

# **Econ 133 – Global Inequality and Growth**

## **Inherited vs. self-made wealth**

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## What we've learned so far:

- There have been dramatic changes in wealth concentration over time
- $r - g$  model useful to think about these changes

## What we're going to learn in this lecture:

- How to divide wealth into inherited vs. self-made wealth
- How the importance of inherited wealth has changed over time
- What factors can account for these changes

# 1 Wealth = inherited wealth + self-made wealth

- What is the fraction of aggregate wealth  $W$  that comes from the past (= inherited) vs. the present (= self-made)?
- Modern societies like to view themselves as meritocratic
- Widespread view that inheritance was important in the past (Balzac, Austen...) but less important today

## Kotlikoff-Summers vs. Modigliani controversy:

- Kotlikoff & Summers (1981, 1988): 80% of US wealth inherited
- Modigliani (1986, 1988): 80% of US wealth is self-made
- Who's right?

## 1.1 How to measure share of inherited wealth in total $W$

- Assume that we observe the aggregate wealth stock  $W_t$  at time  $t$
- We'd like to estimate aggregate inherited wealth stock  $W_{Bt} \leq W_t$
- And the share of inherited wealth in total wealth  $\varphi_t = W_{Bt}/W_t$ .
- Assume we observe annual inheritance flow  $B_s$  in any year  $s \leq t$ .

- We could define stock of inherited wealth  $W_{Bt}$  as sum of past  $B_s$
- Problem 1: critical to include inter vivos gift flows
- Problem 2: Should only take into account fraction of inheritance flow  $B_{st} \leq B_s$  received at time  $s$  by people still alive in  $t$
- Standard simplification: cumulate the full inheritance flows observed the previous  $H = 30$  years ( $H$ : average generation length)
- Problem 3: inheritances produce flow returns!

## 1.2 The Modigliani vs. Kotlikoff-Summers measures

- Modigliani (1986, 1988) chooses zero capitalization:

$$W_{Bt}^M = \sum_{t-30 \leq s \leq t} B_s$$

- Kotlikoff and Summers (1981, 1988) capitalize past inheritance flows using economy's average rate of return to wealth  $r$

$$W_{Bt}^{KS} = \sum_{t-30 \leq s \leq t} B_s \cdot (1 + r)^{t-s}$$

- If  $g = r = 0\%$  and  $B_s = B$ , both definitions coincide and

$$W_{Bt}^M = W_{Bt}^{KS} = H \times B_s$$

- Ex: if  $B = 10\%$  of national income and  $H = 30$  years, then stock of inherited wealth  $W_{Bt}^M = W_{Bt}^{KS} = 300\%$  of national income
- If aggregate wealth amounts to  $400\%$  of national income, then share of inherited wealth  $\varphi_t^M = \varphi_t^{KS} = 75\%$  of total wealth

- But in general case where  $g$  and  $r - g$  are different from zero, the two definitions lead to widely different conclusions
- Ex: with  $g = 2\%$ ,  $r = 4\%$  and  $H = 30$ , for a given inheritance flow  $B = 10\%$  of national income and aggregate wealth  $W = 400\%$  of national income,  $\varphi_t^M = 56\%$  and  $\varphi_t^{KS} = 103\%$ .
- About half of wealth comes from inheritance according to the Modigliani definition, and all of it according to the KS definition

What is the main difference between Modigliani's and Kotlikoff and Summers' definition of inherited wealth?

A — Modigliani assumes that inheritance does not produce flow returns

B — Modigliani assumes that inherited wealth is invested in bonds

C — Kotlikoff and Summers assume that inherited wealth grows as fast as GDP

D — They are the same

## 1.3 The problems with the Modigliani and KS measures

- Both Modigliani's and KS's definitions are problematic
- 0 capitalization makes no sense: inheritors with 0 labor income can appear as life-cycle savers
- Full capitalization also inadequate:  $\varphi_t$  can be higher than 100%

- In reality, wealth accumulation always involves 2 kinds of people:
- Inheritors: people whose assets are  $<$  capitalized value of wealth they inherited (they consume more than their labor income)
- Savers: people whose assets are  $>$  capitalized value of wealth they inherited (they consume less than their labor income)

## 1.4 Example: Is Donald Trump a self-made man?

- Born in 1946, son of real estate tycoon Fred Trump
- Trump's wealth today  $\approx$  \$2.9 billion (= Bloomberg 2015 detailed investigation)
- Inherited his father's real estate company. Value of inheritance  $\approx$  40 million in 1974 (= \$200 million divided among 5 children)

- Average post-tax real rate of return on wealth in the US  $\approx 5\%$ :

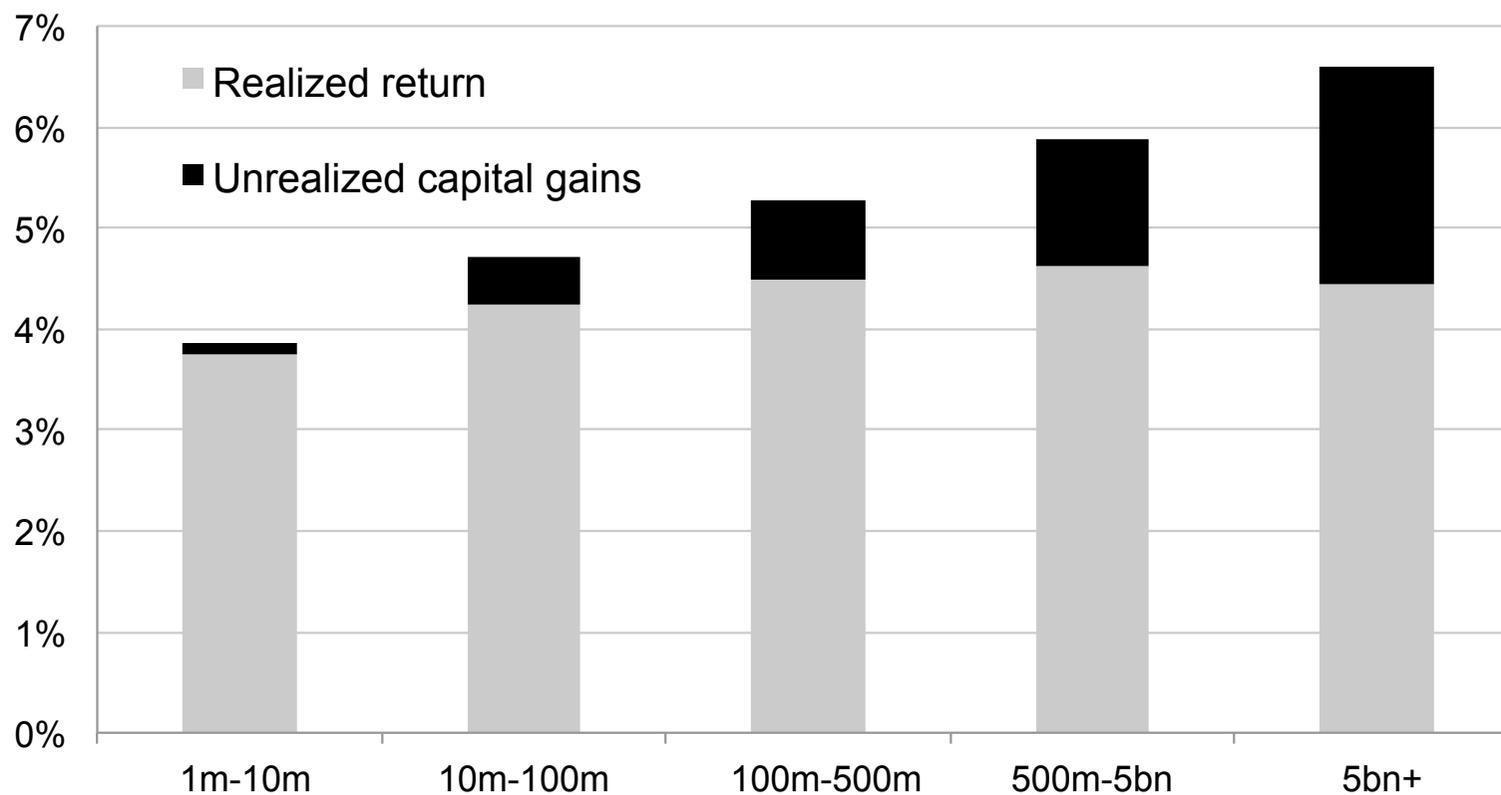
$$r = (1 - \tau_K) \cdot \frac{\alpha}{\beta} \approx 5\%$$

(With  $\alpha \approx 30\%$ ,  $\beta \approx 400\%$  and tax rate on capital  $\approx 30\%$ )

- Inflation rate of 3.5% so nominal return  $r \approx 8.5\%$
- Capitalized value of 1974 bequest = 40 million  $\times e^{42 \cdot r} = \$1.42$  billion = \$40m bequest received + \$1,380m cumulated return
- 1.42 billion < 2.9 billion: by that metric, Trump is a “saver”

- But what if real return equals 7.0% rather than 5%?
- Then capitalized value of 1974 bequest = 40 million  $\times e^{42 \cdot r} =$   
\$3.29 billion = \$40m bequest received + \$3,250m cum. return
- In that case Trump is a rentier: has consumed more than his labor income
- Nobody knows what  $r$  he got, but evidence that rates of return rise a lot with initial wealth

**Figure C4: Return on foundation wealth, 1990-2010 average**  
**Returns including realized & unrealized gains**



Source: Saez and Zucman (2016)

## 1.5 The correct measure of $\varphi_t$

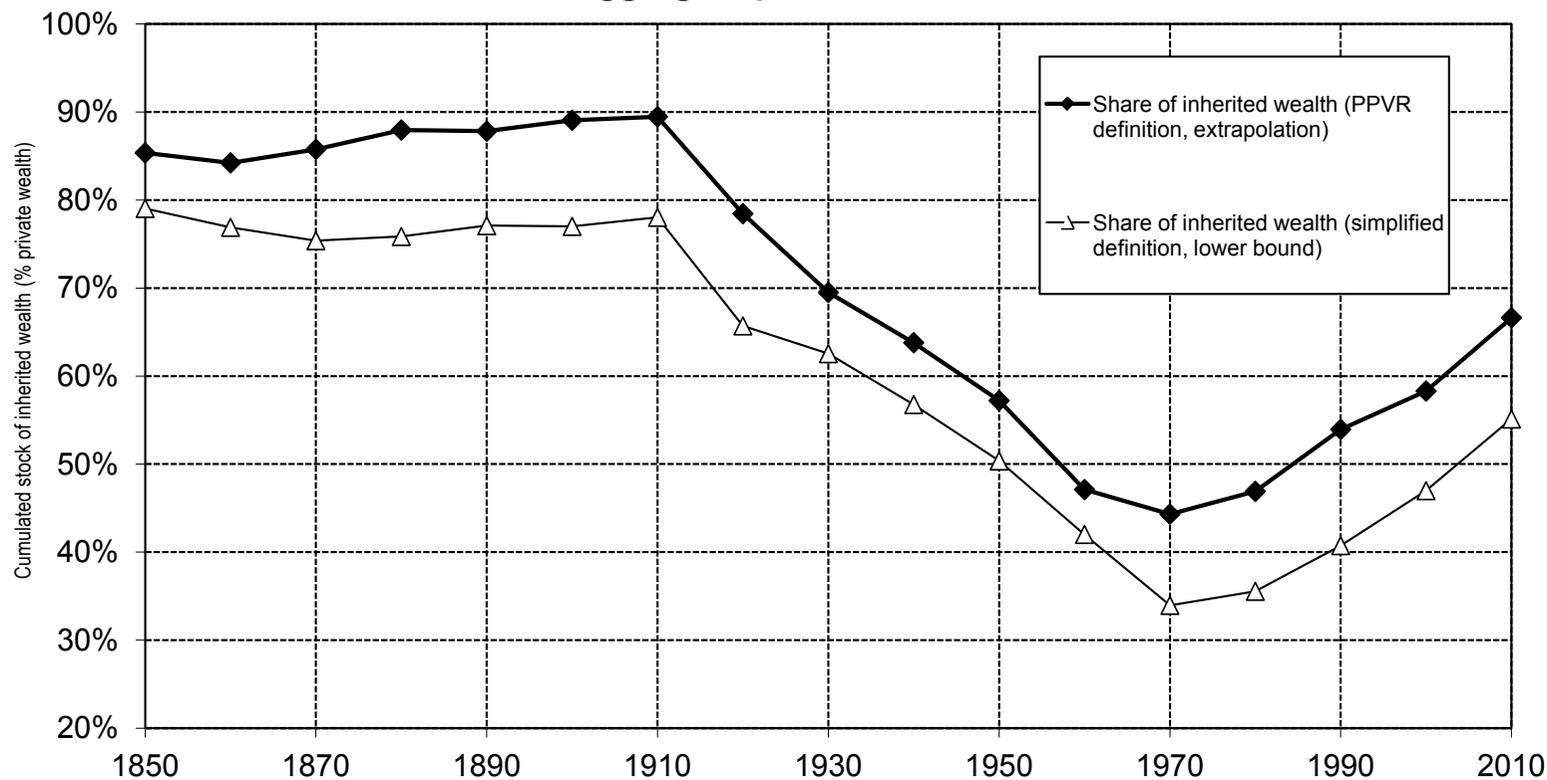
- Correct measure = Piketty, Postel-Vinay, and Rosenthal (2013)
- Aggregate inherited wealth = sum of inheritors' wealth plus the inherited fraction of savers' wealth
- Self-made wealth = non-inherited fraction of savers' wealth
- By construction, inherited and self-made wealth are less than 100% and sum to aggregate wealth

## 2 Estimates of share $\varphi$ of inherited wealth in total wealth

Lots of data issues involved:

- To identify rentiers vs. savers, one needs micro data on wealth and inheritance
- This is rare because few countries have universal estate or inheritance tax
- One exception: France = quasi-universal inheritance tax since 1790

**Figure 4.4. The cumulated stock of inherited wealth as a fraction of aggregate private wealth, France 1850-2010**

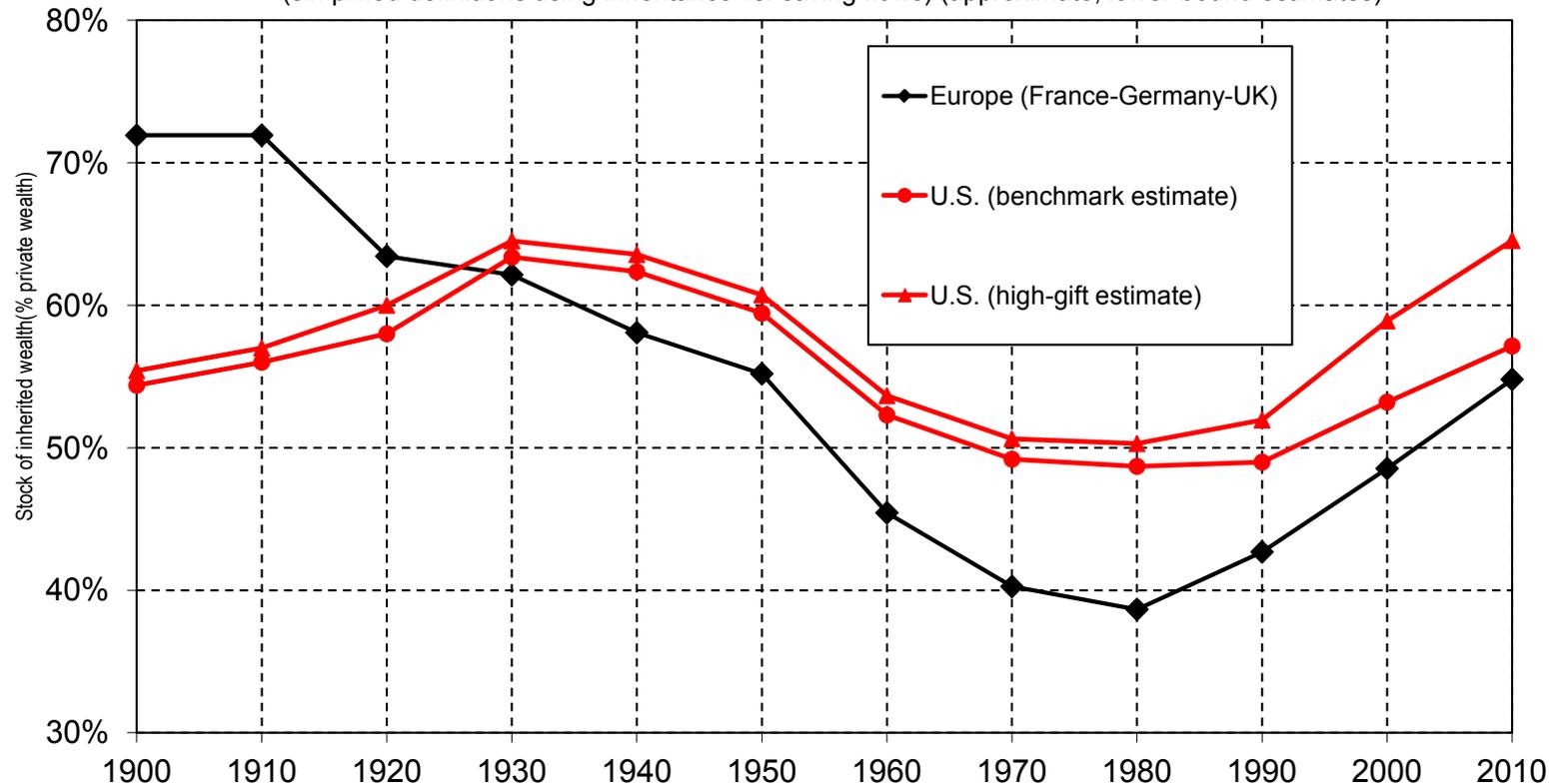


Inherited wealth represents 80-90% of total wealth in France in the 19th century; this share fell to 40%-50% during the 20th century, and is back to about 60-70% in the early 21st century.

Source: Piketty and Zucman (2015)

**Figure 1. The share of inherited wealth. Europe and the U.S. 1900-2010**

(simplified definitions using inheritance vs. saving flows) (approximate, lower-bound estimates)



The inheritance share in aggregate wealth accumulation was over 70% in Europe in 1900-1910. It fell abruptly following 1914-1945 shocks, down to 40% in 1970-1980 period. It is back to about 50-60% in 2000-2010 and rising. The U.S. pattern also appears to be U-shaped, but less marked, and with significant uncertainty regarding recent trends, due to data limitations.

Source: Alvaredo, Garbinti and Piketty (2015)

### 3 Explaining the changes in share of inherited wealth $\varphi$

- Key parameter: bequest-plus-gift flow  $B_t^*$
- If the bequest flow is large, a lot of wealth is transmitted from the past to the present
- High bequest flows lead to high shares of inherited wealth  $\varphi$  in the following decades
- What determines the bequest-plus-gift flow?

Bequest flow  $B_t^*$  can always be computed as

$$B_t^* = (1 + v_t) \cdot \mu_t \cdot m_t \cdot W_t$$

- $m_t =$  mortality rate (adult decedents / total adult population)
- $\mu_t =$  ratio between average adult wealth at death and average adult wealth for the entire population
- $v_t = V_t/B_t =$  estimate of the gift/bequest flow ratio

What does this formula mean?

- If  $\mu_t = 1$  and  $v_t = 0$  (no gift), then  $B_t^* = m_t \cdot W_t$
- That is, if mortality rate is 1%, then 1% of total wealth is transmitted every year
- If  $\mu_t = 0$  (pure life-cycle theory) and  $v_t = 0$ , then there is no inheritance at all

Assume the mortality rate is 1%, people die with twice the average per-adult wealth, and the private wealth / national income ratio is 5. Then the inheritance flow  $B$  will be equal to:

A — 10% of private wealth

B — 10% of national income

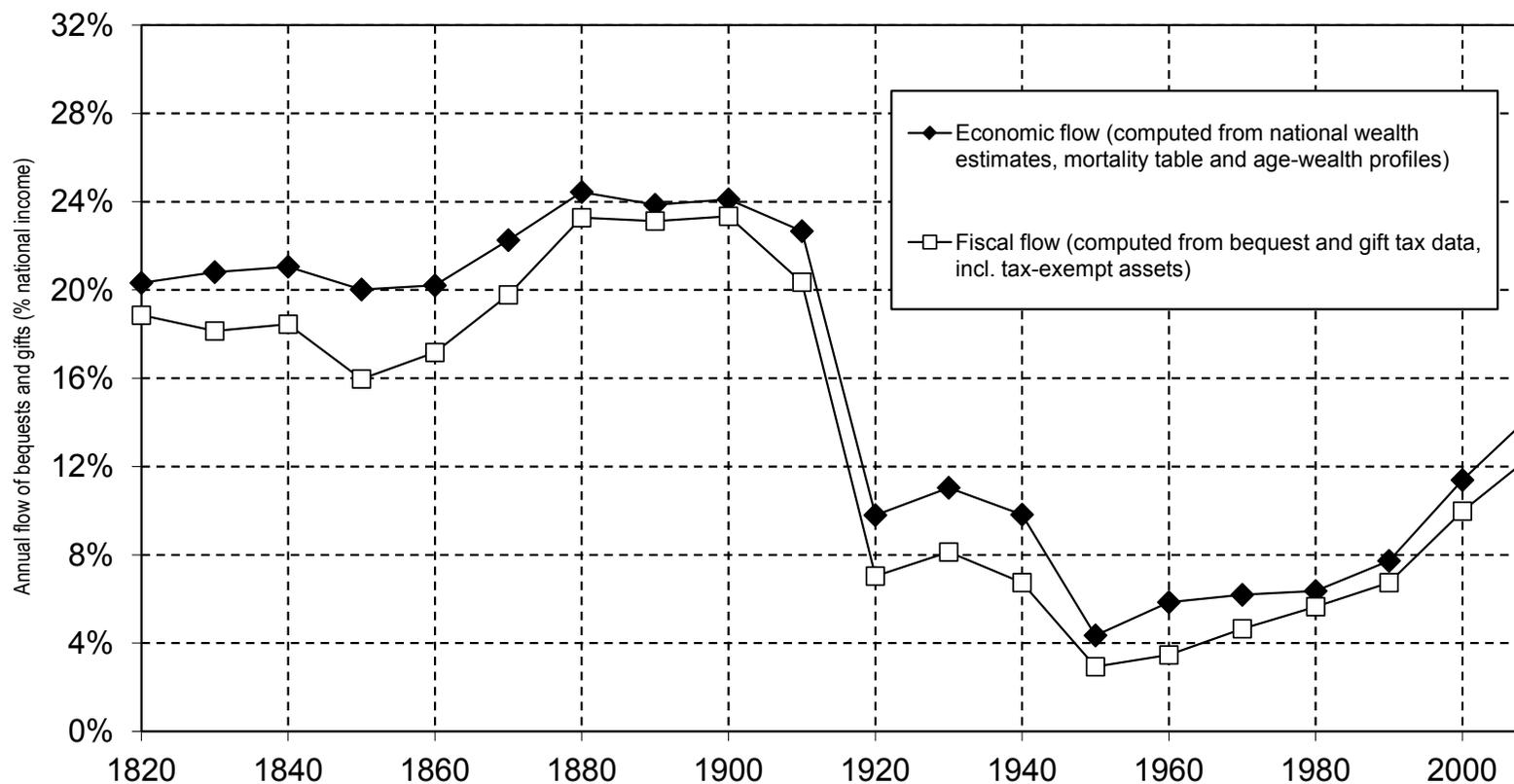
C — 20% of national income

D — 5% of national income

## 4 Example: the case of France

- Study by Piketty (2011) where inheritance tax data are exceptionally good
- Bequest flow has followed a spectacular U-shaped pattern over the 20th century

**Figure 4.1. The annual inheritance flow as a fraction of national income, France 1820-2010**



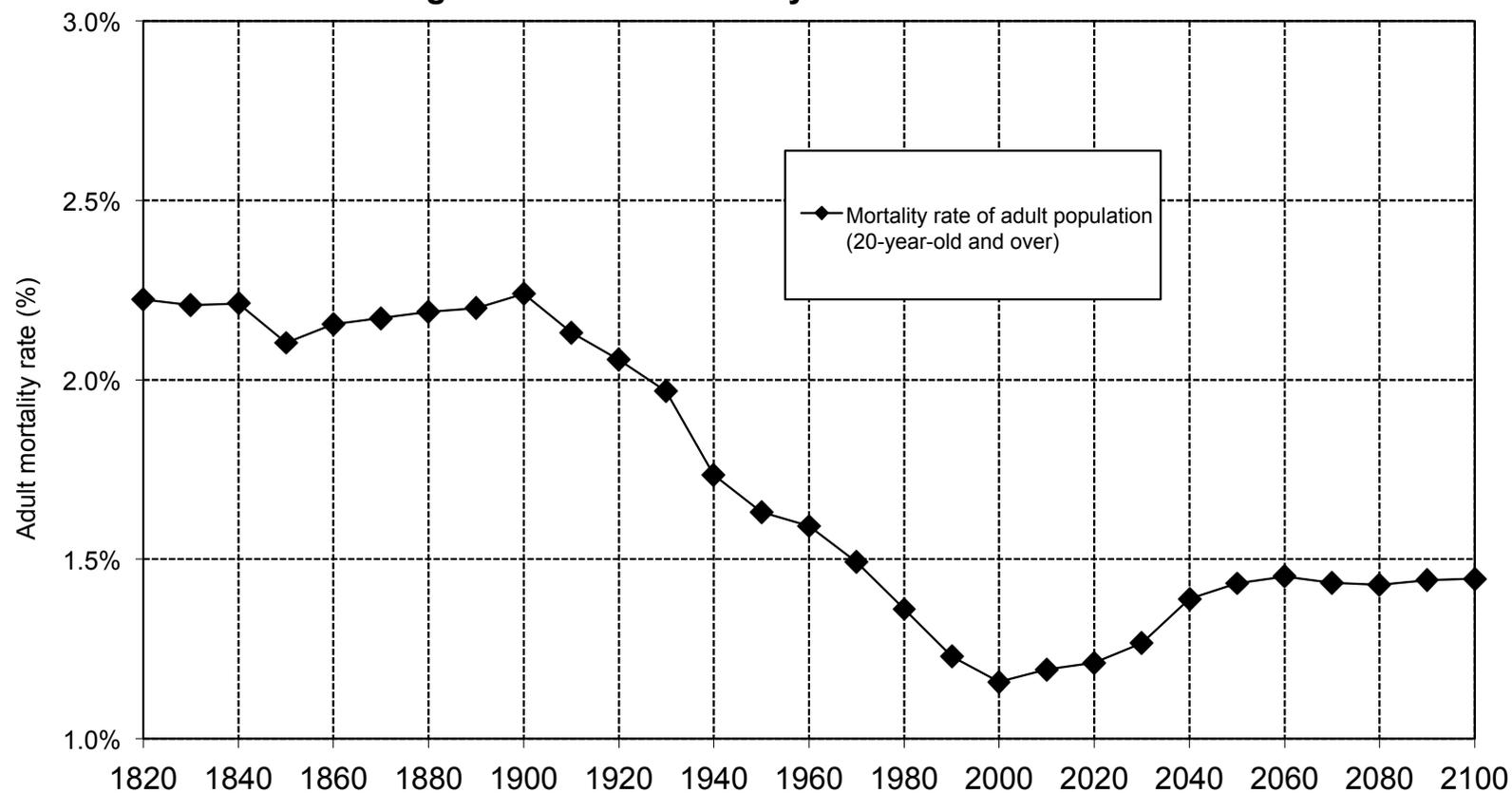
The annual inheritance flow was about 20-25% of national income during the 19th century and until 1914; it then fell to less than 5% in the 1950s, and returned to about 15% in 2010.

Source: Piketty (2011)

Key role of  $\mu$  and gifts in explaining the evolution of the bequest flow:

- Relative wealth of decedents was at its lowest historical level in the aftermath of World War 2
- In recent years,  $\mu_t$  has been rising, and  $v_t$  rising a lot
- $\mu$  tends to be high when  $r > g$ , because makes it easier for old people to accumulate a lot of wealth
- As old people grow richer, inheritance is making a comeback

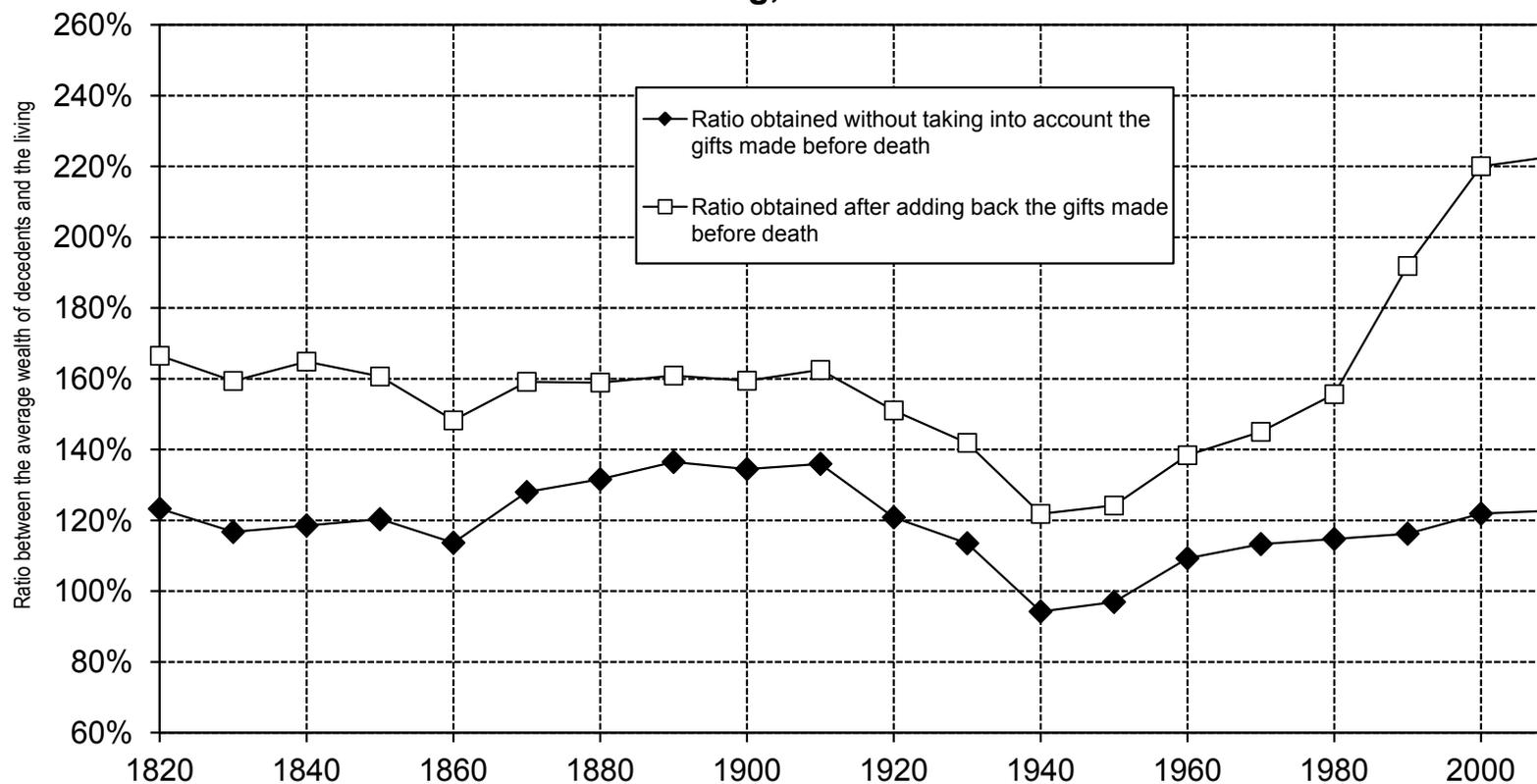
**Figure 11.2. The mortality rate in France 1820-2100**



The mortality rate fell in France during the 20th century (rise of life expectancy), and should increase somewhat during the 21st century (baby-boom effect). Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

Source: Piketty (2014)

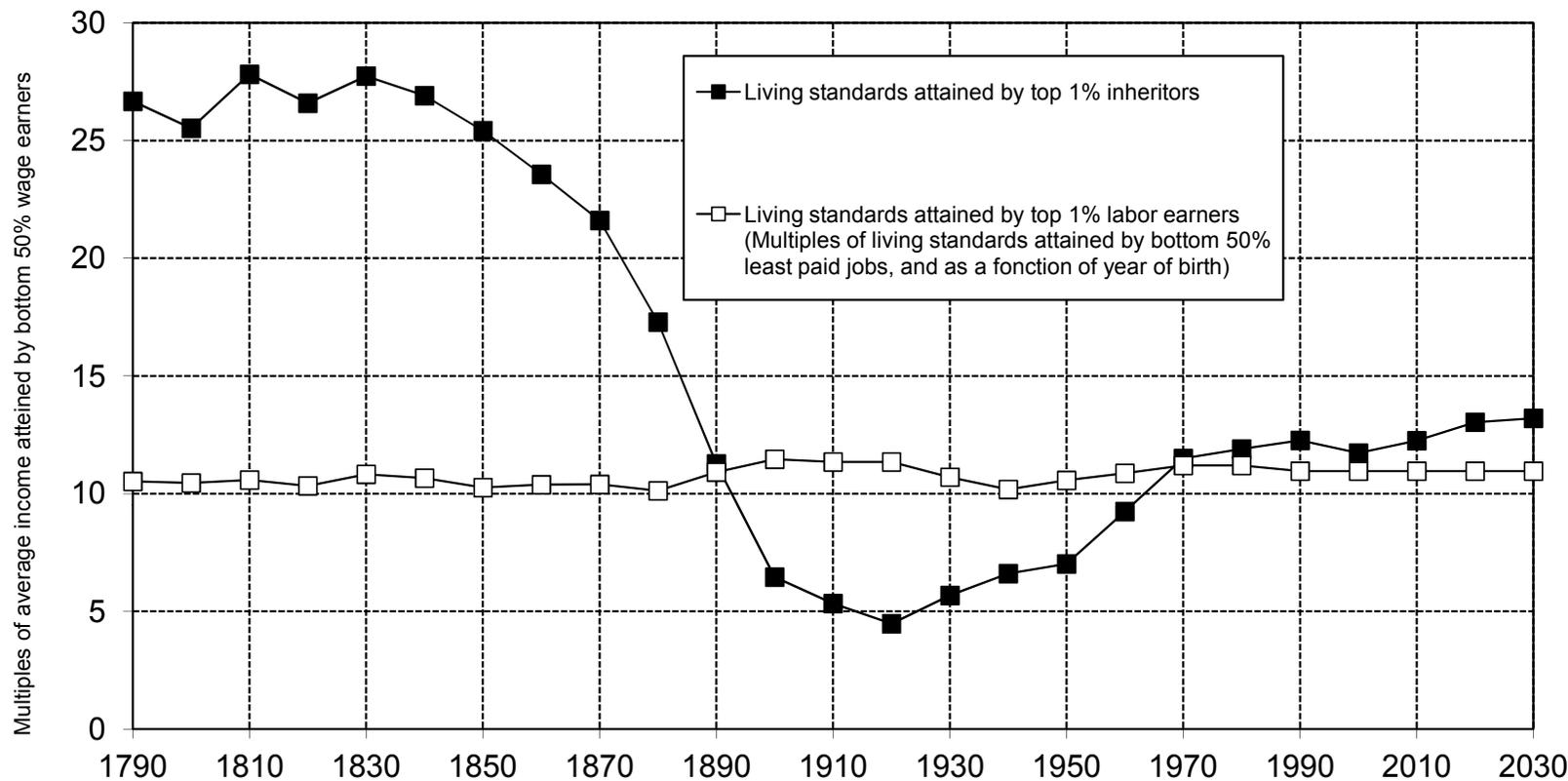
**Figure 4.3. The ratio between average wealth at death and average wealth of the living, France 1820-2010**



In 2000-2010, the average wealth at death is 20% higher than that of the living if one omits the gifts that were made before death, but more than twice as large if one re-integrates gifts.

Source: Piketty (2011)

**Figure 11.10. The dilemma of Rastignac for cohorts born in years 1790-2030**



In the 19th century, the living standards that could be attained by the top 1% inheritors were a lot higher than those that could be attained by the top 1% labor earners. Sources and series: see [piketty.pse.ens.fr/capital21c](http://piketty.pse.ens.fr/capital21c).

Source: Piketty (2014)

## 5 Summary

- Aggregate wealth = inherited wealth + self-made wealth
- To properly measure inherited wealth, one has to distinguish two types of agents: savers and inheritors
- Today about 50%–60% of total wealth comes from inheritance
- Inherited wealth tends to be big when  $r > g$

## References

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