Introducing the Luxembourg Income Study (LIS): Illustrations of Research with the LIS and LWS Databases

Training Session on the LIS and LWS Databases
Stone Centre on Socio-Economic Inequality in Asia
University of Hong Kong

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10-11am

Janet C. Gornick
Professor of Political Science and Sociology
James M. and Cathleen D. Stone Distinguished Chair in Socio-Economic Inequality
Director, Stone Center on Socio-Economic Inequality – Home to the US Office of LIS
Graduate Center, City University of New York

LIS CROSS-NATIONAL DATA CENTER in Luxembourg

STONE CENTRE ON SOCIO-ECONOMIC INEQUALITY IN ASIA
香港大學亞洲社會經濟不平等研究中心
THE UNIVERSITY OF HONG KONG

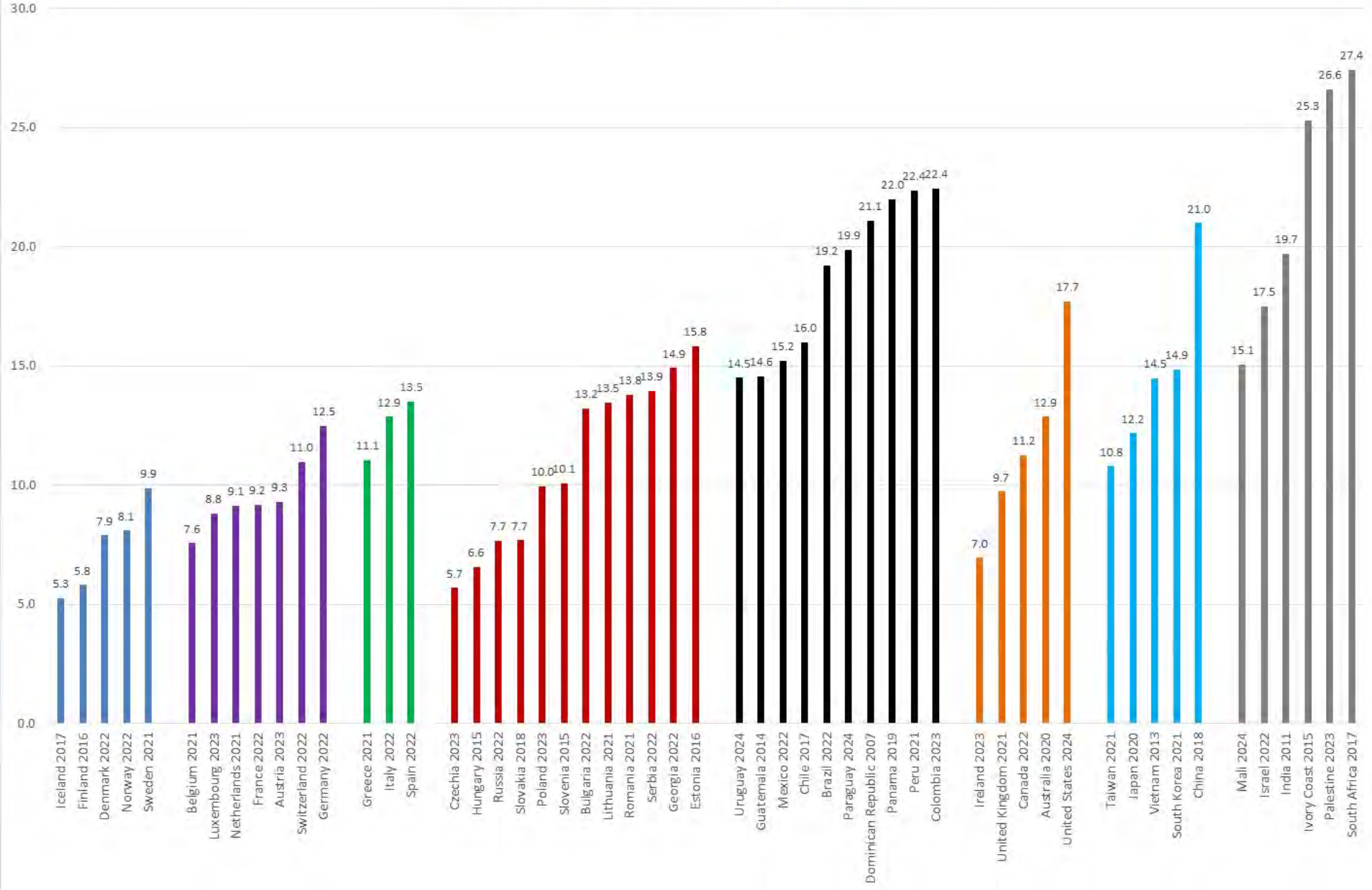
Illustrations Based on LIS and LWS Microdata

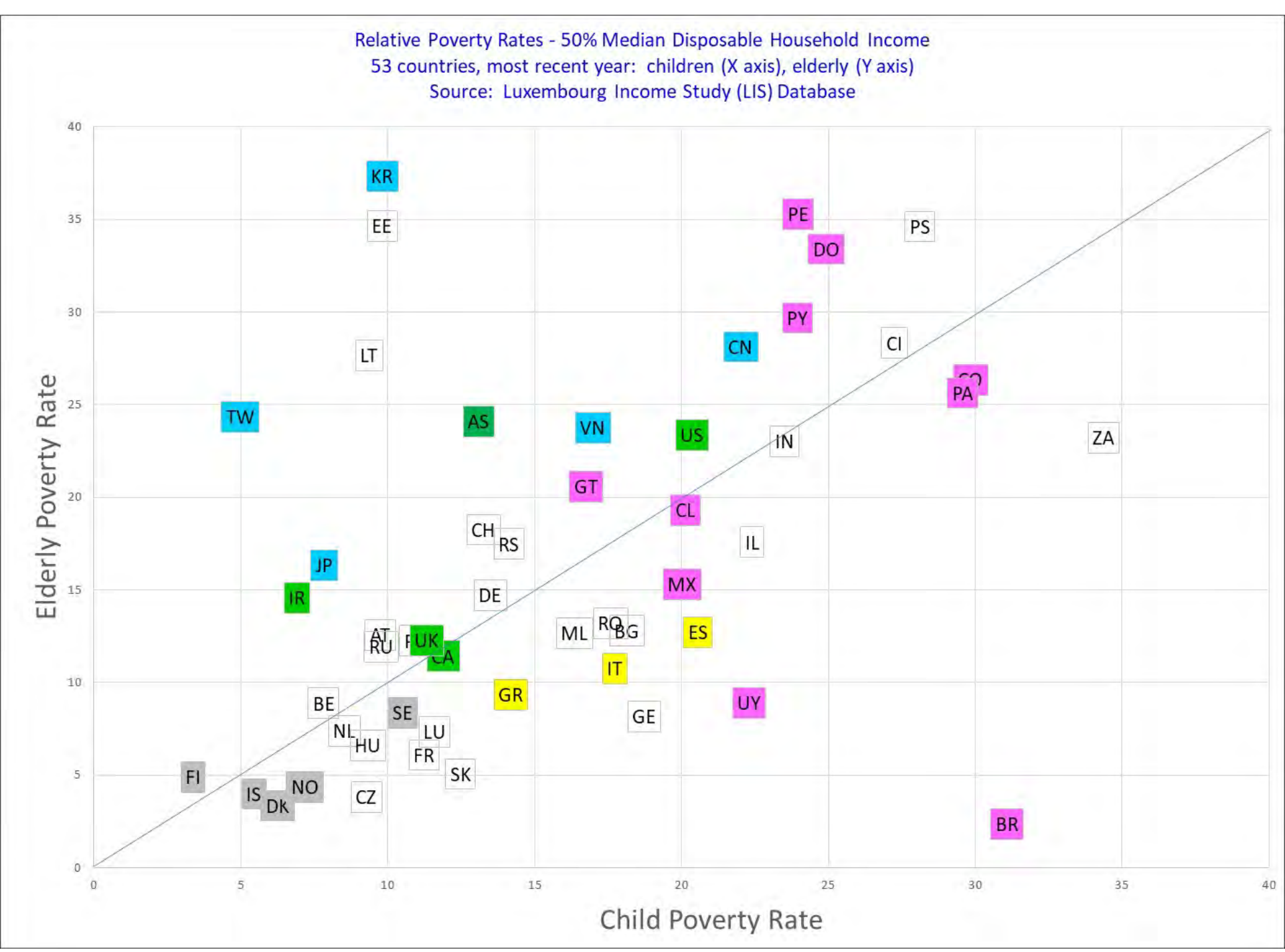
Income Poverty

Relative Poverty Rates - 50% Median Disposable Household Income

53 countries, most recent year, total population

Source: Luxembourg Income Study (LIS) Database




Relative Poverty Rates - 50% Median Disposable Household Income
53 countries, most recent year: children (X axis), elderly (Y axis)
Source: Luxembourg Income Study (LIS) Database
Elderly Poverty Rate
Child Poverty Rate
0
5
10
15
20
25
30
35
40
KR
EE
PE
PS
DO
PY
CN
CI
LT
PA
TW
AS
VN
US
IN
ZA
GT
CL
CH
RS
IL
JP
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AT
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UK
CA
IT
GR
BE
SE
GE
UY
NL
LU
HU
FR
FI
SK
IS
DK
NO
CZ
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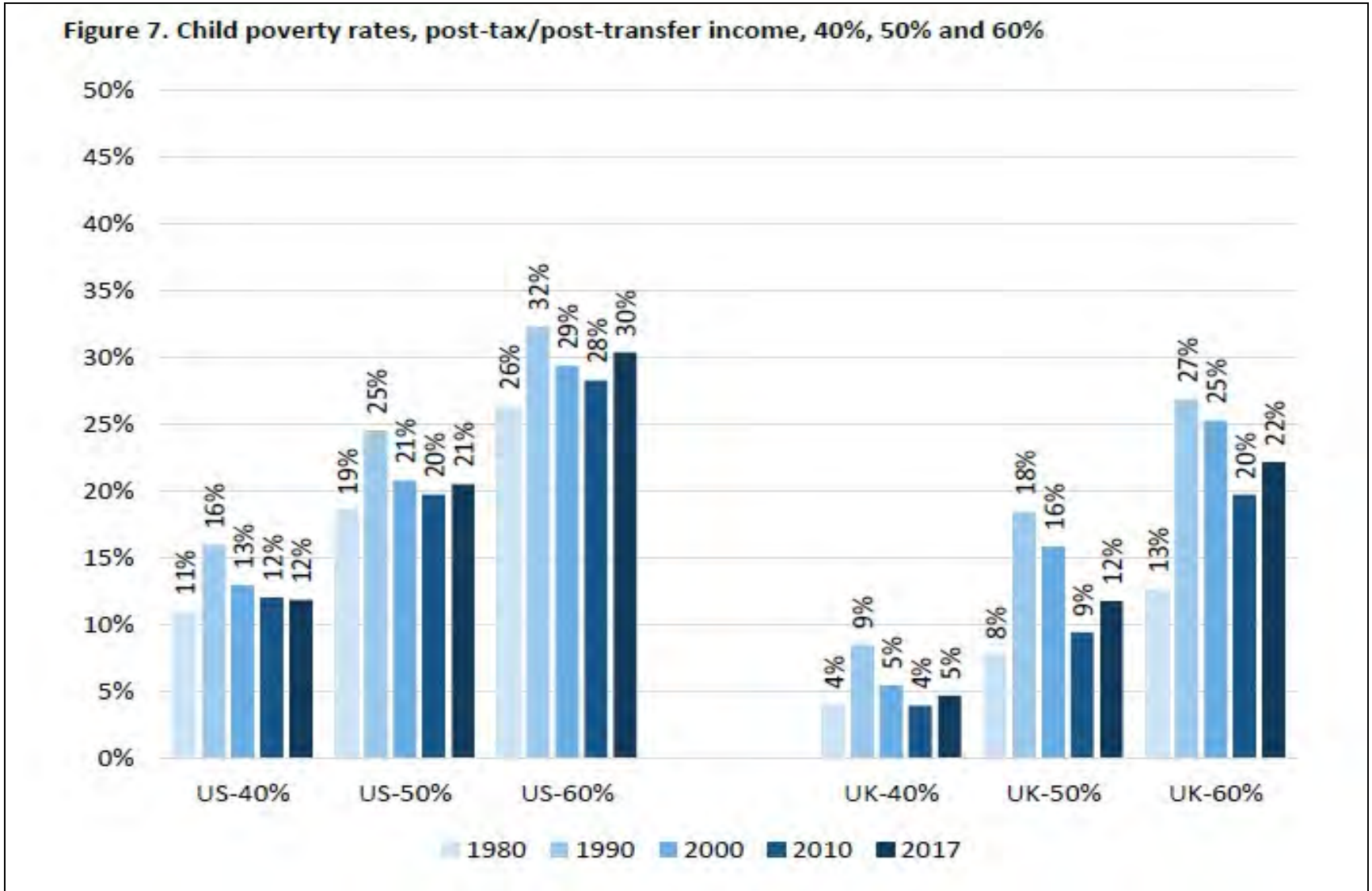
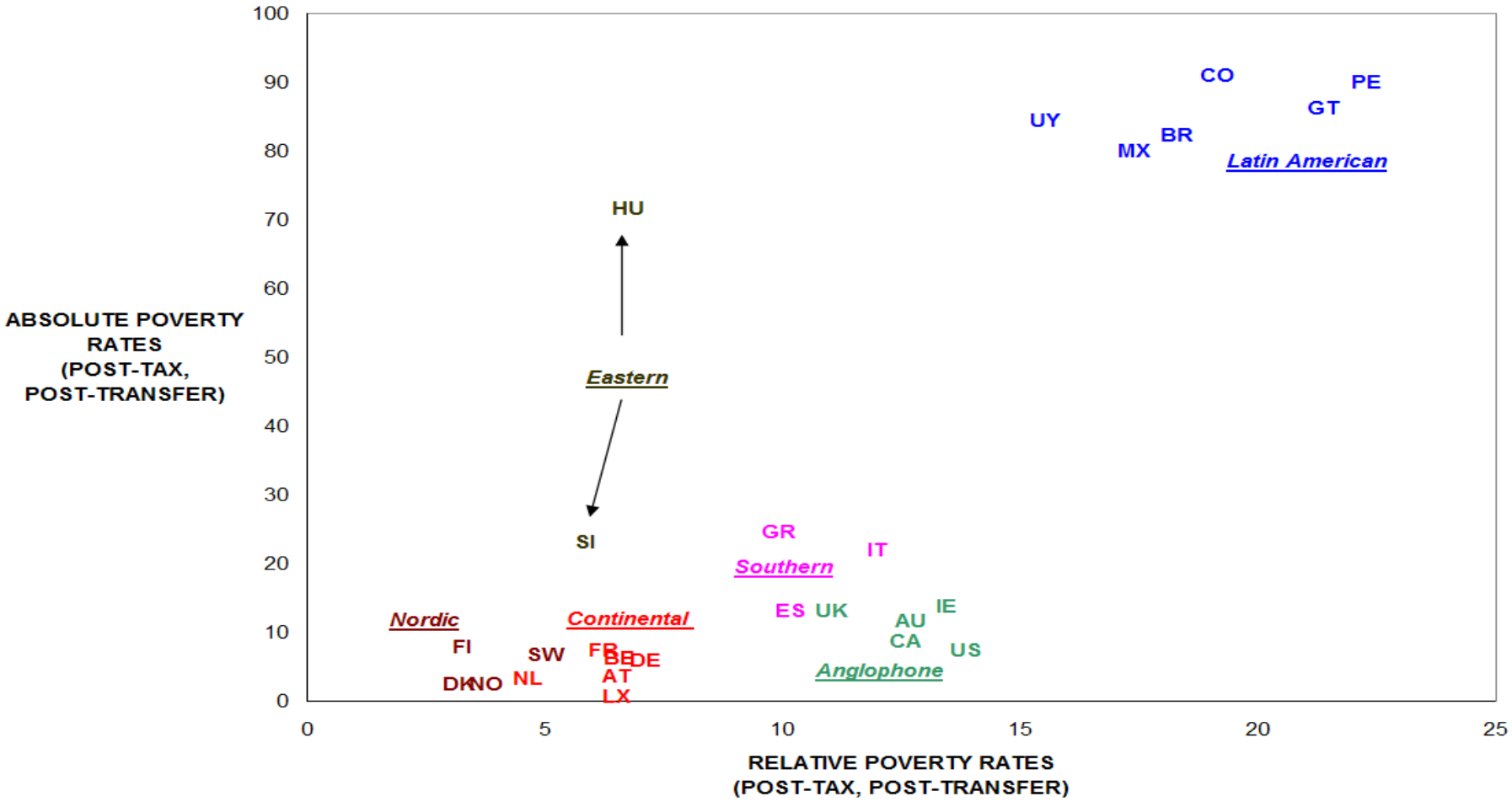
Child Poverty, US and UK
disposable household income, 5 time points, 3 thresholds
Source: Luxembourg Income Study (LIS) Database
Gornick, *IFS Deaton Review,* 2023

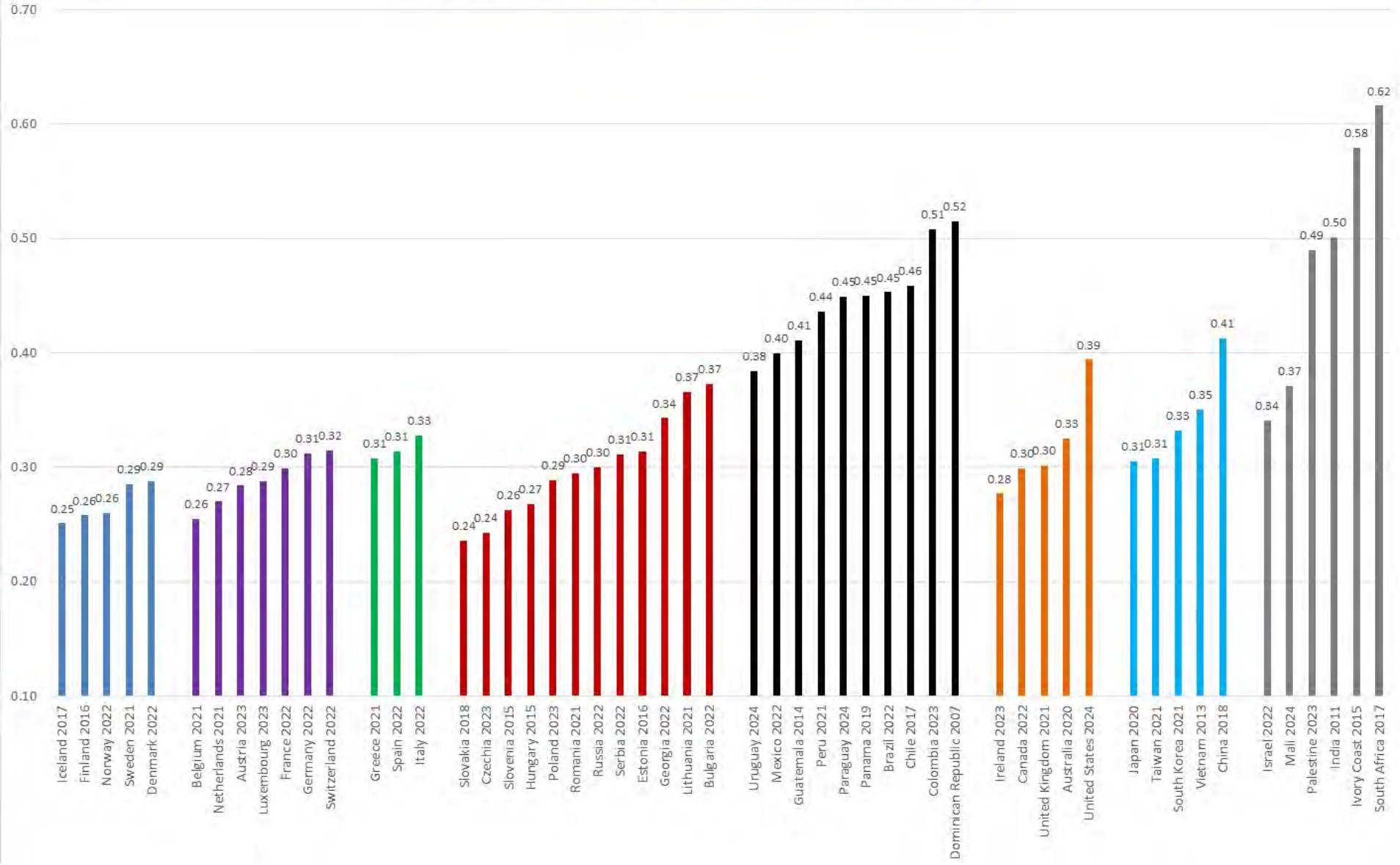


Single-Mother Households
disposable household income,
absolute poverty (US line) versus relative poverty (at 50%)
Source: Luxembourg Income Study (LIS) Database
Gornick and Jäntti 2010



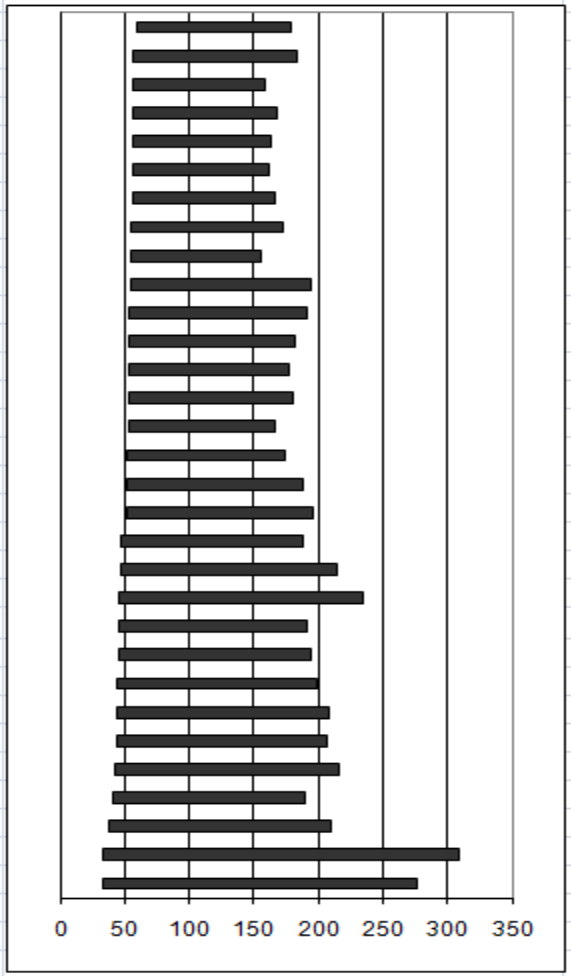
Income Inequality

Income Inequality
disposable household income, Gini coefficients
53 countries, most recent year, total population
Source: Luxembourg Income Study (LIS) Database



Inequality – 90/10 Ratios and Gini Coefficients
disposable household income
Source: Luxembourg Income Study (LIS) Database
(Figure, thanks to Smeeding)

	P10 (Low Income)	Length of bars represents the gap between high and low income individuals	P90 (High Income)	P90/P10 (Decile Ratio)	Gini Coefficient[1]
Czech Republic 1996	59		179	3.01	0.259
Luxembourg 2000	57		184	3.24	0.260
Norway 2000	57		159	2.80	0.251
Sweden 2000	57		168	2.96	0.252
Finland 2000	57		164	2.9	0.247
Slovak Republic 1996	56		162	2.88	0.241
Netherlands 1999	56		167	2.98	0.248
Austria 2000	55		173	3.17	0.260
Denmark 1992	54		155	2.85	0.236
Hungary 1999	54		194	3.57	0.295
France 1994	54		191	3.54	0.288
Switzerland 2002	54		182	3.38	0.274
Germany 2000	54		177	3.29	0.264
Romania 1997	53		180	3.38	0.277
Slovenia 1999	53		167	3.15	0.249
Belgium 2000	53		174	3.31	0.277
Poland 1999	52		188	3.59	0.293
Taiwan 2000	51		196	3.81	0.296
Canada 2000	48		188	3.95	0.302
United Kingdom 1999	47		215	4.59	0.345
Estonia 2000	46		234	5.08	0.361
Japan 1992[2]	46		192	4.17	0.315
Australia 1994	45		195	4.33	0.311
Italy 2000	44		199	4.48	0.333
Spain 2000	44		209	4.78	0.340
Greece 2000	43		207	4.77	0.338
Israel 2001	43		216	5.01	0.346
Ireland 2000	41		189	4.56	0.323
United States 2000	39		210	5.45	0.368
Mexico 2002	33		309	9.36	0.471
Russia 2000	33		276	8.37	0.434
Average[3]	50		194	4.09	0.302

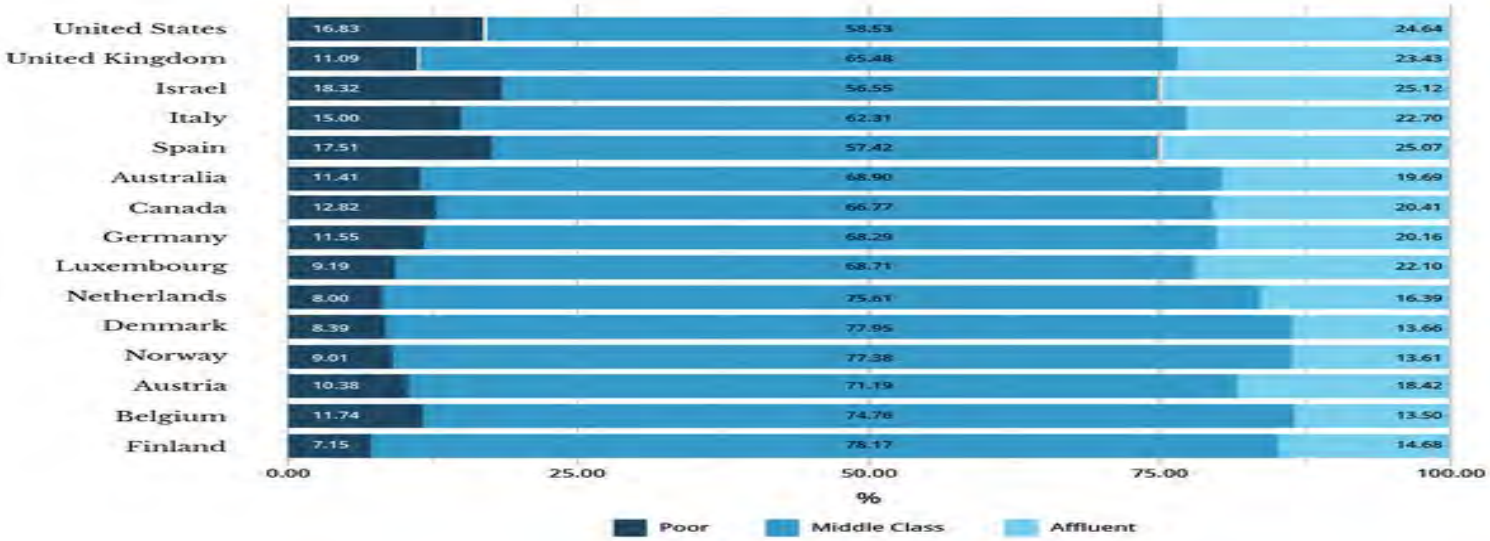


Size of "Middle Class", 1985 and 2016

disposable household income, between half and twice the median, non-elderly

Source: Luxembourg Income Study (LIS) Database

Gornick and Johnson, *SSRC Items,* 2020

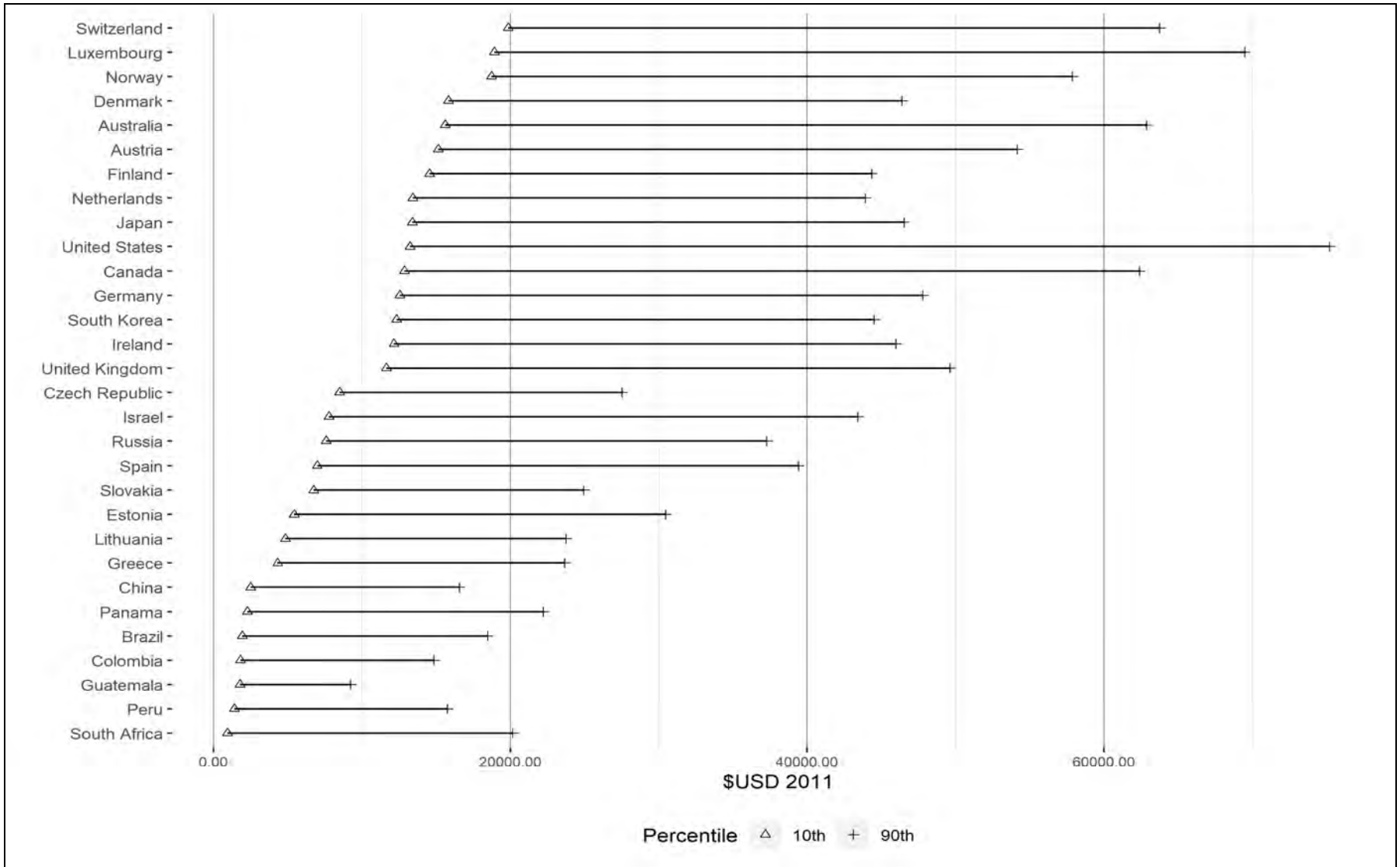


Income Levels, 10th and 90th Percentiles

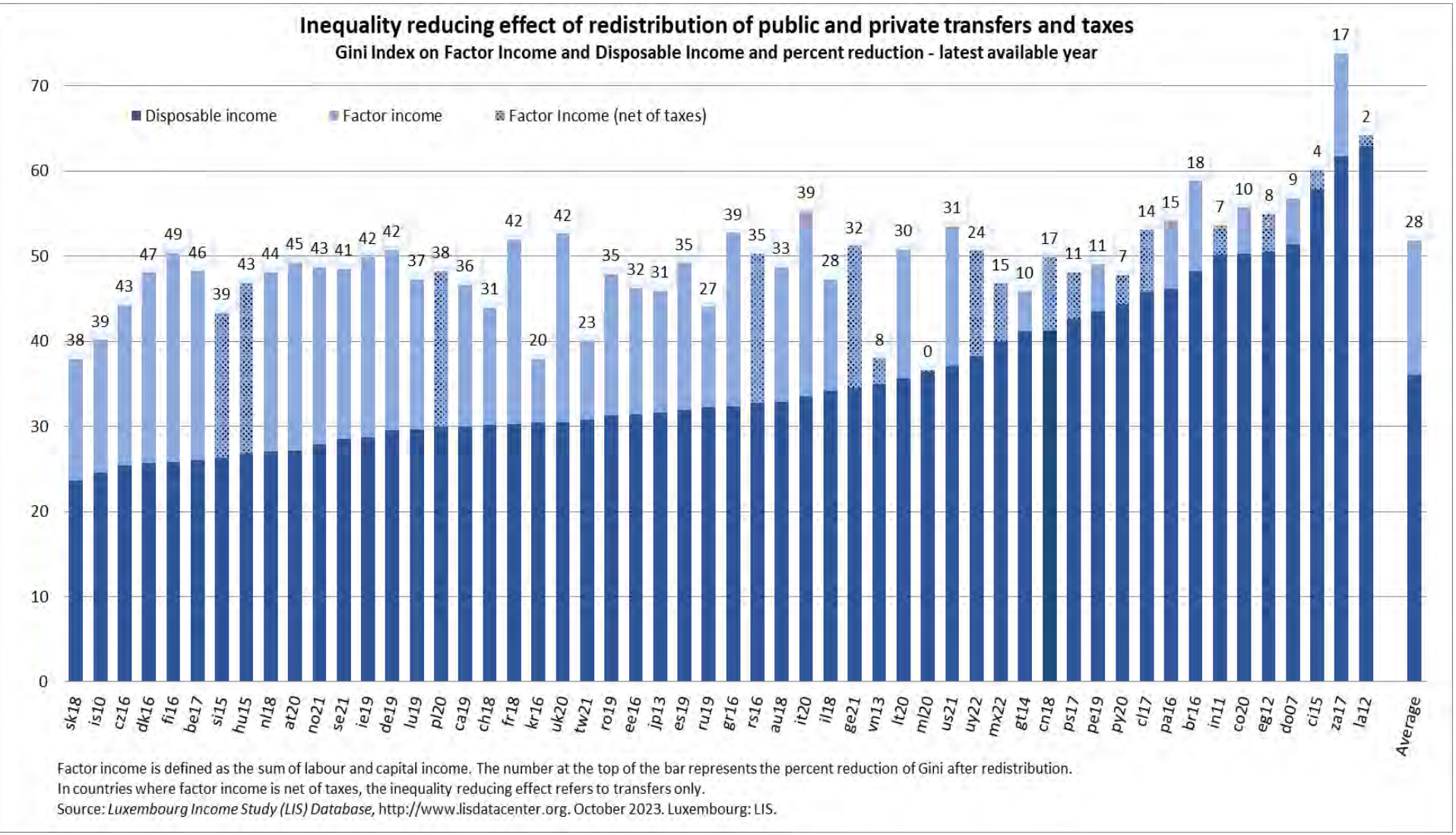
30 countries, approx. 2016, disposable household income, PPP-adjusted dollars, non-elderly households

Source: Luxembourg Income Study (LIS) Database

(Gornick and Johnson, unpublished, 2020)

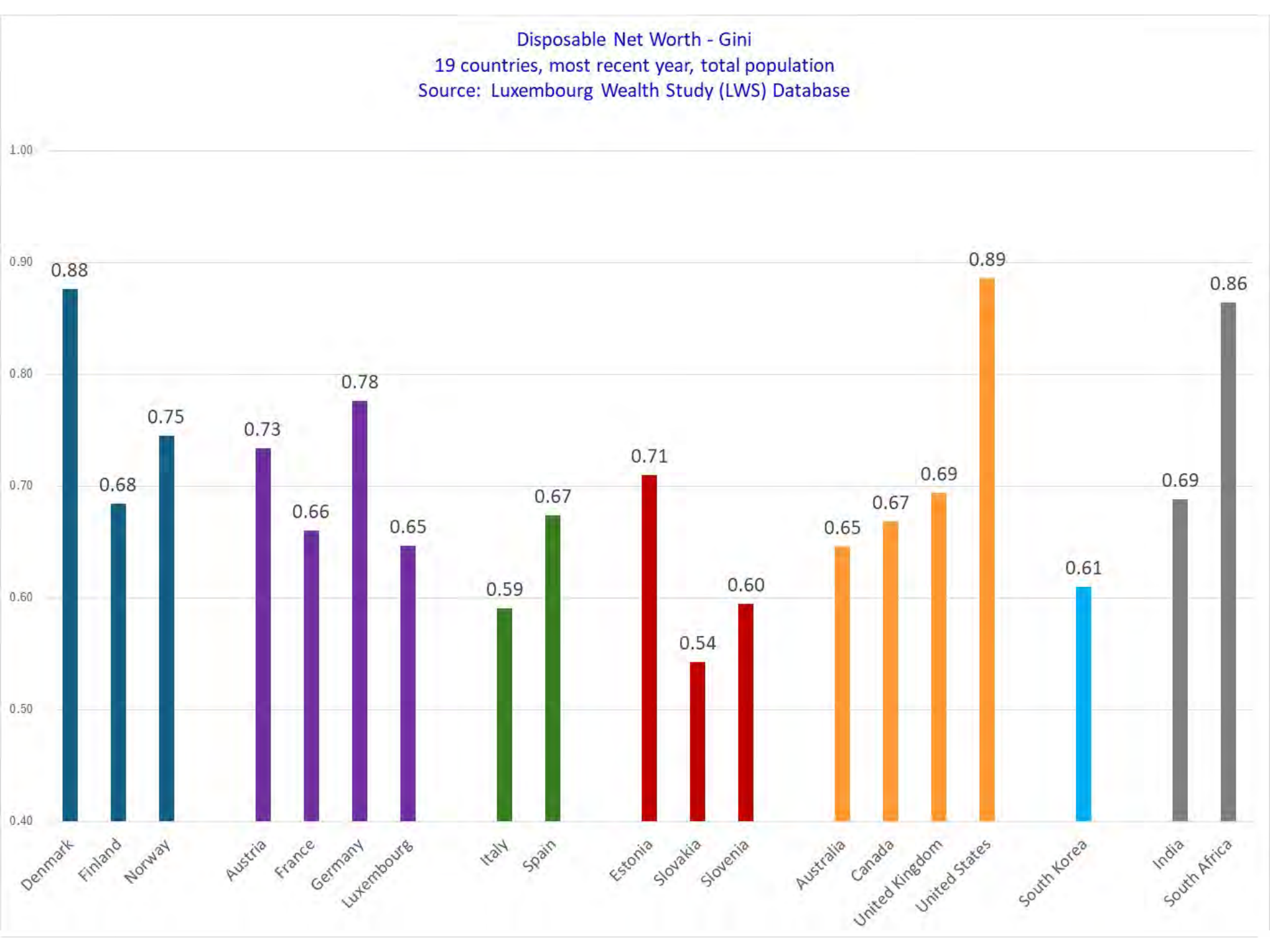


Fiscal Redistribution
53 countries, most recent year, total population
Source: Luxembourg Income Study (LIS) Database
(Figure, thanks to LIS staff)

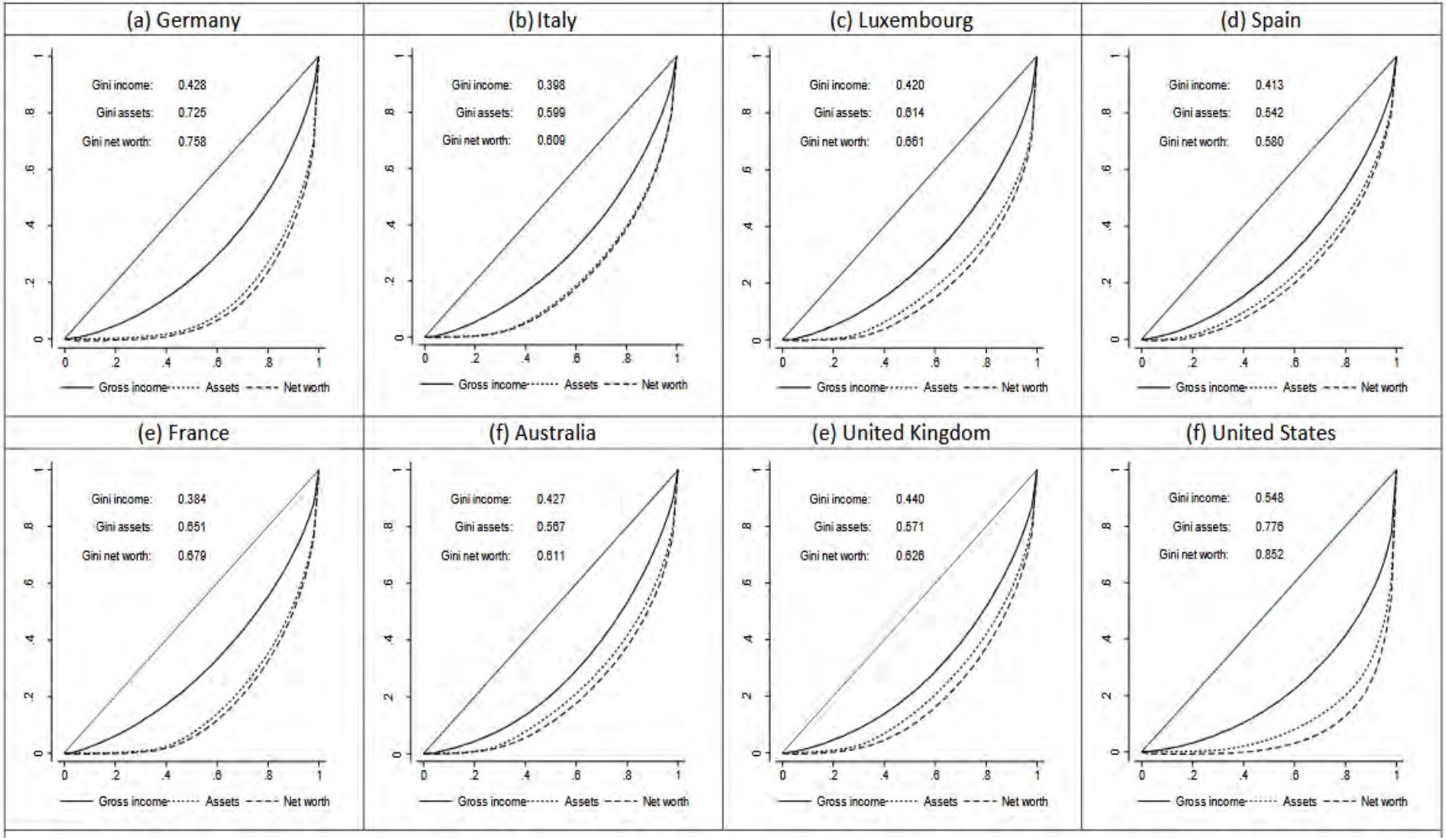


Factor income is defined as the sum of labour and capital income. The number at the top of the bar represents the percent reduction of Gini after redistribution.
In countries where factor income is net of taxes, the inequality reducing effect refers to transfers only.
Source: *Luxembourg Income Study (LIS) Database*, http://www.lisdatacenter.org. October 2023. Luxembourg: LIS.

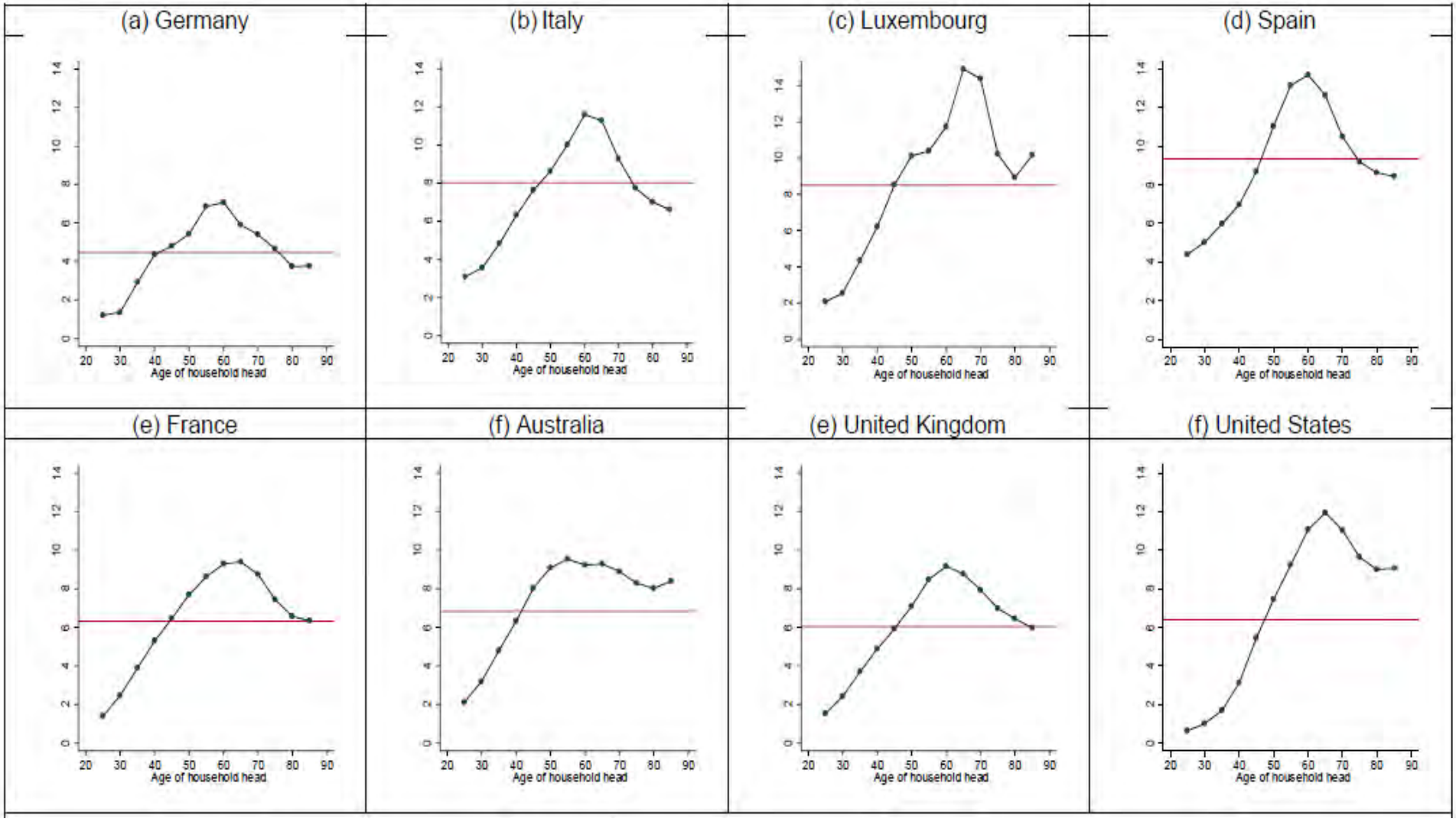
Wealth Inequality


Disposable Net Worth - Gini
19 countries, most recent year, total population
Source: Luxembourg Wealth Study (LWS) Database
1.00
0.90
0.80
0.70
0.60
0.50
0.40
0.88
0.68
0.75
0.73
0.66
0.78
0.65
0.59
0.67
0.71
0.54
0.60
0.65
0.67
0.69
0.89
0.61
0.69
0.86
Denmark
Finland
Norway
Austria
France
Germany
Luxembourg
Italy
Spain
Estonia
Slovakia
Slovenia
Australia
Canada
United Kingdom
United States
South Korea
India
South Africa

Gross Household Income, Total Assets, and Net Worth:
Lorenz curves and Gini coefficients
Source: Luxembourg Wealth Study (LIS) Database
(Figures, thanks to Cowell et al, LWS Working Paper #24)



Average Net Worth
by Age of Household Head
Source: Luxembourg Wealth Study (LIS) Database
(Figures, thanks to Cowell et al, LWS Working Paper #24)



Microdata combined with external data

Three main approaches

A. macro-macro
B. macro-micro
C. micro-micro

Microdata combined with external data

A. “macro-macro”

mainly, pooled time-series-cross-sectional (PTSCS) models

LIS microdata aggregated,
for either dependent or independent variables

Example: work by Brady and Leicht *(Research in Social Stratification and Mobility,* 2015*)*

"We utilize an unbalanced panel research design of 16 affluent Western democracies from 1969 to 2000 where the unit of analysis is a country-year." (N=81)

(They examine the impact of cumulative right power on three measures of inequality.)

Table 5. Random Effects Models of Labor Market Inequality on Cumulative Right Party Power with First and Second Models of Table 3 in 16 Affluent Western Democracies (N=81).

	Gini		*90/10 Ratio*		*90/50 Ratio*	
Cumulative Right Party Power	.230*** (3.26)	.305*** (7.66)	395.396*** (2.99)	418.413*** (3.00)	.993*** (3.26)	1.031*** (3.30)
BIC′	-33.304	-60.589	-19.723	-16.567	-55.604	-53.526
R^2 Within	.738	.631	.298	.300	.718	.719
R^2 Between	.634	.940	.702	.712	.771	.785
R^2 Overall	.654	.766	.591	.597	.738	.745

*** p<.01 ** p<.05 * p<.10 (two-tailed tests)

Notes: The dependent variables are multiplied by 100. Labor market inequality is measured as gross income minus state social transfers for households headed by 25-59 year olds. The unstandardized coefficient and t-score in parentheses are displayed. The independent variables from the first and second models in Table 3 are included but not shown. Independent variables are lagged one year.

Example: work by Huber, Petrova, and Stephens (*LIS WP 750,* 2018)

"Depending on data availability, we use 18 (top 1% data) to 21 (Gini data) countries over 51 years, with different time periods for different variables." (N varies across models, 211-498)

(They assess the impact of the size of the financial sector on various measures of inequality.)

Table 2. Determinants of Inequality

	Model 1		Model 2		Model 3		Model 4	
	Top 1% share				Market Income Gini among the working age population			
Value added in Finance	.208	**			.515	***		
Employment in finance			-.297				.738	
Secular center and right government	.083	***	.114	***				
Union density	-.045	***	-.039	***	-.091	*	-.144	**
Centralizations of unions and bargaining	-2.073	*	-1.844	*				
Powers of works councils	.211		.451					
Veto points	.239		.130					
Stock market capitalization	.006	**	.007	**	.009	*	.008	*
GDP per capita	.115	***	.106	***				
Unit of Analysis = Individuals	1.166	**	.534					
Unemployment					.414	***	.648	***
% of children living in single mother households					.693	***	.616	**
Industrial employment					.287	^	.343	^
Education Spending					.037		-.227	
Employment as a % of the working age population					-.252	***	-.077	
Constant	2.494		4.091		42.794	***	31.951	***
Common ρ	.90		.90		.90		.90	
R^2	.82	***	.83	***	.77	***	.78	***
Observations	498		490		223		211	

Microdata combined with external data

B. “macro-micro”

multi-level models

LIS data (households or persons) nested in countries
to assess “effect” of country-level variables on
micro-level outcomes and/or micro-level slopes

Example: work by Brady, Blome, and Kmec (*Socio-Economic Review*, 2020)

"We estimate multi-level models of individuals nested in a cross-section of 21 rich democracies…"
(They analyze the relationship between two work-family policies and seven labor market outcomes.)

Table 4. Multilevel Logistic Regression Models of Being a Manager Among Employees Aged 25-54: Coefficients and (Z-scores).

	M1: Female Cross-Section	*M2: Female Cross-Section*	*M3: Female & Male Cross-Section*	*M4: Female Panel*	*M5: Female Panel*	*M6: Female & Male Panel*
Paid leave	-.019	-.018	-.016	-.120**	-.088**	-.093**
	(-1.51)	(-1.46)	(-1.74)	(-6.16)	(-4.64)	(-3.36)
Paid leave^2	.0001	.0001	.0001	.0007**	.0005**	.0005**
	(1.66)	(1.66)	(1.94)	(6.58)	(4.94)	(3.49)
Childcare Coverage	-.016	-.017	-.006	.088**	.040**	.060**
	(-1.42)	(-1.43)	(-.71)	(4.36)	(2.66)	(3.29)
Mother		-.114			-.208**	
		(-1.29)			(-2.96)	
N	134,839	134,839	285,308	137,801	137,801	302,284
# Countries	21	21	21	12	12	12

Notes: All models control for education, marital status, age and age-squared, number of children (except models 2 and 5), child under 5, and employment of other household member. Models 1 and 4 control for country-level unemployment rate and wage coordination. Panel models include fixed effects for countries and decades, and interactions between country fixed effects and children or female.
* p<.05, ** p<.01

Example: work by Boeckmann, Misra, and Budig (*LIS WP 594*, 2013)

"… we use multi-level models to model individual-level and country-level characteristics simultaneously."
(They analyze the effect of childcare policies and cultural attitudes on the motherhood gap in employment probabilities.)

Country-Level Covariates and Cross-Level Interactions

Enrollment of 0-2 Yr. Olds	-.005											
	.008											
Mother * Enroll. 0-2 Yr Olds	.024	***										
	.003											
Enrollment of 3-5 Yr. Olds			.007									
			.006									
Mother * Enroll. 3-5 Yr Olds			-.004	*								
			.002									
Leave Generosity					.007	*						
					.003							
Mother * Leave Gen.					.000							
					.001							
Max. Length of Leave							.003	+				
							.001					
Mother * Length of Leave							-.003	***				
							.000					
Preference Measure A*									-.041	**		
									.014			
Mother * Pref. Measure A*									.039	***		
									.004			
Preference Measure B*											-.020	*
											.008	
Mother * Pref. Measure B*											.025	***
											.002	
Intercept	-.645	***	-1.142	**	-.856	***	-.825	***	-.195		-.019	
	.136		.440		.137		.163		.197		.274	
N	71637		71637		71637		71637		70664		70664	

Note: Standard errors in parentheses; + p<0.10, * p<0.05, ** p<0.01, *** p<0.001, two-tailed test

*Preference Measure A = % of Respondents preferring maternal full-time employment when children preschool aged

*Preference Measure B = % of Respondents preferring maternal full-time employment when children school aged

Microdata combined with external data

C. “micro-micro”

statistical matching models

LIS/LWS microdata can be matched/merged

with other micro-data

(note: LIS/LWS data may be the “donor” or the “host”)

Example: work by Paradowski and Flynn (LWS WP 19, 2015)

"This paper employs individual-level data from the American National Election Studies (ANES), the Comparative Study of Electoral Systems (CSES), and the Luxembourg Wealth Study Database (LWS)."
(They assess the influence of wealth, as a proxy for class, on voting behavior.)

Table 3. Determinants of Vote Choice for Left Party, Probit Regression

	United States		Sweden		Germany	
	Model 1	Model 2	Model 1	Model 2	Model 1	Model 2
Wealth	-0.103***	-0.060***	-.0.54*	-0.013	-0.048**	0.019
	(0.01)	(0.02)	(.03)	(0.03)	(0.40)	(.03)
Income		-0.060***		-0.025		-0.086***
		(.020)		(0.03)		(0.03)
Partisanship (base category		1.394***		0.407***		0.146*
independent): Left		(0.06)		(0.10)		(0.08)
Partisanship (base category				-0.120		-0.196**
independent): Center				(0.18)		(0.09)
Partisanship (base category		-1.445***		-0.257*		-0.088
independent): Right		(0.06)		(0.14)		(0.20)
Business owner		0.131*		0.019		-0.007
		(0.07)		(0.15)		(0.16)
Age		-0.145***		-0.146**		-0.022
		(0.04)		(0.07)		(0.06)
Gender (female=1)		0.054		0.012		0.046
		(0.05)		(0.09)		(0.07)
Employment status		-0.068		-0.067		-0.241***
(employed=1)		(0.07)		(0.19)		(.09)
Retirement status (retired=1)		0.027		0.054		-0.331**
		(0.10)		(0.23)		(0.13)
Year (base category 1996): 2000		-0.303***				
		(0.07)				

Example: work by Ragnarsdottir, Kostecki, Gornick (*European Sociological Review*, 2023)

"The authors use data from the Harmonized European (HETUS) and American Time Use Surveys (ATUS), combined with income data from the Luxembourg Income Study (LIS) Database."

(They assess various distributional outcomes using an extended income definition.)

Table 3. Market earnings, extended earnings (means); ratio of extended to market earnings

	Market earnings	Extended earnings	Ratio of extended to market earnings
Women			
Finland 2010	22,675	36,660	1.62
France 2010	19,544	32,929	1.68
Germany 2010	15,642	40,087	2.56
Italy 2010	11,286	28,435	2.52
Spain 2010	19,853	31,055	1.56
United Kingdom 2010	18,547	33,466	1.80
United States 2010	27,181	38,419	1.41
Cross-country averages	19,247	34,436	1.88
Men			
Finland 2010	30,525	38,619	1.27
France 2010	29,073	36,227	1.25
Germany 2010	38,091	52,564	1.38
Italy 2010	16,132	22,404	1.39
Spain 2010	26,454	31,699	1.20
United Kingdom 2010	33,819	41,839	1.24
United States 2010	48,986	55,664	1.14
Cross-country averages	31,869	39,859	1.26

Notes: Pertains to women and men aged 25–59. Includes persons employed full time, part time, or not at all. Zeros are included. Earnings from paid work are net of income taxes and social contributions. Earnings expressed in PPP-adjusted 2014 US dollars. Cross-country averages are unweighted.