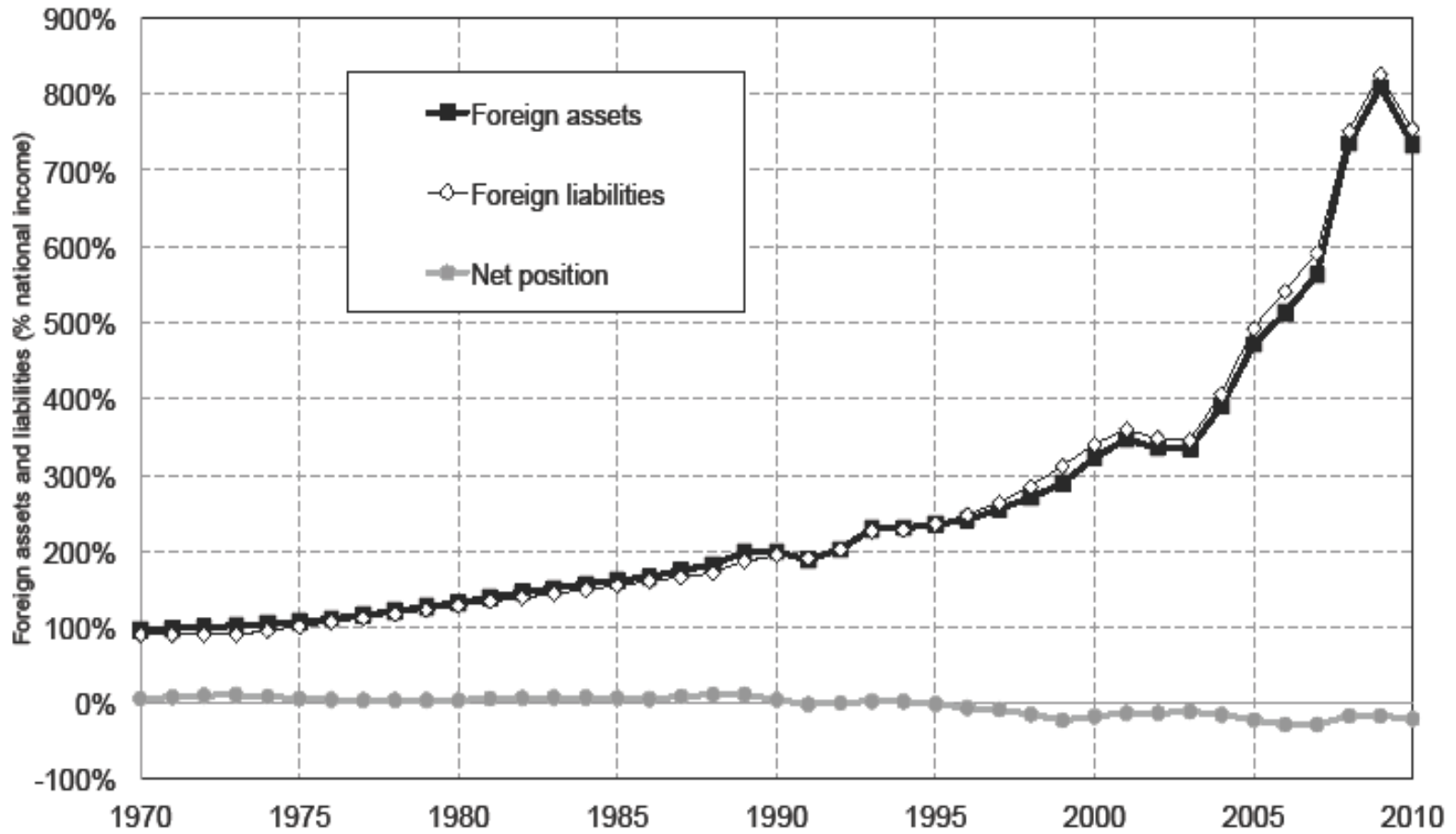
Sources et series: see piketty.pse.ens.fr/capital21c.

Figure S5.9. Foreign assets and liabilities in France, 1970-2010



Like in Germany, foreign assets and liabilities have risen a lot since 1980s-1990s (but with a negative net position at the end of the period. Sources et series: see piketty.pse.ens.fr/capital21c.

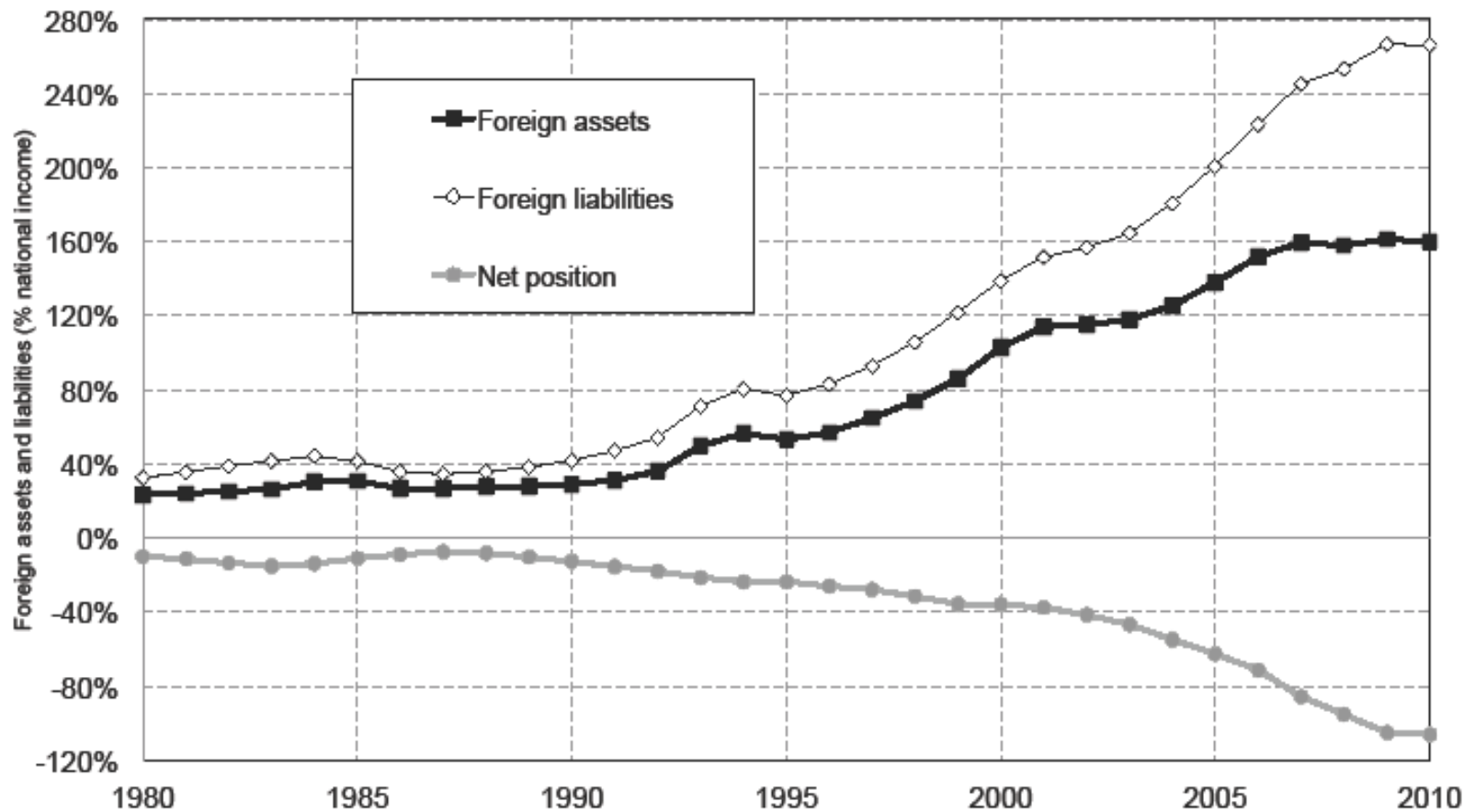
Figure S5.10. Foreign assets and liabilities in the U.K. 1970-2010



In the U.K., foreign assets and liabilities reached 7-8 years of national income at the end of the period

Sources et series: see piketty.pse.ens.fr/capital21c.

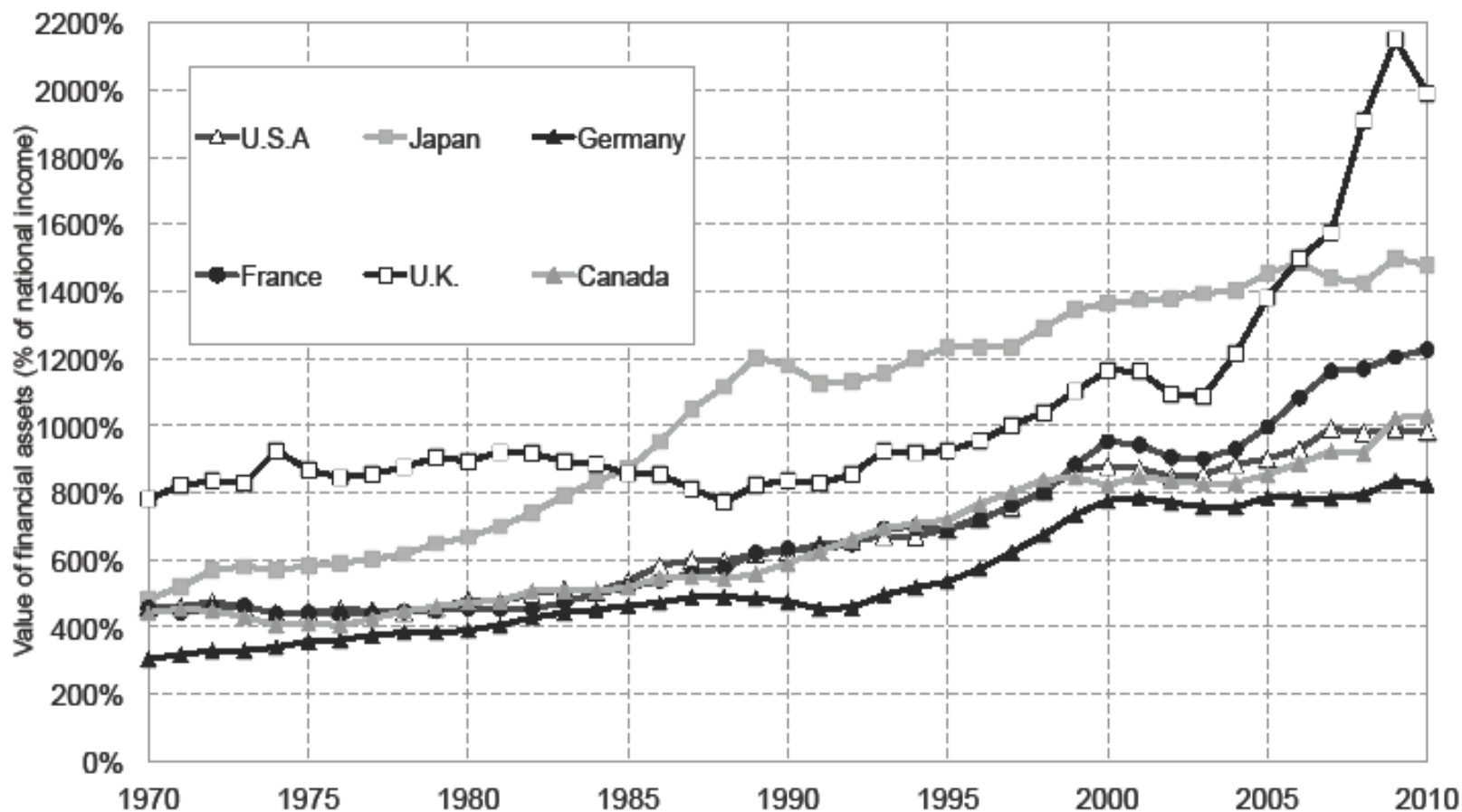
Figure S5.11. Foreign assets and liabilities in Spain, 1980-2010



Net foreign debt of Spain exceeds a year of national income in 2010.

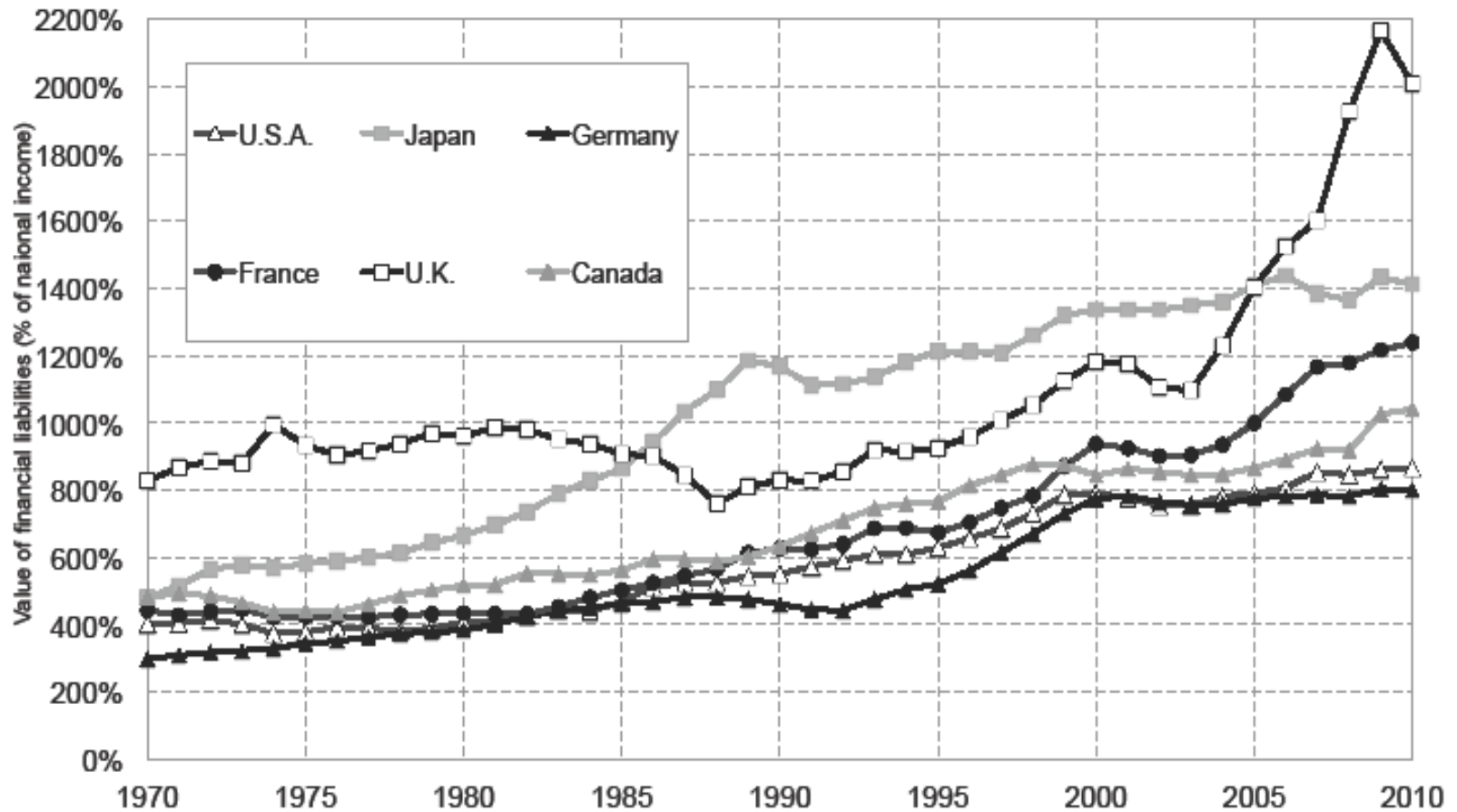
Sources et series: see piketty.pse.ens.fr/capital21c.

Figure S5.3. Financial assets in rich countries



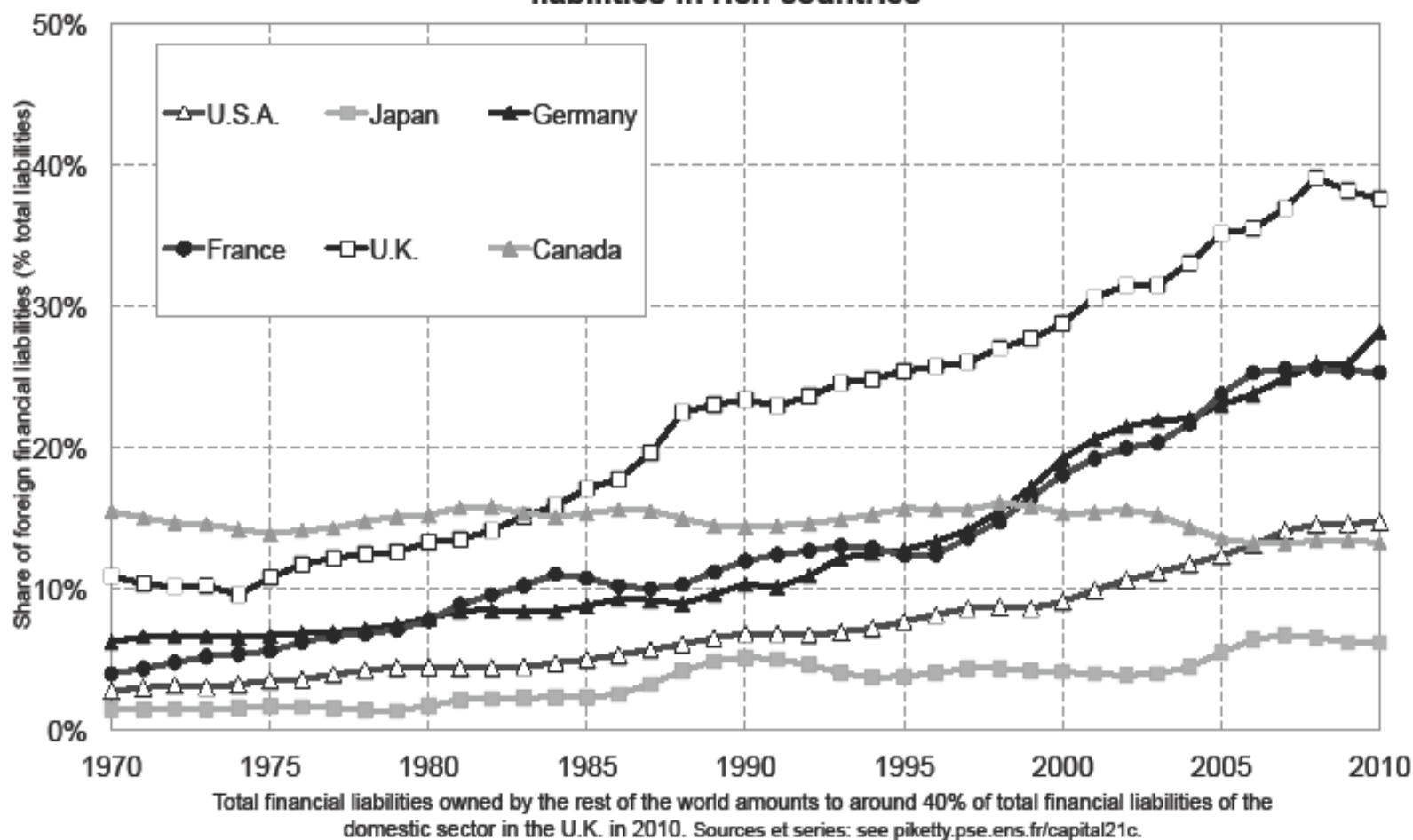
Total financial assets owned by the domestic sector (firms, households, administration) reached 20 years of national income in 2010 in the U.K.. Sources et series: voir piketty.pse.ens.fr/capital21c.

Figure S5.4. Financial liabilities in rich countries



Total of financial liabilities owned by the domestic sector (firms, households, administration) reached 20 years of national income in 2010 in the U.K. Sources et series: voir piketty.pse.ens.fr/capital21c.

Figure S5.5. Share of foreign financial liabilities in the total financial liabilities in rich countries



2. Inequality and wealth.

- Core macro issues about capital accumulation or public debt cannot be properly understood in representative agent models. E.g. if everybody held the same public debt, it would be easy to solve debt crisis in Europe...
- The point is that ownership of wealth, capital, public debt, etc. is highly concentrated. We need more systematic data collection in order to make progress.

(see Garbinti-Goupille-Piketty, « Accounting for wealth inequality dynamics: France 1800-2014 », PSE 2016)

TABLE 1 – Wealth thresholds and wealth shares in France, 2012

Wealth group	Number of adults	Wealth threshold	Average wealth	Wealth share
Full Population	50 862 082	0 €	196 915 €	100.0%
Bottom 50%	25 431 041	0 €	20 643 €	5.2%
Middle 40%	20 344 833	89 404 €	187 653 €	38.1%
Top 10%	5 086 000	392 200 €	1 115 323 €	56.6%
<i>incl. Top 1%</i>	<i>508 600</i>	<i>1 895 825 €</i>	<i>4 528 902 €</i>	<i>23.0%</i>
<i>incl. Top 0.1%</i>	<i>50 860</i>	<i>7 464 203 €</i>	<i>15 650 993 €</i>	<i>7.9%</i>

Results are obtained by capitalizing income tax returns. The unit is the adult individual (20-year-old and over; net wealth of married couples is splitted into two). Fractiles are defined relative to the total number of adult individuals in the population.

Asset composition by wealth level, France 2012

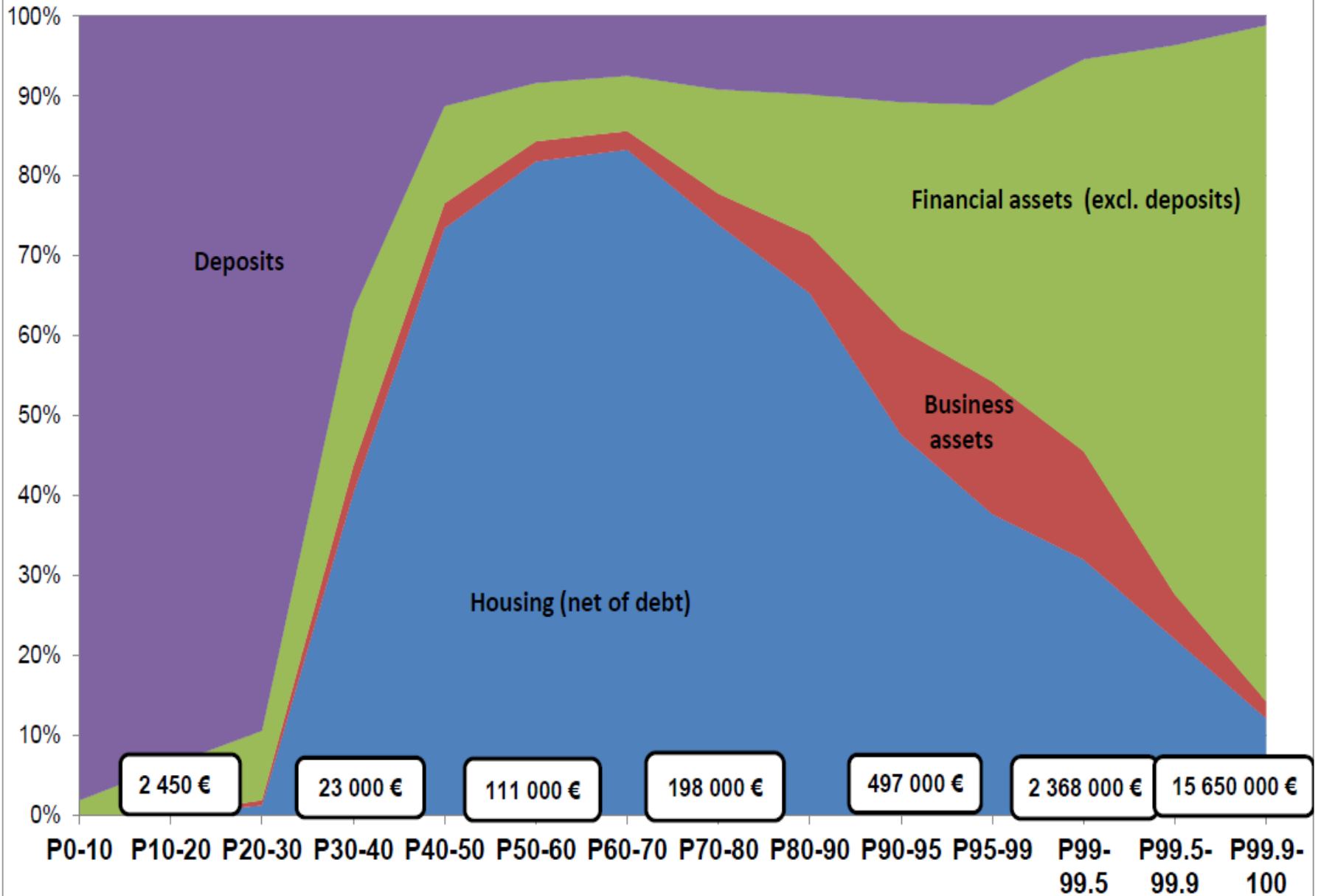


Figure 2. Composition of aggregate personal wealth, France 1970-2014

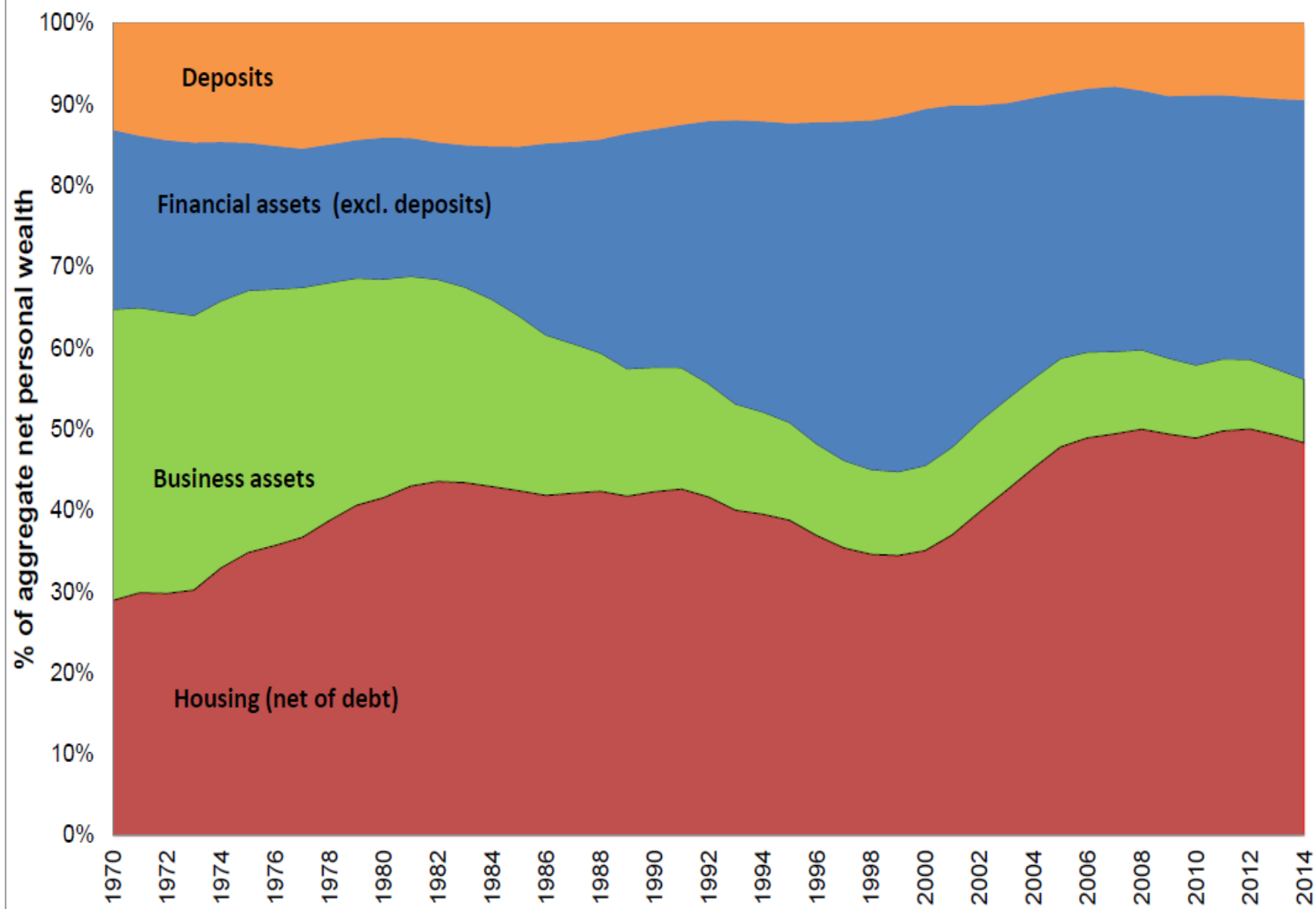
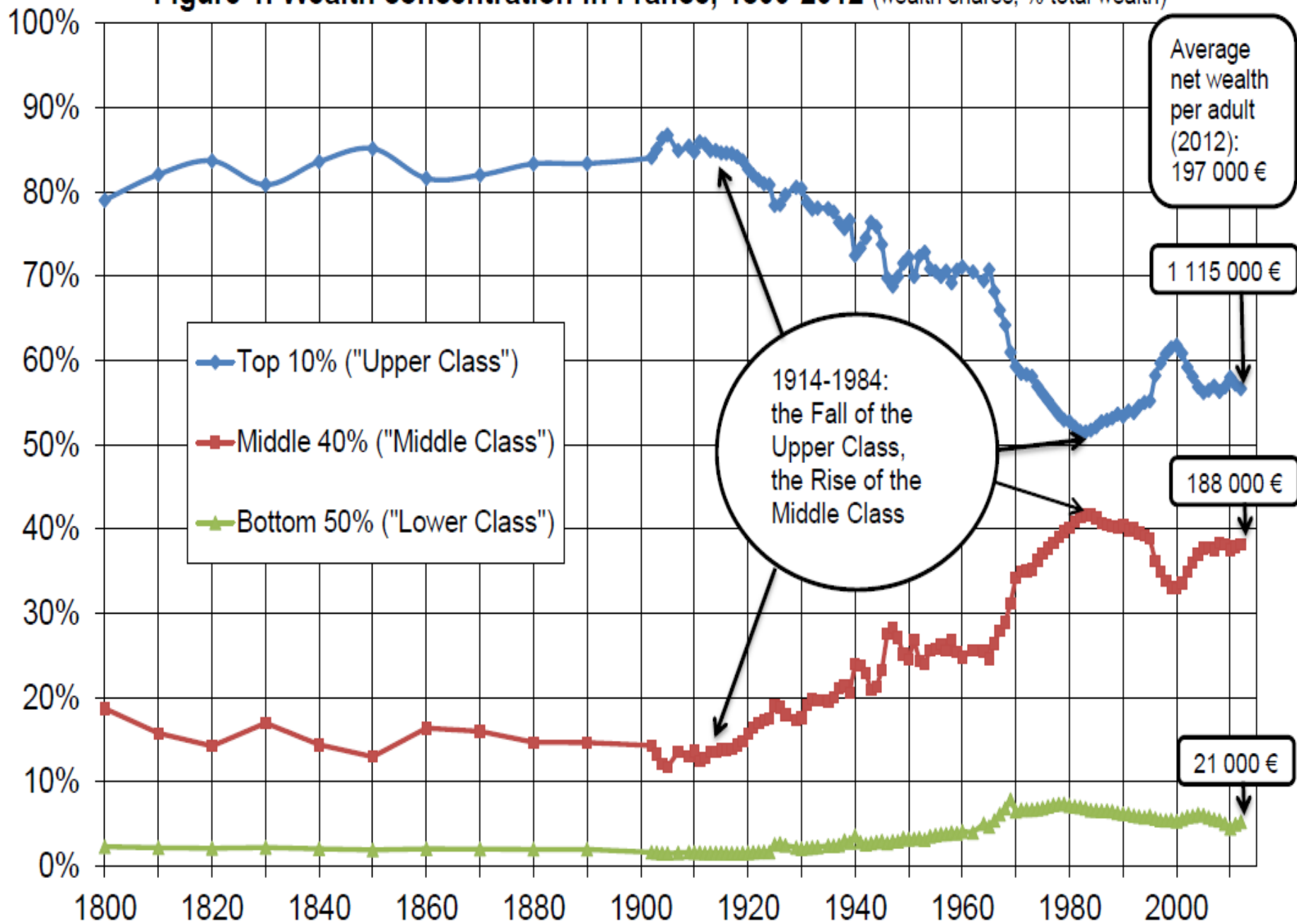
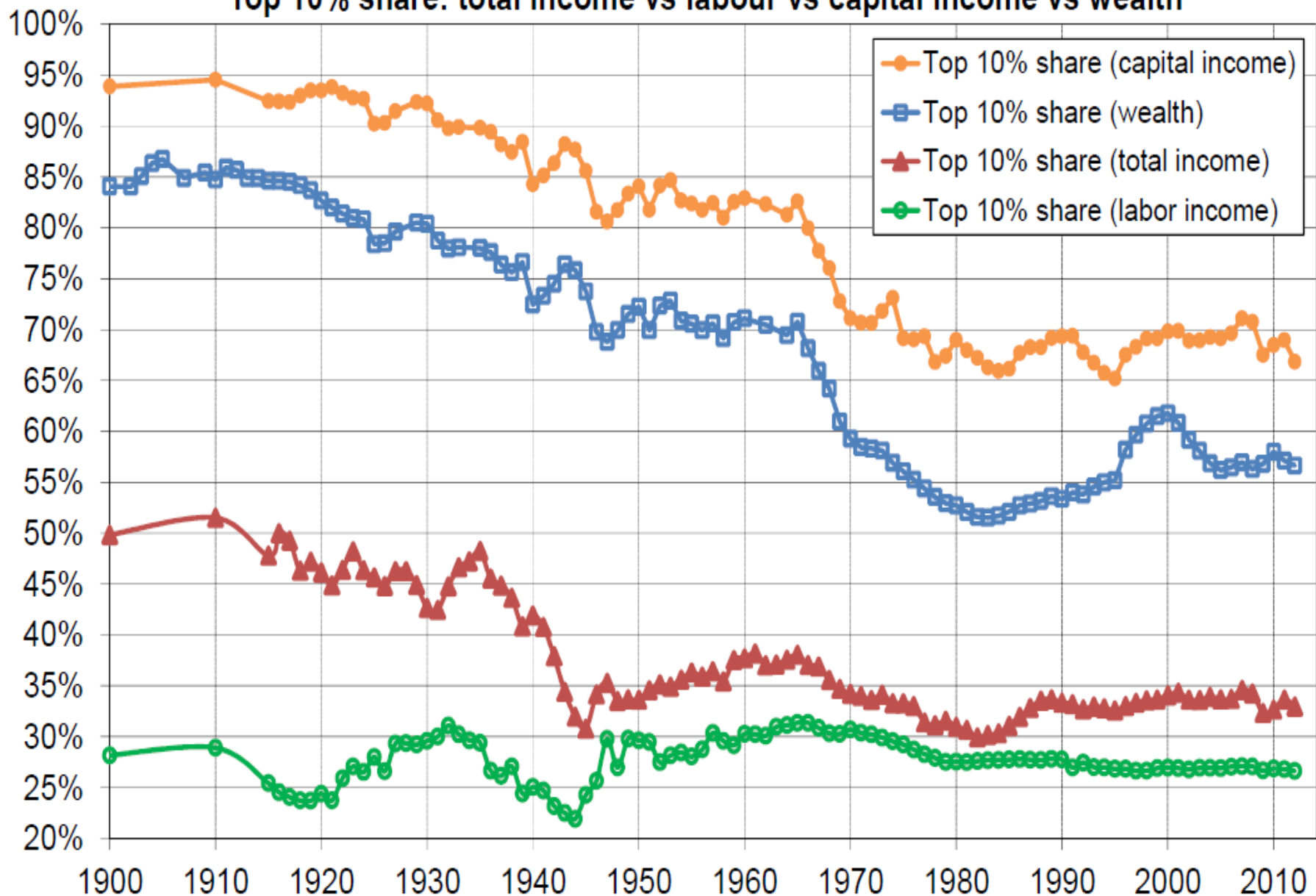


Figure 1. Wealth concentration in France, 1800-2012 (wealth shares, % total wealth)

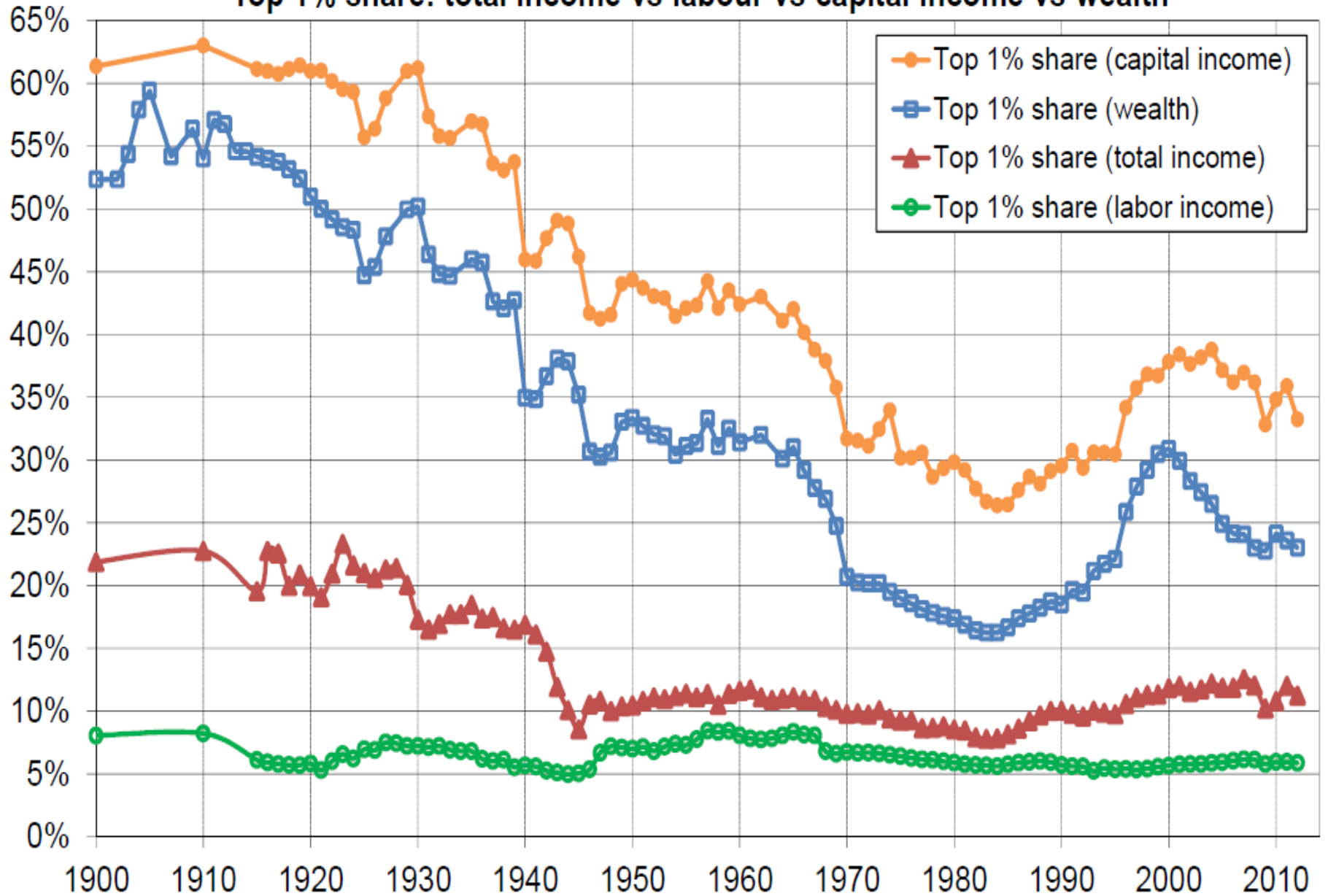


Top 10% share: total income vs labour vs capital income vs wealth



Distribution of total income, labor income, capital income and net wealth among adults.
Equal-split-adults series (income and wealth of married couples divided by two).

Top 1% share: total income vs labour vs capital income vs wealth



Distribution of total income, labor income, capital income and net wealth among adults.
Equal-split-adults series (income and wealth of married couples divided by two).

Why is wealth inequality so large?

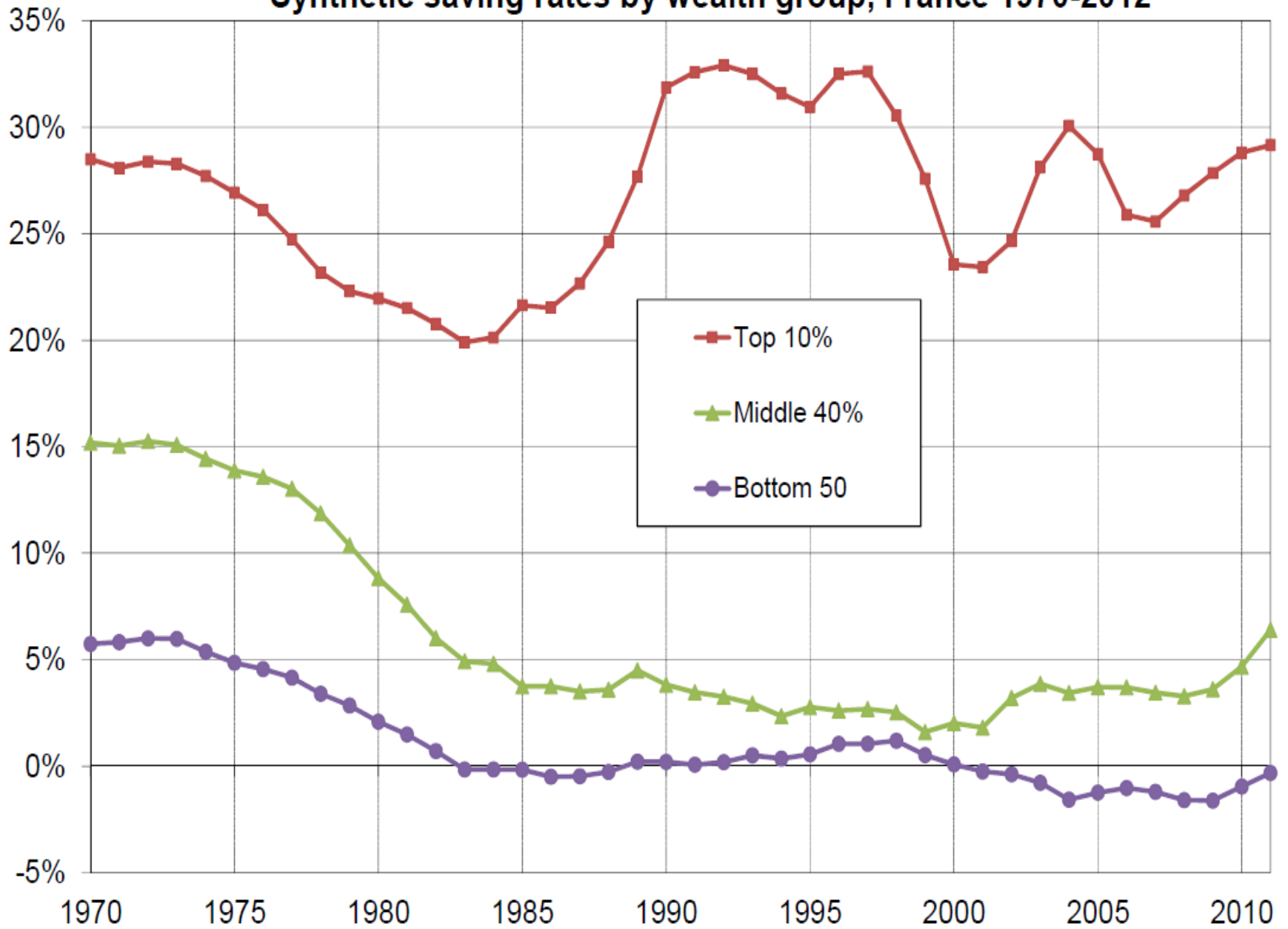
- Cumulative effects of unequal labor incomes, saving rates and rates of return
- Large multiplicative effects, especially with long horizon and inheritance

Equation of wealth accumulation at time $t + 1$ for the wealth group p
(for instance $p =$ top 10% wealth group):

$$W_{t+1}^p = (1 + q_t^p)[W_t^p + s_t^p(Y_{Lt}^p + r_t^p W_t^p)]$$

- W^p is the aggregate wealth for the wealth group p , Y_L^p labor income
- q^p is the real rate of capital gain
- s^p is the saving rate, r^p is the after-tax rate of return (for group p)
- **We infer group-level synthetic saving rates s_t^p from the observation of W_t^{p+1} , W_t^p , Y_{Lt}^p , r_t^p , q_t^p**

Synthetic saving rates by wealth group, France 1970-2012



Steady-state formulas for top wealth shares

From the equation of wealth accumulation, with the same notations as above:

$$W_{t+1} = (1 + q_t)[W_t + s_t(Y_{Lt} + r_t W_t)]$$

and assuming q_t has to be equal to 0 at steady state, we directly derive:

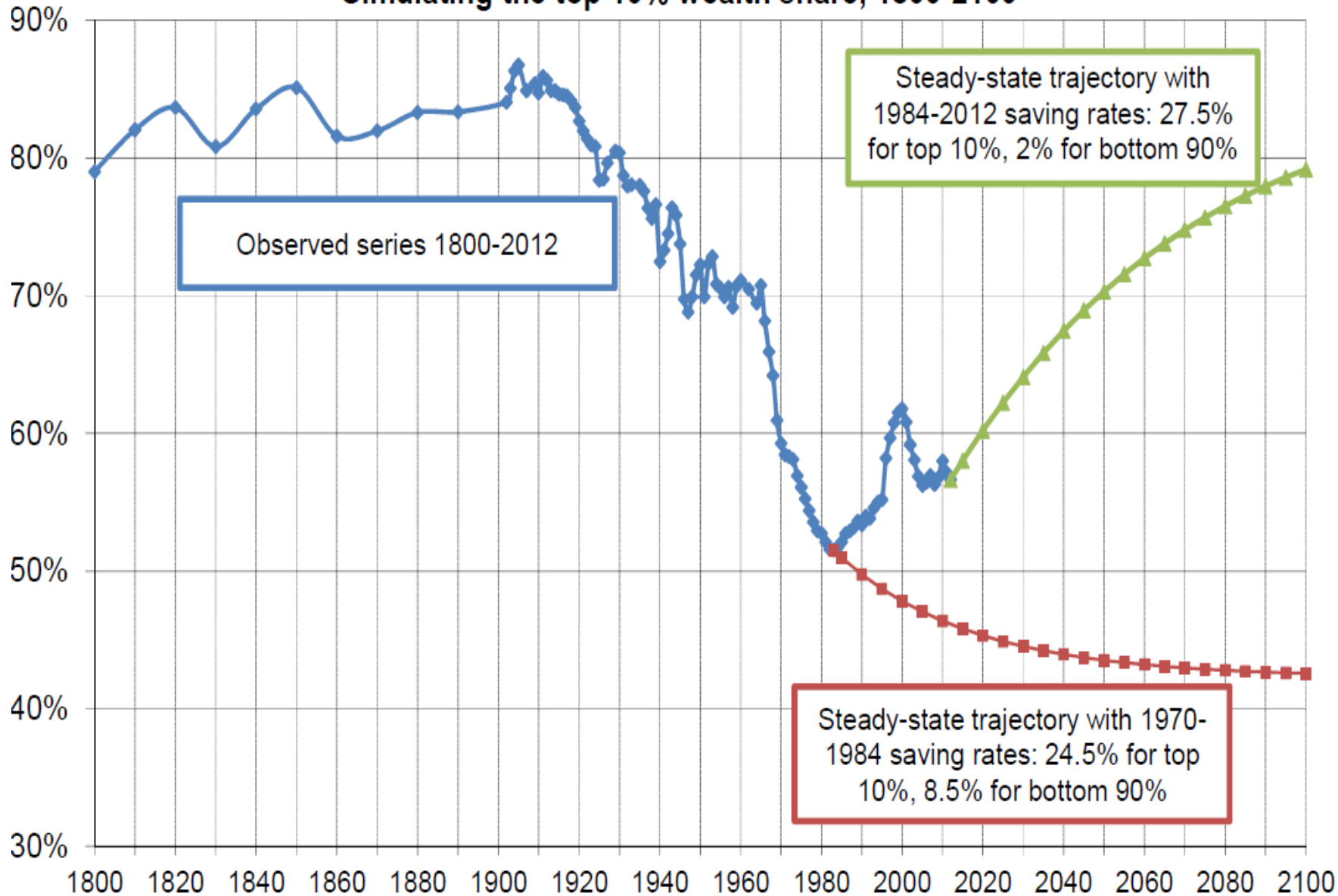
$$sh_{W}^p = \left(1 + \frac{s^p r^p - sr}{g - s^p r^p}\right) \frac{s^p}{s} sh_{Y_L}^p$$

- sh_{W}^p (resp. $sh_{Y_L}^p$) is the share of wealth (resp. labor income) held by wealth group p (for instance $p = \text{top 10\% wealth group}$)
- g is the growth rate, s the aggregate saving rate and r the aggregate after-tax rate of return

If $s^p = s$ and $r^p = r$ (i.e. top wealth group has the same saving rate and rate of return as average), then $sh_{W}^p = sh_{Y_L}^p$: wealth inequality = labor income inequality

but if $s^p > s$ and $r^p > r$, then this can generate large multiplicative effects, and lead to very high steady-state wealth concentration

Simulating the top 10% wealth share, 1800-2100



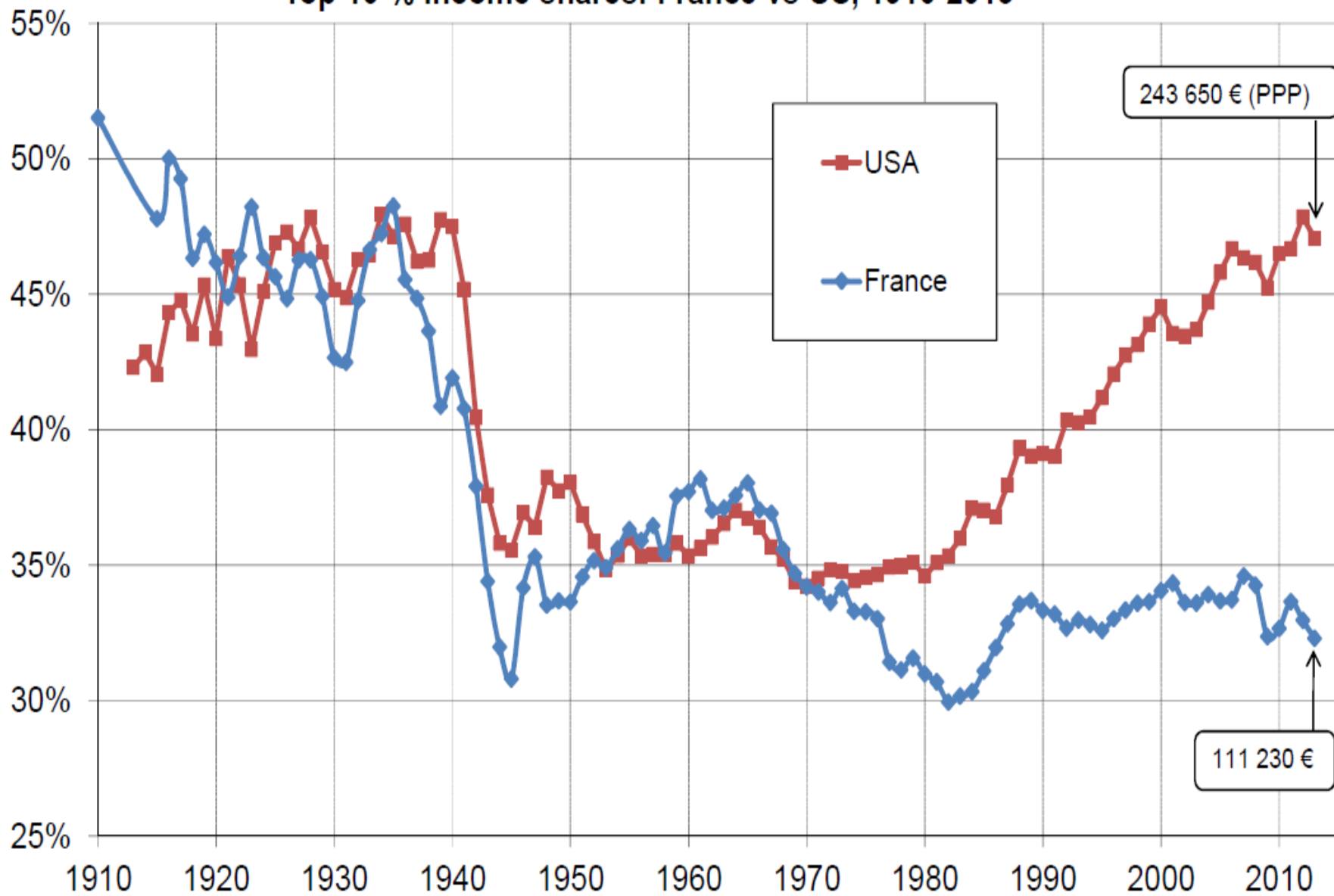
3. Inequality and welfare

- GDP levels and growth rates can differ enormously for bottom 50% vs top 10%. E.g. in the U.S. bottom 50% average annual income has stagnated at about 15000\$ (2014\$) since 1980

(see Piketty-Saez-Zucman, « Distributional National Accounts (DINA): U.S. 1913-2014 », PSE and Berkeley 2016)

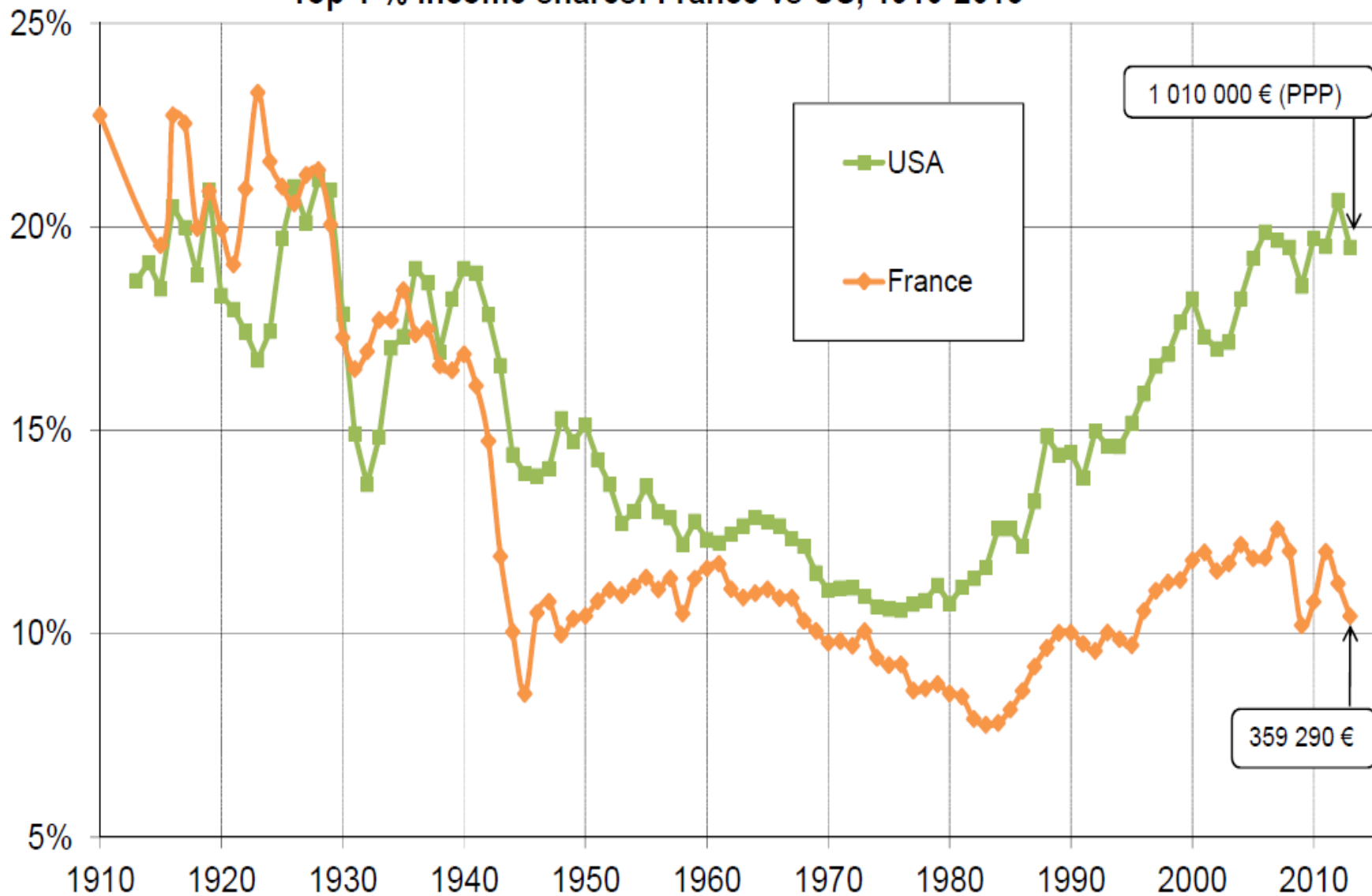
- To the extent that macroeconomists care about welfare (rather than GDP growth per se), they should care about inequality, even if it had no impact at all on financial instability or capital accumulation or public debt.

Top 10 % income shares: France vs US, 1910-2013



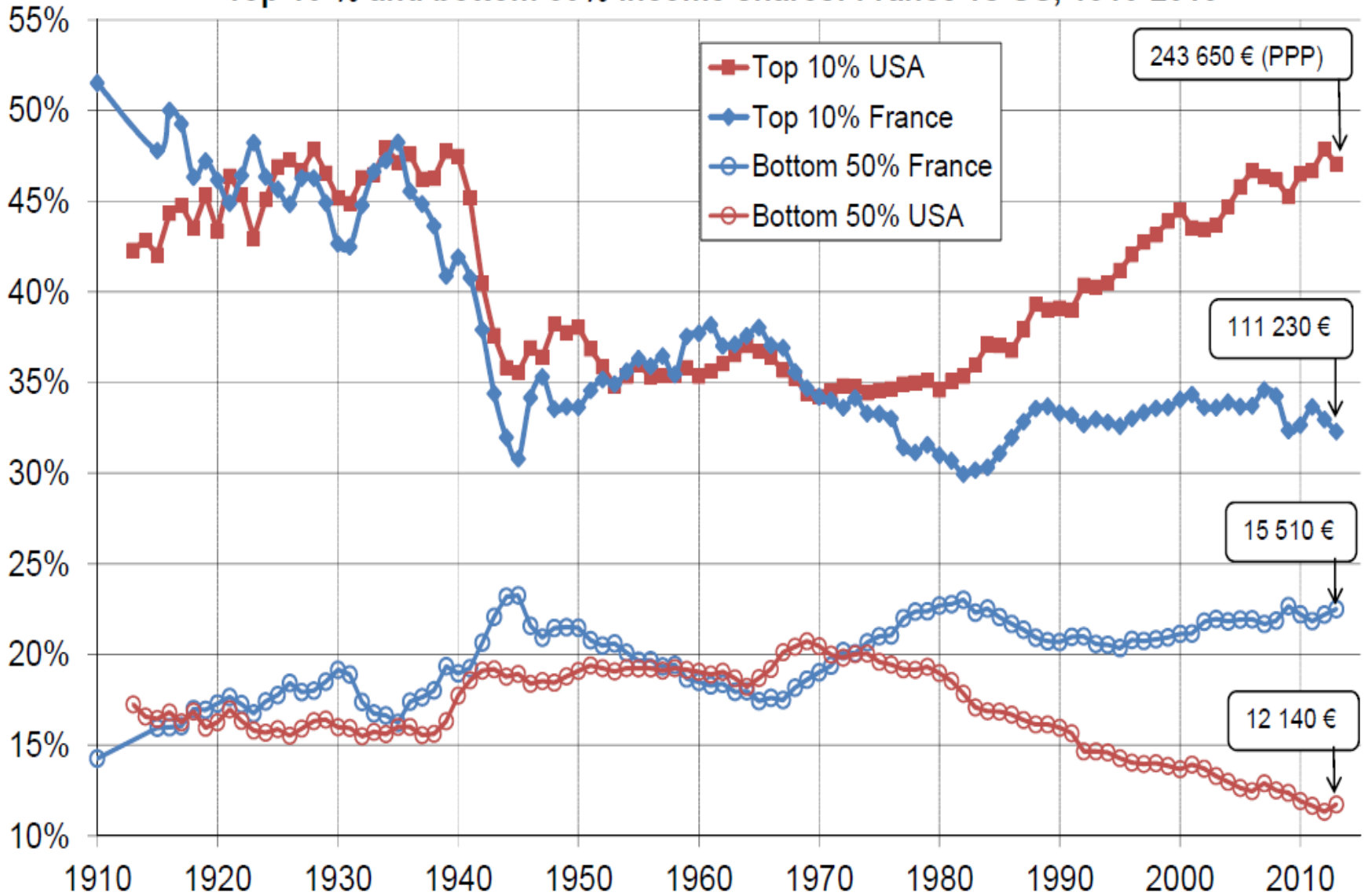
Distribution of pretax national income (before all taxes and transfers, except pensions and unempl. insurance) among adults. Equal-split-adults series (income of married couples divided by two).

Top 1 % income shares: France vs US, 1910-2013



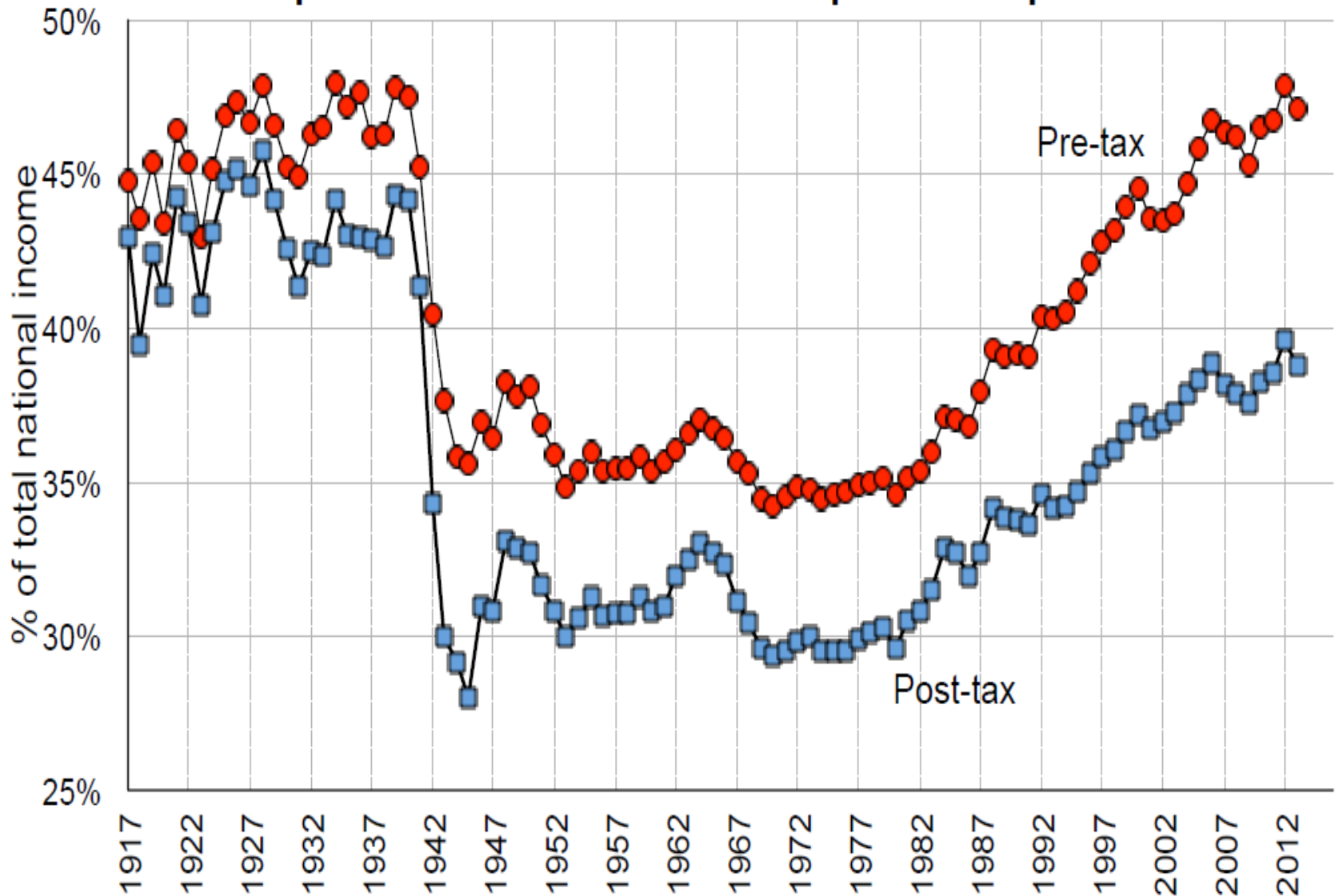
Distribution of pretax national income (before all taxes and transfers, except pensions and unempl. insurance) among adults. Equal-split-adults series (income of married couples divided by two).

Top 10 % and bottom 50% income shares: France vs US, 1910-2013



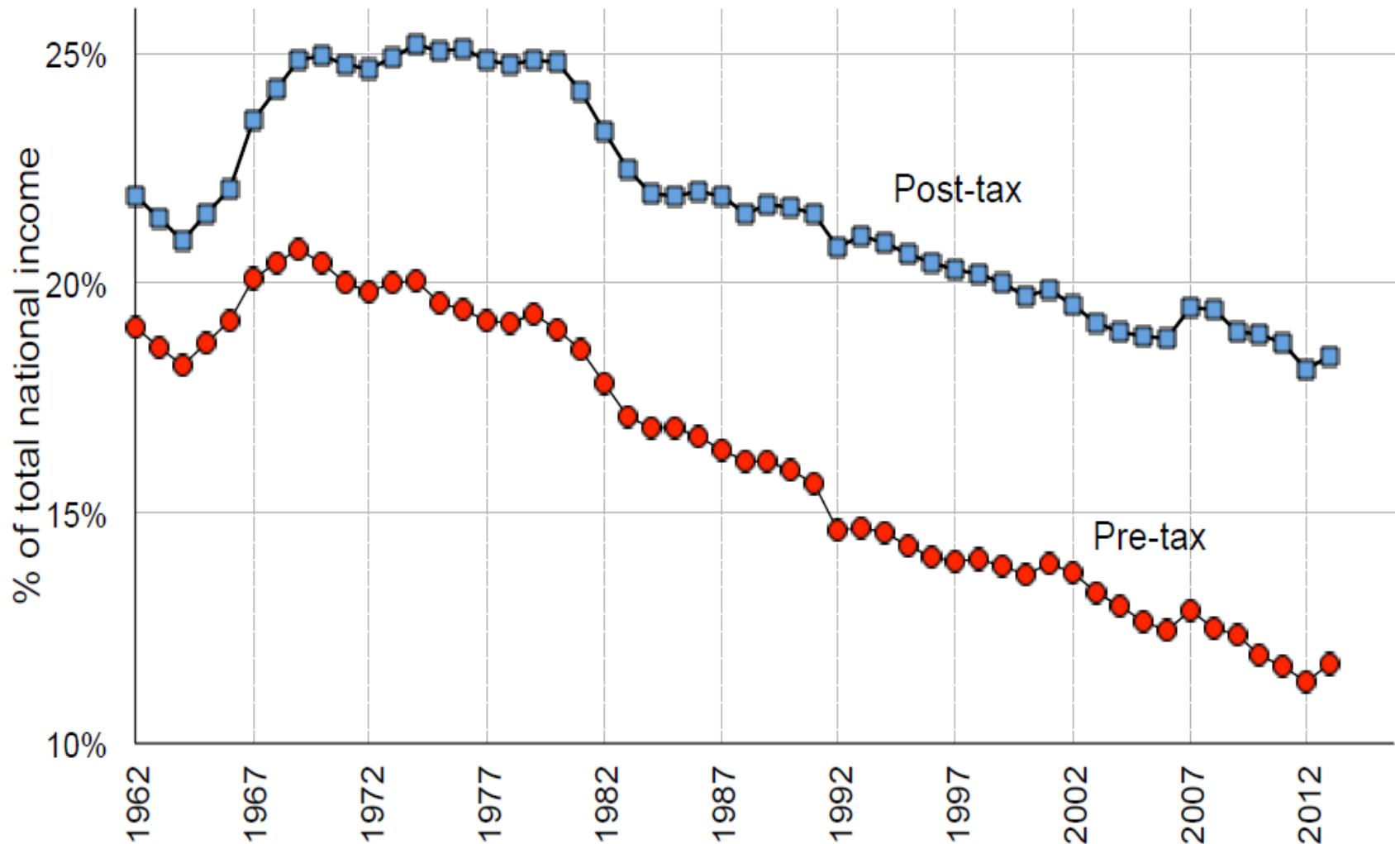
Distribution of pretax national income (before all taxes and transfers, except pensions and unempl. insurance) among adults. Equal-split-adults series (income of married couples divided by two).

Top 10% national income share: pre-tax vs. post-tax



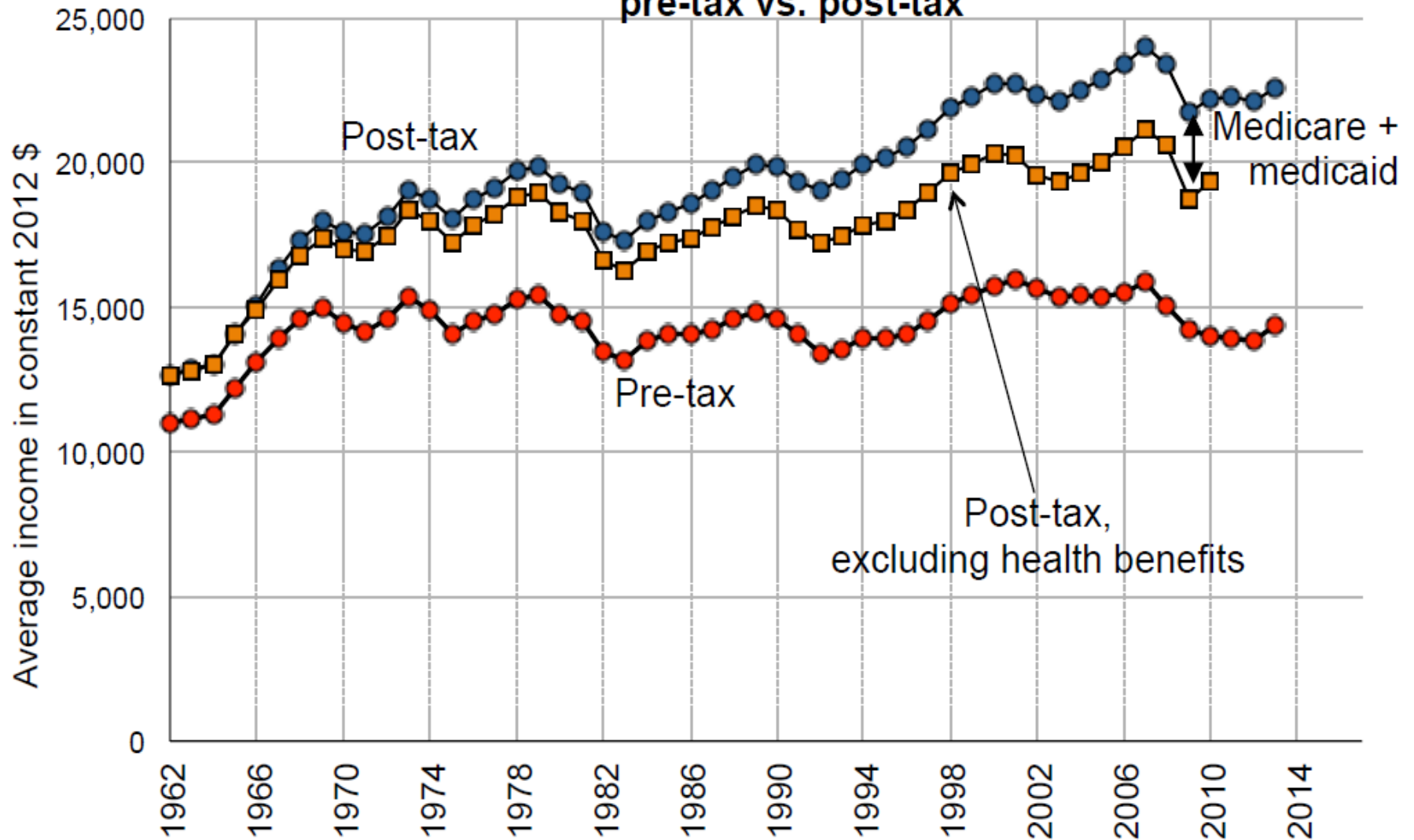
Source: Piketty, Saez, Zucman (2016). Pre-tax income and post-tax income match total national income and are divided equally among spouses. Post-tax income deducts all taxes and adds back all transfers and government spending.

Bottom 50% national income share: pre-tax vs. post-tax



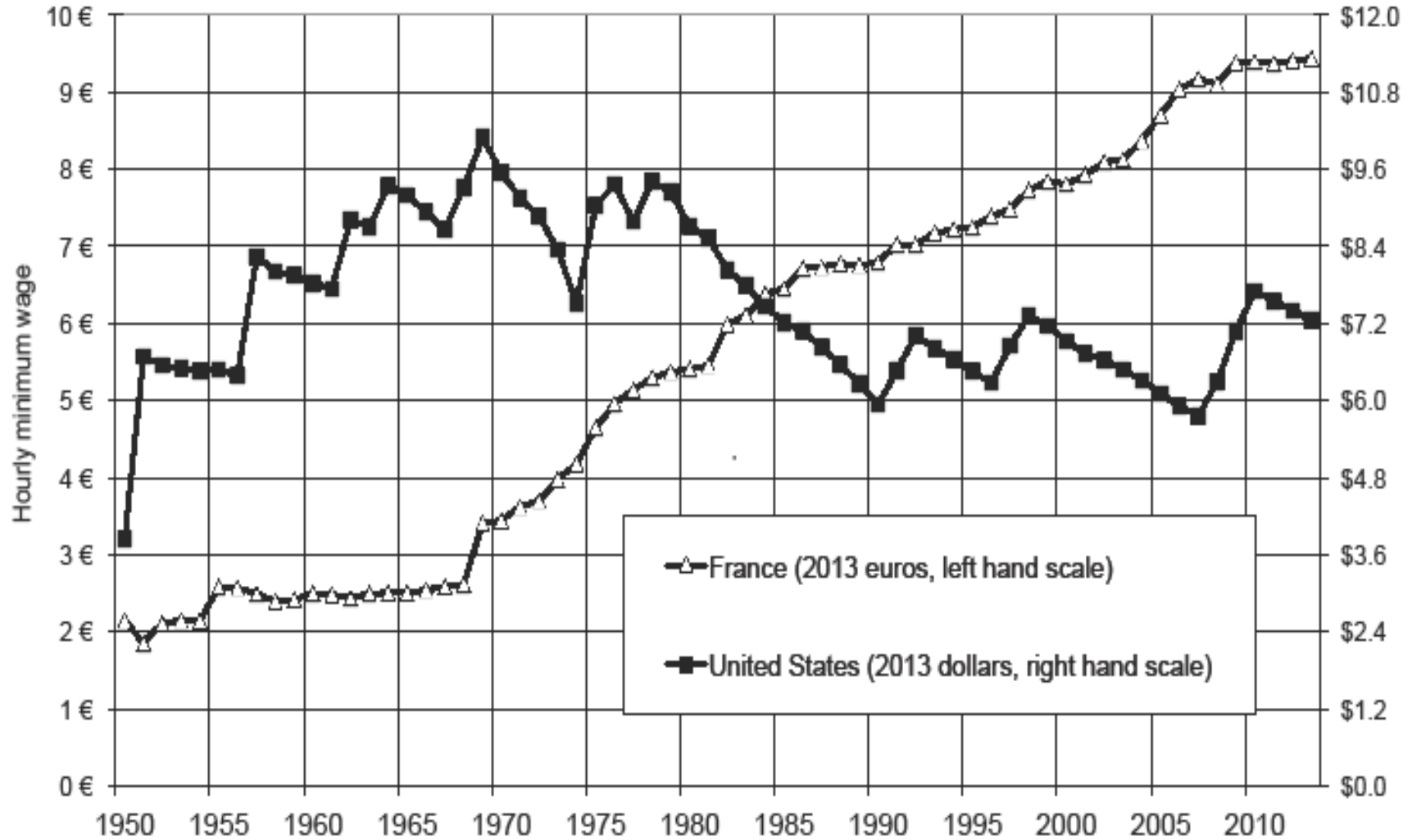
Source: Piketty, Saez, Zucman (2016). Pre-tax income and post-tax income match total national income and are divided equally among spouses. Post-tax income deducts all taxes and adds back all transfers and government spending.

Real income of bottom 50% equal-split: pre-tax vs. post-tax



Real values are obtained by using the national income deflator and expressed in 2012.

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.

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

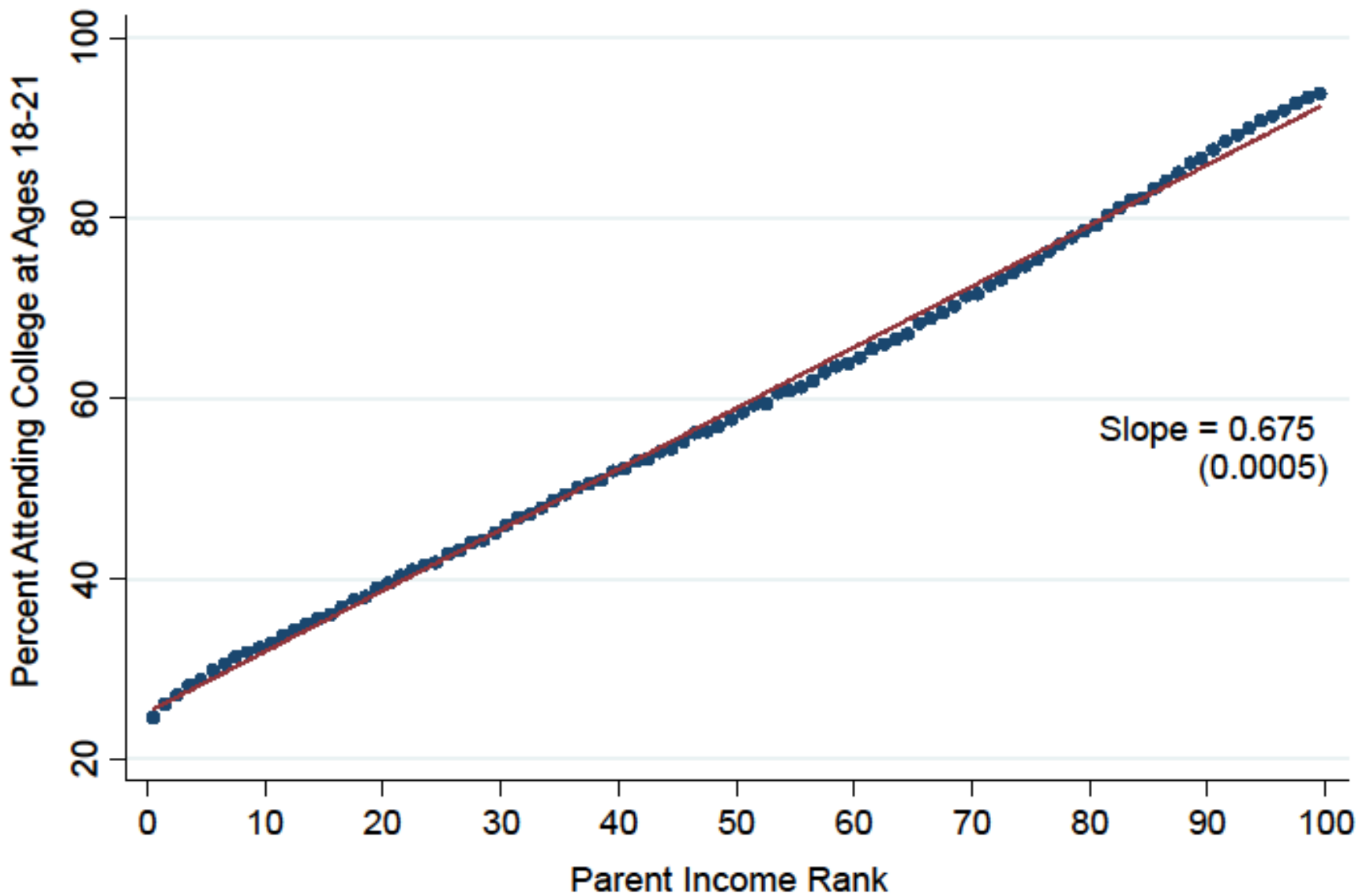
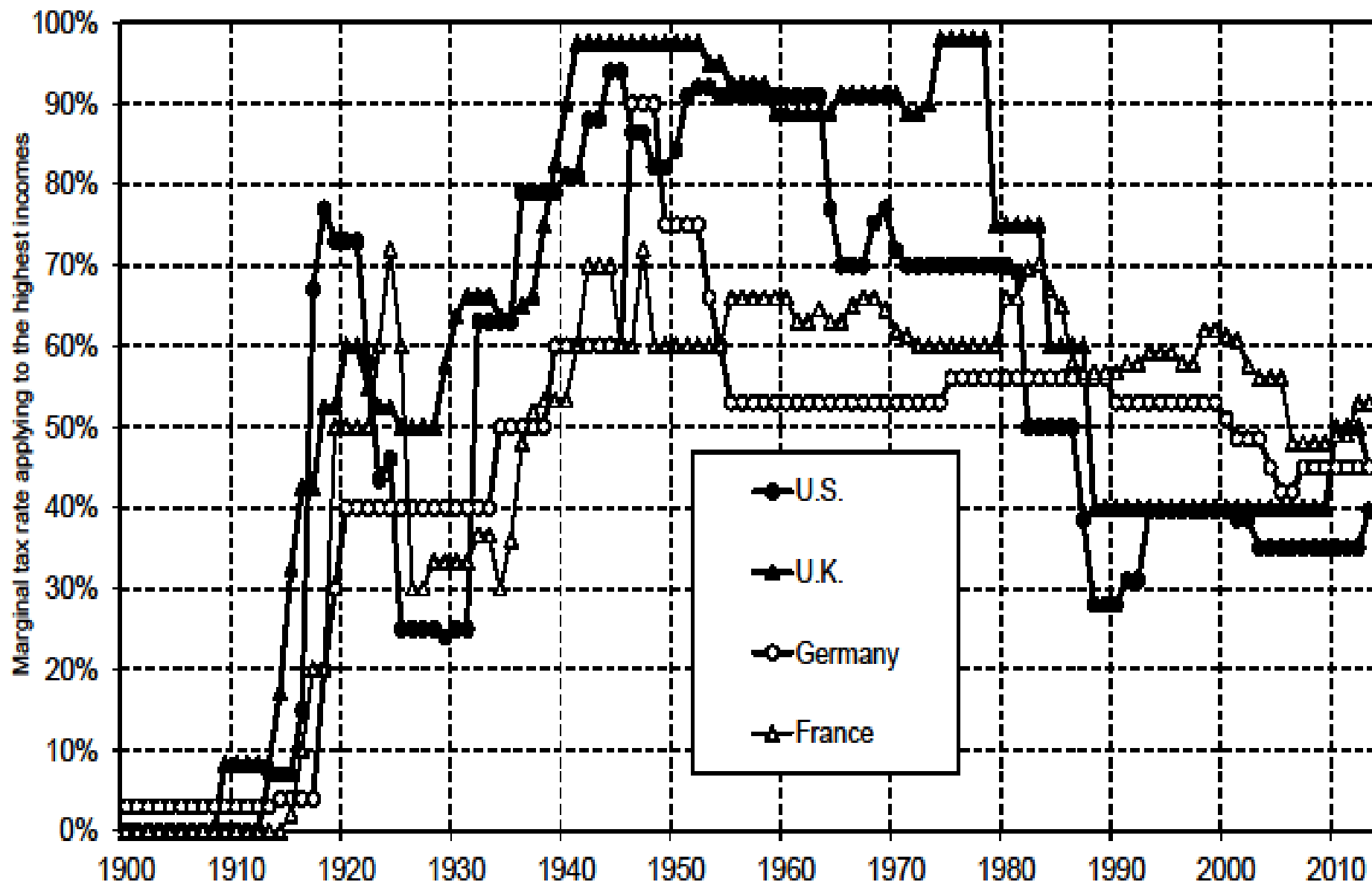
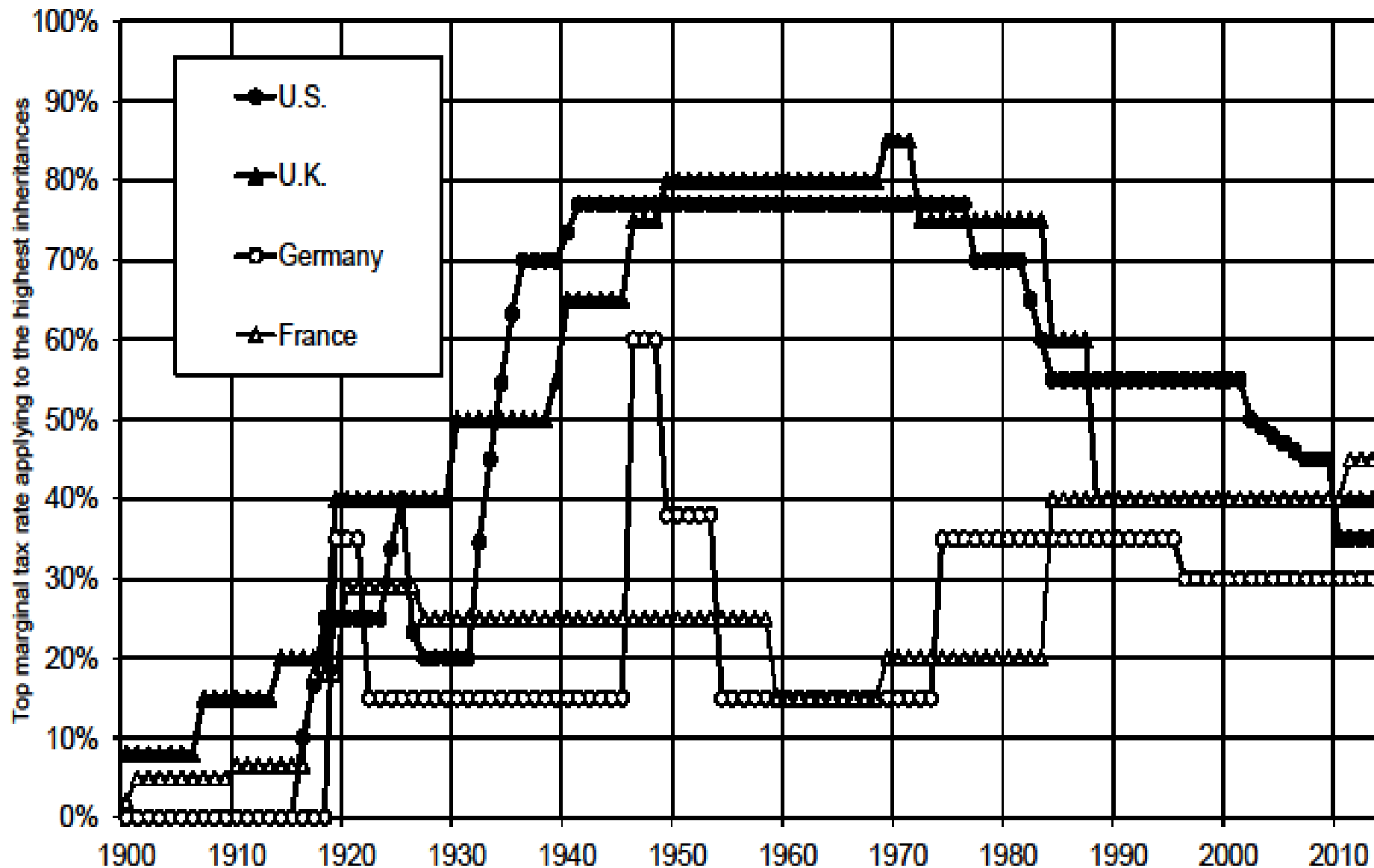


Figure 14.1. Top income tax rates, 1900-2013



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.

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.

Conclusions

- In this presentation I have tried to show that macroeconomists should care about inequality, because of its impact on financial stability and other core macro issues such as capital accumulation and welfare, and also because of its impact on global welfare
- General conclusion: it is urgent for macroeconomics to move beyond representative-agent models. This is happening too slowly, and sometime with too much energy devoted to model-solving and too little attention to data. Of course models can be useful, but only if they are simple and used with parcimony.