V. Poverty & Inequality

Measuring inequality

EE406: Contemporary Economic Issues
Semester 1/2020
Faculty of Economics, Thammasat University

Measuring inequality

What is income?

National income Y of a country = net domestic output Y_d + Net Foreign Income (NFI)

At world level… $Y = Y_d$

Net domestic output:

$$Y_d = F(K, L) = \text{GDP} - \text{capital depreciation}$$

Inequality between labour and capital

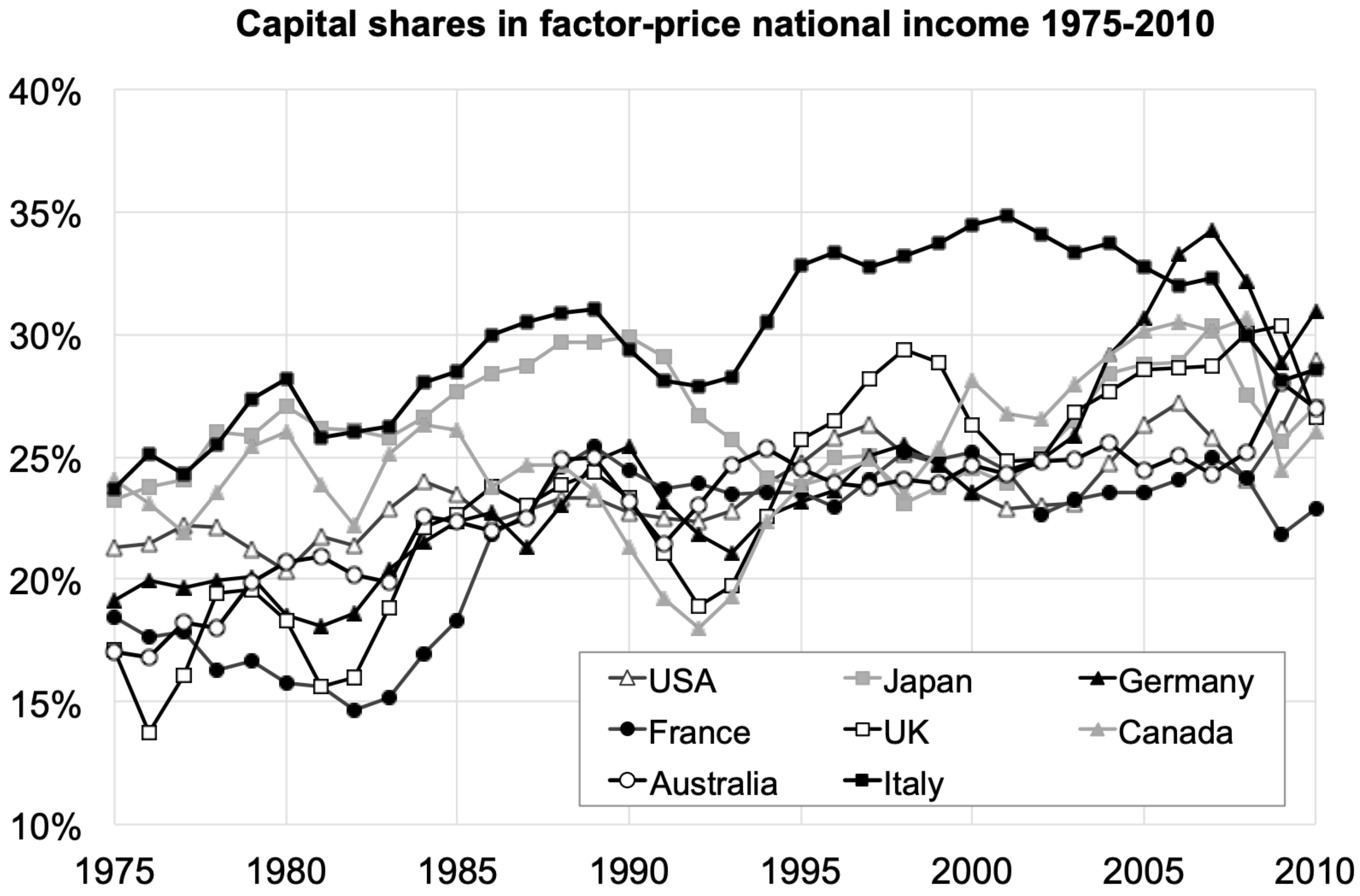
$$Y = F(K, L) = Y_K + Y_L$$

Where Y_K = Capital income = corporate profits + rents + interests + K component of mixed income (HH unincorporated businesses)

Y_L = labour income = wages + supplements to wages + labour component of mixed income

$\alpha = Y_K/Y$ = share of capital income in national income ≈ 25-30%

$1 - \alpha = Y_L/Y$ = share of labour income in national income ≈ 70-75%



Source: Piketty and Zucman (2014)

Functional vs. personal income distribution

- Functional income distribution: distribution of $Y = Y_K + Y_L$ across factors of production K and L
- What classical economists were interested in
- Personal income distribution: distribution of $Y = \sum_i y_i$ across individuals i
- What today's economists are mostly interested in

Functional vs. personal income distribution

Both are related, since y_i depends on:

- Distribution of y_{Li} across individual i
- Distribution of y_{Ki} across individual i
- Relative size of $Y_K = \sum_i y_{Ki}$ and $\sum_i y_{Li}$
- Correlation between y_{Li} and y_{Ki}

Pre-tax and post-tax income

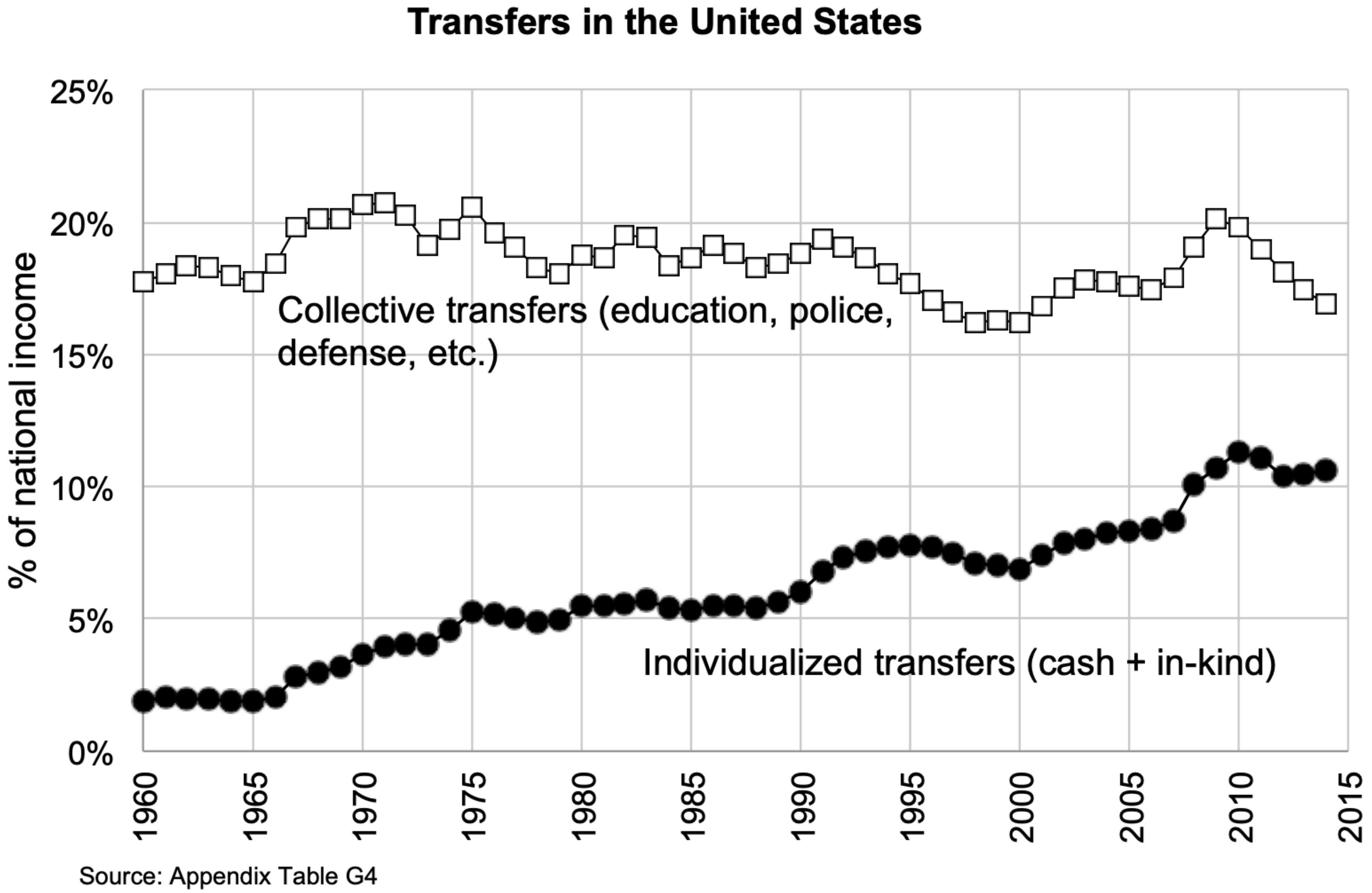
- So far we abstracted from the intervention of the government in the economy
- If no government, individual income $y_i = y_{Ki} + y_{Li}$ = income that derives from the ownership of factors of production
- With government intervention, the actual income that people can spend or save can be different from $y_{Ki} + y_{Li}$

Pre-tax income

- Pre-tax income = income before government taxes and transfers
- Inequality of pre-tax income ≈ inequality generated by the market
- This is the income that governments usually try to tax

Post-tax income

- Post-tax income = income after all taxes have been paid and all benefits have been received = income people can consume or save
- Two types of transfers:
  - Individualized transfers (monetary, in-kind)
  - Collective transfers



Source: Piketty, Saez and Zucman (2016)

The Distribution of National Income in the United States, 2014

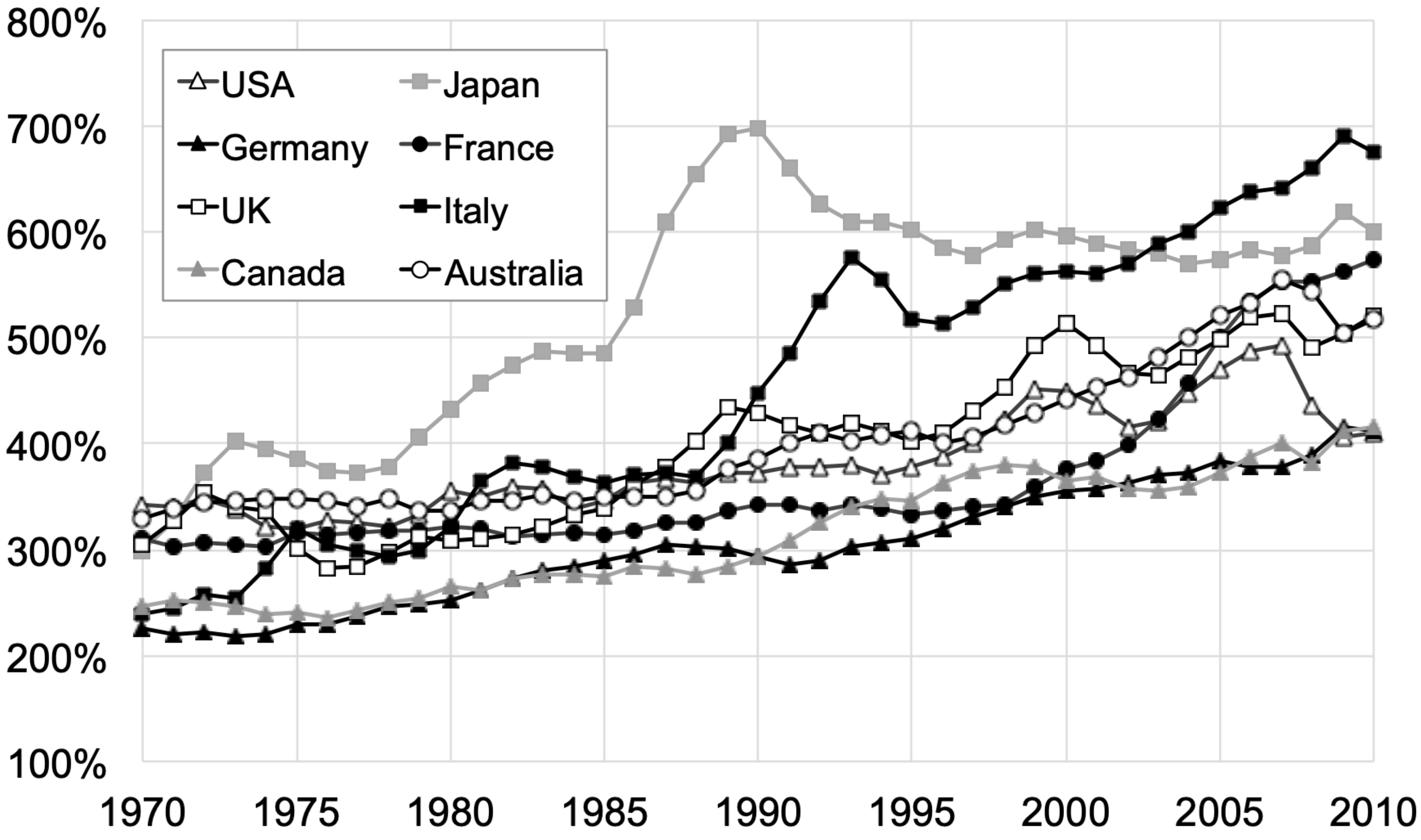
Income group	Number of adults	Pre-tax income: Average income	Pre-tax income: Income share	Post-tax income: Average income	Post-tax income: Income share
Full Population	234,400,000	$64,600	100%	$64,600	100%
Bottom 50%	117,200,000	$16,200	12.5%	$25,000	19.4%
Middle 40%	93,760,000	$65,400	40.5%	$67,200	41.6%
Top 10%	23,440,000	$304,000	47.0%	$252,000	39.0%
Top 1%	2,344,000	$1,300,000	20.2%	$1,010,000	15.6%
Top 0.1%	234,400	$6,000,000	9.3%	$4,400,000	6.8%
Top 0.01%	23,440	$28,100,000	4.4%	$20,300,000	3.1%
Top 0.001%	2,344	$122,000,000	1.9%	$88,700,000	1.4%

Source: Piketty, Saez and Zucman (2016)

Capital and wealth: definition

1. Private wealth
   - Private wealth = assets – liabilities of household
   - Assets = all non-financial (housing, land…) and financial assets (equities, bonds, bank deposits…)
   - Recorded in the national balance sheet
2. Public wealth
   - Public wealth = assets – liabilities of the government
   - Liabilities = public debts; assets = school, roads, barracks…
3. National wealth = public + private wealth

Private wealth / national income ratios 1970-2010



Source: Piketty and Zucman (2014). Authors' computations using country national accounts. Private wealth = non-financial assets + financial assets - financial liabilities (household & non-profit sectors)

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What we know so far

Trends in the functional distribution of income

- The capital share is rising, the labour share falling
- One explanation is that the rise of capital share of income may be the consequence of the rise in the stock of capital
- Another explanation is that the market power of capital is rising
- Because y_K is very unequally distributed (more than y_L), rising capital share have big consequences on interpersonal inequality

The tools to understand interpersonal ineq.

1. Data sources to understand inequality between individuals
2. Metrics: Gini coefficient, Pareto-Lorenz curve, top share, …
3. Unit of observation

Data sources for interpersonal inequality

1. Survey data
   - Surveys are a popular data source to study inequality:
     - Ask a sample of families about their income, wealth...
     - Lots of socio-demographic characteristics
     - Revolutionized empirical research in second half of 20th century
   - Numerous household surveys now available
     - Luxembourg income study (40 countries, 1968–)
     - Luxembourg wealth studies (12 countries, 1994–)
     - World Bank Living Standard Measurement Studies (39 countries, 1985–).
   - Survey data are useful, but insufficient:
     - Large gap between surveys and macro totals
     - Practical pbs: non-response & under-reporting at the top

Data sources for interpersonal inequality

- 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
  - Kuznets (1953) first to use tax data to compute top income shares
  - Extended by Atkinson, Piketty, Saez (2011) and others

Data sources for interpersonal inequality

Limits of tax data:

- Miss tax evasion
- Miss legally tax-exempt income
- Ex: US tax data only capture 60% of US national income
- Silent on distribution within bottom 90%

Data sources for interpersonal inequality

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
- First attempt: King (1696)
- Current attempt to compile DINAs throughout the world: http://WID.world

The distribution of national income in Thailand, 2016

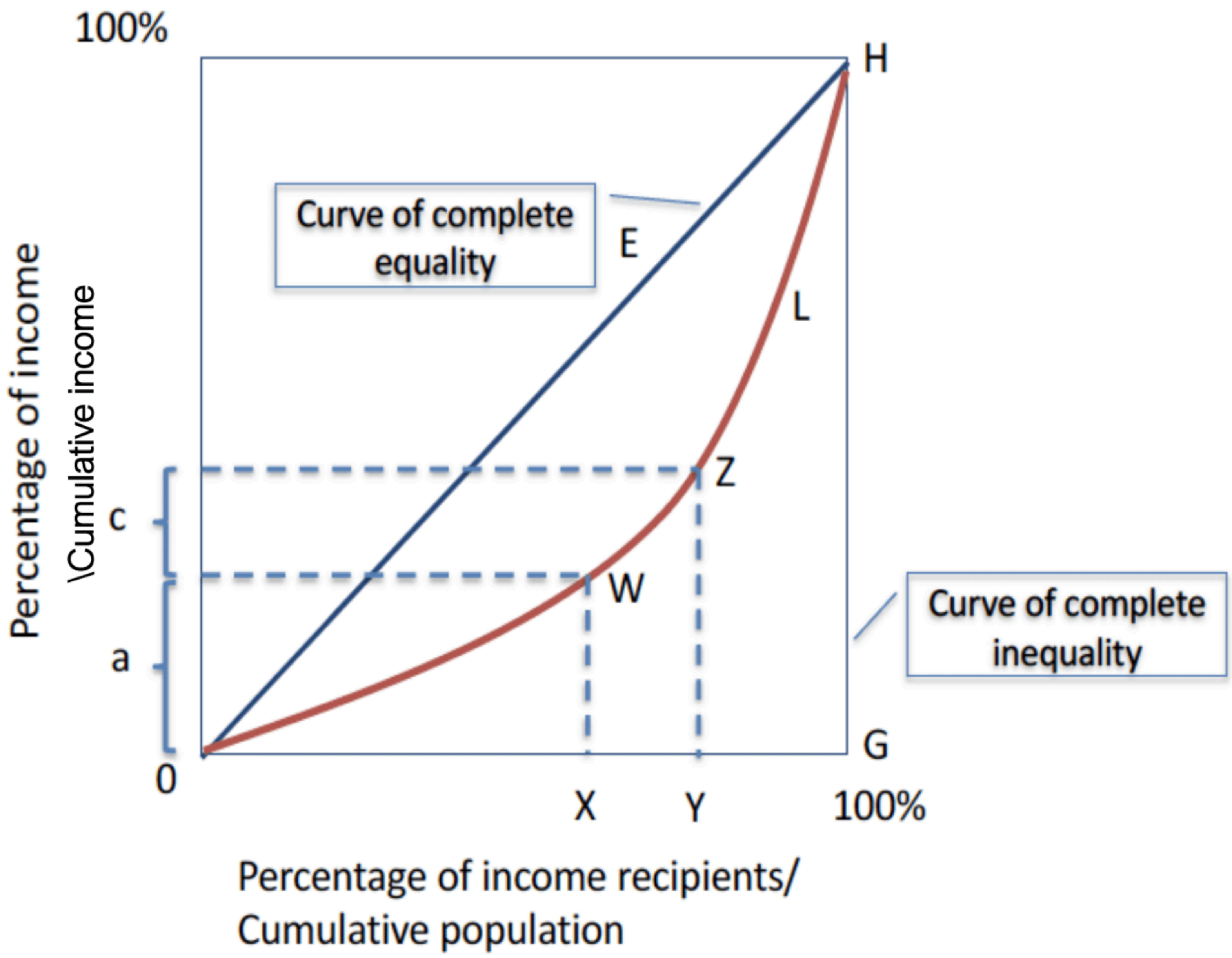
Table 2.6: Thresholds, averages, and national income shares in Thailand, 2016

Income groups	Number of adults	Threshold		Average income		Income share
		Thai Baht	2017 Dollar PPP	Thai Baht	2017 Dollar PPP	
Full population	36,459,685	0.00	0.00	309,812.72	24,739.50	100%
Bottom 50%	18,229,843	0.00	0.00	86,124.00	6,877.27	13.90%
Middle 40%	14,583,874	148,886.28	11,889.03	267,299.00	21,344.65	34.51%
Top 10%	3,645,969	599,218.32	47,849.42	1,598,302.00	127,629.32	51.59%
incl. Top 1%	364,597	2,608,684.70	208,311.48	6,187,370.00	494,080.49	19.97%
Top 0.1%	36,460	9,880,617.50	788,997.64	23,881,425.00	1,907,005.11	7.71%
Top 0.01%	3,646	35,758,214.00	2,855,403.18	98,109,090.00	7,834,312.07	3.17%
Top 0.001%	365	148,958,048.00	11,894,757.49	436,085,575.00	34,822,772.10	1.41%

Source: Jenmana (2018)

How to quantify inequality?

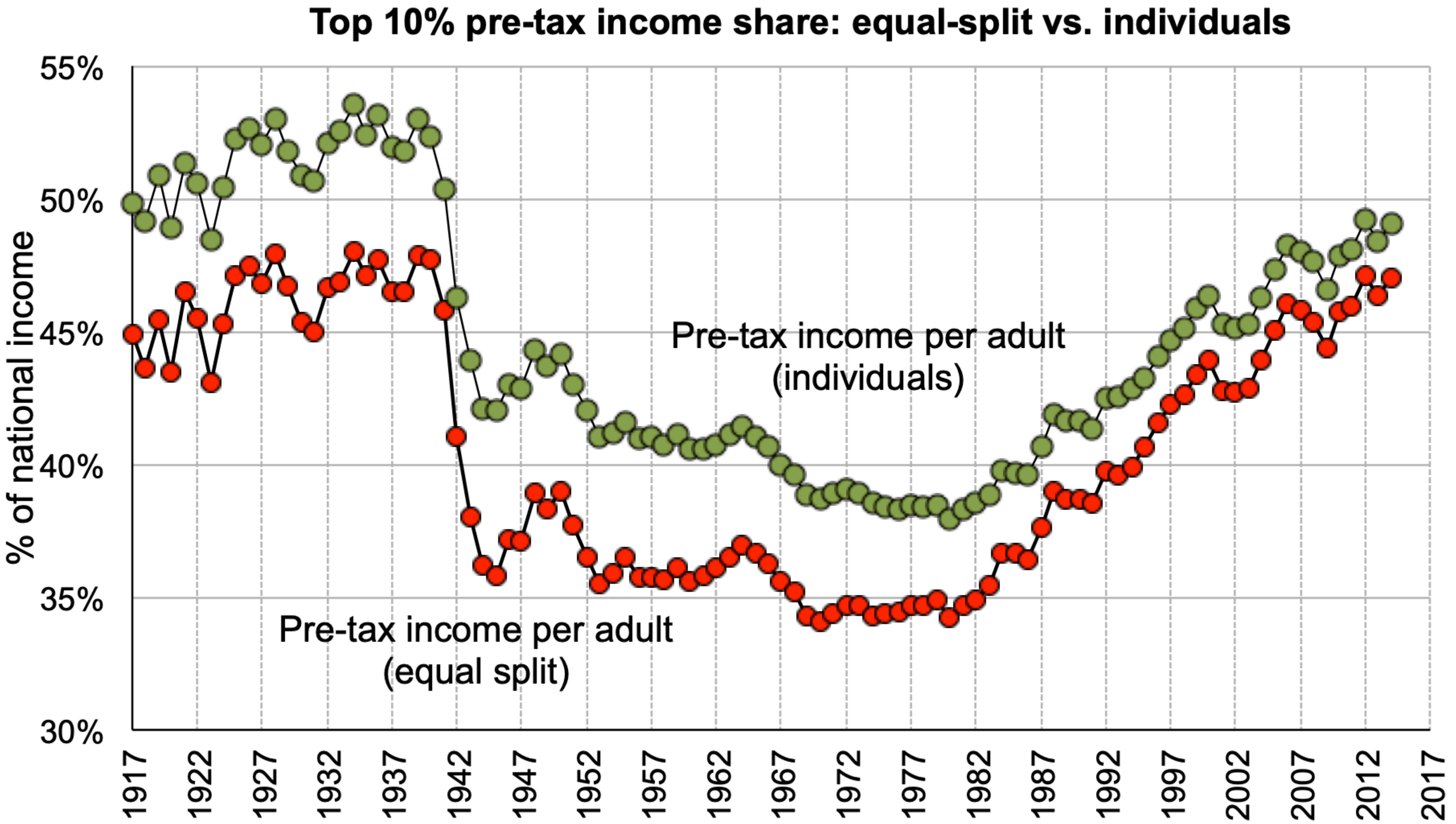
- Inequality often summarized by Gini coefficient G
- Lorenz curve shows % of income earned by people below fractile p
- G = 2 x area between 45 degree line and Lorenz curve
- G =0 means Lorenz curve is the 45 degree line = perfect equality


100%
H
Curve of complete equality
E
L
Percentage of income
\Cumulative income
c
Z
W
a
Curve of complete inequality
G
0
X
Y
100%
Percentage of income recipients/
Cumulative population

- Problem of Gini: quite abstract & requires lots of data
- Shares are more concrete (“the top 1% income share”)
- Gini coefficient cannot be decomposed into inequality within and inequality between groups.

Unit of observation

- Individual adult: assumes no sharing of resources between spouses
- Equal-split adults: assumes full sharing of resources
- Tax unit ≈ households: relevant for tax policy simulations



Source: Appendix Table II-B9.

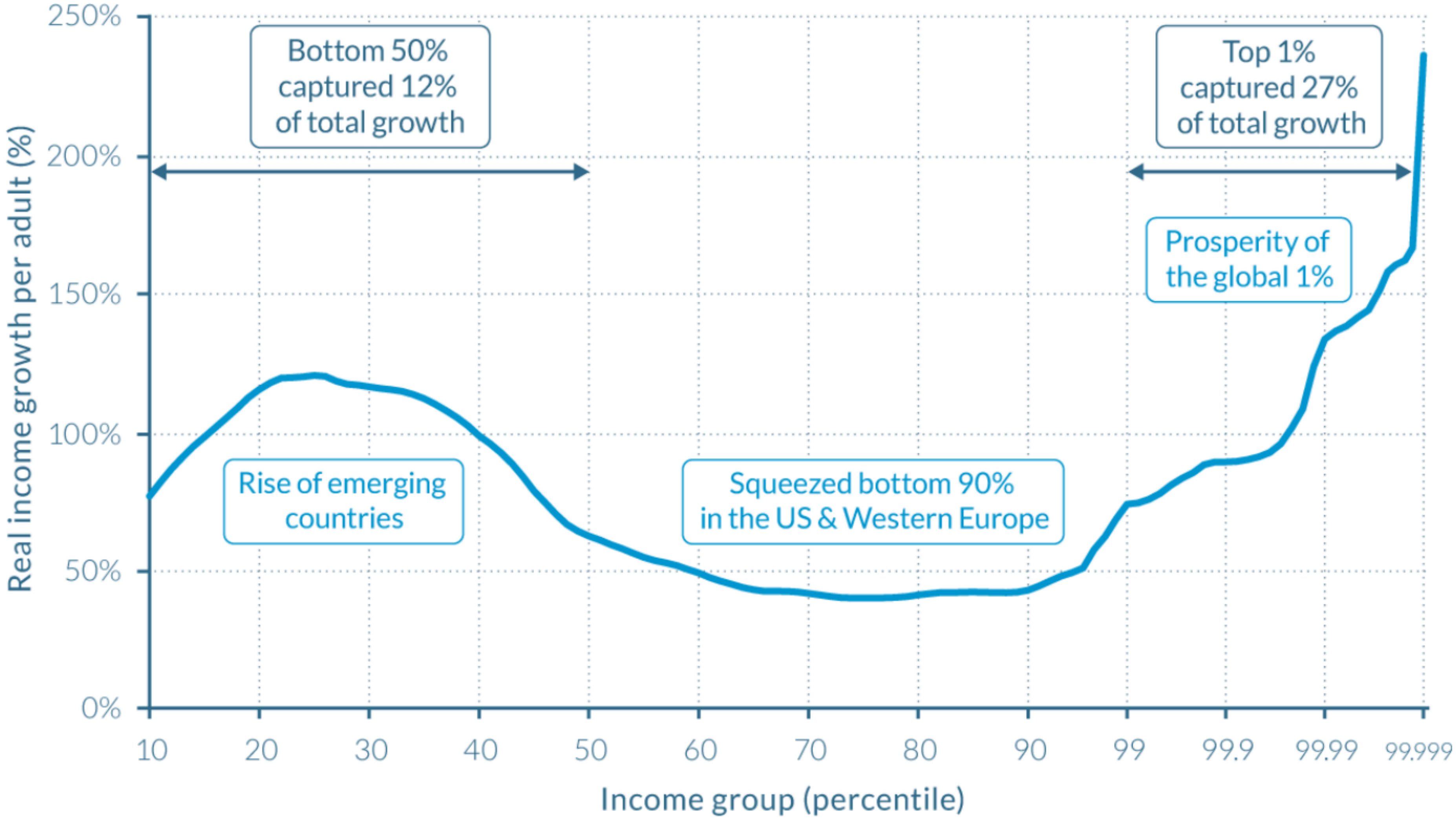
What we know about inequality, today

Global picture

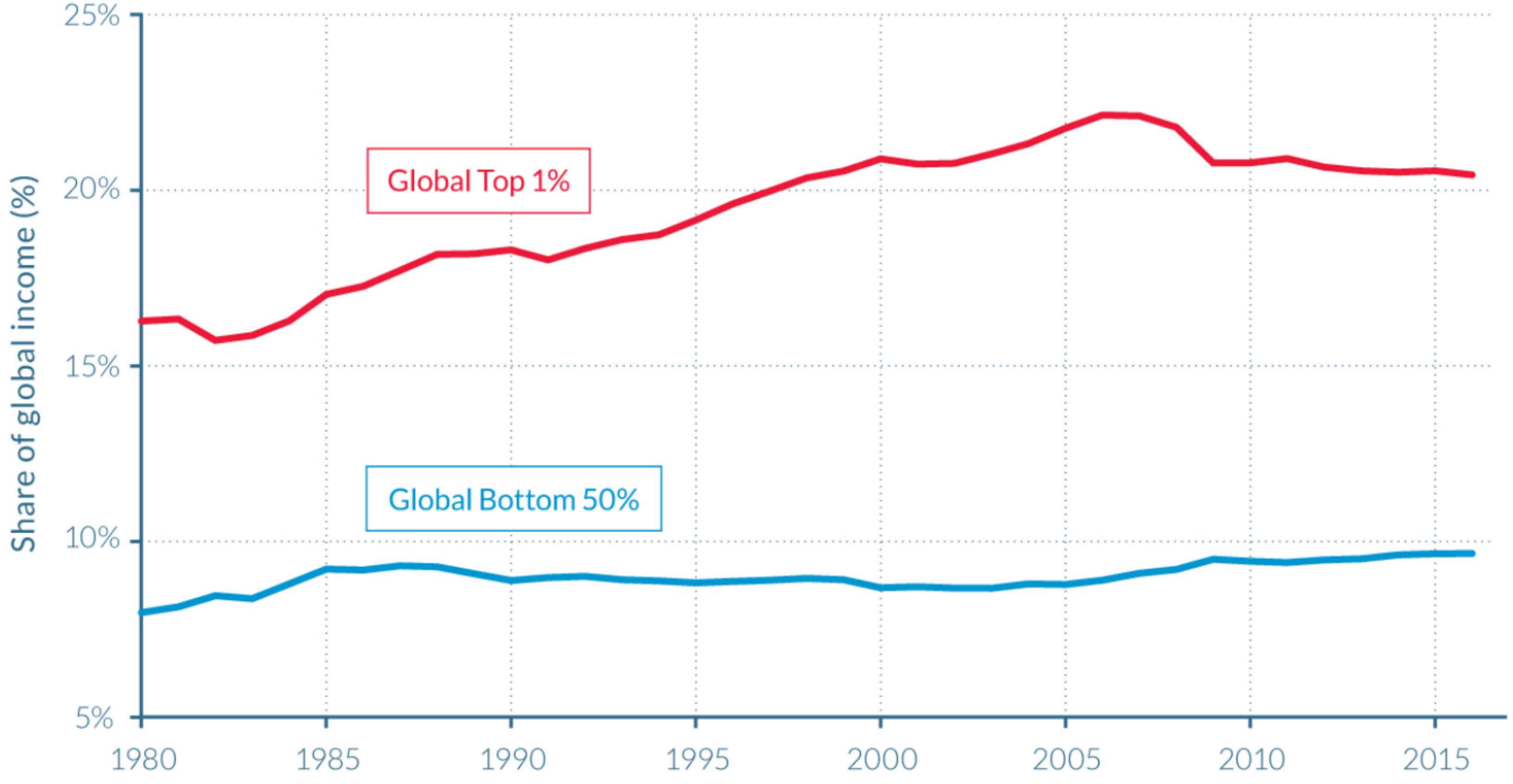
- Convergence in average income across countries, but rising inequality within countries
- More precisely: from 1980 to 2000 rising global inequality (global top 1% income share → 16% in 1980 to 22% in 2000
- Then falling slightly 2000-2018 (top 1% share = 20% in 2018).

Distribution of world growth:

- Poorest half of the global population has seen its income grow significantly thanks to high growth in Asia.
- But top 0.1% has captured as much growth as the bottom half since 1980.
- Income growth sluggish or even nil for individuals between the global bottom 50% and top 1% (includes North American and European lower- and middle-income groups)

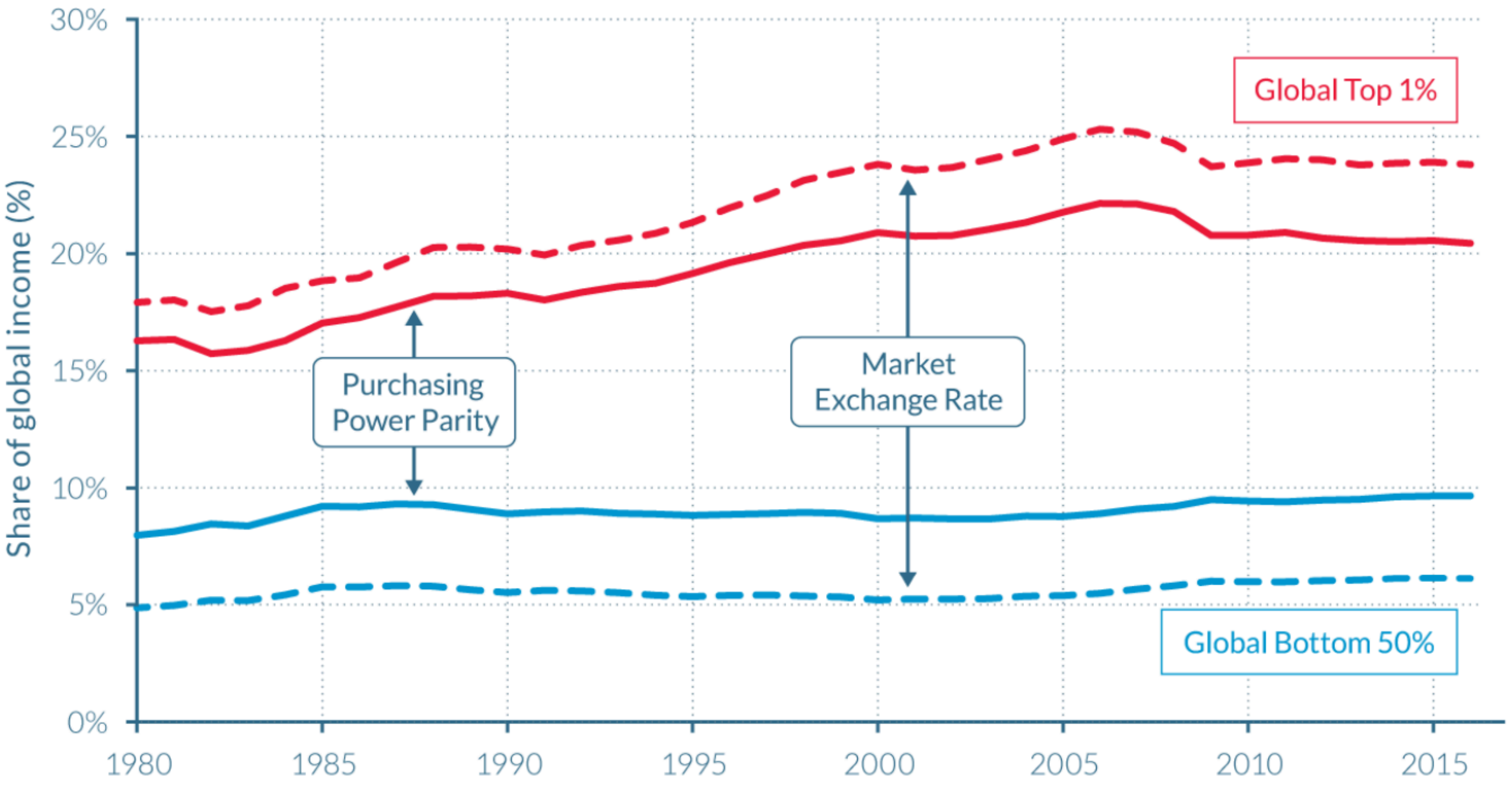


Source: WID.world (2017). See wir2018.wid.world/methodology.html for more details.



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

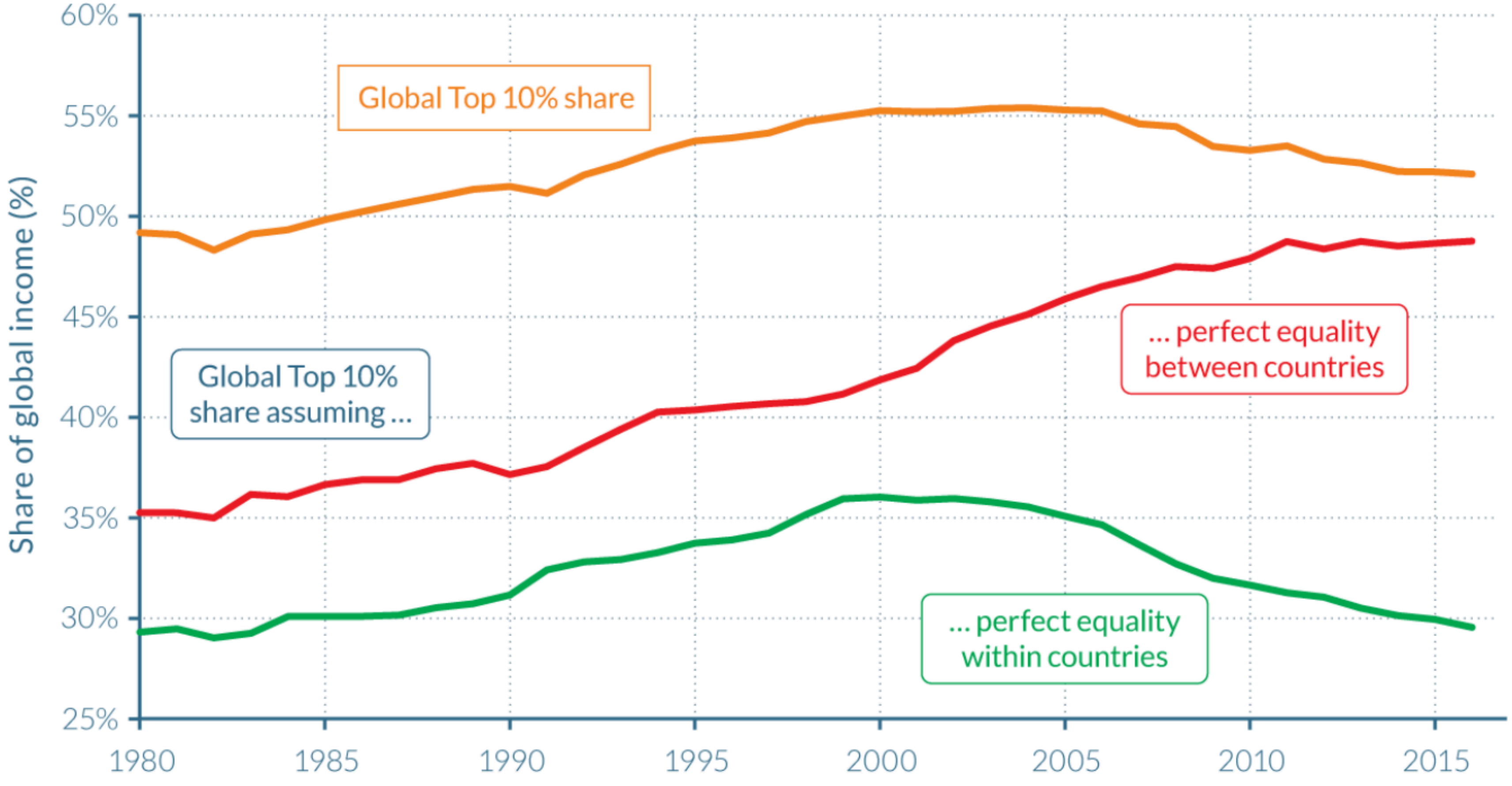
In 2016, 22% of global income was received by the Top 1% against 10% for the Bottom 50%. In 1980, 16% of global income was received by the Top 1% against 8% for the Bottom 50%.



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

In 2010, the Top 1% received 24% of global income when measured using Market Exchange Rates (MER). When measured using Purchasing Power Parity (PPP), their share was 21%. Thick lines are measured at PPP values, dashed lines at MER values. Income estimates account for differences in the cost of living between countries. Values are net of inflation.

Rising role of within-country inequality



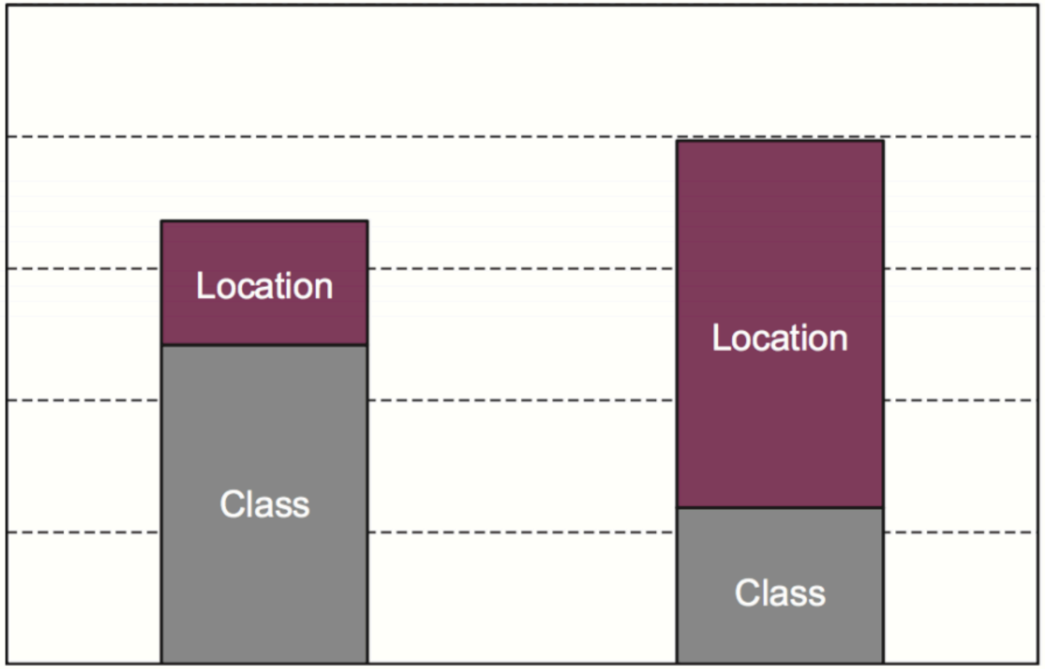
Source: WID.world (2017). See wir2018.wid.world/methodology.html for data series and notes.

In 2010, 53% of the world's income was received by the Top 10%. Assuming perfect equality in average income between countries, the Top 10% would have received 48% of global income.

Global inequality in the long run

- Estimates by Bourguignon and Morrisson (2002) as far back as early 19th century
- Global inequality increased from beginning of 19th century to World War 2 (class inequality + Industrial Revolution)
- After that: stabilized or at least grew more slowly

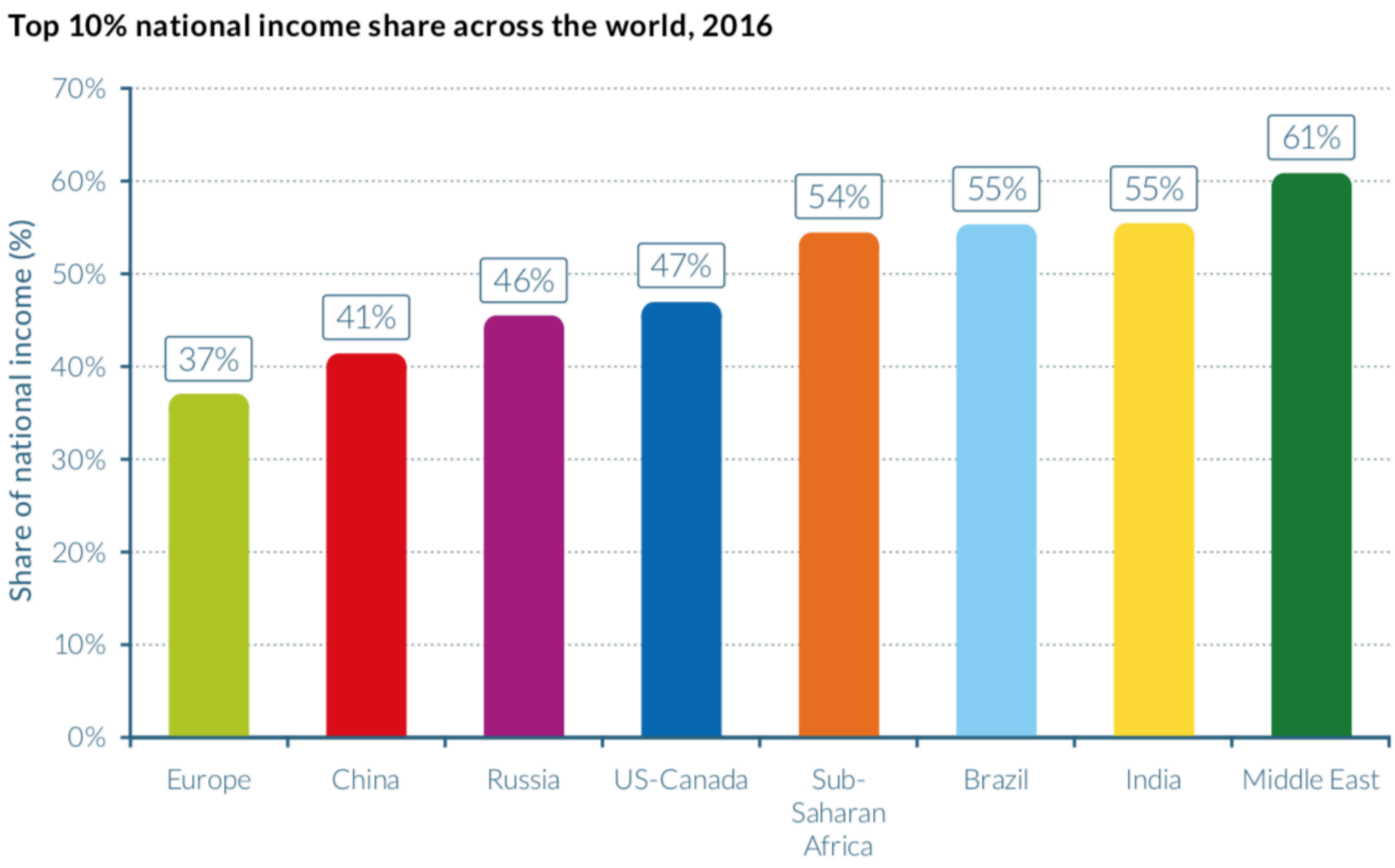
Figure 6. A non-Marxian world: level and composition of global inequality in the 19th century and around 2000 (measured by the Theil index).



Source: Milanovic (2013)

Inequality today: orders of magnitude

- 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% ≈ 35%


Top 10% national income share across the world, 2016
Share of national income (%)
70%
60%
50%
40%
30%
20%
10%
0%
37%
41%
46%
47%
54%
55%
55%
61%
Europe
China
Russia
US-Canada
Sub-Saharan Africa
Brazil
India
Middle East

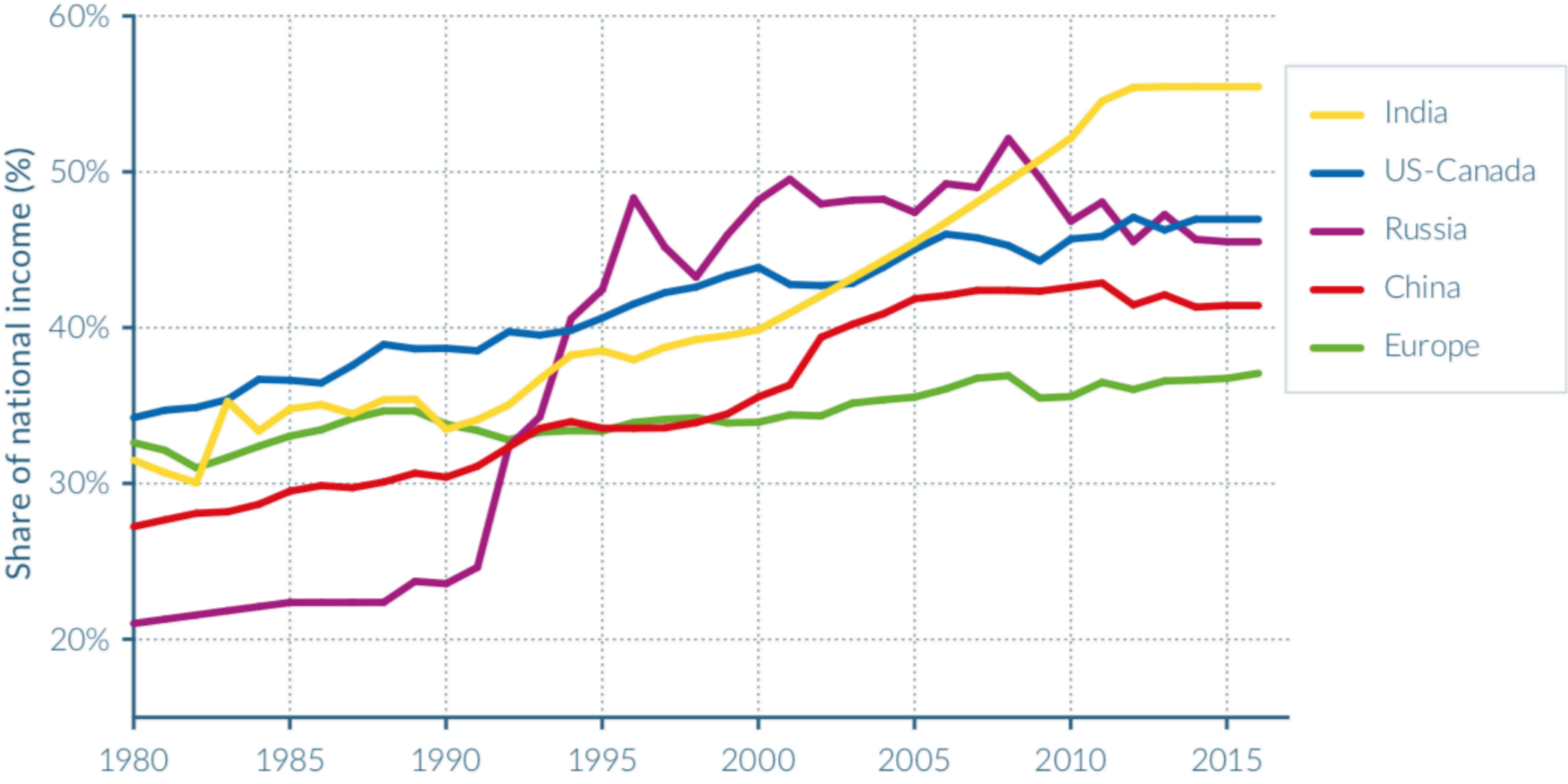
Labor vs. capital income inequality

- 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

Evolution since the 1980s

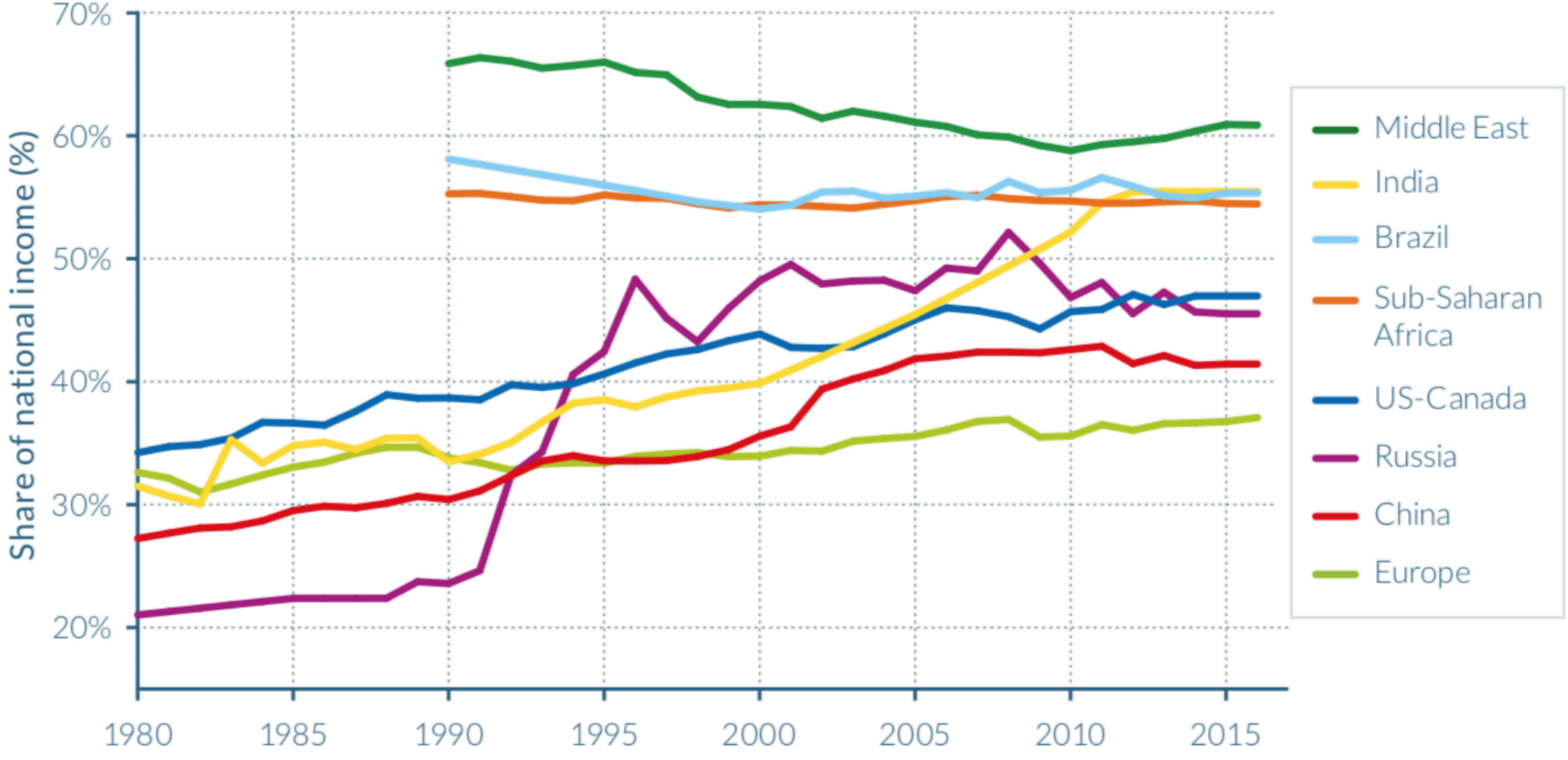
- Rising inequality is a global phenomenon
- But increase at different speeds, reflecting diversity of national institutions and policies
- Among developed countries: faster rise in Anglo-saxon countries
- Among emerging countries, variety of national trajectories; strongest rise in Russia

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.

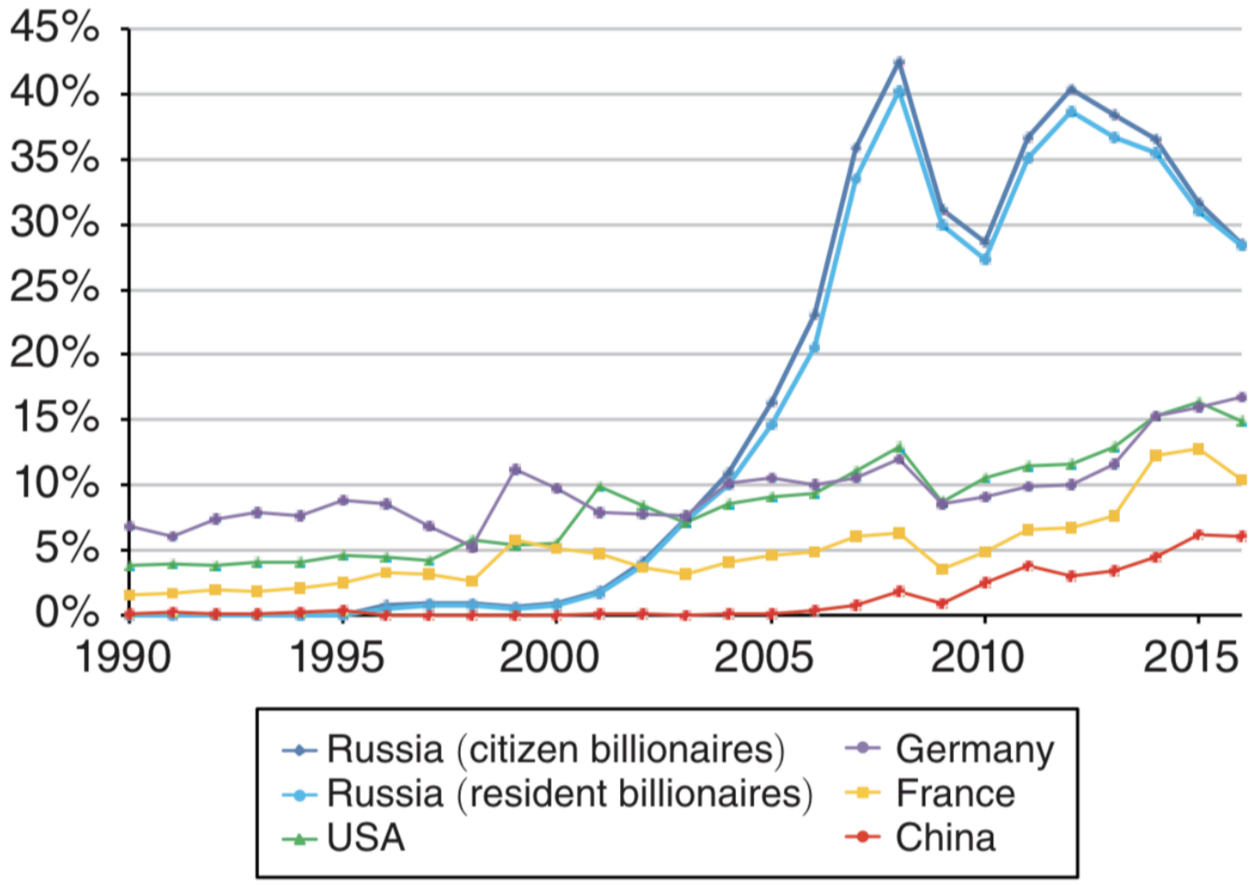
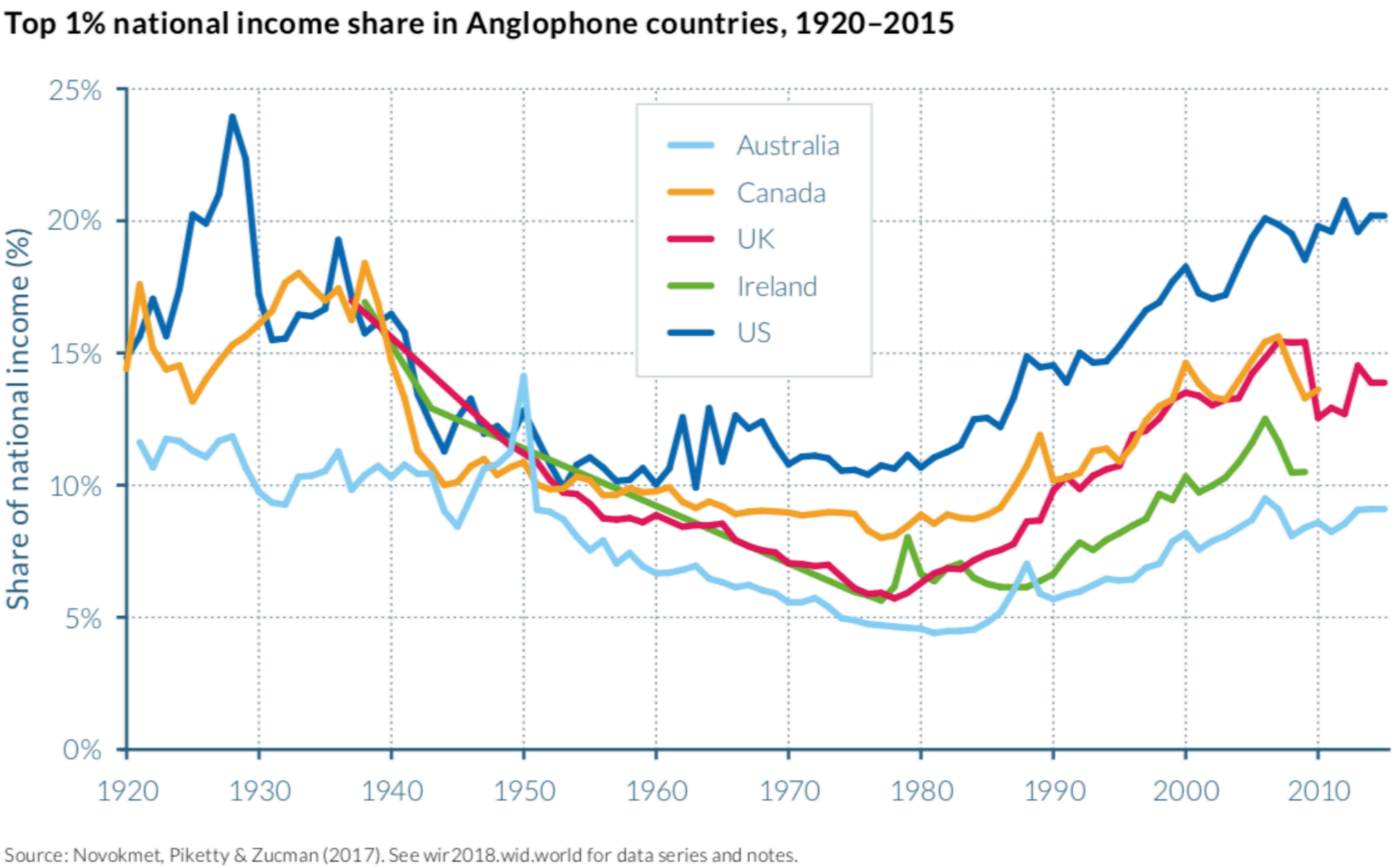


FIGURE 5. TOTAL FORBES BILLIONAIRE WEALTH: RUSSIA VERSUS OTHER COUNTRIES, 1990–2016
(Percent national income)

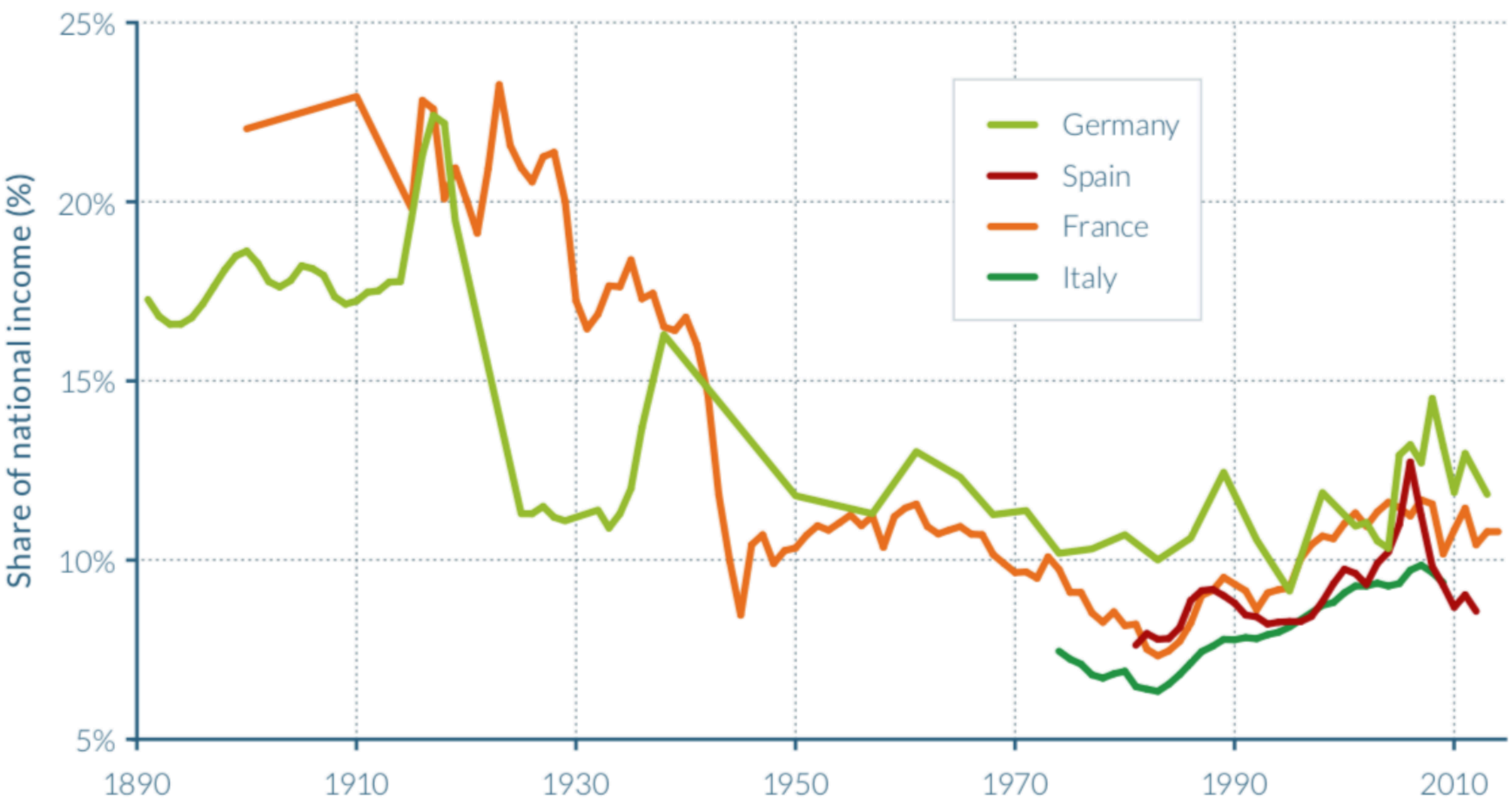
The decline of income inequality 1920s–1970s

Rise in inequality since 1980 contrast sharply with general fall in inequality between 1920s and 1970s

1. In developed countries
   - 1920s-1970s combination of political, social, and economic shocks
   - Followed by egalitarian policies: Social Security, public education, pro-labor policies, progressive taxation
   - Decline in inequality largely a capital phenomenon
     - Large shocks to top fortunes 1913-1945
     - Rise of patrimonial middle-class


Top 1% national income share in Anglophone countries, 1920–2015
Share of national income (%)
25%
20%
15%
10%
5%
0%
1920
1930
1940
1950
1960
1970
1980
1990
2000
2010
Australia
Canada
UK
Ireland
US
Source: Novokmet, Piketty & Zucman (2017). See wir2018.wid.world for data series and notes.

Top 1% national income share in European countries, 1890–2014



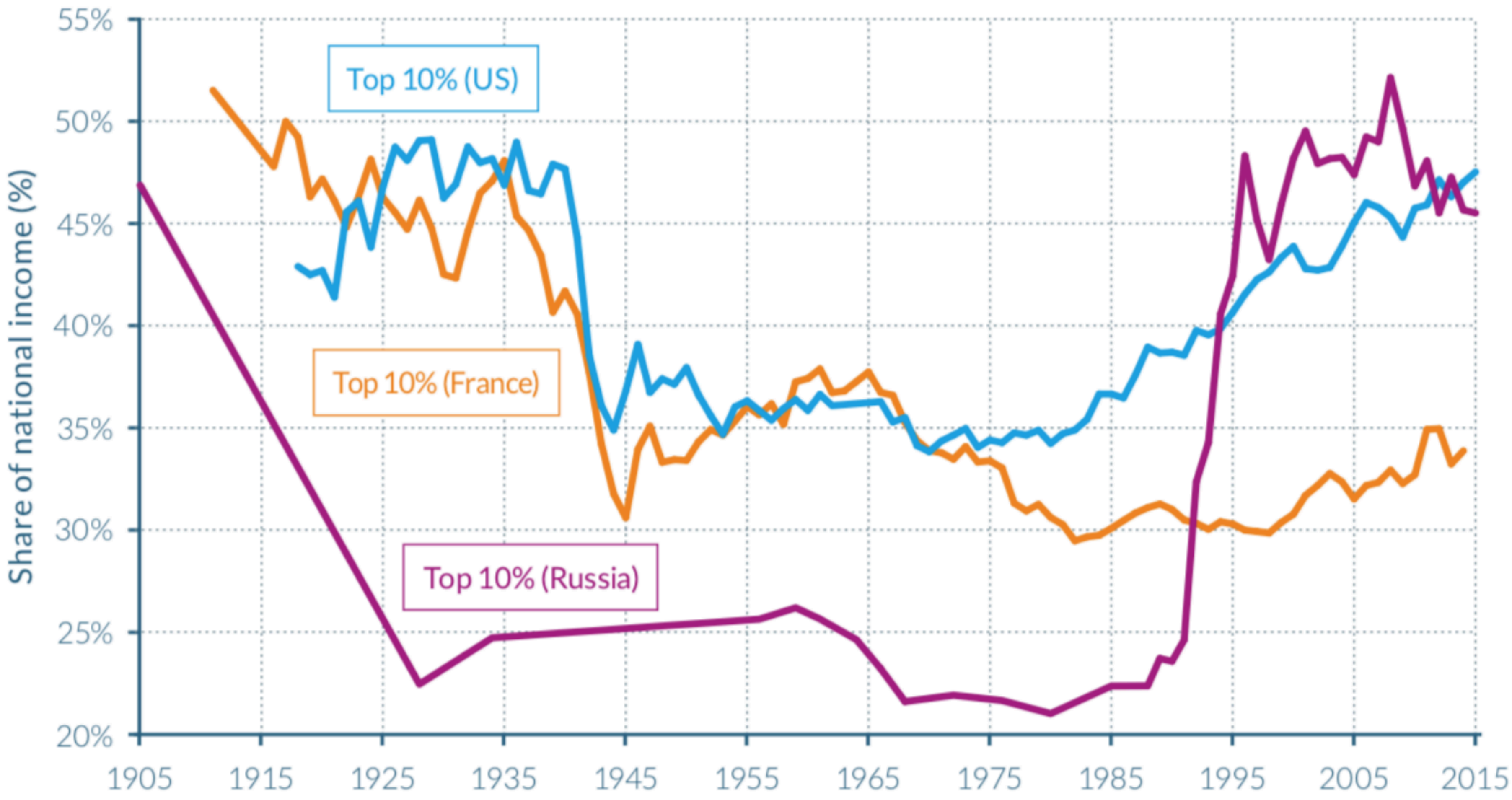
Source: WID.world (2017). See wir2018.wid.world for data series and notes.

2. In emerging countries

Political and social shocks led to even more radical reduction of inequality:

- Abolition of private property in Russia, plans, education, land redistribution
- Socialist policies in India post-independence

Top 10% income share in France, Russia and the US, 1905–2015

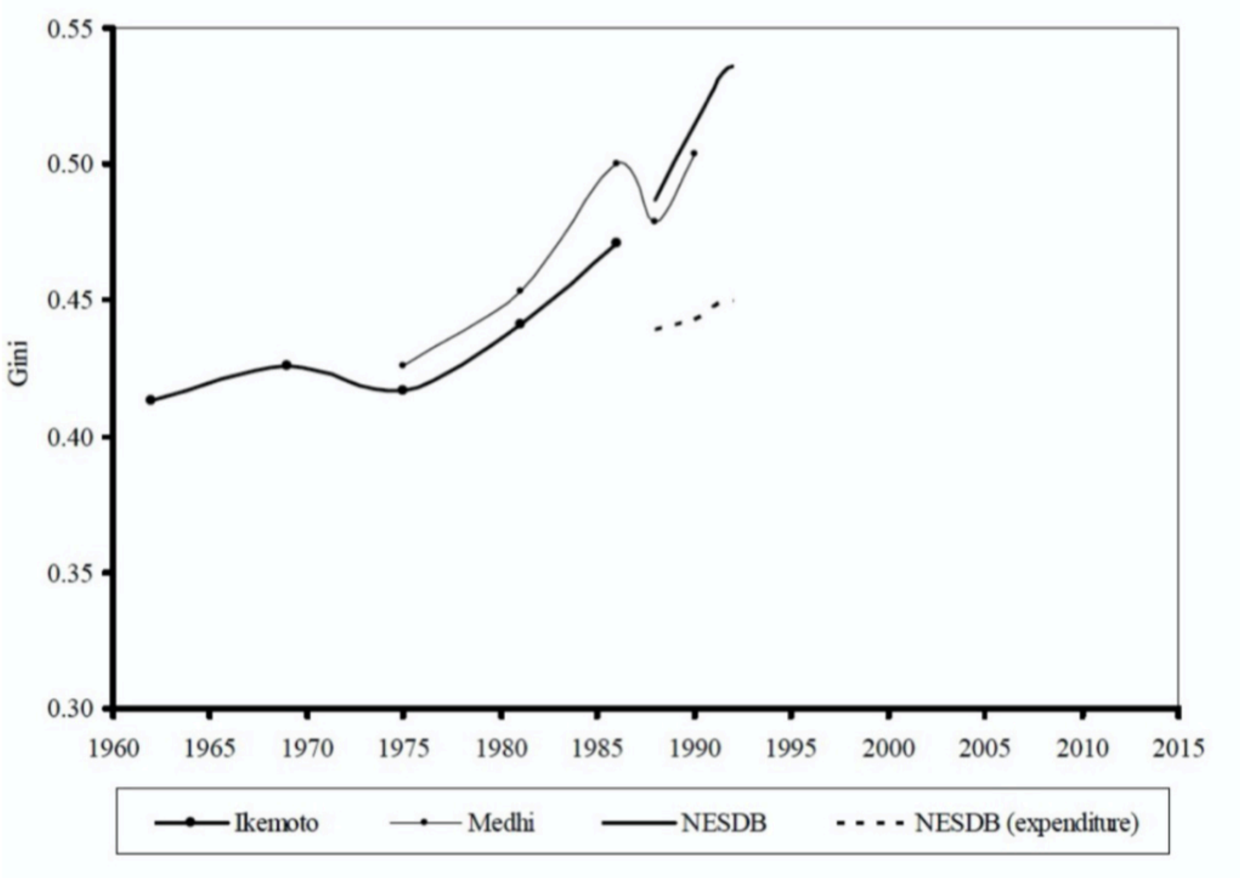


Source: Novokmet, Piketty and Zucman (2017). See wir2018.wid.world for data series and notes.

- After historical decline in most parts of the world from 1920s to 1970s, income inequality is on the rise in nearly all countries.
- But variety of national pathways, highlighting key role of political and institutional factors
- Among rich countries, Anglo-Saxon countries have experienced a sharp rise in inequality since the 1980s.

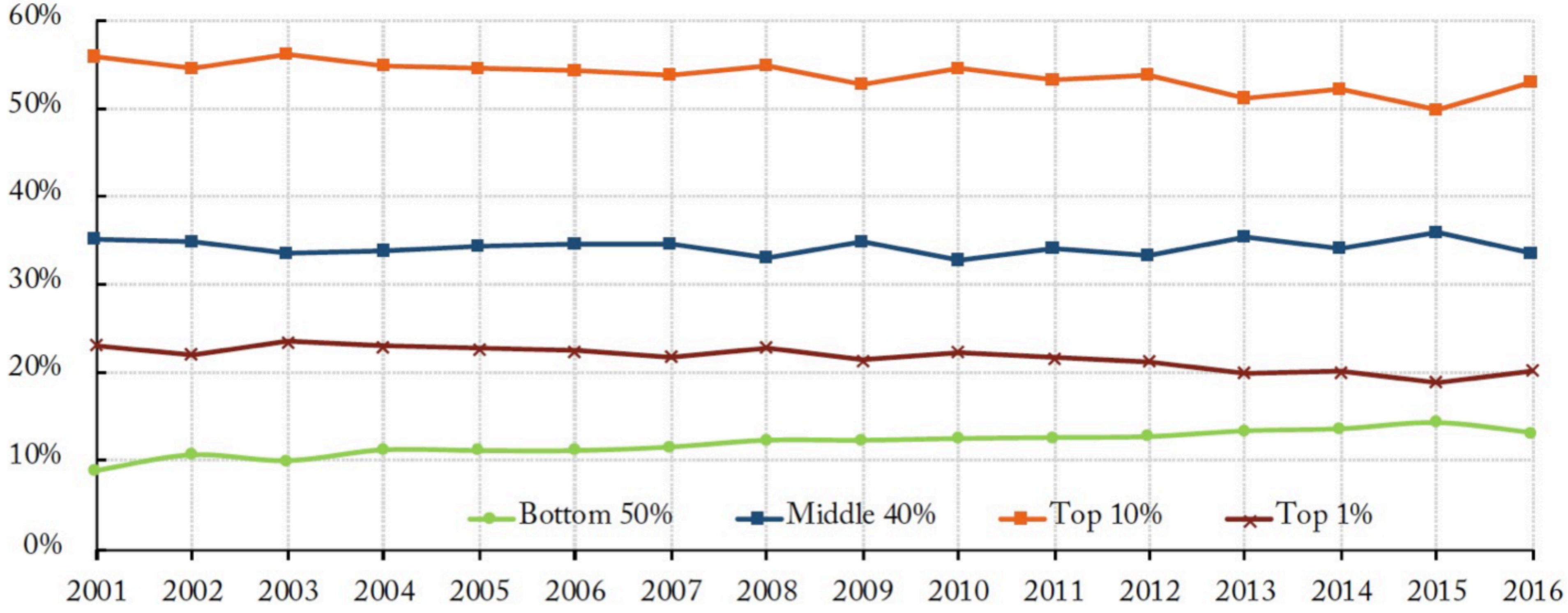
- In China, India, and Russia, three formerly communist or highly regulated economies, inequality surged with opening and liberalization policies.
- Steepest rise occurred in Russia, where the transition to a market economy was particularly abrupt.
- Too little is known of long-run dynamics of income inequality in many low- income countries.

Thai situation



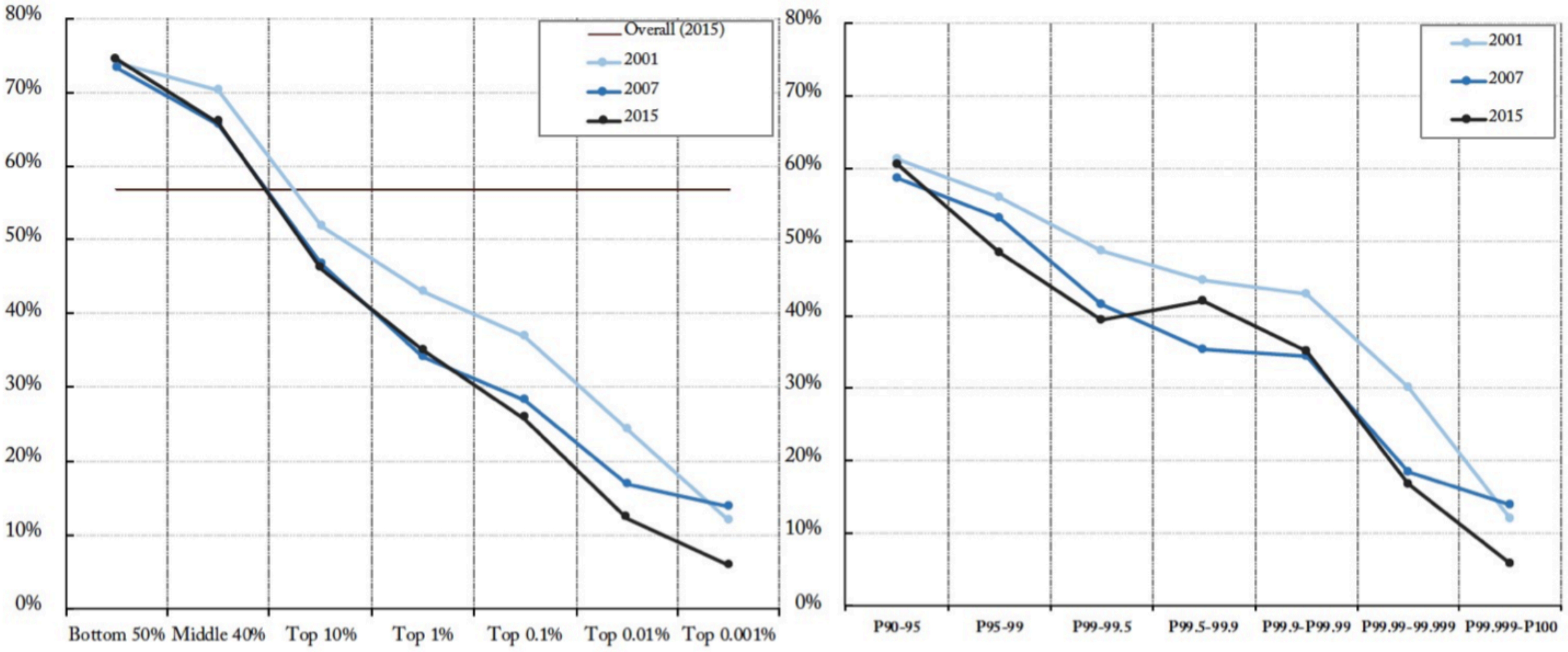
Source: Reprinted from Phongpaichit (2016).

Figure: Income inequality in Thailand: national income share, 2001-2016



Source: Jenmana (2018).

Income composition



Source: Jenmana (2018).