Distribution and Growth: How Much Can Inequality Increase in the 21st Century?

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Lille, June 21st 2012

Why inequality keeps rising?

- Long run distributional trends = key question asked by 19^{C} economists
- Many came with apocalyptic answers
- Ricardo-Marx: a small group in society (land owners or capitalists) will capture an ever growing share of income & wealth

  → no “balanced development path” can occur
- During 20^{C}, a more optimistic consensus emerged: “growth is a rising tide that lifts all boats”

  (Kuznets 1953; cold war context)

- But inequality ↑ since 1970s destroyed this fragile consensus (US 1976-2007: ≈60% of total growth was absorbed by top 1%)

→ 19^{C} economists raised the right questions; we need to adress these questions again; we have no strong reason to believe in balanced development path

- 2007-2011 world financial crisis also raised doubts about balanced devt path… will stock options & bonuses, or oil-rich countries, or China, or tax havens, absorb an ever growing share of world ressources in 21^{C} capitalism?

Convergence vs divergence

- **Convergence forces do exist**: diffusion of knowledge btw countries (fostered by econ & fin integration)

& wth countries (fostered by adequate educ institutions)

- **But divergence forces can be stronger**:

(1) When top earners set their own pay, there's no limit to rent extraction → top income shares can diverge

(2) The wealth accumulation process contains several divergence forces, especially with r > g → a lot depends on the net-of-tax global rate of return r on large diversified portfolios : if r=5%-6% in 2010-2050 (=what we observe in 1980-2010 for large Forbes fortunes, or Abu Dhabi sovereign fund, or Harvard endowment), then global wealth divergence is very likely

This talk: two issues

- **1.The rise of the working rich**

(Atkinson-Piketty-Saez,« Top Incomes in the Long Run of History », JEL 2011; new results from *World Top Incomes Database*)

(key mechanism: grabbing hand)

- **2.The return of wealth & inheritance**

(Piketty, « On the Long Run Evolution of Inheritance », QJE 2011; Piketty-Zucman, « Capital Accumulation in Rich Countries », WP 2012; first results from *World Wealth & Inheritance Database*) *(preliminary)*

(key mechanism: r>g)

(r = rate of return to wealth, g = growth rate)

1. The Rise of the Working Rich

- **World top incomes database**: 25 countries, annual series over most of 20C, largest historical data set
- **Two main findings**:

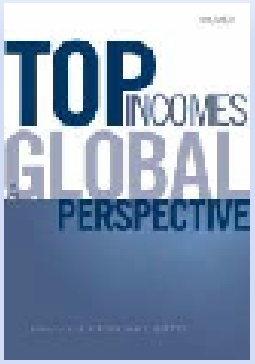
- **The fall of rentiers**: inequality ↓ during first half of 20C = top capital incomes hit by 1914-1945 capital shocks; did not fully recover so far (long lasting shock + progressive taxation)

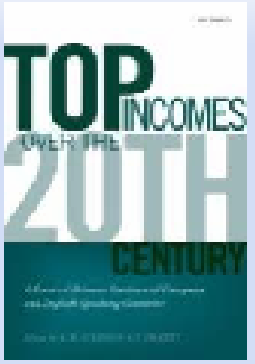
→ without war-induced economic & political shock, there would have been no long run decline of inequality; nothing to do with a Kuznets-type spontaneous process

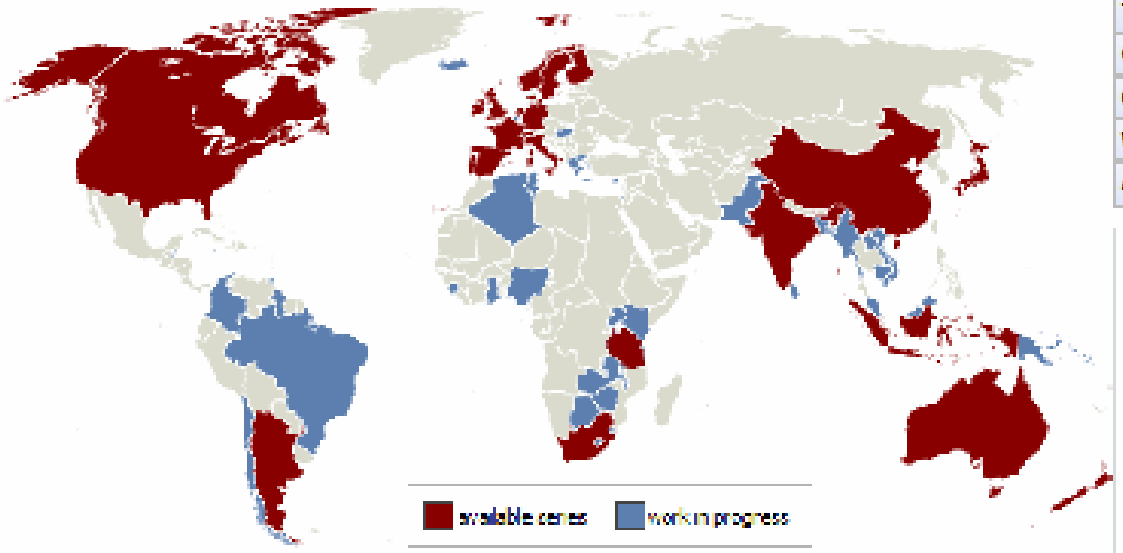
- **The rise of working rich**: inequality ↑ since 1970s; mostly due to top labor incomes, which rose to unprecedented levels; top wealth & capital incomes also recovering, though less fast

→ **what happened?**

The World Top Incomes Database







Institute for New Economic Thinking

Center for Equitable Growth

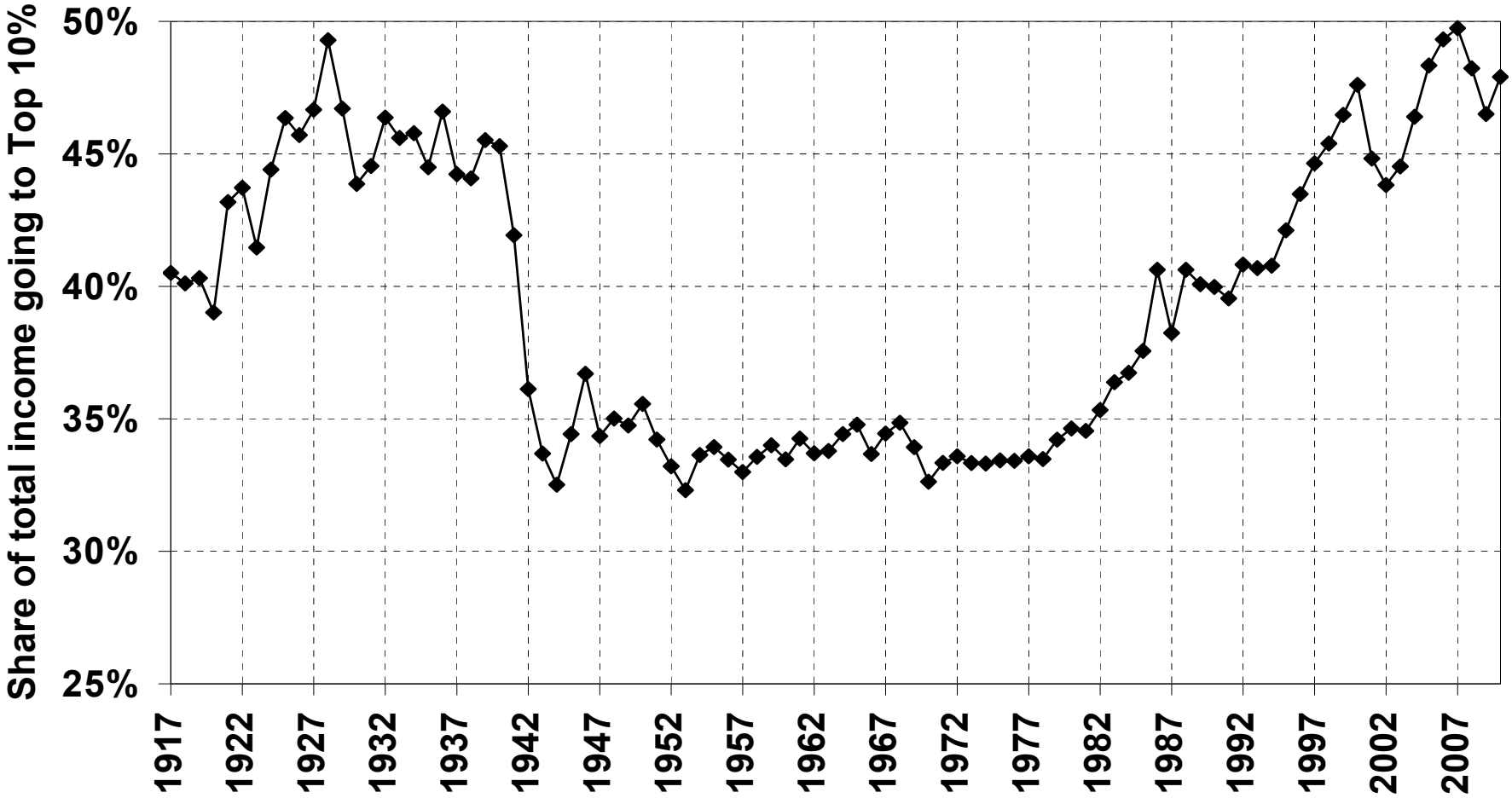
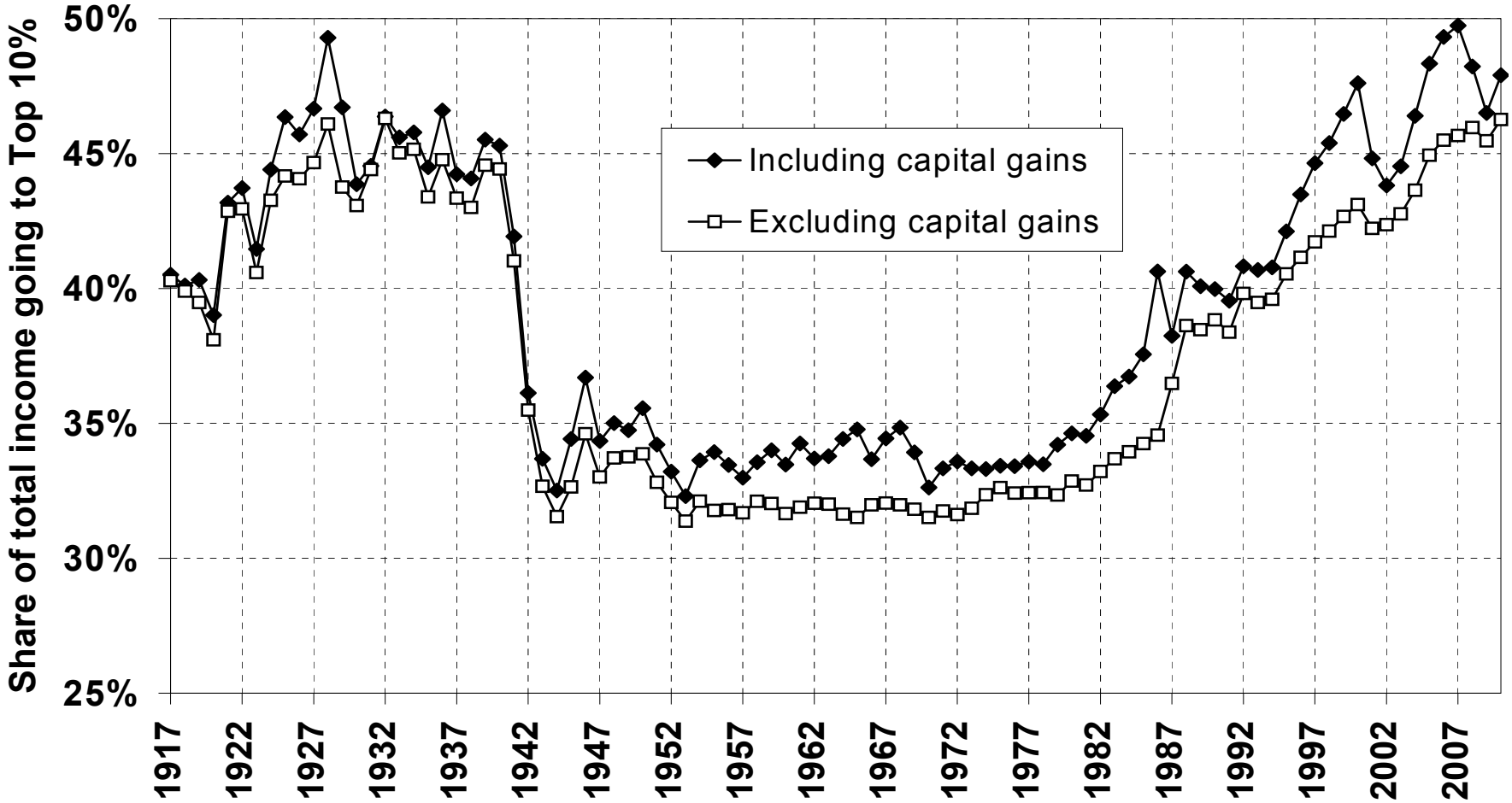


FIGURE 1

The Top Decile Income Share in the United States, 1917-2010

Source: Piketty and Saez (2003), series updated to 2010.
Income is defined as market income including realized capital gains (excludes government transfers).



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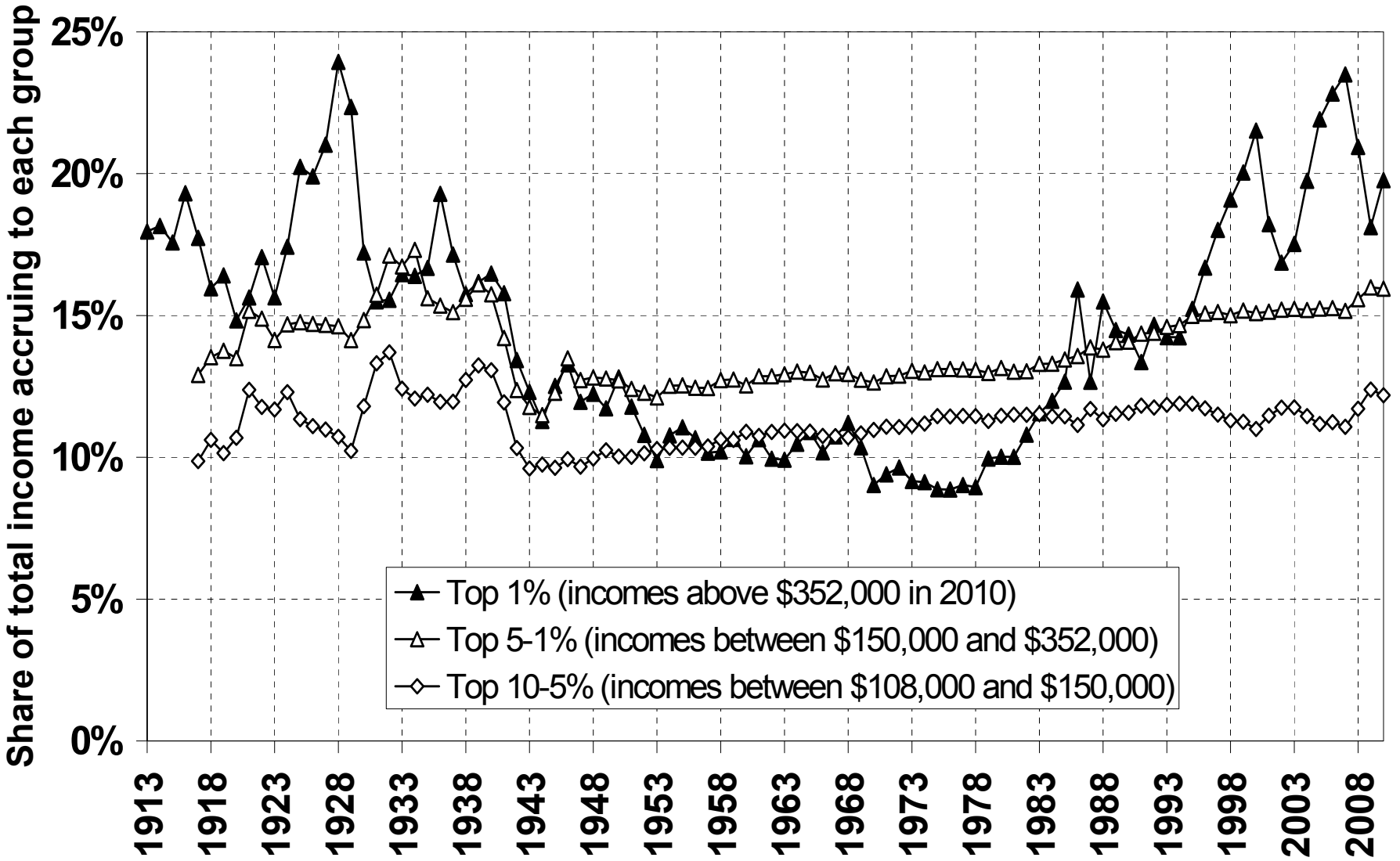
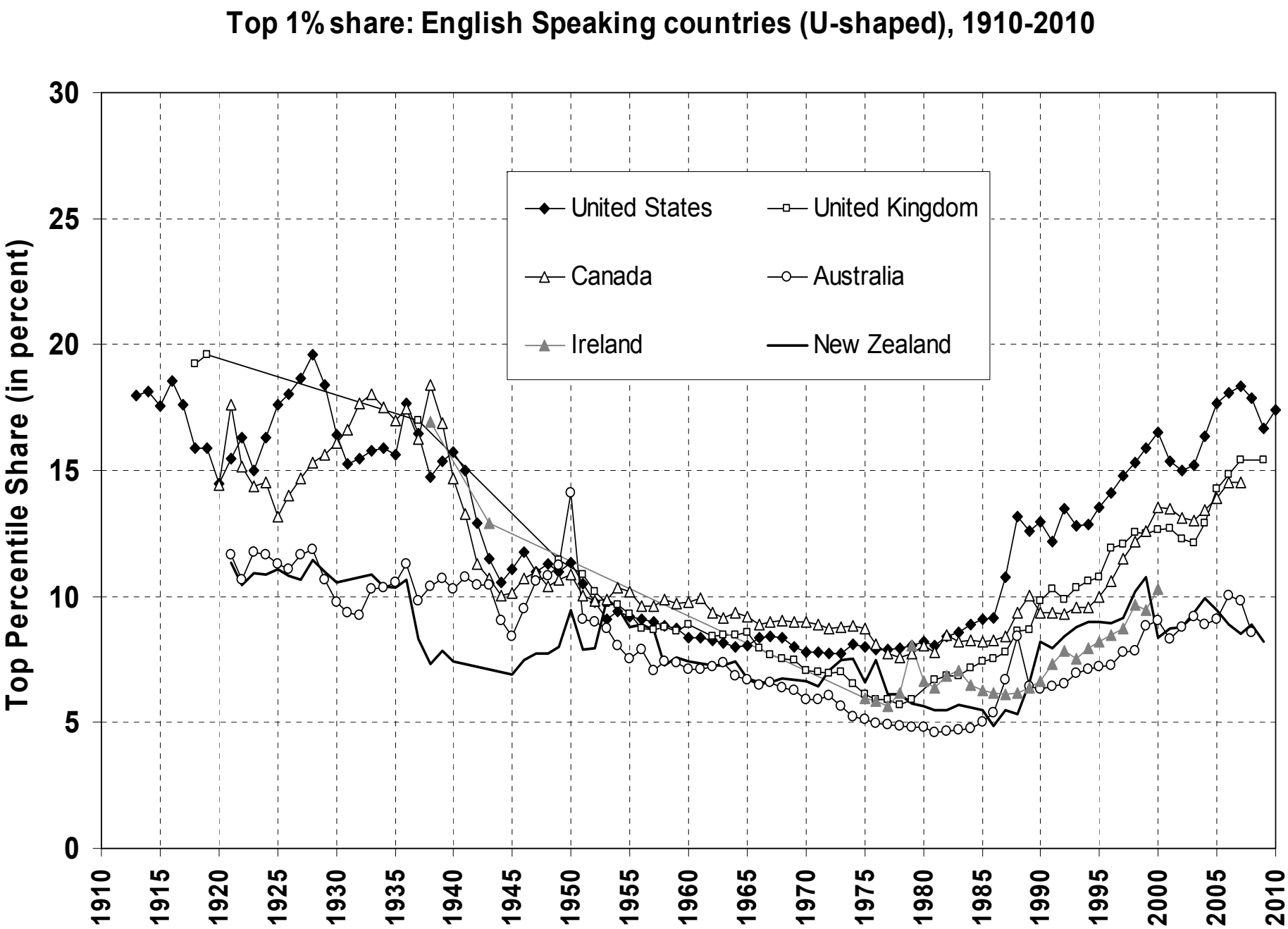
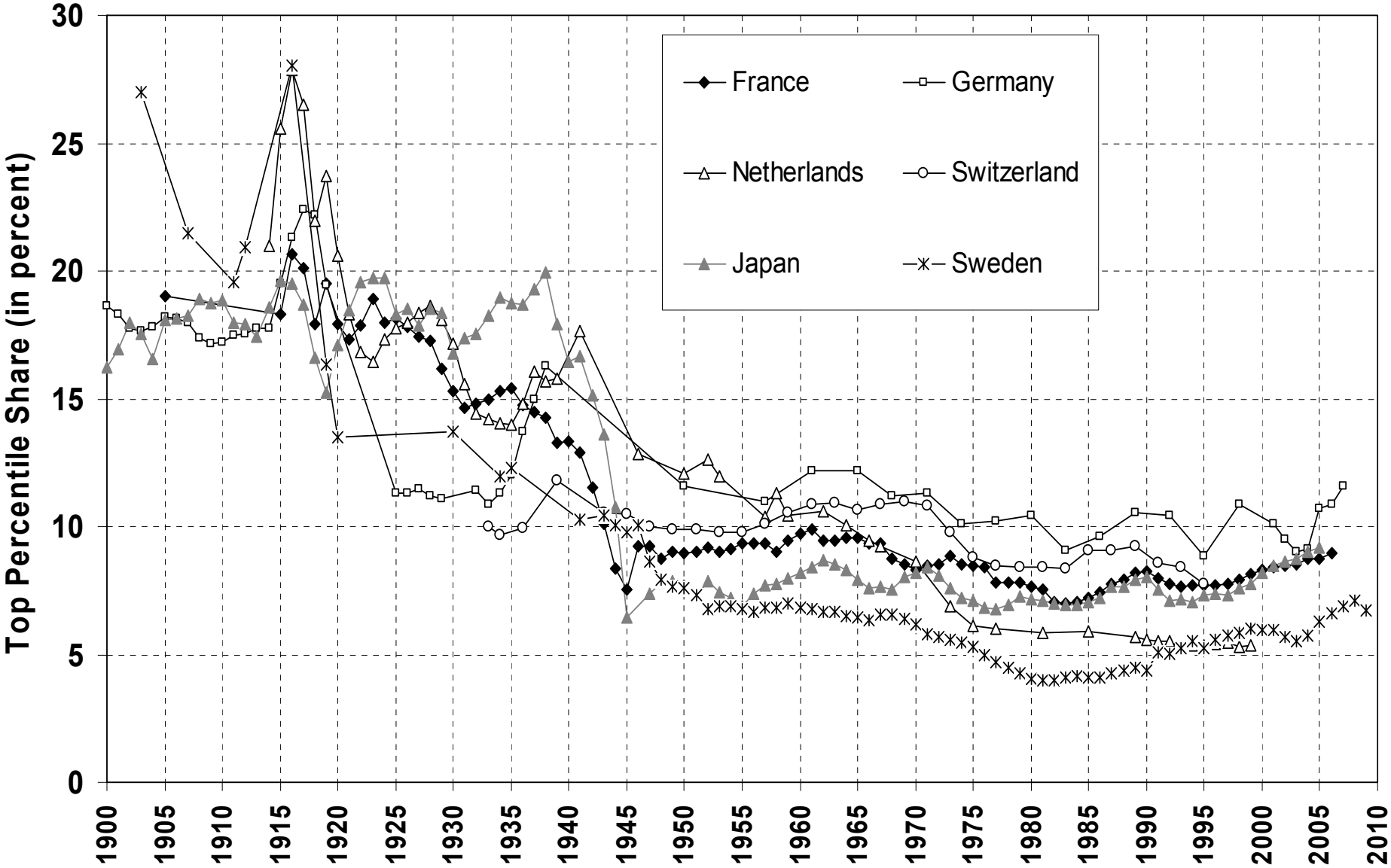


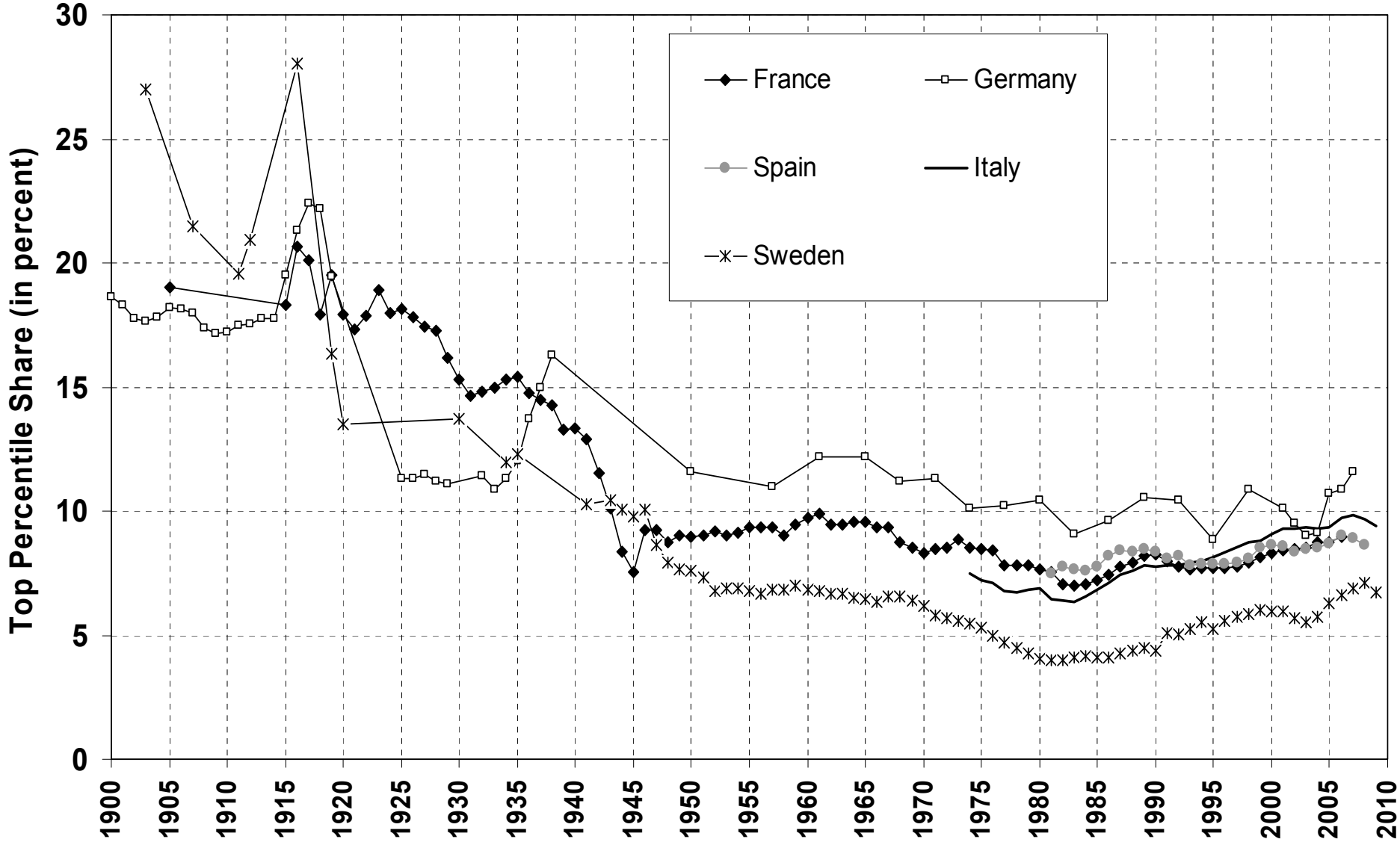
FIGURE 2

Decomposing the Top Decile US Income Share into 3 Groups, 1913-2010

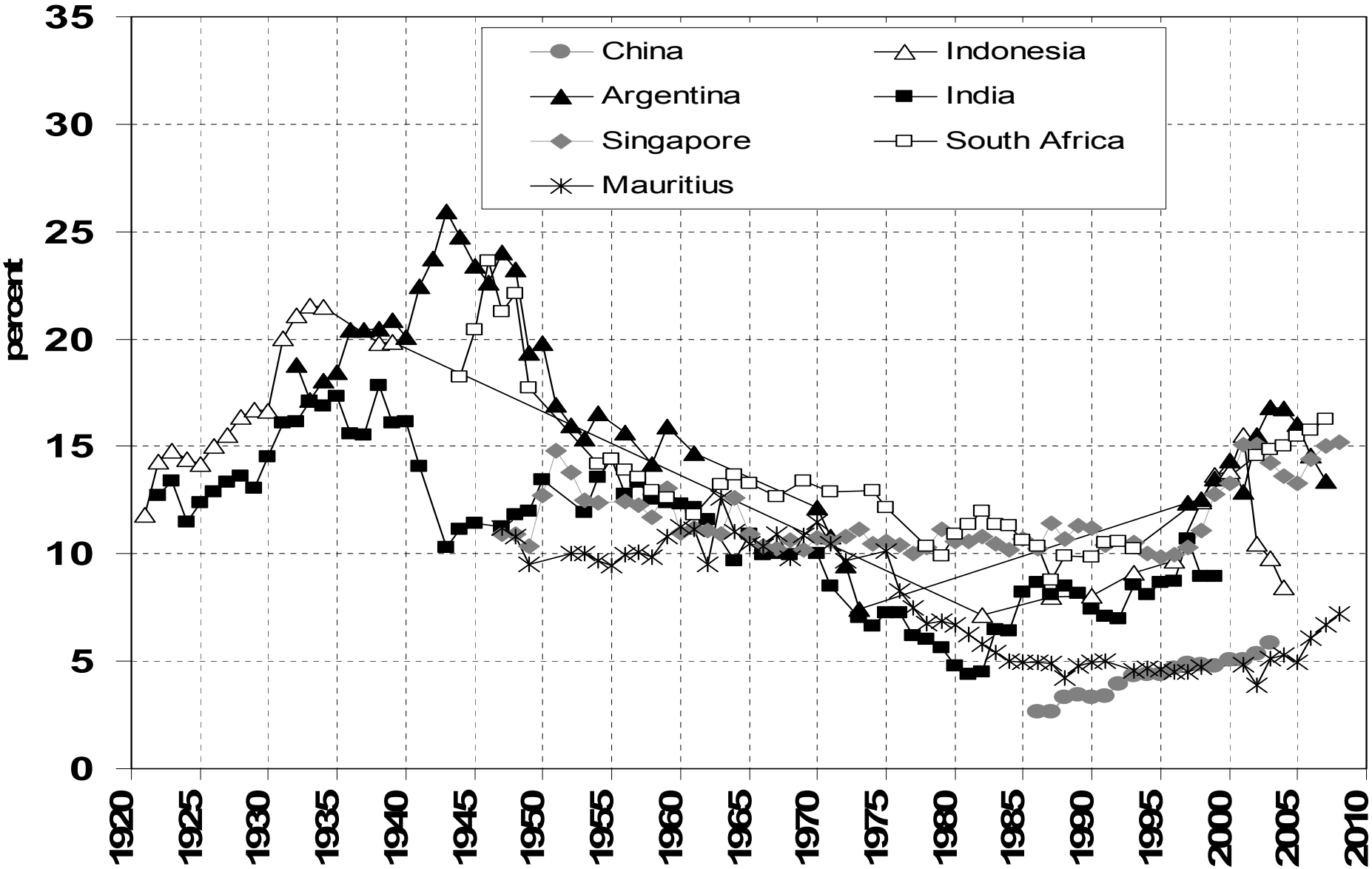

Top 1% share: English Speaking countries (U-shaped), 1910-2010
Top Percentile Share (in percent)
30
25
20
15
10
5
0
1910
1915
1920
1925
1930
1935
1940
1945
1950
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
United States
United Kingdom
Canada
Australia
Ireland
New Zealand

Top 1% share: Continental Europe and Japan (L-shaped), 1900-2010

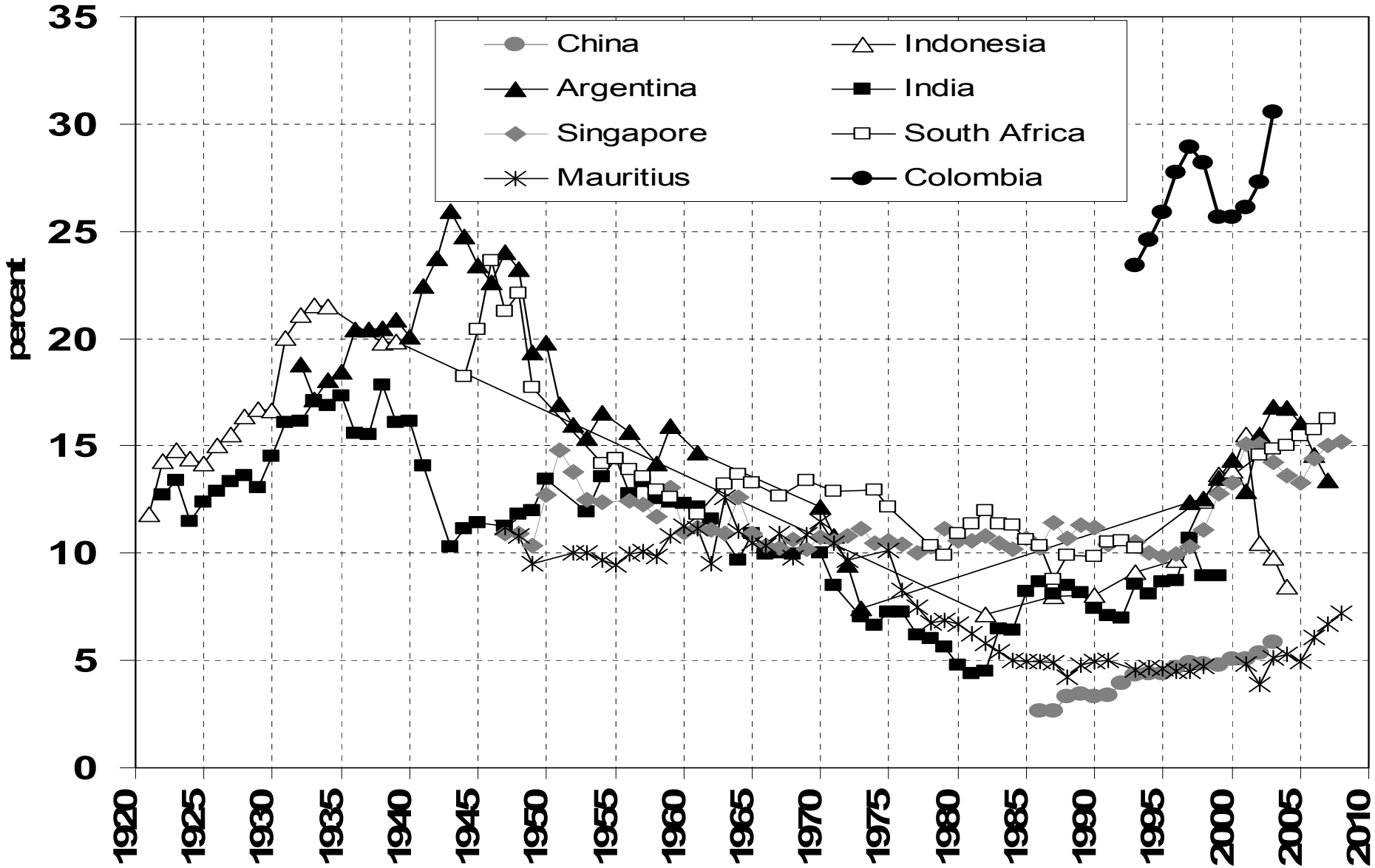



Top 1% share: Continental Europe, North vs South (L-shaped), 1900-2010
Top Percentile Share (in percent)
0
5
10
15
20
25
30
1900
1905
1910
1915
1920
1925
1930
1935
1940
1945
1950
1955
1960
1965
1970
1975
1980
1985
1990
1995
2000
2005
2010
France
Germany
Spain
Italy
Sweden

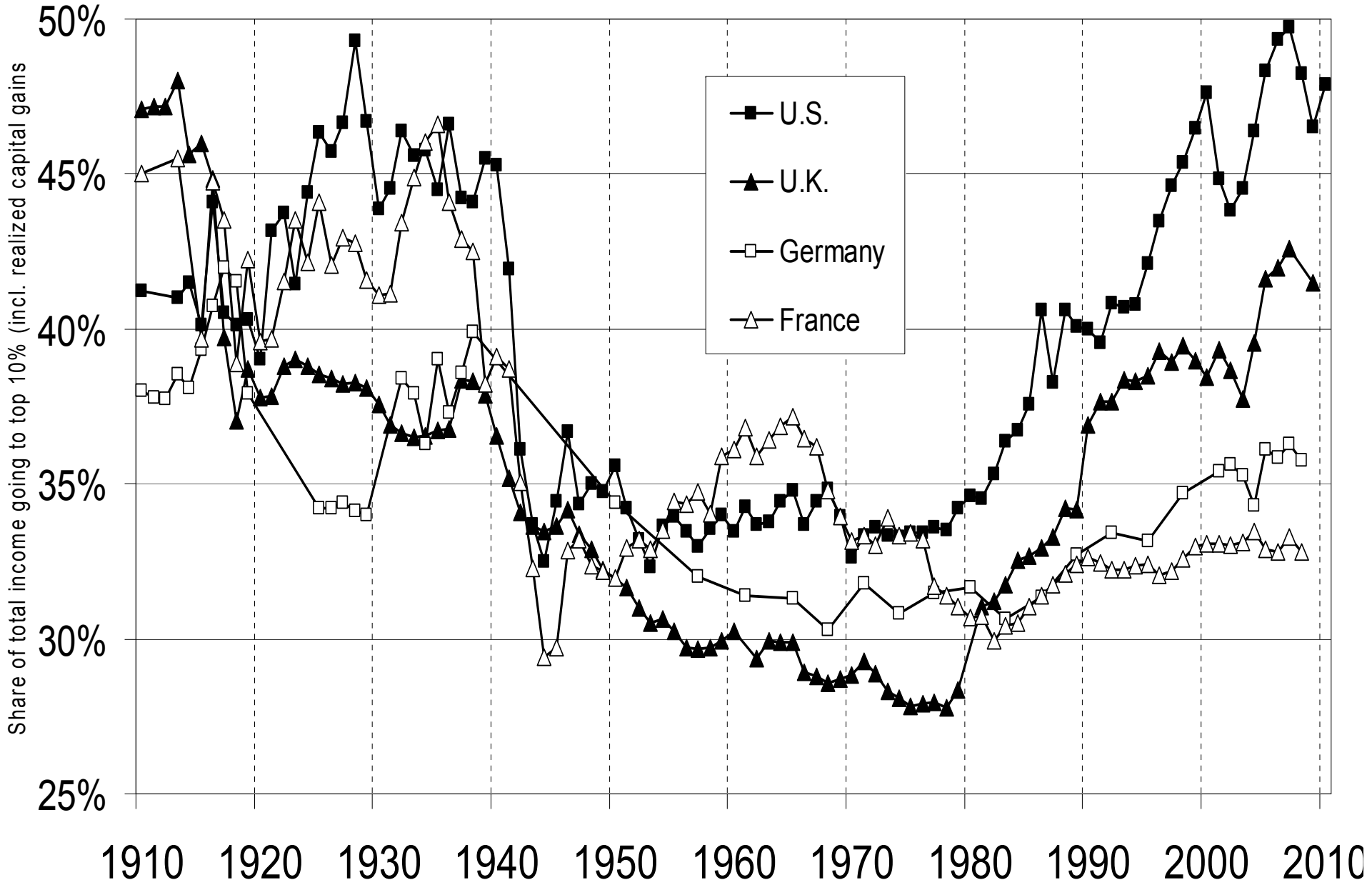
Top 1% share: Developing and emerging countries, 1920-2010



Top 1% share: Developing and emerging countries, 1920-2010



Top Decile Income Shares 1910-2010



Source: World Top Incomes Database, 2012. Missing values interpolated using top 5% and top 1% series.

Why did top incomes rise so much?

- Hard to account for observed cross-country variations with a pure technological, marginal-product story

- One popular view: US today = working rich get their marginal product (globalization, superstars); Europe today (& US 1970s) = market prices for high skills are distorted downwards (social norms, etc.)

→ very naïve view of the top end labor market…

& very ideological: we have zero evidence on the marginal product of top executives; it could well be that prices are distorted upwards…

- A more realistic view: grabbing hand model = marginal products are unobservable; top executives have an obvious incentive to convince shareholders & subordinates that they are worth a lot; no market convergence because constantly changing corporate & job structure (& costs of experimentation → **competition not enough**)

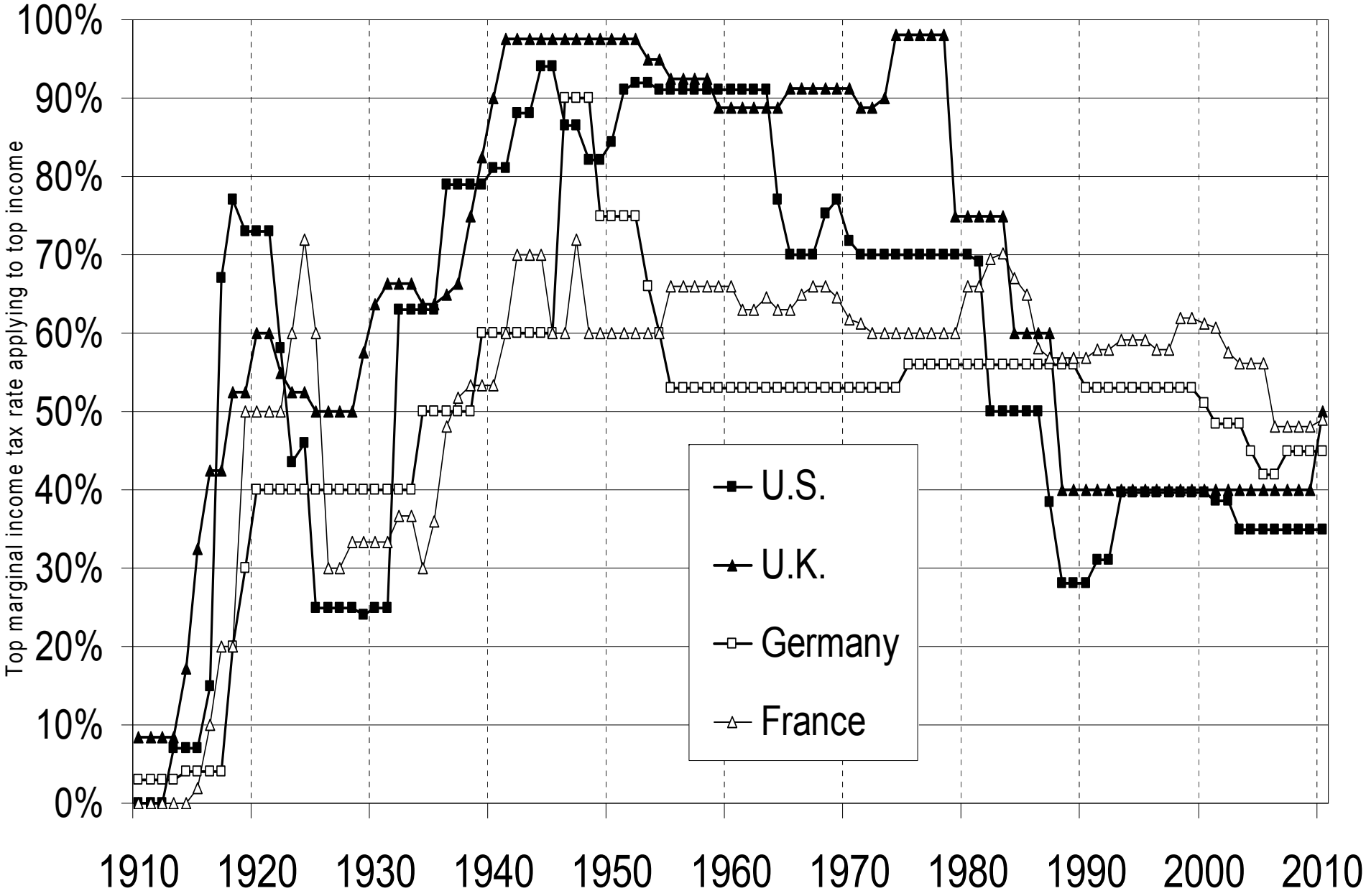
→ when pay setters set their own pay, there's no limit to rent extraction... **unless confiscatory tax rates at the very top**

(memo: US top tax rate (1m$+) 1932-1980 = 82%)

(no more fringe benefits than today)

(see Piketty-Saez-Stantcheva, NBER WP 2011)

Top Income Tax Rates 1910-2010



Source: World Top Incomes Database, 2012.

2. The return of wealth & inheritance

- The rise of top incomes should fuel the rise of top wealth

- But there are other long-run effects explaining the return of wealth & inheritance

- Two different effects (could go separately):

(2a) The return of wealth

(Be careful with « human capital » illusion: human k did not replace old-style financial & real estate wealth)

(2b) The return of inherited wealth

(Be careful with « war of ages » illusion: the war of ages did not replace class war)

2a. The return of wealth

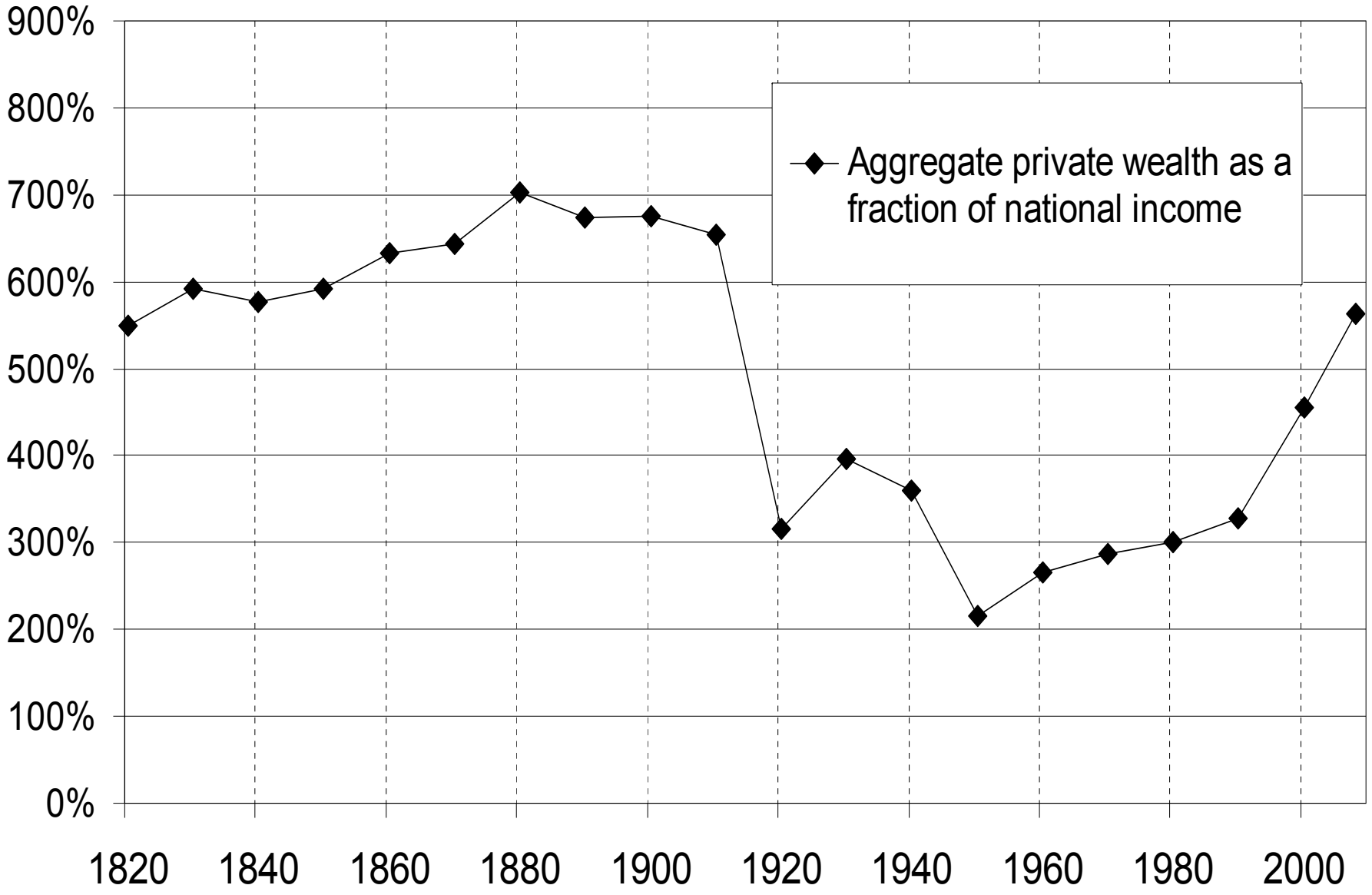
- The « human capital » illusion: « in today's modern economies, what matters is human capital and education, not old-style financial or real estate wealth »
- Technocractic model : Parsons, Galbraith, Becker
  (unidimensional class structure based upon human K)
- But the share of old-style capital income (rent, interest, dividend, etc.) in national income is the same in 2010 as in 1910 (about 30%), and the ratio between aggregate private wealth and national income is also the same in 2010 as in 1910 (about 600%)
- Today in France, Italy, UK: $\beta = W/Y \approx 600\%$

Per adult national income $Y \approx 30\,000€$

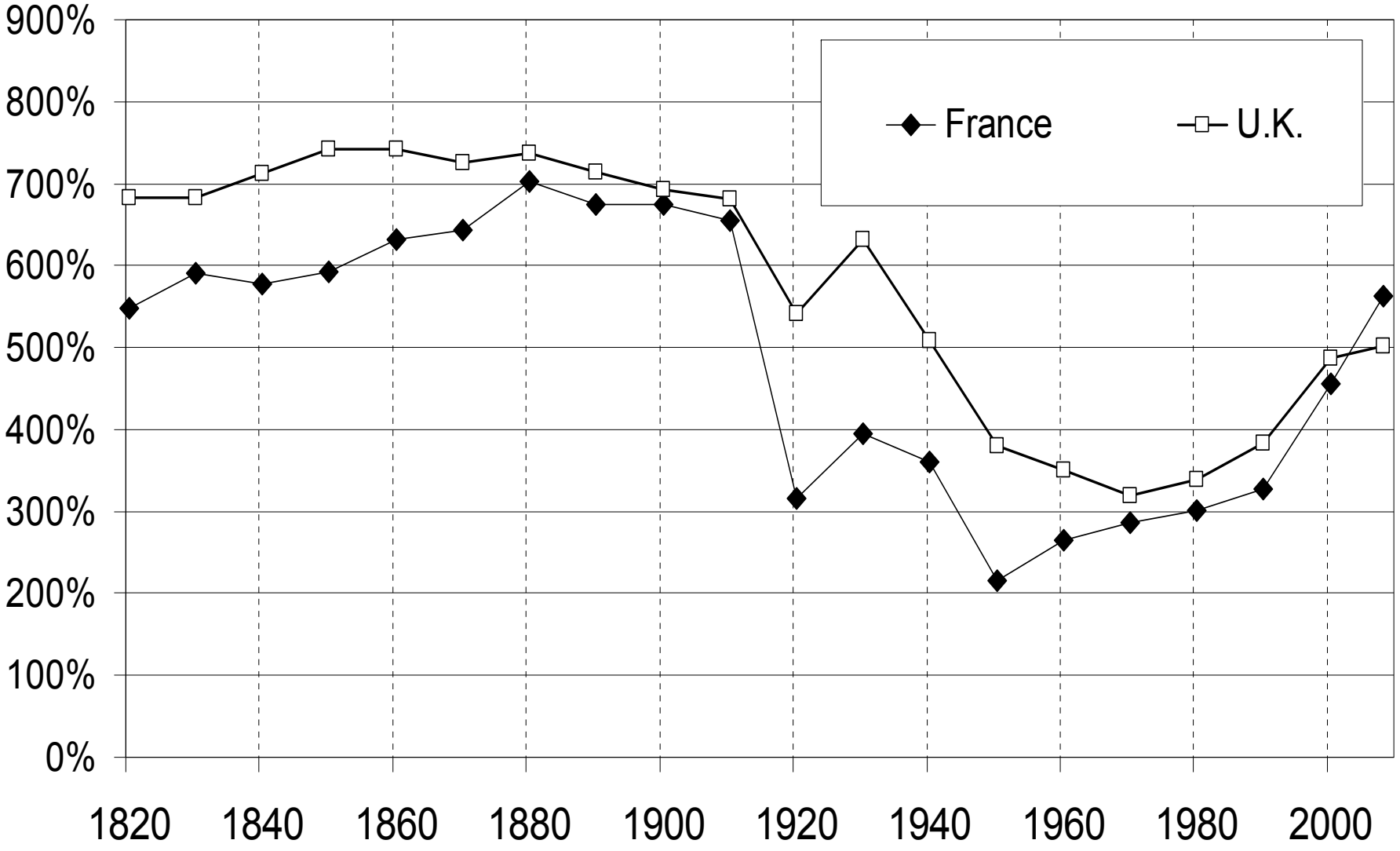
Per adult private wealth $W \approx 200\,000€$

(wealth = financial assets + real estate assets – financial liabilities)

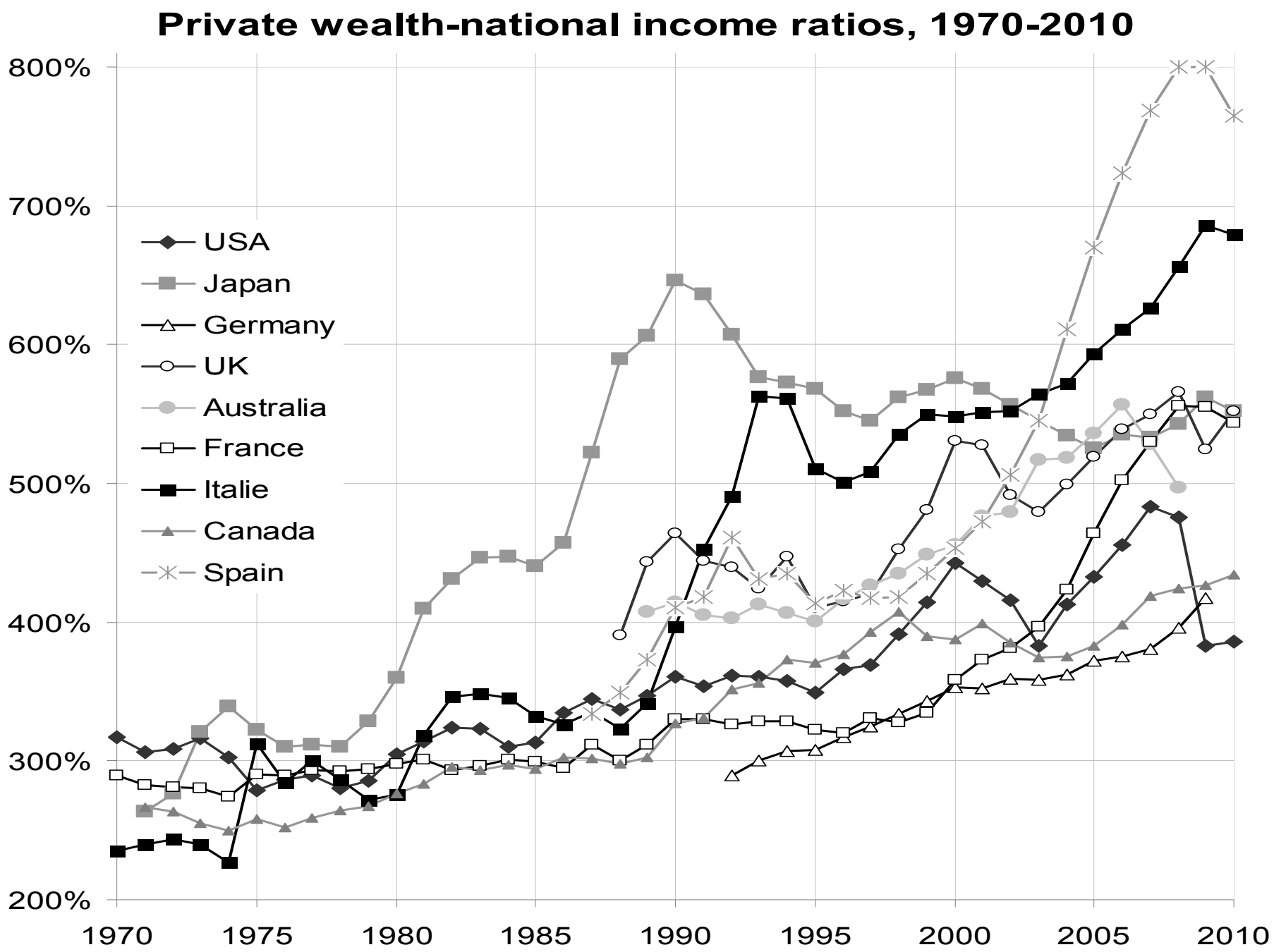
(on average, households own wealth equal to about 6 years of income)


Wealth-income ratio in France 1820-2010
900%
800%
700%
600%
500%
400%
300%
200%
100%
0%
1820
1840
1860
1880
1900
1920
1940
1960
1980
2000
Aggregate private wealth as a fraction of national income

Wealth-income ratio: France vs UK 1820-2010



Sources: France: Piketty 2011; UK: Atkinson 2012, Giffen 1878, Goldsmith 1985


Private wealth-national income ratios, 1970-2010
800%
700%
600%
500%
400%
300%
200%
1970
1975
1980
1985
1990
1995
2000
2005
2010
USA
Japan
Germany
UK
Australia
France
Italie
Canada
Spain

- There are sevreal long-run effects explaining the return of high wealth-income ratios :

- it took a long time to recover from world war shocks
  (1913 stock mkt & real estate capitalization recovered during 2000s)
- financial deregulation & tax competition → rising capital shares and wealth-income ratios
- growth slowdown in rich countries: **r > g**

  → rise of wealth-income and inheritance-income ratios

  + rise of wealth inequality (amplifying mechanism)

  (r = rate of return to wealth, g = productivity growth + pop growth)

- **Aggregate effect: Harrod-Domar-Solow formula: β* = s/g**

  (β* = wealth-income ratio, s = saving rate)

(i.e. s=10%, g=2% → β*=500%; if g=1%, then β*=1000%)

(i.e. if we save 10% of income each year, then in the long run we accumulate 5 years of income if growth rate is 2%)

→ highly unstable process if growth rate is low

2b. The return of inherited wealth

- In principle, one could very well observe a return of wealth without a return of inherited wealth
- I.e. it could be that the rise of aggregate wealth-income ratio is due mostly to the rise of life-cycle wealth (pension funds)
- Modigliani life-cycle theory: people save for their old days and die with zero wealth, so that inheritance flows are small
- However the Modigliani story happens to be wrong (except in the 50s-60s, when there's not much left to inherit…)
- Inheritance flow-private income ratio $B/Y = \mu\, m\, W/Y$

(with m = mortality rate, μ = relative wealth of decedents)

- B/Y has almost returned to 1910 level, both because of W/Y and because of μ: with g low & r>g, $B/Y \to \beta/H$

→ with β=600% & H=generation length=30 years, then B/Y≈20%, i.e. annual inheritance flow ≈ 20% national income

Figure 1: Annual inheritance flow as a fraction of national income, France 1820-2008

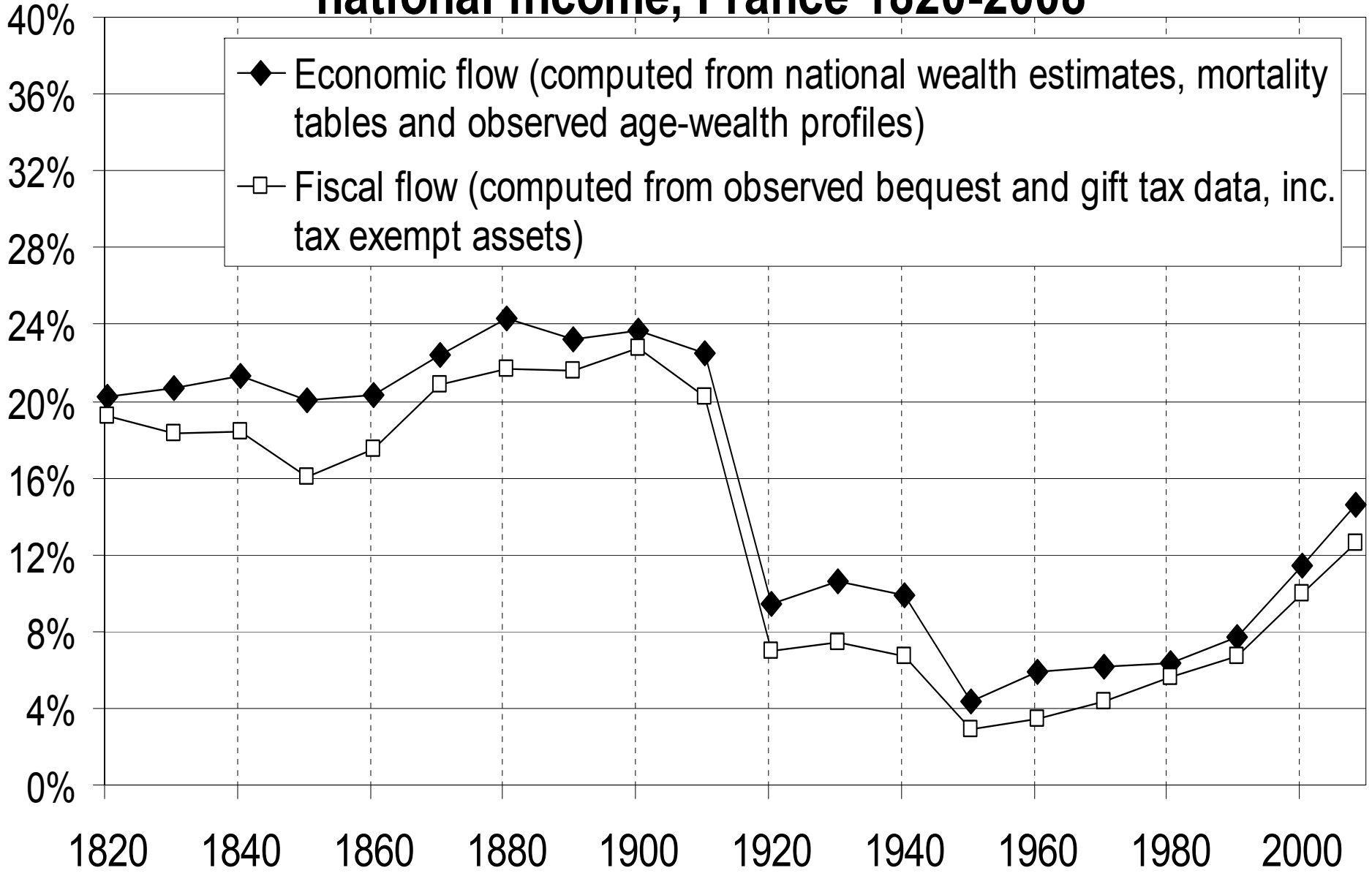
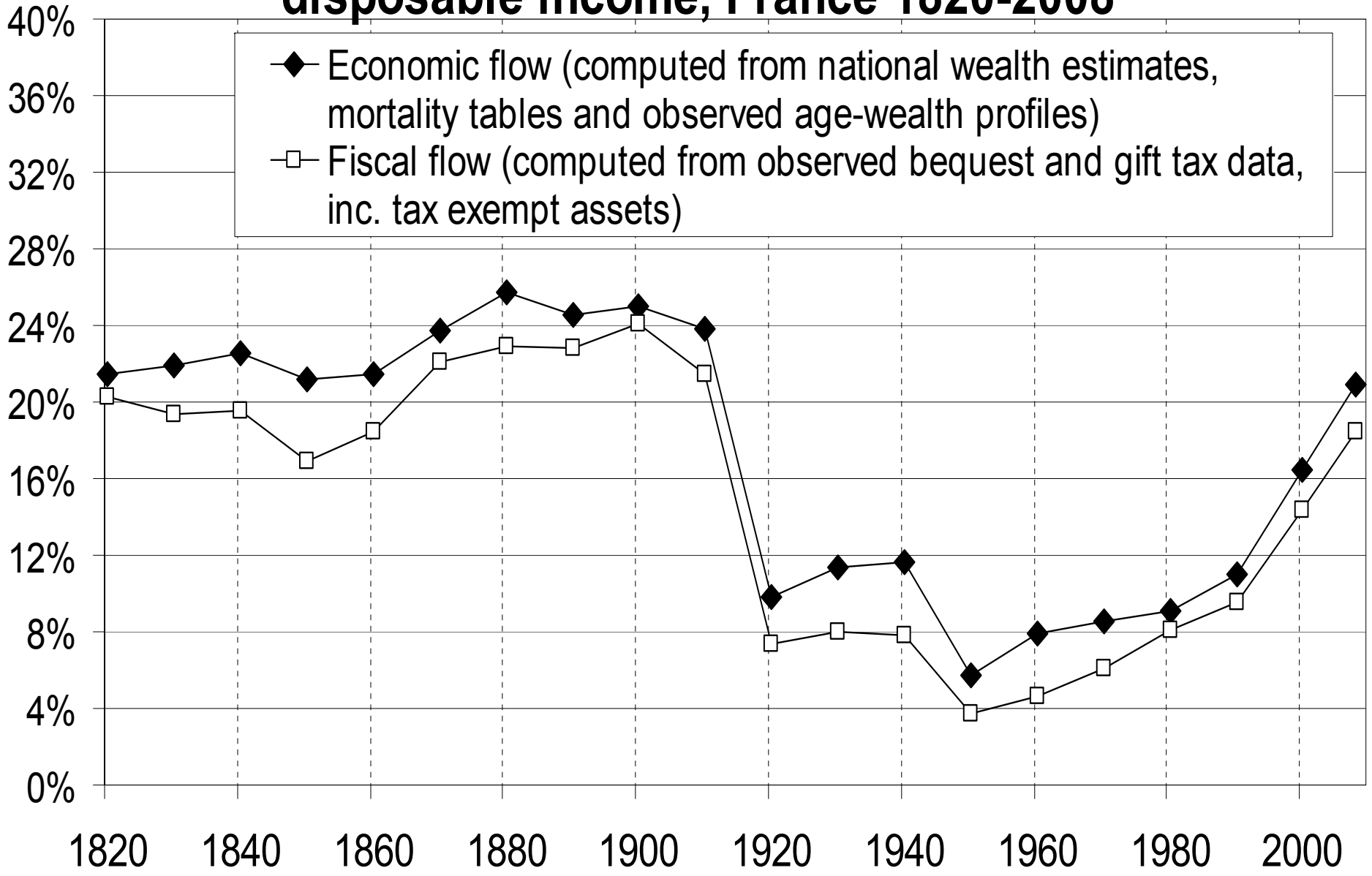


Figure 2: Annual inheritance flow as a fraction of disposable income, France 1820-2008



- An annual inheritance flow around 20%-25% of disposable income is a very large flow

- E.g. it is much larger than the annual flow of new savings (typically around 10%-15% of disposable income), which itself comes in part from the return to inheritance (it's easier to save if you have inherited your house & have no rent to pay)

- An annual inheritance flow around 20%-25% of disposable income means that total, cumulated inherited wealth represents the vast majority of aggregate wealth (typically above 80%-90% of aggregate wealth), and vastly dominates self-made wealth

- **Main lesson: with r>g, inheritance is bound to dominate new wealth; the past eats up the future**

Note: r = rate of return to capital = (net profits + rents)/(net financial + real estate wealth) ; g = growth rate (g+n)

- **Intuition**: with r>g & g low (say r=4%-5% vs g=1%-2%), wealth coming from the past is being capitalized faster than growth; heirs just need to save a fraction g/r of the return to inherited wealth → $b_y=\beta/H$ (with $\beta=W/Y$)

→ with $\beta=600\%$ & $H=30$, then $b_y=20\%$

- It is only in countries & time periods with g exceptionally high that self-made wealth dominates inherited wealth (OECD in 1950s-70s or China today)
- r>g also has an amplifying effect on wealth inequality

Table 3: Intra-cohort distributions of labor income and inheritance, France, 1910 vs 2010

Shares in aggregate labor income or inherited wealth	Labor income 1910-2010	Inherited wealth	
		1910	2010
Top 10% "Upper Class"	**30%**	**90%**	**60%**
incl. Top 1% "Very Rich"	*6%*	*50%*	*25%*
incl. Other 9% "Rich"	*24%*	*40%*	*35%*
Middle 40% "Middle Class"	**40%**	**5%**	**35%**
Bottom 50% "Poor"	**30%**	**5%**	**5%**

Back to distributional analysis: macro ratios determine who is the dominant social class

- 19^{C}: top successors dominate top labor earners

→ rentier society (Balzac, Jane Austen, etc.)

- For cohorts born in1910s-1950s, inheritance did not matter too much → labor-based, meritocratic society
- But for cohorts born in the 1970s-1980s & after, inheritance matters a lot

→ 21^{c} class structure will be intermediate between 19^{c} rentier society than to 20^{c} meritocratic society – and possibly closer to the former

- The rise of human capital & meritocracy was an illusion .. especially with a labor-based tax system

Figure 15: Cohort fraction inheriting more than bottom 50% lifetime labor resources (cohorts born in 1820-2020)

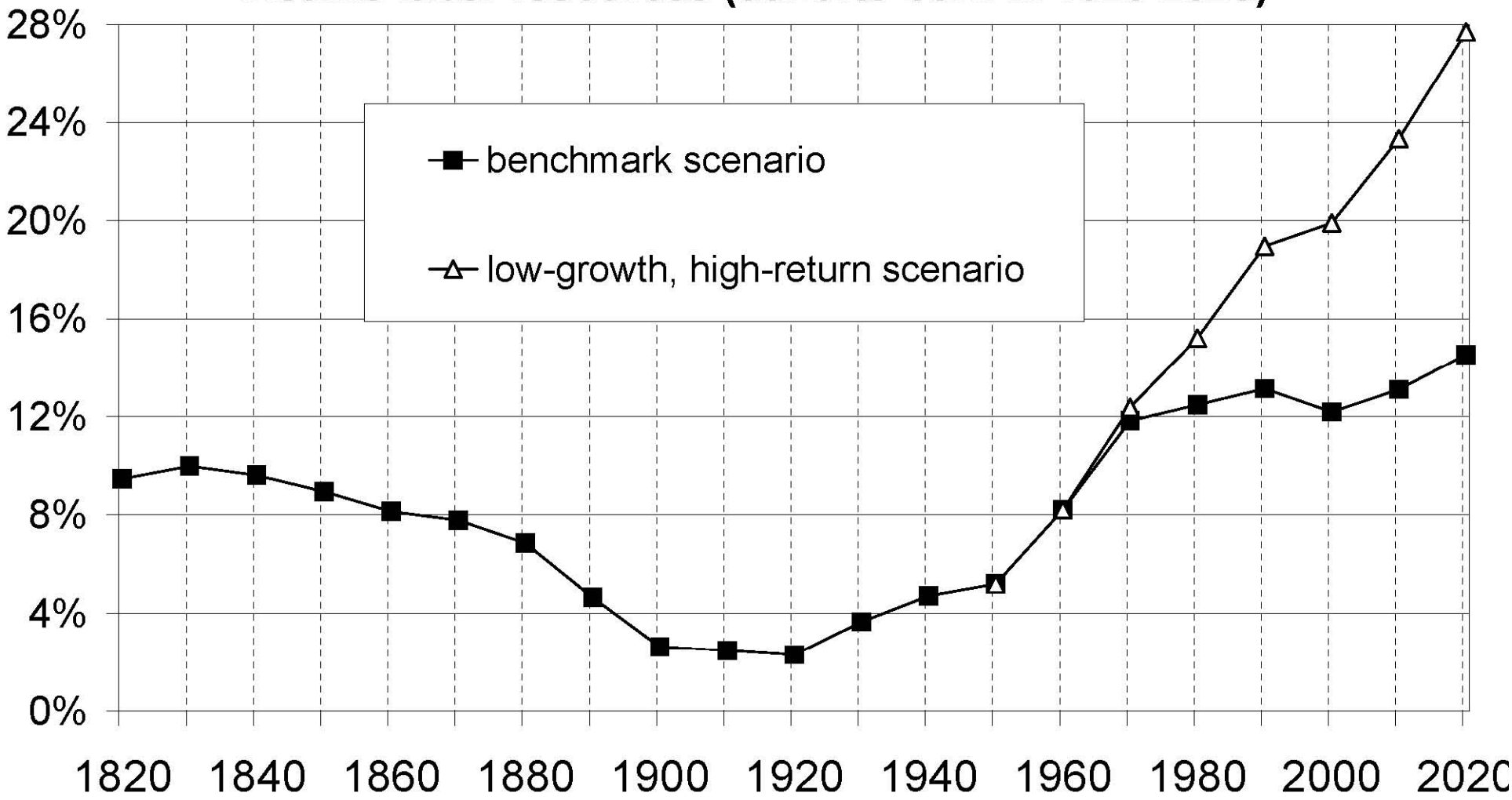
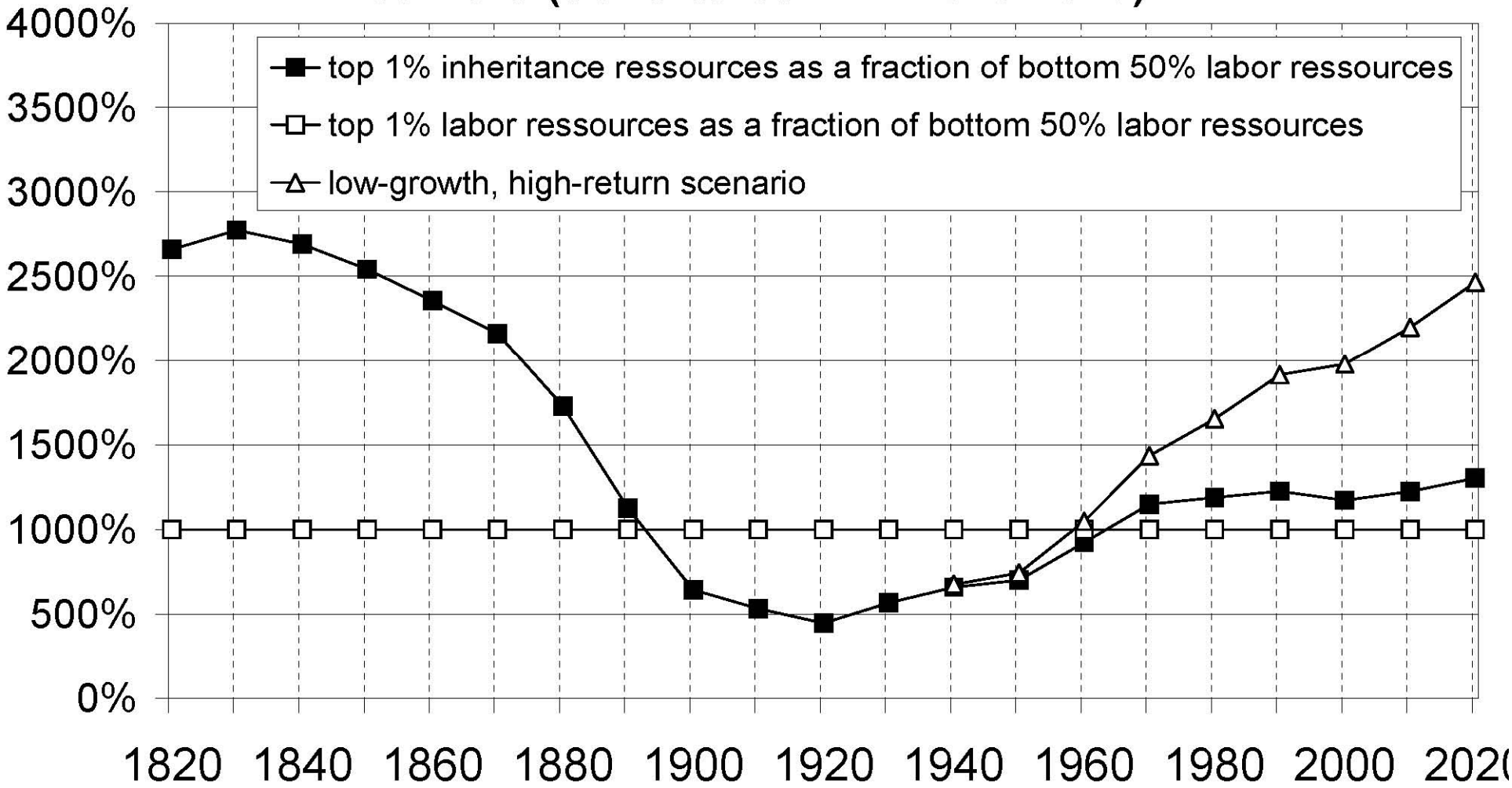


Figure 14: Top 1% successors vs top 1% labor income earners (cohorts born in 1820-2020)



What have we learned?

- A world with g low & r>g is gloomy for workers with zero initial wealth… especially if global tax competition drives capital taxes to 0%… especially if top labor incomes take a rising share of aggregate labor income

→ A world with g=1-2% (=long-run world technological frontier?) is not very different from a world with g=0% (Marx-Ricardo)

- From a r-vs-g viewpoint, 21^{c} maybe not too different from 19^{c} – but still better than Ancien Regime… except that nobody tried to depict AR as meritocratic…

The meritocratic illusion

Democracies rely on meritocratic values: in order to reconcile the principle of political equality with observed socio-economic inequalities, they need to justify inequality by merit and/or common utility

- **But effective meritocracy does not come naturally from technical progress & market forces; it requires specific policies & institutions**

- Two (quasi-)illusions: (1) human K didn't replace financial K (2) war of ages didn't replace war of classes
- « Meritocratic extremism » : the rise of working rich & the return of inherited wealth can seem contradictory; but they go hand in hand in 21^{c} discourse: in the US, working rich are viewed as the only cure against the return of inheritance – except of course for bottom 90% workers…

- **More competitive & efficient markets won't help to curb divergence forces:**

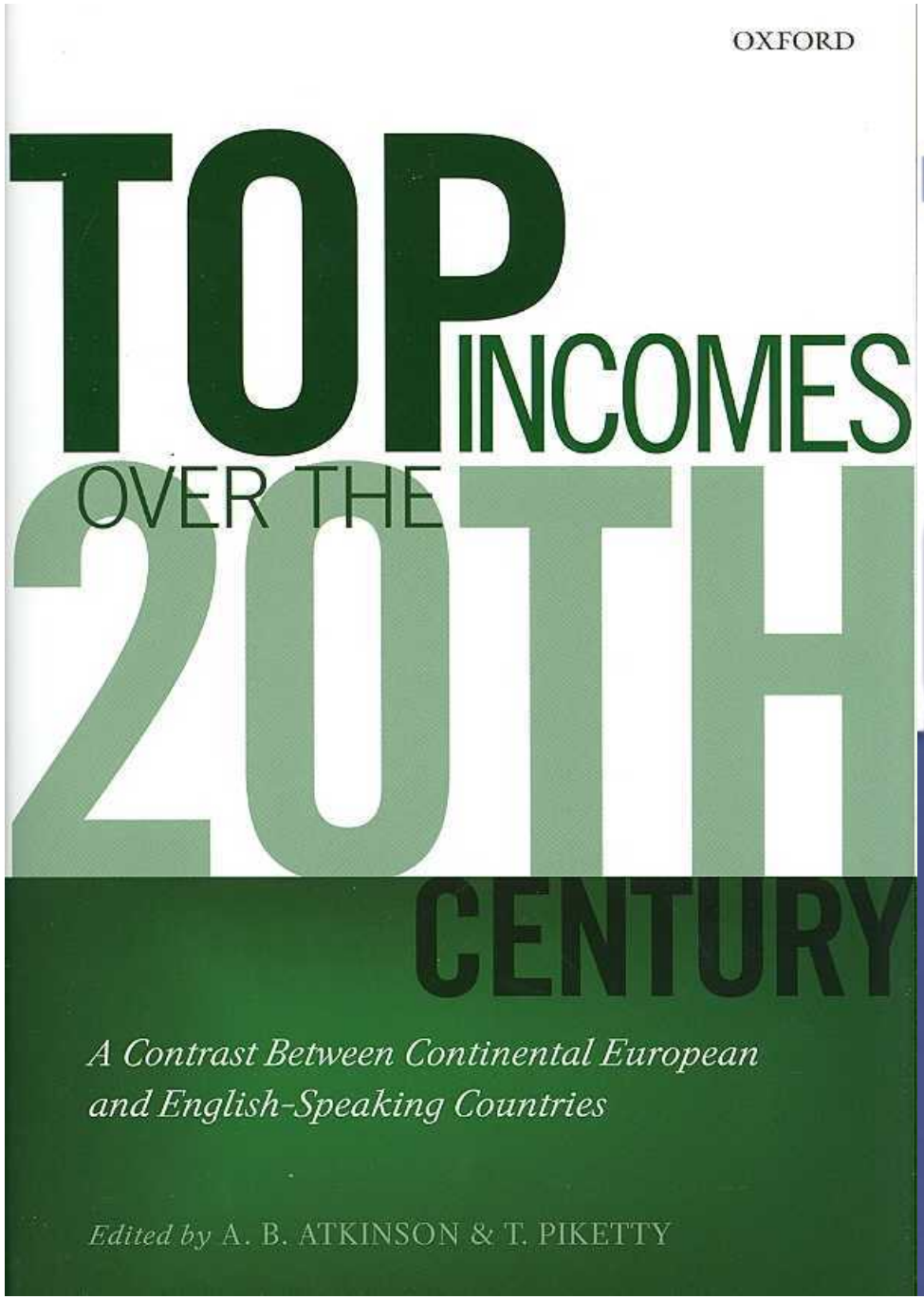
(1) Competition and greed fuel the grabbing hand mechanism; with imperfect information, competitive forces not enough to get pay = marginal product; **only confiscatory top rates can calm down top incomes**

(2) The more efficient the markets, the sharper the capital vs labor distinction; with highly developed k markets, any dull successor can get a high rate of return

- **r>g = nothing to do with market imperfections**
- Standard model: $r = \delta+\sigma g > g$ (Golden rule)

→ The important point about capitalism is that r is large (r>g → tax capital, otherwise society is dominated by rentiers), volatile and unpredictable (→ financial crisis)

Supplementary slides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OVER THE 20TH CENTURY
A Contrast Between Continental European and English-Speaking Countries
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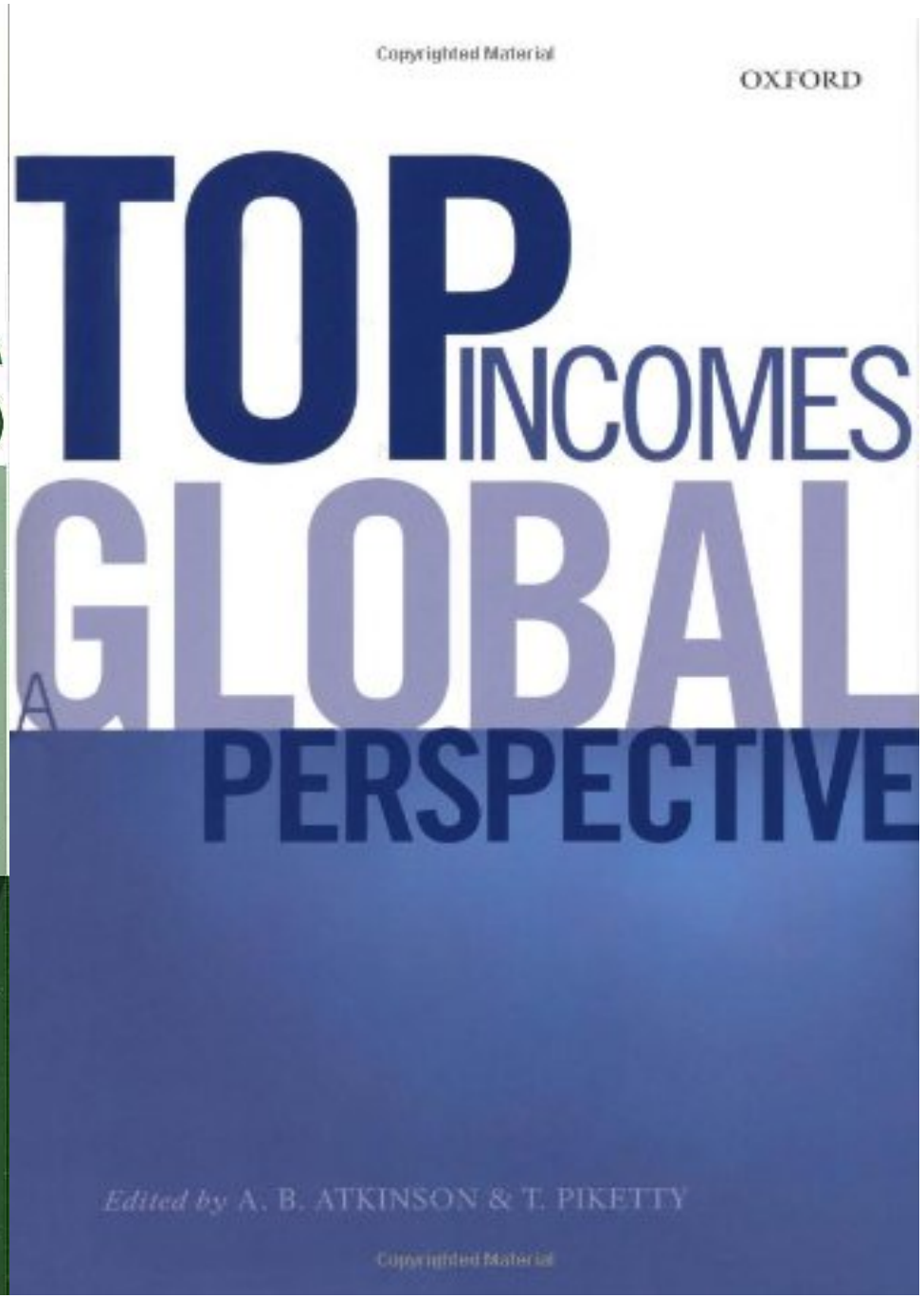
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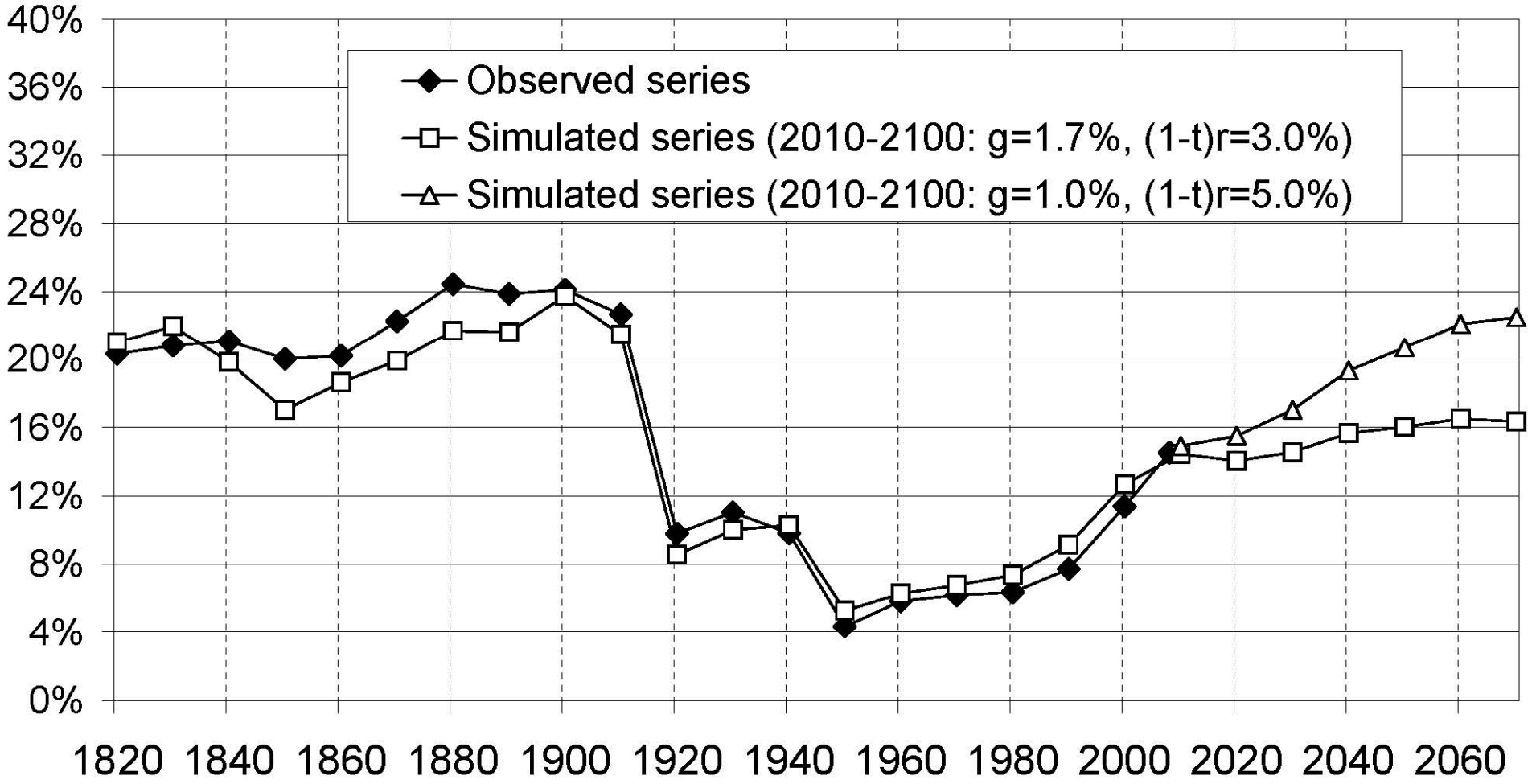
Table 1. Top Percentile Share and Average Income Growth in the US

	Average Income Real Annual Growth	Top 1% Incomes Real Annual Growth	Bottom 99% Incomes Real Annual Growth	Fraction of total growth captured by top 1%
	(1)	(2)	(3)	(4)
Period 1976-2007	1.2%	4.4%	0.6%	58%
Clinton Expansion 1993-2000	4.0%	10.3%	2.7%	45%
Bush Expansion 2002-2007	3.0%	10.1%	1.3%	65%

Computations based on family market income including realized capital gains (before individual taxes).
Incomes are deflated using the Consumer Price Index (and using the CPI-U-RS before 1992).
Column (4) reports the fraction of total real family income growth captured by the top 1%.
For example, from 2002 to 2007, average real family incomes grew by 3.0% annually but 65% of that growth accrued to the top 1% while only 35% of that growth accrued to the bottom 99% of US families.
Source: Piketty and Saez (2003), series updated to 2007 in August 2009 using final IRS tax statistics.

Figure 9: Observed vs simulated inheritance flow B/Y, France 1820-2100



The future of global inequality

- **Around 1900-1910**: Europe owned the rest of the world; net foreign wealth of UK or France >100% of their national income (>50% of the rest-of-the-world capital stock)
- **Around 2050**: will the same process happen again, but with China instead of Europe?

→ this is the issue explored in Piketty-Zucman, « Will China Own the World? Essay on the Dynamics of the World Wealth Distribution, 2010-2050 », WP PSE 2011

- **Bottom line**: international inequalities even less meritocratic than domestic inequalities; e.g. oil price level has nothing to do with merit; the fact that Greece pays interest rate r=10% on its public debt has nothing to do with merit; the price system has nothing to do with merit…

- Assume global convergence in per capita output Y & in capital intensity K/Y
- With large differences in population

& fully integrated K markets

& high world rate of return r (low K taxes)

Then moderate differences in savings rate

(say, s=20% in China vs s=10% in Europe+US, due to bigger pay-as-you-go pensions in Old World, traumatized by past financial crashes)

can generate very large net foreign asset positions

→ under these assumptions, China might own a large part of the world by 2050

- Likely policy response in the West: K controls, public ownership of domestic firms, etc.
- **But this is not the most likely scenario**: a more plausible scenario is that global billionaires (located in all countries… and particularly in tax havens) will own a rising share of global wealth
- A lot depends on the net-of-tax global rate of return r on large diversified portfolios
- If r=5%-6% in 2010-2050 (=what we observe in 1980-2010 for large Forbes fortunes, or Abu Dhabi sovereign fund, or Harvard endowment), then global divergence is very likely

- Both scenarios can happen

- But the « global billionaires own the world » scenario is more likely than the « China own the world » scenario

- And it is also a lot harder to cope with: we'll need a lot of international policy coordination; without a global crackdown on tax havens & a coordinated world wealth tax on the global rich, individual countries & regions will keep competing to attract billionaires, thereby exacerbating the trend

→ Free, untaxed world K markets can easily lead to major imbalances & global disasters

Figure 13: The share of inheritance in lifetime ressources received by cohorts born in 1820-2020

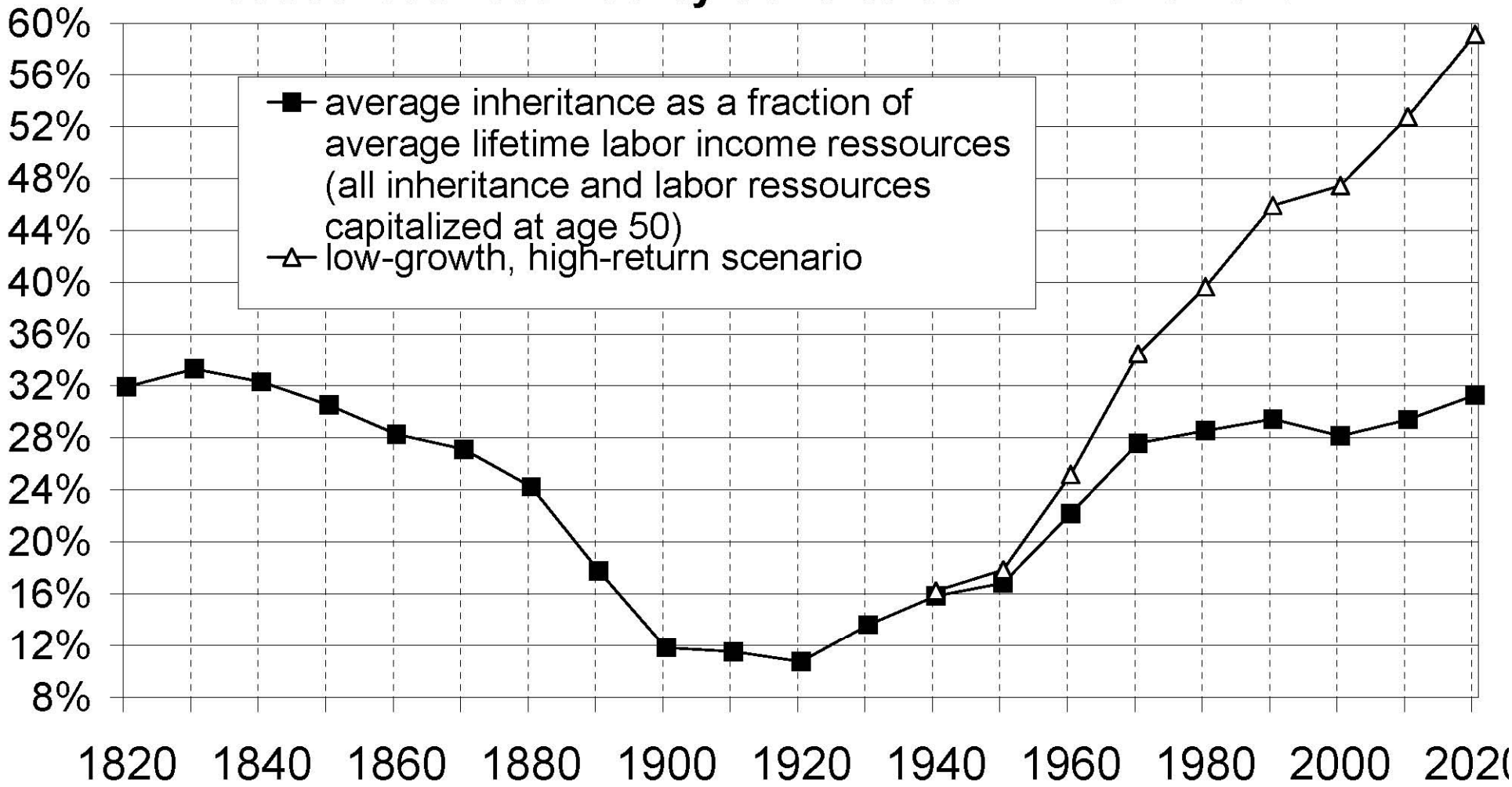
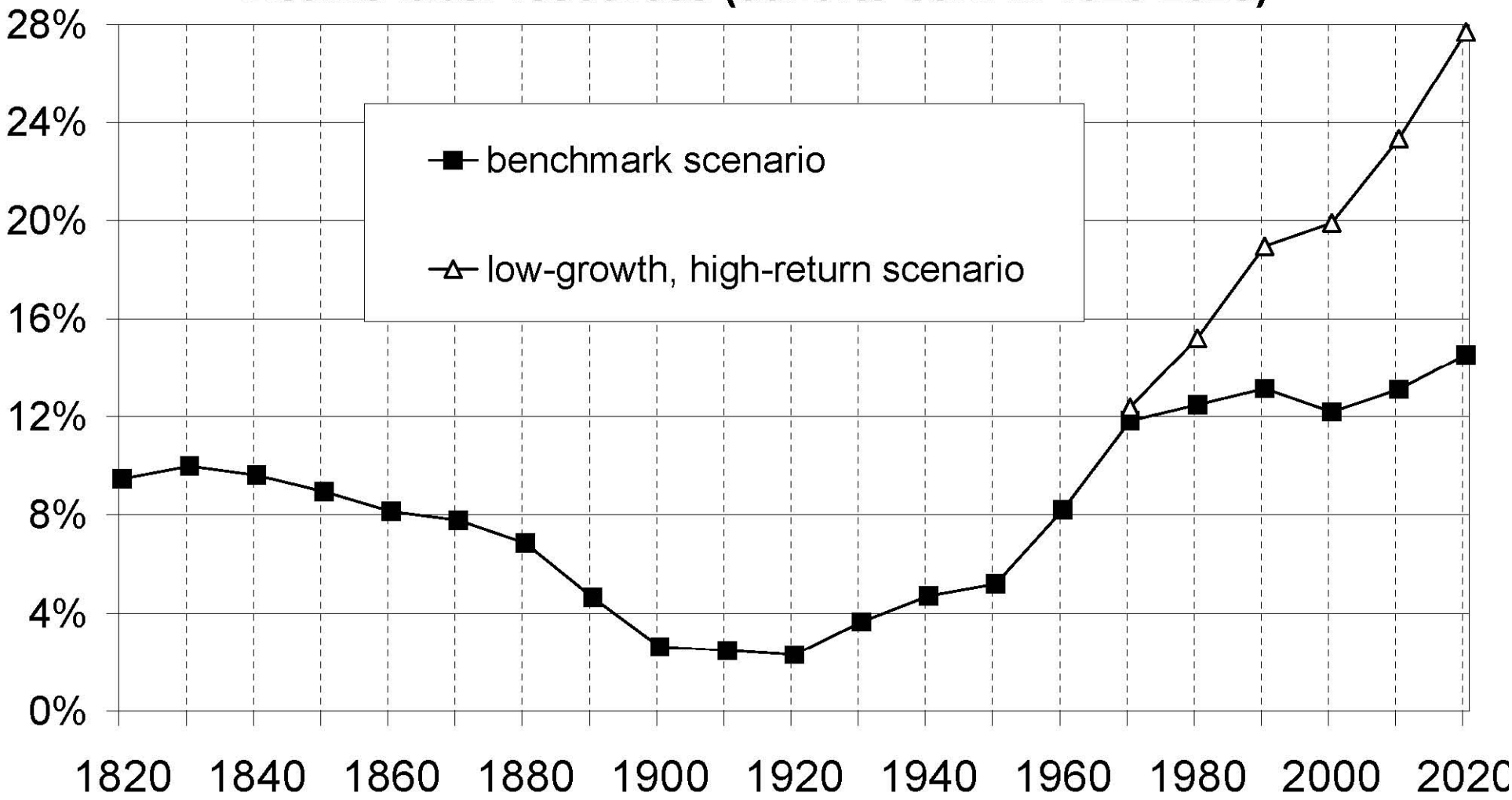


Figure 17: Cohort fraction inheriting more than bottom 50% lifetime labor resources (cohorts born in 1820-2020)



Computing inheritance flows: simple macro arithmetic

$$\mathbf{B_t/Y_t = \mu_t\ m_t\ W_t/Y_t}$$

- W_t/Y_t = aggregate wealth/income ratio
- m_t = aggregate mortality rate
- μ_t = ratio between average wealth of decedents and average wealth of the living (= age-wealth profile)

→ The U-shaped pattern of inheritance is the product of three U-shaped effects

Table 1: Accumulation of private wealth in France, 1820-2009

	Real growth rate of national income g	Real growth rate of private wealth g_w	Savings-induced wealth growth rate $g_{ws} = s/\beta$	Capital-gains-induced wealth growth rate q	*Memo: Consumer price inflation* *p*
1820-2009	1.8%	1.8%	2.1%	-0.3%	*4.4%*
1820-1913	1.0%	1.3%	1.4%	-0.1%	*0.5%*
1913-2009	2.6%	2.4%	2.9%	-0.4%	*8.3%*
1913-1949	1.3%	-1.7%	0.9%	-2.6%	*13.9%*
1949-1979	5.2%	6.2%	5.4%	0.8%	*6.4%*
1979-2009	1.7%	3.8%	2.8%	1.0%	*3.6%*

Figure 3: Mortality rate in France, 1820-2100

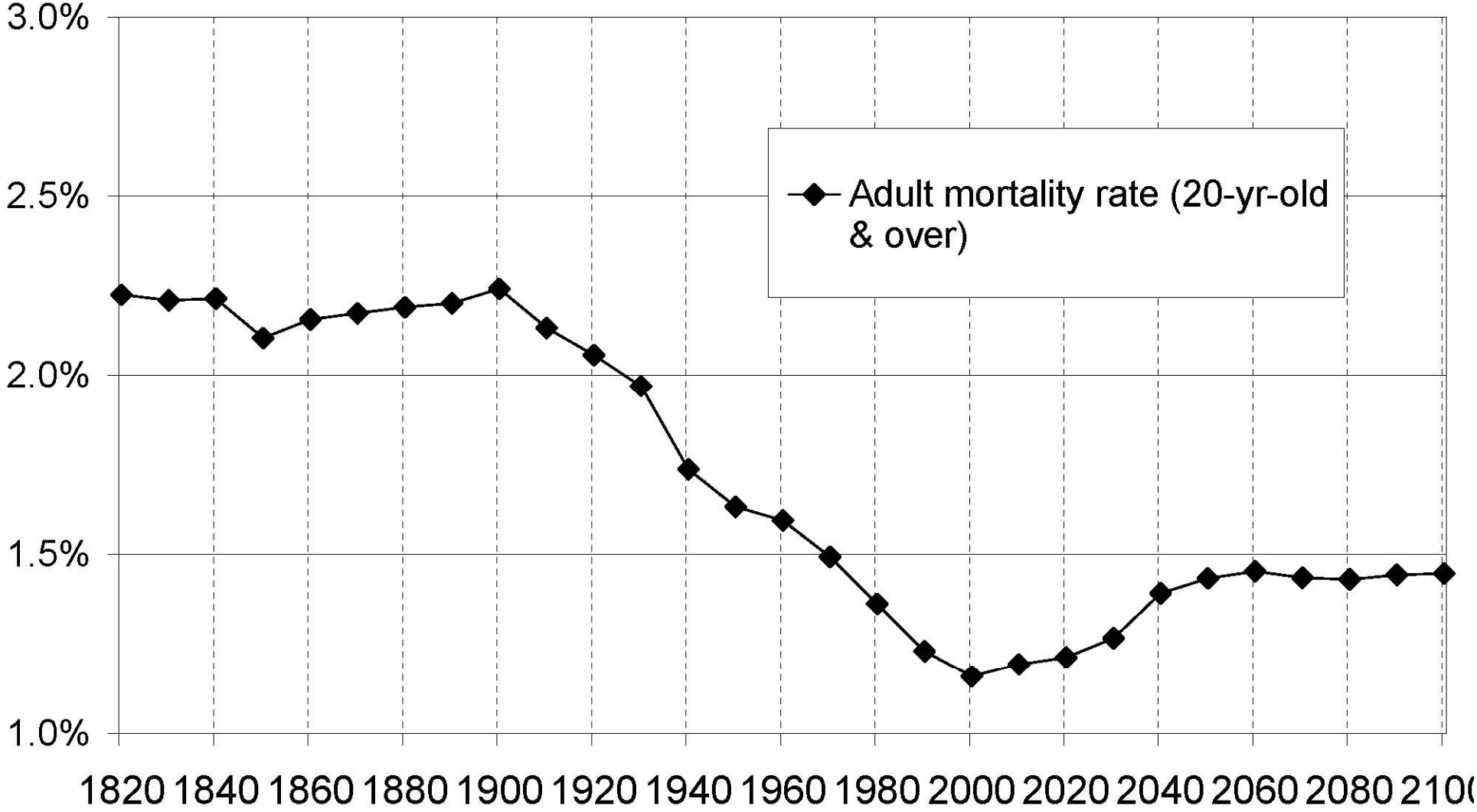


Figure 4: The ratio between average wealth of decedents and average wealth of the living France 1820-2008

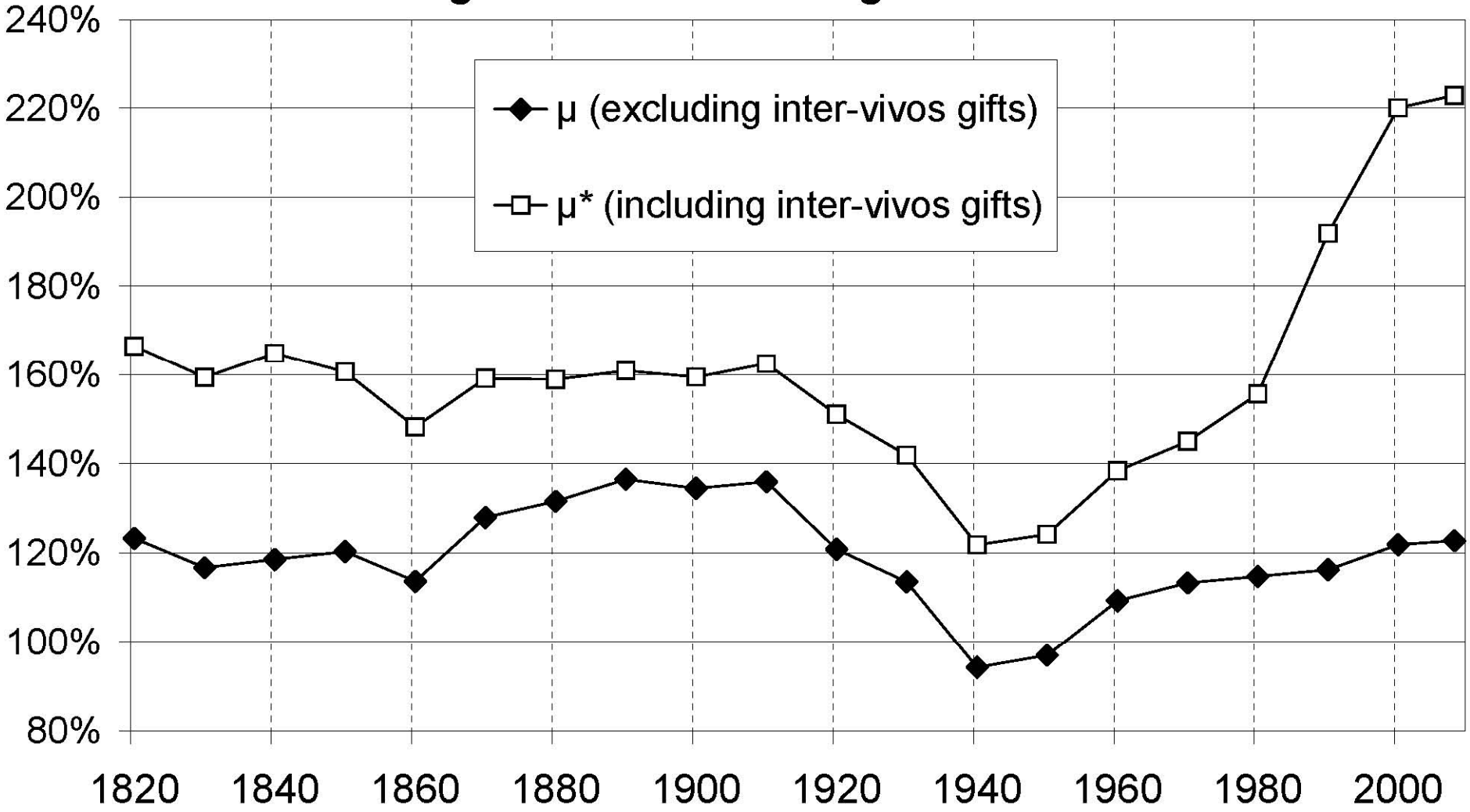
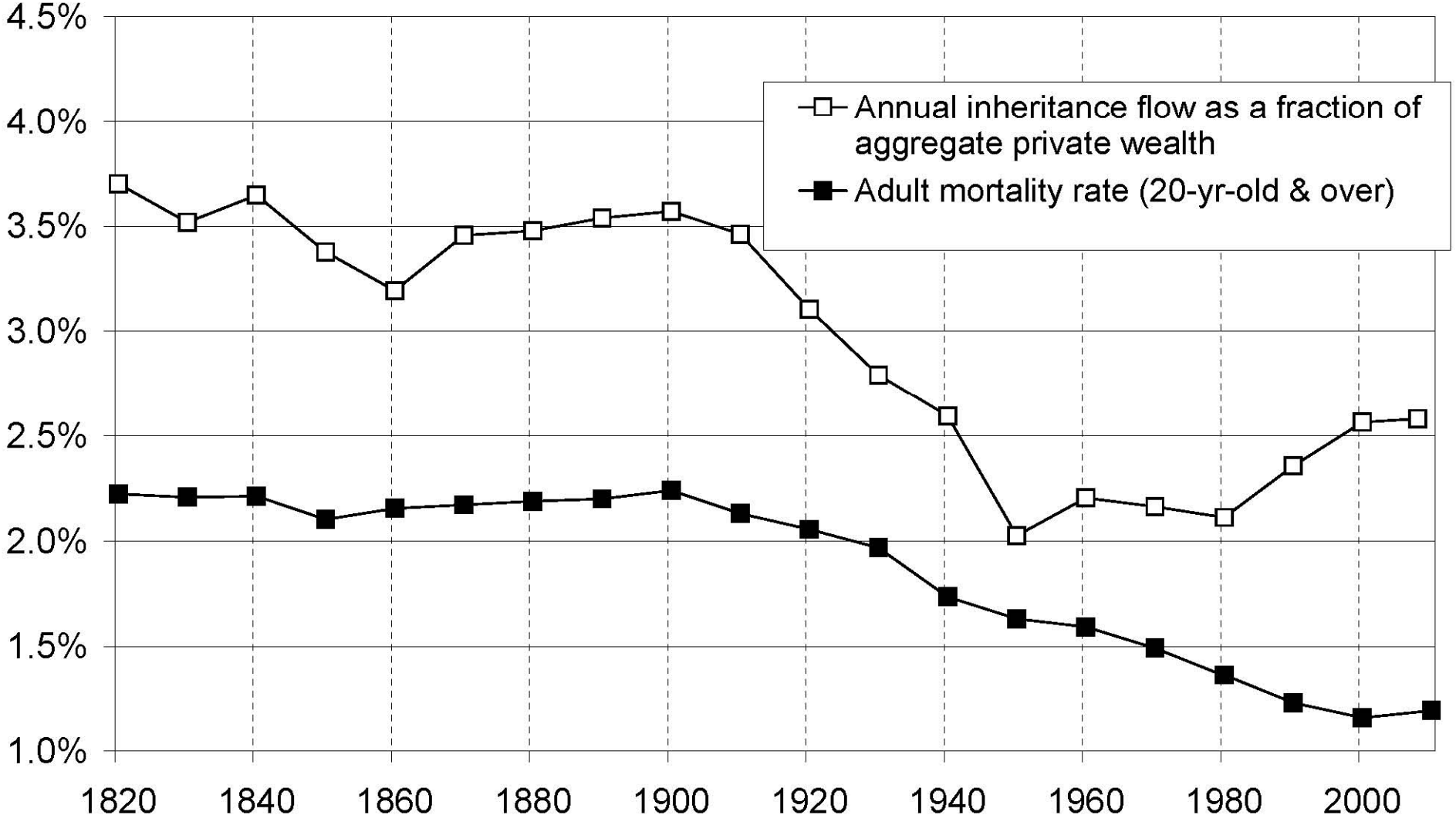


Figure 5: Inheritance flow vs mortality rate in France, 1820-2008



Steady-state inheritance flows

- Standard models: $r = \theta+\sigma g = \alpha g/s$ (>g)
- Everybody becomes adult at age A, has one kid at age H, inherits at age I, and dies at age D $\rightarrow$ I = D-H, m = 1/(D-A)
- Dynastic or class saving: $\mu = (D-A)/H$

  $\rightarrow b_y = \mu\, m\, \beta = \beta/H$

- **Proposition**: As $g \rightarrow 0$, $b_y \rightarrow \beta/H$

Figure 6: Steady-state cross-sectional age-wealth profile in the class savings model (s_L=0, s_K>0)

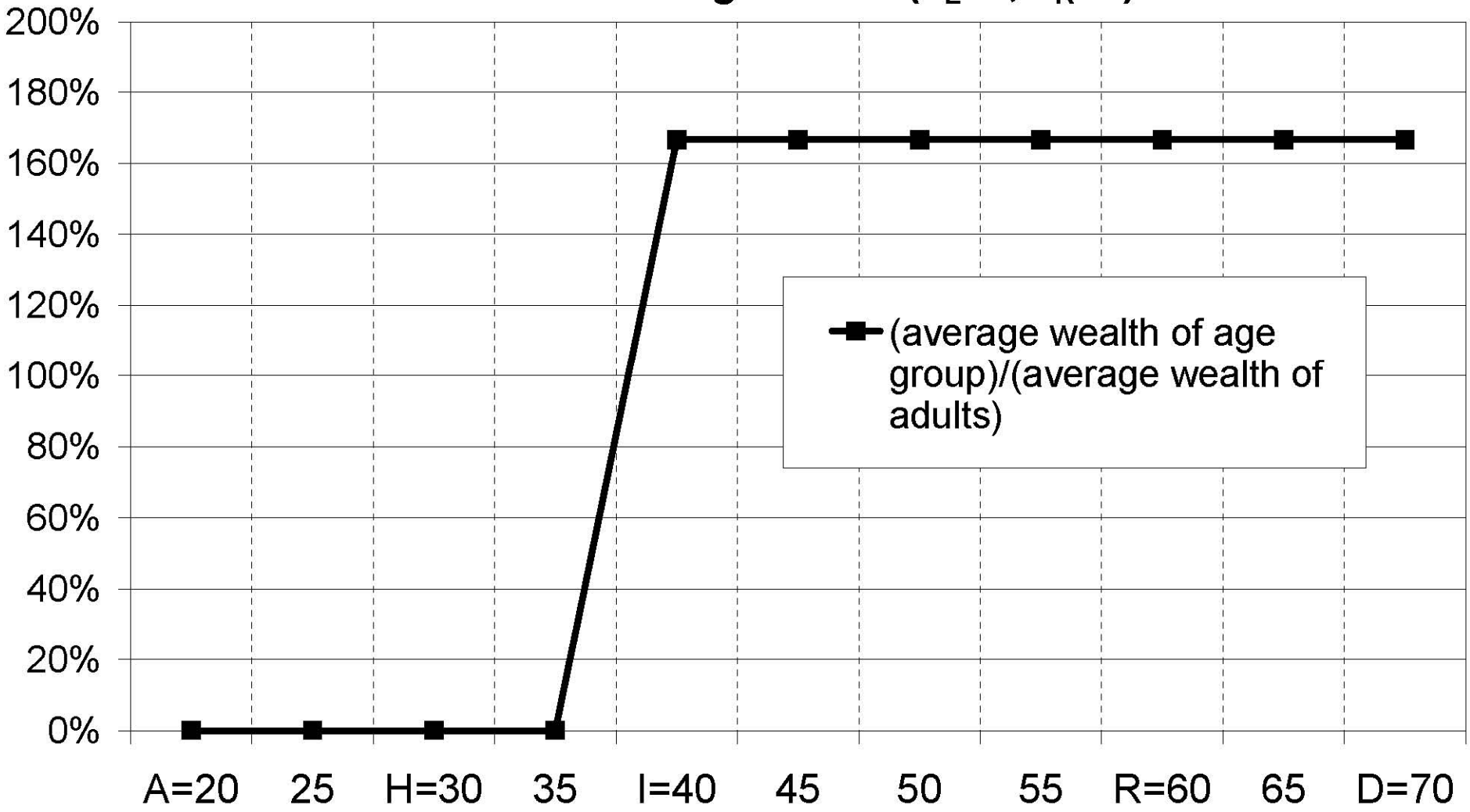


Figure 7: Steady-state cross-sectional age-wealth profile in the class savings model with demographic noise

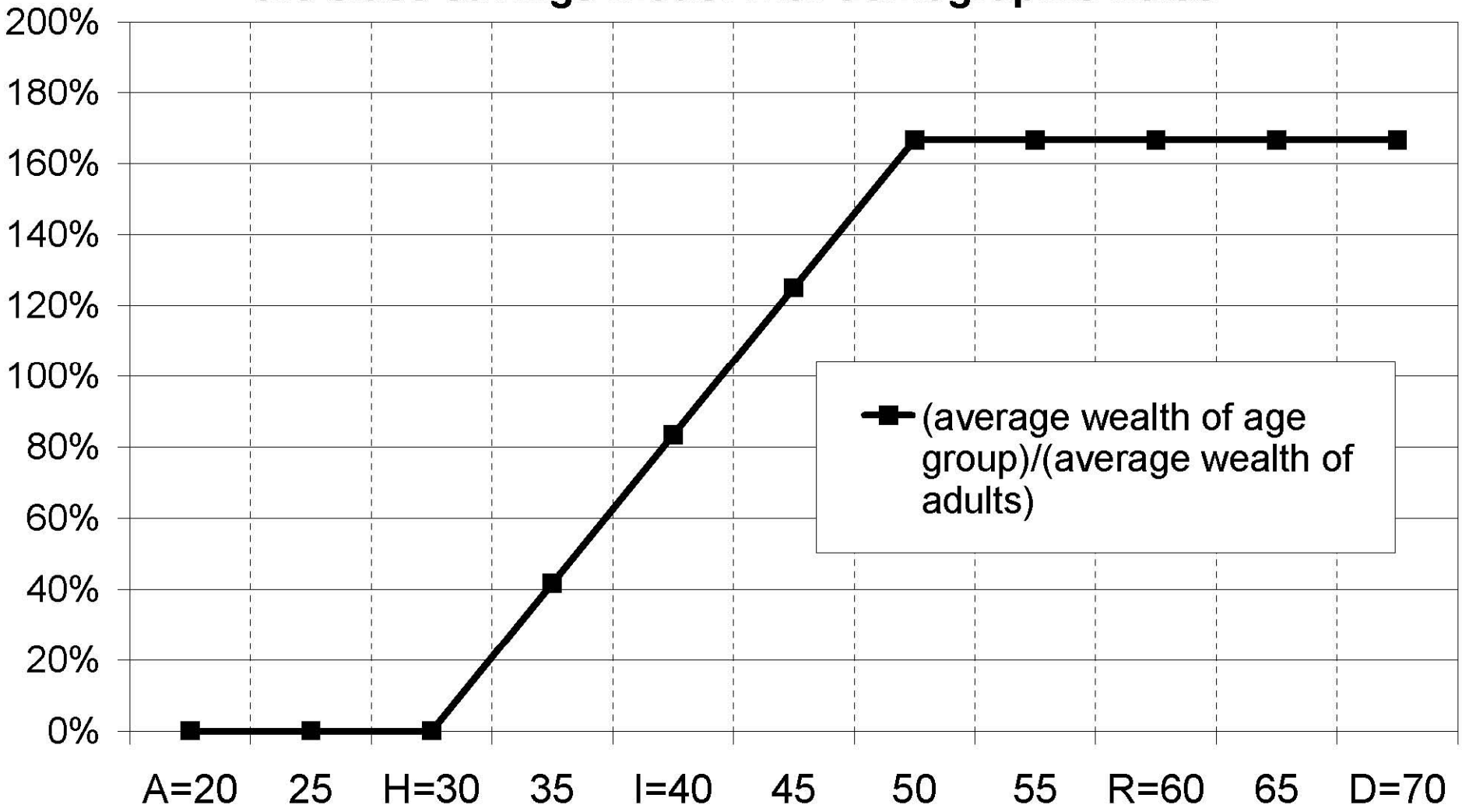


Figure 8: Private savings rate in France 1820-2008

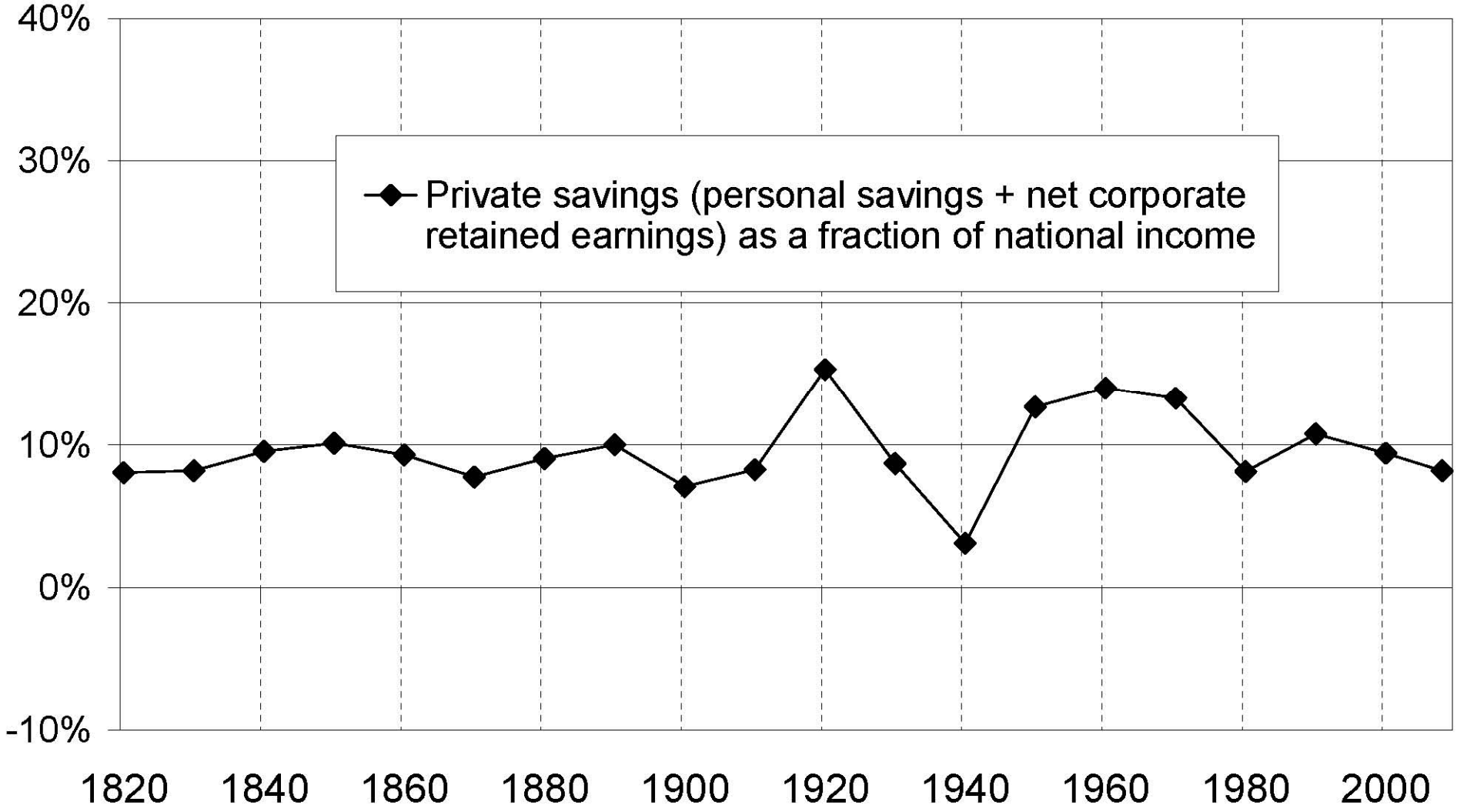


Figure 10: Labor & capital shares in national income, France 1820-2008

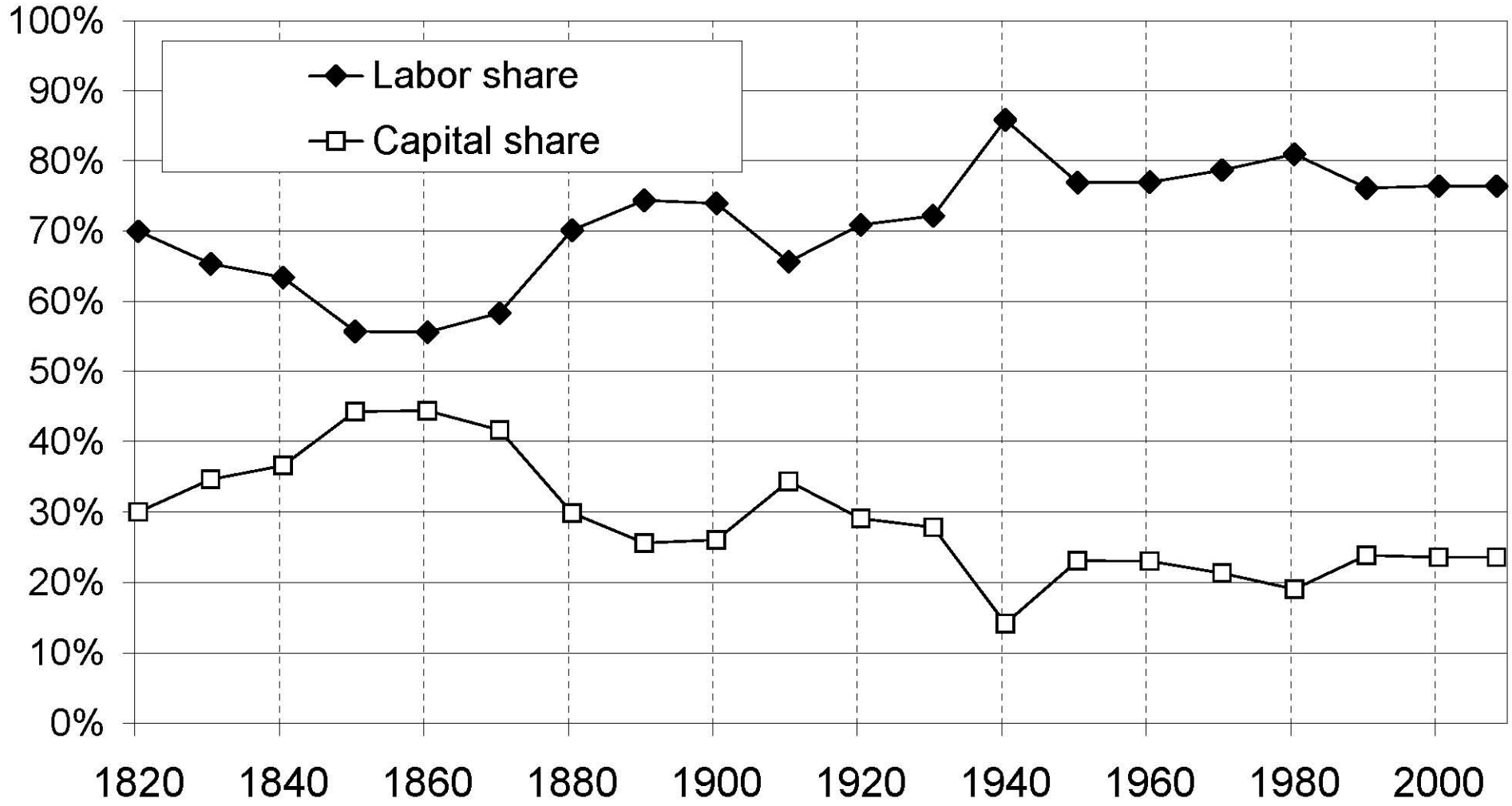


Figure 11: Rate of return vs growth rate France 1820-1913

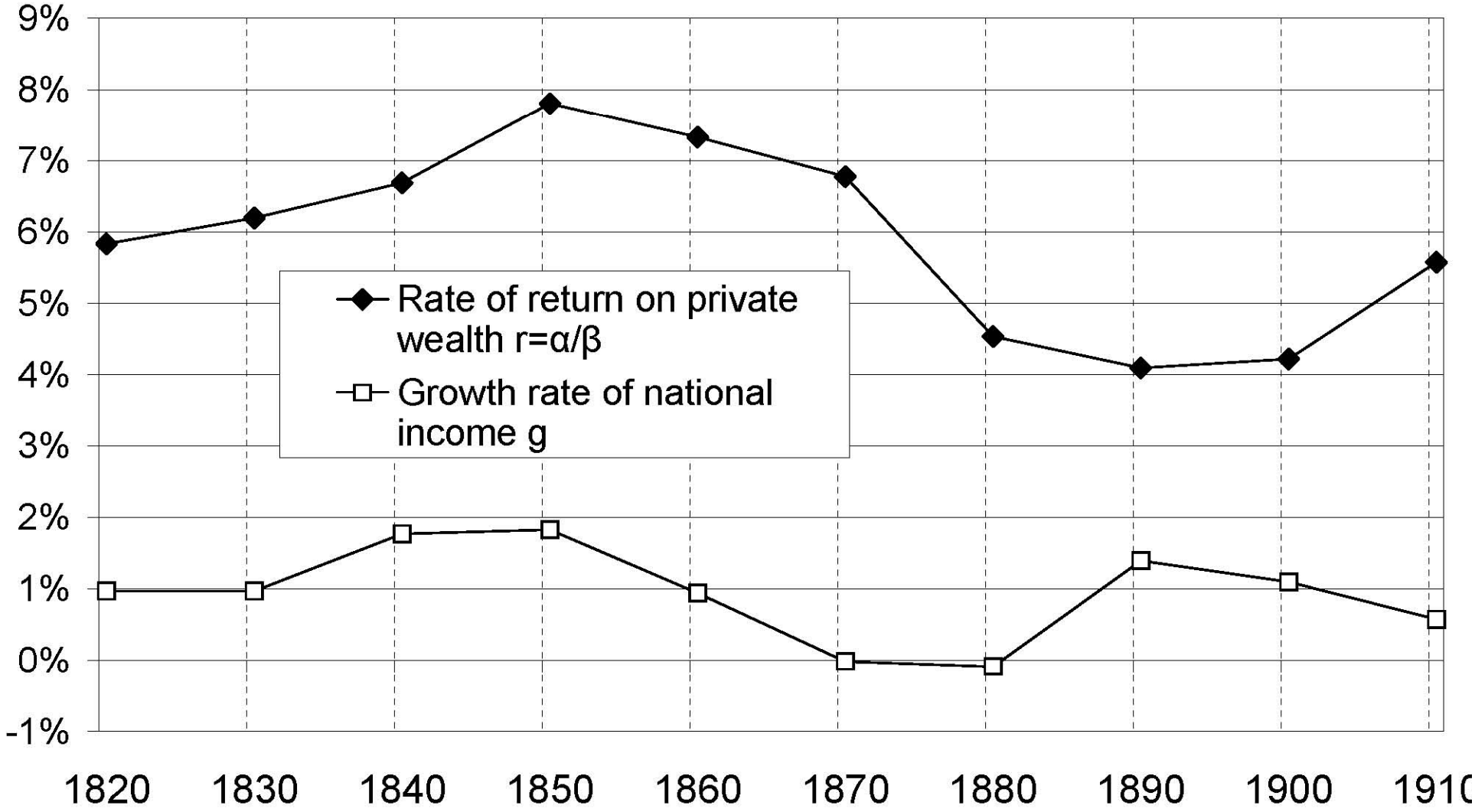


Figure 12: Capital share vs savings rate France 1820-1913

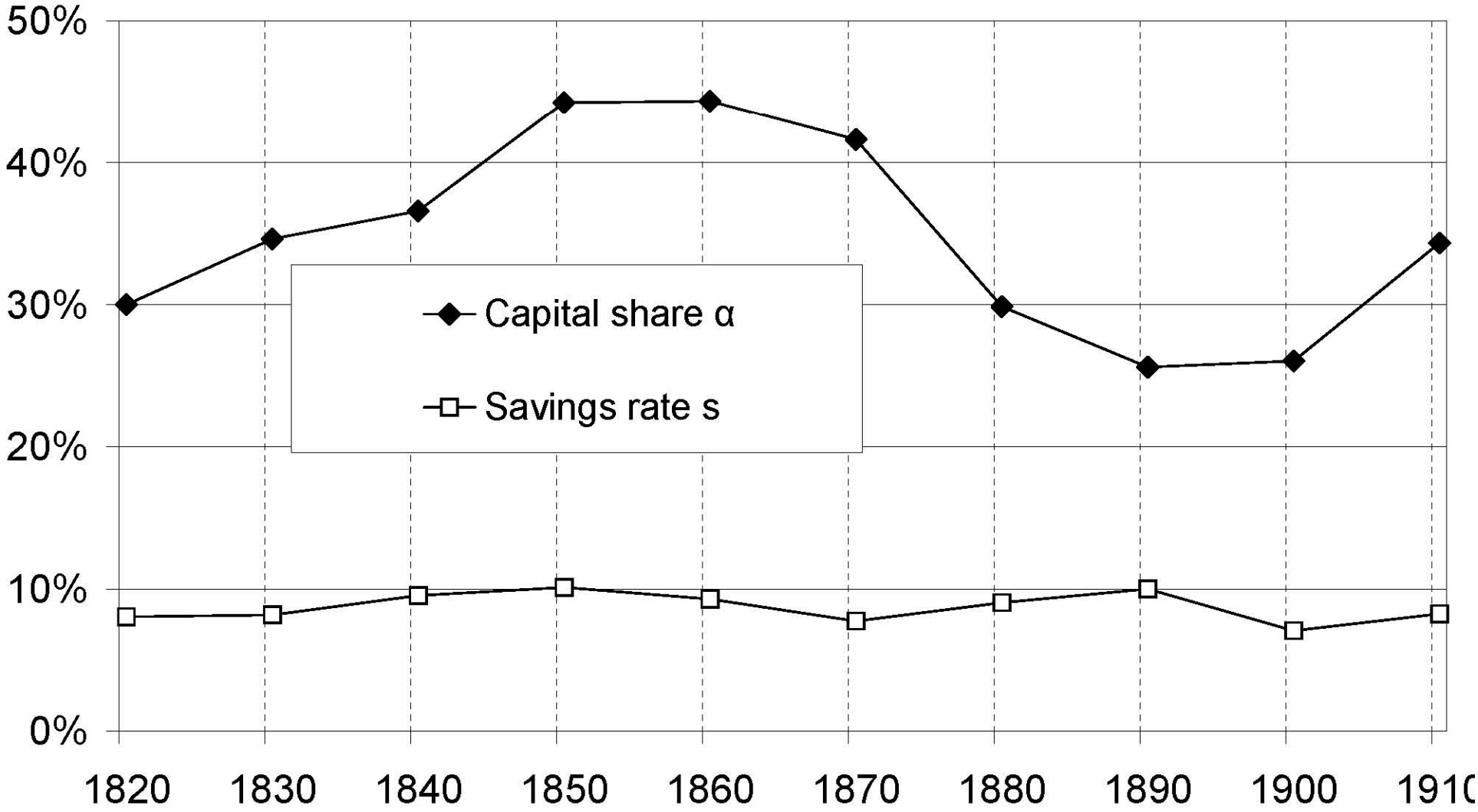


Figure 18: The share of non-capitalized inheritance in aggregate wealth accumulation , France 1850-2100

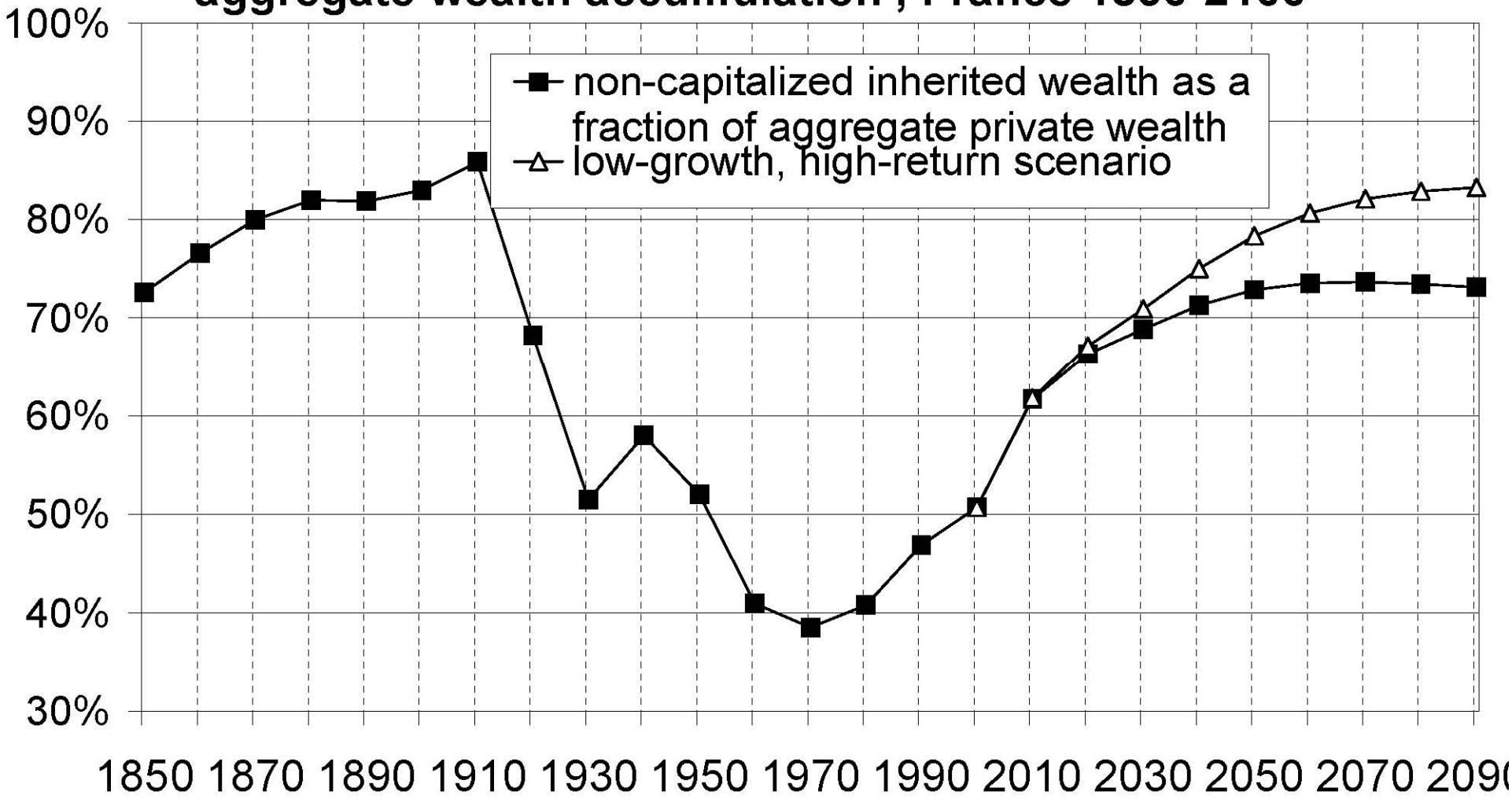


Figure 19: The share of capitalized inheritance in aggregate wealth accumulation , France 1900-2100

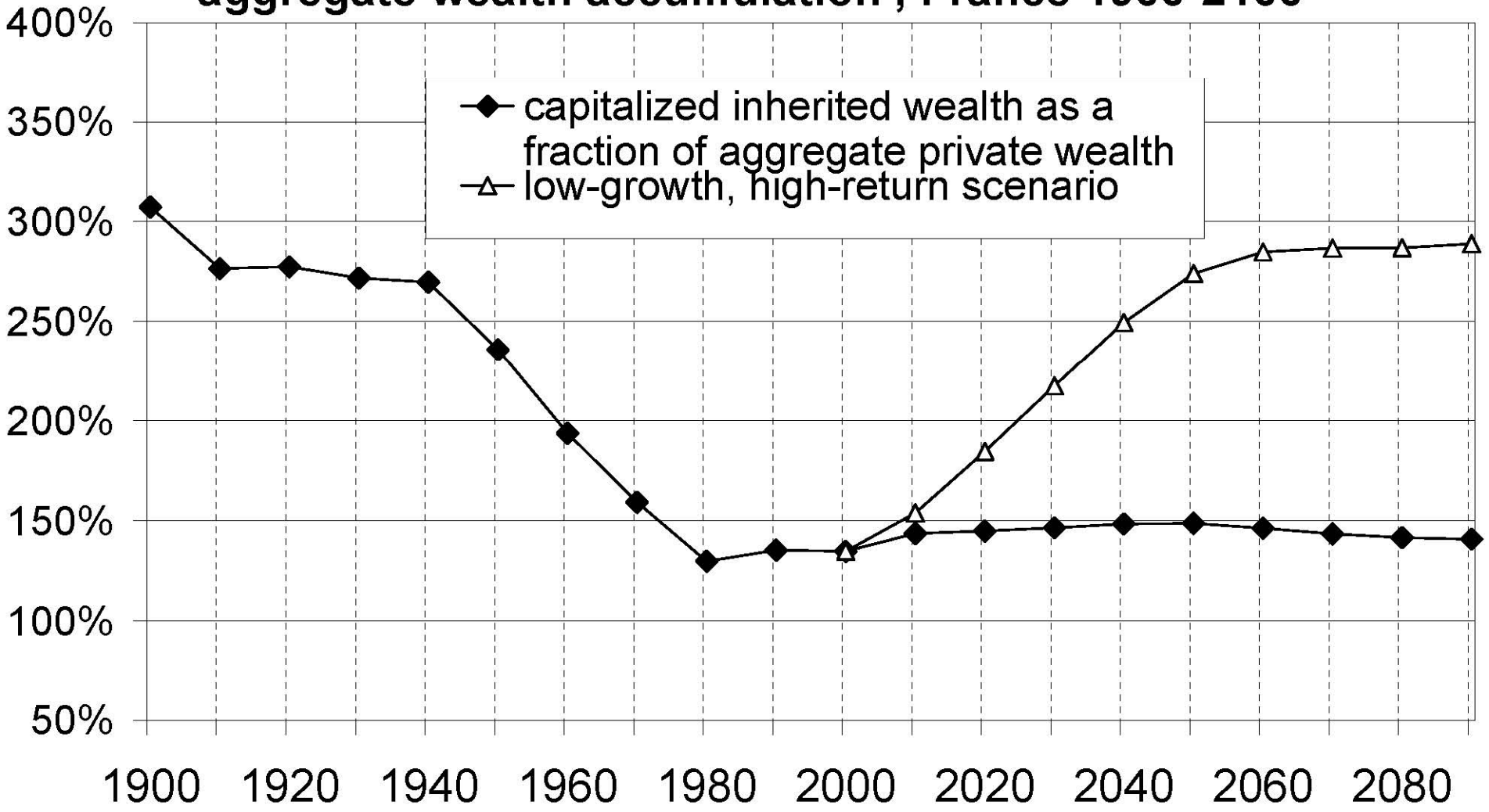


Table 2: Rates of return vs growth rates in France, 1820-2009

	Growth rate of national income g	Rate of return on private wealth $r = \alpha/\beta$	Capital tax rate τ_K	After-tax rate of return $r_d = (1-\tau_K)\alpha/\beta$	Real rate of capital gains q	Rate of capital destruct. (wars) d	After-tax real rate of return (incl. k gains & losses) $r_d = (1-\tau_K)\alpha/\beta + q + d$
1820-2009	**1.8%**	**6.8%**	19%	**5.4%**	-0.1%	-0.3%	**5.0%**
1820-1913	**1.0%**	**5.9%**	8%	**5.4%**	-0.1%	0.0%	**5.3%**
1913-2009	**2.6%**	**7.8%**	31%	**5.4%**	-0.1%	-0.7%	**4.6%**
1913-1949	**1.3%**	**7.9%**	21%	**6.4%**	-2.6%	-2.0%	**1.8%**
1949-1979	**5.2%**	**9.0%**	34%	**6.0%**	0.8%	0.0%	**6.8%**
1979-2009	**1.7%**	**6.9%**	39%	**4.3%**	1.0%	0.0%	**5.3%**