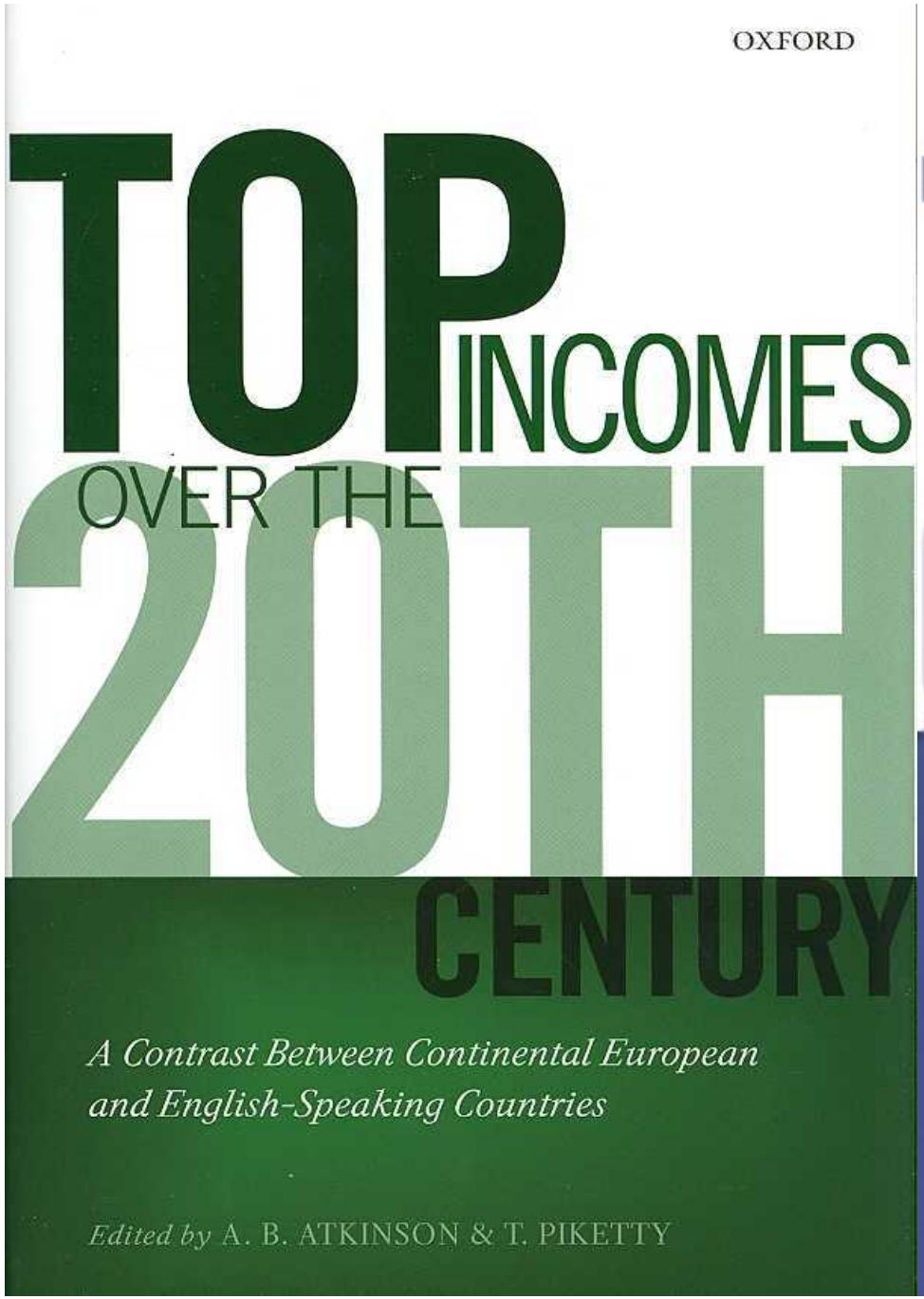
Wealth, Inequality & Taxation
T. Piketty, IMF 27-09-2012
Supplementary slides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TOP INCOMES
OVER THE 20TH CENTURY
A Contrast Between Continental European and English-Speaking Countries
Edited by A. B. ATKINSON & T. PIKETTY

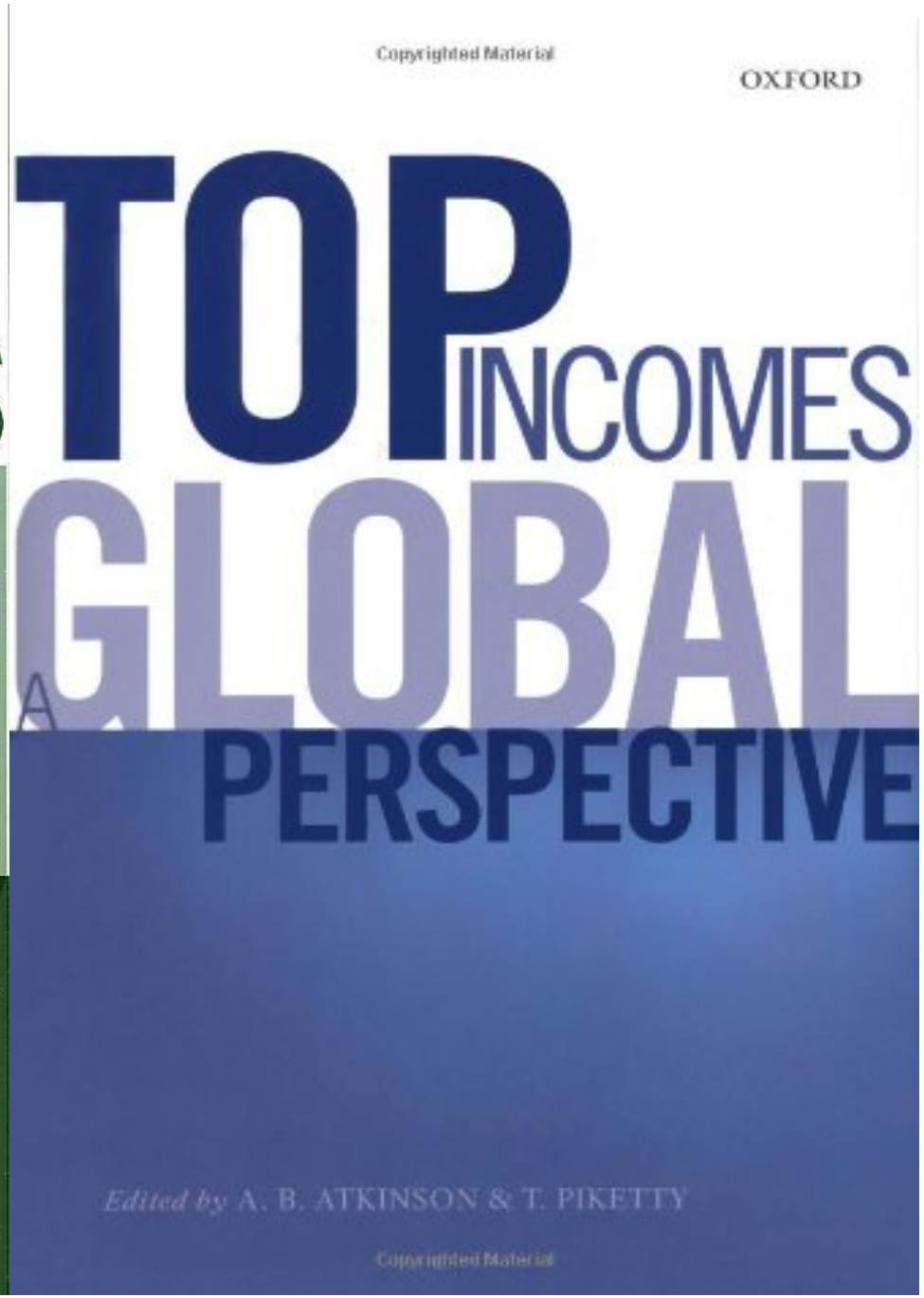
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Table 1. Top Percentile Share and Average Income Growth in the US

	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%

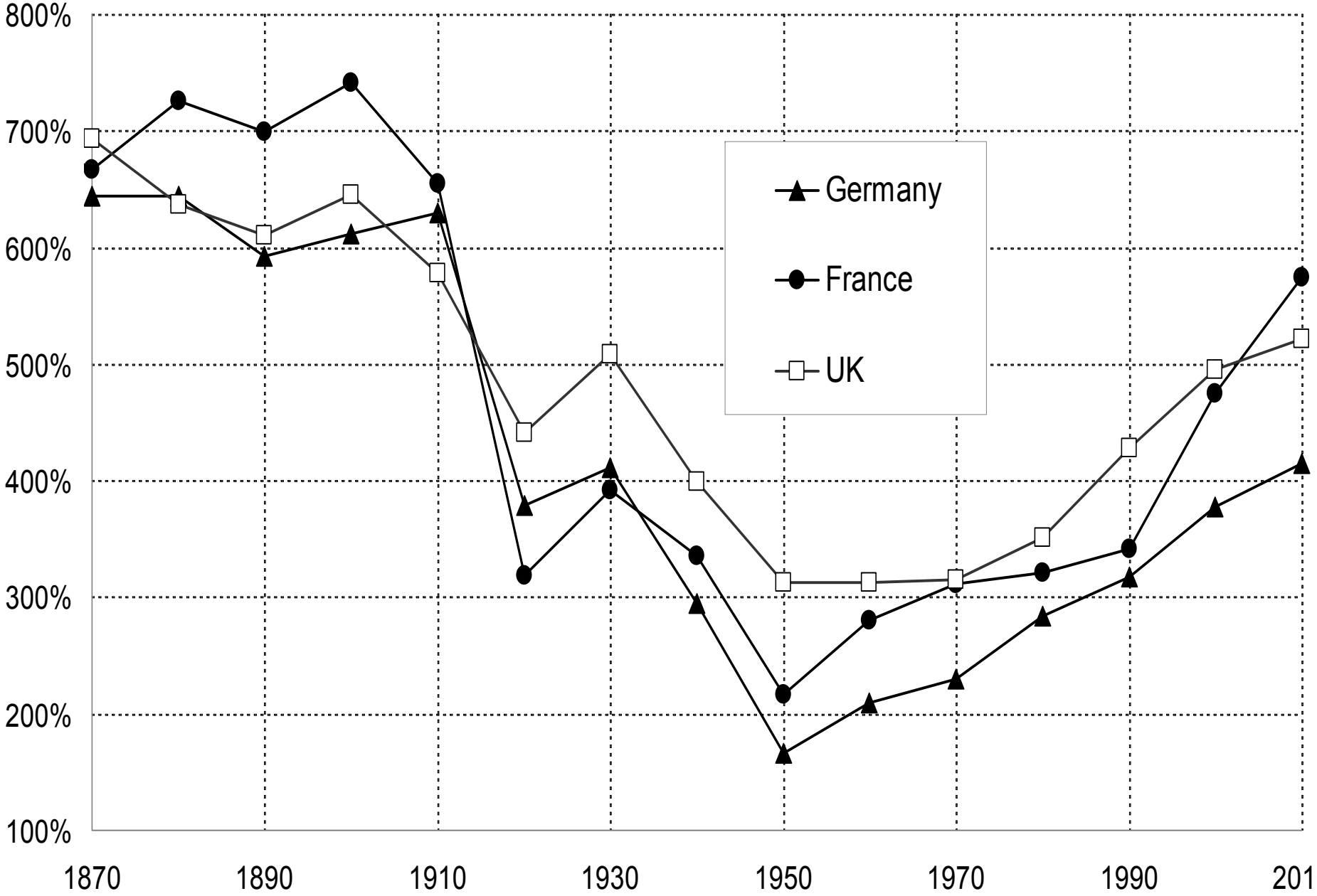
Computations based on family market income including realized capital gains (before individual taxes).
Incomes are deflated using the Consumer Price Index (and using the CPI-U-RS before 1992).
Column (4) reports the fraction of total real family income growth captured by the top 1%.
For example, from 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.

Decomposition results: 1870-2010

- Annual series for US, Germany, France, UK, 1870-2010
- Additive vs multiplicative decomposition of wealth accumulation equation into volume vs price effects
- Private saving (personal + corporate) vs personal
- Private wealth vs national wealth accumulation
- Domestic vs foreign wealth accumulation

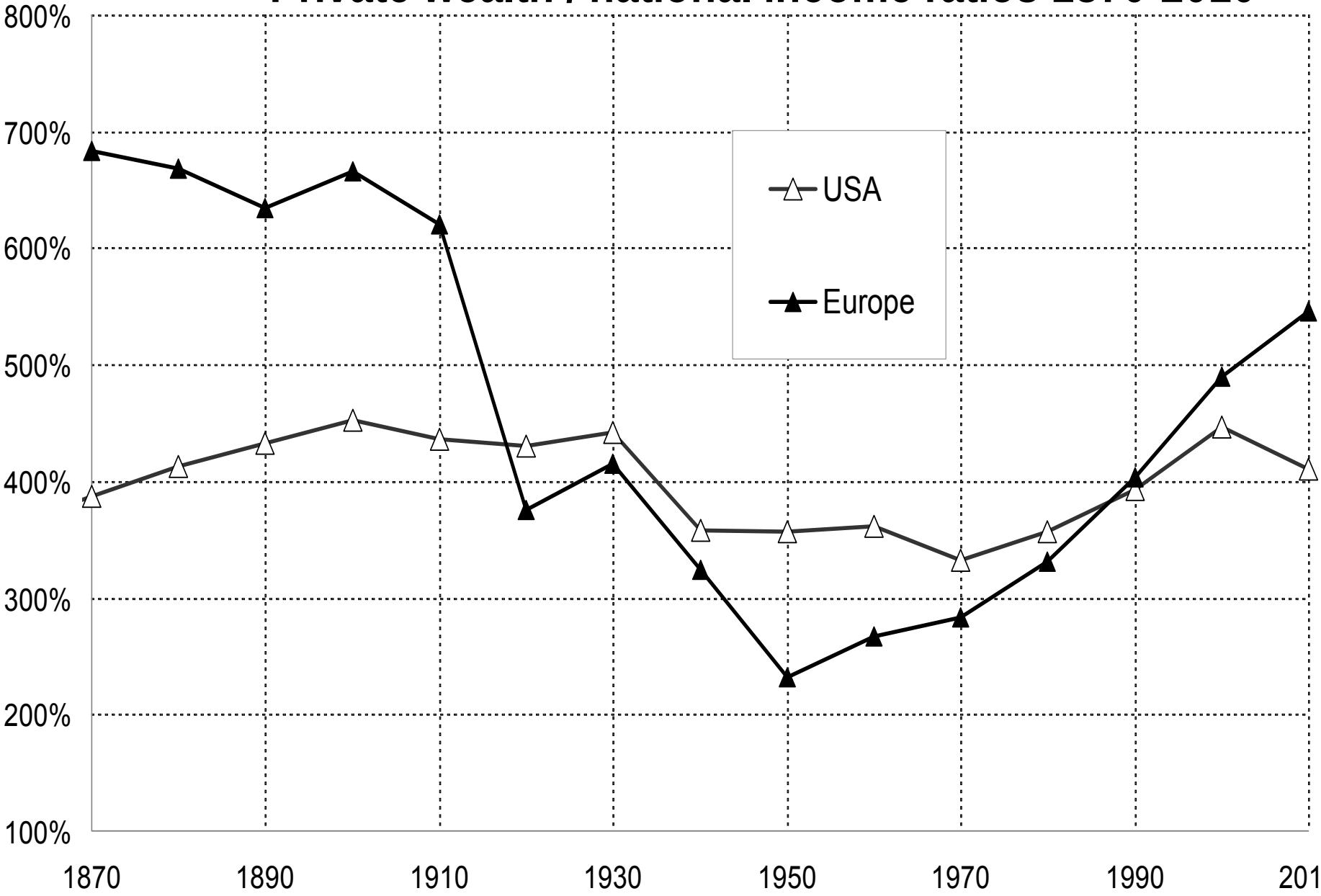
- **Main conclusion**: over the entire 1910-2010 period, capital gains wash out; i.e. 1910-1950 fall in relative asset price compensated by 1950-2010 (except in Germany, where asset prices seem abnormally low: stakeholder effect?)
- In the long run (1870-2010 or 1910-2010), changes in wealth-income ratios are well accounted for by $\beta=s/g$

Private wealth / national income ratios in Europe, 1870-2010



Authors' computations using country national accounts. Private wealth = non-financial assets + financial assets - financial liabilities (household & non-profit sectors)

Private wealth / national income ratios 1870-2010



Authors' computations using country national accounts. Private wealth = non-financial assets + financial assets - financial liabilities (household & non-profit sectors)

Table 20: Growth rate vs private saving rate in rich countries, 1870-2010

	Real growth rate of national income	Population growth rate	Real growth rate of per capita national income	**Net private saving rate** (personal + corporate) (% national income)
U.S.	**3.4%**	1.5%	1.9%	**8.3%**
Germany	**2.3%**	0.5%	1.7%	**12.1%**
France	**2.1%**	0.4%	1.7%	**10.6%**
U.K.	**1.9%**	0.5%	1.4%	**6.7%**

Accumulation of private wealth in France, 1870-2010 (multiplicative decomposition)

	Private wealth-national income ratios		Real growth rate of private wealth	Savings-induced wealth growth rate (incl. war destructions)	Capital-gains-induced wealth growth rate
	β_t	β_{t+n}	g_w	$g_{ws} = s/\beta$	q
1870-2010	667%	575%	2.0%	2.4% ***121%***	-0.4% ***-21%***
1870-1910	667%	766%	1.5%	1.2% ***81%***	0.3% ***19%***
1910-2010	766%	575%	2.2%	2.9% ***132%***	-0.7% ***-32%***
1910-1950	766%	192%	-2.0%	0.9% ***-47%***	-2.9% ***147%***
1950-1980	192%	321%	6.3%	5.4% ***86%***	0.9% ***14%***
1980-2010	321%	575%	3.8%	3.0% ***81%***	0.7% ***19%***

Accumulation of private wealth in the U.K., 1870-2010 (multiplicative decomposition)

	Private wealth-national income ratios		Real growth rate of private wealth	Savings-induced wealth growth rate	Capital-gains-induced wealth growth rate
	β_t	β_{t+n}	g_w	$g_{ws} = s/\beta$	q
1870-2010	690%	522%	1.7%	1.5% ***85%***	0.3% ***15%***
1870-1910	690%	678%	1.8%	1.6% ***85%***	0.3% ***15%***
1910-2010	678%	522%	1.7%	1.4% ***85%***	0.3% ***15%***
1910-1950	678%	355%	-0.2%	0.6% ***-314%***	-0.8% ***414%***
1950-1980	355%	309%	1.6%	2.2% ***134%***	-0.6% ***-34%***
1980-2010	309%	522%	4.4%	1.7% ***40%***	2.6% ***60%***

Accumulation of private wealth in the U.S., 1870-2010 (multiplicative decomposition)

	Private wealth-national income ratios		Real growth rate of private wealth	Savings-induced wealth growth rate	Capital-gains-induced wealth growth rate
	β_t	β_{t+n}	g_w	$g_{ws} = s/\beta$	q
1870-2010	386%	410%	3.4%	2.9% ***84%***	0.6% ***16%***
1870-1910	386%	446%	4.3%	2.9% ***67%***	1.4% ***33%***
1910-2010	446%	410%	3.1%	2.9% ***93%***	0.2% ***7%***
1910-1950	446%	365%	2.7%	2.6% ***95%***	0.1% ***5%***
1950-1980	365%	355%	3.4%	3.8% ***110%***	-0.4% ***-10%***
1980-2010	355%	410%	3.3%	2.3% ***72%***	0.9% ***28%***

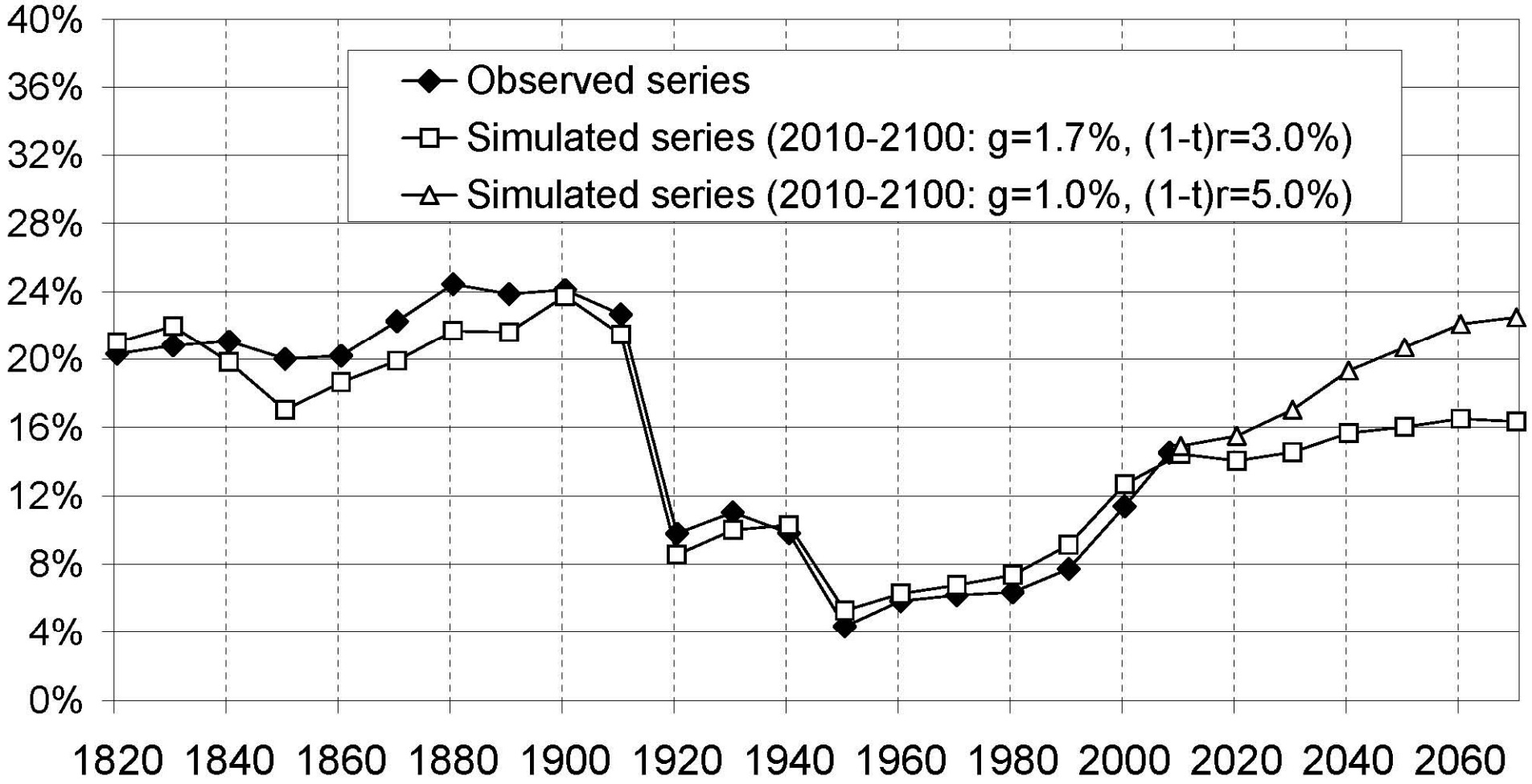
Accumulation of private wealth in Germany, 1870-2010 (multiplicative decomposition)

	Private wealth-national income ratios		Real growth rate of private wealth	Savings-induced wealth growth rate	Capital-gains-induced wealth growth rate
	β_t	β_{t+n}	g_w	$g_{ws} = s/\beta$	q
1870-2010	704%	415%	2.1%	3.5% ***163%***	-1.3% ***-63%***
1870-1910	704%	608%	2.1%	2.3% ***109%***	-0.2% ***-9%***
1910-2010	608%	415%	2.1%	3.9% ***184%***	-1.8% ***-84%***
1910-1950	608%	181%	-1.8%	1.4% ***-79%***	-3.2% ***179%***
1950-1980	181%	253%	6.1%	7.7% ***123%***	-1.5% ***-23%***
1980-2010	253%	415%	3.4%	3.7% ***107%***	-0.2% ***-7%***

Accumulation of national wealth in Germany, 1870-2010 (multiplicative decomposition)

	Market-value national wealth-national income ratios		Real growth rate of national wealth	Savings-induced wealth growth rate (incl. war destructions)	Capital-gains-induced wealth growth rate
	β_t	β_{t+n}	g_w	$g_{ws} = s/\beta$	q
1870-2010	759%	418%	2.0%	2.2%	-0.2%
				110%	**-10%**
1870-1910	759%	638%	2.1%	2.2%	-0.2%
				108%	**-8%**
1910-2010	638%	418%	2.0%	2.3%	-0.2%
				111%	**-11%**
1910-1950	638%	236%	-1.3%	-1.2%	-0.1%
				95%	**5%**
1950-1980	236%	328%	6.1%	6.8%	-0.7%
				111%	**-11%**
1980-2010	328%	418%	2.6%	2.5%	0.0%
				99%	**1%**

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



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)

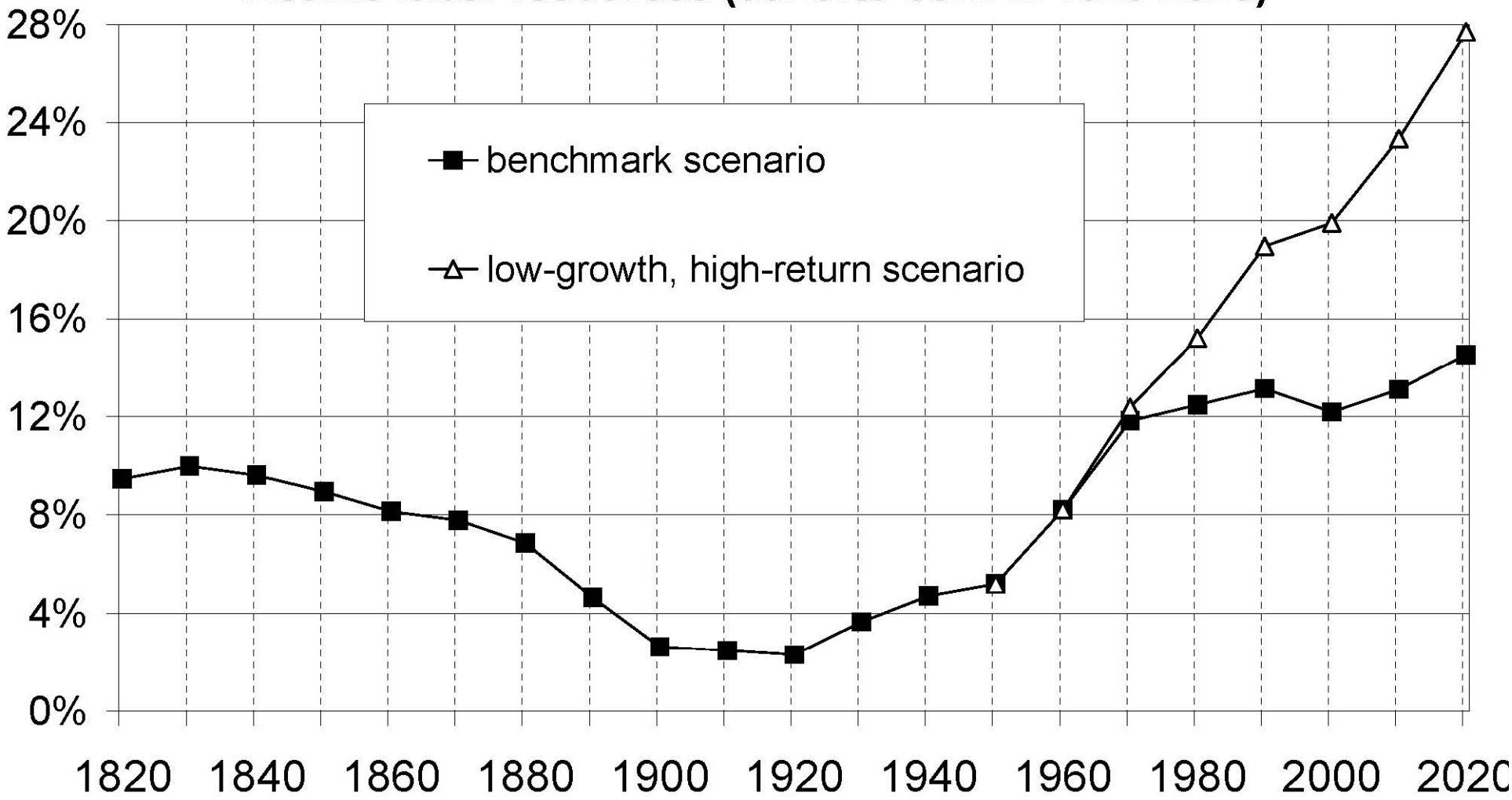
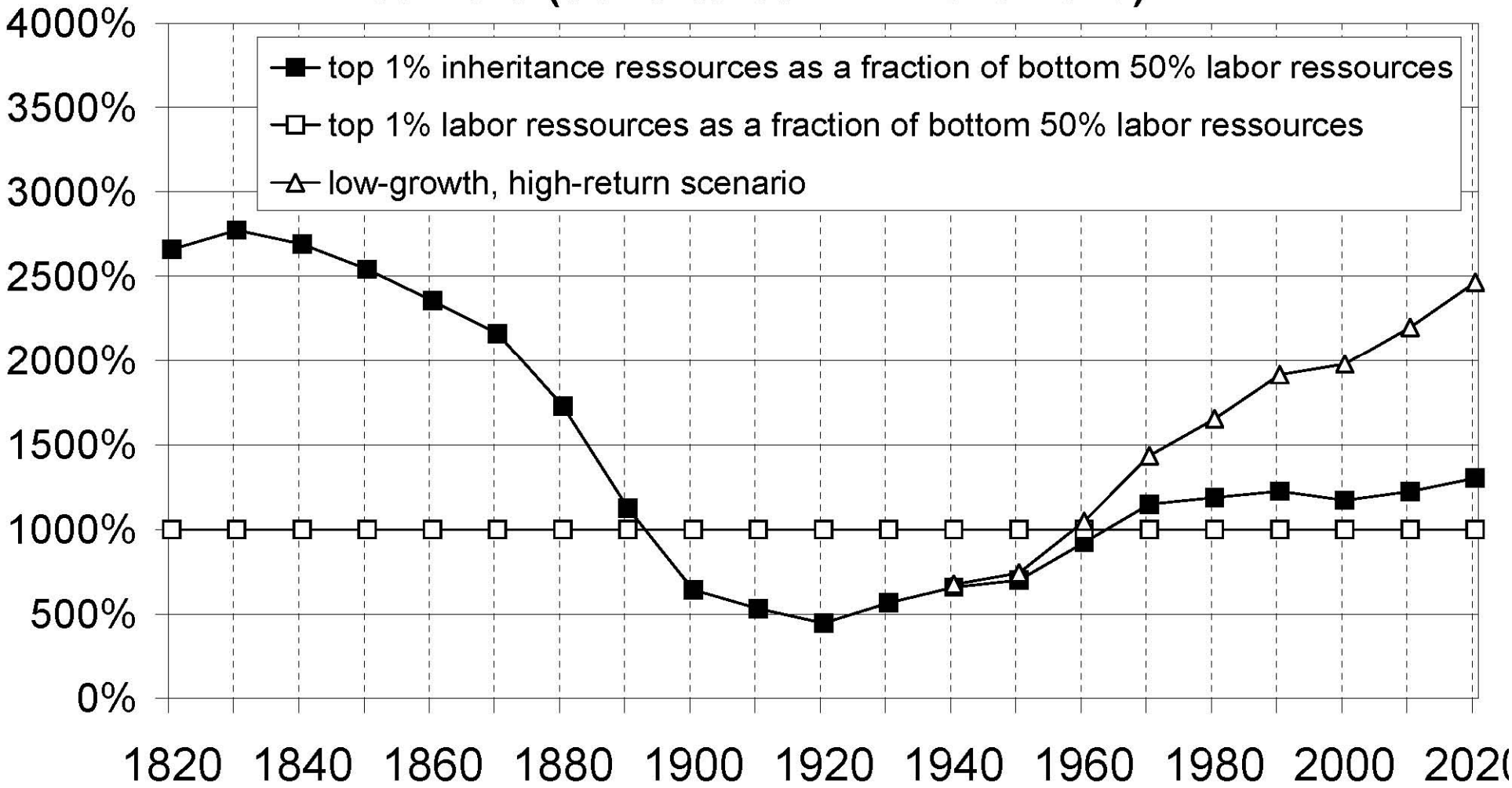


Figure 14: Top 1% successors vs top 1% labor income earners (cohorts born in 1820-2020)



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)

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

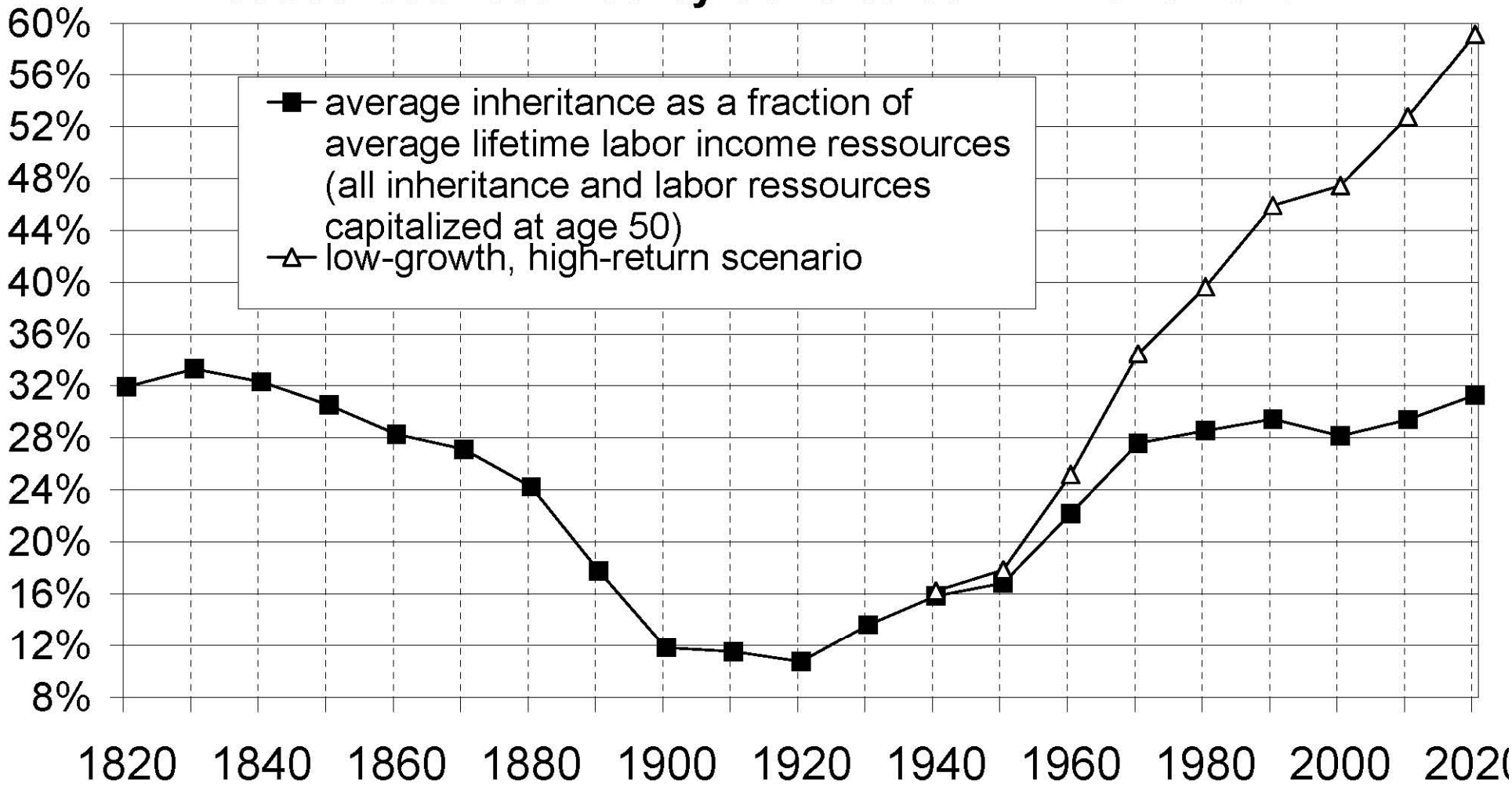
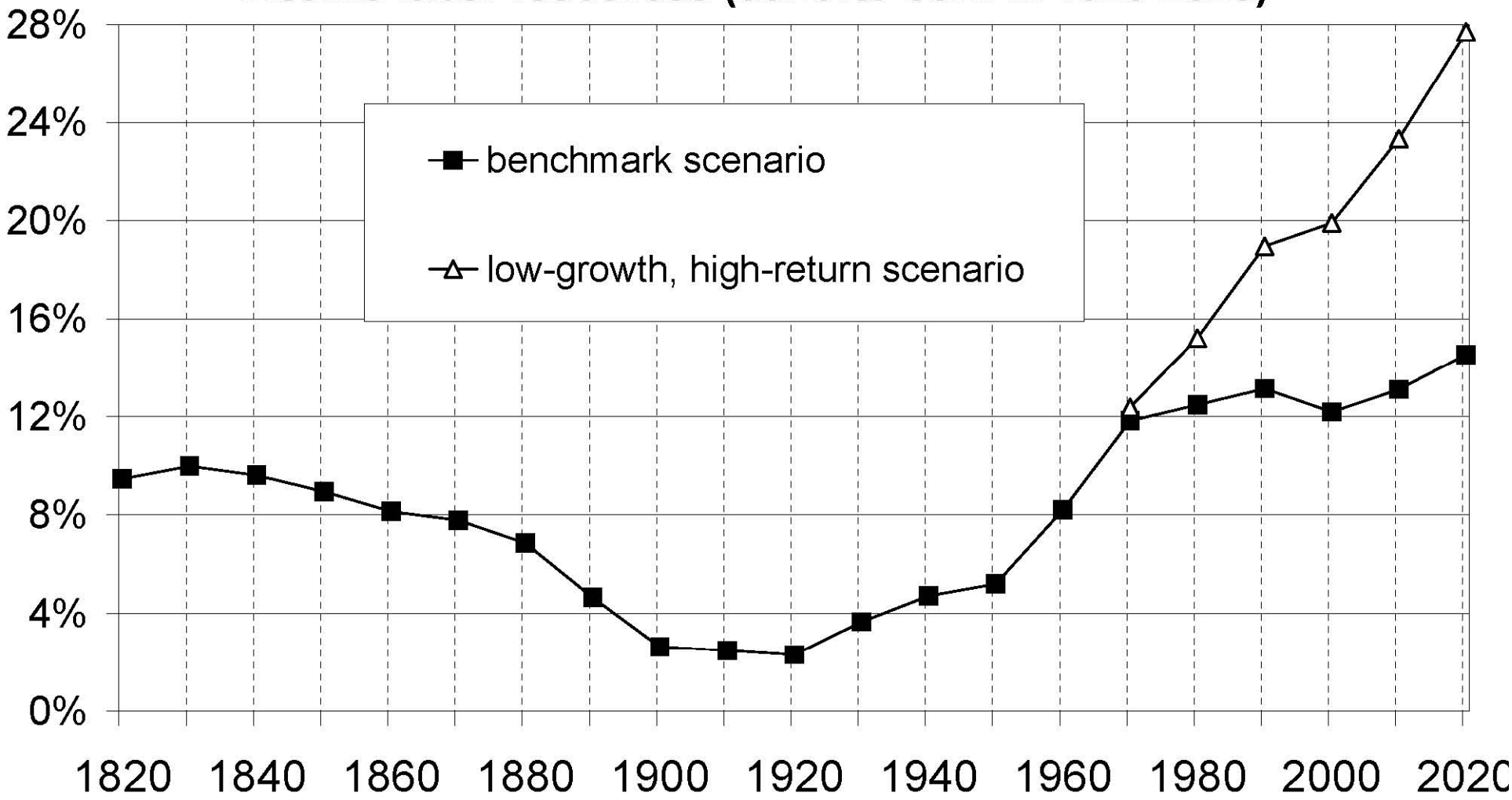


Figure 17: Cohort fraction inheriting more than bottom 50% lifetime labor resources (cohorts born in 1820-2020)



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

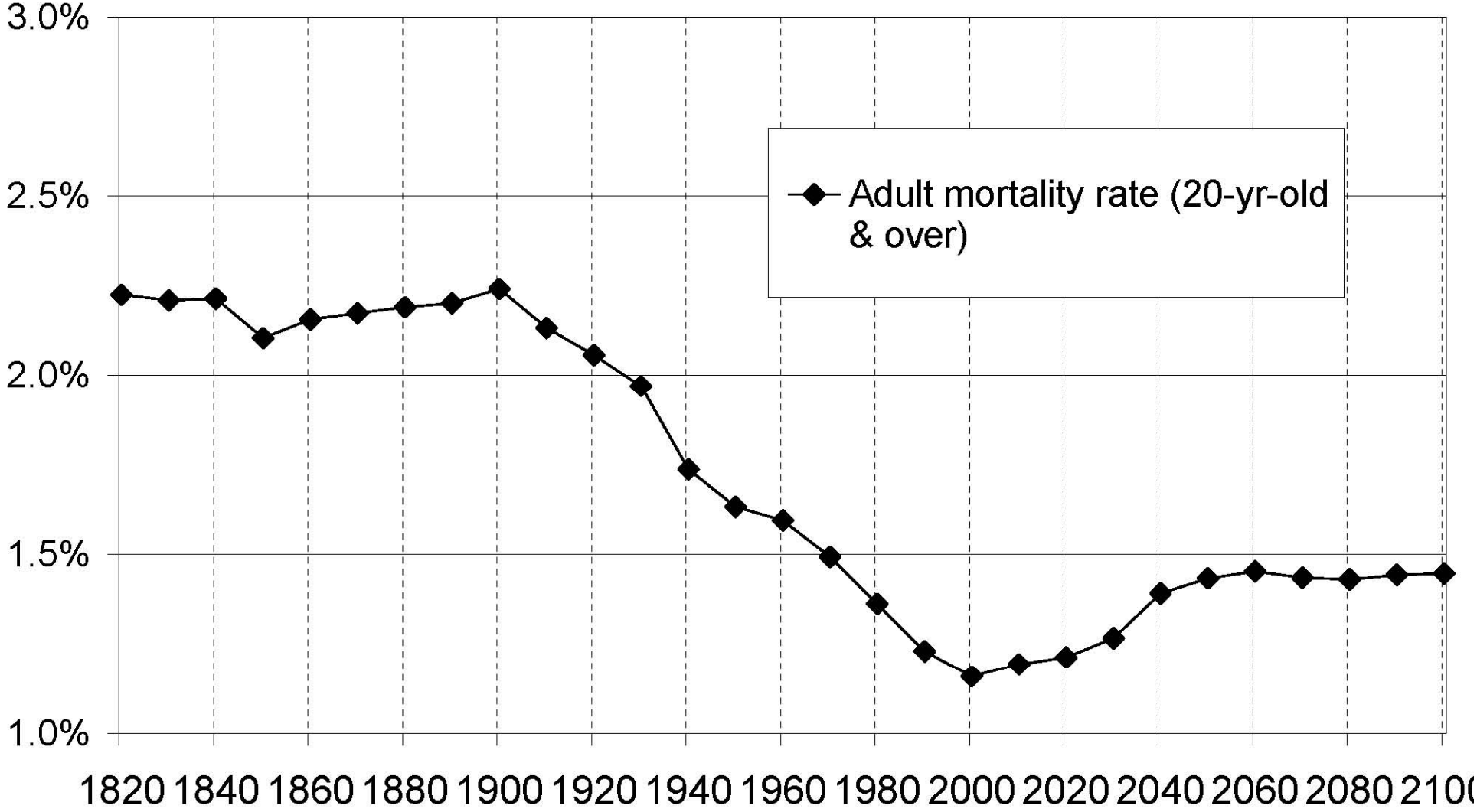


Figure 4: The ratio between average wealth of decedents and average wealth of the living France 1820-2008

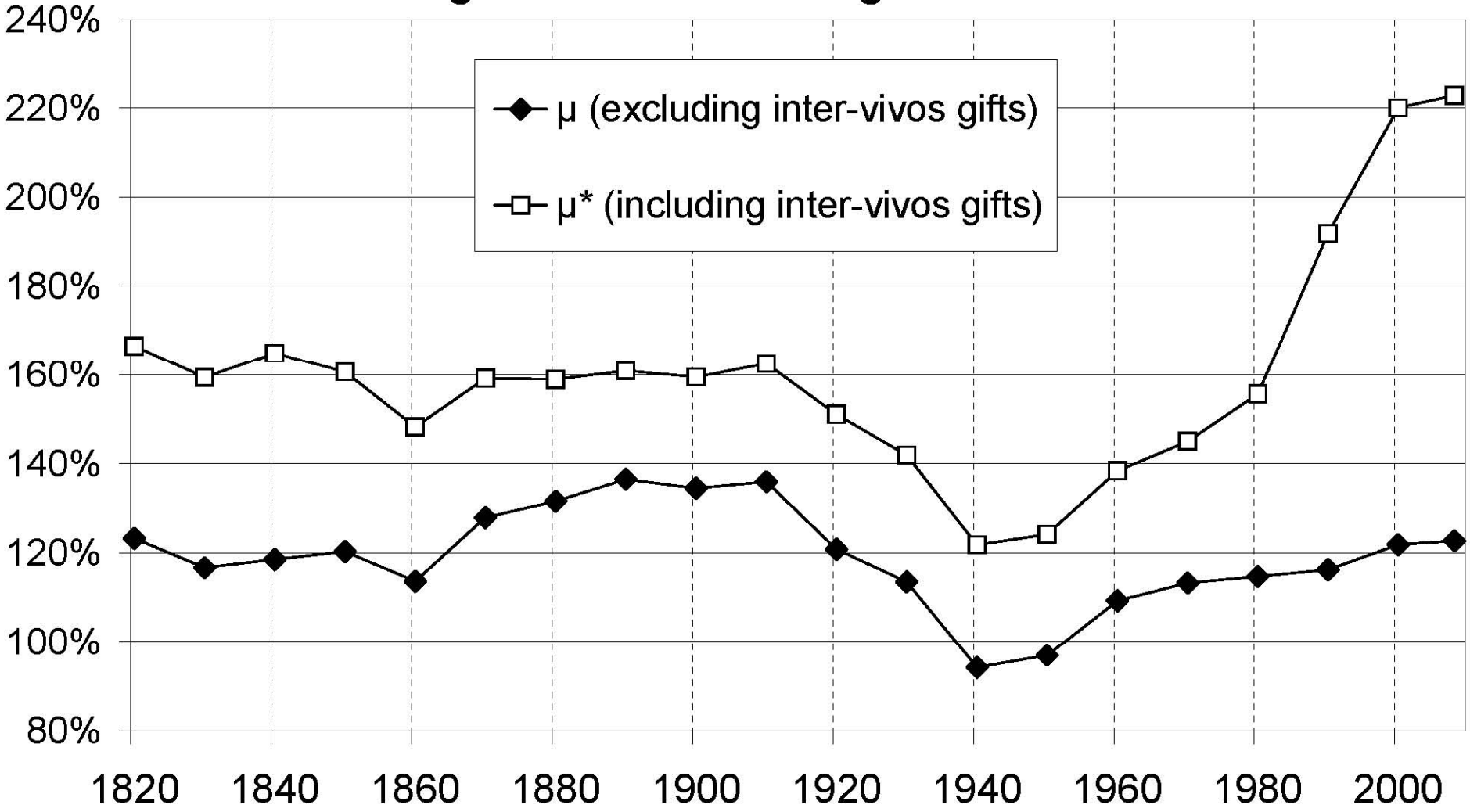
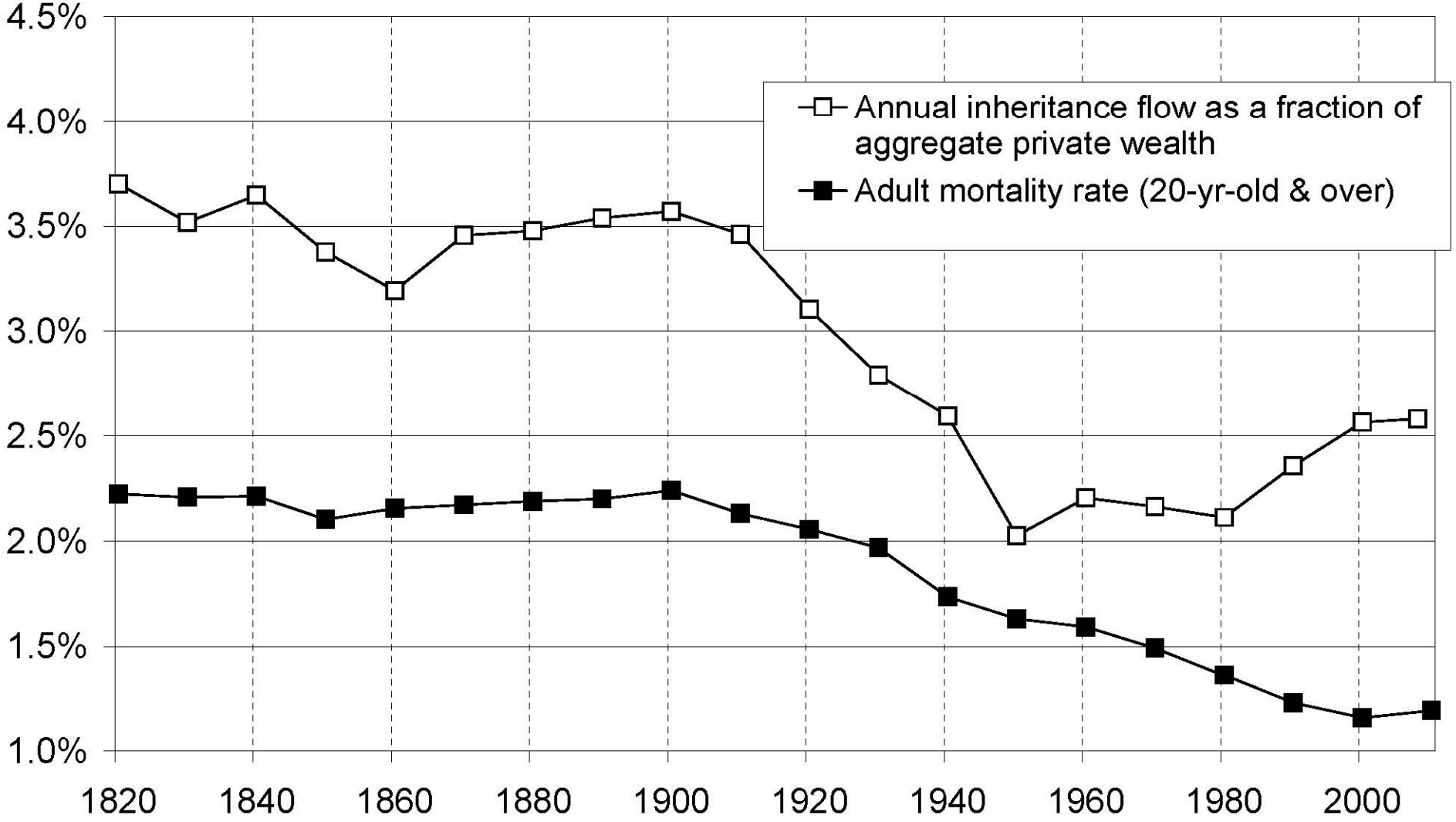


Figure 5: Inheritance flow vs mortality rate in France, 1820-2008



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)

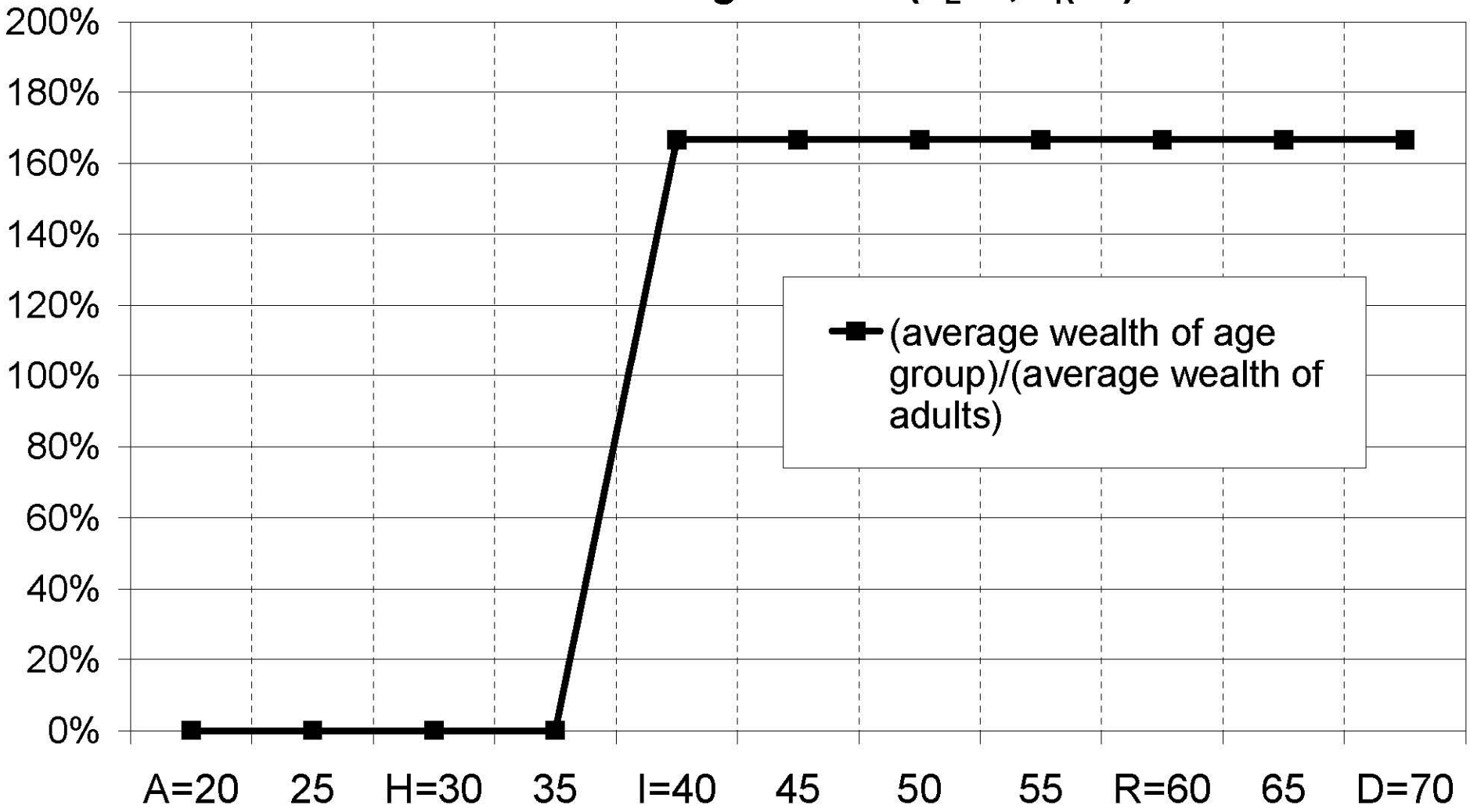


Figure 7: Steady-state cross-sectional age-wealth profile in the class savings model with demographic noise

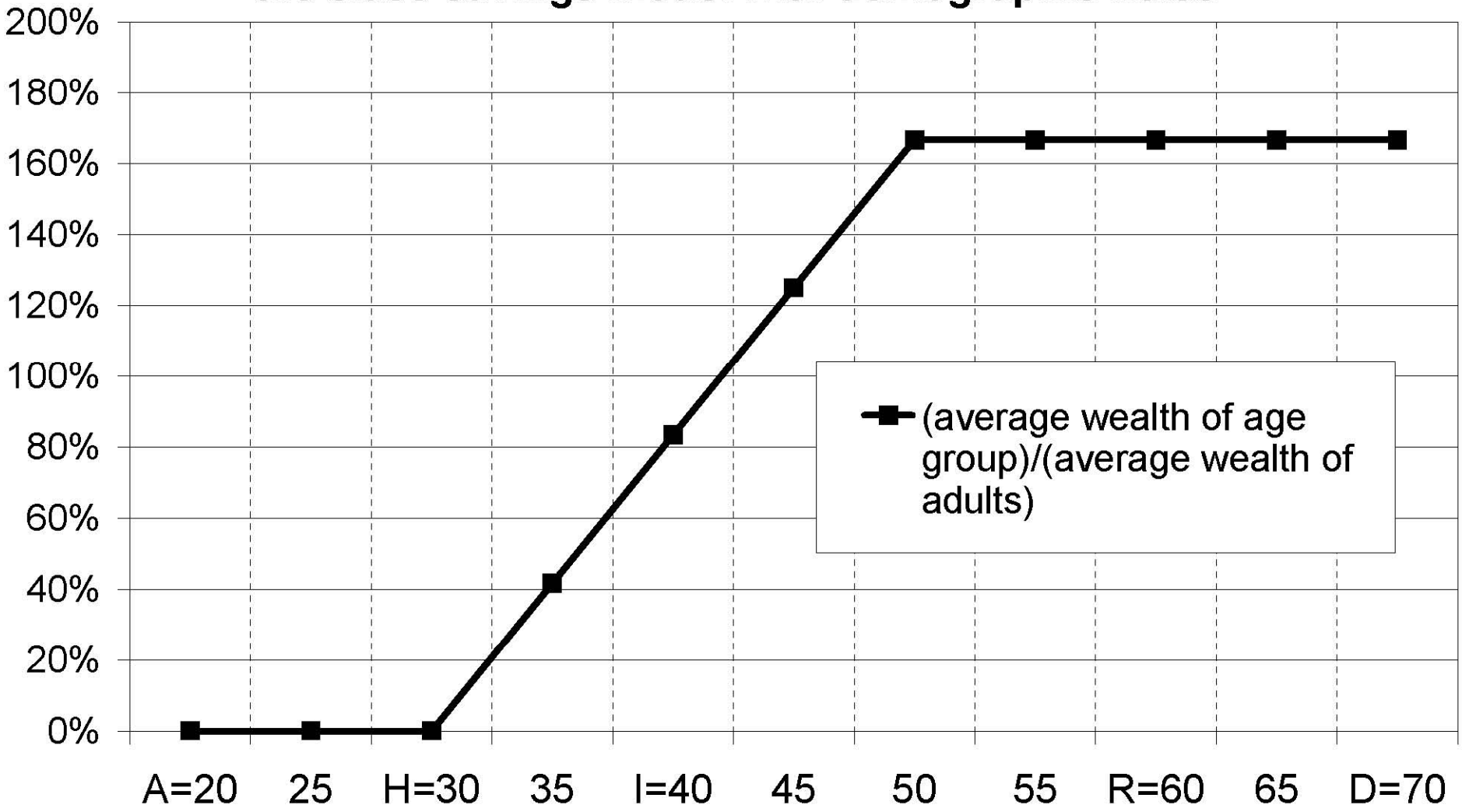


Figure 8: Private savings rate in France 1820-2008

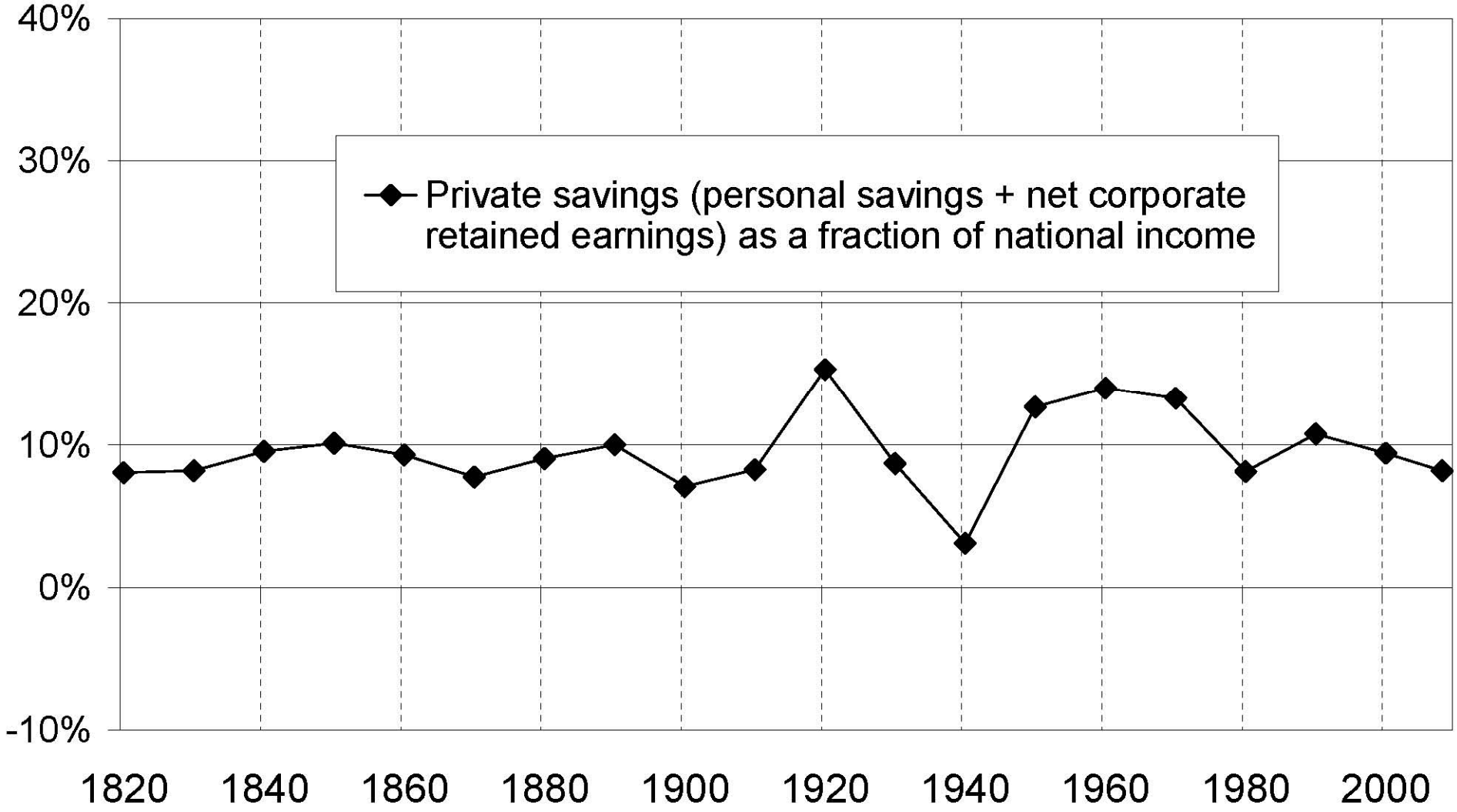


Figure 10: Labor & capital shares in national income, France 1820-2008

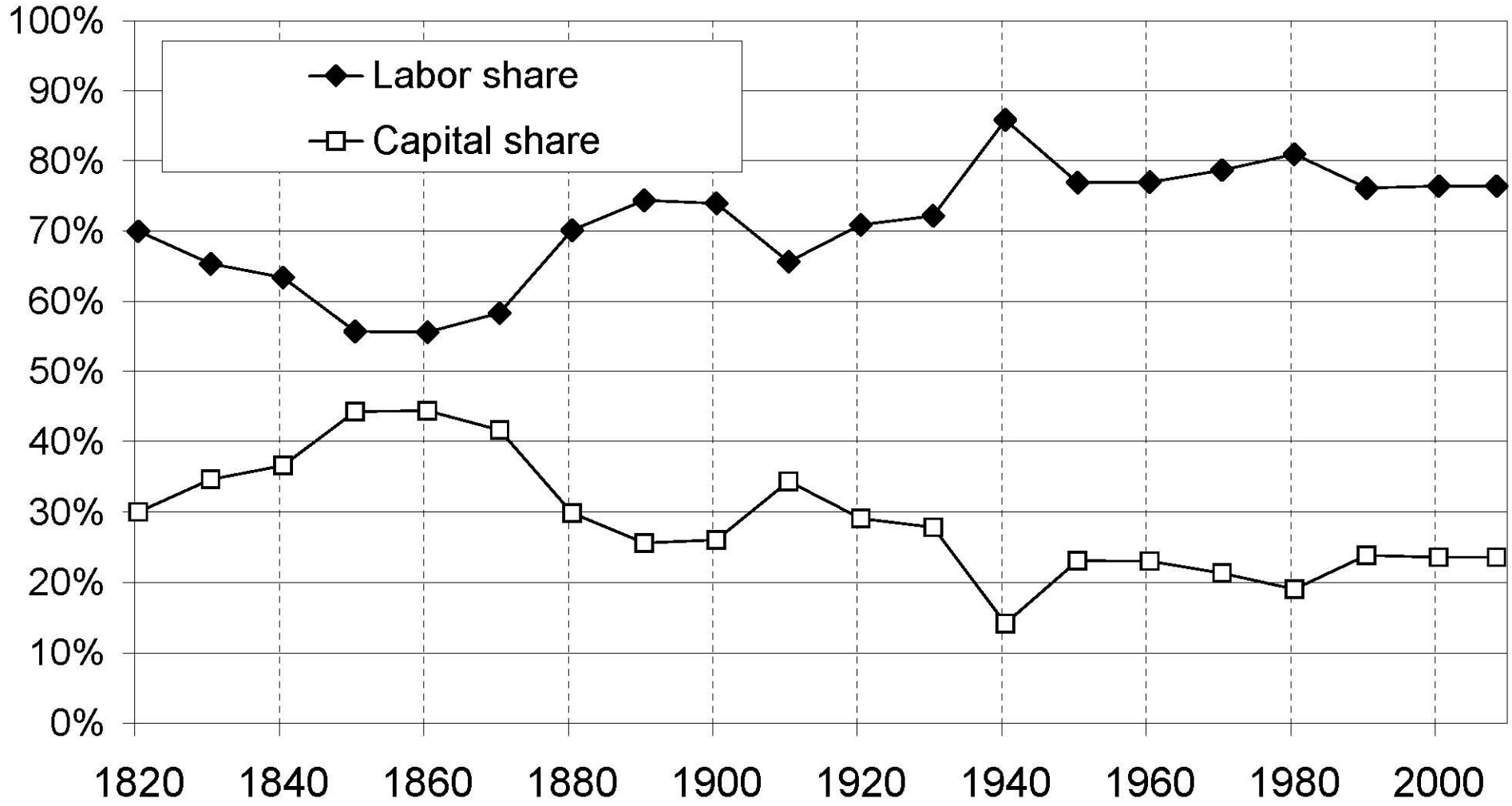


Figure 11: Rate of return vs growth rate France 1820-1913

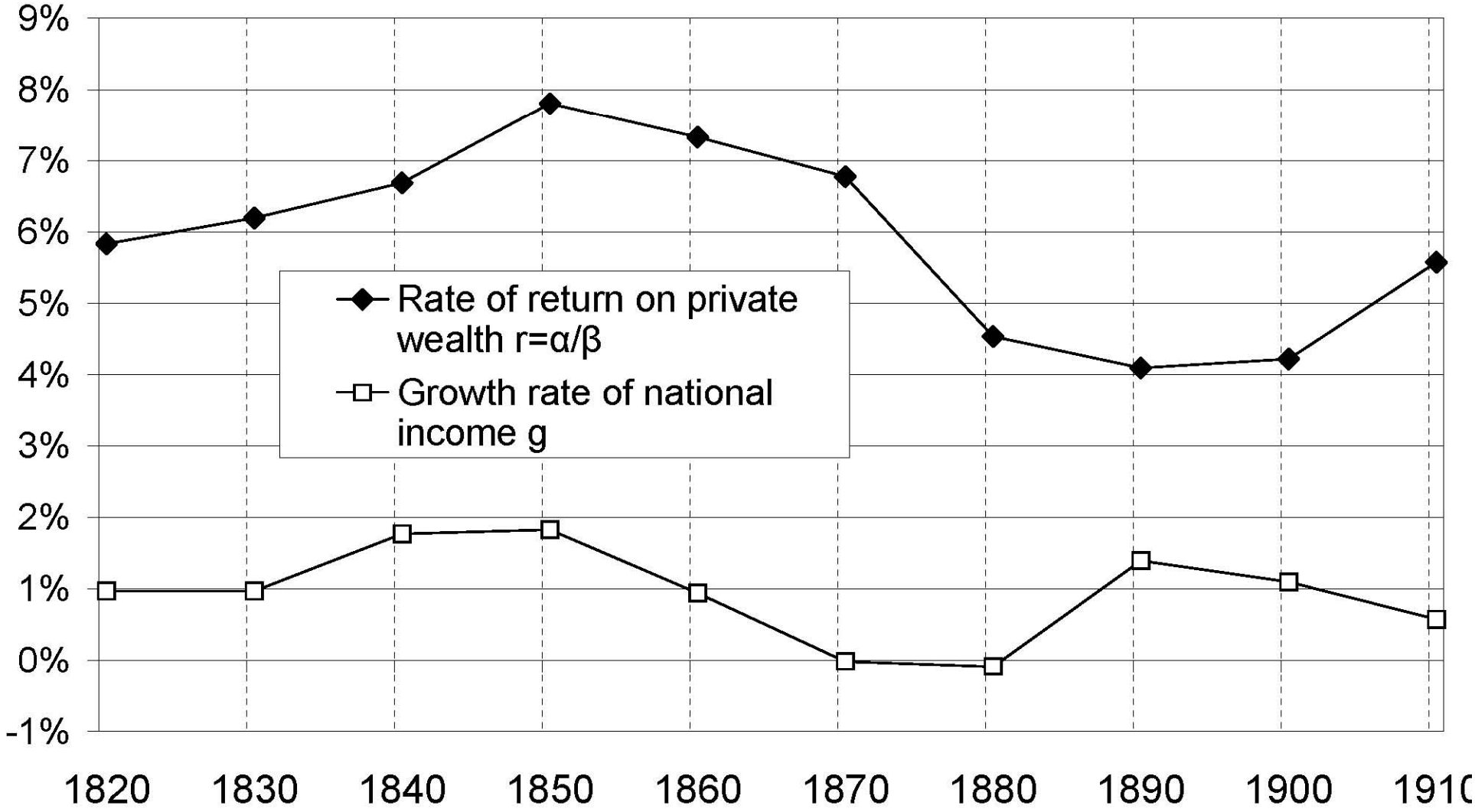


Figure 12: Capital share vs savings rate France 1820-1913

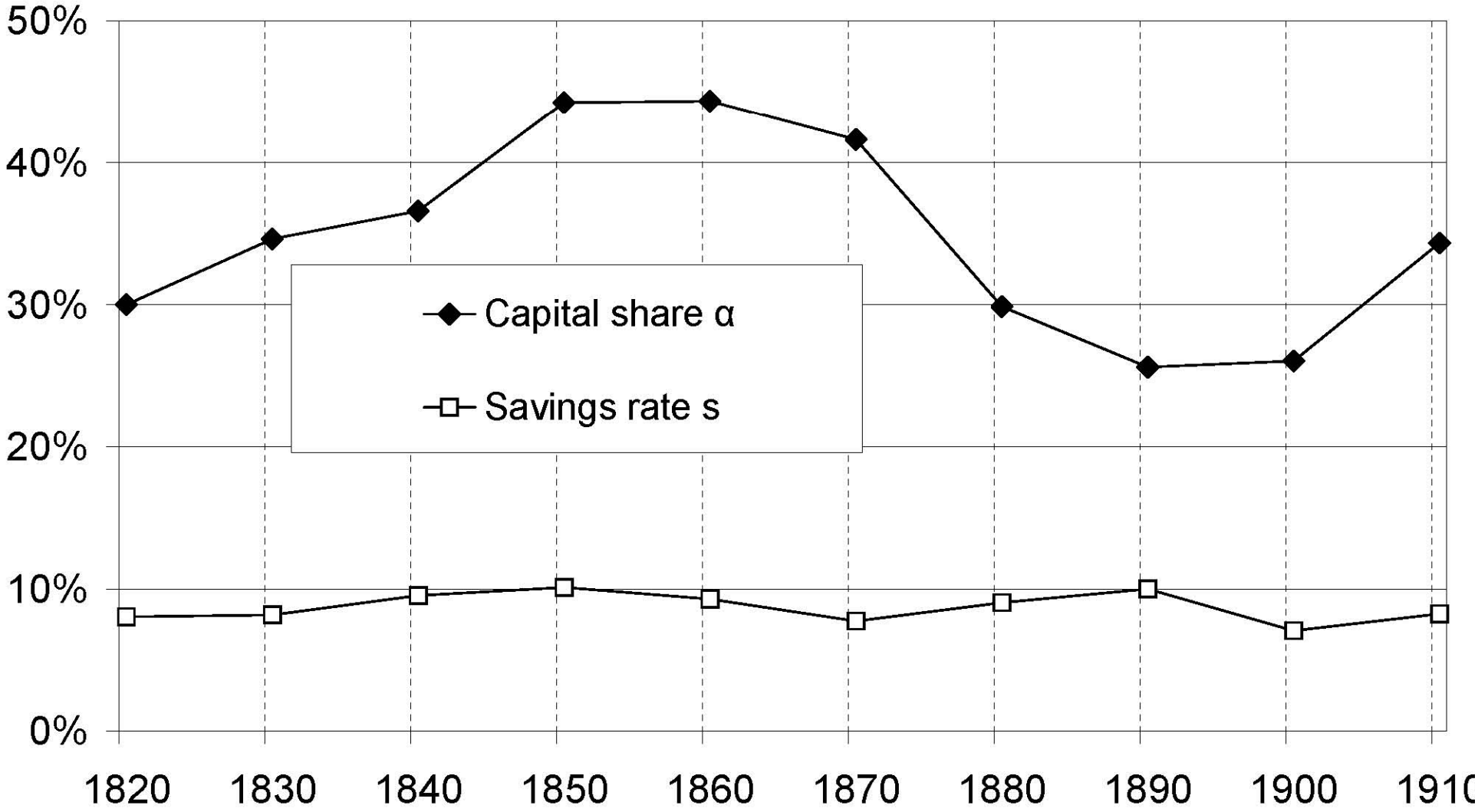


Figure 18: The share of non-capitalized inheritance in aggregate wealth accumulation , France 1850-2100

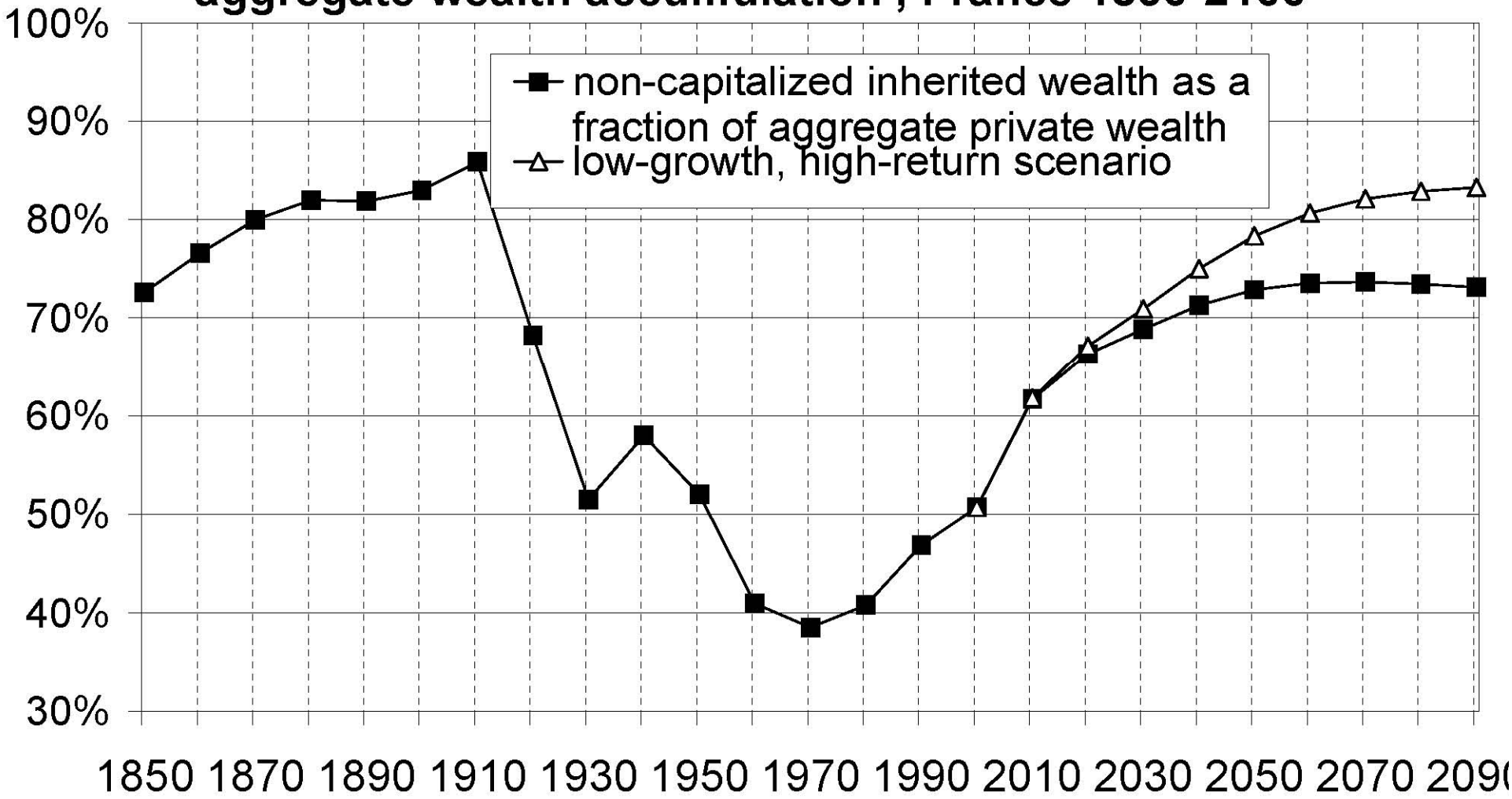


Figure 19: The share of capitalized inheritance in aggregate wealth accumulation , France 1900-2100

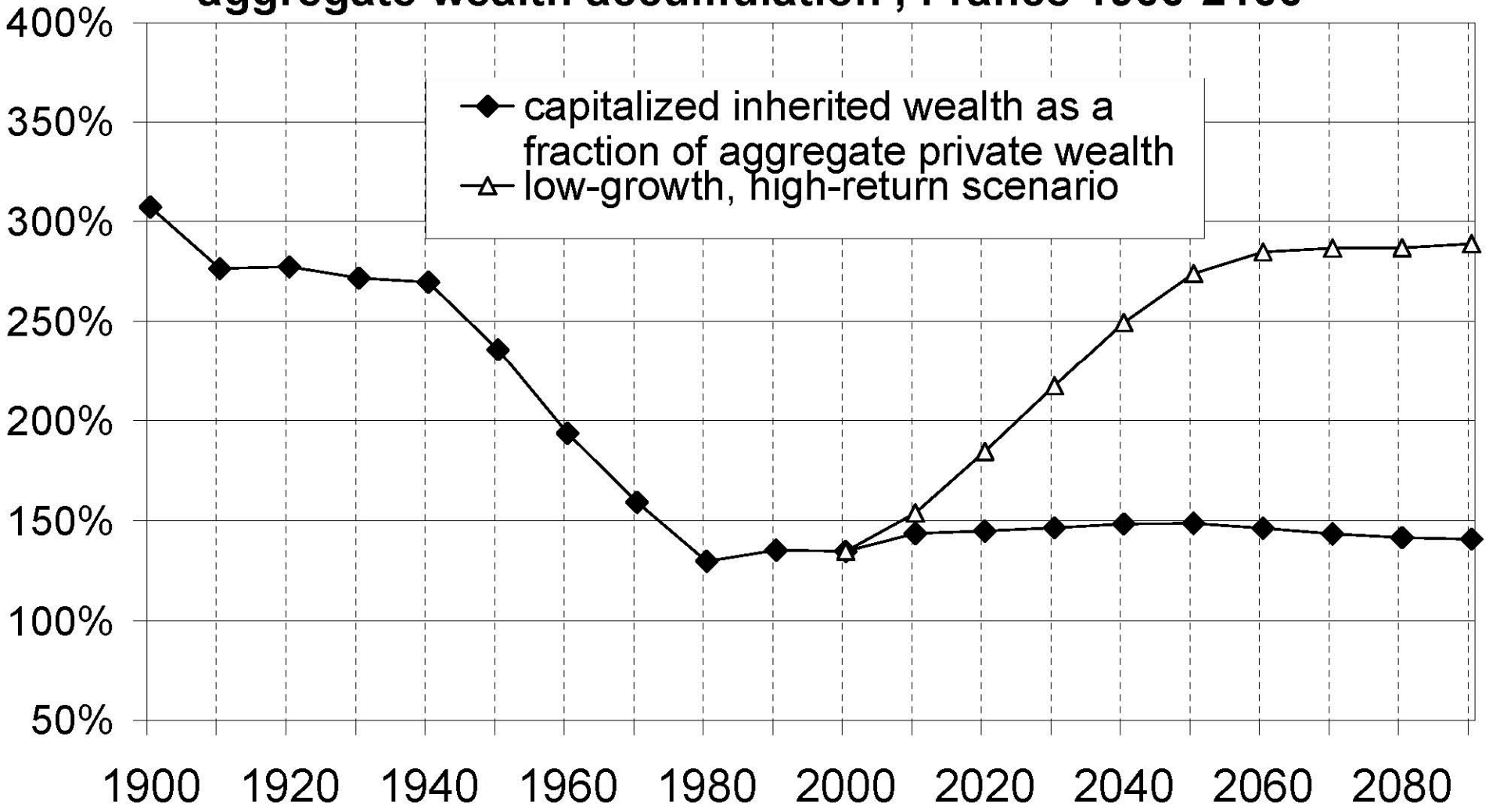


Table 2: Rates of return vs growth rates in France, 1820-2009

	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%**