A Simplified Mortality Multiplier Method: New Estimates of Wealth Concentration

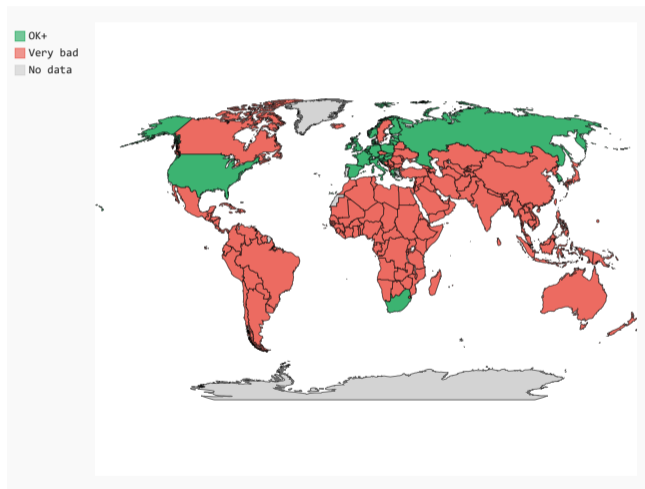Facundo Alvaredo [*]   **Yonatan Berman** [†]   Salvatore Morelli [‡]

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Lack of data on wealth

Based on the World Inequality Report (2022)

We focus on individual estates data

- ▶ The mortality multiplier method

- ▶ Pre-dates all other estimation methods (Mallet (1908): first application, for England and Wales)

- ▶ Exists/ed in a number of countries, in some cases for many years – long before income tax

- ▶ Covers well the top of the distribution (*c.f.* surveys)

We focus on individual estates data

Tax levied
Tax repealed
No tax/data
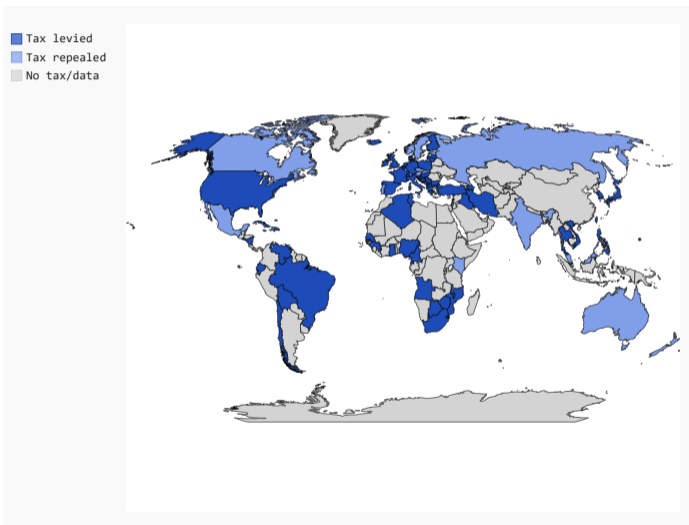
We focus on individual estates data

▶ Basic idea – decedents are "sampled" from the living population – the sampling rate is the mortality rate

▶ The living population is estimated by reweighting according to inverse sampling weights (multipliers): a multiplier is the number of living people a decedent represents

▶ Challenges:

    ▶ Exemptions, evasion, planning

    ▶ Coverage

    ▶ **Obtaining mortality rates**

Good reasons to believe multipliers matter
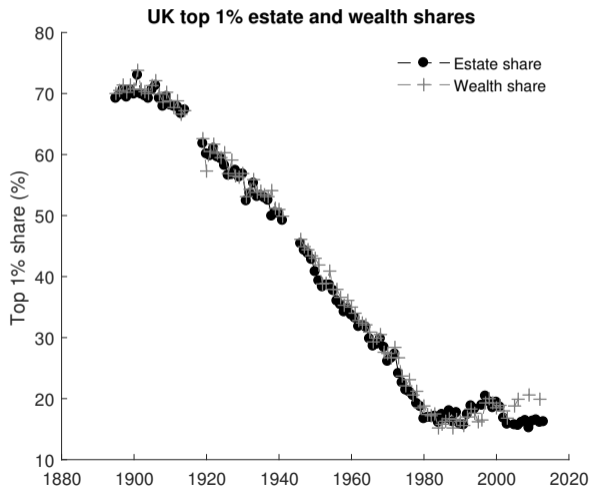
Mortality multipliers are highly heterogeneous

- ▶ Age

- ▶ Gender

- ▶ Income/Wealth

- ▶ Education

- ▶ Marital status

- ▶ Occupation

- ▶ Geography

Good reasons to believe multipliers matter
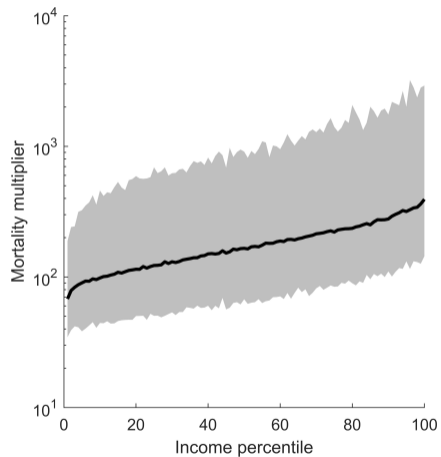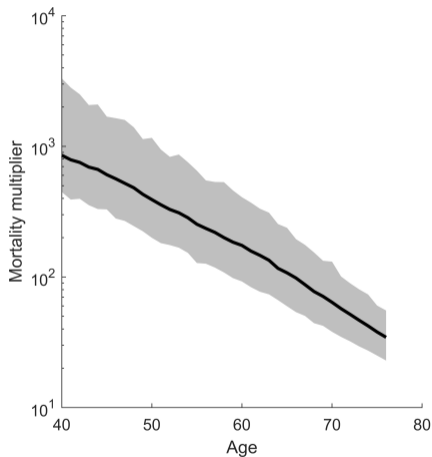
Authors' calculation based on Chetty *et al.* (2016)

But top estate and wealth shares may be very close

Alvaredo, Atkinson and Morelli (2018)

This paper

► How could the application of multipliers matter little to top wealth shares?

► Develop a simplified mortality multiplier method which exploits this understanding

► Novel long-run series top wealth shares for countries where:

   ► Data have not been exploited yet

   ► Full method cannot be applied

   ► Other data sources are limited (*e.g.* Japan, Belgium, South Africa)

The simplified mortality multiplier method – BOTTOM LINE

- ▶ The following ingredients are needed:

  - ▶ Estate tax tabulations

 - ▶ Aggregate mortality rates

  - ▶ (External total wealth)

The simplified mortality multiplier method – BOTTOM LINE
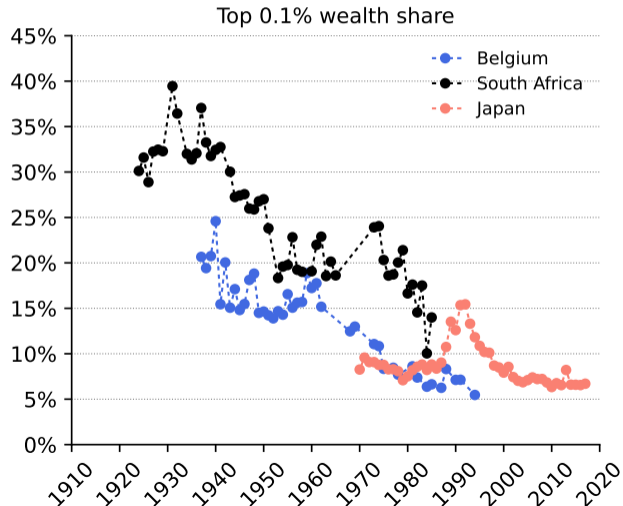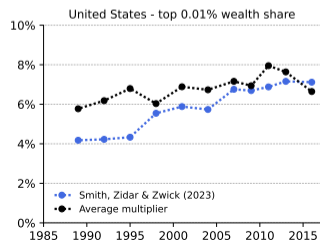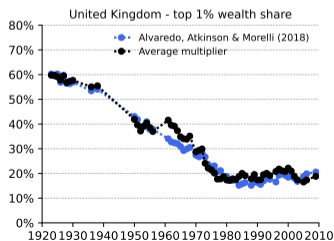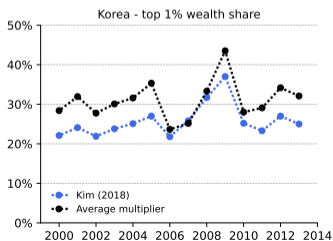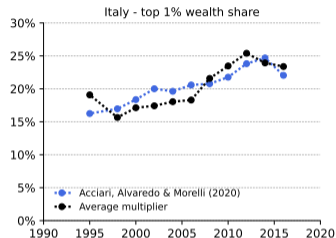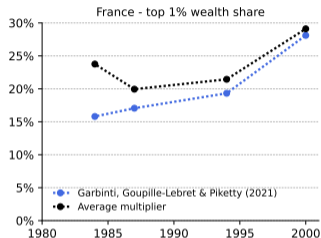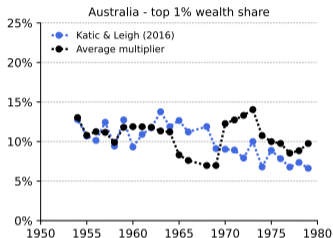
The mortality multiplier method

▶ Decedents are "sampled" from the living population

▶ The sampling rate is the mortality rate

▶ The living population is estimated by reweighting according to inverse sampling weights (multipliers): a multiplier is the number of living people a decedent represents

▶ What happens if we apply the same multiplier – the average multiplier ($\bar{m} = \frac{N}{N_E}$) – to every decedent?

▶ How does it compare to the application of heterogeneous multipliers?

▶ (This would be the simplified method)

The simplified mortality multiplier method
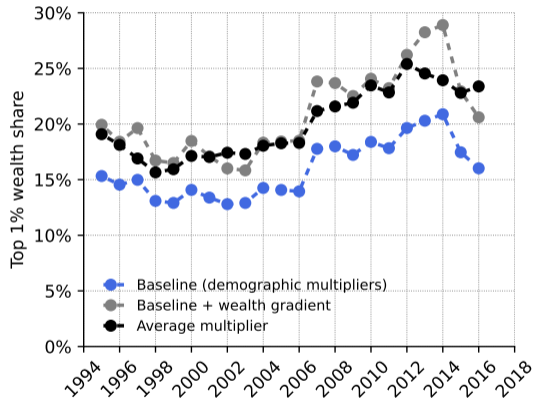
▶ Wealth increases with age on average (multipliers ↓ wrt average)

▶ Yet, there is some health premium to being rich (multipliers ↑ wrt average)

The simplified mortality multiplier method

The simplified mortality multiplier method

▶ Why does the application of multipliers matter little to top wealth shares in practice?

▶ For this presentation – I compare coefficients of variation (std deviation / mean)

▶ In analogy to Atkinson & Harrison (1978) for the capitalization method:

$$Y_W^2 = Y_E^2 \left(1 + \frac{\sum_{i=1}^{N_E} \left(\frac{\mu^2 m_i}{\bar{m}} - 1 \right) w_{E,i}^2}{N_E \sigma_E^2} \right)$$

$$Y_W^2 \approx Y_E^2 \text{ if } \mu^2 \frac{m_i}{\bar{m}} \approx 1 \text{ at the top of the estate distribution}$$

▶ For example, if $\mu = 1.4$, we get equality if $\bar{m}/m_i \approx 2$ (*c.f.* Forbes 400 data)

New estimates of wealth concentration

▶ The average multiplier may be useful to represent the top of the distribution of estates

▶ We can use partial knowledge of estates and the average multiplier to apply a Simplified Mortality Multiplier Method:

    ▶ We apply the average multiplier as the multiplier for all observed estates

    ▶ Together with knowing the total wealth (from another source) this is enough to obtain estimates for top wealth shares
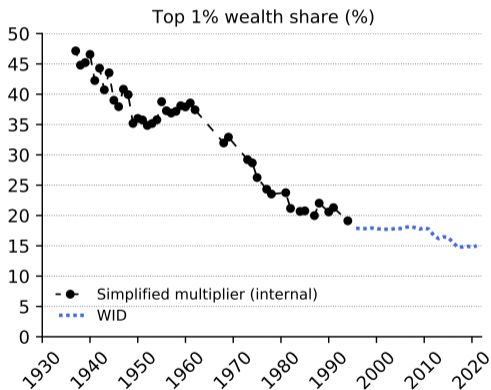
New estimates of wealth concentration

- ▶ Now we can use historical administrative data to estimate top wealth shares in many countries, *e.g.*:

  - ▶ **Belgium (since 1937)**
  - ▶ **Japan (since 1905)**
  - ▶ **South Africa (since 1923)**
  - ▶ Italy (since 1900)
  - ▶ Spain (since 1901)
  - ▶ Denmark (since 1909)

Belgium

- ▶ 1937–1994

- ▶ Good coverage ∼50%
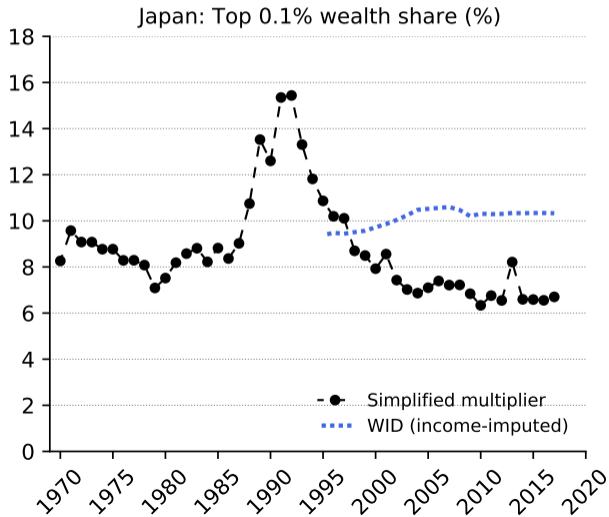
- ▶ No external total

Belgium

Belgium
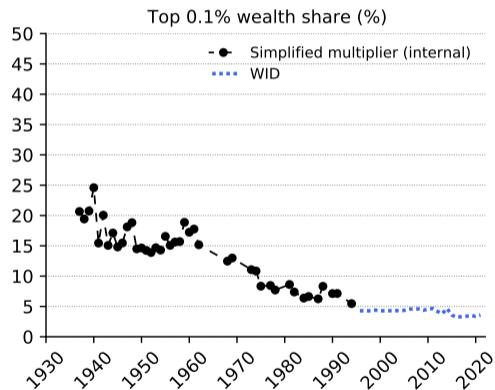
Japan

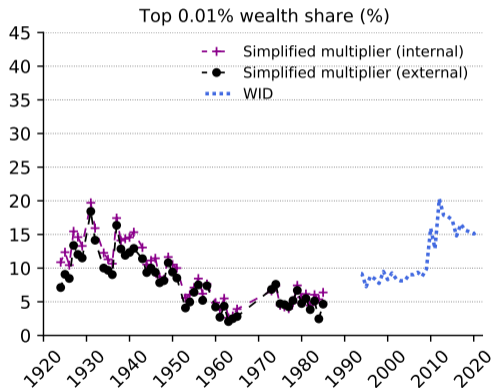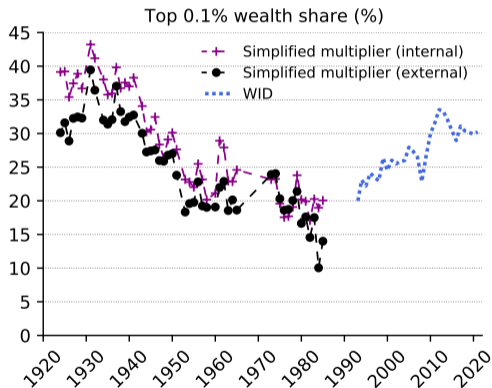- ▶ 1970–2017

- ▶ Limited coverage 5%–10%

- ▶ External total from WID

Japan

Japan: Top 0.1% wealth share (%)

South Africa

▶ 1923–1985

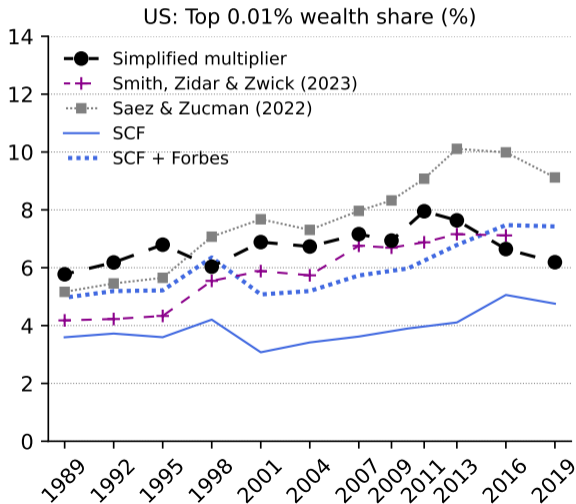▶ Limited coverage 2%–10%
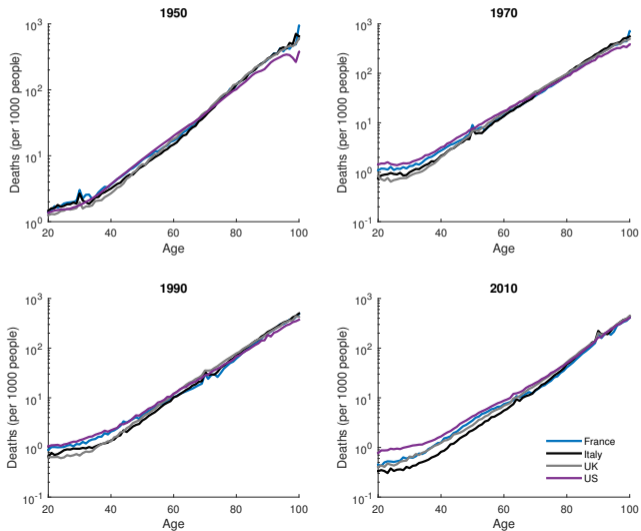
▶ External total from WID

South Africa

Conclusions

- ▶ The concentration of estates may provide the same informative content as the concentration of wealth

- ▶ Depends on whether mortality multipliers at the top of the estate distribution:
    - ▶ Sufficiently close to the average in the population
    - ▶ Weakly correlate with wealth

- ▶ The top includes mainly older people (multipliers ↓ wrt average), but rich (multipliers ↑ wrt average)

- ▶ The average mortality multiplier can provide rough estimates for top wealth shares and other inequality measures

- ▶ We apply a simplified mortality multiplier method to produce long-run top wealth share series

- ▶ This unlocks data previously thought to be unusable

What about the current debate on US top wealth shares?

US: Top 0.01% wealth share (%)

- Simplified multiplier
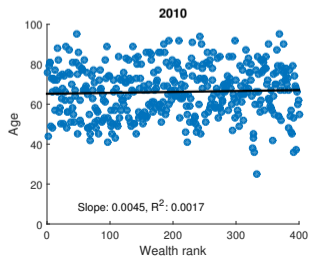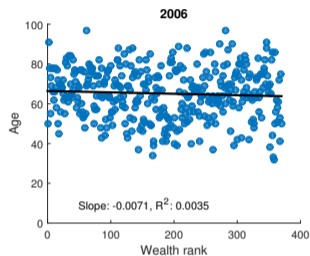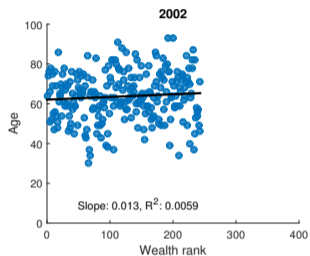- Smith, Zidar & Zwick (2023)
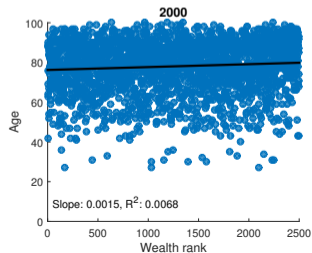- Saez & Zucman (2022)
- SCF
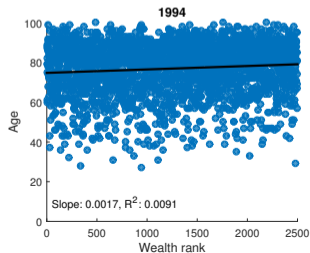- SCF + Forbes

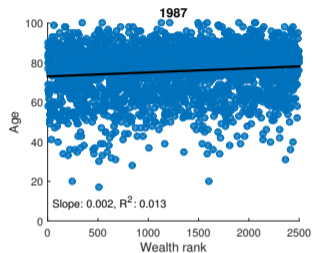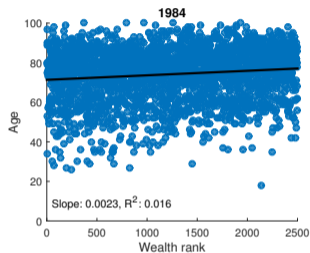# Mortality rates are exponential in age
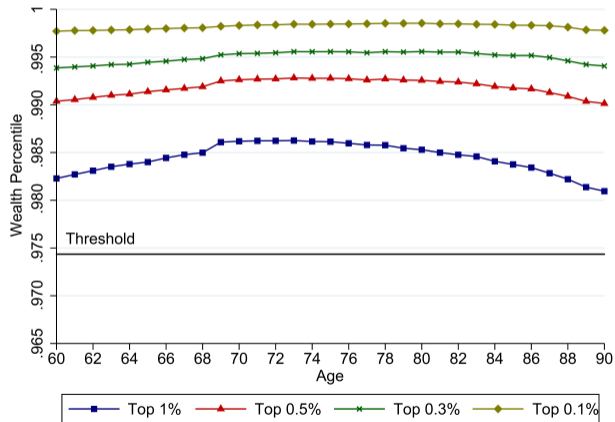
Mortality rates depend only weakly on wealth
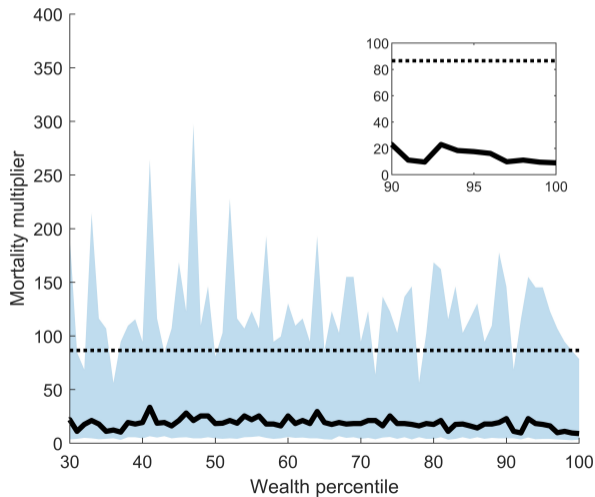
Wealth increases with age, not necessarily at the very top
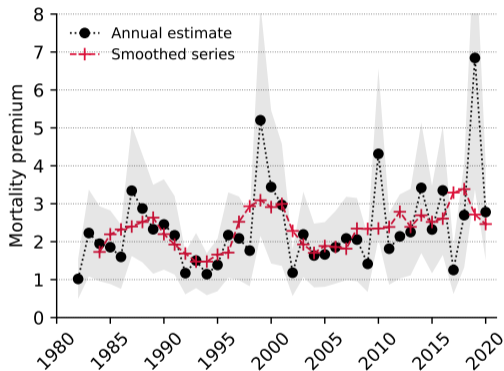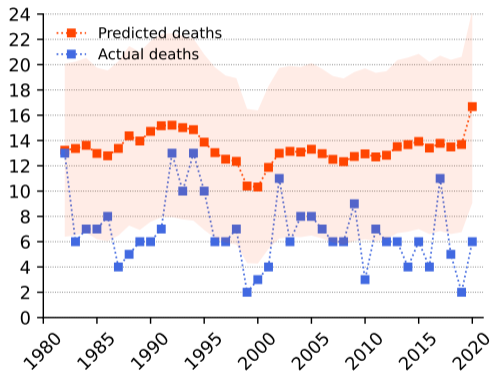
Wealth increases with age, not necessarily at the very top

Wealth increases with age, up to a point

Jakobsen *et al.* (2018)

Mortality among Forbes 400

Mortality among Forbes 400