

Long run trends in the distribution of income and wealth

Chapter 8 in Atkinson & Bouguignon (eds), *Handbook of Income Distribution*, vol 2.

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(joint with Jesper Roine, SITE)

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Outline of the chapter

1. Introduction
2. Long run trends in income inequality
3. Long run trends in wealth inequality
4. Determinants of long run trends in inequality
5. Going forward

Overall questions of the chapter

- What do we know (and how do we know) about the distribution of income and wealth over time?
- How does inequality change over the path of development?
 - Esp: Did inequality increase during industrialization?
- Are there common trends across countries or over the path of development?
- How do the facts relate to proposed theories about changes in inequality?

Our focus

- "Long run" = From the industrialization until today
- We focus on today industrialized economies

Data constraints:

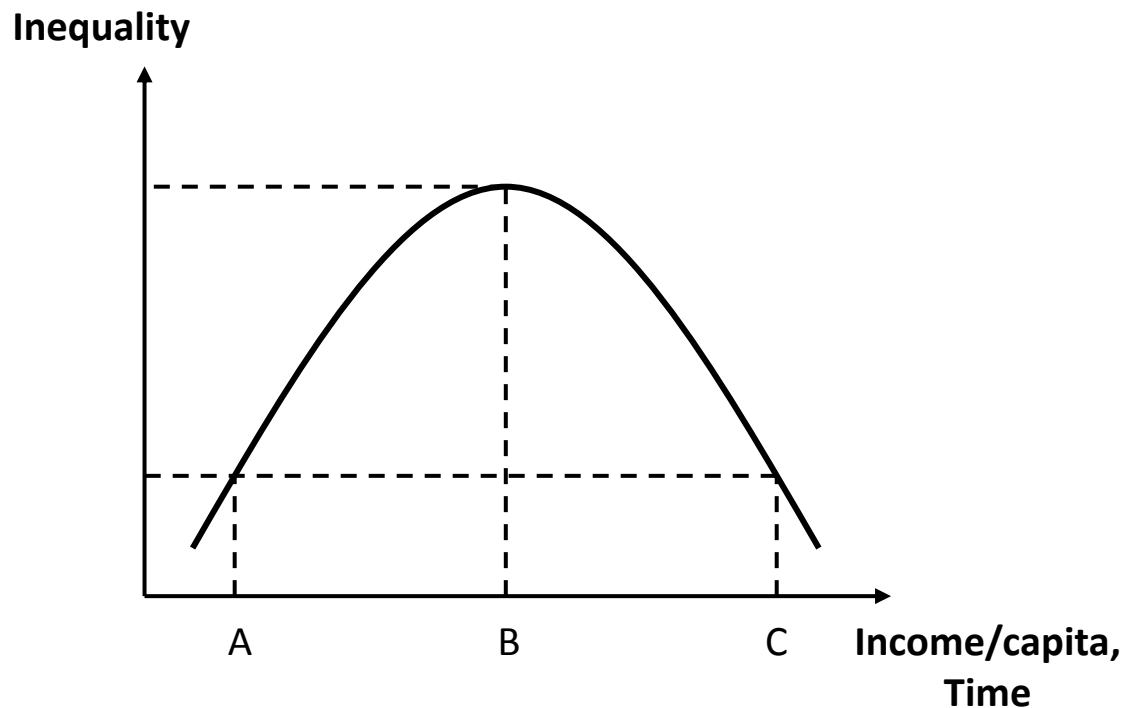
- "Economist's pipe dream" (Kuznets)? Not really...
- We cannot ask questions like "What data series do we prefer?"
- Instead we face questions like "Are there any data at all?"

Previous work that we build on

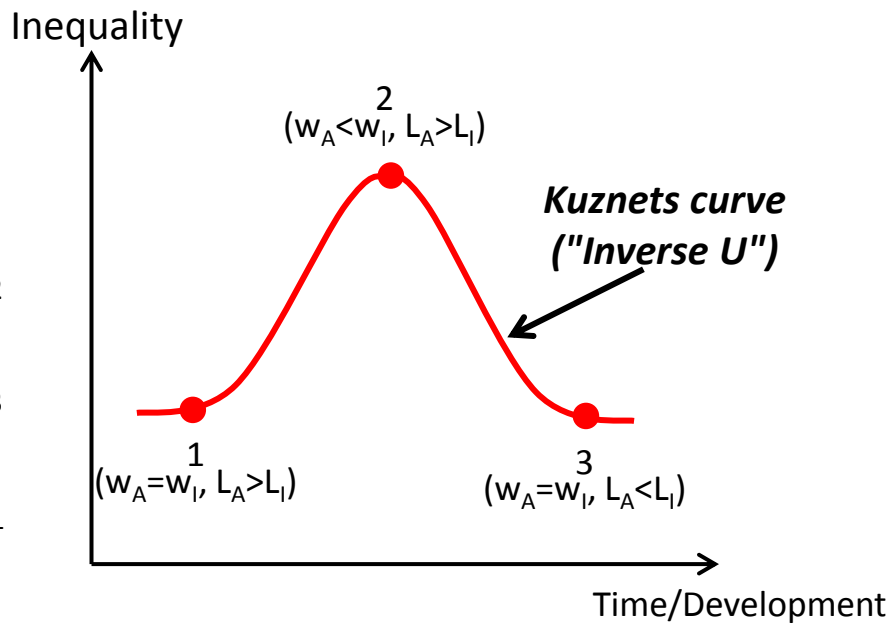
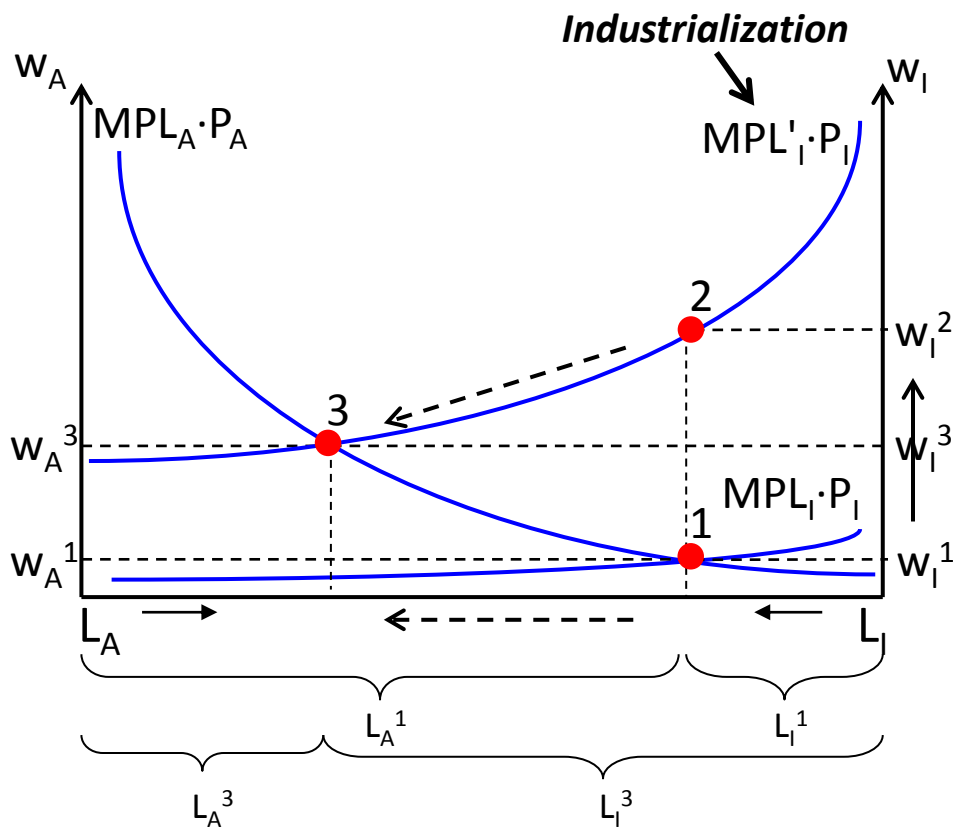
- Kuznets (1953, 1955)
 - Frankel and Herzfeld (1943) for SA; Bentzel (1952) for Sweden
- Economic history studies by, among others:
 - Lee Soltow
 - Peter Lindert
 - Jeff Williamson
 - Many others...
- Recent work on top income shares
 - Thomas Piketty, Anthony Atkinson, Emmanuel Saez
 - Many others contributing with country case studies (in the WTID)

Does inequality change over the path of development?

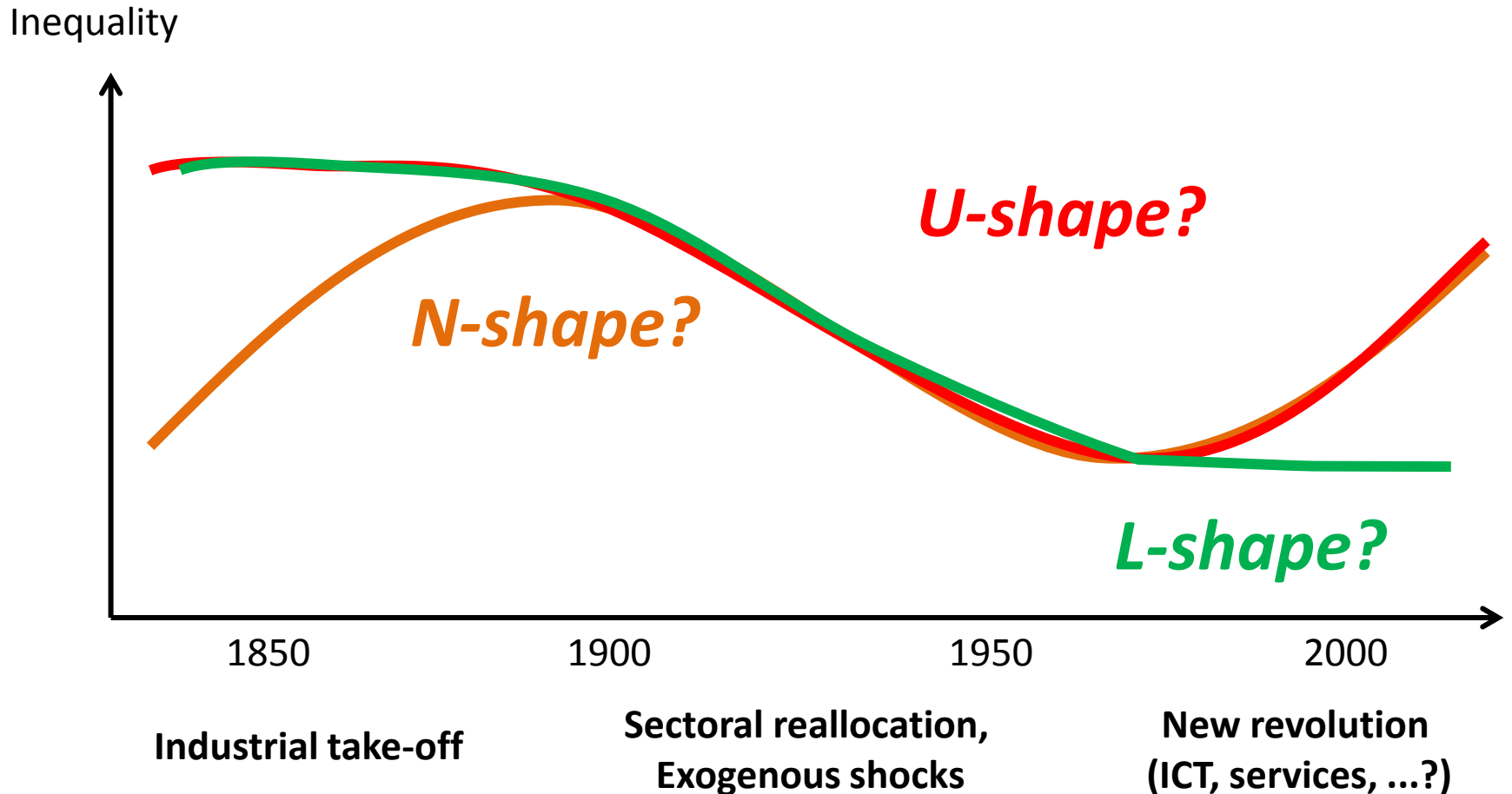
- Simon Kuznets (1953,1955)
 - Two-sector model
 - Inequality follows an inverse-U shape over the course of development (industrialization)



Simple(st?) representation of the Kuznets curve



Empirically: was there a *N*, *U* or *L* over time?



What is this chapter not about?

- Income mobility
 - See Jäntti and Jenkins (HID vol2)
- Pre-industrial (non-individual income-based) inequality
- Synthesizing theories of long run inequality
 - Meade 1964; Stiglitz 1969; Banerjee and Newman 1993; Galor and Zeira 1993; Aghion and Bolton 1997; Piketty 1997; Mookherjee and Ray 2006;
- Inequality as an explanatory (RHS) variable

Chapter 2: Long run trends in income inequality

1. Methods and data in the top income literature
 1. Tax statistics and the definition of income
 2. Reference totals for the population and income
 3. Interpolation techniques and the interpretation of the Pareto coefficient
 4. Tax avoidance and tax evasion and Other issues
 5. So can we trust the top income data?
2. The evidence and what we learn
 1. Common trends or separate experiences?
 2. The importance of developments within the top decile
 3. The importance of capital incomes and capital gains
3. The relation between top income data and other measures of inequality
 1. Comparing tax-based and survey-based estimates of top income shares
 2. Theoretical and empirical relationship between top shares and overall inequality measures
 3. Other series over long run inequality: wages, factor prices and life prospects
4. Income inequality over the long run: Taking stock of what we know

Launching the top income literature

- Kuznets (1953, 1955), Piketty (2001): General dissatisfaction with available inequality data
 - short time periods
 - scattered
 - differences across countries making comparisons difficult
- A solution: use *tax data*
 - available since the early 20th C. and earlier ➡ Long-run series
 - high-frequency data, often annual
 - information about income sources
 - available in most countries ➡ cross-country comparisons
 - before WWII, primarily top incomes observed

Top income shares data

Income concept

- Gross market income before most taxes and transfers
 - Includes labor, capital, business income
 - Some variation across countries (capital gains, tax units)

Computation of top income shares

- We estimate the share of *total income* that goes to the top 10, 5, 1, 0.1, etc % of *all potential income earners*.
- Reference totals:
 - Income: All personal income in the economy (not only taxed income)
 - Population: All potential tax units (not just those who file tax returns)

Reference total income concept: National Accounts vs. Tax Assessments

Total 'Personal sector total income'

- Nonhousehold income (nonprofit institutions, e.g., charities)
- = **Household sector total income**

- Items not included in the tax base (such as employers' social security contributions, nontaxable transfer payments etc.)
- = **Household gross income reported to tax authorities**

- Taxable income not declared by filers
- Taxable income of those who do not file tax returns
- = **Assessed taxable income of filers**

Example of historical source: Sweden 1916, 1919

Tab. C. Antal taxerade, taxerat belopp och uträknad skatt åren 1917 och 1920 samt deras procentiska ökning från år 1917 och skattens förhållande till det taxerade beloppet för vardera taxeringsåret inom olika inkomstgrupper.

Taxerat belopp om		Antal taxerade					Taxerat belopp					Uträknad skatt						
		Absoluta tal		Ökning från år 1917, %			Tusental kronor			Ökning från år 1917, %		Tusental kronor		Ökning från år 1917, %			I förhållande till tax. bel., %	
År 1917	År 1920	År 1917	År 1920	Lb.	St.	Hela riket	År 1917	År 1920	Lb.	St.	Hela riket	År 1917	År 1920	Lb.	St.	Hela riket	År 1917	År 1920
Högst 1 100 kr.	Högst 1 200 kr.	430 153	446 981	24.8	-34.5	3.9	378 075	426 274	38.1	-31.0	12.7	1 437	460	-53.5	-96.9	-68.0	0.38	0.11
1 200- 1 400 »	1 210- 1 500 »	185 856	216 897	42.0	-14.1	16.7	238 927	305 614	55.9	-5.9	27.9	1 441	992	0.9	-76.4	-31.2	0.60	0.32
1 500- 2 000 »	1 510- 2 000 »	196 833	275 066	85.0	-8.0	39.7	333 868	492 447	95.5	-3.2	47.5	2 810	2 812	30.9	-37.5	0.1	0.84	0.57
2 100- 2 500 »	2 010- 2 500 »	56 624	185 496	315.7	139.4	227.6	128 969	424 698	316.2	141.5	229.3	1 555	3 732	203.1	70.2	140.0	1.21	0.88
2 600- 3 000 »	2 510- 3 000 »	30 821	168 205	490.3	396.0	445.7	86 094	470 077	487.7	399.3	446.0	1 258	5 290	352.8	281.7	320.5	1.46	1.13
3 100- 4 000 »	3 010- 4 000 »	32 108	245 330	601.6	730.8	664.1	112 466	858 680	596.8	734.8	663.5	2 049	12 416	461.1	553.2	506.0	1.82	1.45
4 100- 5 000 »	4 010- 5 000 »	16 921	110 144	441.3	660.0	550.9	75 806	492 163	441.0	656.5	549.2	1 546	9 077	411.8	560.7	487.1	2.04	1.84
5 100- 6 000 »	5 010- 6 000 »	14 098	50 676	209.8	305.4	259.5	76 643	277 549	213.1	307.5	262.1	1 664	6 333	240.9	317.1	280.6	2.17	2.28
3 100- 6 000 »	3 010- 6 000 »	63 127	406 150	475.6	612.2	543.4	264 915	1 628 392	446.0	583.6	514.7	5 259	27 826	379.5	478.0	429.1	1.99	1.71
Högst 6 000 »	för fören., utl. m. fl.	11 943	16 777	71.4	22.1	40.6	18 348	36 258	157.9	67.1	97.6	413	1 686	433.0	245.4	308.2	2.25	4.65
6 100- 8 000 kr.	6 010- 8 000 kr.	14 327	45 014	203.6	222.3	214.2	99 882	309 783	200.6	217.5	210.1	2 352	8 812	272.4	276.3	274.7	2.35	2.84
8 100- 10 000 »	8 010- 10 000 »	8 099	20 747	156.0	156.3	156.2	72 778	185 530	155.0	154.9	154.9	1 857	6 090	232.9	224.7	227.9	2.55	3.2*
10 100- 12 000 »	10 010- 12 000 »	5 203	12 023	130.7	131.3	131.1	57 229	131 635	129.6	130.2	130.0	1 560	4 654	202.5	196.2	198.3	2.73	3.54
12 100- 15 000 »	12 010- 15 000 »	4 709	10 860	110.3	141.6	130.6	63 322	145 529	109.9	140.6	129.8	1 850	5 564	180.1	211.8	200.8	2.92	3.82
15 100- 20 000 »	15 010- 20 000 »	4 497	9 219	80.9	117.3	105.0	77 811	158 617	80.3	115.9	103.8	2 460	6 853	150.8	192.7	178.6	3.16	4.32
20 100- 25 000 »	20 010- 25 000 »	2 478	4 793	76.8	100.9	93.4	55 432	106 946	76.2	100.5	92.9	1 887	5 120	151.2	180.5	171.3	3.40	4.79
25 100- 30 000 »	25 010- 30 000 »	1 619	2 886	62.0	85.3	78.3	44 335	79 035	61.8	85.4	78.3	1 597	4 172	140.4	170.4	161.2	3.60	5.28
30 100- 40 000 »	30 010- 40 000 »	1 964	3 155	37.2	70.3	60.6	67 837	108 715	37.7	69.5	60.3	2 617	6 294	109.4	153.3	140.5	3.86	5.79
40 100- 50 000 »	40 010- 50 000 »	1 100	1 774	60.3	61.6	61.3	49 279	79 173	60.4	60.8	60.7	2 035	5 001	148.6	144.9	145.7	4.13	6.32
50 100-100 000 »	50 010-100 000 »	2 028	2 854	36.4	42.1	40.7	139 404	195 872	35.2	42.2	40.5	6 380	14 799	123.9	134.5	132.0	4.58	7.56
Över 100 000 »	Över 100 000 »	1 525	1 756	27.2	11.5	15.1	383 644	419 813	30.4	3.4	9.4	19 182	53 518	236.4	162.6	179.0	5.00	12.75
Summa		1 022 906	1 830 653	94.1	59.1	79.0	2 560 149	5 704 408	146.8	104.4	122.8	57 950	163 675	193.3	176.9	182.4	2.26	2.87

ANDRA SKATTEKYLIDIGA ÄN INL. AKTIEBOLAG O. SOLIDARISKA BANKBOLAG. 21*

Tax statistics data: Example

- Note: Historical data mostly tabulated distributions!
- We can (after adjustments) construct tables like the following:

L Bound (SEK)	No. of income earners	Sum of Incomes (SEK)	Share of reference total population	Share of reference total income
0	328 992	847 671 193	11.935%	48.025%
600	327 737	847 371 859	11.889%	48.008%
1000	310 499	834 994 327	11.264%	47.306%
...
80000	429	67 127 825	0.016%	3.803%
100000	296	55 242 145	0.011%	3.130%
145600	141	37 009 694	0.005%	2.097%

Reference totals 1907: **2 756 634** **1 765 080 057**

- How can we get precisely estimated top shares from this?

Computing top fractile shares: Pareto interpolation

We assert that the top of the distribution is Pareto distributed

- Choose income bracket threshold s s.t. fraction p of tax units above are as close as possible to fractile.
 - β is the ratio of average income of tax returns $> s$ to s
 - Pareto's alpha is $\alpha = \beta / (\beta - 1)$ and $k = sp^{(1/\alpha)}$
 - Pareto's law: top incomes distributed according to a distribution function $F(y)$ for income y :

$$1 - F(y) = ky^{-\alpha}$$

- This allows us to compute exact top shares for specific fractiles p
- Alternatively: Mean-split histograms

Drawbacks of using top income data

- Income concepts are defined by tax law - not us
- Shifts in income and tax unit definitions
- Data are aggregated/tabulated, not individual
- Missing data points and sometimes disparate sources
- Tax avoidance and evasion
 - Mainly a problem if this shifts systematically over time, which is not obvious
 - Interjurisdictional capital movements may incur problem, but they hardly interfere with long run trends

World top income dataset (WTID)

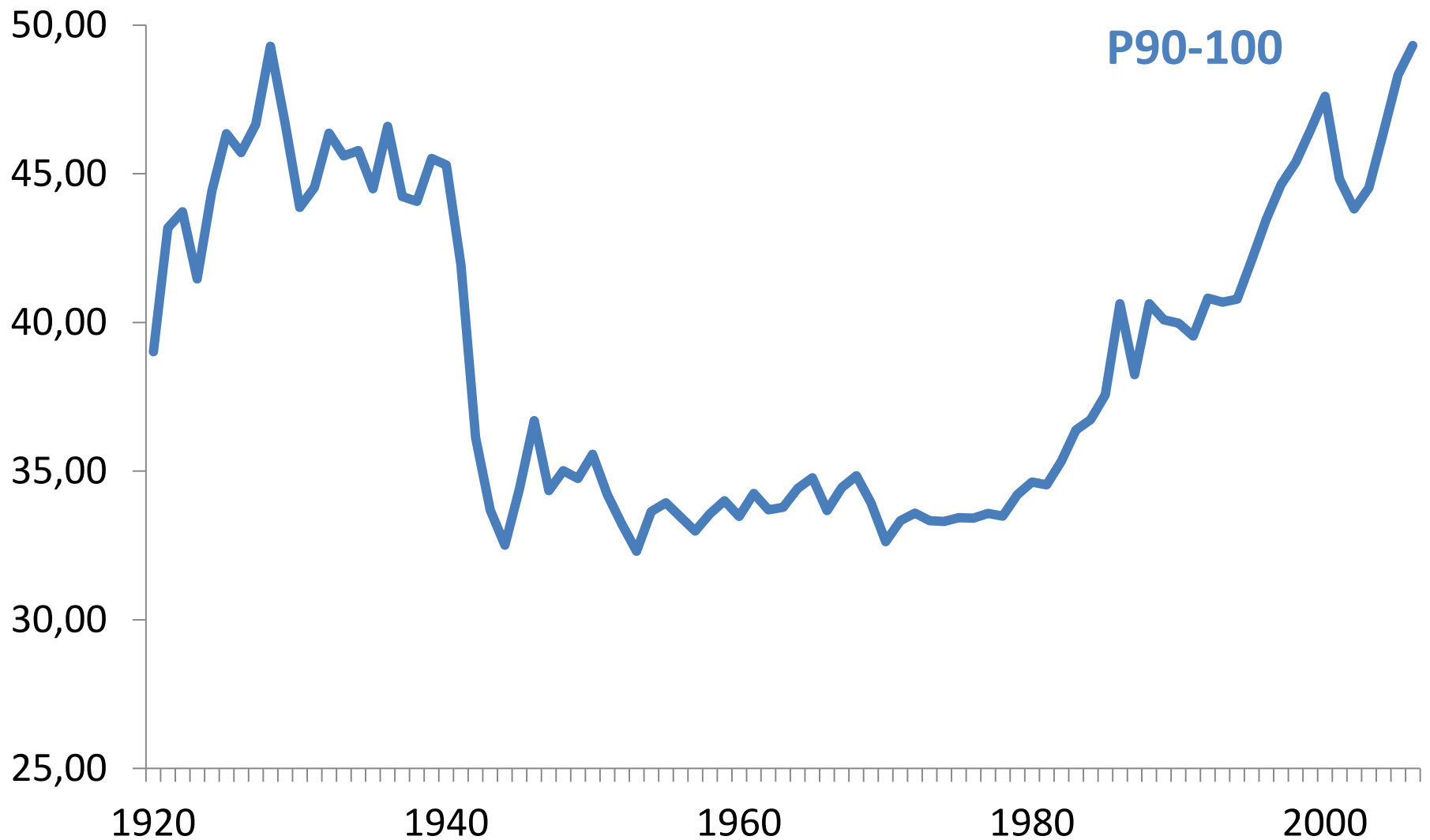
- Data for 26 countries – and counting
 - Europe: CHE, DEN, FIN (*some new 19th C evidence!*), FRA, GBR, GER, IRL, ITA, NET, NOR, POR, SPA, SWE
 - Americas: ARG, CAN, COL, USA
 - Soon: BRA, CHI
 - Asia-Australia: AUS, CHI, IND, INO, JAP, NZL, SIN
 - Africa: MAU, RSA, TAN
 - Soon: 12 former British colonies
- Most countries span decades, often from WWI, some even earlier
- Most series have annual frequency
- WTID: World top income database:
 - www.topincomes.g-mond.parisschoolofeconomics.eu

Evidence: Income inequality

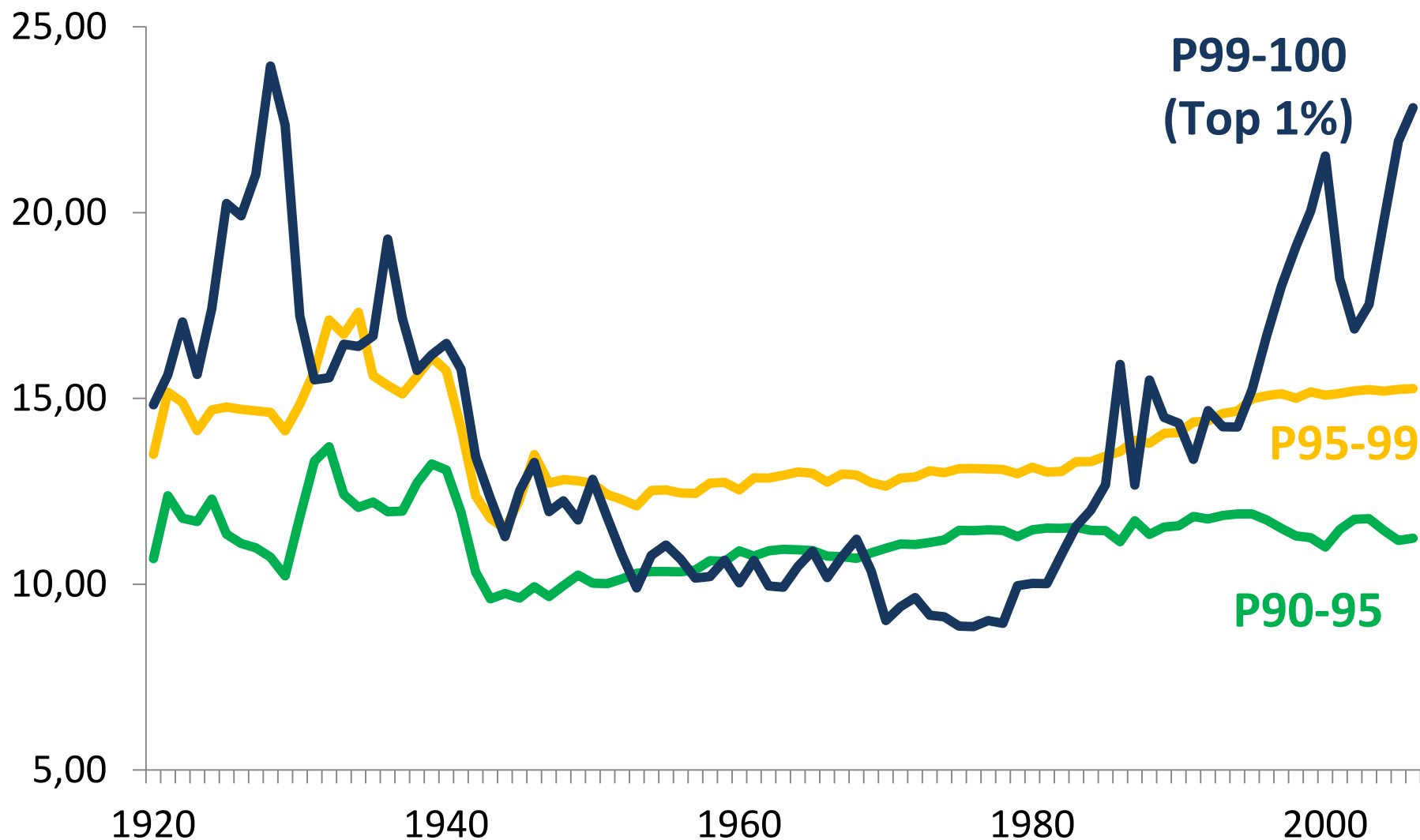
We present evidence as follows:

- Globally and across geographical country groups
- Splitting up the top decile (differences within the top)
- Composition across sources of income
- The role of realized capital gains

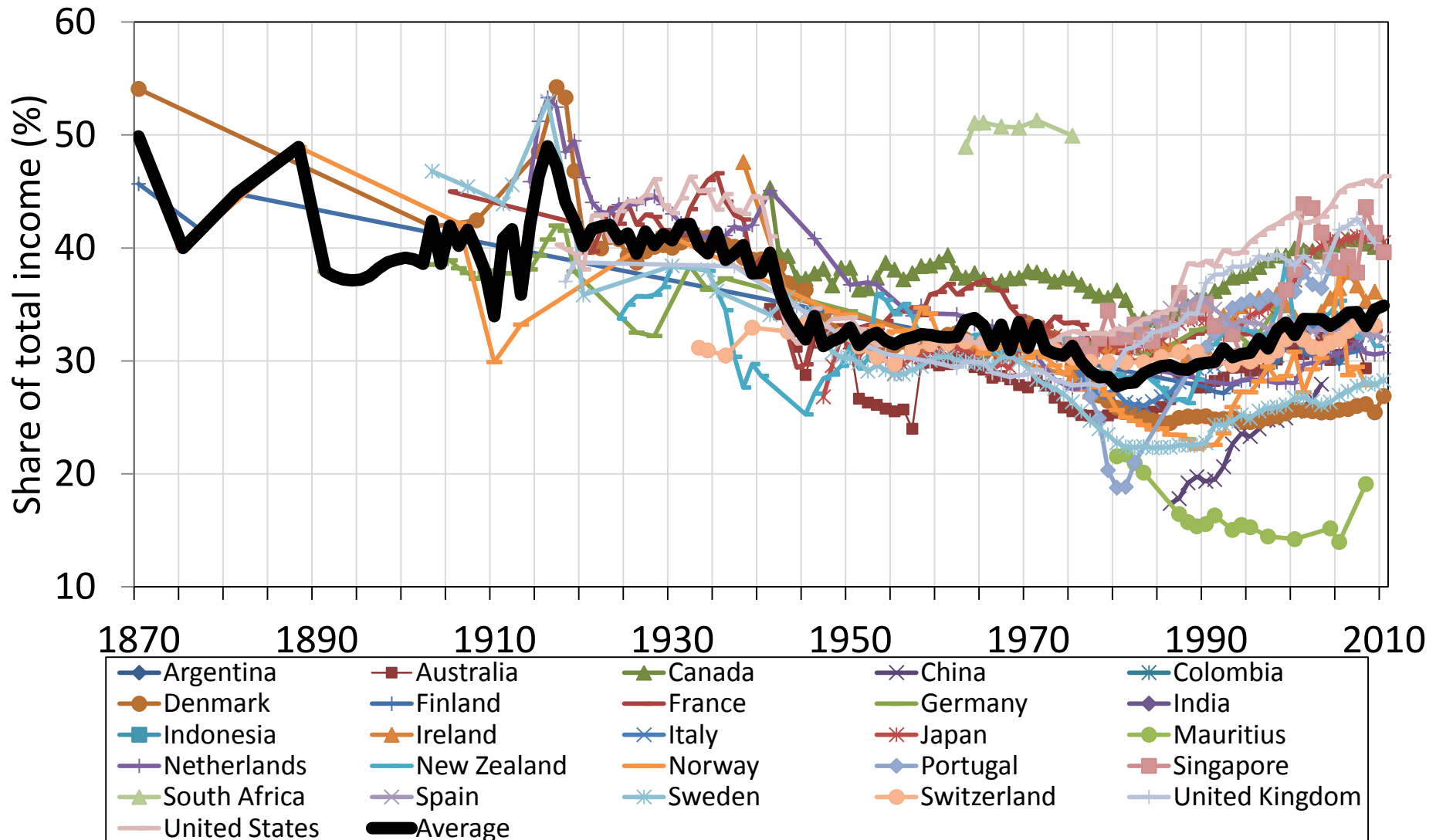
Top income decile: US, 1920-2006



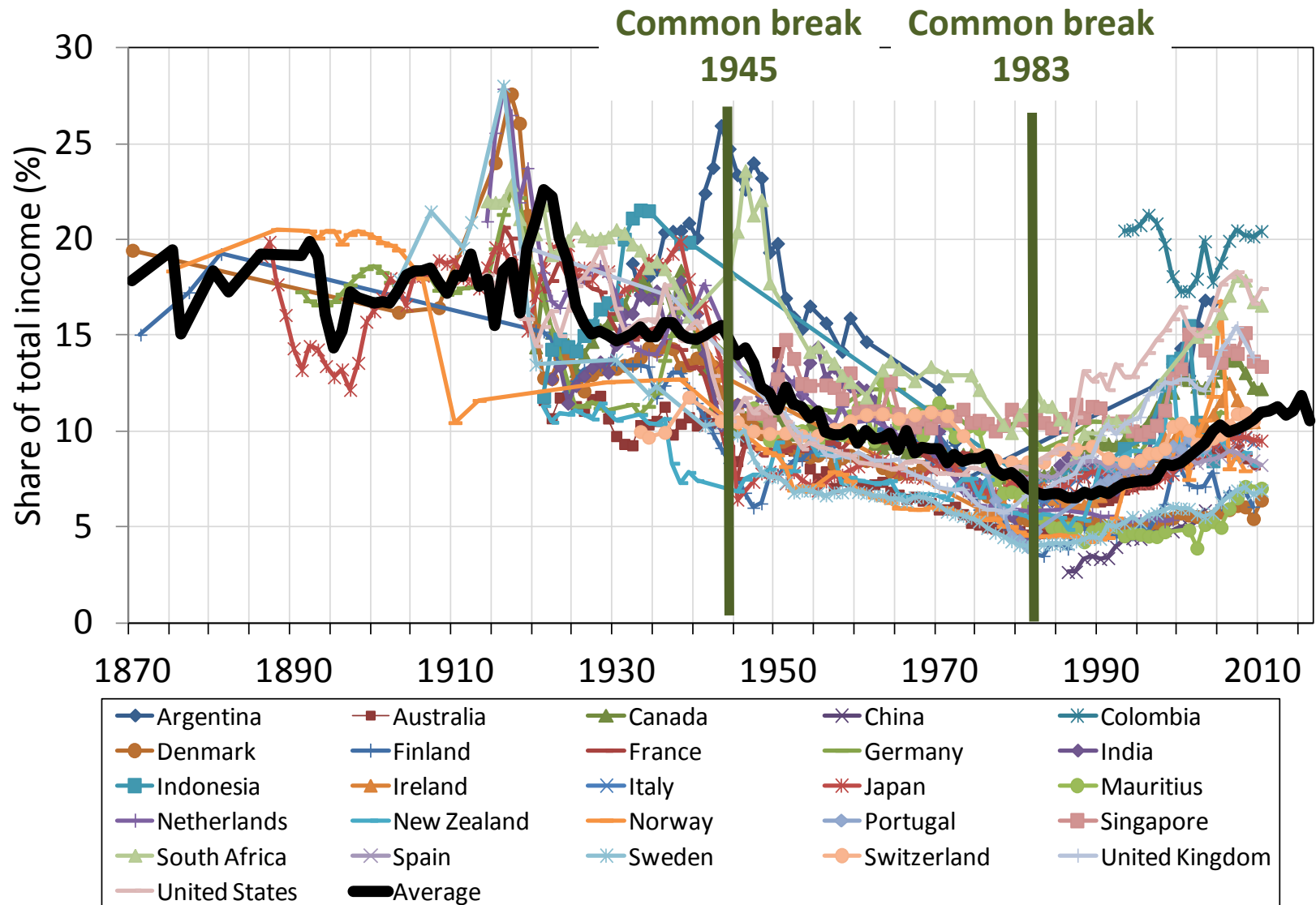
Differences within the top: Splitting up the top decile



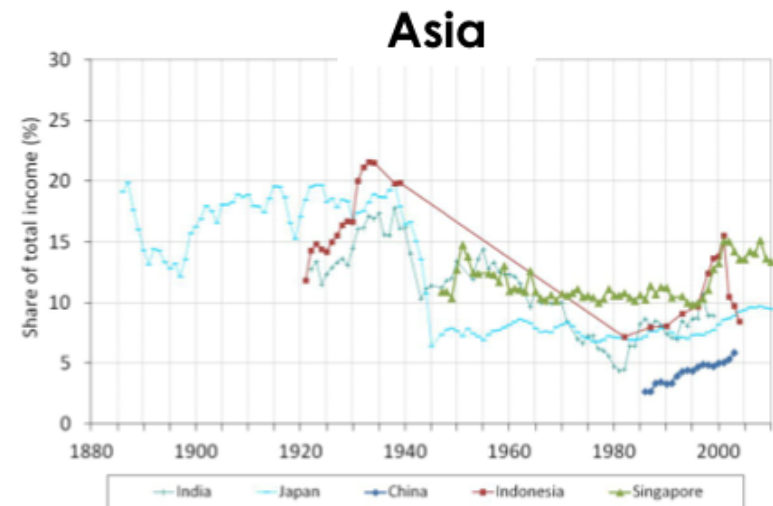
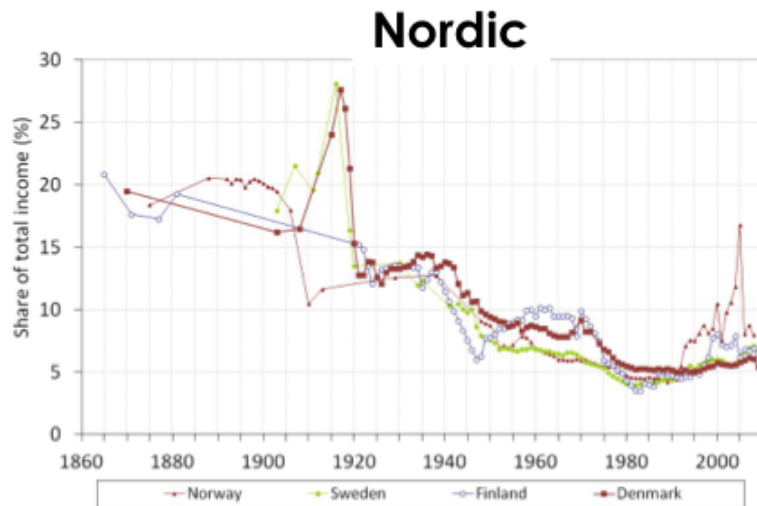
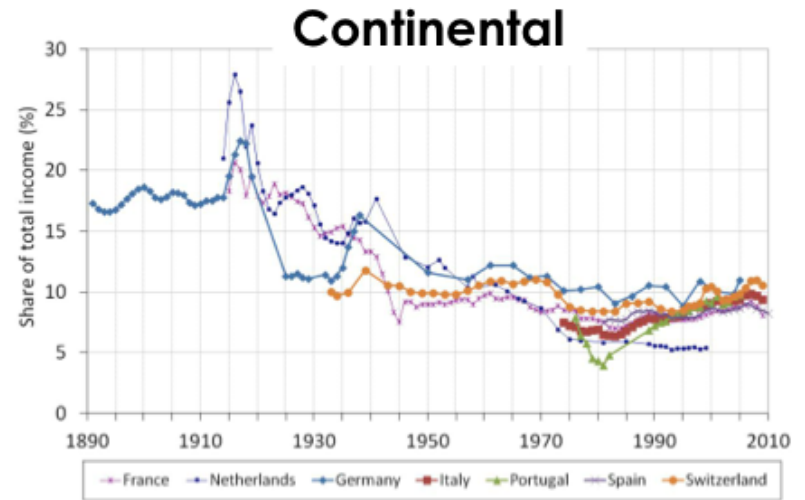
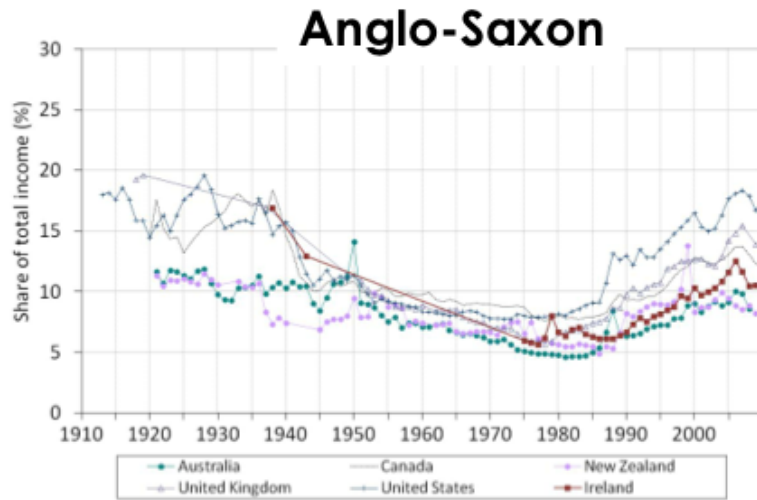
Income inequality from industrialization to today (Top 10% income share, 26 countries)



Income inequality trends: Top 1% income share

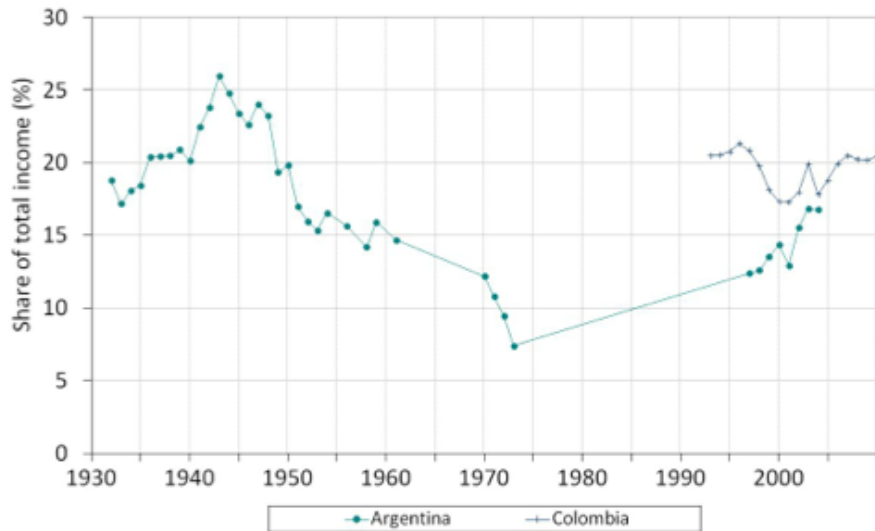


Trends in top 1% income shares across countries

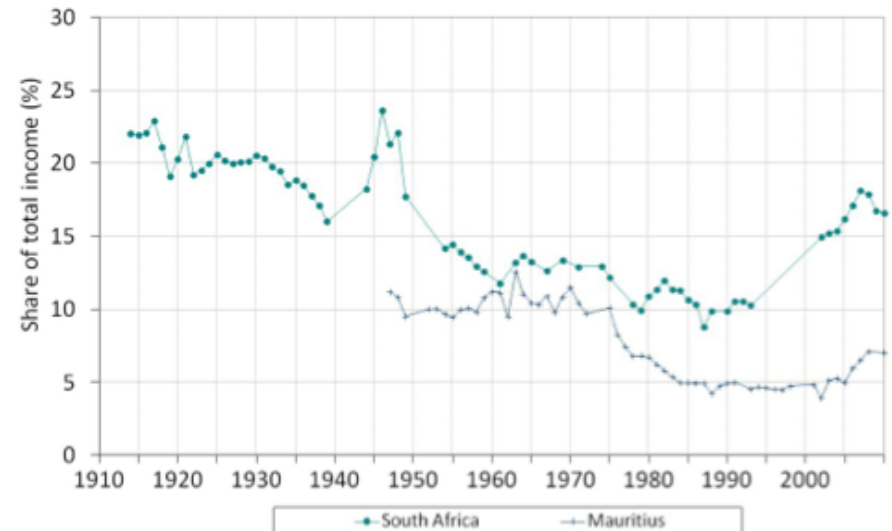


Trends in top 1% income shares across countries

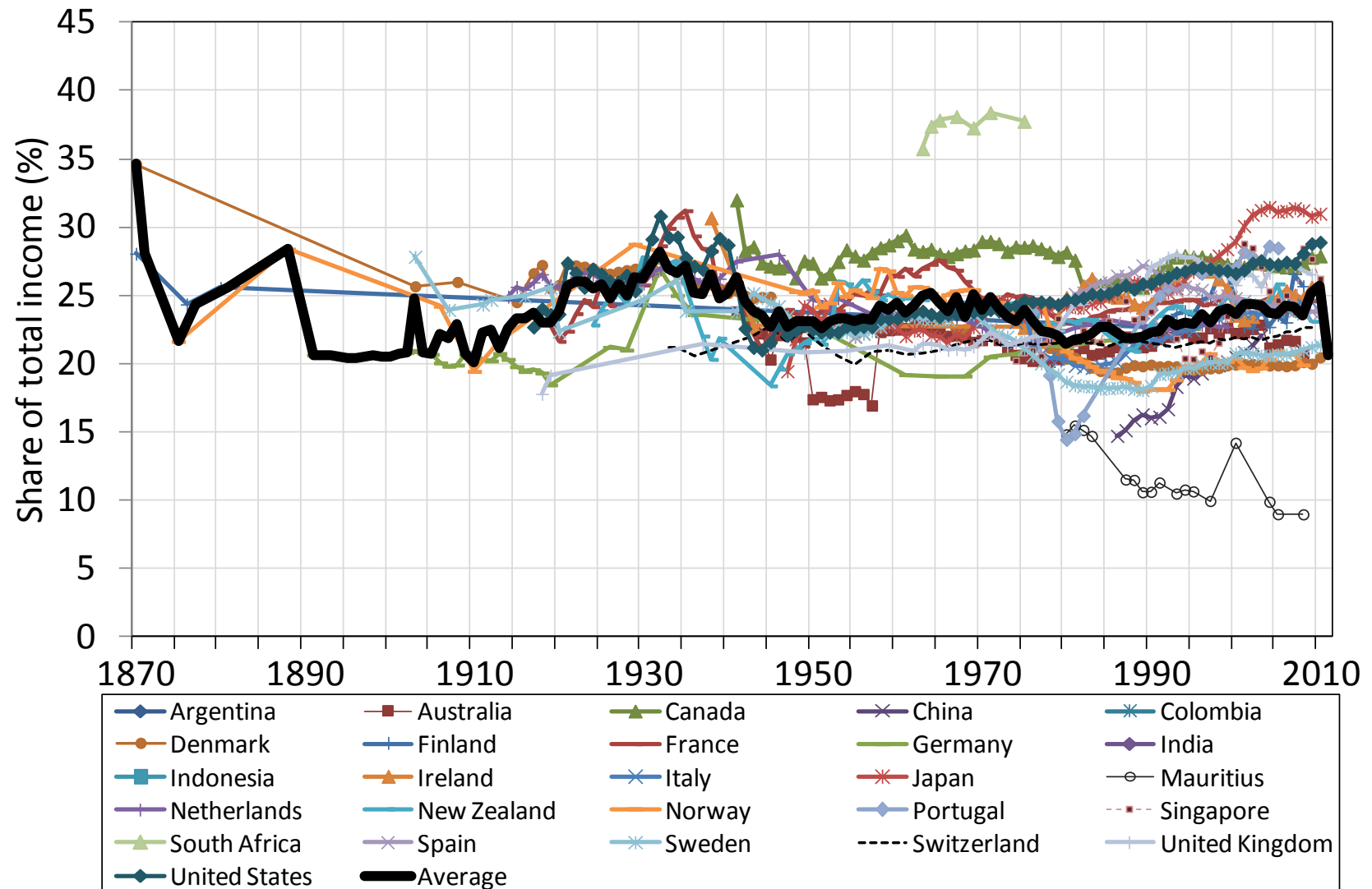
"Latin America"



"Africa"

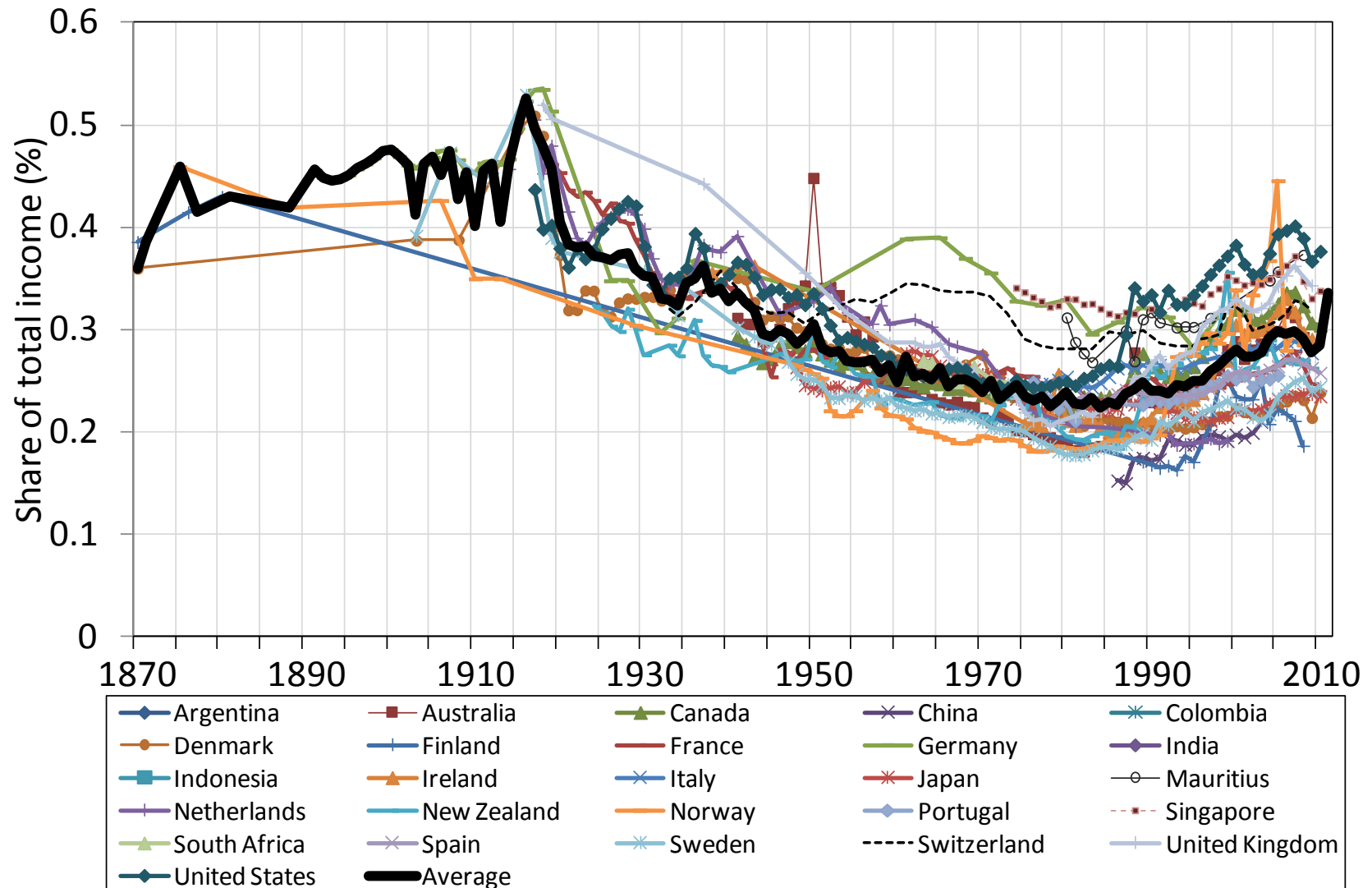


P90-99 (The "upper middle class"): No trend!



Robustness/inequality within the top

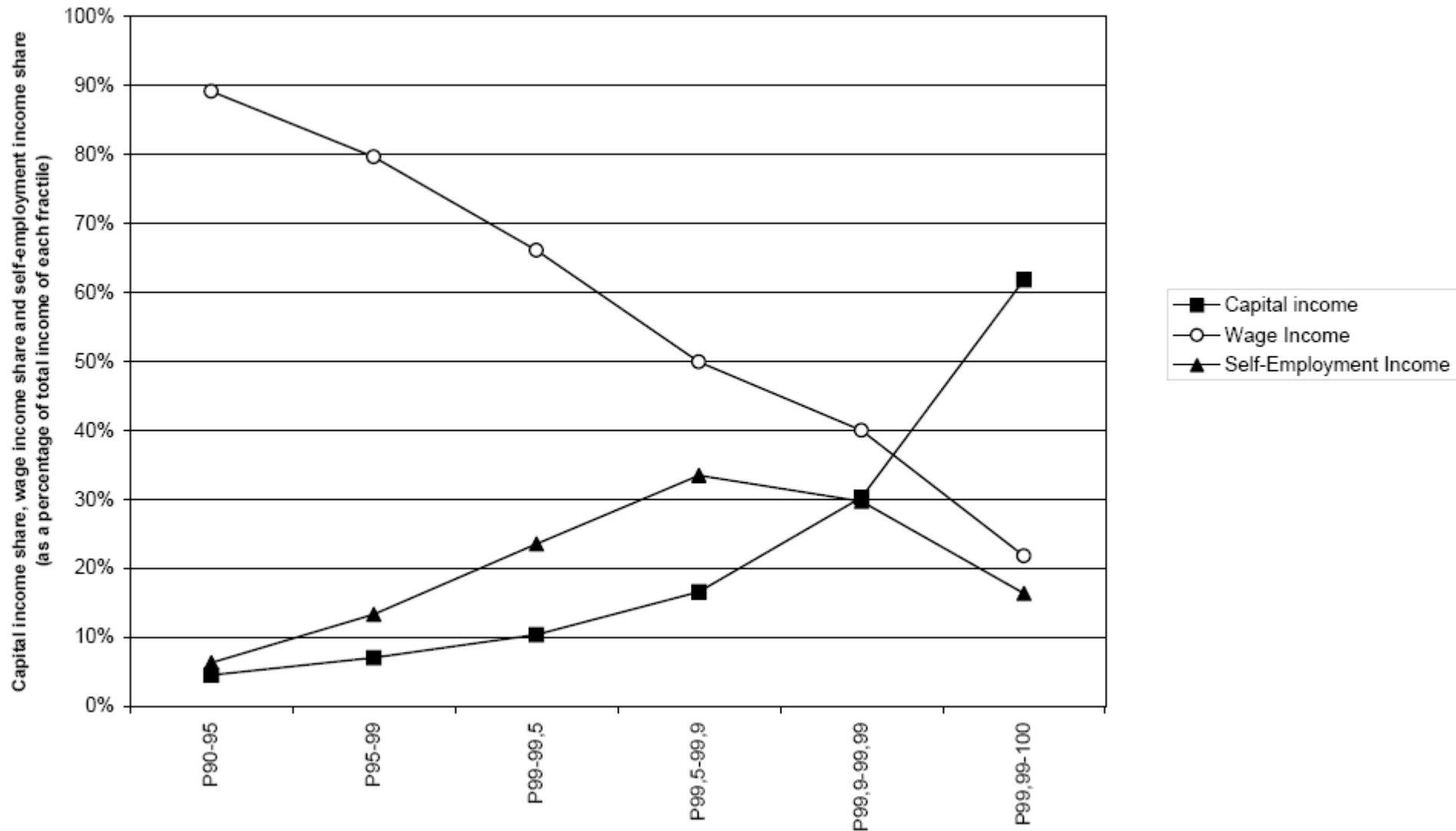
Shares-within-shares (Share T1% / Share T10%)



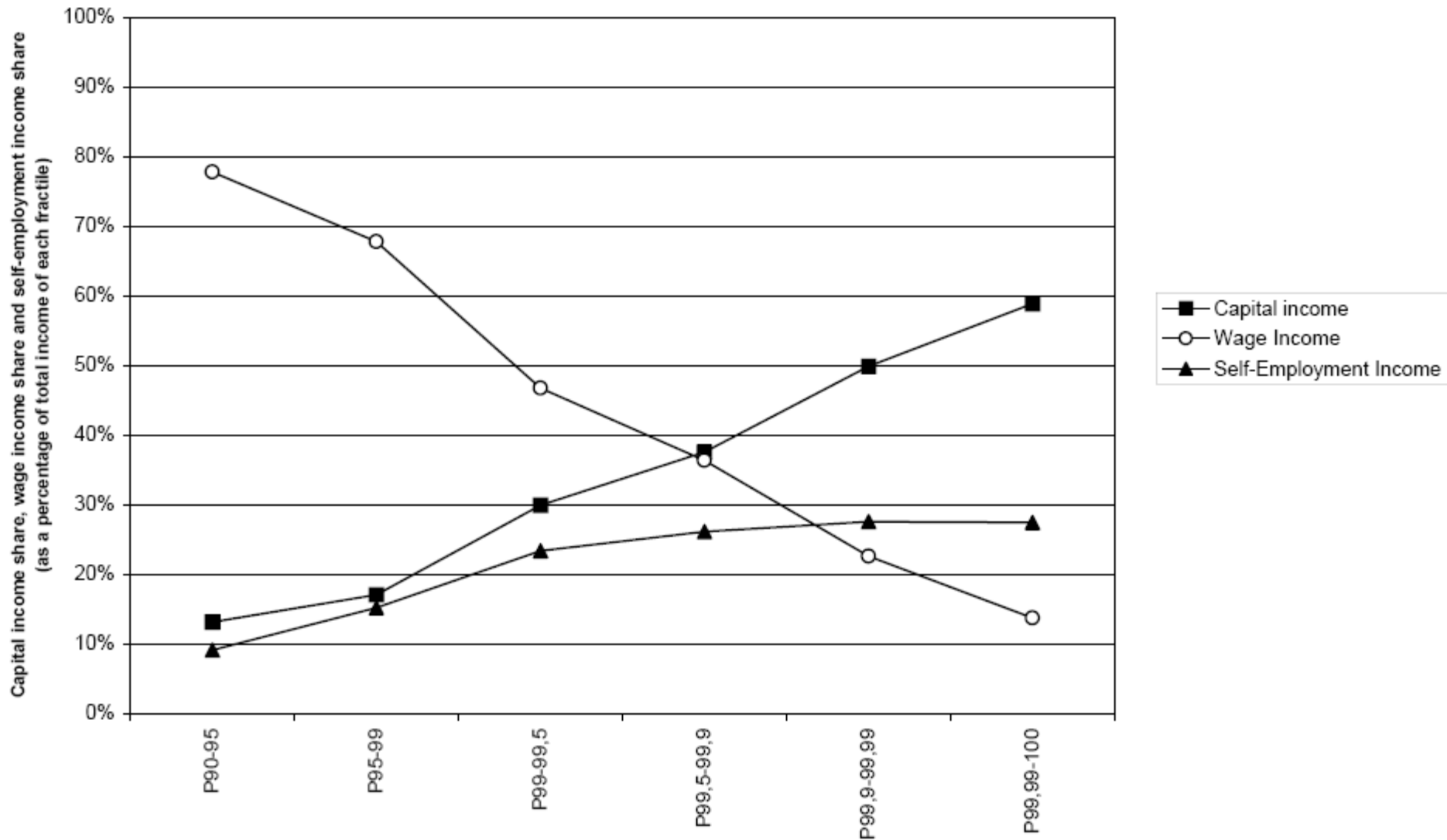
Decomposing income: Labor, Business, Capital

- Aggregate today (typical):
 - Labor income: 90%
 - Self-employment: 5%
 - Capital: 5%
- But what about composition across the distribution?
- And has this changed over time?

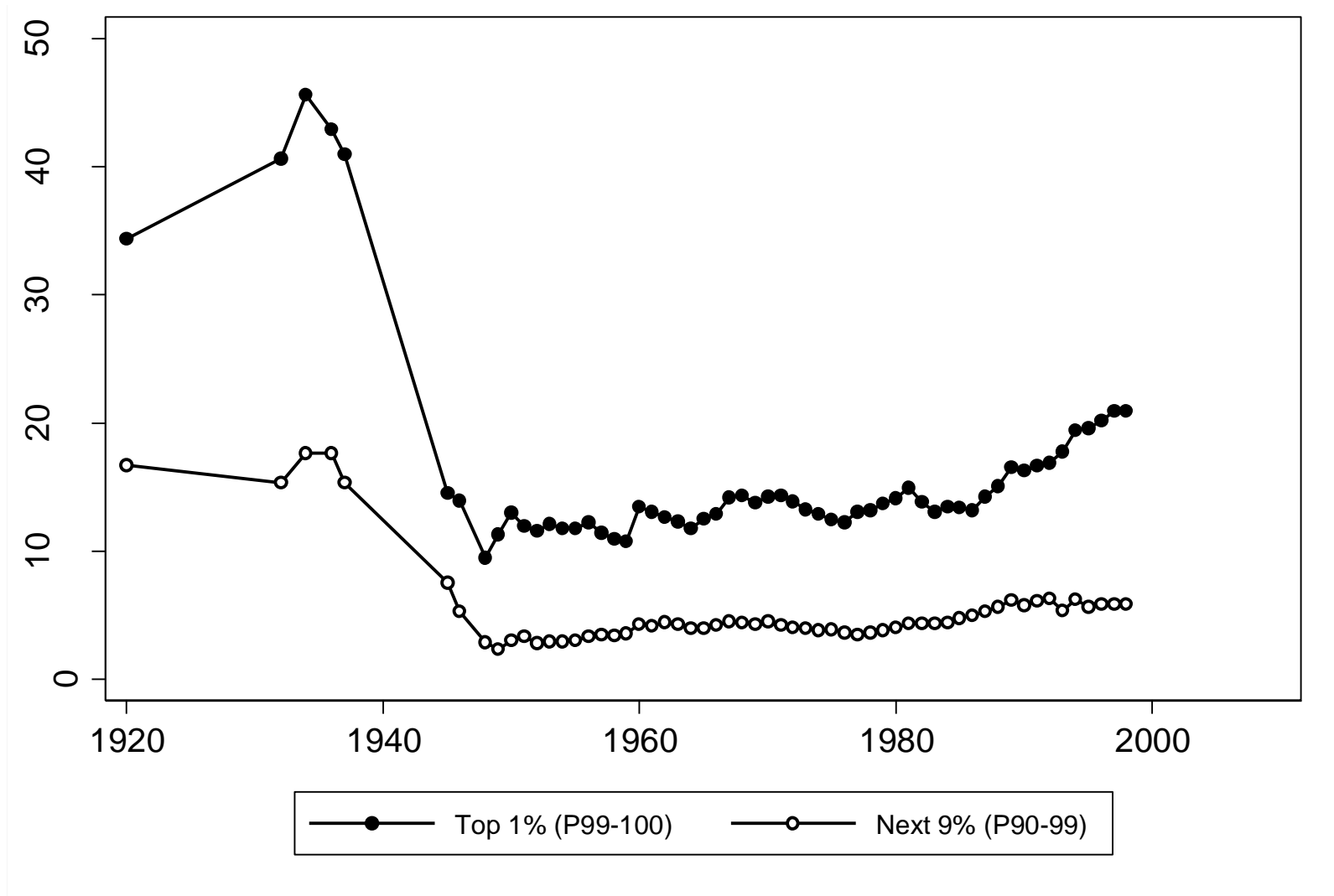
Composition within the top: France 1998



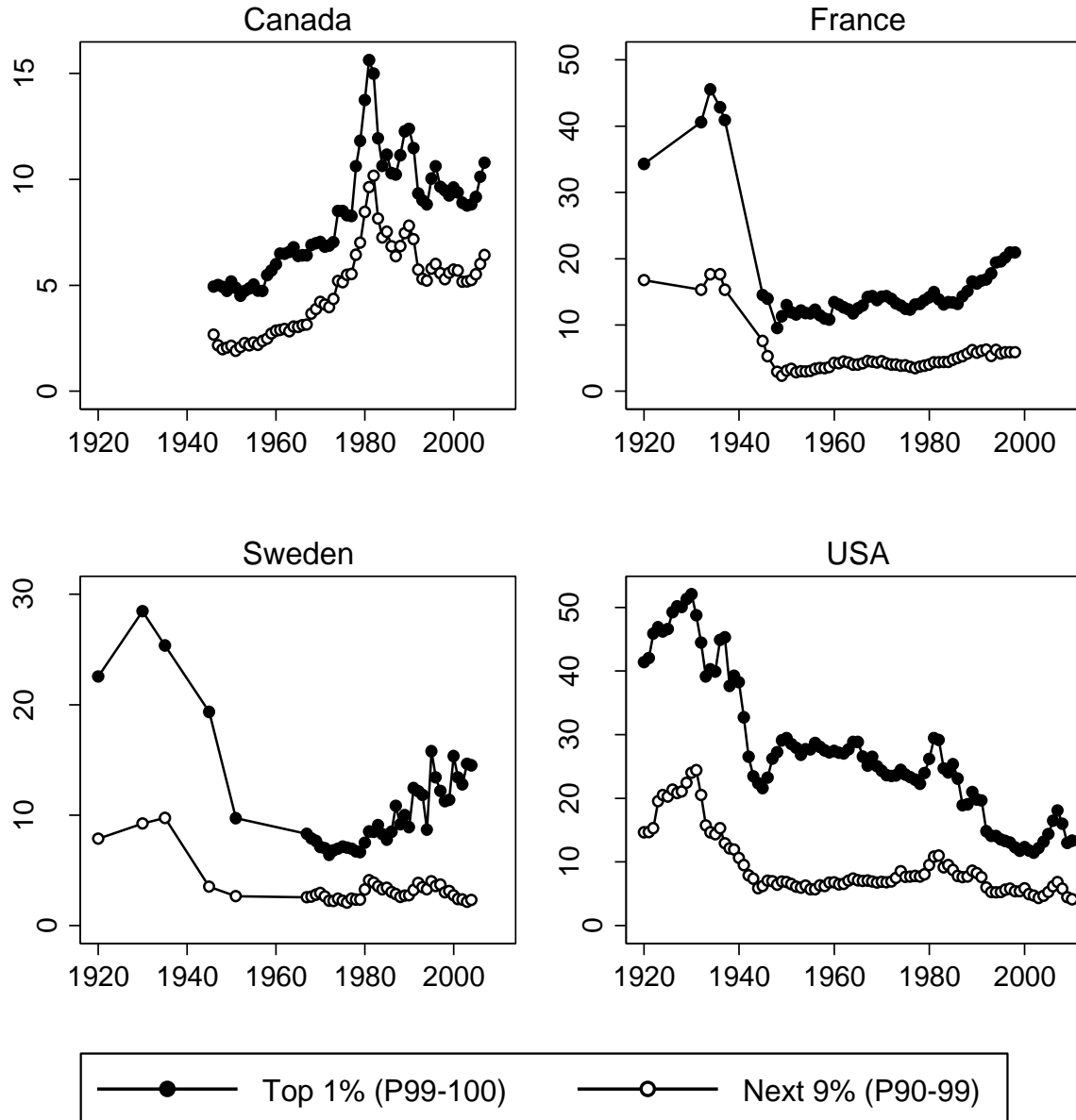
Composition within the top: France 1932



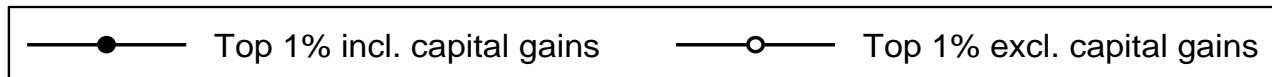
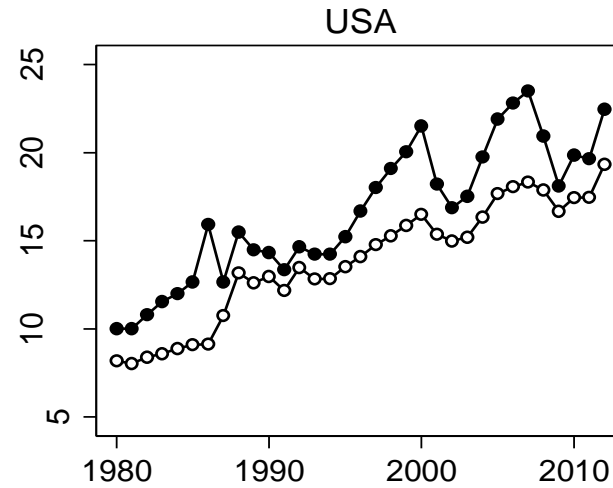
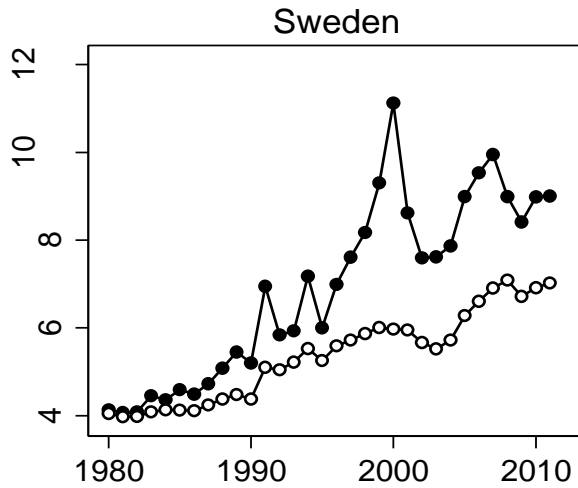
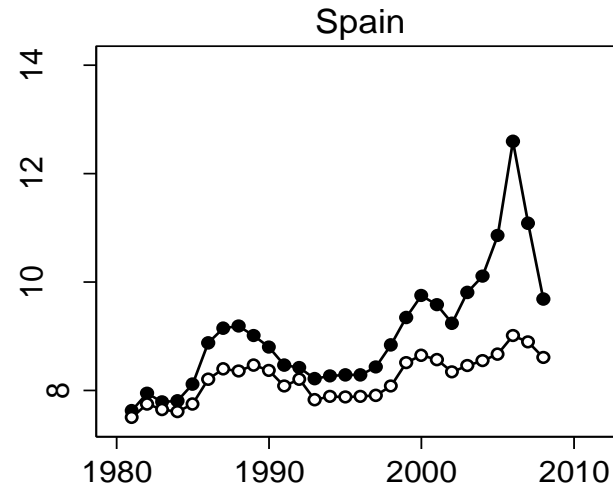
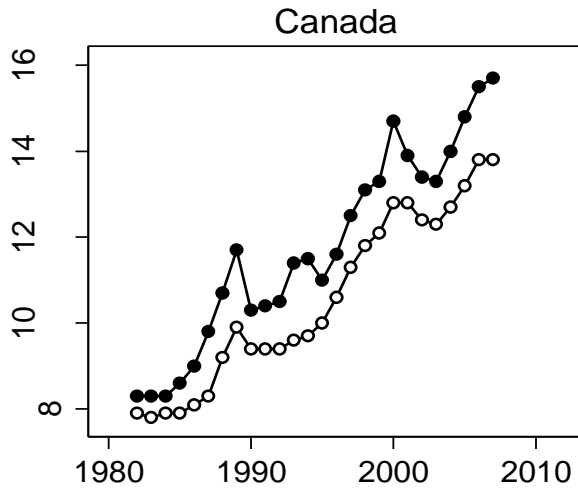
Evolution of the capital income share: France 20th C



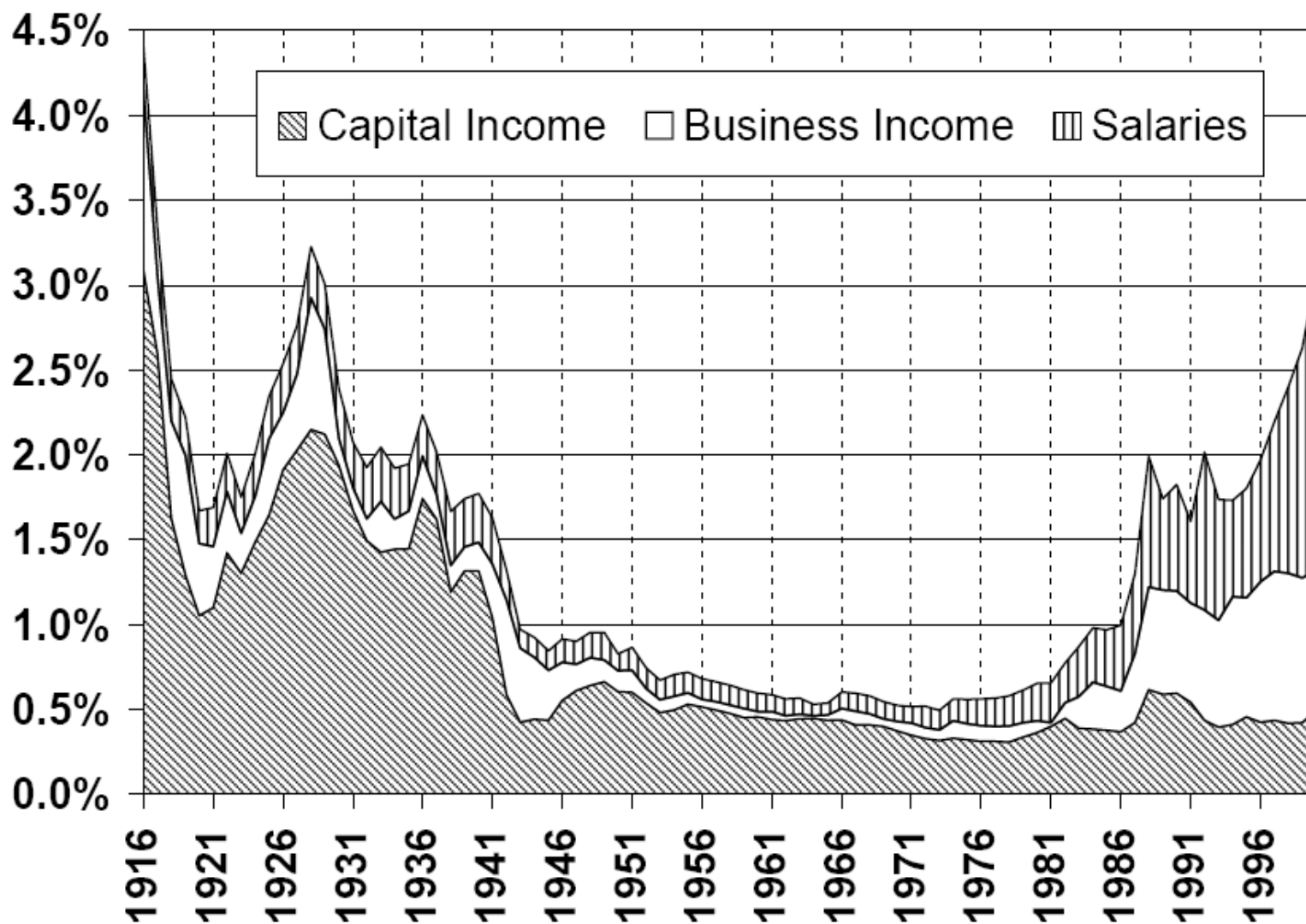
Trend in capital income share, four countries



Role of realized capital gains (1980-)



Composition of US Top 0.01%: From capital to earnings



Summarizing trends

- Top income share trends
 - High level in late 19th century
 - Great inequality reversal during 20th century up until 1980
 - After 1980, trends differ across countries
 - Anglo-Saxon countries increasing top shares
 - Continental European countries no increase
 - Nordic countries in between
 - Asia mixed
- Intermediate top ("upper middle class"): No trend at all
- Capital income share important driver
 - Shocks to private wealth central to change in income distribution

Are top income shares a good proxy for overall income inequality?

- Theoretical and empirical answers (Atkinson, 2007; Leigh, 2007)
- For starters, top income shares possess many fine properties:
 - Anonymity, scale independence, population principle.
 - Not transfer principle.
- Mechanical relation between top income share and Gini
 - Let S be income share of infinitesimal top group and G' the Gini in the population except the top group. Then we can approximate:

$$G = S + (1 - S)G'$$

- Ex: US top income share rose 14 pp in 1976-2006. Atkinson shows that if $G = 0.4$ and top income share increases

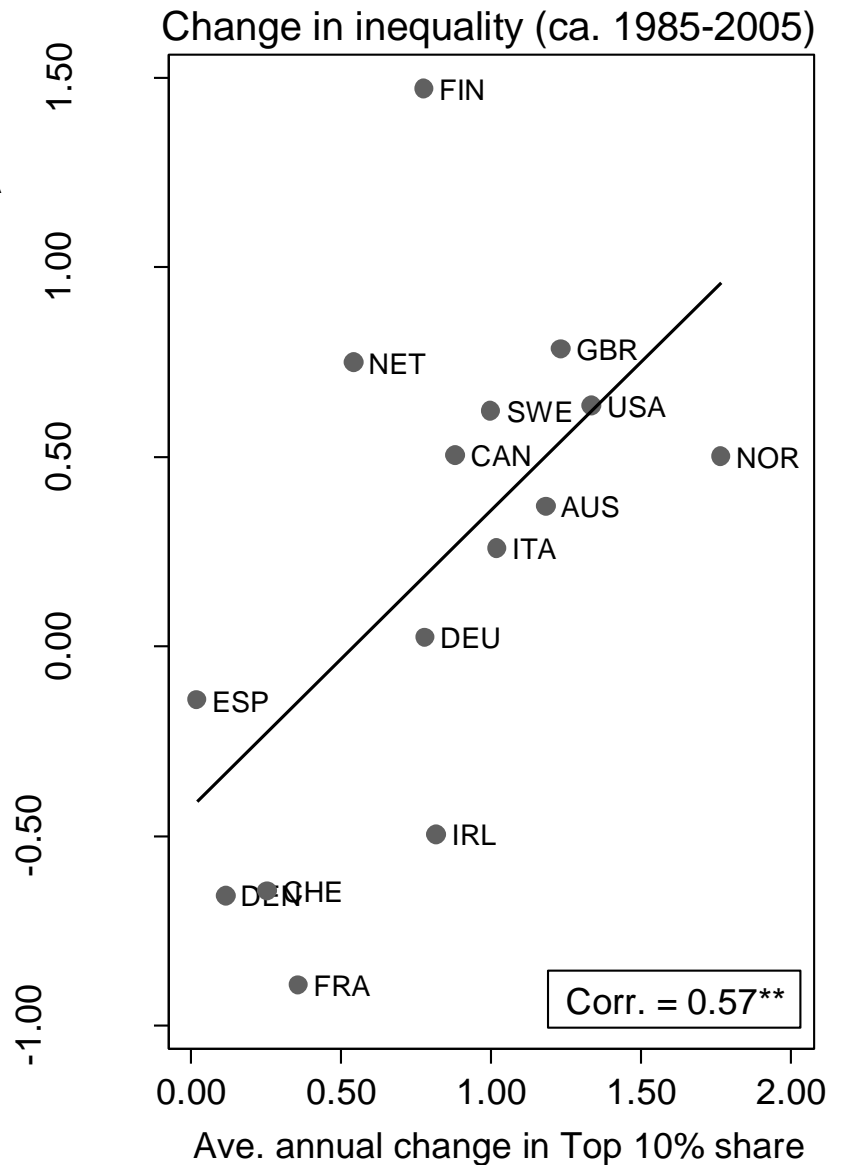
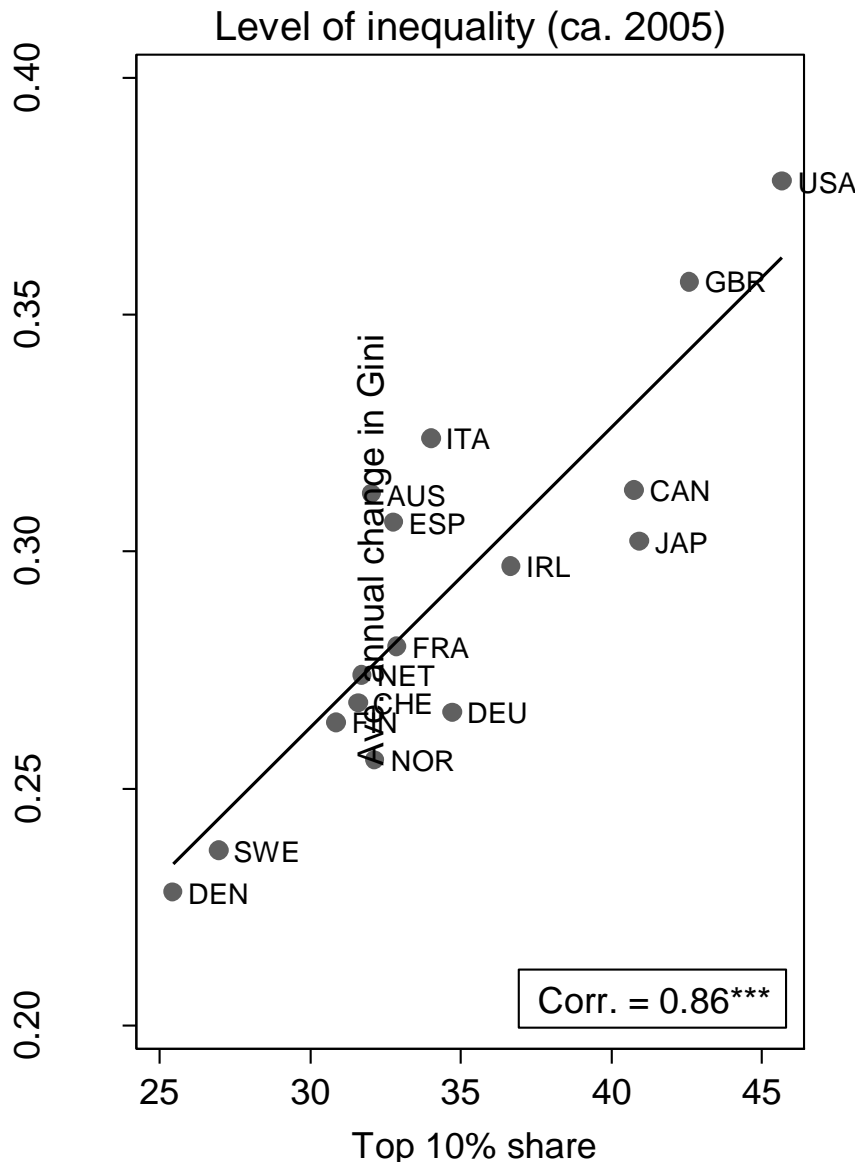
Empirical relation: Regression analysis

- $$\ln(S_{it}) = b_0 + b_1 \ln(\text{Ineq measure})_{it} + \lambda_i + \mu_t + \varepsilon_{it}$$

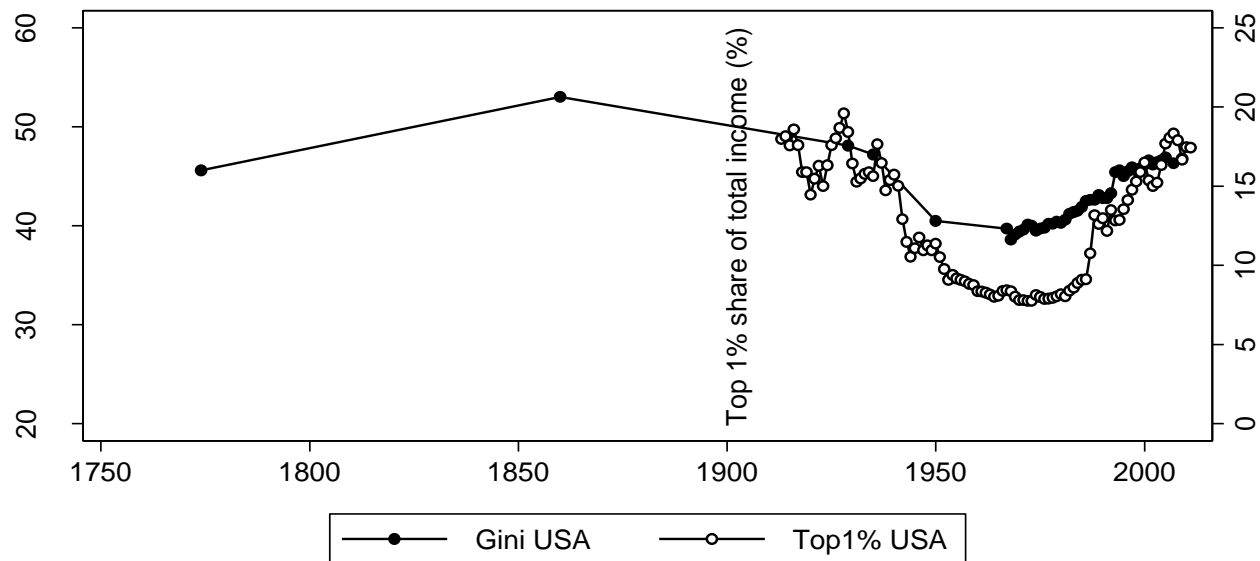
VARIABLES	Top 10% share and WIID			Top 1% share and WIID		
	gini_wiid	gini_wiid C FE	gini_wiid C&Y FE	gini_wiid	gini_wiid C FE	gini_wiid C&Y FE
gini_wiid	0.231*** (0.036)	0.170*** (0.03)	0.141*** (0.028)	0.783*** (0.065)	0.455*** (0.075)	0.266*** (0.062)
Observations	453	453	453	497	497	497
R-squared	0.077	0.779	0.88	0.239	0.678	0.857

Top 1% share and LIS Inequality measures						
VARIABLES	Gini	Gini FE	Gini C&Y FE	P90/P10	P90/10 + FE	P90/10+ C&Y FE
Gini level	1.315*** (0.161)					
Gini + FE		1.326*** (0.43)				
Gini + FE + YE			0.804*** (0.287)			
P90/10				1.028*** (0.218)		
P90/10 + FE					0.457 (0.31)	
P90/10 + FE+YE						0.828** (0.39)
Observations	112	112	112	112	112	112
R-squared	0.518	0.952	0.403	0.343	0.736	0.949

Gini and top income shares: Recent trends/levels

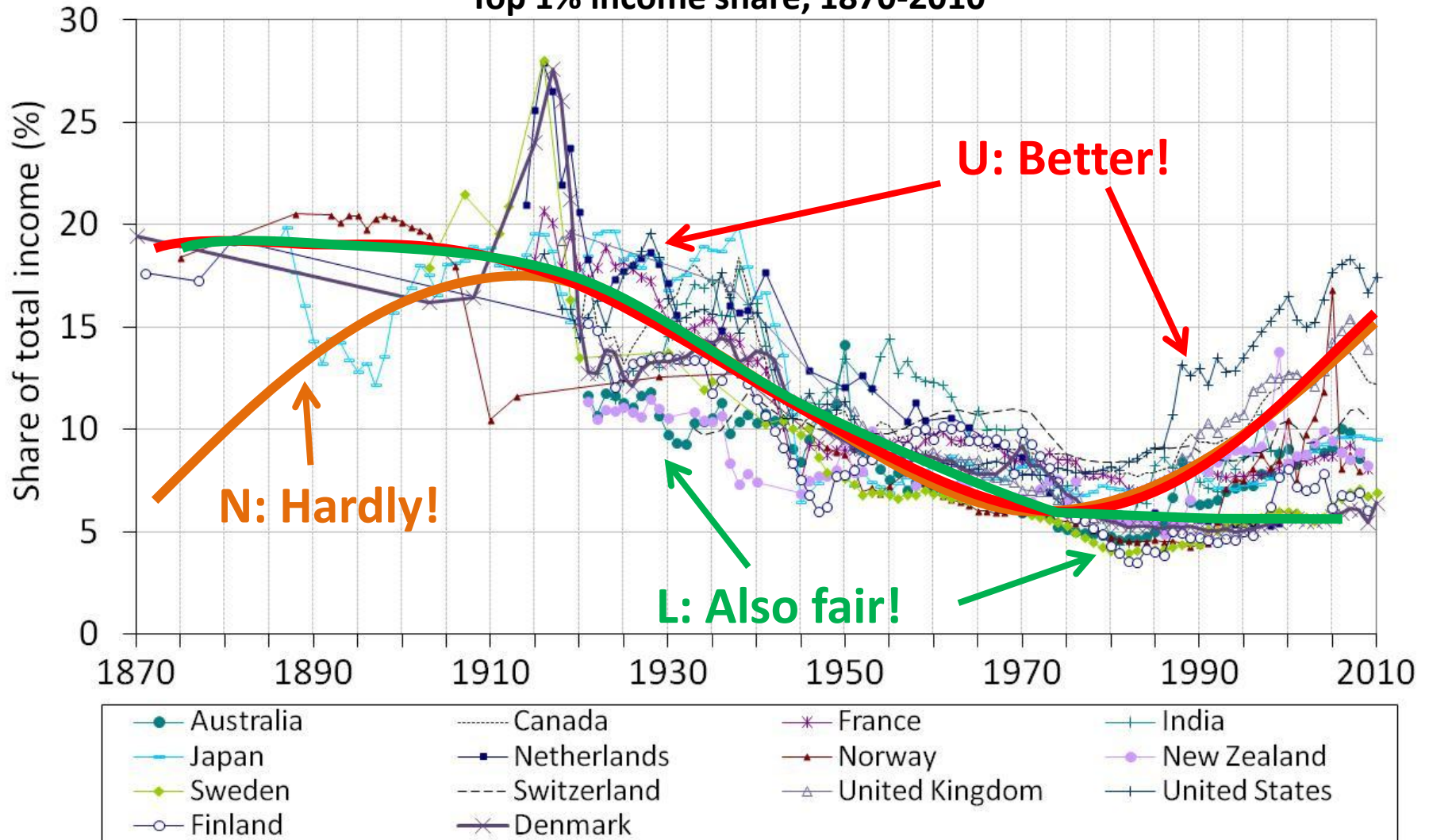


Gini and top income shares: Long-run trends

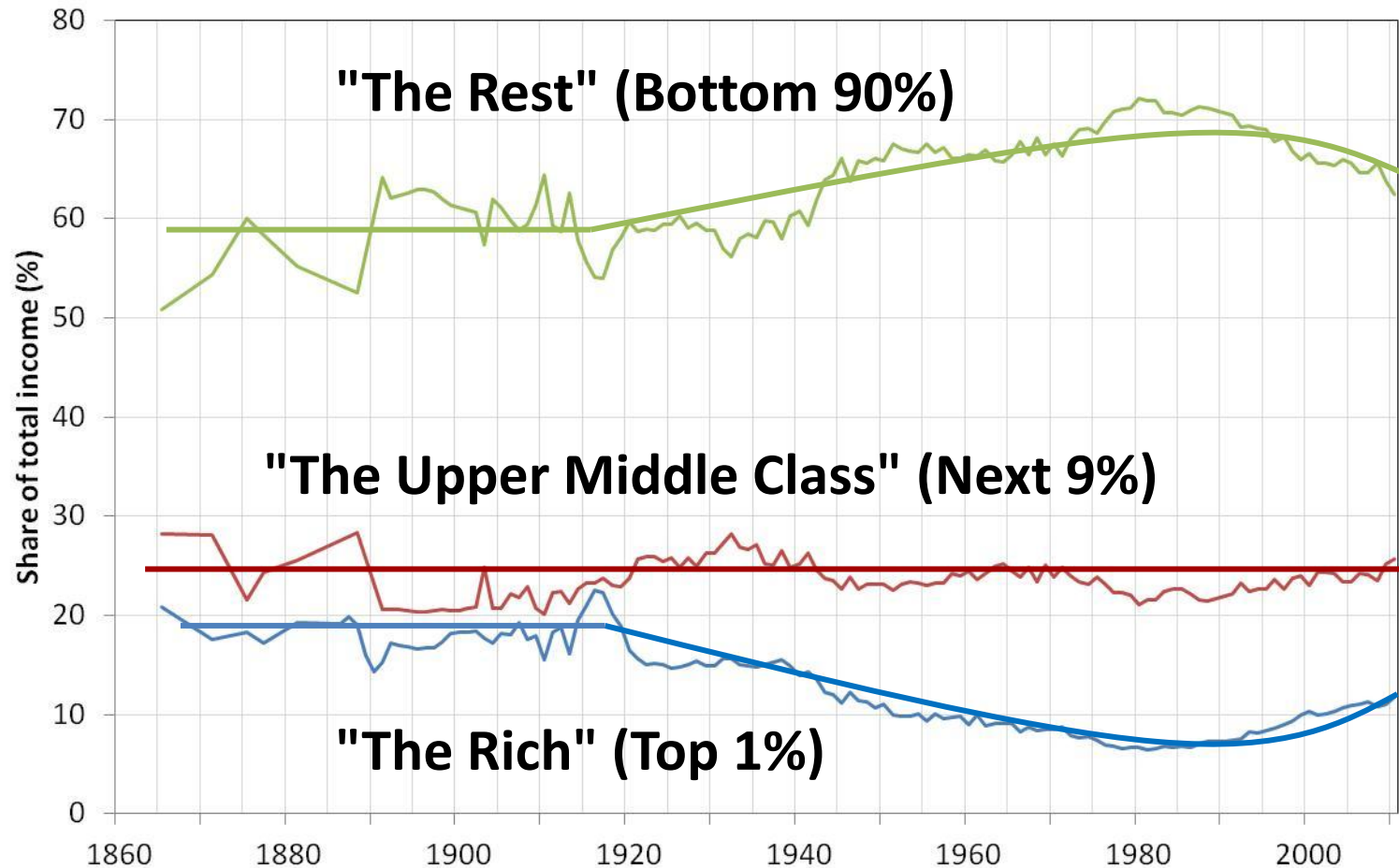


N, U or L?

Top 1% income share, 1870-2010



Long run trends over the whole income distribution (unweighted averages)



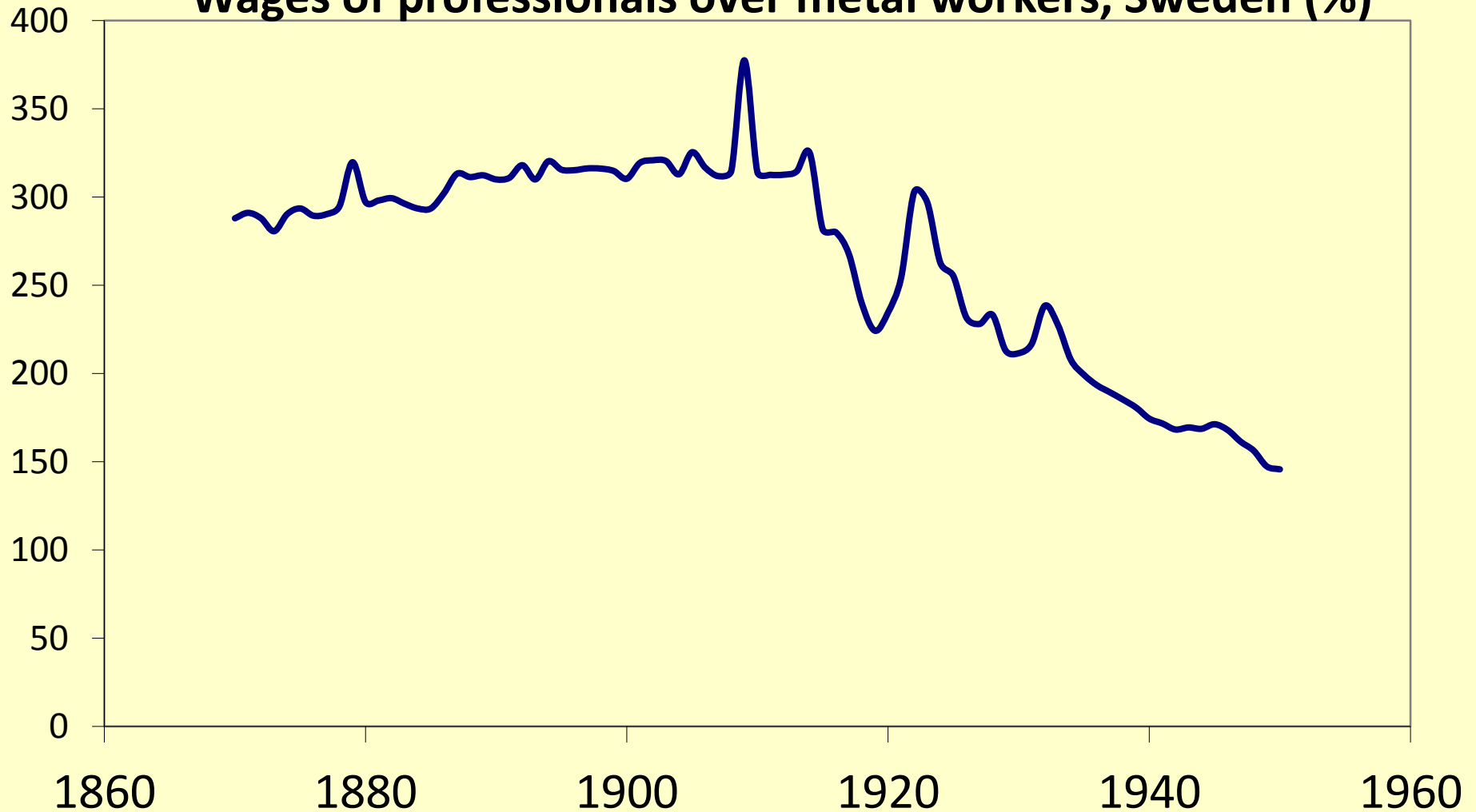
Other outcomes than income inequality?

- Wealth concentration (next section)
- Wage dispersion
 - Skill premium (w_S/w_U)
 - Urban-rural wage premium (w_U/w_R)
- Relative factor prices (w/r)
- Life expectancy (health)

Trend in skill premium (w_S/w_{US})

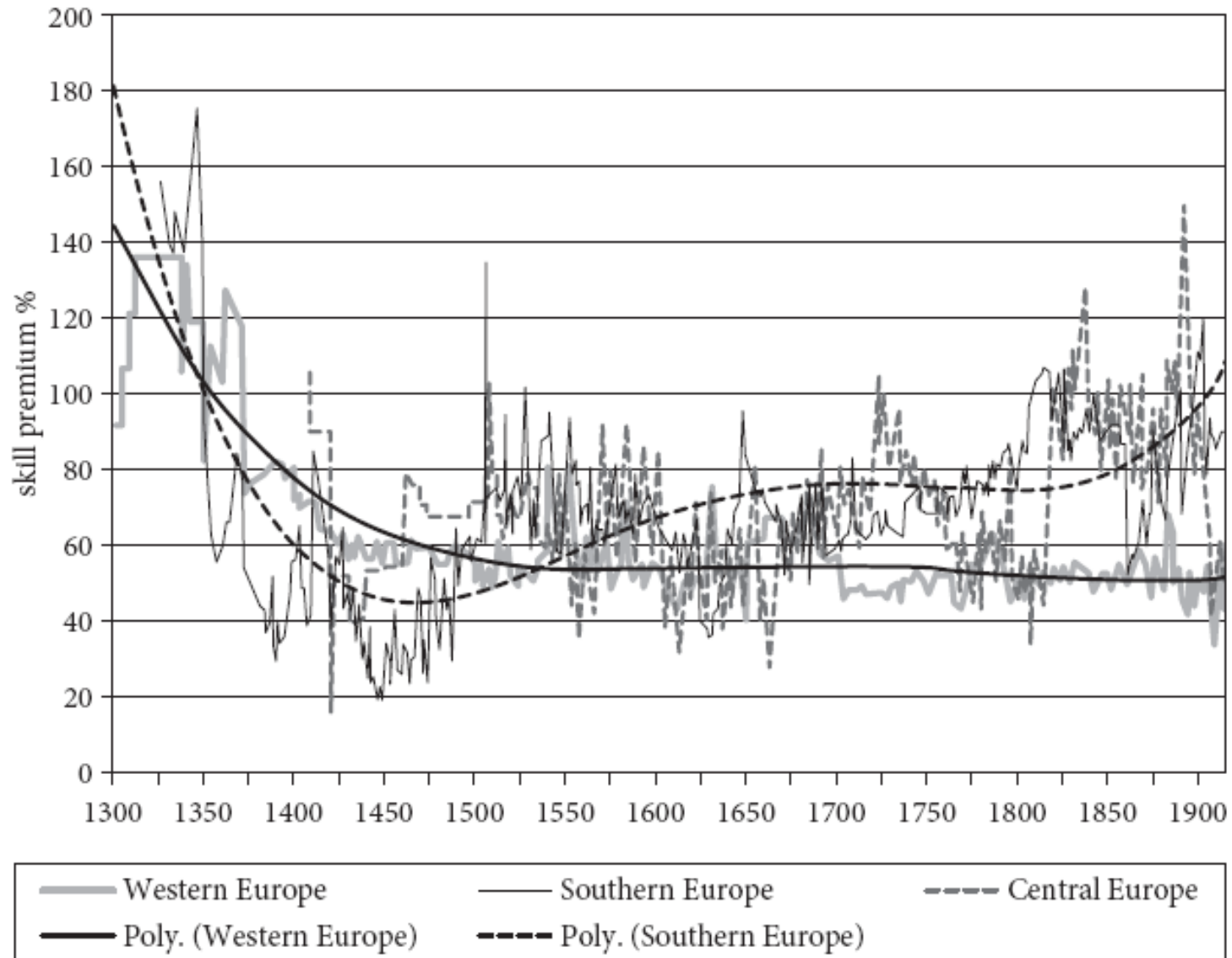
(Jungenfeldt, 1960)

Wages of professionals over metal workers, Sweden (%)



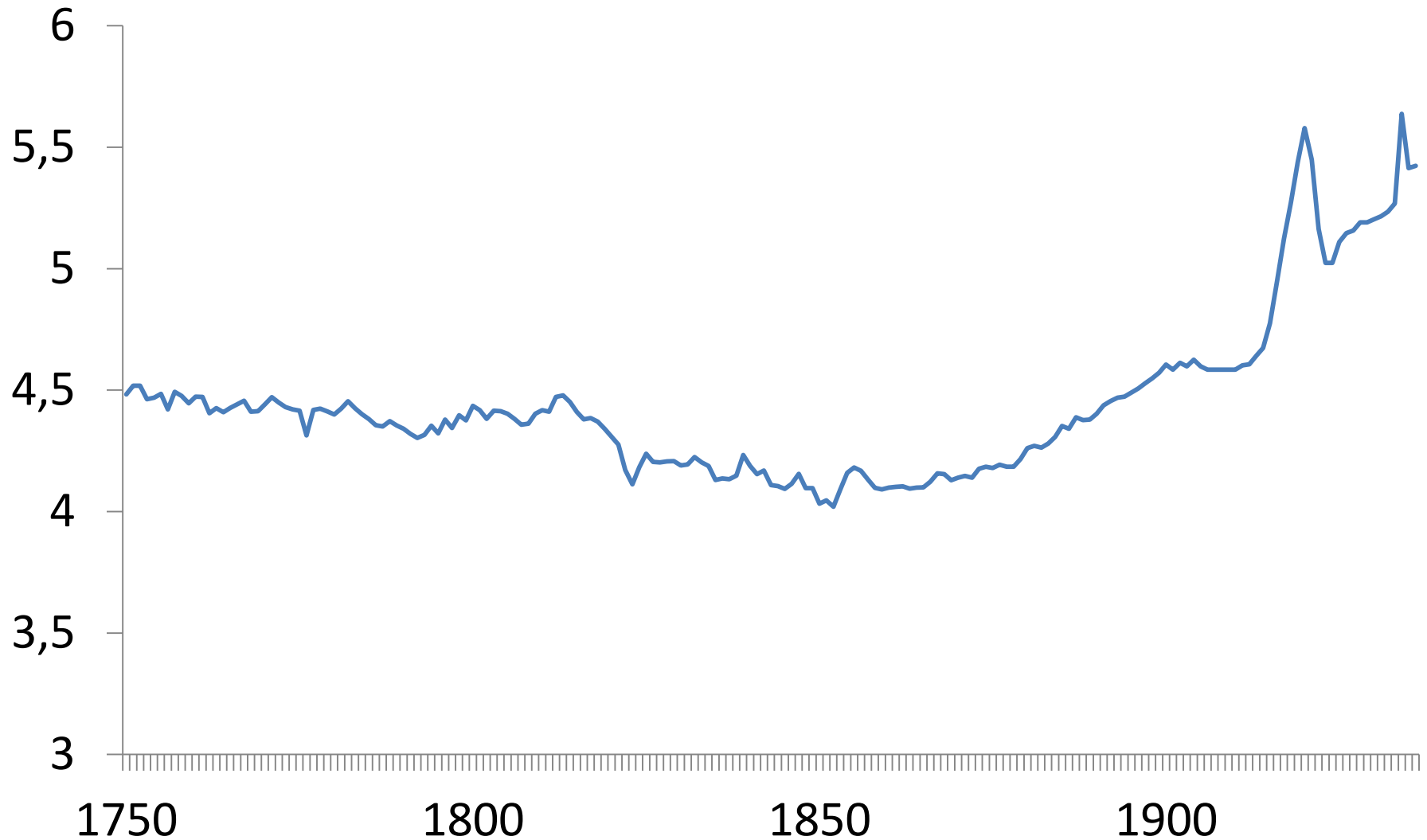
Skill premium of craftsmen in construction

(van Zanden, 2004)



Wage/Land rental ratio in England 1750-1926

(O'Rourke and Williamson, 1996)



Life prospects inequality, England

(Clark, 2008, *A Farewell to Alms*)

Table 14.4 Life Prospects of Rich and Poor in England

Period, group	Stature (males, centimeters)	Life expectancy	Surviving children	Literacy (%)
Preindustrial				
Rich	174.0	39	3.85	85
Poor	168.5	33	1.93	30
Difference	3%	18%	99%	183%
Modern				
Rich	178.2	80.8	1.33	100
Poor	176.0	74.3	1.64	88
Difference	1%	9%	-19%	14%

Taking stock: income inequality trends

- Did income inequality increase during the industrial revolution?
 - Data quality not good enough for final answer
 - But most evidence suggests: "No, not really"
- 20th Century: Great inequality reversal
 - Reduced capital income shares suggest role of private wealth
- From 1980, inequality either increases or remains low
 - Mainly top earnings-driven, but capital matters much in some countries
- Large differences across the distribution (and within the top)
- Thus, what long run shape fits best with the evidence?
 - U (Anglo-Saxon countries, in part Nordic countries)
 - L (Continental European countries, Asian countries)
 - Not N (i.e., no clear inequality increase during industrialization)

Chapter 3: Long run trends in wealth inequality

1. Data and measurement
 1. The wealth holding unit
 2. The concept of wealth
 3. Measuring historical wealth inequality
 4. Tax avoidance and evasion
2. Evidence on long run trends in wealth inequality
 1. Country specific evidence
 2. Cross-country trends in long-run wealth concentration
3. The composition of wealth
4. Concluding discussion: What do the long-run wealth inequality trends tell us?

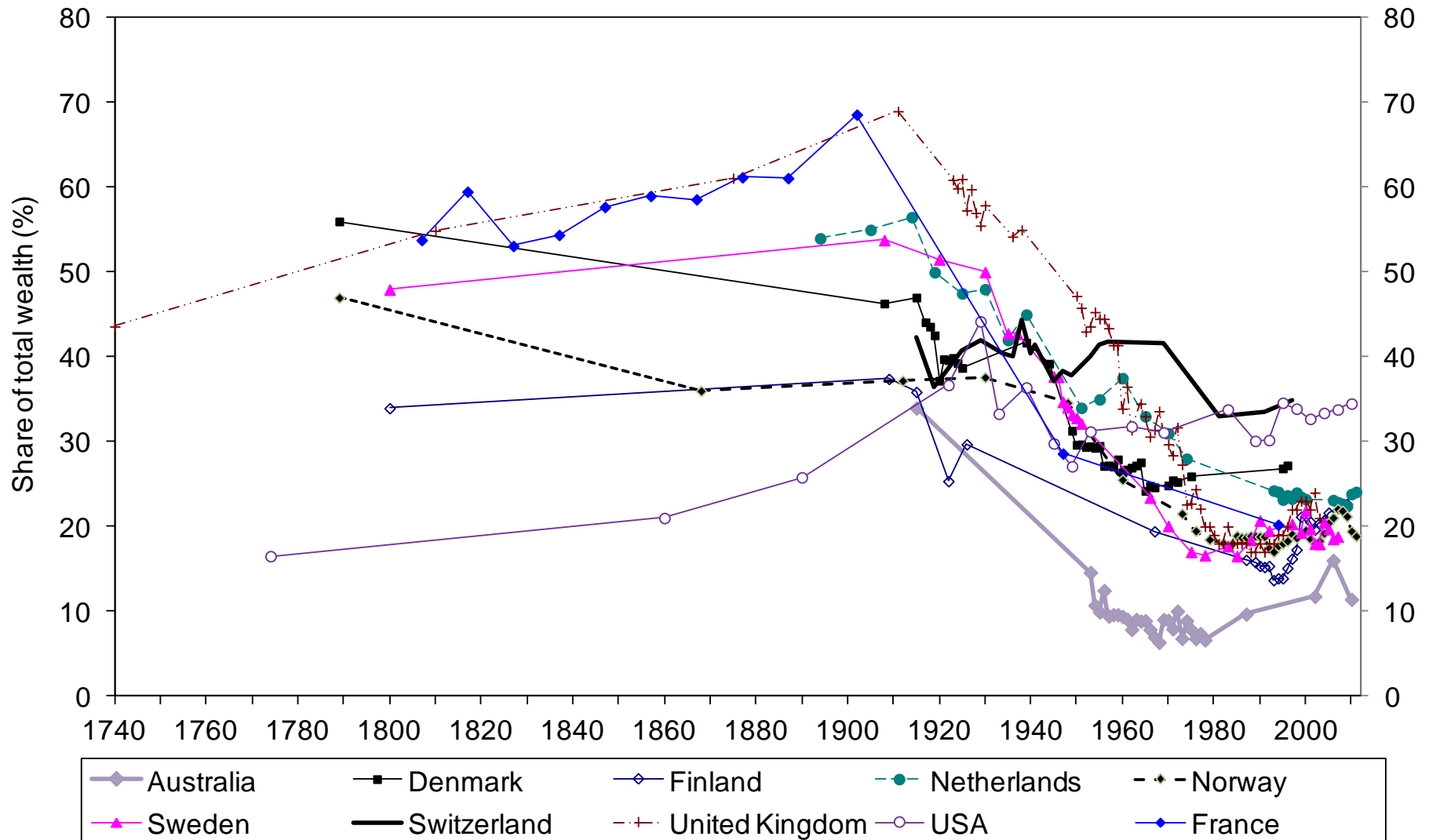
Estimating the wealth concentration

- Personal wealth data less consistent than income data
- **A mix of sources:** Estate tax data, Wealth tax data, Survey data
- **Wealth concept:** *Net worth* (excl. pensions, human) = non-financial and financial assets less debt, all at current market values
- **Wealth holders:**
 - *Households* (wealth tax data, surveys) or *individuals* (estate data; mortality multipliers)
 - Historically: household composition complicated
- **Inequality measurement:** *Top wealth shares*
 - Same approach as for top incomes
 - We observe top wealth holders in data
 - We relate their wealth to reference totals for wealth and population
 - Note: Wealth share of bottom half typically 5%.

Previous literature

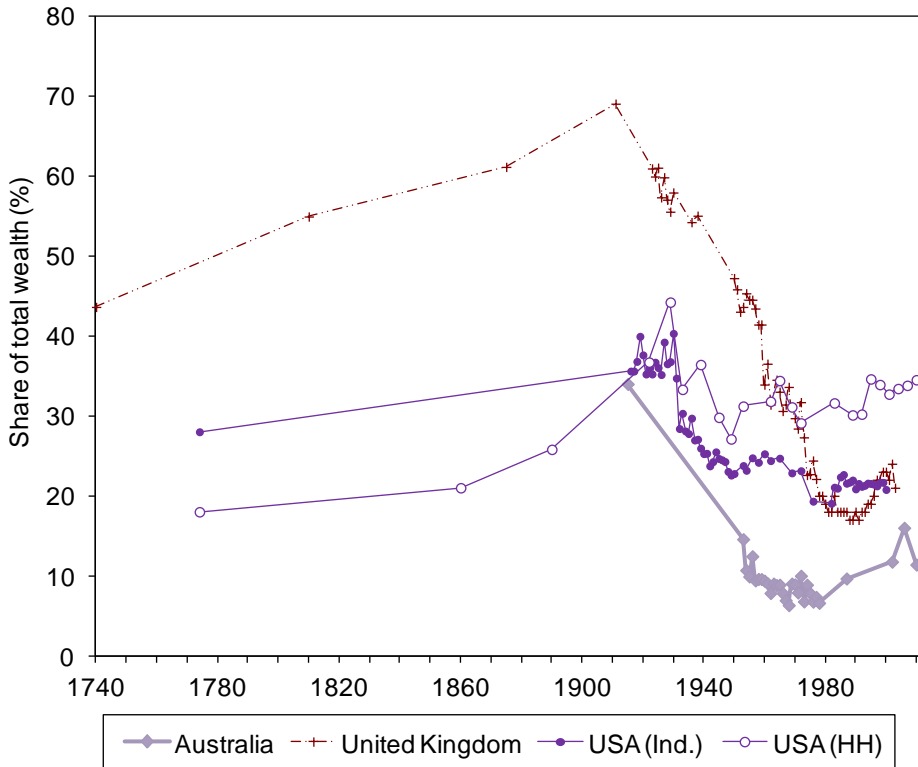
- Australia: Katic and Leigh (2013)
- Denmark: Soltow, This study, Alvaredo et al
- France: Piketty, Postel-Vinay & Rosenthal (2006)
- Switzerland: Dell, Piketty & Saez (2007)
- Sweden: Roine & Waldenström (2009); Spånt (1979, 1986)
- Finland: Soltow, Tuomala and Vilmunen (1988), Jäntti, This study
- Norway: Mohn (1873), Kier (1915), Epland and Kirkeberg (2012), This study
- U.K.: Atkinson & Harrison (1978), Lindert (1986)
- U.S.: Lampmann (1962), Lindert & Williamson (1980), Lindert (1986), Wolff (1987, 2004)

Evidence: Wealth inequality

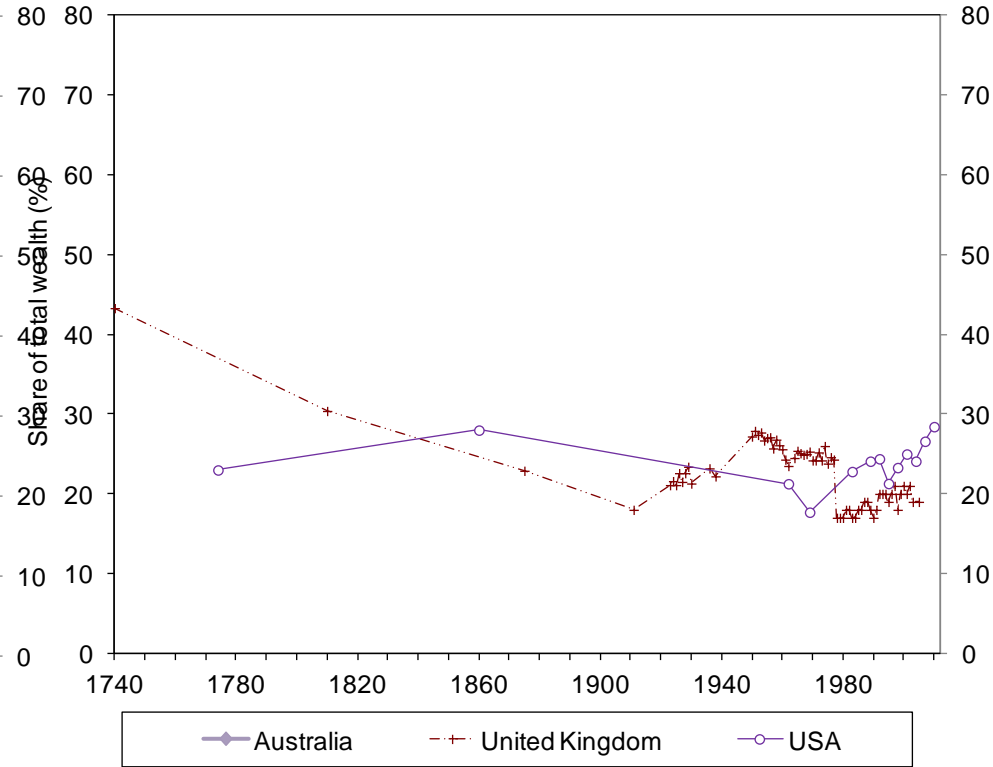


Wealth concentration: Anglo-Saxon countries

a) Top 1% (P99–100)

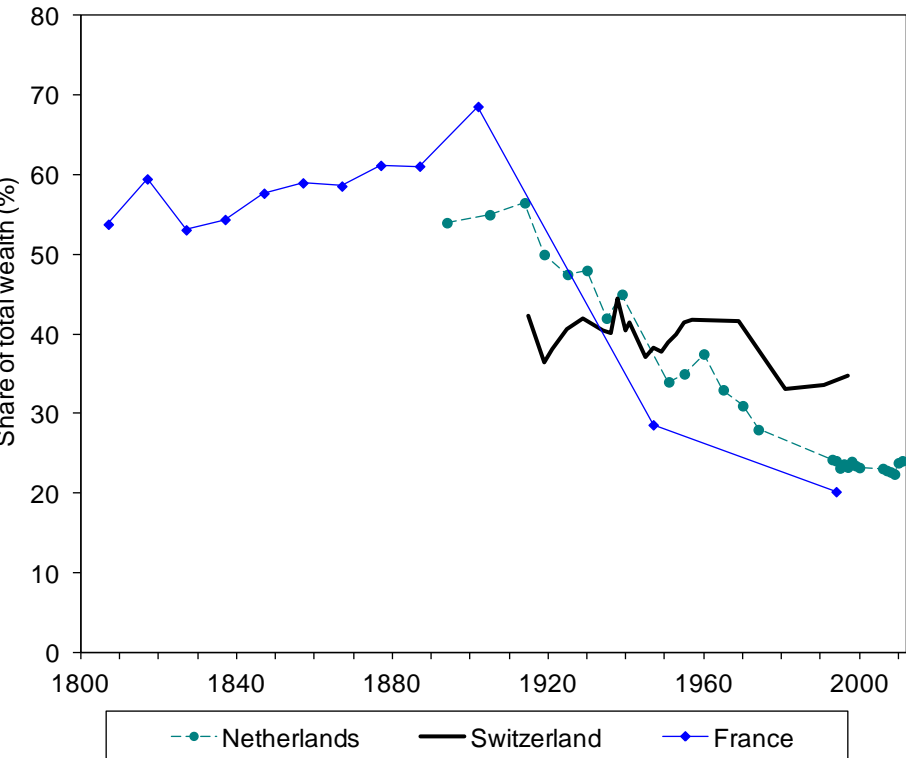


b) Next 4% (P95–99)

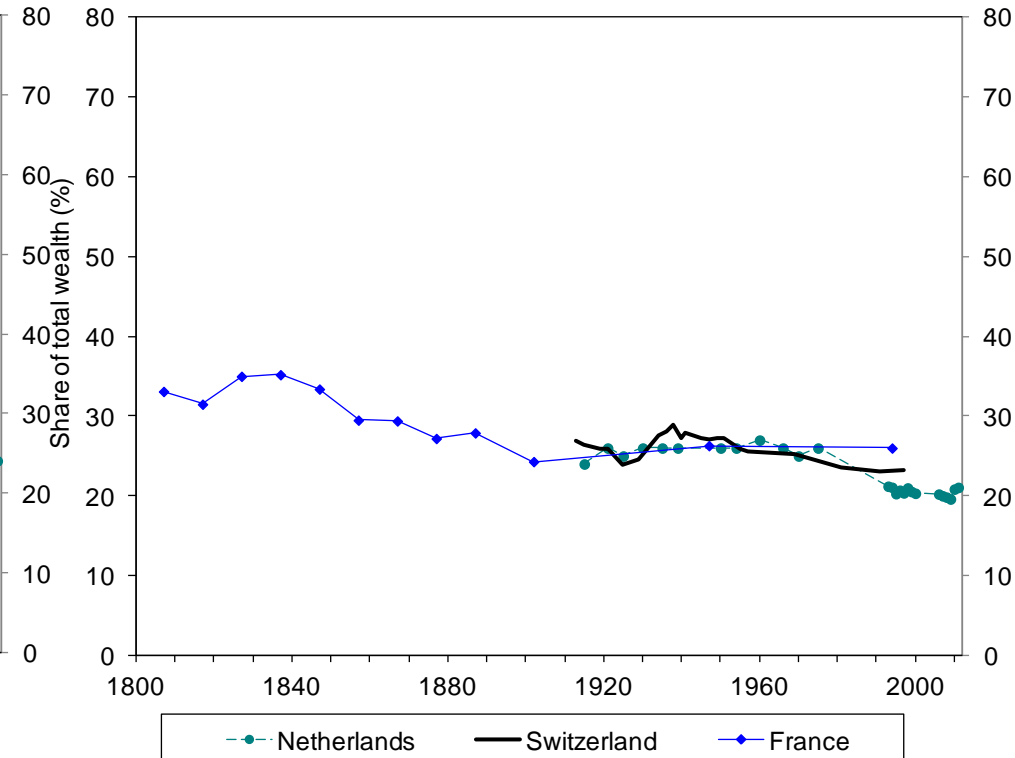


Wealth concentration: Continental Europe

a) Top 1% (P99–100)

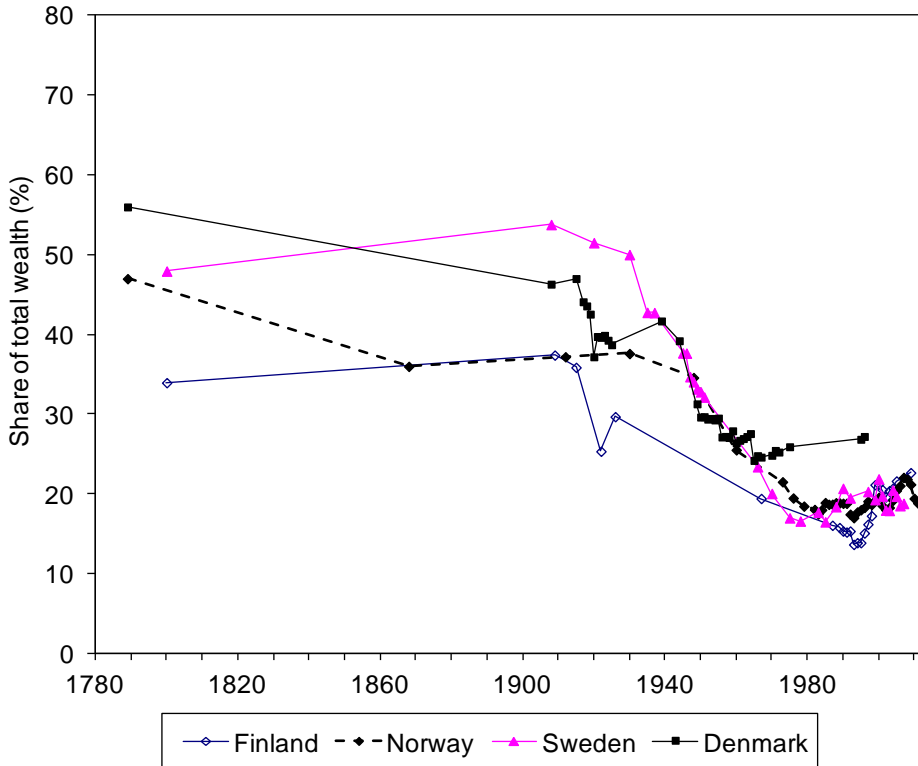


b) Next 4% (P95–99)

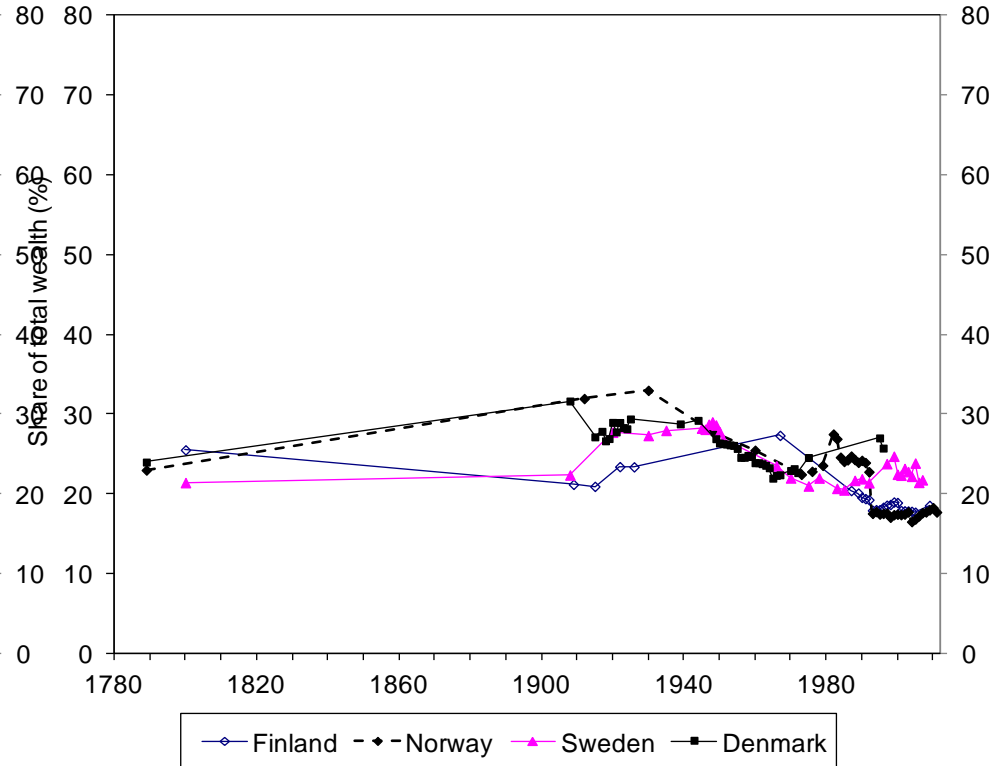


Wealth concentration: Nordic countries

a) Top 1% (P99–100)



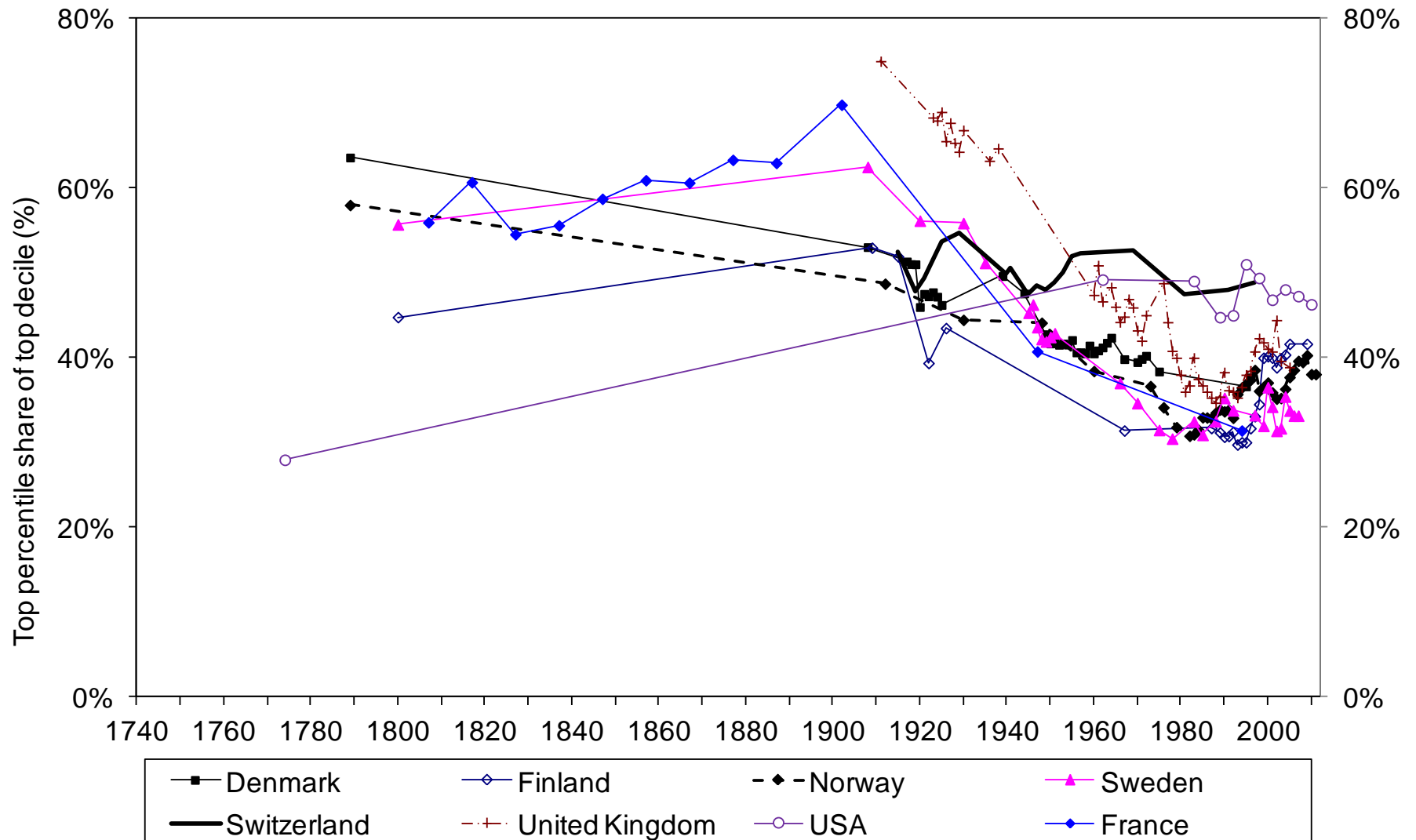
b) Next 4% (P95–99)



Main trends in wealth inequality

	From industrial take-off to WWI		From 1914 to 2010	
	P99–100 (Top 1%)	P95–99	P99–100 (Top 1%)	P95–99
Australia	–	–	Decrease	–
Denmark	Decrease	Flat	Decrease	Flat
Finland	Flat	Flat	Decrease	Flat
France	Increase	Flat	Decrease	Flat
Netherlands	Flat?	Flat?	Decrease	Flat
Norway	Flat	Increase	Decrease	Decrease
Sweden	Flat	Flat	Decrease	Flat
Switzerland	–	–	Flat	Flat
United Kingdom	Increase	Decrease	Decrease	Flat
United States	Increase	Flat?	Flat/Decrease	Flat?

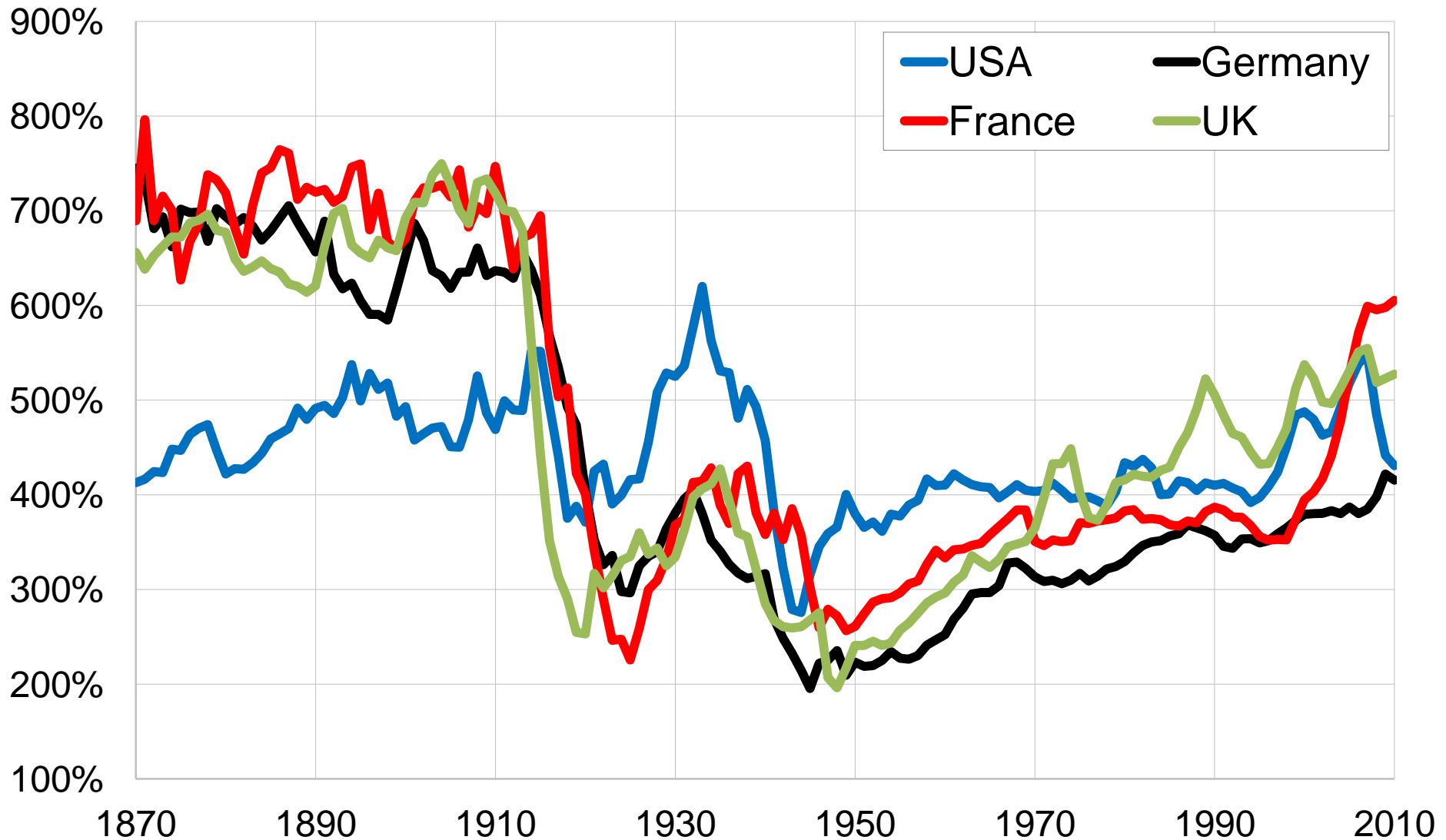
Wealth shares-within-shares (Share T1% / Share T10%)



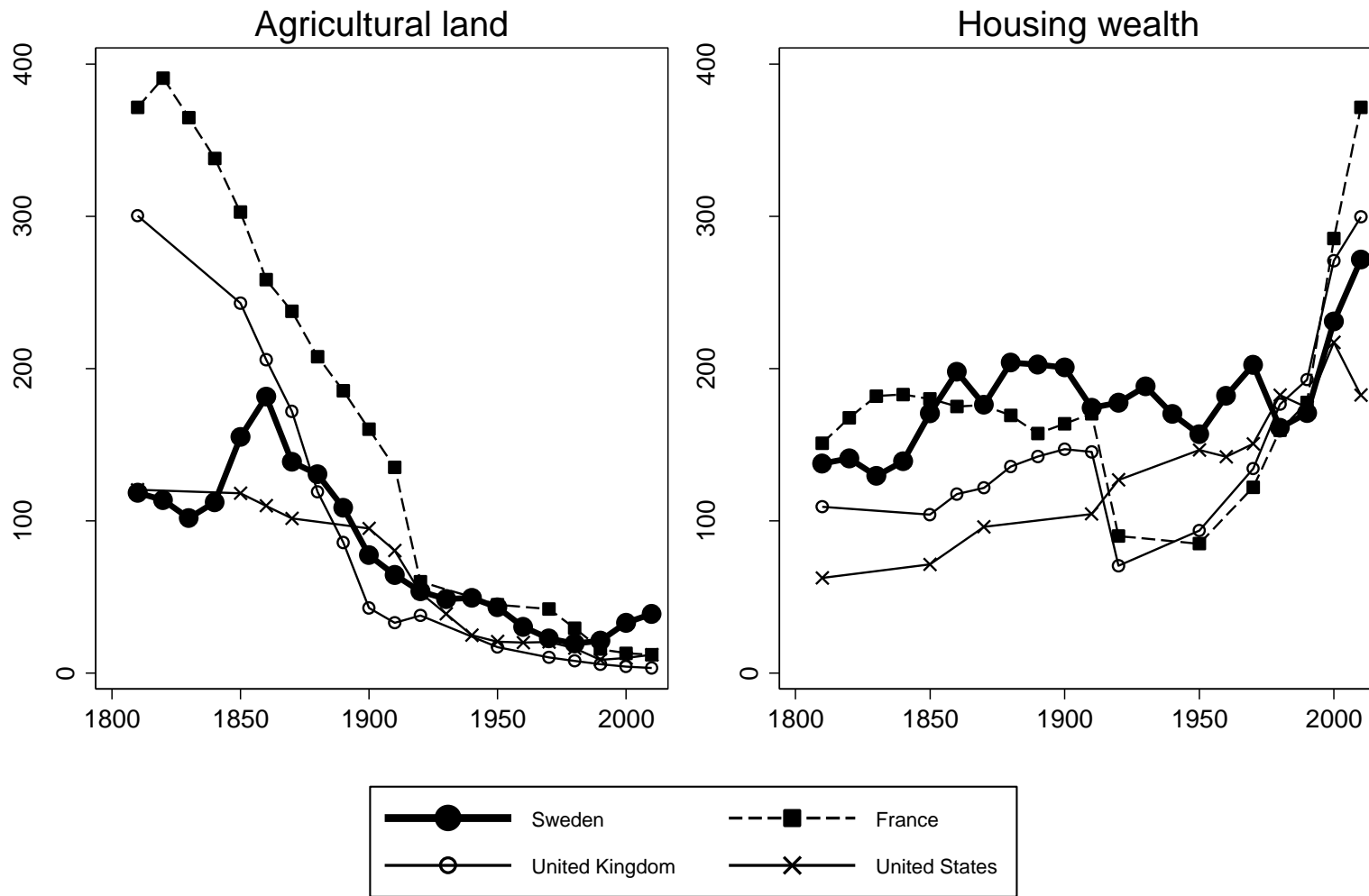
Composition of wealth

- Scarce distributional evidence
- Aggregate (Piketty & Zucman, 2014; Waldenström & Ohlsson, 2014):
 - Reduction in agricultural assets
 - Growth of "popular wealth during 20th C"
- Distribution
 - Housing wealth dominates middle class portfolios
 - Financial assets most important among the rich
 - Growth in owner-occupied housing reduced wealth concentration

Private wealth/National income 1870-2010



Decrease in agriculture and rise of housing wealth



Wealth-income ratios and wealth concentration

- Based on Piketty & Zucman (2014, HIDv2)
- Stylized facts:
 - 19th C: High wealth-income ratio (W/Y); High wealth concentration
 - 20th C: Falling/low W/Y ; Falling/low wealth concentration
- Dynamic wealth accumulation models: Role of wealth depends on ratio btw growth rate g and net-of-tax capital returns \bar{r} .
 - With $\bar{r} > g$, old wealth accumulates faster than new wealth is created
 - Models with random shocks (e.g., to saving taste) produce Pareto upper tails in wealth distribution
 - Wealth concentration steep function in $\bar{r} - g$
- Historically:
 - g was moderate in 19th C; very high in mid-20th C; low today
 - \bar{r} was high in 19th C; very low in mid-20th C; rising today
 - 21st C: will \bar{r} increase with international tax competition? g remains low

Summing up wealth inequality trends

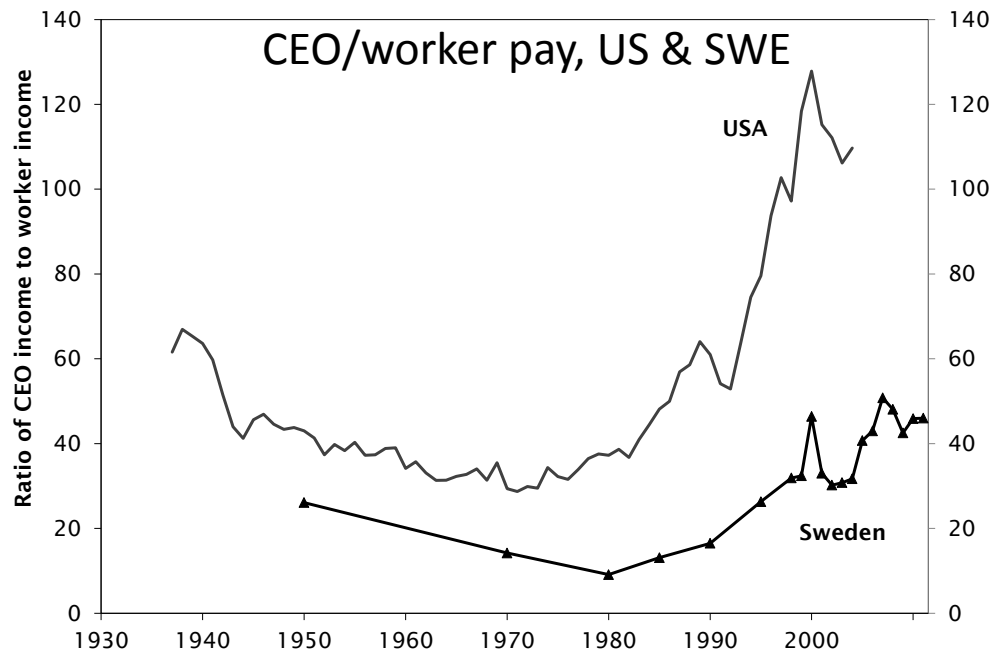
- Mixed evidence on role of industrialization (18th-19th C):
 - Rising inequality in the US, UK-top1%, France
 - Flat (or decreasing) in Denmark, Finland, The Netherlands, Norway, Sweden, UK-top5%
 - No strong support for an inverse-U
- Great wealth inequality reversal during 20th century
 - Growth, Human capital, Savings-induced popular wealth accumulation, Taxation and regulation
- Large differences across top wealth groups
- Similar trends with top income shares (except after 1980)

Chapter 4: Determinants

1. Determinants of long run trends in inequality
 1. A first look at inequality trends, structural changes and shocks
 1. What about the Kuznets curve?
2. Combining wage earnings and wealth
 1. Explaining the drop over the first half of the 20th century: Wealth shocks and the cumulative effects of taxes
3. Explaining increasing top wages: Skill-biased technological change, executive compensation and superstar effects
4. Econometric evidence on determinants of top income shares
 1. Determinants of inequality: Correlations over the long run
 2. The effect of top tax rates on top incomes
 3. Political and institutional factors and the impact of crises
5. What do we learn?

Earnings dispersion: Superstars, SBTC

- Large number of papers emphasize role of skill-biased technical to increased earnings inequality
 - But Western income inequality has not increased everywhere
- Superstar effects may explain higher relative CEO compensation
 - Rosen (1981), Terviö (2007), Gabaix & Landier (2008) etc.



Next step: Country panel regression

- Which are the main potential factors?
 - Extend analysis of Roine, Vlachos, Waldenström, 2009, JPubEc
 - Use WTID
 - Role of taxes/policy vs “global forces”
- Relation of inequality to broad trends
 - Globalization
 - Technological revolutions
 - Financial development
 - Wars and crises
 - Taxation
 - Government spending
 - Democratization

Potential determinants

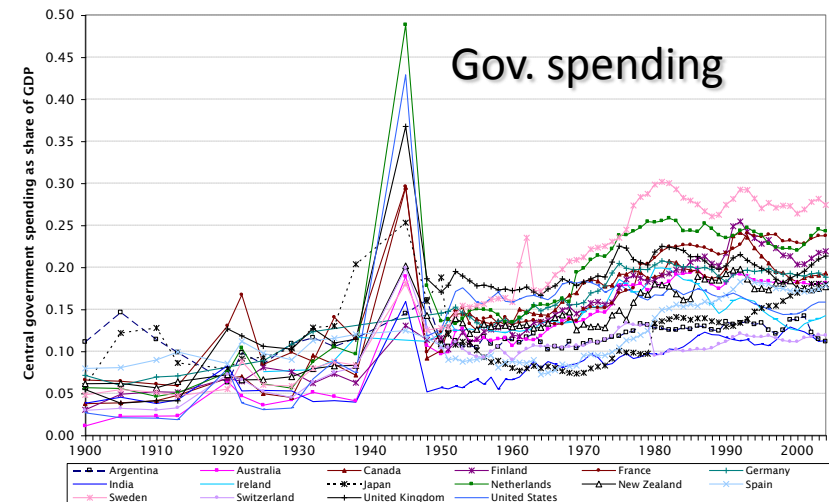
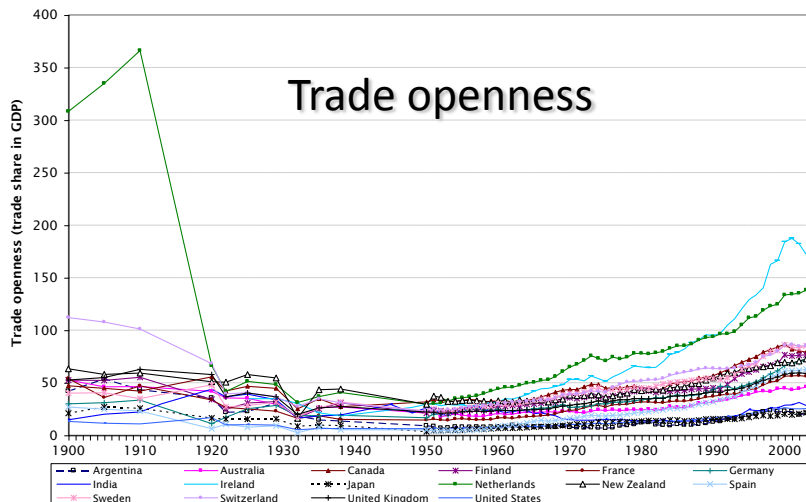
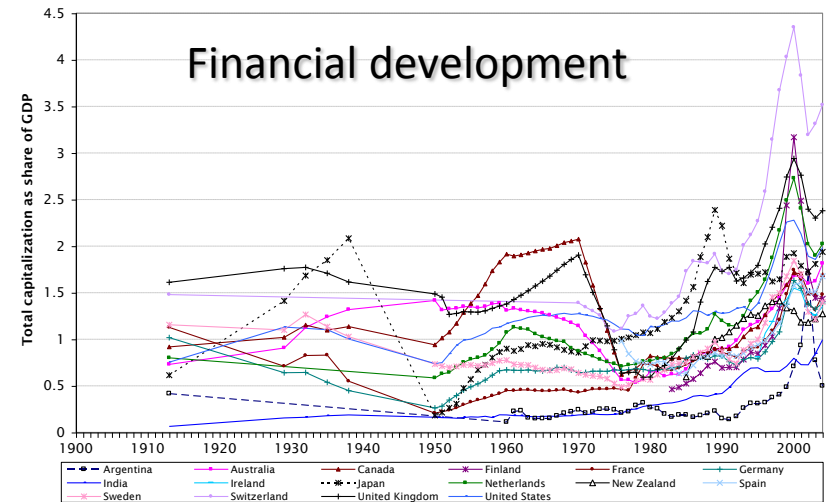
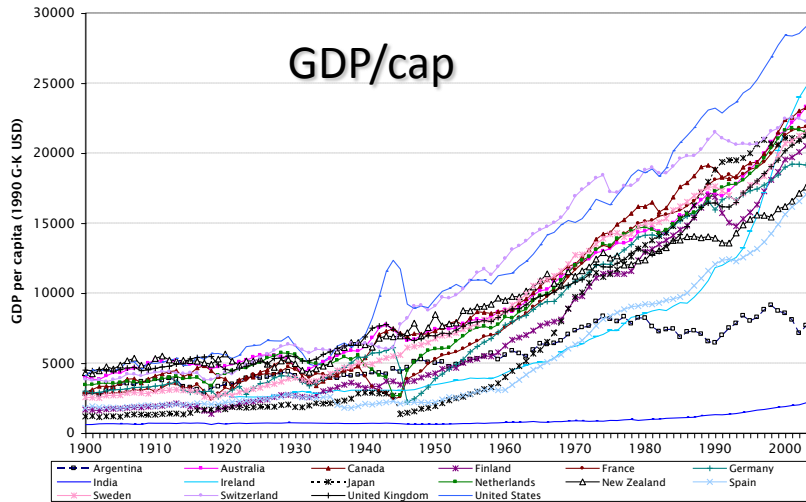
- **Economic growth**
 - Top incomes are more closely tied to the economy (bonuses, incentive contracts)
- **Technological shocks**
 - Original Kuznets hypothesis.
 - Tinbergen/Katz & Goldin (Race between education and technology)
 - But only skill-biased or also "de-skilling"? (Caselli, 1999)
- **Trade openness**
 - Standard argument: Capitalists gain in capital abundant cntrs
 - "Superstars" in global labor markets (Rosen, 1980; Gersbach & Schmutzler, 2007)

Potential determinants

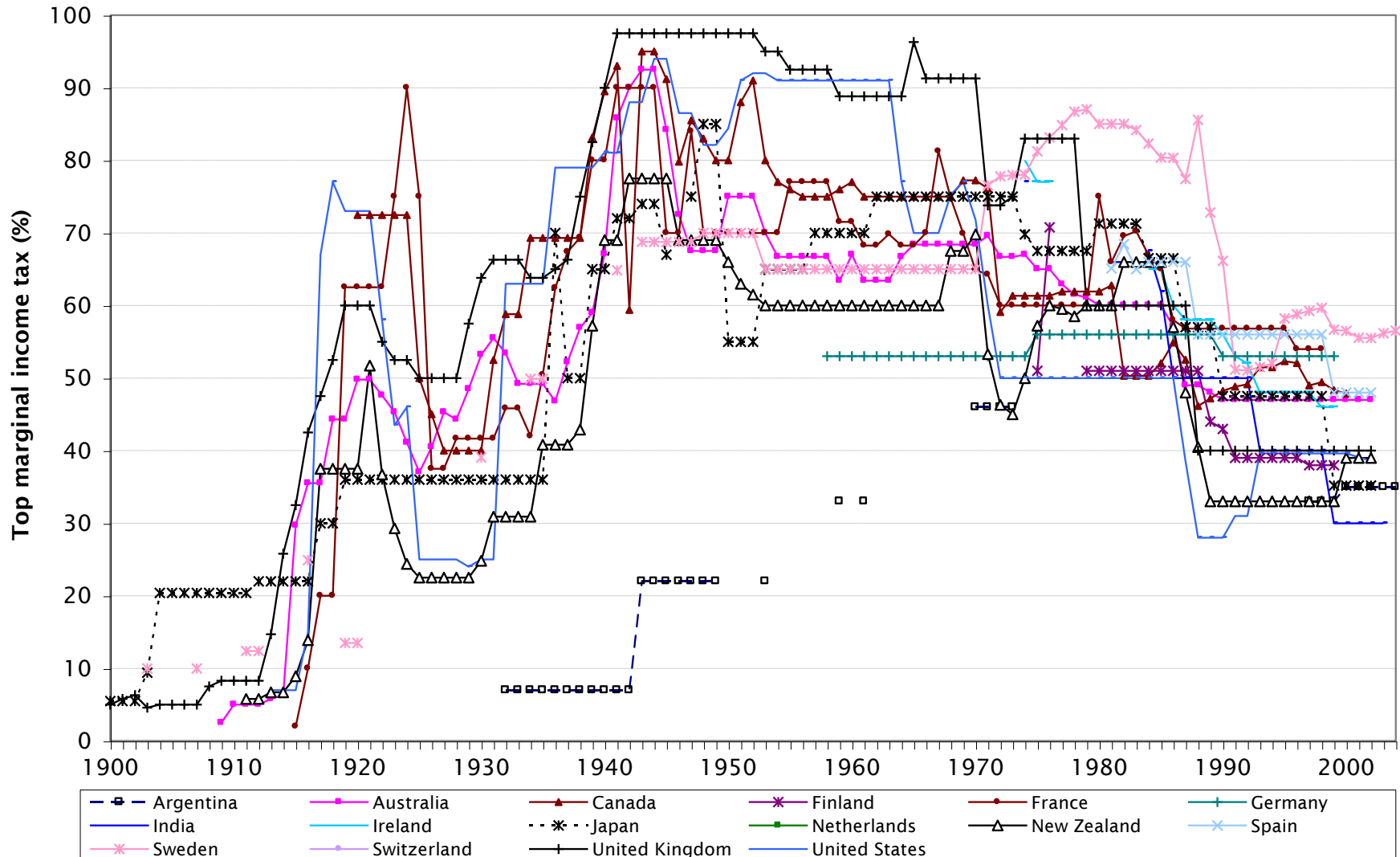
- **Financial development**
 - Typically seen as *pro-poor*
 - Reduces credit constraints, pools resources (Beck et al. 2007)
 - When is finance *pro-rich*?
 - When the rich have control over politics and finance
 - At early stages of development (Greenwood & Jovanovic 1990)
- **Marginal income taxation**
 - Two potential effects from higher top marginal tax:
 - Lowers pre-tax income through reduced incentives to work
 - Raises pre-tax income to compensate for tax increase

Altogether: Theory provides conflicting answers

Potential determinants



Top marginal income taxation



Empirical methodology

- Log-linear regression model:
 - Control for unobserved time-invariant effects and country-specific trends
 - Mainly conditional correlations

- First-difference GLS (FDGLS)

$$\Delta y_{it} = \Delta \mathbf{x}'_{it-1} b_1 + \gamma_t + \lambda_i + \varepsilon_{it}$$

- Dynamic first-difference (DFD)

$$\Delta y_{it} = b_1 \Delta y_{it-1} + \Delta \mathbf{x}'_{it-1} b_2 + \gamma_t + \lambda_i + \varepsilon_{it}$$

Do financial crises matter?

	Top 1%		Top 10-1%	
Bank crisis	-1.13***	-1.12***	0.33	0.35
Currency crisis		0.21		-0.31
Obs	180	180	144	144
Controls	Yes	Yes	Yes	Yes
N countries	17	17	15	15

Crisis data from Bordo et al. (2001) and Laeven and Valencia (2008)

Summarizing determinants analysis

1. So, is there a Kuznets curve?
 - Crude version: Inverse-U over development? Answer is no.
 - Decrease during 20th C due to other forces
 - Recent increase (ICT) does not increase inequality everywhere

2. What does panel regression analysis learn us?
 - Finance is strongly pro-rich
 - Trade openness has no clear impact on inequality
 - Economic growth positively correlated with top 1% share; negatively correlated with "upper middle class" share
 - Top taxes reduce top income shares (and affects capital accumulation)

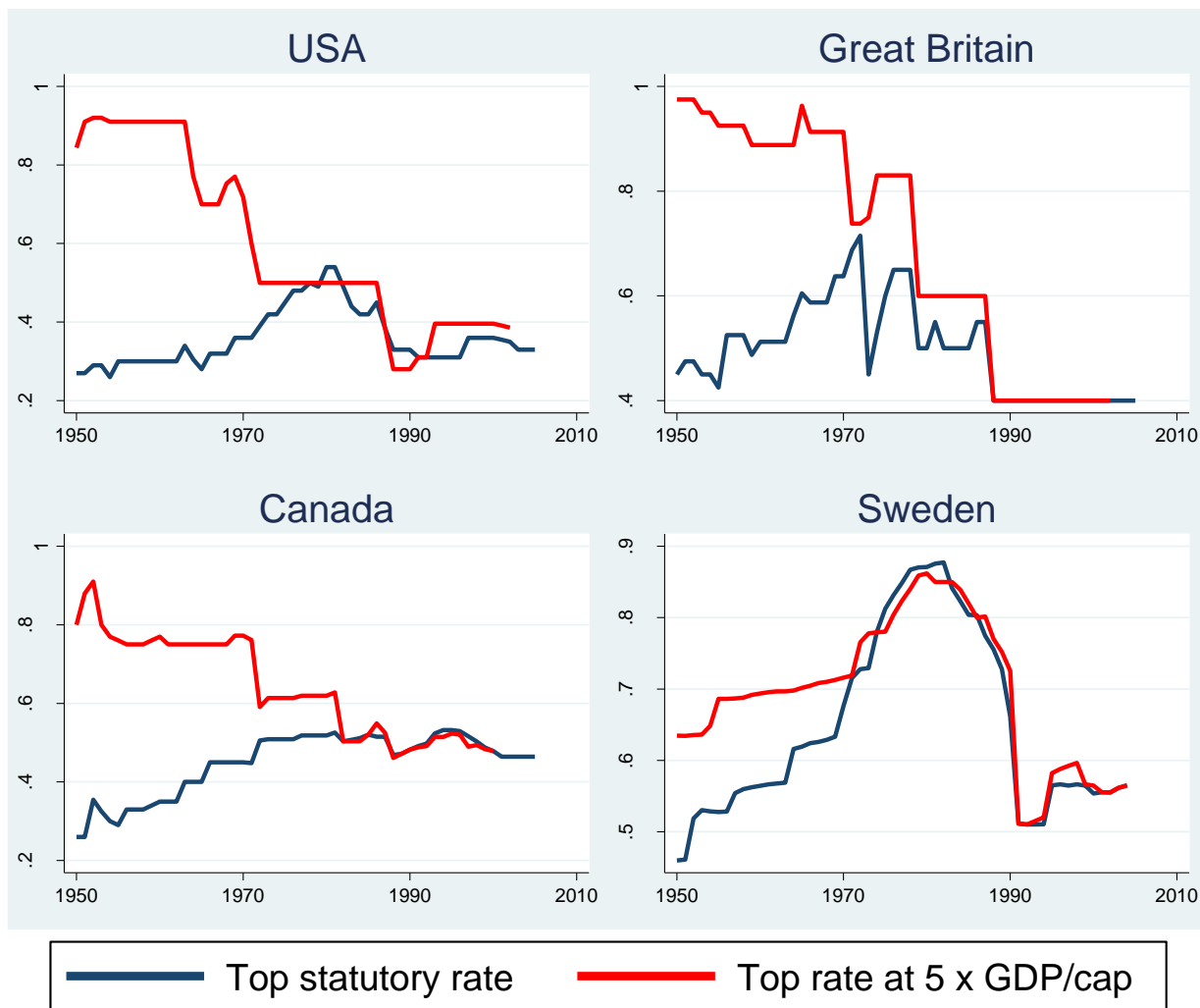
Chapter 5: Summary and Going forward

- We study long-run evolution of income and wealth inequality since industrialization in today's rich countries
 - Based on top income and wealth shares
- Income and wealth concentration follow similar (but not identical) long run trends
- We find little support for strong inequality increases during industrialization
- 20th century: Great inequality reversal
 - Wealth shocks, redistribution, educational expansion, middle class catch-up
 - Little role for sector reallocation á la Kuznets

Going forward

1. Extending the top income database: higher #countries but also in terms of adding new dimensions.
2. Further incorporate top income shares in empirical work, both as LHS and RHS variable.
3. Changes within the top are important on their own and deserve further attention.
4. Extend models combining earnings, income and wealth (e.g., taxation, inheritance)
5. Add missing links: mobility, health, gender

A word of caution: Top tax rate measures problematic



The mechanics of the Kuznets curve

- Same logic as the *specific factors model* from trade theory
- Assumptions:
 - Two sectors (agriculture (A) and industry (I) producing one good each
 - Both sectors use labor (L), but the industrial sector also uses capital (K) inputs and the agricultural sector uses land (T) inputs.
 - Labor is freely mobile across sectors. Capital and land are immobile (i.e., *specific*).
 - Perfectly competitive factor and output markets
 - Demand is equal across regions (single D-curve)
 - Industry output: $Q_I = Q_I(K, L_I)$; Agricultural output: $Q_A = Q_A(T, L_A)$. All factors exhibit diminishing returns to scale.
 - Also assume:
 - Constant output prices ($\Delta P_I = \Delta P_A = 0$)
 - No population growth ($\Delta L = 0$).

The mechanics of the Kuznets curve

Equilibrium on labor market: $L_A + L_I = L$

Firms' demand for labor set by profit-maximization: $MR = MC$.

Since labor market is competitive, workers get paid their marginal value to the firm's output as determined by goods markets.

➔ The wage for an industry worker is

$$W_I = MPL_I \cdot P_I$$

➔ The wage for an agricultural worker is

$$W_A = MPL_A \cdot P_A$$