Eco L3 - Globalization, Inequality, and Redistribution

Lecture 3: Global Income Inequality

Gabriel Zucman

gabriel.zucman@psemail.eu

Roadmap

1. Data sources to study inequality between individuals

2. Metrics: Gini coefficient, Pareto-Lorenz coefficient, top shares

3. Pre-tax vs. post-tax inequality

4. Global income inequality

1 Data sources for interpersonal inequality

1.1 Survey data

- Surveys are a popular data source to study inequality:

- Useful, but insufficient:
  - Large gap between surveys and macro totals
  - Practical pbs: non-response & under-reporting at the top

1.2 Tax data

- Tax administrations have published tabulations of income by size of income since beginning of income tax (usually early 20th century)
- In recent decades, availability of micro-samples of tax returns
- Limits of tax data:
  - Miss tax evasion
  - Miss legally tax-exempt income

1.3 Distributional national accounts

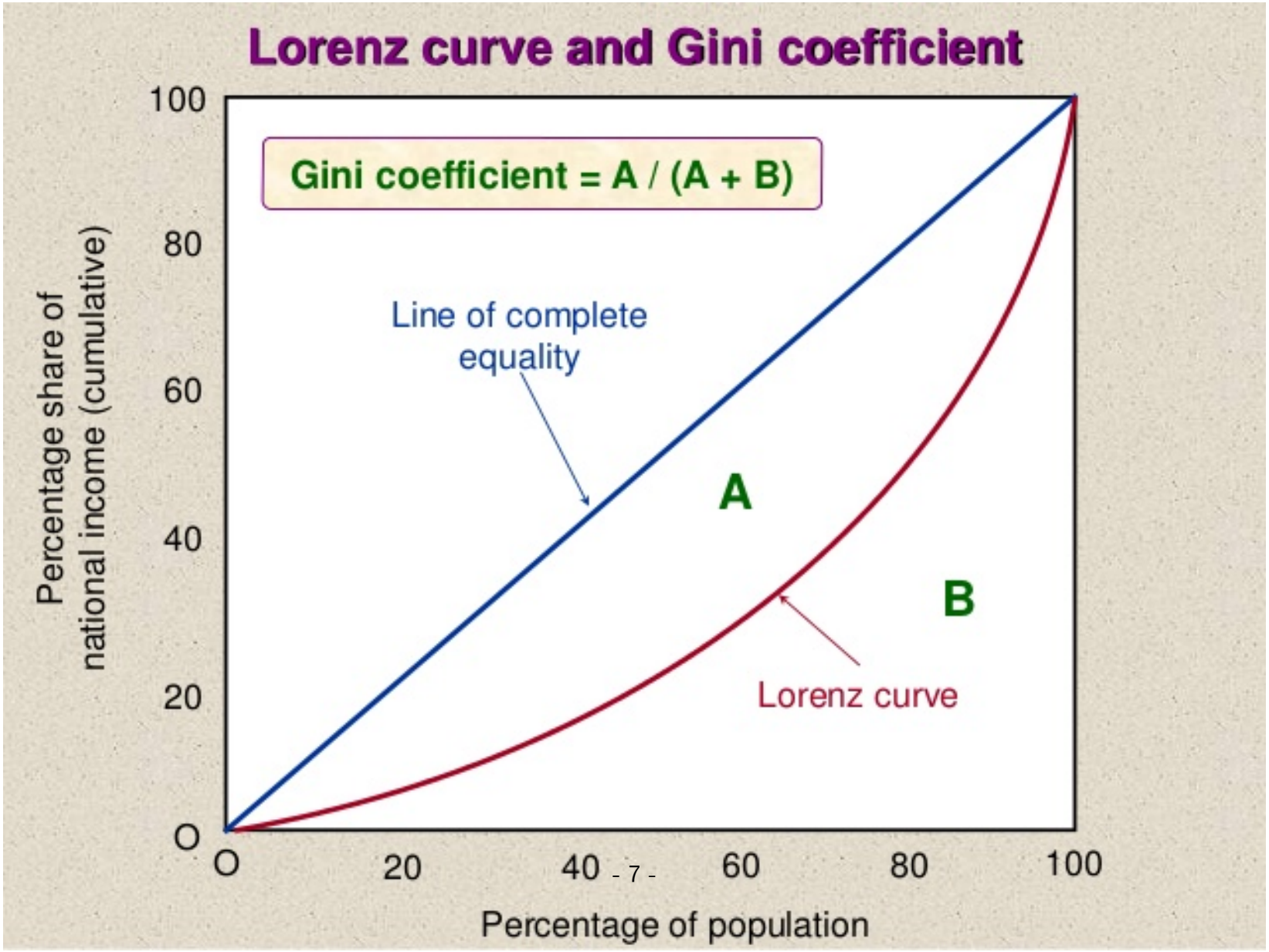
DINAs = decompositions of national account aggregates such that:

- Distributions of income, wealth, saving, taxes, transfers... are consistent with what survey/tax data show
- Totals match macro aggregates
- World Inequality Database: ongoing attempt to create DINAs throughout the world: `http://WID.world`

2 How to quantify inequality?

2.1 Gini coefficient

- Inequality often summarized by Gini coefficient G
- Lorenz curve shows % of income earned by people below fractile p
- G $=$ 2 x area between 45 degree line and Lorenz curve
- G =0 means Lorenz curve is the 45 degree line $=$ perfect equality


Lorenz curve and Gini coefficient
Gini coefficient = A / (A + B)
Line of complete equality
A
B
Lorenz curve
Percentage share of national income (cumulative)
Percentage of population
100
80
60
40
20
O
O
20
40
60
80
100

2.2 Income and wealth shares

- Problem of Gini: quite abstract & requires lots of data
- Shares are more concrete ("the top 1% income share")

2.3 Pareto coefficients

- Another useful metric of inequality is the Pareto coefficient
- At the top, income & wealth well approx. by Pareto distributions

- Pareto distributions have a probability density function

$$f(y) = \frac{ac^a}{y^{1+a}}$$

- and a cumulative distribution function $1 - F(y) = (c/y)^a$

- with $c =$ constant and $a =$ Pareto coefficient

- Key property of Pareto distributions: ratio average/threshold $=$ constant

- Note $y^*(y)$ average income of pop. above threshold y. Then:

$$y^*(y) = y\frac{a}{a-1} = yb$$

- b is called the inverted Pareto-Lorenz coefficient

- If a=2, b=2: average income above \$100,000 = \$200,000; average income above \$1 million = \$2 million, etc.

- US 1970s, income: $b = 1.7$–1.8 ($a = 2.2$–2.3)

- US 2010s, income: $b = 2.2$–2.5 ($a = 1.7$–1.8)

- For wealth distributions, b can be larger than 3

2.4 Unit of observation

- Tax unit $\approx$ households
- Individual adult: assumes no sharing of resources between spouses
- Equal-split adults: assumes full sharing of resources

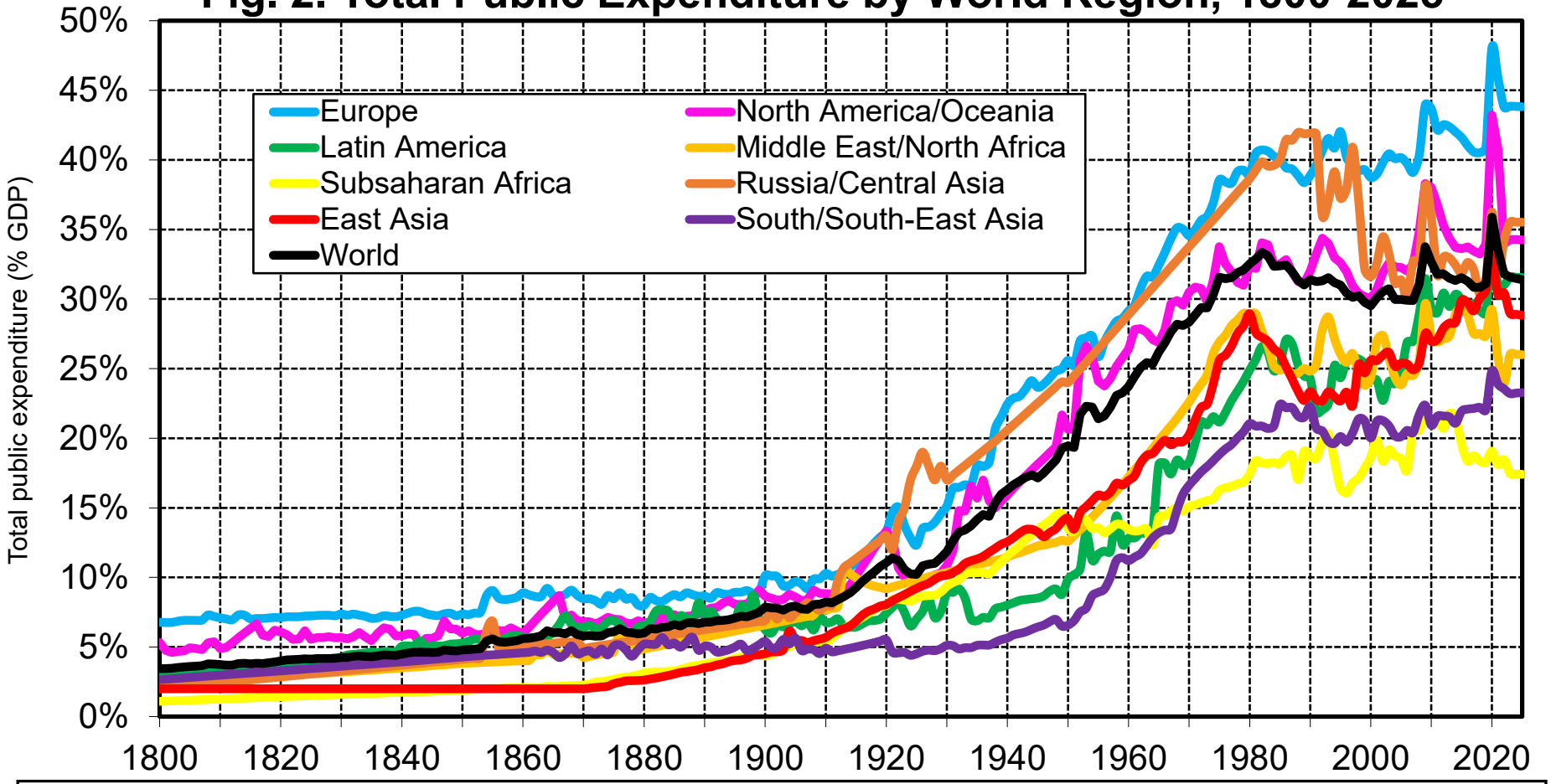
3 Pre-tax vs. post-tax inequality

3.1 What do governments do?

Governments tax and redistribute a big fraction of national income

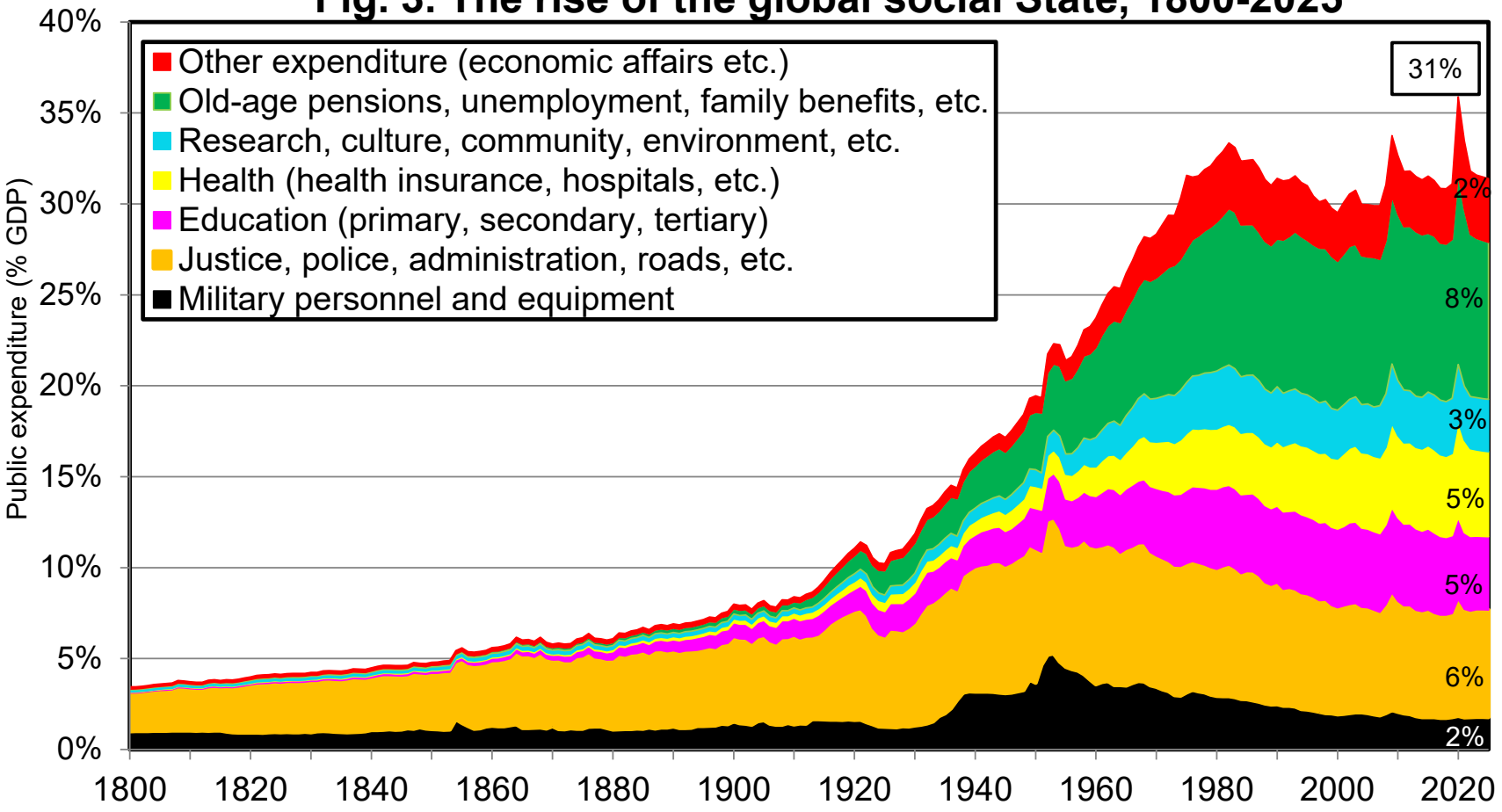
- US: 1/3 of national income
- Europe: 40-50% of national income
- Developing countries: 5-30% of national income

Fig. 2. Total Public Expenditure by World Region, 1800-2025



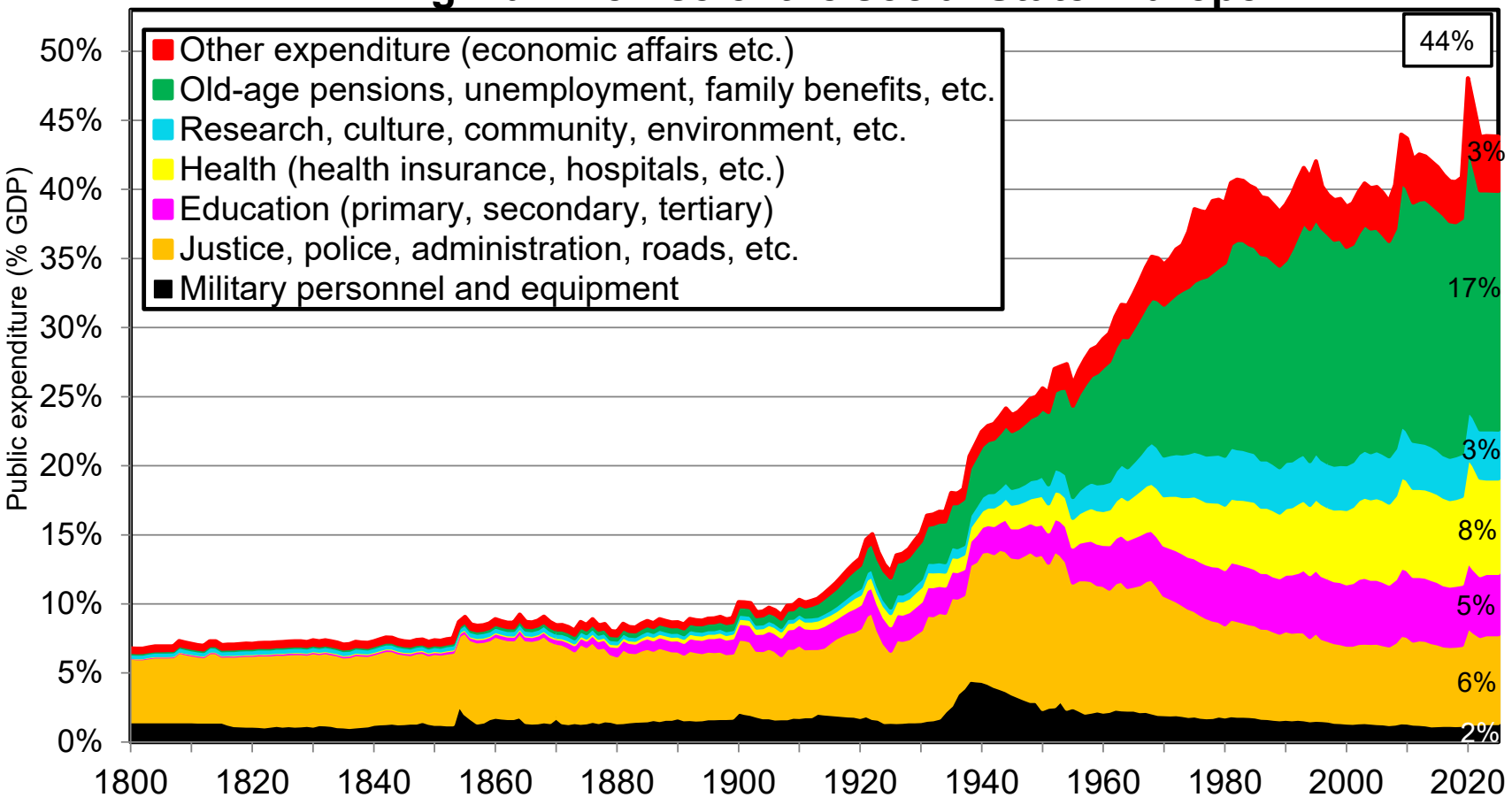
Interpretation. Total public expenditure rose from about 3% of global GDP in 1800 to about 31% in 2025, with large regional variations. Total public expenditure includes all expenditures by all public administrations (including central and local government, social security funds, etc.), except interest payments (and except exceptional expenditure during world wars). **Sources and series**: wid.world

Fig. 3. The rise of the global social State, 1800-2025



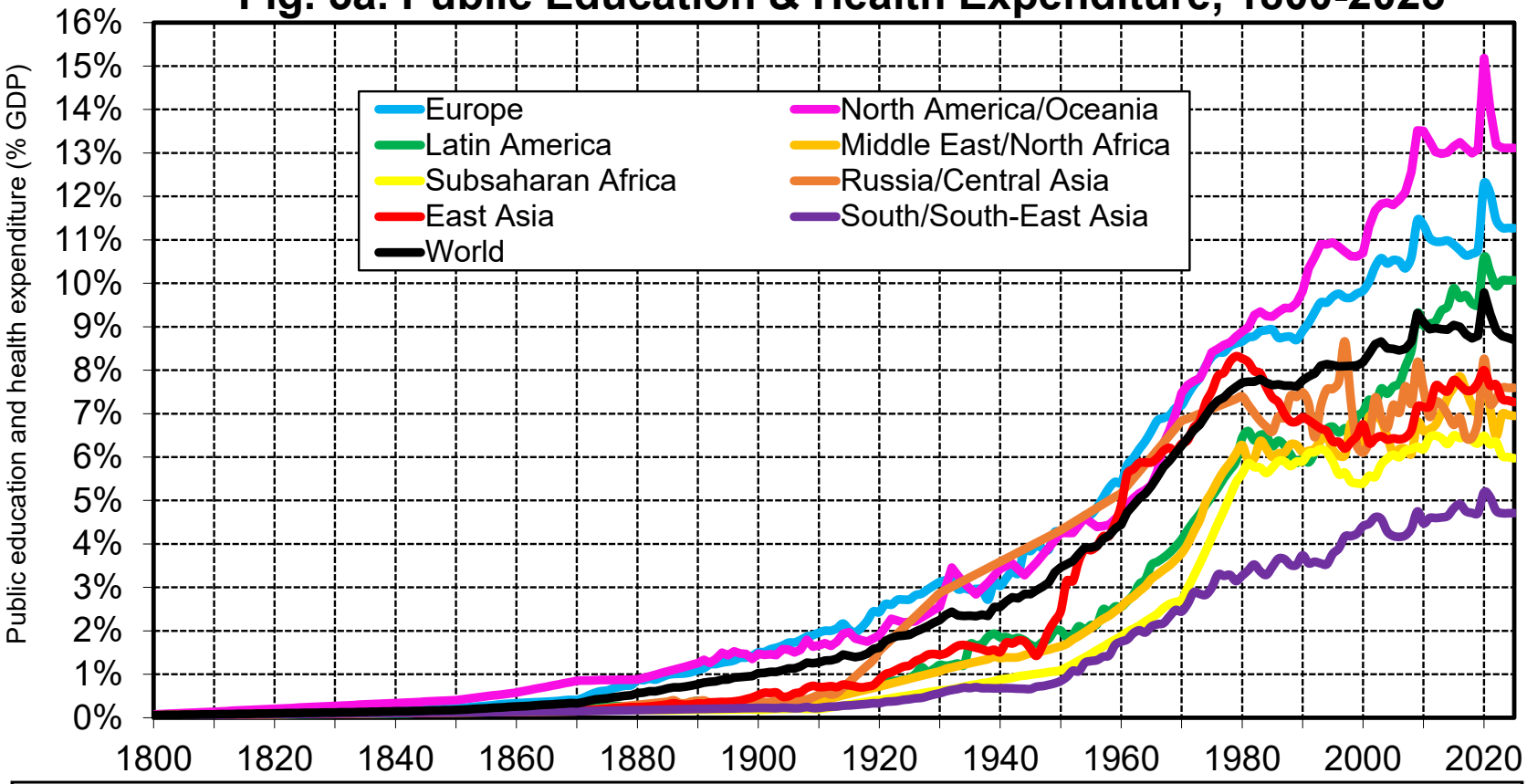
Interpretation. In 2025, total public expenditure amounts to about 31% of global GDP (PPP), including about 2% for military expenditure, 6% for general public services (justice, police, general administration, roads, etc.), 5% for education, 5% for health, 3% for research, culture/recreation/religion, community services (water, light, etc.), environmental protection (waste, biodiversity, etc.), 8% for social protection (old-age pensions, unemployment, family benefits, maternity, sick-leave, safety nets, etc.) and 2% for other expenditures (economic affairs excluding roads and basic infrastructures included in general public services). **Sources and series**: wid.world

Fig. 4a. The rise of the social State: Europe



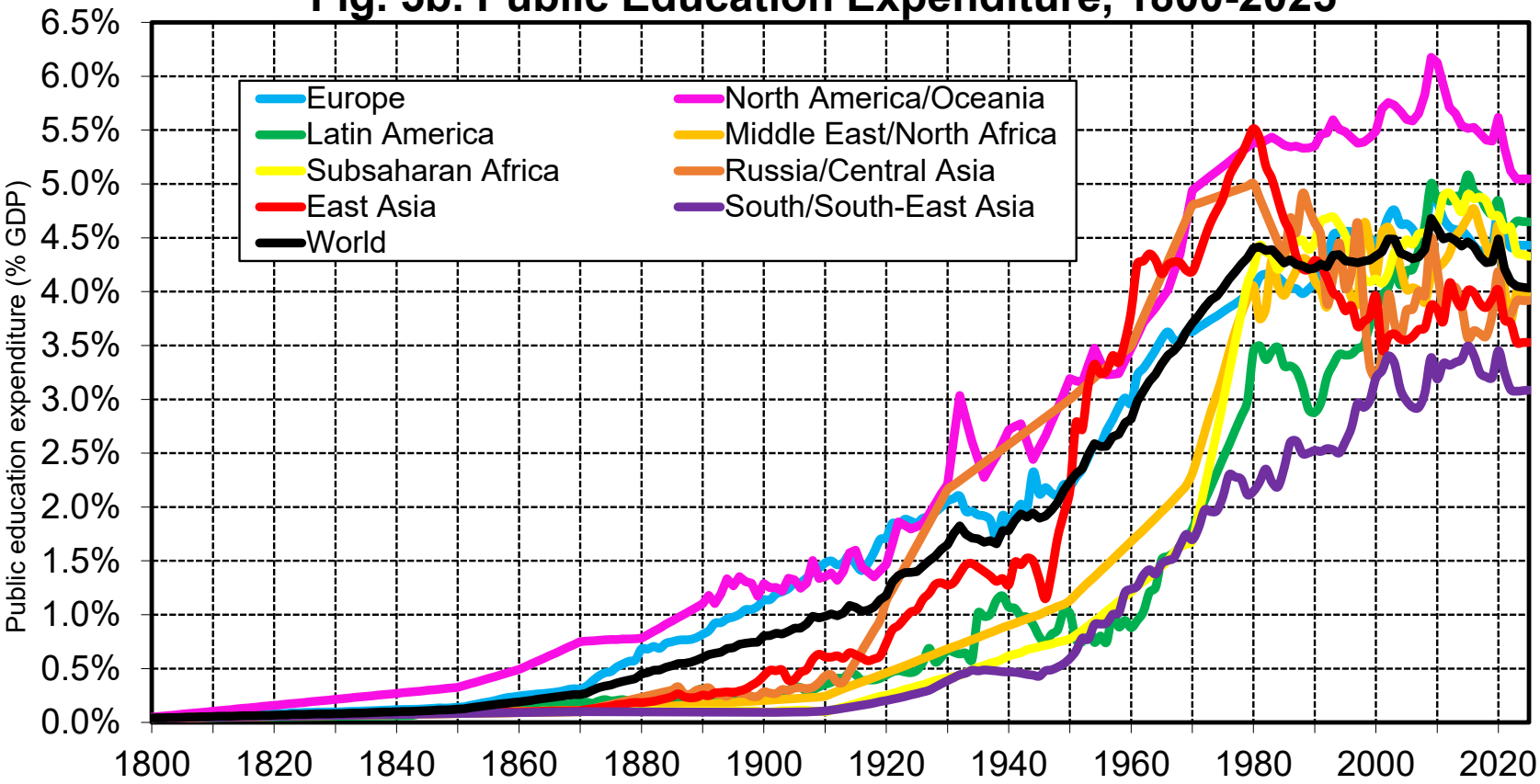
Interpretation. In 2025, total public expenditure amounts to about 44% of GDP in Europe, including about 2% for military expenditure, 6% for general public services (justice, police, general administration, roads, etc.), 5% for education, 8% for health, 3% for research, culture/recreation/religion, community services (water, light, etc.), environmental protection (waste, biodiversity, etc.), 17% for social protection (old-age pensions, unemployment, family benefits, maternity, sick-leave, safety nets, etc.) and 3% for other expenditures (economic affairs excluding roads and basic infrastructures included in general public services). **Sources and series**: wid.world

Fig. 5a. Public Education & Health Expenditure, 1800-2025



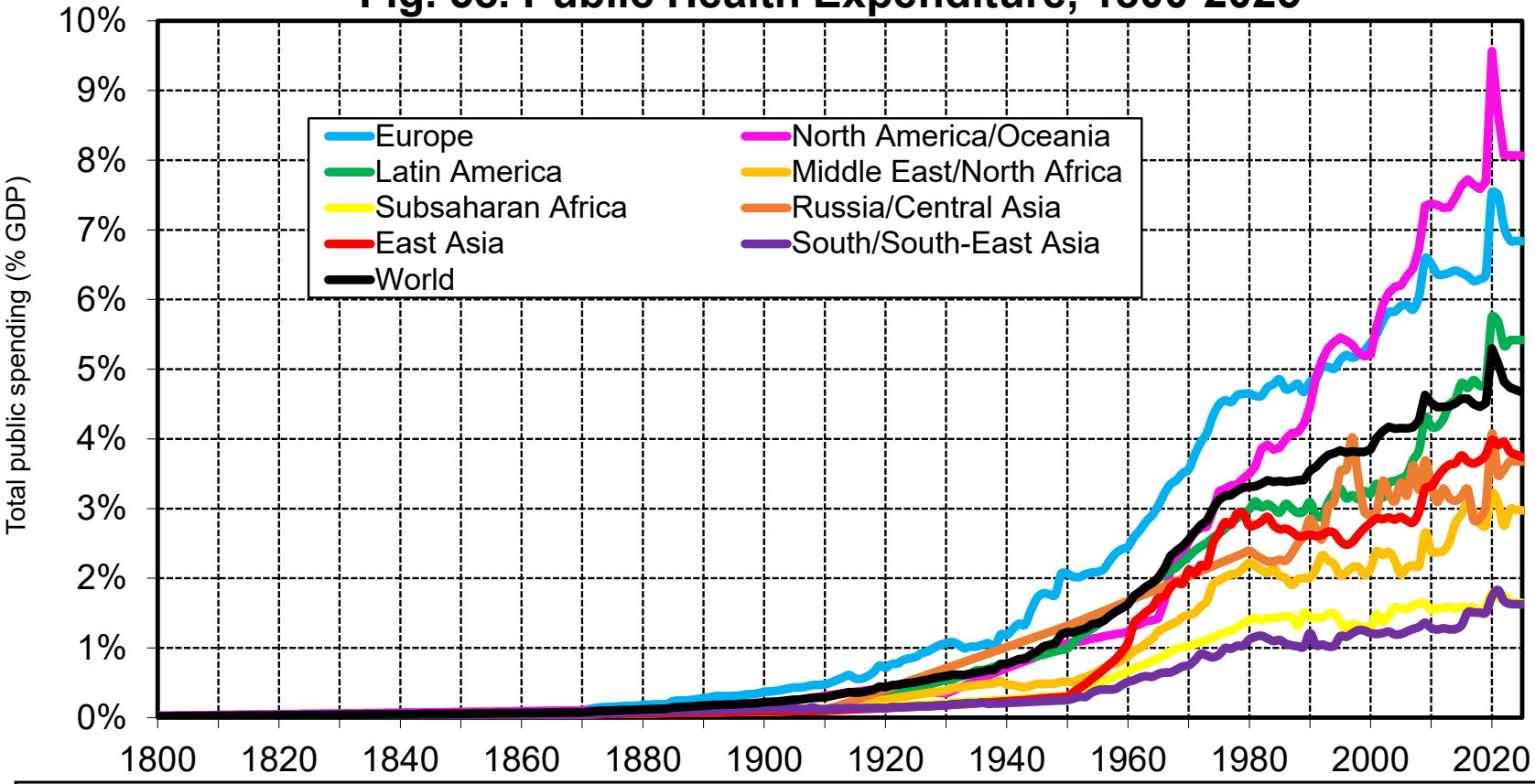
Interpretation. Public education and health expenditure rose from less than 1% of GDP before 1900 to about 9% of GDP in 2025 at the global level, with large regional variations (from about 5-6% of GDP in South & South East Asia and Subsaharan Africa to 11-14% of GDP in Europe and North America/Oceania). **Sources and series**: wid.world

Fig. 5b. Public Education Expenditure, 1800-2025



Interpretation. Public education expenditure rose from less 1% of GDP before 1900 to about 4-4.5% of GDP at the global level in 2025, with surprisingly similar levels in many world regions, including Europe and Subsaharan Africa. However the share of school-age population in total population varies widely across regions (e.g. it is more than 2.5 times as large in SSAF than in Europe). It is therefore critical to look at age-corrected education expenditures in order to make meaningful comparisons. **Sources and series**: wid.world

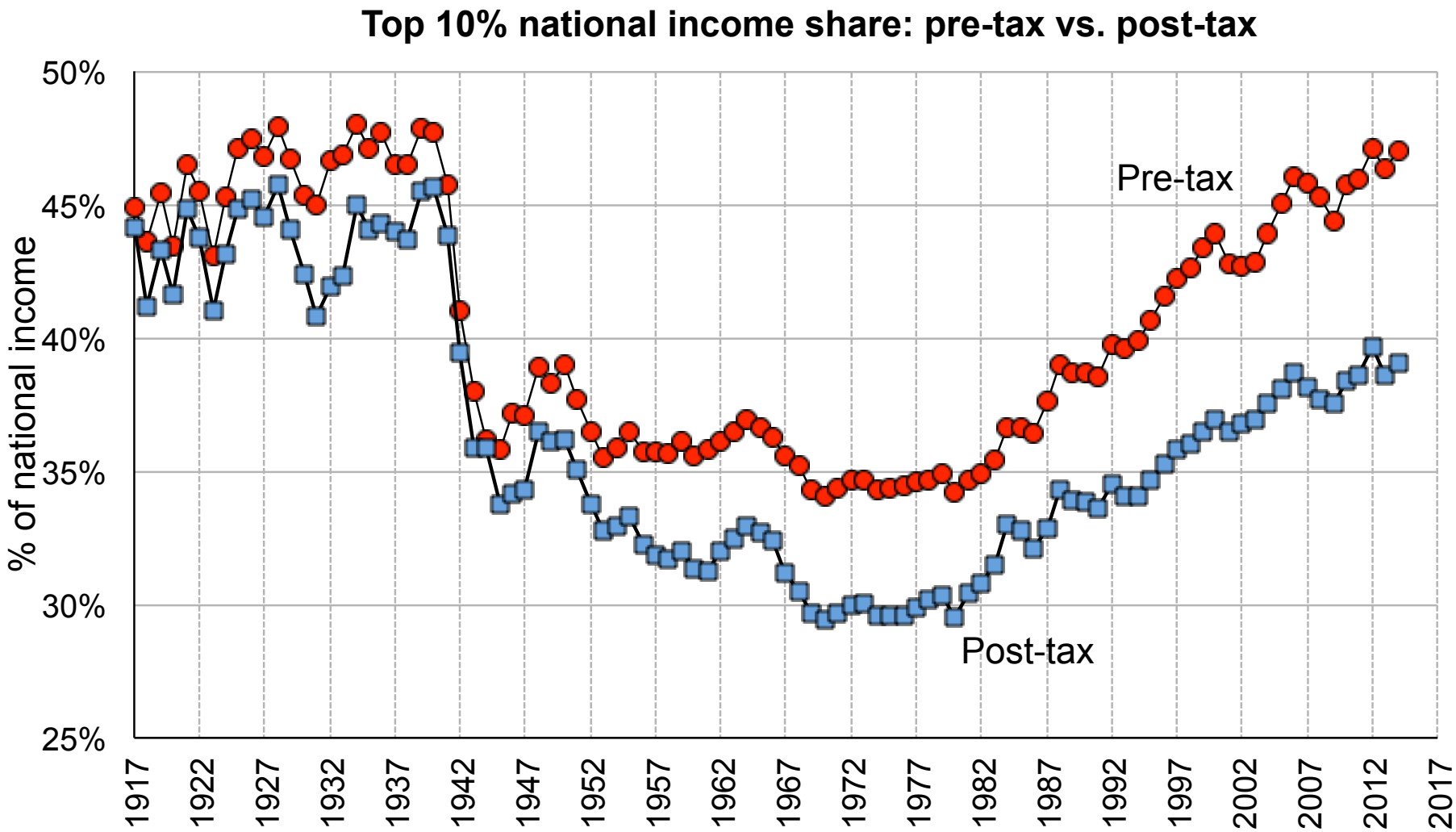
Fig. 5c. Public Health Expenditure, 1800-2025



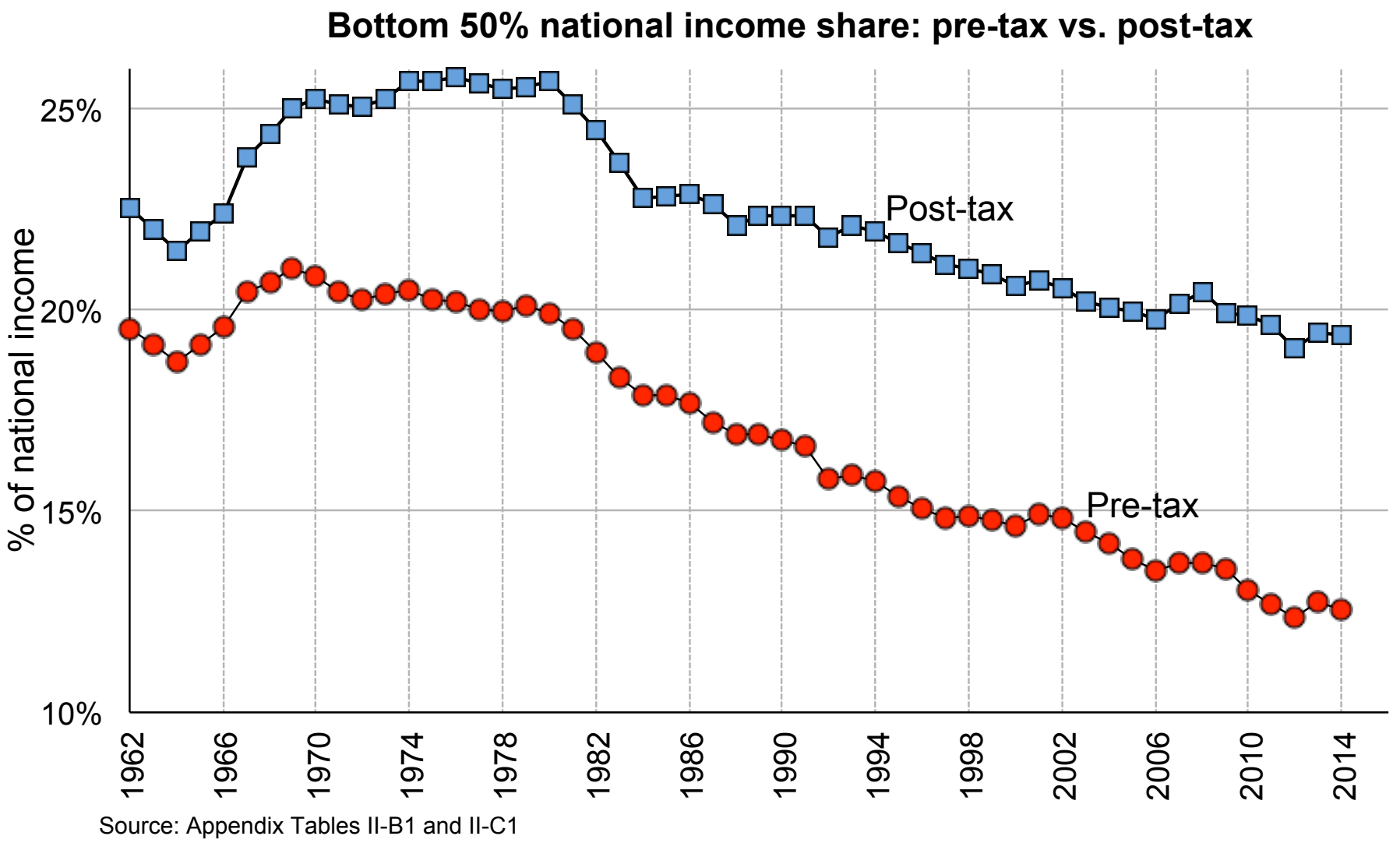
Interpretation. Public health expenditure was less than 0.5% before 1900 and is about 5% of GDP in 2025, with enormous variations across world regions, from 1-2% of GDP in South & South-East Asia and Subsaharan Africa to 7-8% of GDP in Europe and North America/Oceania. These very large gaps are partly due to different age structures (with a much larger old-age population share in richer countries). Like for education, one needs to analyze age-corrected health expenditure in order to make proper comparisons. **Sources and series**: wid.world

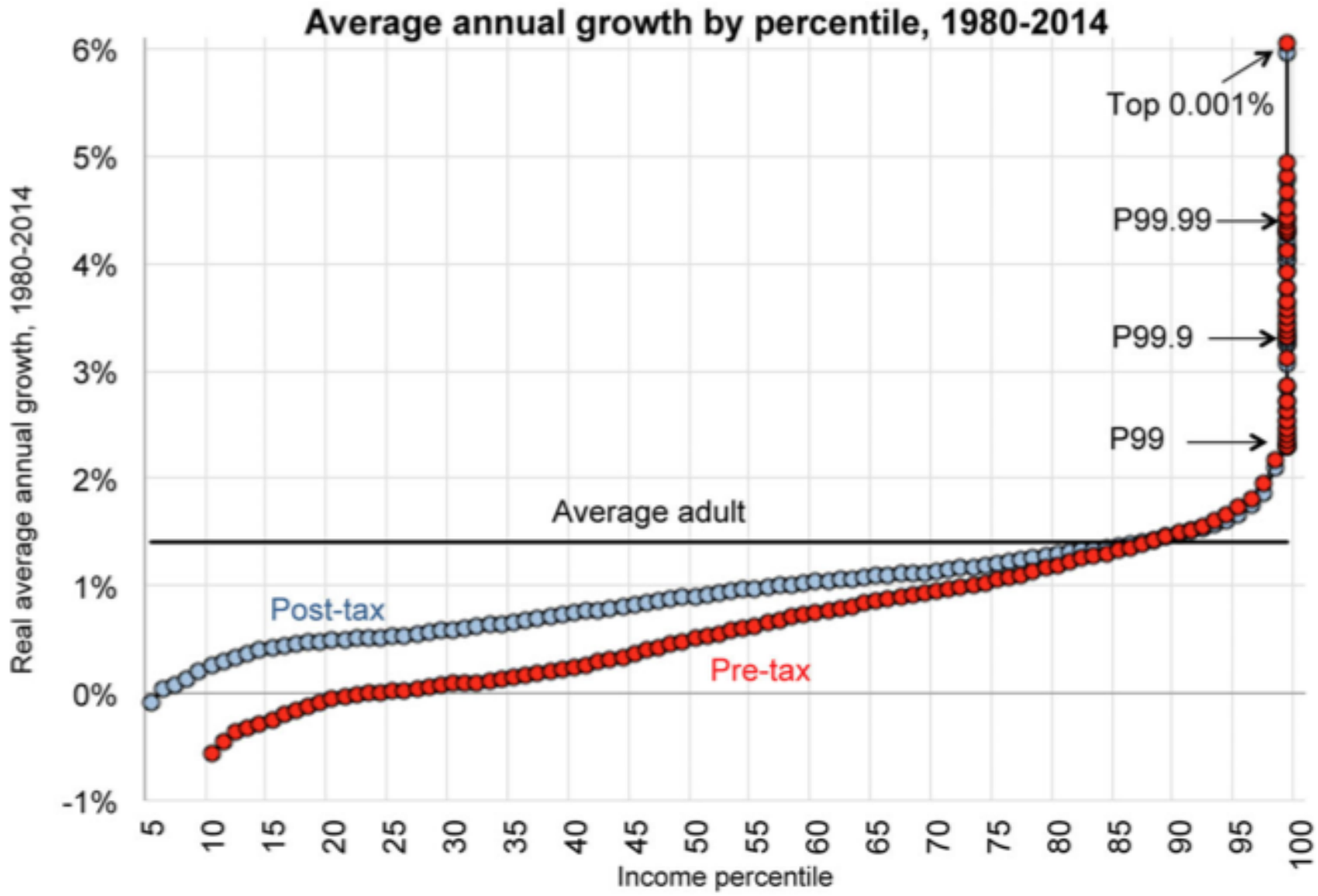
3.2 Post-tax vs. pre-tax inequality

- Denote z pre-tax income, $y = z - T(z) + B(z)$ post-tax income
- If inequality in y is less than inequality in $z \Leftrightarrow$ tax and transfer system is redistributive
- This is generally the case: T akin to a flat tax, but B to a lump sum
- Hence less inequality on a post-tax-and-transfer basis than pre-tax



Source: Appendix Tables II-B1 and II-C1


Bottom 50% national income share: pre-tax vs. post-tax
% of national income
25%
20%
15%
10%
Post-tax
Pre-tax
1962
1966
1970
1974
1978
1982
1986
1990
1994
1998
2002
2006
2010
2014
Source: Appendix Tables II-B1 and II-C1

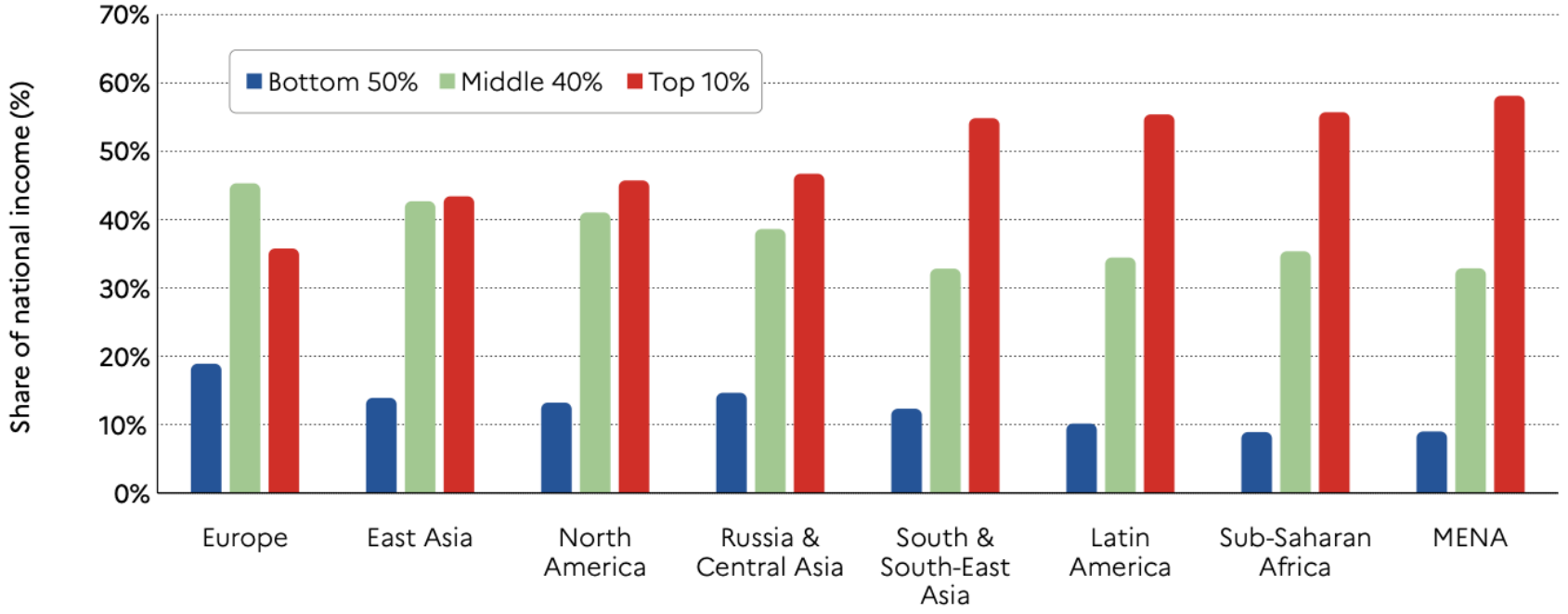

Average annual growth by percentile, 1980-2014
Real average annual growth, 1980-2014
6%
5%
4%
3%
2%
1%
0%
-1%
Top 0.001%
P99.99
P99.9
P99
Average adult
Post-tax
Pre-tax
5
10
15
20
25
30
35
40
45
50
55
60
65
70
75
80
85
90
95
100
Income percentile

4 Global income inequality

4.1 Inequality today

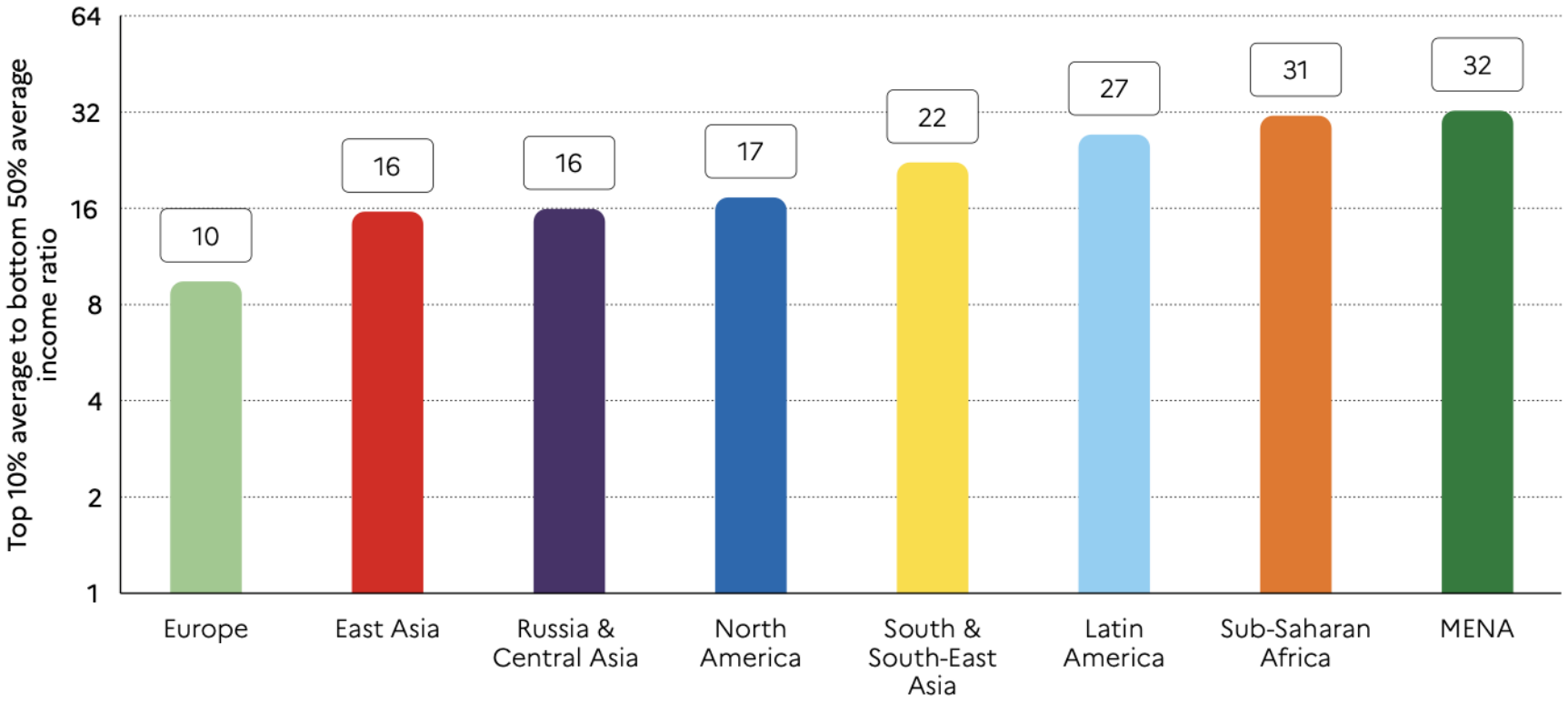
- Most unequal countries: Middle-East, sub-Saharan Africa, Brazil, India = top 10% share 55%–60%
- Legacy of status-based inequality systems (slavery, castes, colonial system)
- Less unequal countries: Continental Europe = top 10% $\approx$ 35%

Figure 2 ***The poorest half lags behind: Bottom 50%, middle 40% and top 10% income shares across the world in 2021***



Interpretation: *In Latin America, the top 10% captures 55% of national income, compared to 36% in Europe. Income is measured after pension and unemployment contributions and benefits paid and received by individuals but before income taxes and other transfers.*
Sources and series: *www.wir2022.wid.world/methodology.*

Figure 1.4 ***Income gaps across the world: Top 10 % vs. Bottom 50%, 2021***



Interpretation: *In Latin America, the bottom 50% earns 27 times less than the top 10%. The value is 9 in Europe. Income is measured after pension and unemployment benefits are received by individuals, but before other taxes they pay and transfers they receive.* ***Sources and series:*** *wir2022.wid.world/methodology*

4.2 Labor vs. capital income inequality

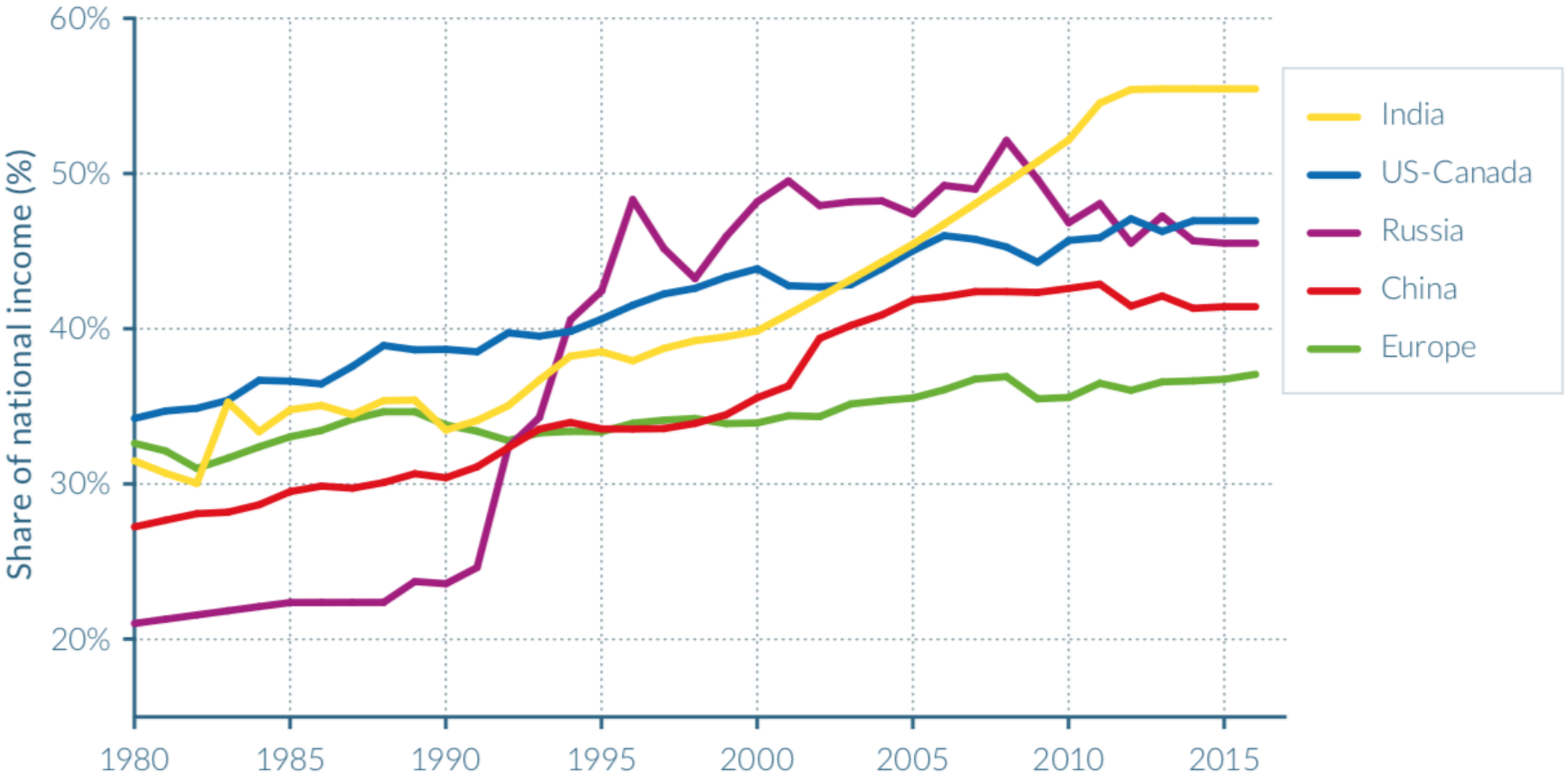
Labor income Y_L always less concentrated than capital income Y_K:

- Top 10% share is 20-30% for labor income, 50-90% for capital
- Bottom 50% share is 20-30% for labor income, 0-10% for capital
- Gini coefficients: 0.2 – 0.4 for labor income, 0.6 – 0.8 for capital

4.3 Evolution since the 1980s

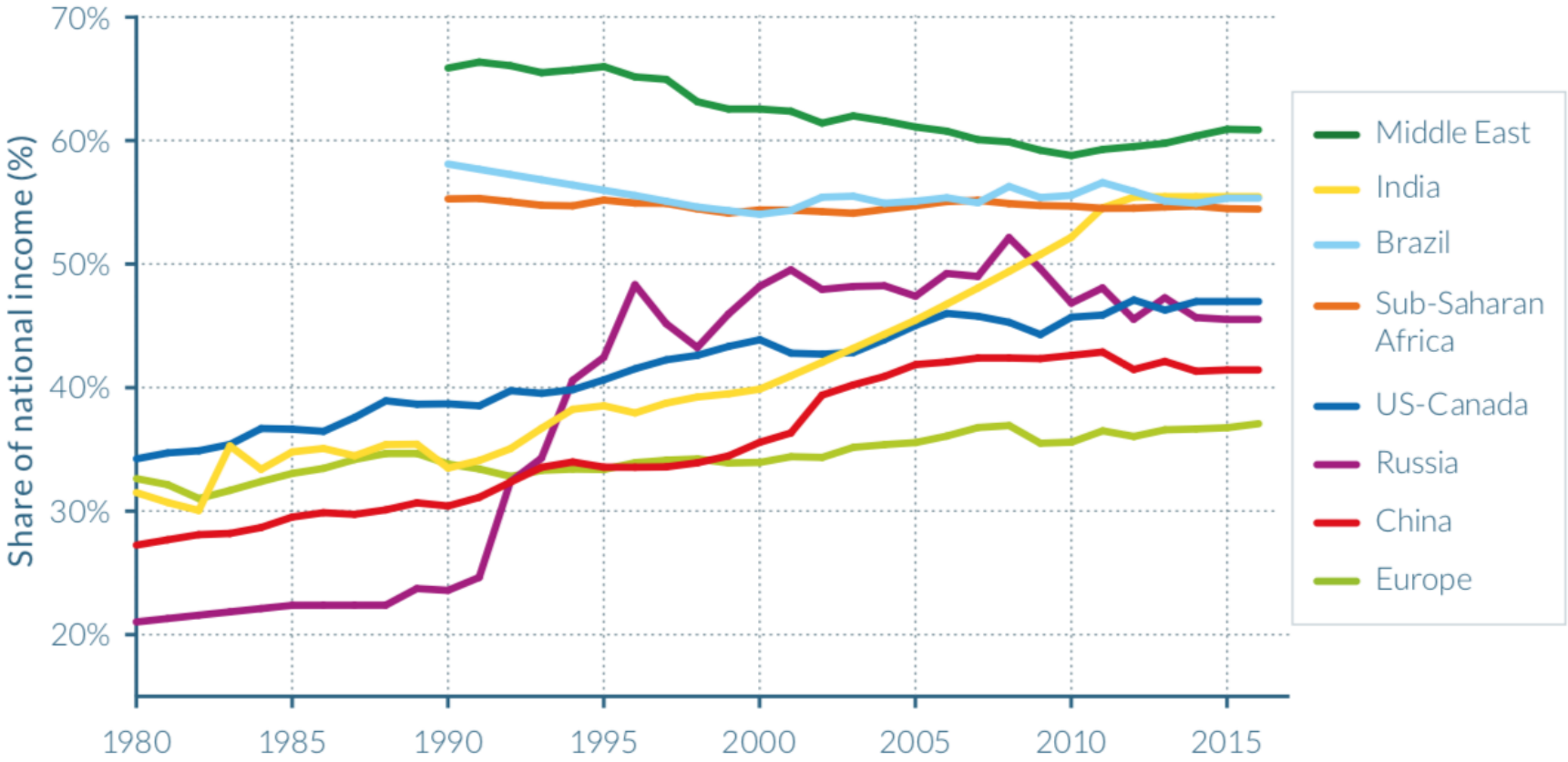
- Rising inequality is a global phenomenon
- But increase at different speeds, reflecting diversity of national institutions and policies
- Among developed countries: faster rise in English-speaking countries
- Among emerging countries: strongest rise in ex-communist countries

Top 10% income shares across the world, 1980–2016: Rising inequality almost everywhere, but at different speeds



Source: WID.world (2017). See wir2018.wid.world for data series and notes.

Top 10% income shares across the world, 1980–2016: Is world inequality moving towards the high-inequality frontier?



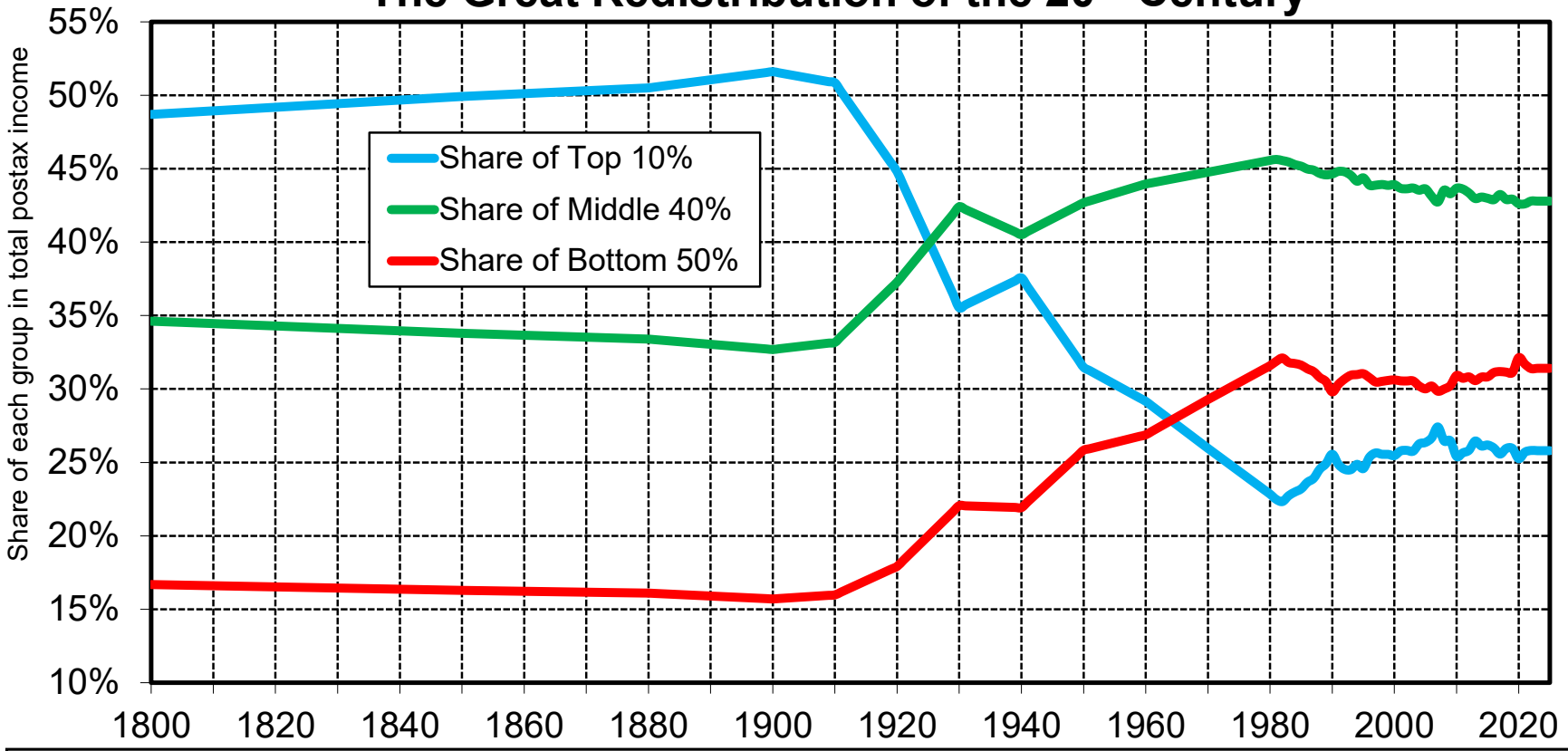
Source: WID.world (2017). See wir2018.wid.world for data series and notes.

4.4 The decline of income inequality 1920s–1970s

- Rise in inequality since 1980 contrast sharply with general $\searrow$ in inequality between 1920s and 1970s
- Key reference on long-run rise of equality: Andreescu et al. (2025), "Equality and Development: A Comparative & Historical Perspective 1800–2025"
  - 1920s-1970s combination of political, social, and economic shocks
  - Followed by egalitarian policies: Social Security, public education, pro-labor policies, progressive taxation, etc.

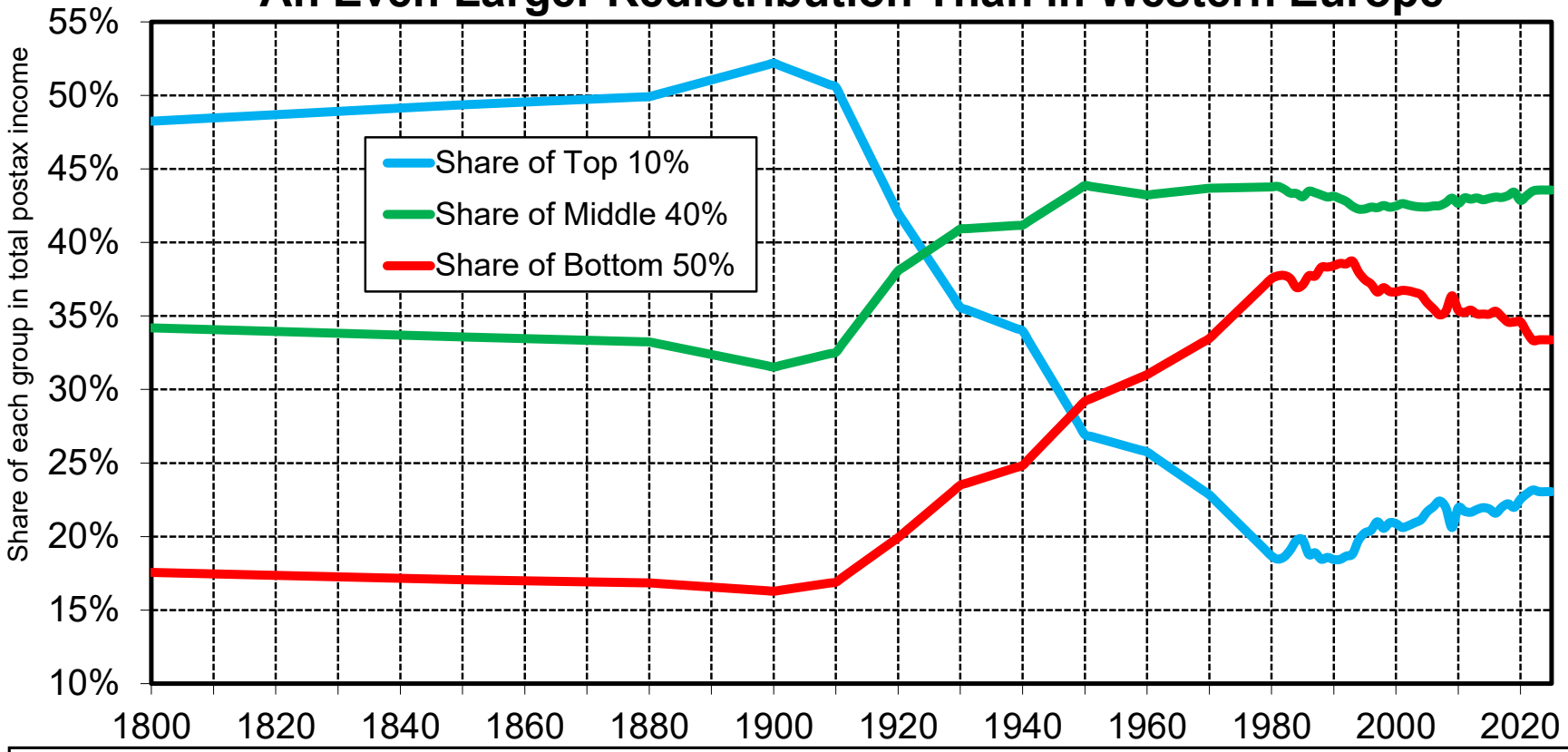
  $\rightarrow$ large reduction of inequality on a post-tax basis

Fig. 1. Income Shares in Western Europe: The Great Redistribution of the 20th Century



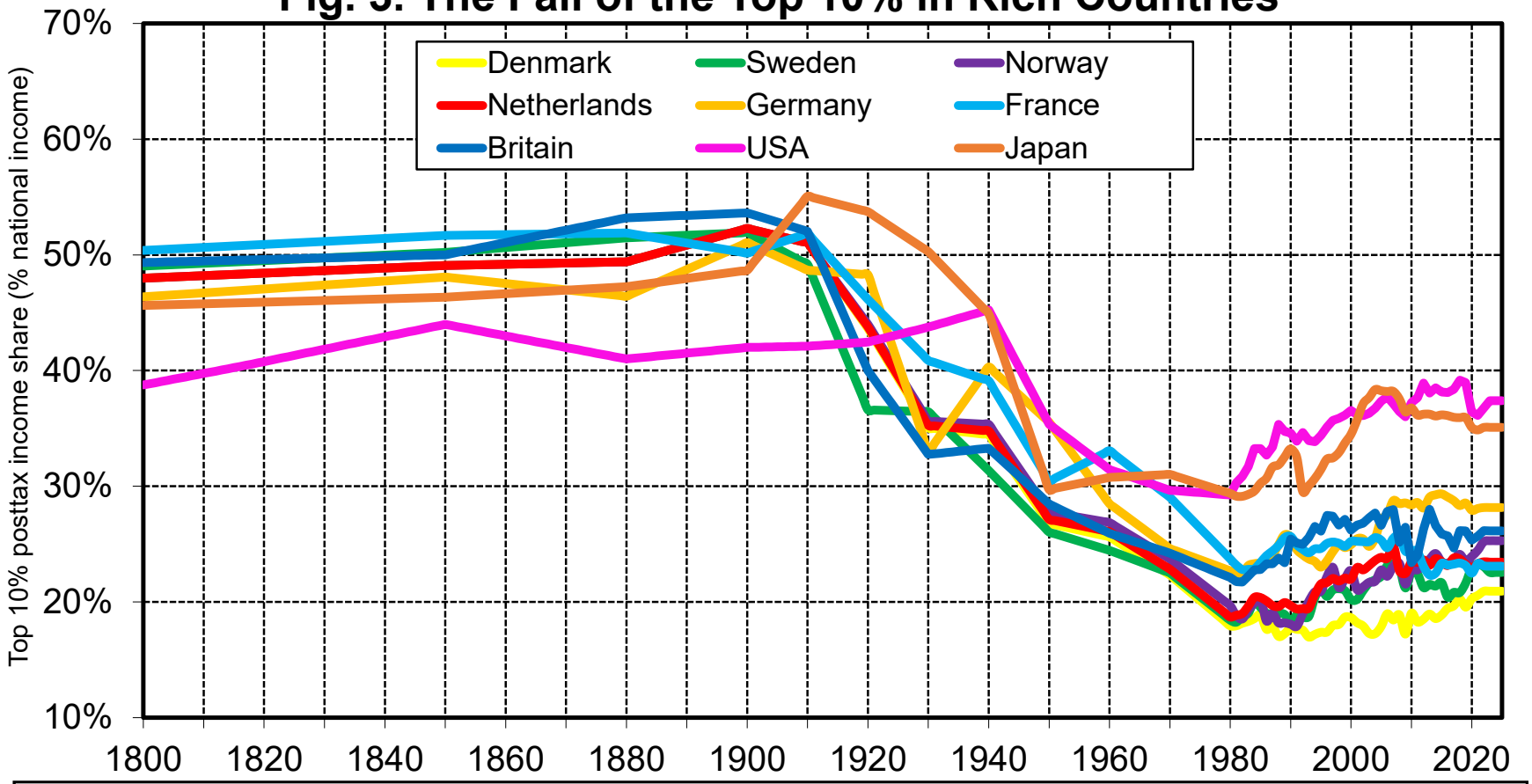
Interpretation. In Western Europe (which we define as the average Germany-France-Britain), the share of the top 10% highest incomes in total posttax income (including capital income - rent, dividends, interest, profits - & labour income - wages, self-employment income, pensions, unemployment benefits, other transfers) fell from over 50% in 1910 to less than 25% in 1980. It has stabilized around 25% since 1980-1990 (with a moderate increase), i.e. at a lower level than the share of the bottom 50% (about 30%). **Sources and series**: wid.world (A1a)

Fig. 2. Income Shares in Nordic Europe: An Even Larger Redistribution Than in Western Europe



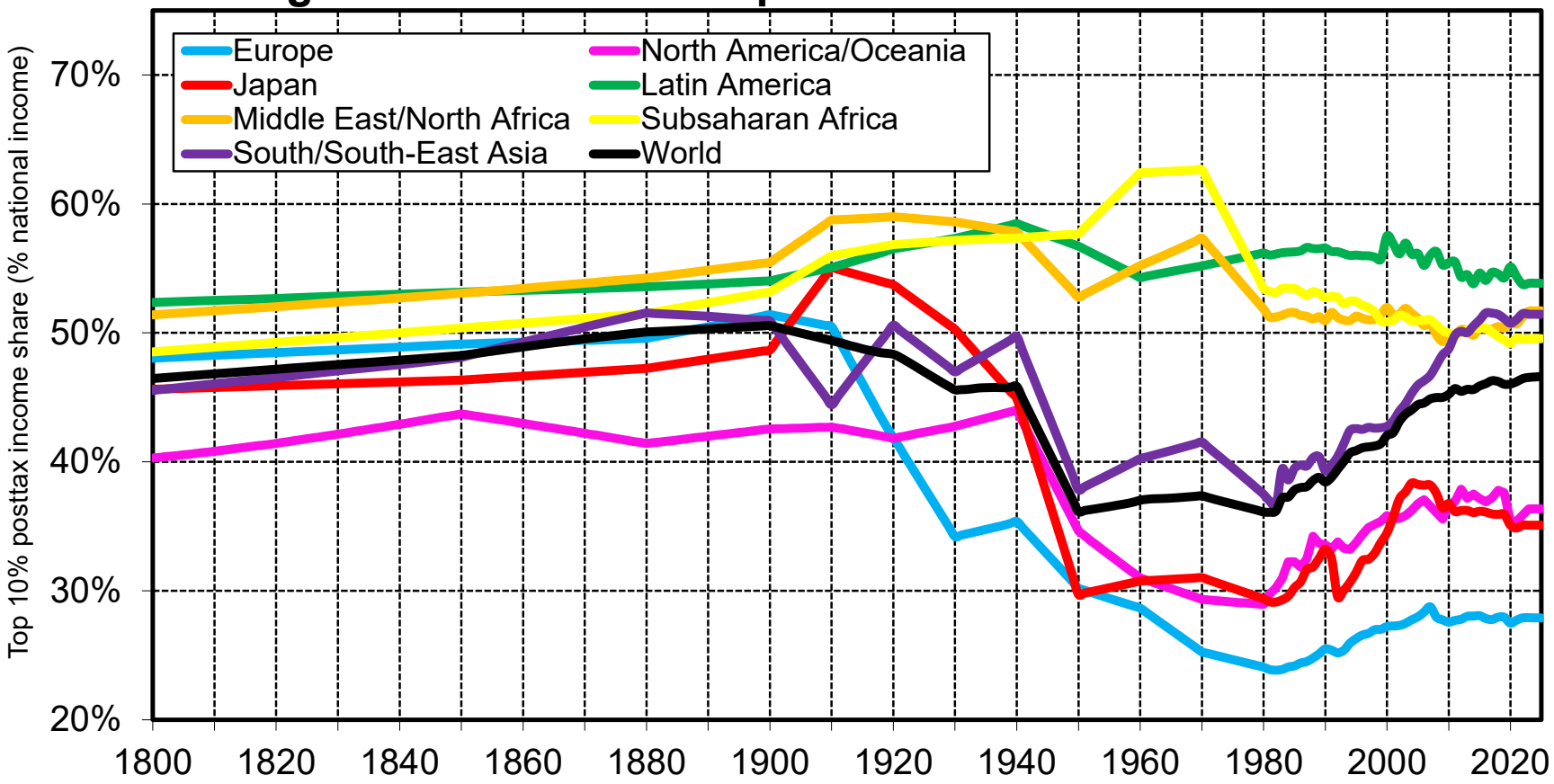
Interpretation. In Nordic Europe (which we define as the average Sweden-Denmark-Norway-Netherlands), the top 10% posttax income share fell from over 50% in 1910 to less than 20% in 1980-1990 (i.e. even more than in Western Europe). It has increased since 1990, but it remains at a lower level than in Western Europe, and at a much lower level than the bottom 50% income share. **Sources and series**: wid.world (A1b)

Fig. 3. The Fall of the Top 10% in Rich Countries



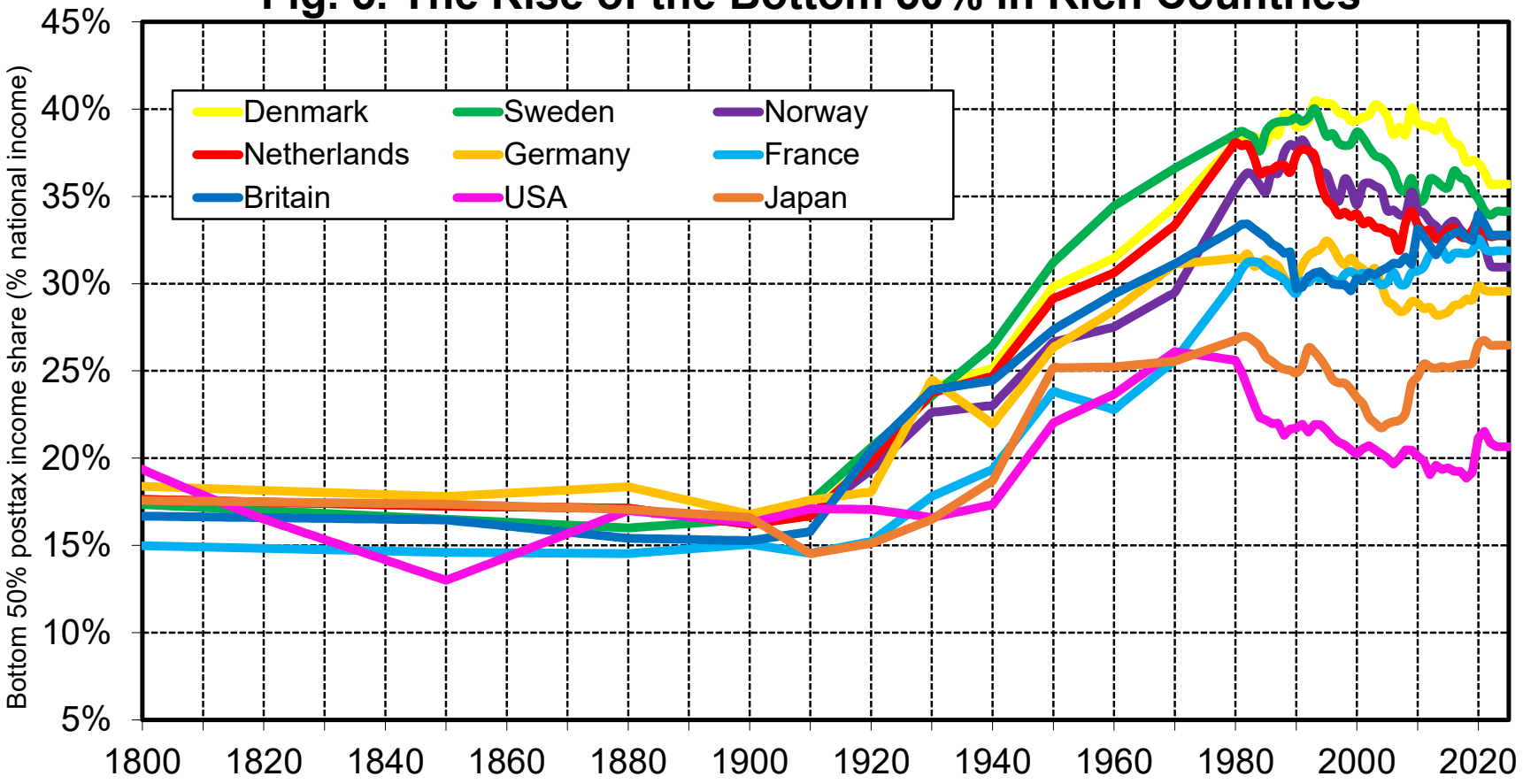
Interpretation. We observe a substantial decline of the top 10% posttax income share in all rich countries in the long-run (including in the USA, and in spite of rising inequality since 1980-1990). The fall was particularly strong in Western and Nordic Europe, and especially in Nordic Europe, with a decline from over 50% of total income in 1900-1910 to about 20-25% in 2010-2025 (with a modest increase since 1980-1990). **Sources and series**: wid.world (A1c)

Fig. 4. The Fall of the Top 10%: Rich Countries vs Others



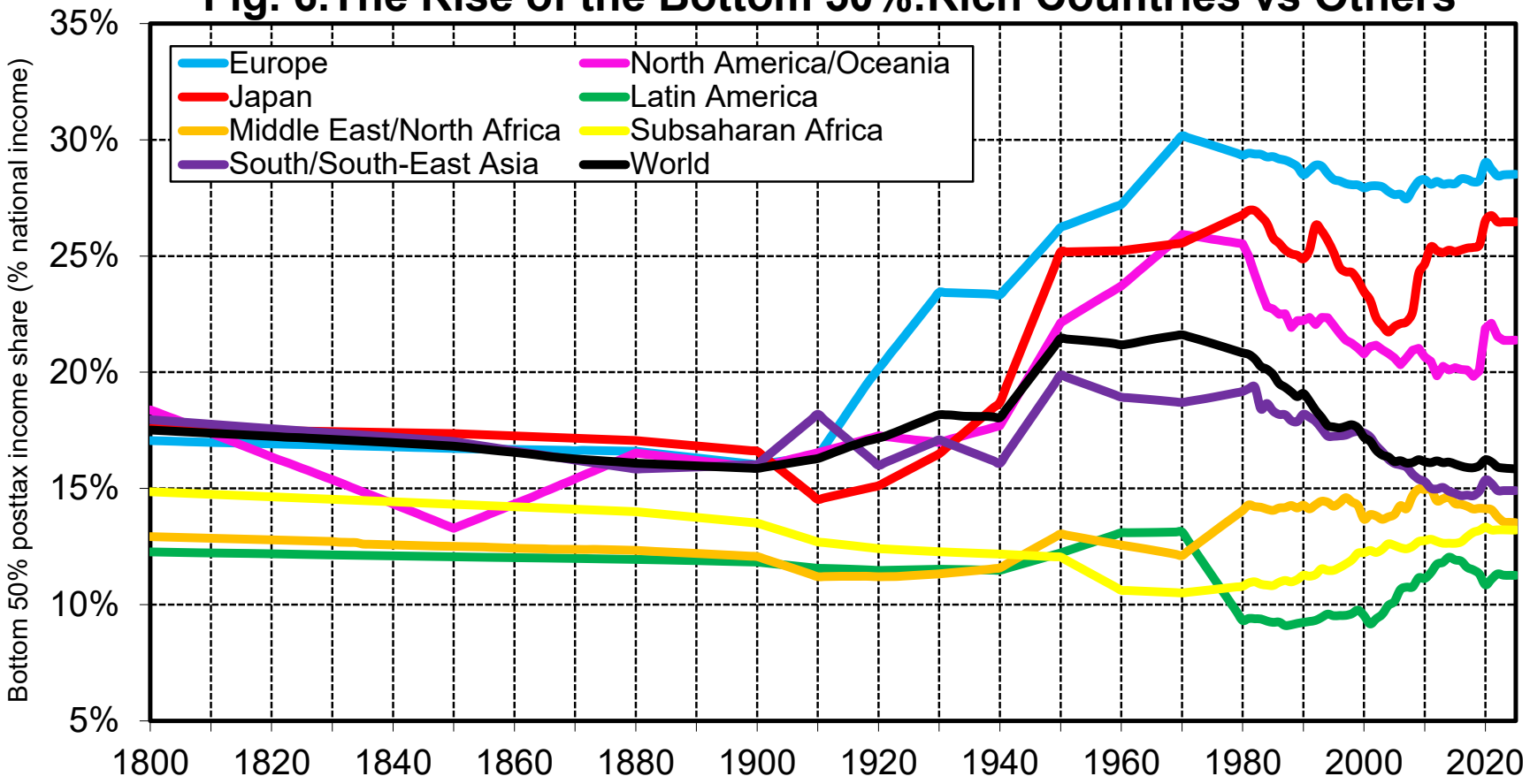
Interpretation. In Europe, the top 10% posttax income share was over 50% of total income until WW1 and was divided by two between 1910 & 1980, before stabilizing around 25-30% since 1980-1990 (with a moderate increase). We also observe a significant long-run decline in North America/Oceania and Japan (from about 45-50% to 35%). In contrast, the top 10% income share almost did not decline at all in the long-run in Latin America, Subsaharan Africa and Middle East/North Africa (around 50-55% throughout the period). **Sources and series**: wid.world (A1d)

Fig. 5. The Rise of the Bottom 50% in Rich Countries



Interpretation. We observe a substantial rise of the bottom 50% posttax income share in all rich countries over the past 100 years (including in the USA, and in spite of rising inequality since 1980-1990). The rise was particularly strong in Western and Nordic Europe, and especially in Nordic Europe, with an increase from from about 15% of total income in 1900-1910 to about 30-40% in 2010-2025 (with a modest decline since 1980-1990). **Sources and series**: wid.world (A1e)

Fig. 6.The Rise of the Bottom 50%:Rich Countries vs Others

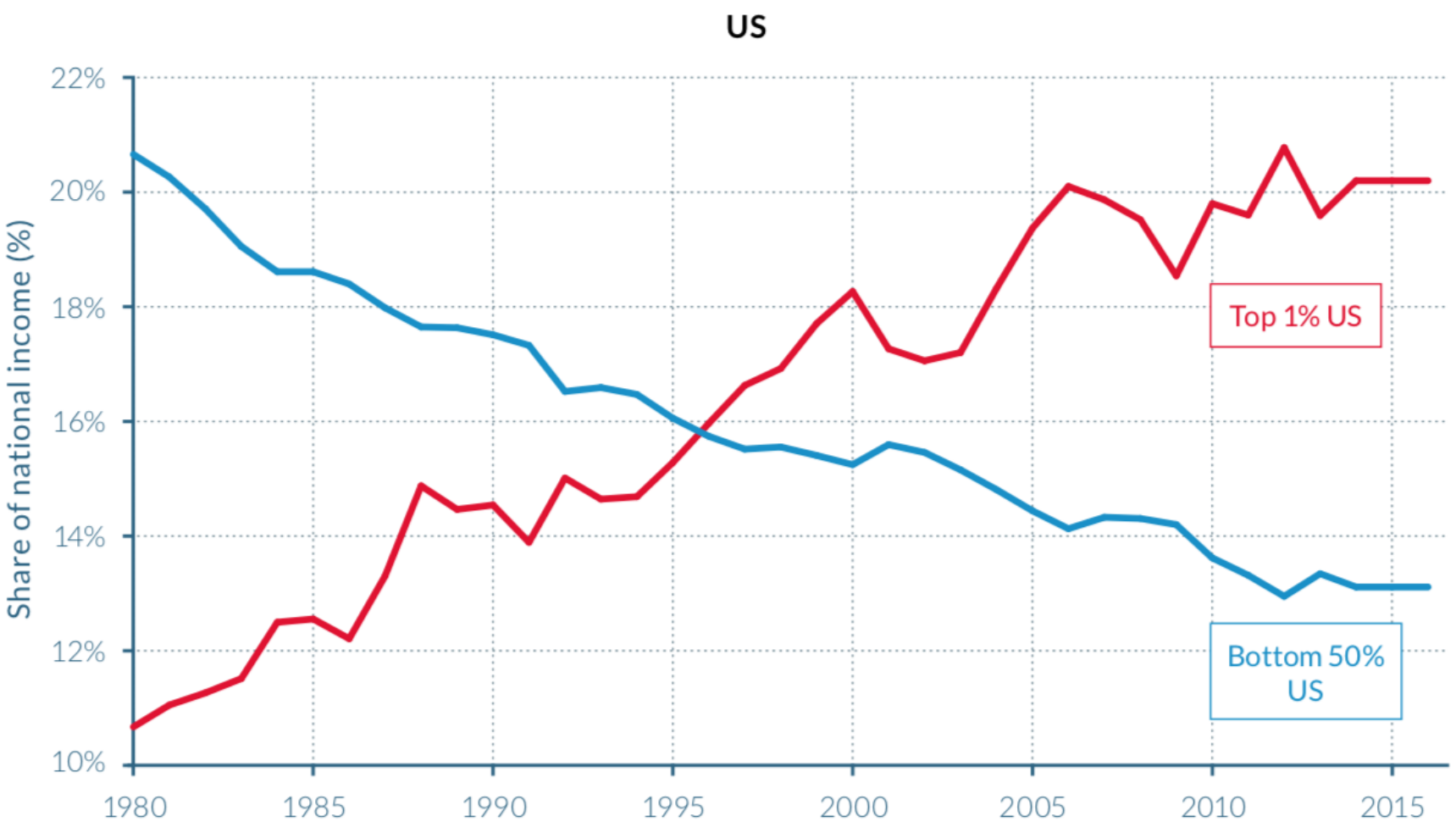


Interpretation. In Europe, the bottom 50% posttax income share rose from about 15% until 1910 to about 30% by 1980, before stabilizing around 30% since 1980-1990 (with a moderate decline). We also observe a significant long-run rise in North America/Oceania and Japan (from about 15% to 20-25%). In contrast, the bottom 50% income share almost did not rise at all in the long-run in Latin America, Subsaharan Africa and Middle East/North Africa (around 10-15% throughout the period). **Sources and series**: wid.world (A1f)

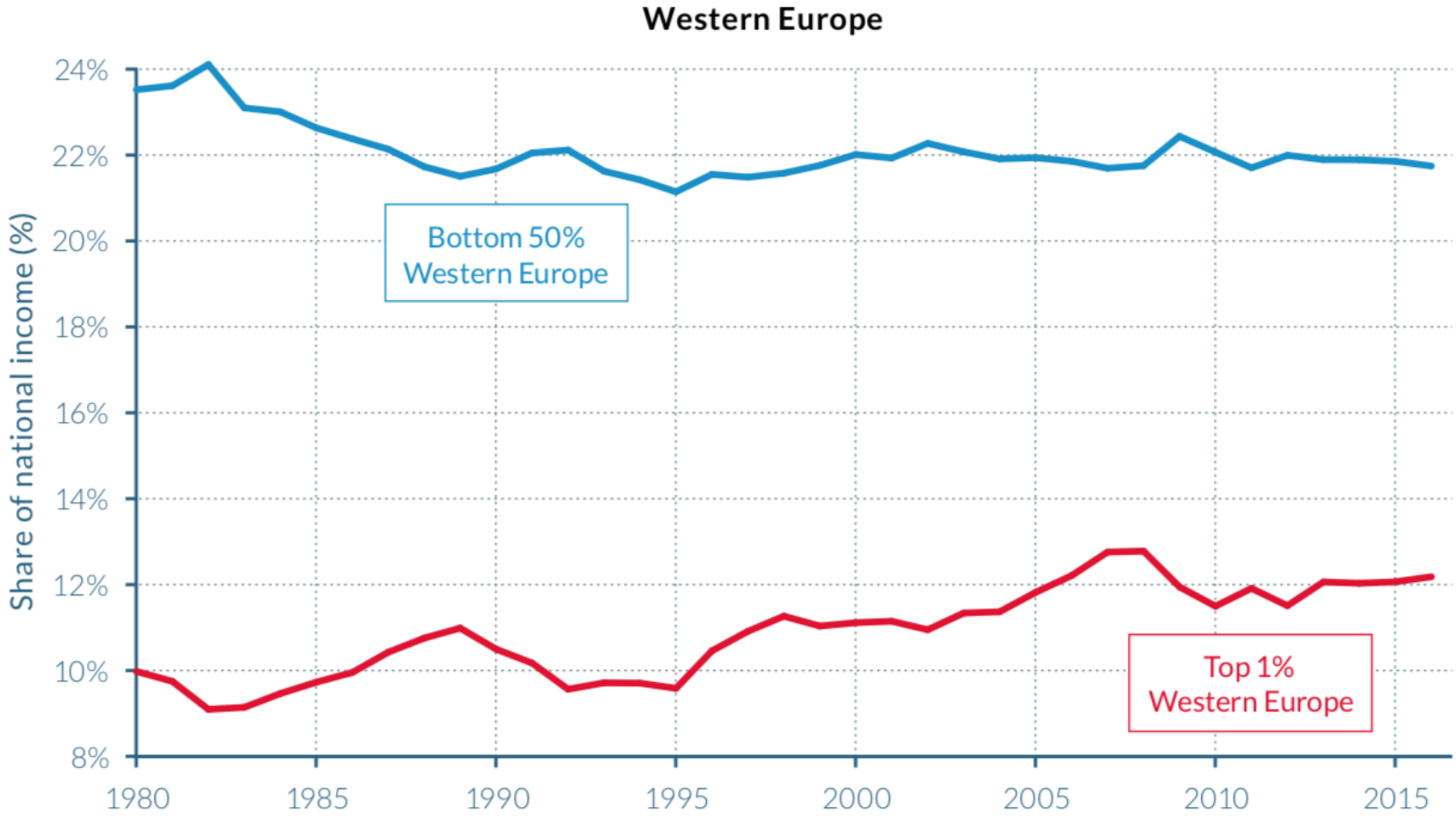
4.5 The U.S. vs. other developed countries

- Inequality has increased more in the US than other developed countries since the 1980s
- Technology, globalization cannot explain this pattern
- Domestic policies matter

Top 1% vs. Bottom 50% national income shares in the US and Western Europe, 1980–2016



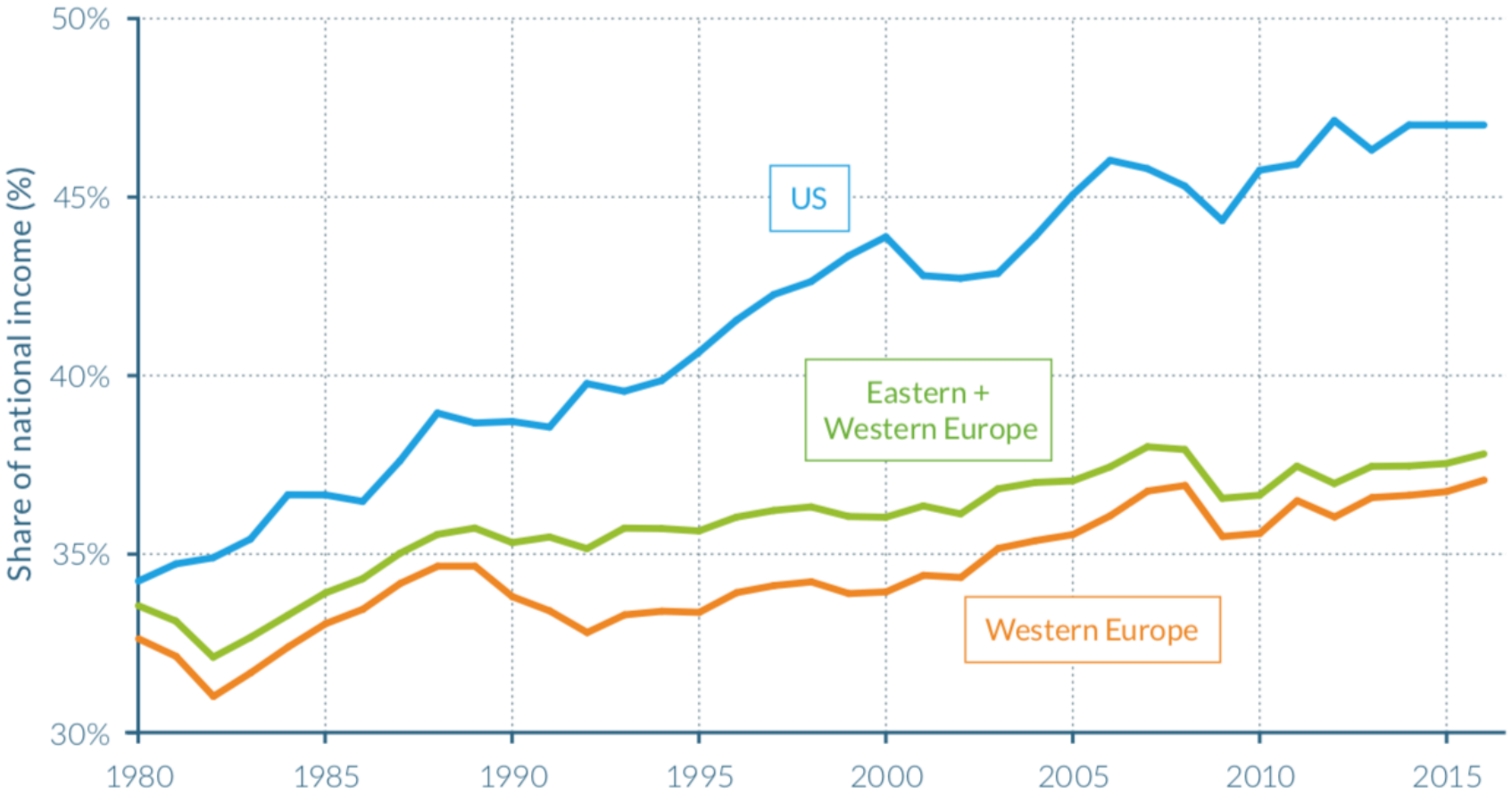
Source: WID.world (2017). See wir2018.wid.world for data series and notes.



Source: WID.world (2017). See wir2018.wid.world for data series and notes.

In 2016, 22% of national income was received by the Bottom 50% in Western Europe.

Top 10% national income share in Europe and the US, 1980–2016



Source: WID.world (2017). See wir2018.wid.world for data series and notes.

In 2016, 38% of national income was received by the Top 10% in Eastern and Western Europe.